

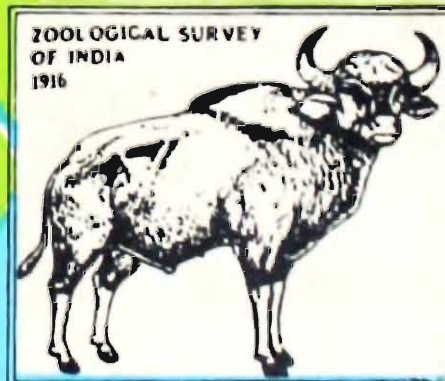
STATE FAUNA SERIES 3

FAUNA OF WEST BENGAL

PART-7

ZOOLOGICAL SURVEY OF INDIA

1997



FAUNA OF WEST BENGAL

PART - 7

INSECTA

(Diptera and Lepidoptera)

Edited by
The Director
Zoological Survey of India, Calcutta



ZOOLOGICAL SURVEY OF INDIA
1997

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Published : July, 1997
ISBN 81-85874-03-4

Project Co-ordinator
Dr. A. K. Ghosh

	Price
Inland	: Rs. 1200.00
Foreign	: \$ 70 £ 50

Production
Publication Division, Zoological Survey of India, Calcutta.

Printed at PRESTECH, 39, Mahatma Gandhi Road, Calcutta 7000 82 and Published by the Director,
Zoological Survey of India, Calcutta.

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1997

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INSECTA : DIPTERA

M. DUTTA, P. PARUI AND M. MUKHERJEE
Zoological Survey of India, Calcutta

INTRODUCTION

West Bengal, a State in the eastern India, lies approximately between 86°35' and 89°35' E longitudes and 21°31' and 27°14' N latitudes, under the Tropic of Cancer. It can be considered "India in a miniature form", because it coins all major physiographical features of India as a whole. It rises from the sea-level at the Bay of Bengal to a maximum elevation of over 3650 m at the mountain ranges of Sandakphu and Phalut in the Himalaya.

The entire Darjiling District and a part of the Jalpaiguri District cover the lofty mountains and hills down to the Terai, with sub-temperate and sub-tropical climate. The submontane region includes the rest of the Jalpaiguri District and the District of Koch Bihar, with sub-tropical to tropical climate. The Puruliya District, the major parts of the Bankura and Birbhum Districts, the western part of the Bardhaman District and the north-western part of the Medinipur District are essentially a projected region of the Chotanagpur Plateau from Bihar with semi-arid tropical climate. The southern part of the Medinipur District and the 24-Parganas District from the coastal region, with moist tropical climate as in the remaining parts of the plains in the State. Owing to this tremendous diversity in the physiography, the State has had its variegated assemblages of flora and fauna of special interest.

The Diptera fauna of West Bengal is fairly known and the large part of the credit goes to a number of renowned dipterists working in the age-old Indian Museum/Zoological Survey of India and the School of Tropical Medicine located at Calcutta, apart from certain workers in Colleges, Universities and other premier institutes in the State as well as in the country. Moreover, from the times immemorial, there are gracious contributions from foreign workers who were fond of visiting "Bengal", especially Darjiling, the queen of the hill-stations in India. References to such works are cited under each family in the text.

Recently, several collecting trips were conducted districtwise by this institute for addition and revaluation of the fauna in West Bengal in aid of our comprehensive knowledge. Such trips that brought the Dipterous material for this report are enumerated below along with that of earlier days.

BANKURA	M. Dutta	1985 (October)
BARDDHAMAN	S. K. Ghosh	1985 (October)
	B.N. Das	1985 (December)
CALCUTTA	A. P. Kapur	1959 (December)
	S. Ali	1965 (January)
	B. Chakraborty	1965 (January)
	K. D. Chatterjee	1965 (August)
	O. B. Chhotani	1965 (October)
	A. N. T. Joseph	1969 (February)
	S. K. Gupta	1982 (April)
	P. Parui	1988 (November)

DARJILING	H. S. Sharma	1973 (April)
	B. C. Nandi	1975 (April)
	A. N. T. Joseph	1978 (September)
	M. Prasad	1979 (July-August)
	A. K. Hazra	1986 (March)
	B. C. Das	1986 (April)
	R. C. Basu	1986 (April)
HAORA	K. R. Rao	1965 (October) & 1967 (November)
	A. N. T. Joseph	1967 (August)
	P. Parui	1967 (November)
HUGLI	K. D. Chatterjee	1961 (October)
	A. N. T. Joseph	1964 (November)
	K. R. Rao	1964 (November)
	M. S. Shisodia	1965 (August)
JALPAIGURI	S. Chattopadhyaya	1984 (December)
	M. Datta	1986-1987 (December-January)
	S. K. Tandon	1987 (October)
KOCH BIHAR	S. Chattopadhyaya	1985 (October)
	R. S. Barman	1986 (December)
MALDA	K. P. Mukherjee	1987 (June)
MEDINIPUR	B. C. Das	1985 (August)
	S. Biswas	1985 (September)
NADIA	B. C. Nandi	1974 (August)
	B. N. Das	1985-1986 (December-January)
	A. R. Lahiri	1986 (January-February)
		1986 (November)
PURULIYA	M. Datta	1985 (November)
	S. Sen	1985 (November)
	B. C. Das	1986 (July)
24-PARGANAS	A. Suroto	1955 (December)
	S. Ali	1955 (December) & 1960 (January)
	R. K. Varshney	1962 (January)
	K. K. Ray	1965 (August)
	K. R. Rao	1965 (December)
	A. N. T. Joseph	1966 (December)
	N. K. Pramanik	1977 (November)
	P. Parui	1986 (January)
	B. N. Das	1986 (March)
	M. Mukherjee	1988 (February)

An attempt is made here to report the material comprising families : Tipulidae, Psychodidae, Bibionidae, Stratiomyidae, Tabanidae, Bombyliidae, Syrphidae, Micropezidae, Otitidae, Sciomyzidae, Sepsidae, Chloropidae, Ephydriidae, Hippoboscidae, Muscidae, Calliphoridae and Sarcophagidae. The families Simuliidae and Asilidae are, however, dealt with separately. Finally, a few old collections from the State reported elsewhere recently are only referred to this paper, barring citation of the same material once again.

The species recorded for the first time from West Bengal are marked with a single asterisk, and double, if it is from India.

MATERIALS AND METHODS

The diptera are a large and diverse group of insects inhabiting almost all possible situations. Nearly the half of Diptera in their immature stages live in water. Collecting in the vicinity of water where adults are most likely to occur, is, therefore, most profitable. Sweeping by an insect net (with fine white cloth) through a site of grass, herbs, shrubs or tree-tops along the sides of water-bodies or in crop-fields or even in the forest is the general method of acquiring a great number of specimens in the shortest possible time. The other ideal spot for collection is the animal-farms where several groups of Diptera breed or live on animals or on their excrements. Such sweeping by a net or picking single specimens on animals, walls, windows, tree-trunks, large leaves and so on will also yield good catches.

The Dipterous specimens are very delicate and fragile and so a careless touch easily removes the pubescence, wings and legs or even the entire head. It is, therefore, imperative to take away specimens from the net after sweeping only once or twice.

The perfect condition of specimens depends not only upon careful sweeping but also upon cautious killing and taking out of the net. After sweeping, the contents of the net are pushed to the bottom by means of gentle flying in the air for sometime and then pinching the net with the hand, the bottom with the contents is driven in the killing jar (glass jar having at the bottom a layer of cotton soaked with Chloroform and Benzene lined by a cover of blotting paper) and is kept for sometime allowing the insects to die. Thereafter, the net is taken out and spread on the ground for picking up the dead specimens in the insect envelopes by means of a hair-brush or a light forceps (leave for holding wings only). The specimens must accompany the collection-data, *i.e.*, place of collection, altitude, nature of habitat, date of collection, name of collector etc. written with a pencil. The specimens in the envelopes are then dried in the sun and are temporarily preserved in the paper/cardboard box containing naphthalene powder/balls as fungicide.

In the laboratory, the specimens in the envelopes are kept above a layer of phenol solution at the bottom of a desiccator-like container for 2-3 days at normal temperature, mainly for softening the body-parts in aid of perfect stretching and mounting on pins on the pinning board. The tiny insects are preferably mounted on paper cones. After about a week, the set specimens along with the nicely written data-labels attached to pins, are removed in the insect box containing cotton-balls soaked with phenol solution at four corners for final preservation and studies. If any part of a specimen requires examination, that part is severed from the body upon softening and cleared in phenol solution. It should strictly be borne in mind that the part whether mounted on slide or preserved in a microvial is to be kept with the specimen with an appropriate reference to successive workers. For further details and comprehensive knowledge on mounting and preservation, the reader is referred to Brunetti (1912b).

MORPHOLOGY AND TERMINOLOGY

The Diptera (Fig. A) structurally comprise the most highly specialized members of the Class Insecta. Nearly all parts of the head, thorax and abdomen exhibit a wide diversity and are important in taxonomy.

The head (Fig. G) is occupied by two large compound eyes which are, as a rule, larger in males than in females. The space between the eyes is the frons or front. The eyes are generally contiguous in males (holoptic) and are markedly separated by the frons in females (dichoptic); rarely both the conditions are found in both sexes. The upper facets are larger and more prominent than the lower ones in males of some species; this condition is rarely seen in females. The upper part of the frons is the vertex and below it are often three small simple eyes called the ocelli, occasionally on a triangular depressed space. Besides this ocellar triangle (vertical triangle) there is in the holoptic condition another triangle called the frontal triangle below the eyes above the antennae. The space demarcated by the frontal suture (absent in Orthorrhapha and Aschiza) is the face bounded laterally by the facial ridges or facialia which carry vibrissae at lower extremities. The frontal suture is actually the consequence of invagination of a frontal sac or pilinum used for emergence from the puparium. There is a crescentic sclerite known as the frontal lunule above the bases of the antennae in the Cyclorrhapha. The genae or parafacialia or cheeks are the spaces on either side of the face anterior to eyes. The upward continuations of the genae are parafrontals, while lower ones are jowls. The sclerite anterior to the face is the clypeus.

The antennae offer very important characteristics for classification of Diptera. The antenna consists of scape, pedicel and flagellum, the latter typically of a variable number of nearly similar cylindrical segments in the Nematocera (Fig. B). In the Brachycera (Figs. C & D) and especially in the Cyclorrhapha (Fig. G), it is 3-segments and carries apically an annulated or jointed appendage. In the Brachycera, it is called style which is always terminal in position. In the Cyclorrhapha, it is very slender and is called arista which is usually dorsal in position.

The mouthparts of Diptera are highly modified in adaptation to diverse habits. The mandibles in Diptera are generally absent and the maxillae are generally incomplete but the palpi are well-developed and consist of 4 segments or are reduced to single segmented appendages. The labium forms the proboscis which is often used in identification of certain species. The mouthparts in the Cyclorrhapha, however, show the highest modifications in forming the proboscis.

Moreover, the chaetotaxy in the head as well as in the thorax carries tremendous value in identification specially in the Cyclorrhapha. The names of the hairs, setae or bristles are derived from the seat or state of occurrence.

The thorax (Figs. H & I) is characterized by the great development of its median segment, the mesothorax and the consequent reduction of the prothorax and metathorax. The mesonotum is distinctly divisible into prescutum, scutum, scutellum and postnotum, although the latter being greatly modified in the higher Diptera. The transverse suture completely or incompletely separates the scutum from the prescutum. There are certain swellings called calli or callosities on either side of the mesonotum. The humeral callus occupies the antero-dorsal corner of the prescutum, the prealar callus above the wing-base, and the postalar callus on the postero-dorsal corner of the scutum. Generally, both the protonotum and the metanotum are hidden by the overlying prescutum and scutellum. The sides of the thorax (pleurae) in most Diptera are clearly divisible by sutures. The three main sutures recognized are : (1) the notopleural suture running from the humeral callus to the wing-base and separating the

mesonotum from the pleuron; (2) the sternopleural suture running below the notopleural suture separating the mesopleura (dorsal part of mesepisternum) from the sternopleura or katepisternum (ventral part of mesepisternum); and (3) the mesopleural suture passing downwards from the wing-base to the mid-coxa and separating the mesopleura from the pteropleura (dorsal part of mesepimeron). The metapleura lie behind the pteropleura and below the metapleura lie the hypopleura.

The Diptera, with the exceptions of apterous and subapterous forms in certain families, have a pair of wings (Figs. L, M N & O) with unique characteristics. The shape of the wing and the disposition of its veins, cells and pubescence have great taxonomic value. The Costa (C) occupies the fore margin of the wing and the sub-costa (Sc) is connected with the Costa nearly at its base by a short humeral cross-vein (h). The Radius (R) divides into two the first branch (R₁) runs to the margin and the second branch, the prefurca (occasionally used) or the Radial sector (Rs) typically divides into four veins (R₂-R₅). But all these branches are not always distinctive due to coal scence and abolition of certain branches. Thus, in the Nematocera, Rs gives rise to distinct R₂ and R₃, while in some Brachvera Rs is 3-branched with R₄ and R₅. In other Brachycera and also in the Cyclorrhapha, Rs is 2-branched. A most important cross-vein called anterior or radio-median cross-vein (r-m) extends from the radius to the media, above the discal cell (R₂). The Media (M) divides twice, giving rise to four branches M₁-M₄, occasionally with the coalescence of adjacent veins in the higher Diptera. In case of Cubitus (Cu), vein Cu₁ is a atrophied and of Anal vein (A), veins 2A and 3A are much reduced. Another important cross-vein called posterior or medio-cubital cross-vein (m-cu) connects the media to the cubitus.

The cells of the wing are named from the veins anterior to them. Thus, the cell behind the costa is the costal cell; the cell behind the subcosta, the subcostal cell; the cell behind the vein R₁, the R₁ (marginal) cell and so on. The cell behind the vein R₂, is the R₂ (submarginal) cell, if the vein is not forked, and if it is forked, there are two submarginal cells. The cell inside the anterior cross-vein is the basal cell 1 and the one outside is the posterior cell 1. The number of the posterior cells depends upon the forking of vein R₅.

Besides these veins and cells, presence or absence of pubescence or its nature bears taxonomic value.

The halteres (Fig. 1) in the Diptera are the modified second pair of wings and consist generally of a narrow stem and a broad oval knob or capitellum.

The hind margin of the wing (Fig. N) is produced basally as a free lobe called alula and there are often one or two additional lobes referred to as squamae (calypters) on the inner side of the alula.

Besides the colouration, the pairs of the legs (Fig. F) also bear some taxonomic value. The prepectal bristle on the outer side of the tibiae in many Acalypteres and tibial spurs in certain Diptera call for considerable importance. Similarly, the feet with pulvilli or arolium or claws may be characteristic.

In Diptera, the number of abdominal segments are mostly difficult to ascertain because of great modifications of terminal segments forming the genitalia (Fig. P). The male genitalia (hypopygium) (Fig. J) include claspers comprising coxite and style, and an aedeagus with accessory structures lying between sterna 8 and 9, while in the female genitalia, segments 6-10 take part in the formatin of the ovipositor with the accessory structures. The male genitalia in the Diptera afford most reliable characters in the species determination.

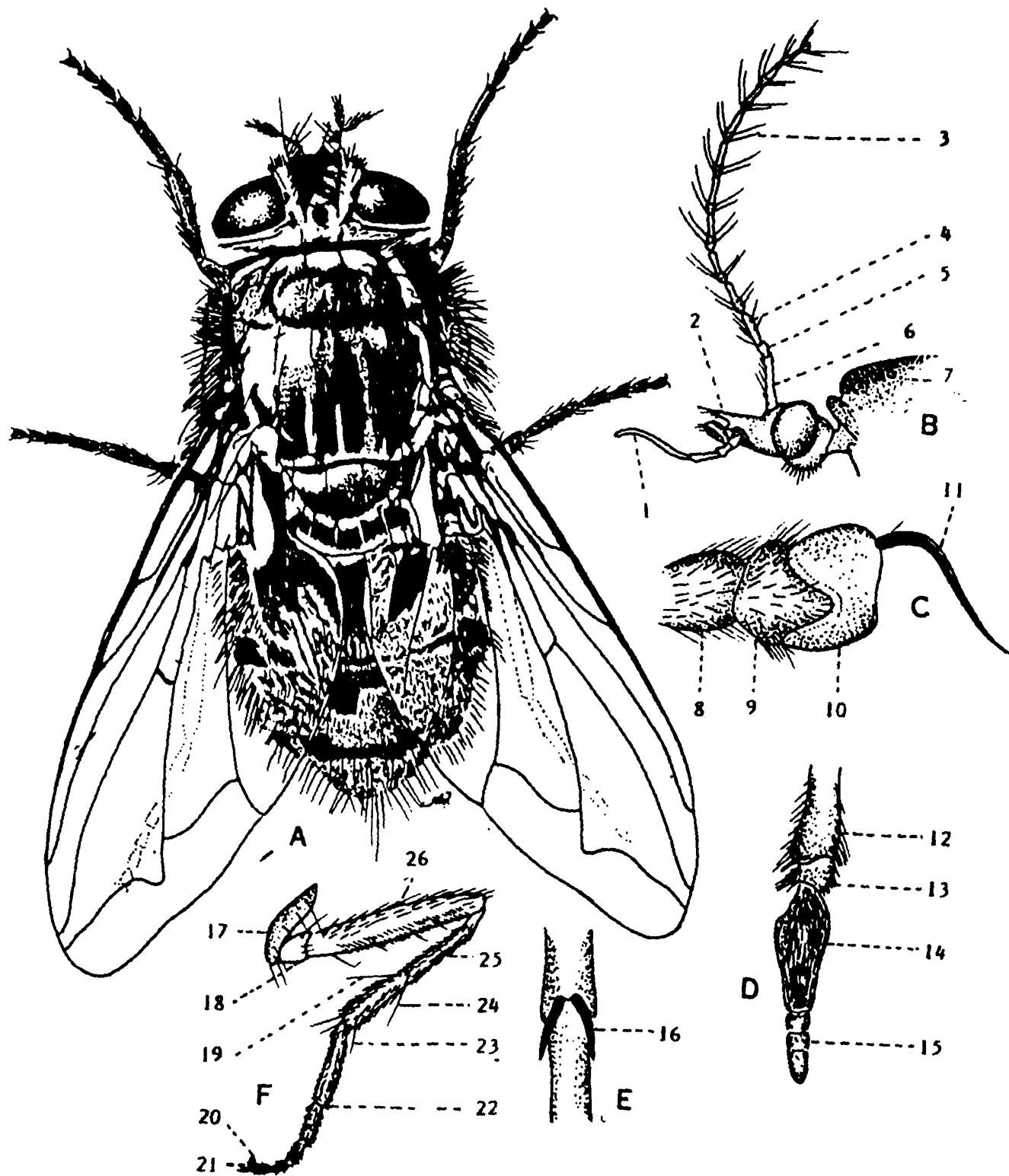


Fig. A. A muscid fly (dorsal view); B Head and anterior part of thorax of *Tipula* (lateral view); Fig. C. Antenna of *Ptecticus* (inner view); Fig. D. Antenna of *Haematopota* (lateral view); Fig. E. Hind tibia of *Chrysops* (dorsal view); Fig. F. Left mid-leg of a muscid fly (anterior view).

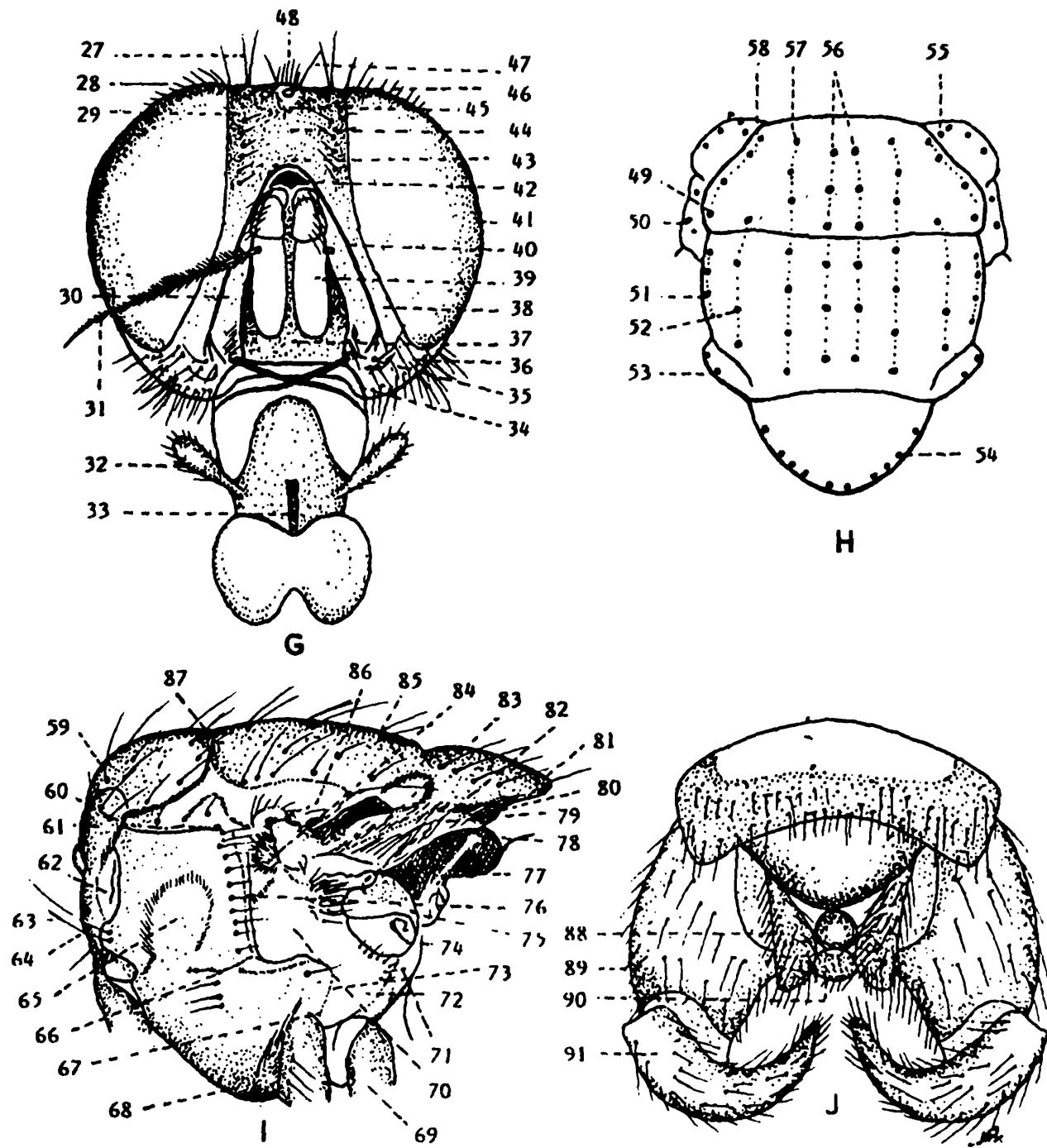


Fig. G. Head of a female muscid fly (front view); Fig. H. Thorax of a calliphorid fly (dorsal view); Fig. I. Thorax of a calliphorid fly (lateral view); Fig. J. Male genitalia of *Penthetria japonica* Wied. (dorsal view).

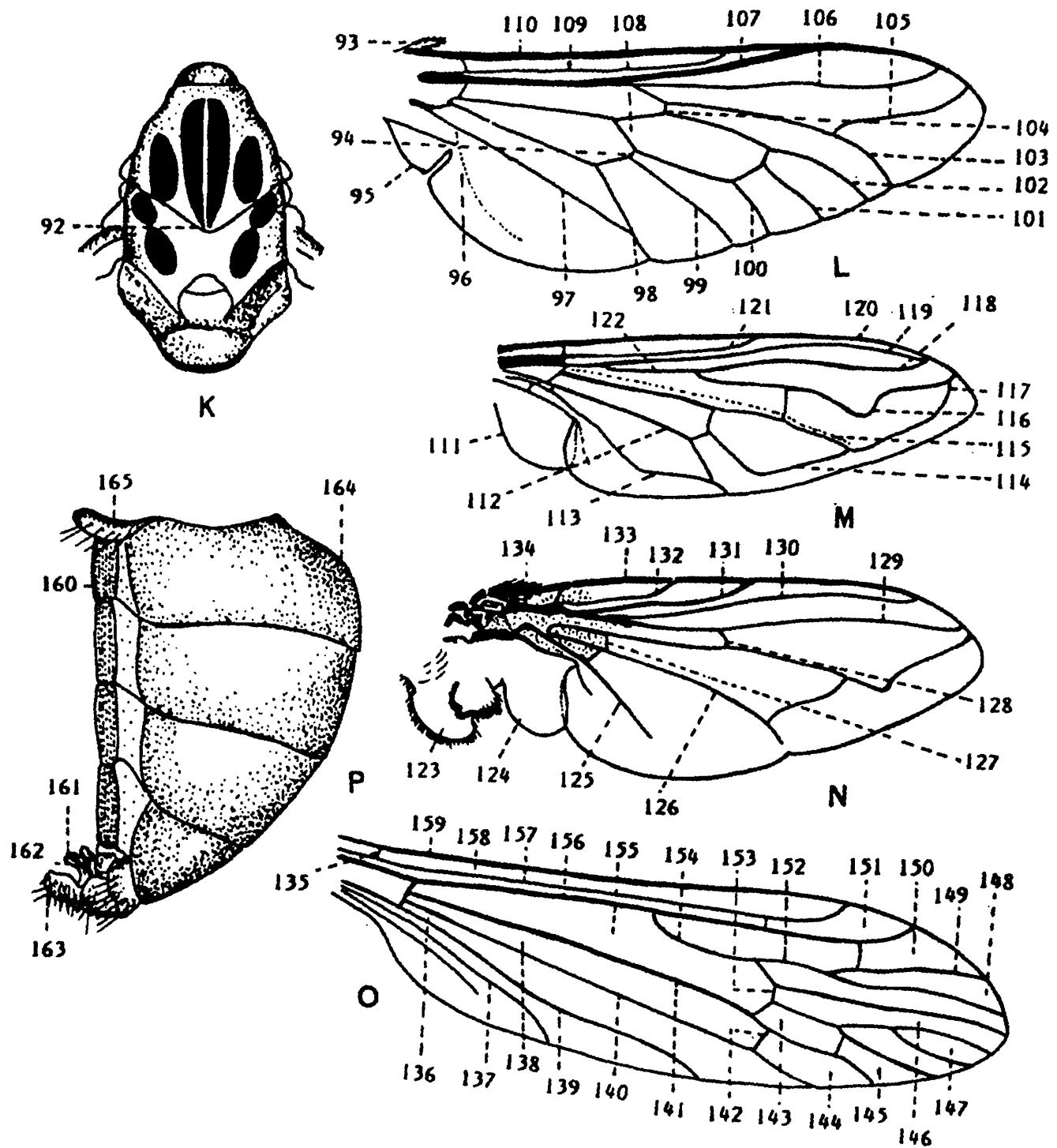


Fig. K. Thorax of *Holorusia ornatithorax* (Brunetti) (dorsal view); Fig. L. Wing of *Tabanus*; Fig. M. Wing of *Eristalinus*; Fig. N. Wing of *Calliphora*; Fig. O. Wing of tipulid fly; Fig. P. Abdomen of male muscid fly.

Following are the essential terminologies. The letters and numerals in parentheses represent these terminologies in the illustrations (Pages6-8) as well as in the text.

Abdomen (P)	Acrostichal bristle (56)
Aedcagus (90)	Alula (95, 111, 124)
Anal cell (136)	Anal vein or A (96, 97, 113, 125, 137, 139)
Ancpisternum (65)	Antenna (4, 39)
Anterior cross-vein (104, 128, 153)	Antero-ventral seta or av seta (19)
Arista (11, 31)	
Basal cell 1 (155)	Basal cell 2 (138)
Basicosta (93)	Basistyle (89)
Basitarsus (23)	
Calli or callosities (1)	Calypter (79, 123)
Capitellum (1)	Cell (L, M, N, O)
Cerci (88)	Check (38)
Clasper (91)	
Claw (20)	Clypeus (34)
Costa (110, 120, 133, 159)	Costal cell (158)
Coxa (17)	Cosite (89)
Cross-vein (L, N, N, O)	Cubitus or Cu (112, 126, 140)
Cu ₁ + 1A (98)	
Dochoptic (G)	Discal cell (108, 143)
Dististyle (91)	Dorsocentral bristle (57)
Epandrium (163)	Epistome (34)
Eye (41)	
Face (37)	Facial ridge (30)
Facialia (30)	Femur (26)
Flagellum (10, 14)	Frons (43)
Frontal lunule (42)	Frontal stripe (44)
Frontal suture (40)	Fronto-orbital bristle (29)
Gena (38)	Genitalia (J)
Haltere (77)	Head (G)
Hind coxa (69)	Humeral bristle (55)
Humeral callus (61)	Humeral cross-vein (135)
Hypopleuron (72)	Hypopygium (J)
Inner forceps (161)	Intra-alar bristle (52)
Jowl (36)	

- Katepisternum (68)
 Labrum (33)
 Marginal cell (150)
 Media or Medial vein or M (141)
 Medial vein 1 & 2 or M_{1+2} (117)
 Medial vein 3 or M_3 (100)
 Medial vein 3 & 4 or M_{3+4} (114)
 Mesepimeron (I)
 Mesonotum (I)
 Mesopleuron (65)
 Metapleuron (71)
 Metathoracic spiracle (74)
 Naus (2)
 Notopleural suture (60)
 Ocellar bristle (47)
 Ocelli (46)
 Outer forceps (163)
 Palpi (1, 32)
 Paramere (162)
 Phallosome (90)
 Posterior cell 1 (146)
 Posterior cell 4 (145)
 Posterior cross-vein (94, 127, 142)
 Post-humeral bristle (58)
 Post-ocular bristle (28)
 Pre-alar callus (84)
 Pre-genital (P)
 Prescutum (7, 59)
 Presutural dorso-central bristle (57)
 Propleuron (64)
 Prothoracic spiracle (62)
 Pteropleuron (70)
 Radial sector or R_s (122, 154)
 Radial vein 2 & 3 or R_{2+3} (106, 118, 130)
 Radial vein 3 & 4 or R_{3+4} (152)
 Knob (78)
 Leg (F)
 Maxillary palpus (1, 32)
 Medial vein 1 or M_1 (102)
 Medial vein 2 or M_2 (101)
 Medial vein 4 or M_4 (99)
 Medio-cubital cross-vein or m-cu (94, 127, 142)
 Mesepisternum (I)
 Mesopleural suture (76)
 Metanotum (80)
 Metatarsus (23)
 Notopleural bristle (50)
 Notopleuron (50)
 Ocellar triangle (945)
 Orbital bristle (29)
 Parafacialia (38)
 Pedicel (5, 9, 13)
 Post-alar bristle (53)
 Posterior cell 2 (147)
 Posterior cell 5 (144)
 Postero-ventral or pv seta (24)
 Postnotum (80)
 Post-ventral bristle (48)
 Pre-furca (154)
 Prescutellum (85)
 Presutural bristle (49)
 Propleural bristle (I)
 Prostigmatic bristle (63)
 Prothorax (I)
 Pulvilli (21)
 Radial vein 1 or R_1 (107, 119, 131)
 Radial vein 3 or R_3 (149)
 Radial vein 4 or R_4 (104)

Radial vein 5 or R ₅ (103)	Radial vein 4 & 5 or R ₄₊₅ (116, 129)
Radio-median cross-vein or r-m (104, 128, 153)	Radius or radial vein (156)
Scape (6, 8 12)	Scuteller bristle (54)
Scutellum (81)	Scutum (85)
Squama (79, 123)	Stem-vein (134)
Sternopleural bristle (73)	Sternopleural suture (66, 67)
Sternopleuron (68)	Sternum (160)
Style (15)	Subcosta or Sc (109, 121, 132, 157)
Subcostal cell (151)	Submarginal cell 1 (148)
Superior forceps (163)	Supra-squamal ridge (83)
Surstyle (91)	Suture (K)
Tarsal claw (20)	Tarsus (22)
Tergum (164)	(Thorax (I)
Tibia (25)	Tibial spur (16)
Transverse suture (87, 92)	Trochanter (18)
Veins (L, M, N, O)	Vena spuria or spurius vein (115)
Venter (P)	Ventrobasal scale (165)
Vertex (46)	Vertical bristle (27)
Vertical triangle (45)	
Vibrissae (35)	Verticil (3)

LIST OF TAXA

Family TIPULIDAE

Subfamily TIPULINAE

- | | |
|---|---|
| 1. <i>Ctenophora (Pselliophora) laeta</i> (Fabricius) | 2. <i>Iolorusia ornatithorax</i> (Brunetti) |
| 3. <i>Tipula (Acutipula) subvernalis</i> Alexander | 4. <i>T (Vestiplex) himalayensis</i> Brunetti |

Subfamily LIMONIINAE

- | | |
|---|--|
| 5. <i>Pseudolimnophila pallidicoxa</i> (Brunetti) | 6. <i>Conosia irrorata</i> (Wiedemann) |
| 7. <i>Styringomyia ceylonica</i> Edwards | *8. <i>Trentepohila (Trentepohlia) nigrapicalis</i> (Brunetti) |

Family PSYCHODIDAE

Subfamily PSYCHODINAE

- | | |
|--|---|
| 10. <i>Brunettia albonotata</i> (Brunetti) | *11. <i>Psychoda albopicta</i> Brunetti |
|--|---|

Family BIBIONIDAE

Subfamily PLECIINAE

12. *Penthetria japonica* Wiedemann

- | | |
|---|---|
| 50. <i>E. polychromata</i> Brunetti | 51. <i>Mesembrius bengalensis</i> (Wiedseemann) |
| 52. <i>M. quadrivittatus</i> (Wiedemann) | 53. <i>Phytomia (Phytomia) errans</i> (Fabricius) |
| 54. <i>P. (Dolichomerus) crassa</i> (Fabricius) | 55. <i>Syritta indica</i> (Wiedemann) |
| 56. <i>S. orientalis</i> Macquart | 57. <i>Chalcosyrphus (Syrittoxylota) annulatus</i> (Brunetti) |

Family MICROPEZIDAE
Subfamily TAENIAPTERINAE

58. *Mimegralla albimana* (Doleschall)

Family OTITIDAE
Subfamily ULIDINAE

59. *Physiophora aenea* (Fabricius)

Family SCIOMYZIDAE
Subfamily SCIOMYZINAE

60. *Sepedon ferruginosus* Wiedemann

Family SEPSIDAE
Subfamily SEPSINAE

- | | |
|--|--|
| 61. <i>Australosepsis niveipennis</i> (Becker) | 62. <i>Dicranosepsis bicolor</i> (Wiedemann) |
| 63. <i>Sepsis himalayensis</i> Brunetti | 64. <i>S. nitens</i> Wiedemann |
| 65. <i>Saltella setigera</i> Brunetti | 66. <i>Decachaetophora aeneipes</i> (de Meijere) |

Family CHLOROPIDAE
Subfamily CHLOROPINAE

67. *Pachylophus rufescens* (de Meijere)

Family EPHYDRIDAE
Subfamily PSILOPINAE

68. *Psilopa pollinosa* (Kérész)

Subfamily NOTIPHILINAE

- | | |
|--|--|
| 69. <i>Typosilopa chinensis</i> (Wiedemann) | **70. <i>Paralimna concors</i> Cresson |
| *71. <i>Pseudolynchin canariensis</i> (Macquart) | *72. <i>P. lineata</i> de Meijere |

Family HIPPOBOSCIDAE
Subfamily ORNITHOMYINAE

73. *Pseudolynchia canariensis* (Macquart)

Subfamily HIPPOBOSCINAE

74. *Hippobosca variegata* Megeerle von Mühlfeld

Family MUSCIDAE
Subfamily MUSCINAE

75. *Musca (Musca) domestica* Linnacus
77. *Orthelia indica* (Robineau-Desvoidy)
79. *O. timorensis* (Robineau-Desvoidy)
76. *M. (Philaematomyia) crassirostris* Stein
78. *O. lauta* (Wiedemann)

Subfamily PHAONIINAE

80. *Atherigona (Atherigona) pulla* (Wiedemann)

Family CALLIPHORIDAE
Subfamily CALLIPHORINAE

81. *Bengalia torosa* (Wiedemann)
83. *Hemipyrellia ligurriens* (Wiedemann)
*85. *Lucilia papuensis* Macquart
82. *Calliphora (Calliphora) pattoni* Aubertin
84. *II. pulchra* (Wiedemann)

Family CHRYSOMYINAE

86. *Chrysomya megacephala* (Fabricius)
87. *C. rufifacies* (Macquart)

Family SARCOPHAGIDAE
Subfamily SARCOPHAGINAE

88. *Bercaea haemorrhoidalis* (Fallen)
90. *P. (L.) dux* (Thomson)
92. *P. (P.) knabi* (Parkar)
94. *Iranihindia martellatoides* (Baranov)
89. *Parasarcophaga (Liosarcophaga) brevicornis* (Ho)
91. *P. (Parasarcophaga) albiceps* (Meigen)
93. *P. (P.) orchidea* (Böttcher)
95. *Seniorwhitea karmeni* (Böttcher)

Key to the Families

1. Adult antennae (Fig. B) having more than 5 segments which are not fused into a solid structure2
 Adult antennae (Figs. C, D & G) 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 ...4
2. Thorax with a V-shaped suture (Fig. K) on mesonotum. Ocelli absentTipulidae
 Thorax without such suture on mesonotum3
3. Antennal segment 2 strongly elongate; ocelli present. Wings not scaly or densely hairyBibionidae
 Antennal segment 2 small; ocelli absent. Wings not scaly or densely hairy, held roof-like over the bodyPsychodidae
4. Adults without a ptilinum or frontal lunule5
 Adults usually with a ptilinum or frontal lunule (Fig. G : 42).....8

5. Wing with certain veins having upturned ends and a vein-like thickening called vena spuria (Fig. M : 115) present between R and MSyrphidae
Wing without such upturned veins or a vena spuria between R and M.....6
6. Flies with dense bristles; antennal segment 3 simpleBombyliidae
Flies devoid of bristles; antennal segment 3 annulated7
7. Squamae small; vein C not encompassing the wing..... Stratiomyiidae
Squamae large; vein C entirely encompassing the wing (Fig. L : 110)Tabanidae
8. Palpi long and slender, forming a sheath for mouthparts; abdomen indistinctly segmented; living on birds and mammals except bats.....Hippoboscidae
Palpi not forming a sheath for mouthparts; abdomen distinctly segmented; not ectoparasites in adult stage9
9. Antennal segment 2 above without a distinct external groove; theca not developed at the base of proboscis 10
Antennal segment 2 above with a distinct external groove; theca developed at the base of proboscis 15
10. Costa complete 11
Costa more or less interrupted either at the end of Sc or R₁ 14
11. Vibrissae present. Palpi reducedSepsidae
Vibrissae absent 12
12. Tibiae with preapical bristles. Clypeus hidden; no peristomal bristles.....Sciomyzidae
Tibiae without preapical bristles 13
13. Legs long and stilt-like. Tarsi shorter than their tibiaeMicropezidae
Legs not specially long. R₁ bristly above or else the end of Cell Cu₂ pointedOtitidae
14. Sc entirely absent. Cell Cu₂ absentChloropidae
Sc partially developed. Convergent postvertical bristles absentEphydriidae
15. Hypopleura without a row of strong bristles below spiracle.....Muscidae
Hypopleura with one or more vertical series of bristles below spiracle 16
16. Arista of antenna pubescent or with feathering not extending much beyond middle; body dull black or striped grey and black.....Sarcophagidae
Arista feathered to tip or body entirely metallic blue or greenCalliphoridae

SYSTEMATIC ACCOUNT

Family TIPULIDAE

References on the fauna of West Bengal : Macquart 1834; 1838; Enderlein 1912; Brunetti 1911, 1912, 1913, 1918; Edwards 1932; Alexander 1927, 1930, 1942, 1959, 1960, 1961, 1963, 1964, 1965, 1966, 1967, 1968; Alexander and Vane-Wright 1972; Joseph and Parui 1973.

A total of 164 species under 34 genera of 3 subfamilies are heretofore known in West Bengal vis-a-vis 1,368 species under 59 genera of 3 subfamilies in India.

Key to the Subfamilies

1. Terminal segment of maxillary palpus elongate, whiplash-like (Fig. B : 1); nasus usually distinct; antenna (Fig. B : 4) usually with 13 segments; wing with Sc₁ usually atrophied; vein Cu₁ constructed at m-cu, latter usually at or close to fork of M₃₊₄; body-size usually largeTipulinae
- Terminal segment of maxillary short; not distinct nasus; antenna usually with 14 or 16 segments; wing with Sc₁ present; Vein Cu₁ straight, not constricted at m-cu, latter placed far before fork of M₃₊₄ (Fig. O), body-size usually smallLimoninae

Key to the Genera of Tipulinae

1. Antennae in male 13-segmented, flagellar segments branched, intermediate ones each with 4 short branches; in female antennae 11-segmented, flagellar segments strongly protuberant to show a subserrate appearance*Ctenophora* Meigen (1 species only)
- Antennal segments unbranched, if protuberant, antenna with 13 segments2
2. Antennae with lower faces of flagellar segments slightly protuberant, without verticils, on upper face with scattered setae; wings with cell R₃ constricted at near midlength by approximation of veins R₃ and R₄₊₅*Holorusia* Loew(1 species only)
- Antennae with flagellar segments provided with strong verticils (Fig. B : 3); wings with cell R₃ not evidently constricted at near midlength.....*Tipula* Linnacus

Genus *Ctenophora* Meigen

1803. *Ctenophora* Meigen, *Maqazin Insektkde*, 2 : 263. Type-species : *Tipula pectinicornis* L.

Subgenus *Pselliophora* Osten Sacken

Diagnosis : Flagellar segments of antennae with 4 branches of equal length in male; Segment 12 with 2 pairs of branches; antennal segment 3 broader from base to tip, without strong protuberance.

1. *Ctenophora (Pselliophora) laeta* (Fabricius)

1794. *Tipula laeta* Fabricius, *Ent. Syst.*, 4: 239.

Material examined : 1 Male, Puruliya Dist., Puruliya, 4. viii. 1986, Coll. B. C. Das.

Diagnosis : Scape of antennae very large, orange-coloured; wings with only 2 large spots and normally a small intermediate one; tibiae with at least hind pair with a pale coloured ring near base.

Distribution : India : West Bengal : Calcutta, Puruliya districts; Karnataka; Kerala; Maharashtra and Uttar Pradesh. Elsewhere : Sri Lanka.

Genus *Holorusia* Loew

1863. *Holorusia* Loew, *Berl. ent. Z.*, 7 : 277. Type-species : *rubiginosa* Loew.

2. *Holorusia ornatithorax* (Brunetti)

1911. *Tipula ornatithorax* Brunetti, *Rec. Indian Mus.*, 6 : 258.

Material examined : 1 Female, Darjiling Dist. Mirik, 2400m, 18. iv. 1986, Coll. B. C. Das.

Diagnosis : Thorax bright orange-yellow, with eight very distinct dark grey spots (Fig. K); wings clear.

Distribution : India : West Bengal : Darjiling district; Uttar Pradesh.

Genus *Tipula* Linnaeus

1758. *Tipula* Linnaeus, *Syst. Nat. Ed.*, 10 : 585. Type-species : *oleracea* L.

Key to the Subgenera

1. Flagellum of antennae with very long verticils exceeding segments in length; claws in male usually with a basal tooth; male hypopygium without a tergal saucer, ovipositor with well-developed hypovalvae *Acutipula* Alexander (1 species only)
- Verticils of moderate length; claws in male simple; male hypopygium with caudal portion of tergum often with a shallow saucer-like portion; ovipositor with hypovalvae greatly reduced *Vestiplex* Bezzi (1 species only)

3. *Tipula (Acutipula) subvernalis* Alexander

1918. *Tipula fasciculata* Brunetti, *Rec. Indian Mus.*, 15 : 269 (preoccupied).

Material examined : 1 Male, Darjiling Dist., Sukhia pokhri, 1850m, 22. iv. 1986, Coll. B. C. Das.

Diagnosis : Wings with basal cell 2 without a round spot distally and instead a clear spot running from Costa to base of posterior cell 4 present; dististyle uniformly broad.

Distribution : India : West Bengal : Darjiling dist; Arunachal Pradesh. Elsewhere : Nepal and Tibet.

4. *Tipula (Vestiplex) himalayensis* Brunetti

1911. *Tipula himalayensis* Brunetti, *Rec. Indian Mus.*, 6 : 252.

Material examined : 1 Male, 1 Female, Darjiling District, Mirik area, 2300-2400m, 19-20 iv. 1986, Coll. B. C. Das.

Diagnosis : Wings with basal cell 2 having a round spot distally; outer dististyle broad at base and gradually narrowed to tip.

Distribution : India : West Bengal, Darjiling district; Uttar Pradesh. Elsewhere : Indochina and Tibet.

Key to the genera of LIMONIINAE

1. Wings with subcostal vein, submarginal cell 2 2
Wings without subcostal vein, submarginal cell 1 *Styringomyia* Loew (1 species only)
2. Discal cell present; posterior cells 5; anal cell open 3
Discal cell absent; posterior cells 3; anal cell closed *Trentepohlia* Bigot
3. Anterior cross-vein distinctly beyond discal cell *Conosia* van der Wulp (1 species only)
Anterior cross-vein at upper corner of discal cell
..... *Pseudolimnophila* Alexander (1 species only)

Genus *Pseudolimnophila* Alexander

1919. *Pseudolimnophila* Alexander, *Mem. Cornell Univ. agric, Exp. Sin.*, 25 : 849 Type-species : *luteipennis* Osten Sacken.

5. *Pseudolimnophila pallidicoxa* (Brunetti)

1912. *Limnophila pallidicoxa* (Brunetti), *Fauna Brit. India*, Diptera, 1 : 523.

Material examined : 1 Male, 1 Female, Darjiling Dist. Mirik, 2400 m, 18. iv. 1986, Coll. B. C. Das.

Diagnosis : Head strongly narrowed and prolonged behind; radial and medial veins beyond cord long and sinuous; vein R₃ extending generally parallel to vein R₄, not diverging markedly at tips; vein 2A strongly curved to margin.

Distribution : India : West Bengal : Darjiling district; Uttar Pradesh.

Genus *Conosia* van der Wulp

1880. *Conosia* van der Wulp, *Tijdschr. Ent.*, 23 : 159. Type-species : *Limnobia irrorata* Wiedemann.

6. *Conosia irrorata* (Wiedemann)

1828. *Limnobia irrorata* Wiedemann, *Aussereurop. zweifl. Insekt.*, 1 : 574.

Material examined : 2 Males, 1 Female, 24-Parganas Dist., Hatbaria, 25. ix. 1977, Coll. N. K. Pramanik.

Diagnosis : Antennae with flagellar segment 1 obconical, larger than other segments; wings with subcostal vein ending a little before tip of R₁ vein; discal cell cylindro conical; anterior branch of M₁₊₂ forked halfway between discal cell and wing margin.

Distribution : India : West Bengal : Calcutta, Darjiling, 24-Parganas district; Arunachal Pradesh; Assam; Bihar and Uttar Pradesh. Elsewhere : Borneo, China, Java, Kotosho Island, Malaya, Nepal, Simeulue Island, Sri Lanka, Taiwan, Africa, Australia, Israel, Japan and New Guinea.

Genus *Styringomyia* Loew

1845. *Styringomyia* Loew, *Dipterol. Beitr.* 1845 : 6. Type-species : *venusta* Loew.

7. *Styringomyia ceylonica* Edwards

1911. *Styringomyia ceylonica* Edwards, *Ann. Mag. nat. Hist.*, (8) 8 : 62.

Material examined : 1 Male, Calcutta, 15. xi. 1988. Coll. P. Parui.

Diagnosis : Wings with small pale grey infuscations on crossveins and elsewhere.

Distribution : India : West Bengal : Calcutta & Darjiling district; Orissa. Elsewhere : Borneo, Malaya, Mentawai Islands, Nepal, Philippines, Sri Lanka, Taiwan and Thailand, New Britain and New Guinea.

Genus *Trenteophlia* Bigot

1854. *Trenteophlia* Bigot, *Annls Soc. Ent. Fr.*, (3) 2 : 473. Type-species : *Limnobia trentepohlii* Wiedemann.

Subgenus *Trentepohlia* Bigot

Diagnosis : Wings with Cell M₂ open by atrophy of veins mand M₃, three being three outer medial veins R₄, M₁₊₂ and M₄.

Key to the Species

1. Wings clear; femora yellowish with black tips*nigroapicalis* (Brunetti)
 Wings at tips distinctly blackish, especially along upper branch of vein R₄.....
*trentepohlii* (Wied.)

*8. *Trentepohlia (Trentepohlia) nigroapicalis* (Brunetti)

1912. *Mongomioides nigroapicalis* Brunetti, *Fauna Brit. India*, Dipt. Nematocera : 483.

Material examined : 1 Male, Calcutta, 15. ix. 1988, Coll. P. Parui.

Distribution : India : West Bengal : Calcutta district; Uttar Pradesh. Elsewhere : Sri Lanka.

9. *Trentepohlia (Trentepohlia) trentepohlii* (Wiedemann)

1828. *Limnobia trentepohlii* Wiedemann, *Aussereurop. zweif. Inskt.*, 1 : 551.

Material examined : 1 Male, 24-Parganas Dist., Hatbaria, 25. ix. 1977, Coll. N. K. Pramanik.

Distribution : India : West Bengal : 24-Parganas district; Assam, Bihar, Kerala and Orissa. Elsewhere : Bangladesh, Borneo, Burma, Java, Malaya, Philippines, Sri Lanka, Sumatra, Taiwan and Thailand.

Family PSYCHODIDAE

Reference on the fauna of West Bengal : Annandale 1908; Brunetti 1908, 1911; Tonnoir 1933; Quate 1962; Duckhouse 1973.

A total of 19 species under 6 genera of 3 subfamilies are heretofore known in West Bengal vis-a-vis 36 species under 8 genera of 3 subfamilies in India.

Subfamily PSYCHODINAE

Diagnosis : Small moth-like flies with broad wings held over body like roof; Vein R forking quite near base of wing; anal vein considerably long.

Key to the Genera

1. Vertex on midline longer than width of eye bridge; antennal segments beyond 13 not markedly reduced than preceding; male surstyle with many clavate tenacula.....
*Brunetti Brunettia* Anandale (1 species only)
 Vertex on midline shorter than width of eye bridge; antennal segments beyond 13 always reduced and much smaller than preceding; male surstyle with a single tenaculum.....
*Psychoda* Latrille (1 species only)

10. *Brunettia albonotata* (Brunetti)

1908. *Psychoda albonotata* Brunetti, *Rec. Indian Mus.*, 2 : 373.

Material examined : 2 Males, 4 Females, 24-Parganas, Dist., Haridevpur, 4. ii. 1988, Coll. M. Mukherjee.

Diagnosis : Flagellar segments of antenna cup-shaped; anterior branch of vein R₅ forking opposite fork of vein M, few dark brown scales on base of wing, tips of all veins with silvery white spot formed by minute white hair-like scales; femora and tibiae yellow, tips of tibiae black.

Distribution : India : West Bengal : Calcutta, 24-Parganas districts. Elsewhere : Bangladesh, Jamaica, Malaya, Pakistan, Seychelles and Sri Lanka.

11. *Psychoda albopicta* Brunetti

1911. *Psychoda albopicta* Brunetti, *Rec. Indian Mus.*, 4 : 296.

Material examined : 2 Males, 2 Females, 24-Parganas Dist., Haridevpur, 4. ii. 1988, Coll. M. Mukherjee.

Diagnosis : Flagellar segments of antenna flask-shaped with long neck; a bunch of black scaly hairs at fork of anterior branch of vein R and at fork of vein M, tips of veins with black hair spots; legs brown, tips of tibiae and metatarsi with a narrow circlet of white scales.

Distribution : India : Bihar only.

Remarks : The species has been kept unrecognized by Duckhouse (1973).

Family BIBIONIDAE

References on the fauna of West Bengal : de Meijere 1904; Brunetti 1911, 1912, 1913, 1925.

A total of 14 species under 3 genera of 2 subfamilies are heretofore known in West Bengal vis-vis 39 species under 4 genera of 2 subfamilies in India.

Subfamily PLECIINAE

Diagnosis : Bibionid flies with robust antennae, segment 3 not elongated; eyes in male joined on forns; radial sector furcate; legs simple.

Genus *Penthetria* Meign

1803. *Penthetria* Meigen, *Magazine Insekunde*, 2 : 264. Type-species : *funnebris* Meigen.

Diagnosis : Vein R₂₊₃ elongate and extending parallel to vein R₄₊₅, male genitalia with claspers lateral in position, large and conspicuous.

12. *Penthetria japonica* Wiedemann

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

Material examined : 1 Female, Darjiling Dist., Sukhia pokhri, 1850 m, 28. ii. 1986, Coll. A. K. Hazra; 5 Males, Darjiling Dist., Mirik, 2400 m, 18. iv. 1986, Coll. B. C. Das.

Diagnosis : Mensonotum bright orange to rufous at least posteriorly; hind basitarsi of male slightly swollen; vein M₁ joined directly to r-m cross-vein and not joined with M₂ beyond crossvein; male genitalia (Fig. J).

Distribution : India : West Bengal : Darjiling district; Arunachal Pradesh; Assam; Himachal Pradesh; Meghalaya and Uttar Pradesh, Elsewhere : Burma, China, Nepal , Taiwan, Japan and Siberia.

Family STRATIOMYIDAE

- References on the fauna of West Bengal : Fabricius 1805; Macquart 1838; de Meijere 1904; Brunetti 1907, 1912, 1913, 1920, 1923; Enderlein 1914, 1921; Séguy 1934; James 1975.

A total of 25 species under 16 genera of 4 subfamilies are heretofore known in West Bengal vis-a-vis 70 species under 34 genera of 4 subfamilies in India.

Key to the Subfamilies

1. Wing with anterior cross-vein joining prefurca to discal cellSarginae
Wing with anterior cross-vein joining Rs to discal cell.....2
2. Upper branch of Cu₁ separated from discal cell by posterior cross-vein.....Stratiomyinae
Upper branch of Cu₁ in punctiform contact with discal cell because of absence of posterior cross-vein.....Clitelariinae (1 species only)

Key to the genera SARGINAE

1. Eyes densely pubescent in both sexes; antennal segment 2 without any expansion
.....*Chloromyia* Duncan (1 species only)
- Eyes bare; antennal segment 2 with a thumb-like expansion over segment 3 on inner side (Fig. C)*Ptecticus* Loew (1 species only)

Genus *Chloromyia* Duncan

1837. *Chloromyia* Duncan, *Mag. Zool. Bot.*, 1 : 164 Type-species; *Musca formosa* Scopoli.

*13. *Chloromyia sapphirina* (Walker)

1849. *Sargus sapphirinus* Walker, *List Dipt. Colln Br. Mus.*, 3 : 519.

Material examined : 1 Female, Jalpaiguri Dist., Jayanti forest nr buxa Tiger Reserve, 13. xii. 1984. Coll. S. Chattopadhyaya.

Diagnosis : Bright bluish flies with purplish tinge; clypeus white; abdomen nearly elliptical, finely punctured and thinly clothed with short hoary hairs; legs blue, wings clear.

Distribution : India : West Bengal : Jalpaiguri District. According to Brunetti (1920), it has probably been described from eastern India.

Genus *Ptecticus* Loew

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

14. *Ptecticus australis* Schiner

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

Material examined : 1 Male, Darjiling Dist. Andheri Kholā, 750 m, 9, iv, 1973, Coll. H. S. Sharma; 1 Male, Maldah Dist. Nalagola, 18. vi. 1987, Coll. K. P. Mukherjee.

Diagnosis : Body not metallic; wings yellowish grey, posterior cross-vein practically absent; fore metatarsus nearly as long as tibia; hind tarsus all white except extreme base of metatarsus; abdominal segment 1 with blackish band.

Distribution : India : West Bengal : Calcutta; Darjiling; Maldah/District Assam; Karnataka; Meghalaya; Punjab; Sikkim and Tamil Nadu. Elsewhere : Sri Lanka, Taiwan and Thailand.

Key to the genera of STRATIOMYINAE

1. Legs generally entirely plate, without distinct femoral bands *Odontomyia* Mg.
 Legs coloured otherwise, with distinct broad black bands on some femora
 *Oplodontha* Rondani

Genus *Odontomyia* Meigen

1803. *Odontomyia* Meigen, *Magazin Insektenkde*, 2 : 265. Type-species : *Musca hydroleon* L.

Key to the Species

1. Abdomen entirely orange..... *lutatius* Wlk.
 Abdomen either banded or spotted 2
2. Abdomen with distinct dark transverse bands *transversa* Brunetti
 Abdomen with dorsal row of spots, more or less forming a median stripe.....
 *dorsoangulata* Brunetti

15. *Odontomyia dorsoangulata* Brunetti

1920. *Odontomyia dorsoangulata* Brunetti, *Fauna Brit. India. male*. Diptera, 2 : 68.

Material examined : 1 Male, Maldah Dist., Nalagola, 18 vi. 1987, Coll. K. P. Mukherjee.

Distribution : India : West Bengal : Calcutta, Maldah, 24-Parganas districts; Bihar; Karnataka; Tamil Nadu.

16. *Odontomyia lutatius* Walker

1849. *Odontomyia lutatius* Walker, *List Dipt. Colln Br. Mus.*, 3 : 532.

Material examined : 1 Female, Calcutta, Eden Garden, 14. ii. 1969. Coll. A. N. T. Joseph.

Distribution : India : West Bengal : Calcutta, Darjiling districts; Bihar. Elsewhere : Java, Sumatra and Taiwan.

***17. *Odontomyia transversa* Brunetti**

1920. *Odontomyia transversa* Brunetti, *Fauna Br. India, Dipt.*, 2 : 71.

Material examined : 2 Females, Medinipur Dist., Haldia, 4. viii. 1985, Coll. B. C. Das.

Distribution : India : West Bengal : Medinipur districts; Tamil Nadu.

Genus *Oplodontha* Rondani

1863. *Oplodontha* Rondani, *Dept. exot.* : 78. Type-species : *Stratiomys viridula* Fabricius.

Key to the Species

1. All femora with broad black median band; hind tibiae with broad apical band.....
*minuta* (Fabricius)
 Hind legs free from bands.....*rubrithorax* Macq.

18. *Oplodontha minuta* (Fabricius)

1794. *Stratiomys minuta* Fabricius, *Ent. Syst.*, 4 : 268.

Material examined : 1 Male, 1 Female, Haora Dist., Bally, 30. viii. 1967, Coll. A. N. T. Joseph ;
 1. Female, Puruliya district, Ajodhya Hill, ca. 700m, 2.xii. 1985, Coll. M. Datta.

Distribution : India : West Bengal Calcutta, Haora, Puruliya districts; Bihar; Uttar Pradesh; Kerala. Elsewhere : Sri Lanka.

19. *Oplodontha rubrithorax* (Macquart)

1838. *Odontomyia rubrithorax* Macquart, *Mem. Soc. Sci. Agric. Little* 1838 : 189 (185)

Material examined : 1 Female, Nadia Dist., Palpara, 2 xi. 1986, Coll. A. R. Lahiri, 2 Females, Murshidabad Dist., Dhulian, 17. vi. 1987, Coll. K. P. Mukherjee.

Distribution : India : West Bengal : Calcutta, Bardhaman, Murshidabad, Nadia, 24-Parganas districts; Uttar Pradesh. Elsewhere : Java; Philippines; Sri Lanka; Sumbawa and Thailand.

Genus *Adoxomyia* Bezzi

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

Diagnosis : Eyes densely pubescent in both sexes; holoptics in males and dischoptic in females; antennal segment 3 elongate conical, with 4 annulations, with 2 jointed apical style; scutellum with 2 spines; wing with Rs forked. Vvein M with 3 ending; posterior cross-vein absent; abdomen 5-segmentedl.

20. *Adoxomyia heminopla* (Wiedemann)

1819. *Clitellaria heminopla* Wiedemann, *Zool. Mag.*, 1 : 30.

Material examined : 1 Male, 24-Parganas Dist., Barrackpore, Nilganj, 22. i. 1986, Coll. P. Parui

Diagnosis : Antennal segments 1 and 2 black, 3 reddish brown to yellowish, tip black; thorax without definite hair-stripes, but with a dark median stripe surrounded by 4 spots arranged in a square; abdomen generally black.

Distribution : India : West Bengal : 24-Parganas district. Bihar, Madhya Pradesh, Punjab, Tamil Nadu and Uttar Pradesh. Elsewhere : Burma, Pakistan and Sri Lanka.

Family TABANIDAE

References on the fauna of West Bengal : Wiedemann 1821; Macquart 1838; Walker 1848; Bigot 1891; Ricardo 1906, 1911, 1913; Schuurmans Stekhoven 1926; Szilady 1926; Philip 1959, Stone and Philip 1974; Stone 1975; Datta 1981, 1991.

A total of 27 species under 6 genera of 3 subfamilies are heretofore known in West Bengal vis-a-vis 193 species under 12 genera of 3 subfamilies in India.

Key to the Subfamilies

1. Ocelli well-developed; hind tibiae with paired apical spurs (Fig. E)
Chrysopsinae (1 species only)
 Ocelli rudimentary or absent; hind tibial spurs absent.....Tabaninae

Genus *Chrysops* Meigen

1803. *Chrysopso* Meigen, *Magazin Insektkde*, 2 : 267. Type-species : *Tabanus caecutiens* L.

Diagnosis : Slender flies with large angular spots or veriegated dark markings on eyes; long antennae, often as long as head and thorax together; wings banded.

21. *Chrysops dispar* (Fabricius)

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

Material examined : 1 Female, Bankura Dist., Simlapal, 31. x. 1985, Coll. M. Datta; 1 Female, Koch Bihar Dist., Mathabhanga, 11. xii. 1986, Coll. R. S. Barman.

Diagnosis : Abdomen with inverted black V-marking on tergum 2, arms extending to 3 and sometimes 4 also.

Distribution : India : West Bengal : Bankura & Koch Bihar districts. Widespread in Oriental region.

Key to the genera of TABANINAE

1. Frontal calli absent; antennal styles quadriannulate; wings nearly clear; tibiae without plae rings*Atylotus* Osten Sacken (1 species only)
 Frontal calli present; antennal styles triannulate; wings with pale spots, wavy lines or punctulations; mid-and hind tibiae with two pale rings.....
*Haematopota* Meigen (1 species only)

Genus *Atylotus* Osten Sacken

1876. *Ostem Sacken*, Mem. Boston Soc nat Hist, 2 : 426. Type-species : *Tabanus bicolor* Weidemann.

22. *Atylotus virgo* (Wiedemann)

1824. *Tabanus virgo* Wiedemann, *Analecta Ent.* : 22.

Material examined : 1 Female, Puruliya Dist., Sardardi, 6. xi. 1985, Coll. M. Datta.

Diagnosis : Antennal plates very stout; very short palpi; thorax and abdomen greyish and grey tomentose; abdominal terga with two small spots.

Distribution : India : West Bengal : Calcutta, Puruliya district; Bihar and Karnataka. Elsewhere : Sri Lanka.

Genus *Haematopota* Meigen

1803. *Haematopota* Meign, *Magazin Insektenkde*, 2 : 67. Type-species : *Tabanus pluvialis* L.

23. *Haematopota javana* Wiedemann

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

Material examined : 1 Female, Jalpaiguri Dist., Chilatpata-Mendabari, 16. x. 1987, Coll. S. K. Tandon.

Diagnosis : Frontal callus yellow; scutum with broad pale band covering subscutellar suture; scutellum distinctly bicoloured, base pale, posterior margin darker; subapical band of wing double; fore coxa usually brown; fore tibia slightly swollen; hind tibia robust.

Distribution : India : West Bengal : Calcutta, Jalpaiguri, 24-Parganas district. Bihar; Mizoram; Tamil Nadu. Elsewhere : Bangladesh, Burma, Java, Laos, Malaya, Sumatra, Thailand and Vietnam.

Family BOMBYLIIDAE

References on the fauna of West Bengal : Fabricius 1781; Macquart 1840; Guerin-Meneville 1844; Brunetti 1909, 1920; Enderlein 1926; Bowden 1875.

A total of 16 species under 12 genera of 5 subfamilies are heretofore known in West Bengal vis-a-vis 84 species under 23 genera of 11 subfamilies in India.

Subfamily EXOPROSOPINAE

Diagnosis : Eyes separated in both sexes and have a long and distinct bisecting line; antennal style without hairs at end; metapleura hairy; squamae fringed with scales; wing with R₂₊₃ originating from R₄₊₅ at right angles and close to r-m.

Key to the Genera

1. Antennal segment 3 with terminal style bearing a microscopic bristle; submarginal cells in wings 3 *Exoprosopa* Macq.
- Antennal segment 3 with terminal style bearing a minute appendage; submarginal cells in wings 4..... *Ligyra* Newman

Genus *Exoprosopa* Macq.

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

Subgenus *Exoprosopa* Macq.

Diagnosis : Marginal cross-vein sinuous and recurrent; R₂₊₃ vein originating opposite or before middle cross-vein; posterior cell 1 typically open but sometimes closed; wings never fenestrate, or if so "window-panes" not hyaline; and abdomen devoid of silvery bands.

Key to the Species

1. Antennae and legs black; clear part of wing with several isolated dark spots; posterior cell 2 as wide at tip as at base*insulata* (Walker)
Antennae and legs brown; clear part of wing at most with a single dark spot; posterior cell 2 twice as wide at base as at tip*lateralis* Brunetti

*24. *Exoprosopa (Exoprosopa) insulata* (Walker)

1852. *Anthrax (Litorhynchus) insulate* Walker, *Insecta Saundersiana*, 1 : 172.

Material examined : 6 Males, 8 Females, Bankura Dist., Bishnupur and Susunia, 25. x. 1985-29. x. 1985, Coll. M. Datta; 1 Male, 2 Females, Puruliya Dist., Sardardi and Garh Dhrubeswar, 6. xi. 1985, 7. xi. 1985, Coll. M. Datta.

Distribution : India : West Bengal; Bankura, Calcutta, Puruliya districts; Karnataka; Madhya Pradesh; Meghalaya; Tamil Nadu and Uttar Pradesh. Elsewhere : Nepal and Sri Lanka.

25. *Exoprosopa (Exoprosopa) lateralis* Brunetti

1909. *Exoprosopa lateralis* Brunetti, *Rec. India Mus.*, 2 : 467.

Material examined : 1 Female, Bankura Dist., Bishnupur Sericulture Nursery, 26. x. 1985, Coll. M. Datta; 3 Females; Puruliya Dist., Sardardi, 6. xi. 1985, Coll. M. Datta.

Distribution : India : West Bengal : Bankura, Calcutta, Puruliya districts; Karnataka.

Genus *Ligyra* Newman

1841. *Ligyra* Newman, *Etmologist*, 1 : 220. Type-species : *Anthrax bombylifformis* Macleay.

Key to Species

1. Wings dark brown, fading to smoky brown towards hind border2
Wings with apical part and considerable portion of posterior half practically clear*oenomaus* (Rondani)
2. Venter black with silvery-white pubescence; wing with posterior cell 2 distinctly wider at base than tip*aurantiaca* (Guérin-Ménéville)
Venter black with yellowish pubescence; wing with posterior cell 2 slightly narrower at base than at tip*semifuscata* Brunetti

26. *Ligyra aurantiaca* (Guérin-Ménéville)

1844. *Anthrax aurantiaca* Guérin-Ménéville, *Icon, du regne anim, Dipt.*, 3 : 539.

Material examined : 1 Female, Bankura Dist., Bishnupur Sericulture Nursery, 26. x. 1985, Coll. M. Datta.

Distribution : India : West Bengal : Bankura, Northern Districts; Bihar.

27. *Ligyra oenomaus* (Rondani)

1875. *Ilyperalonia oenomaus* Rondani, *Annali Mus. civ. Stor. nat. Giacomo Doria*, 7 : 453.

Material examined : 1 Female, Medinipur Dist., Salboni, 9. vii. 1985, Coll. B. C. Das; 1 Female Bankura Dist., Bishnupur Sericulture Nursery, 26. x. 1985, Coll. M. Datta.

Distribution : India : West Bengal : Bankura, Darjiling, Medinipur districts; Arunachal Pradesh; Assam and Sikkim. Elsewhere : Borneo, Malaya and Philippines.

*28. *Ligyra semifuscata* (Brunetti)

1912. *Hyperalonia semifuscata* Brunetti, *Rec. India Mus.*, 7 : 466.

Material examined : 1 Female, Bankura Dist., Bishnupur Sericulture Nursery, 26. x. 1985, Coll. M. Datta.

Distribution : West Bengal : Bankura; Maharashtra.

Family SYRPHIDAE

References on the fauna of West Bengal : Wiedemann 1819; Macquart 1842; de Meijere 1904; Brunetti 1907, 1908, 1913 1923; Knutson Thompson and Vockeroth 1975; Datta and Chakraborti 1986.

A total of 75 species under 35 genera of 2 subfamilies are heretofore known in West Bengal vis-a-vis 236 species under 62 genera of 2 subfamilies in India.

Key to the Subfamilies

1. Pronotum bare; abdomen with 5 pregenital segments in maleSyrphinae
- Pronotum pilose; abdomen with 4 pregenital segments in maleMilesinae

Key to the genera of SYRPHINAE

1. Head broader than thorax; face arched, not hollowed below frontal prominence, always more or less yellow*Paragus* Latreile
- Head about as wide as thorax, face hollowed below frontal prominence, produced again to central knob or to upper mouth edge or to both2
2. Abdomen with pairs of yellow spots; pale markings on face, thorax and scutellum absent.....*Melanostoma* Schiner (1 species only)
- Abdomen with sharply defined yellow bands or pairs of spots or lunules; face, thorax and scutellum always with yellow brown marks3
3. Abdomen unmarginated, about as wide as thorax or relatively broader, yellow side lines on thorax inconspicuous or absent5
4. Subscutellar fringe complete, short or long very dense to rather sparse; male genitalia small, tergum 9 at most one-third as wide as abdomen.....6
- Subscutellar fringe incomplete medially and very short and sparse laterally7
5. Wing with broad brown band, covering one-third or more of wing in width, extending to posterior margin*Dideopsis* Matsumura (1 species only)
- Wing clear8
6. Wing membrane varying from entirely trichose to extensively base; hypopleuron bare below spiracle and in front of its lower end*Allograpta* Osten Sacken (1 species only)
- Extreme posterior margin of wing with a series of minute, discrete, closely spaced black sclerotized dots; hypopleuron with tuft of fine hairs below spiracle.....*Episyrphus* Matsumura & Adachi (1 species only)

7. Female tergum 8 well-developed and exposed; male hind trochanter with a ventral process.....
*Ischiodon* Sack (1 species only)
 Female tergum 6 well-developed and exposed; male hind trochanter without such process.....
*Sphaerophoria* Lepeletier & Sérville
8. Frons less abruptly produced into an antennal prominence; mouth-opening short and oval; ocelli placed near vertex; tuft of short hairs on metathoracic epimeron absent
*Metasyrphus* Matsumura (1 species only)
 Frons rather abruptly produced into an obtuse antennal prominence; mouth-opening narrow and linear; ocelli placed little below vertex; tuft of short hairs on metathoracic epimeron present...
*Asarkina* Macquart (1 species only)

Genus *Allograpta* Osten Sacken

1875. *Allograpta* Osten Sacken, *Bull. Bufalo Soc. nat. Sci.*, 3 : 49. Type-species : *Scaeva obliqua* Say.

*29. *Allograpta javana* (Wiedemann)

1824. *Syrphus javanus* Wiedemann, *Analecta Ent.*, : 34.

Material examined : 1 Male, Nadia Dist., Dhubulia, 19. xii. 1985, Coll. B. N. Das; 1 Female, Darjiling Dist., 2 Km E of Mirik, 2250 m, 20. iv. 1986, Coll. B. C Das.

Diagnosis : Eyes bare; face with black median stripe in females; sometimes brown in males; antennae orange; segment 3 as wide as long; mesonotum shining black, with sharply defined lateral stripes; scutellum black haired; hind femora more or less blackish on apical third, hind tibiae black or blackish brown on basal and apical thirds, rest of legs yellow.

Distribution : India : West Bengal : Darjiling and Nadia districts; Arunachal Pradesh; Karnataka; Meghalaya and Tamil Nadu. Elsewhere : Borneo, China, Java, Malaya, Philippines, Sri Lanka, Sumatra, Taiwan and Thailand, Australia, Fiji, Guadalacanal, Hawaii, Japan, Korea and New Guinea.

Genus *Asarkina* Macquart

1842. *Asarkina* Macquart, *Dipt. exot.*, 2 (2) : 77 (137). Type-species : *Scaeva rostrata* Wiedemann.

Subgenus *Asarkina* Macq.

Diagnosis : Mesonotum with dense anterior collar of long erect hairs; vein R₄₊₅ distinctly dipped into cell R₄₊₅; surstyli strongly convergent and nearly transverse in position.

30. *Asarkina (Asarkina) ericetorum* (Fabricius)

1781. *Syrphus ericetorum* Fabricius, *Spec. Insect.*, 2 : 425.

Material examined : 1 Female, Jalpaiguri Dist., Buxa 19. xii. 1984, Coll. S. Chattopadhyaya, 1 Male, Buxa Tiger Reserve, 21. xii. 1984, Coll. S. Chattopadhyaya; 1 Male, Bankura Dist., Bishnupur, Kumardanga, 26. x. 1985, Coll. M. Datta.

Diagnosis : Male frons bright sulphur yellow with long black erect pubescence, a semicircular 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 antennae; surstylus broad basally, only slightly narrowed to subtruncate apex.

Distribution : India : West Bengal : Bankura and Jalpaiguri districts. Common throughout Oriental region. Elsewhere : Africa, Australia, Fiji, Moluccas, New Guinea and Samoa.

Genus *Dideopsis* Matsumura

1917. *Dideopsis* Matsumura, *Ent. Mag. Kyoto*, 2 : 142. Type-species : *Eristalis aeqrotus* Fabricius.

31. *Dideopsis aeqrota* (Fabricius)

1805. *Eristalis aeqrotus* Fabricius, *Syst. Antliat.*, 243.

Material examined : Frons and face shining black, closely covered with yellowish grey tomentum; mesonotum with anterior collar of long erect hairs; vein R₄₊₅ slightly dipped into cell R₄₊₅; abdomen oval, dull black with orange yellow spots and bands; surstylus broad, short, more strongly broadened and rounded apically.

Distribution : India : West Bengal : Bankura district. Widespread in south-east Asia. Elsewhere : Australia, Moluccas, and New Guinea.

Genus *Episyrphus* Matsumura and Adachi

1917. *Episyrphus* Matsumura and Adachi, *Ent. Mag. Kyoto*, 2 : 134. Type-species : *Musca balteata* De Geer.

32. *Episyrphus balteatus* (De Geer)

1776. *Musca balteata* De Geer, *Mem. pour. Serv. Hist. Ins.*, 6 : 116.

Material examined : 1 Female, Jalpaiguri Dist. Buxa., Tiger Reserve, 18. xii. 1984, Coll. S. Chattopadhyaya, 1 Male, Bardhaman Dist., Ketugram, 10 xii. 1985, Coll. B. N. Das; 1 Male, Dhatrigram, 12. xii. 1985, Coll. B. N. Das; 1 Male, Nadia Dist., Dhubulia, 19. xii. 1985, Coll. B. N. Das; 1 Male Nadia Dist., Nakasipara, 27. i. 1986, Coll. A. R. Lahiri; 1 Male Karimpur, 30. i. 1986, Coll. A. R. Lahiri; 2 Males, Palpara, 2. ii. 1986, Coll. A. R. Lahiri; 1 Female Darjiling Dist., 5 Km NW of Lepchajagat, 1300 m, 30. ii. 1986, Coll. A. K. Hazra; 1 Male, 3 Females, Mirik area, 2300-2400 m, 18. iv. 1986-20. iv. 1986, Coll. B. C. Das.

Diagnosis : Eyes bare; base of antenna with a black dot above; mesonotum with two broad lateral stripes and two narrow submedian stripes; abdomen linear, orange, with transverse black bands reaching lateral margins except a black median spot on tergum 1; surstylus nearly flat, broad basally and evenly rounded apically.

Distribution : India : West Bengal : Bardhaman, Darjiling, Jalpaiguri districts; common throughout Oriental region. Elsewhere : Australia, Bonin islands and Palaeartic region.

Genus *Ischiodon* Sack

1913. *Ischiodon* Sack, *Ent. Mitt.*, 2 : 5. Type-species : *Ischiodon trochanterica* Sack.

33. *Ischiodon scutellaris* (Fabricius)

1805. *Scaveva scutellaris* Fabricius, *Syst. Antliat.* : 252.

Material examined : 2 Males, Nadia Dist., Baliura and Phulia, 21. xii. 1985 & 24. xii. 1985, Coll. B. N. Das; 1 Female, Palpara, 2. xi. 1986, Coll. A. R. Lahiri.

Diagnosis : Eyes bare; metasternum bare; antennal segment 3 sub-acute apically; wing with vein R₄₊₅ upcurved apically and ending appreciably before wing apex; upper margin of sternopleuron with distinct yellow spot; a few short hairs anteriorly below upper patch of sternopleural hairs; surstylus elongate, directed posteriorly, broadened beyond base, not lobed.

Distribution : India : West Bengal; widespread in south-east Asia, Australia, Hawaii, Japan and Micronesia.

Genus *Metasyrphus* Matsumura

1917. *Metasyrphus* Matsumura, *Ent. Mag. Kyoto*, 2 : 147. Type-species : *Scaeva corollae* Fabricius.

Subgenus *Metasyrphus* Matsumura

Diagnosis : Metasternum haired; vein R₄₊₅ nearly or so; ventral and ventro-lateral surfaces of sternum 9 with dense minute pubescence; distal portion of aedeagus usually short, subcircular or slightly compressed, swollen just beyond base.

34. *Metasyrphus (Metasyrphus) corollae* (Fabricius)

1794. *Scaeva corollae* Fabricius, *Ent. Syst.*, 4 : 306.

Material examined : 1 Male, Darjiling Dist., Sukhia pokhri, 2100 m, 24. iv. 1986, Coll. B. C. Das.

Diagnosis : Eyes bare; scutellum yellow-haired; abdomen with 3 pairs of spots, clearly passing over lateral margins; male genitalia very large.

Distribution : India : West Bengal : Darjiling district; also in other parts of Asia including Taiwan; North Africa and Palaearctic region.

Genus *Sphaerophoria* (Lepeletier and Serville)

1828. *Sphaerophoria* Lepeletier and Serville, *Encycl. method.* 10 : 513. Type-species : *Musca scripta* L.

Key to the Species

1. Face unstriped; mesonotum nearly always with two more or less distinct greyish median stripes at least up to suture; abdominal tergum 9 of male sclerotized between cerci and posterior margin*indiana* Bigot
Face with distinct black median stripe; mesonotum without stripes; tergum 9 membranous between cerci and posterior margin*viridaenea* Brunetti

35. *Sphaerophoria indiana* Bigot

1884. *Sphaerophoria indiana* Bigot, *Annls Soc. ent. Fr.*, (6) 4 : 99.

Material examined : 1 Male, Darjiling Dist., Mrik area, 2300-2400 m, iv. 1986, Coll. B. C. Das.

Distribution : India : West Bengal : Darjiling district; Arunachal Pradesh; Bihar; Himachal Pradesh; Karnataka; Kerala; Maharashtra; Sikkim and Uttar Pradesh. Elsewhere : China and probably Sri Lanka; Korea and eastern USSR.

36. *Sphaerophoria viridaenea* (Brunetti)

1915. *Sphaerophoria viridaenea* Brunetti, *Rec. Indian Mus.*, 11 : 216.

Material examined : 1 Male, 1 Female, Darjiling District, Darjiling, Lloyd's Garden, 2100m, 23. iv. 1986, Coll R. C. Basu.

Distribution : India : West Bengal : Darjiling district; Himachal Pradesh and Sikkim.

Genus *Melanostoma* Schiner

1660. *Melanostoma* Schiner, *Wien, ent. Mschar.*, 4 : 213. Type-species : *Musca mellina* L.

37. *Melanostoma orientale* (Wiedemann)

1824. *Syphus orientalis* Wiedemann. *Analecta Ent.*, : 36.

Material examined : 1 Male, Jalpaiguri Dist., Buxa Tiger Reserve, 18 xii. 1984, Coll. S. Chattopadhyaya; 1 Female, Barddhaman Dist., Ketugram, 10 xii. 1985, Coll. B. N. Das; 1 Male Nadia Dist., Karimpur, 30. i. 1986, Coll. A. R. Lahiri; 2 Males, Darjiling Dist., Mirik 2400m, 18. iv. 1986, Coll. B. C. Das.

Diagnosis : Eyes bare; face with two distinct bumps; arista hairy; abdomen shining black, with large quadrate or oblong orange spots anteriorly on at least tegra 3 and 4 laterally leaving a broad median space; surstylus in males narrower and curved at base.

Distribution : India : West Bengal : Barddhaman, Darjiling, Jalpaiguri, Nadia districts; Kashmir. Widespread in Oriental region China, Japan and Manchuria and Palaeartic region.

Genus *Paragus* Latreille

1804. *Paragus* Latreille, *Nouv. Dict. Hist. nat.*, 24 : 94. Type-species : *Syphus bicolor* F.

Key to the Subgenera

1. Eyes with bicolourous pile, with alternating vittae of pale and dark hairs; spurious vein shorter, not extending beyond discal (r-m) cross-vein *Paragus* Latreille (1 species only)
- Eyes with unicolourous pile; spurious vein long, extending beyond discal (r-m) cross-vein...
 *Pandasyophthalmus* Stuckenberg (1 species only)

38. *Paragus (Paragus) serratus* (Fabricius)

1805. *Mulio serratus* Fabricius, *Syst. Analiat.* : 186.

Material examined : 2 Males, Calcutta, Salt Lake, 12. iv. 1982, Coll. S. K. Gupta; 2 Females, Purulia Dist., Ajodhya Hill, ca. 400m, 4. ix. 1985, Coll. M. Datta; 2 Males, Garh Dhrubeswar, 7. ix. 1985, Coll. M. Datta; 1 Male, Nadia Dist. Dhubulia, 19. xii. 1985, Coll. B. N. Das.

Diagnosis : Eyes hairy, with 3 white stripes; scutellum black with yellow margin, serrated; wings with anterior cross-vein distinctly before middle of discal cell; abdomen yellow with brown markings, punctate.

Distribution : India : West Bengal : Calcutta, Darjiling, Nadia, Puruliya districts. Wide spread in India. Elsewhere : Bornco, Java, Nepal, Pakistan and Sri Lanka; Papua and Africa.

*39. *Paragus (Pandasyophthalmus) atratus* de Meijere

1906. *Paragus atratus* de Meijere, *Nova Guinea*, 1 : 85.

Material examined : 1 Female, Jalpaiguri Dist., Buxa Tiger Reserve, 21. xii. 1984, Coll. S. Chattopadhyaya.

Diagnosis : Eyes sparsely hairy in males, bare in females; frons shining blue black; face without stripe, sometimes with a slight extension upwards of black colour of mouth border.

Distribution : India : West Bengal : Jalpaiguri district; Kashmir and Uttar Pradesh. Elsewhere : Java, Malaya, Sumatra, Sumbawa and Timor, New Guinea.

Key to the genera of MILESINAE

1. Hind femur with well-developed anterior, basal patch of setulae4
Hind femur without basal patches of setulae2
2. Eyes pilose; face pilose at least on sides*Eumerus* Meigen (1 specis only)
Eyes and face bare3
3. Subscutellar fringe present; anterior cross-vein (r-m) distinctly beyond middle of discal cell...
.....*Chalcosyrphus* Curran (1 species only)
Subscutellar fringe absent; anterior cross-vein before middle of discal cell.....
.....*Syritta* Lep. & Serv.
4. Eyes pilose5
Eyes bare.....6
5. Antenna with plumose arista.....*Eristalis* Latreille
Antenna with bare arista*Eristalinus* Rondani
6. Marginal cell (R₁) open at wing margin; bare species*Mesembrius* Rondani
Marginal cell closed; pubescent species.....*Phytomia* Guerin-Menevill

Genus *Eumerus* Meigen

1822. *Eumerus* Meigen, *Syst. Bexchr. europ. zweifl. Insekt.*, 3 : 202. Type-species : *Syrphus tricolor* Fabricius.

*40. *Eumerus aeneithorax* Brunetti

1915. *Eumerus aeneithorax* Brunetti, *Rec, Indian, Mus.*, 11 : 244.

Material examined : 1 Female, Darjiling Dist., Kalimpong sub-division, 8. iv. 1973, Coll. H. S. Sharma.

Diagnosis : Frons and vertex aeneous; face dull blackish grey; antennae entirely black; thorax shining aeneous, thickly clothed, abdomen shining black, tegra 2, 3 and 4 each with a pair of whitish lunulate dust spots placed diagonally; eggs black; wing tip entire clear.

Distribution : India : West Bengal : Darjiling district; Himachal Pradesh.

Genus *Eristalinus* Rondani

1845. *Eristalinus* Rondani, *Nouvi Annali Sci. nat. Boloqna*, 2 (2) : 453. Type-species : *Musca sepulchralis*

Key to the Subgenera

1. Metathoracic spiracular hair-patch present*Eristalodes* Mik (1 species only)
Metathoracic spiracular hair-patch absent2
2. Hind femur greatly thickened*Merodonoides* Curran (1 species only)
Hind femur normal*Eristalinus* Rondani

Key to the Species

1. Abdomen with transverse bands or spots2
Abdomen with oblique spots*obliquus* Wiedemann
2. Femur black, tip generally more or less pale3
Femur normally orange or brownish orange*arvorum* Fabricius
3. Tarsi yellowish-white nearly to tips; abdomen shorter, more ovate-conical.....
.....*quinqestriatus* Fabriviuis
Tarsi black, at most pale basally, abdomen longer and narrower, more elongate-conical.....
.....*obscuritarsis* de Meij.

41. *Eristalinus (Eristalinus) arvorum* (Fabricius)

1787. *Syrphus arvorum* Fabricius, *Mantissa Insect.*, 2 : 335.

Material examined : 1 Female, Darjiling Dist., Andheri Khola, 750m, 9. iv. 1973, Coll. H. S. Sharma, 1 Female Medinipur Dist., Salboni, 9. vii. 1985, Coll. B. C. Das; 1 Female, Belpahari, 13.ix.1985, Coll. S. Biswas; 2 Females, Bankura Dist., Bishnupur, 26. x. 1985, Coll. M. Datta; 1 Female, Puruliya Dist., Balarampur, 2. xi. 1985, Coll. S. Sen.

Distribution : India : West Bengal : Bankura, Darjiling, Medinipur, Puruliya districts. Common in south-east Asia, Australia, Hawajii, Japan and Micronesia.

42. *Eristalinus (Eristalinus) obliquus* (Wiedemann)

1824. *Eristalis obliquus* Wiedemann, *Analecta, Ent.* : 38.

Material examined : 1 Female, Bardhaman Dist., Ukhra, 17. x. 1985, Coll. S. K. Ghosh.

Distribution : India : West Bengal : Bardhaman, Calcutta, 24-Parganas districts; Tamil Nadu and also in other parts of southern Orient; New Guinea.

*43. *Eristalinus (Eristalinus) obscuritarsis* de Meijere

1908. *Eristalis obscuritarsis* de Meijere, *Tijdschr. Ent.* 51 : 250.

Material examined : 3 Males, 2 Females Medinipur Dist., Haldia, Jhargram and Salboni, 4. viii. 1985, Coll. B. C. Das; 4 Males, 4 Females, Bankura Dist., Bishnupur and Bankura, 26-29. x. 1985, Coll. M. Datta; 6 Males, 12 Females, Puruliya Dist., Ajodhya Hill, ca. 700m and Garh Dhrubesar, 2-7. xi. 1985, Coll. M. Datta.

Distribution : India : West Bengal : Bankura, Medinipur, Puruliya districts; Kashmir down to Kerala. Elsewhere : Bangladesh, Java, Malaya, Sri Lanka and Taiwan.

44. *Eristalinus (Eristalinus) quinquestriatus* (Fabricius)

1794. *Syrphus quinquestriatus* Fabricius *Ent. Syst.* 4 : 289.

Material examined : 1 Male, Darjiling Dist. Tindharia, 900m, 30. iii. 1986, Coll. A. K. Hazra.

Distribution : India : West Bengal : Calcutta, Darjiling districts; Assam, Bihar, Karnataka, Kerala, Madhya Pradesh, Orissa, Uttar Pradesh, also in other parts of Oriental region. Elsewhere : Japan.

*45 *Eristalinus (Eristalodes) taeniops* (Wiedemann)

1794. *Eristalis taeniops* Wiedemann, *Zool. Maq.*, 2 : 42.

Material examined : 2 Males, Jalpaiguri Dist., Buxa Tiger Reserve, 21. xii. 1984, Coll. S. Chattopadhyaya.

Diagnosis : Eyes brownish to dark reddish brown, with fine longitudinal dark stripes; antenna blackish; mesonotum a little light yellowish grey, with four dull black, close stripes; scutellum yellowish; abdominal segment 3 mainly yellow.

Distribution : India : West Bengal : Jalpaiguri district; Himachal Pradesh. Elsewhere : Pakistan, Nepal, Africa, Canary Islands, Palearctic region.

*46. *Eristalinus (Merodonoides) multifarius* (Walker)

1852. *Eristalis multifarius* Walker, *Insecta Saundersiana*, 1 : 248.

Material examined : 1 Male, Darjiling Dist., Andheri Khola, 750m, 9. iv. 1973, Coll. H. S. Sharma.

Diagnosis : Eye reddish brown, bare, with two distinct black stripes; antenna black; mesonotum ash-grey, with four shining black stripes, scutellum entirely orange; subscutellar fringe absent; wing

with petiolate marginal cell (Fig. M); abdominal tergum 3 mainly orange, with a large semi-circular black spot posteriorly.

Distribution : India : West Bengal : Darjiling district; Gujarat; Kerala, Meghalaya; Rajasthan and Tamil Nadu. Elsewhere : Java, Malaya, Nepal, Sri Lanka and Vietnam.

Genus *Eristalis* Latreille

1804. *Eristalis* Latreille, *Nouv. Dict. Hist. nat.*, 24 : 194. Type-species : *Musca tenax* L.

Key to the Subgenera

1. Upper edge of meropleuron (barrette) pilose*Eristalis* Latreille (1 species only)
- Upper edge of meropleuron bare*Eoseristalis* Kanervo

47. *Eristalis (Eristalis) tenax* (Linnaeus)

1758. *Musca tenax* Linnaeus, *Syst. Nat. Ed.*, 10 : 591.

Material examined : 1 Female, Darjiling Dist., Lloyd's Botanical Garden, 2100m, 26. iii. 1986, Coll. A. K. Hazra; 1 Female, Tindharia, 900m, 30. iii. 1986, Coll. A. K. Hazra; 1 Male, 5 Females, Mirik, 2400m, 18. iv. 1986, Coll. B. C. Das; 1 Male, 2 Females, 2 Km E of Mirik, 2250m, 20. iv. 1986, Coll. B. C. Das; 1 Male, Sukhia pokhri, 2100m, 24. iv. 1986, Coll. B. C. Das.

Diagnosis : Eyes brown-haired, with two longitudinal bands of dense hairs; antenna generally brownish black; mesonotum shining brownish black; scutellum brownish yellow, subscutellar fringe absent; abdominal colouration reddish yellow to black.

Distribution : Nearly cosmopolitan.

Key to the Species

1. Mesonotum without any transverse stripe; abdominal segments 2 and 3 with black spot filling half of anterior margin, segments 4 and 5 shining black*arbustorum* (L.)
- Mesonotum with a transverse stripe of greyish pubescence along suture; abdominal segment 3 in males with triangular or oblong spots on anterior margins, reaching side margins, in females spots smaller and narrower but always on anterior margin*cerealis* Fabricius

*48. *Eristalis (Eoseristalis) arbustorum* (Linnaeus)

1758. *Musca arbustorum* Linnaeus, *Syst. Nat. Ed.*, 10 : 591.

Material examined : 1 Male, Darjiling Dist., Mirik area, 2300m, 20 iv. 1986, Coll. B. C. Das; 2 Males, Darjiling, Lloyd's Botanical Garden, 2100m, 23. iv. 1986, Coll. R. C. Basu.

Distribution : India : West Bengal : Darjiling district; and Holarctic region.

49. *Eristalis (Eoseristalis) cerealis* Fabricius

1805. *Eristalis cerealis* Fabricius, *Syst., Antliat.*, : 232.

Material examined : 2 Females, Darjiling Dist., Mirik, 2400m, 18 iv. 1986, Coll. B. C. Das; 3 Females, Lloyd's Botanical Garden, 2100m, 23. iv. 1986, Coll. B. C. Das.

Distribution : Widespread in Oriental region including West Bengal (Darjiling); Japan, Korea and Sakhalin.

Unplaced Species of *Eristalis* Latreille50. *Eristalis polychromata* Brunetti

1923. *Eristalis polychromatus* Brunetti, *Fauna Brit. India, Diptera*, 3 : 180.

Material examined : 1 Male, Nadia district, Palpara, 2. ii. 1986, Coll. A. R. Lahiri.

Diagnosis : Eyes finely haired, with dark spots; antenna brownish orange; mesonotum dark grey, with four shining black strips; scutellum shining blue black; abdominal terga 2, 3 and 4 orange except posterior margins and median spots, no arcuate whitish band.

Distribution : India : West Bengal : Calcutta and Nadia districts; Kerala and Orissa only.

Genus *Mesembrius* Rondani

1857. *Mesembrius* Rondani, *Dipterol, ital, Prodr.*, 2 : 50. Type-species : *Helophilus peregrinus* Loew.

Key to the Species

1. Mid femur in males with a tooth below near base, and suddenly contracted at tip; abdominal segment 4 with an inverted, widely open V-mark *bengalensis* (Wiedemann)
- Mid femur in males without such tooth and very gradually narrowed apically; abdominal segment 4 without a V-mark..... *quadrivittatus* (Wiedemann)

51. *Mesembrius bengalensis* (Wiedemann)

1819. *Eristalis bengalensis* Wiedemann, *Zool. Maq.*, 1 : 16.

Material examined : 1 Female, Medinipur Dist., Salboni, 9. viii. 1985, Coll. B. C. Das.

Distribution : India : West Bengal : Calcutta and Medinipur districts; Assam, Bihar; Gujarat and Kerala Elsewhere : Other parts of south-east Asia to New Guinea and northern Australia.

52. *Mesembrius quadrivittatus* (Wiedemann)

1819. *Eristalis quadrivittatus* Wiedemann, *Zool. Maq.*, 1 : 17.

Material examined : 2 Females, Calcutta, Salt Lake, 12. iv. 1982, Coll. S. K. Gupta; 1 Male, Nadia Dist., Kalyani, Kulia Jheel, 21. i. 1986, Coll. A. R. Lahiri.

Distribution : India : West Bengal : Calcutta, Darjiling, Nadia, 24-Parganas districts; Assam, Bihar, Gujarat, Karnataka and Madhya Pradesh. Elsewhere : Java, Moluccas and Nepal.

Genus *Phytomia* Guerin-Meneville

1834. *Phytomia* Guerin-Meneville. In *Belanger, Voyage Ind.-Orient.*, 7 : 509. Type-species : *Eristalis chrysopygus* Wiedemann.

Key to the Subgenera

1. Hind femur with a conspicuous tooth below near tip.....
..... *Dolichomerus* Macquart (1 species only)
- Hind femur unarmed..... *Phytomia* Guerin-Meneville

53. *Phytomia (Phytomia) errans* (Fabricius)

1787. *Syphus errans* Fabricius, *Mantissa Insect.*, 2 : 337.

Material examined : 1 Male, Medinipur Dist., Belpahari, 11. ix. 1985, Coll. S. Biswas; 1 Female, Bankura Dist., Bishnupur Sericulture Nursery, 26. x. 1985, Coll. M. Datta; 1 Male Puruliya Dist., Ajodhya Hill, ca. 700m, 4. xi. 1985, Coll. M. Datta.

Diagnosis : Antenna entirely orange, arista orange, bare; mesonotum usually dull black anteriorly, with two broad stripes and broadly yellowish grey posteriorly; abdomen brownish orange, segments 2, 3 and 4 each with a large blackish brown spot posteriorly.

Distribution : India : West Bengal : Bankura, Darjiling, Medinipur, Puruliya districts; Assam, Bihar, Karnataka, Kashmir, Kerala and Tamil Nadu. Elsewhere : In other parts of south-east Asia; Japa.

54. *Phytomia (Dolichomerus) crassa* (Fabricius)

1787. *Syrphus crassus* Fabricius, *Mantissa Insect.*, 2 : 334.

Material examined : 1 Female, Bankura Dist., Bishnupur Sericulture Nursery, 26. x. 1985, Coll. M. Datta.

Diagnosis : Antenna black, arista orange, plumose on basal half; thorax and scutellum black; abdomen shining black, bare, segments 2, 3 and 4 each with a deep impression of a large circle touching anterior margin.

Distribution : India : West Bengal : Bankura; Darjiling districts; Andhra Pradesh; Assam; Bihar; Goa; Karnataka; Kerala; Meghalaya; Sikkim, Tamil Nadu and Uttar Pradesh. Elsewhere : Celebes, Laos, Malaya, Nepal, Sri Lanka and Thailand.

Genus *Syritta* Lapeletier & Serville

1828. *Syritta* Lapeletier and Serville, In Latreille *et al.*, *Encycl. meth.* (Ins.), 10 (2) : 808. Type-species *Musca pipiens* L.

Key to the Species

1. Hind femur entirely orange or brownish basally up to one third or even two-thirds, rest black...
.....*indica* (Wiedemann)
- Hind femur entirely black or very narrowly pale at extreme tip and base*orientalis* Macquart

55. *Syritta indica* (Wiedemann)

1824. *Eumerus indicus* Wiedemann, *analecta Ent.*, : 33.

Material examined : 6 Males, 1 Female, Puruliya Dist., Garh Dhrubeswar, 7. xi. 1985, Coll. M. Datta; 1 Male, Barddhaman district, Ketugram, 10. xii. 1985, Coll. B. N. Das.

Distribution : India : West Bengal : Barddhaman, Calcutta, Puruliya, 24-Parganas districts; Assam, Bihar; Karnataka; Kerala; Madhya Pradesh; Maharashtra; Pondicherry and Uttar Pradesh. Elsewhere : Burma, Nepal and Taiwan.

56. *Syritta orientalis* Macquart

1824. *Syritta orientalis* Macquart, *Dipt. expt.*, 2 (2) : 76 (136).

Material examined : 1 Female, Medinipur Dist., Salboni, 9. viii. 1985, Coll. B. C. Das.

Distribution : India : West Bengal : Calcutta, Darjiling, Medinipur, 24-Parganas districts; Bihar and Pondicherry. Elsewhere : Bangladesh, Burma, Java, Singapore and Sri Lanka.

Genus *Chalcosyrphus* Curran

1925. *Chalcosyrphus* Curran, *Kansas Univ. Sci. Bull.*, 15 : 122. Type-species : *Chalcomyia atra* Curran.

Subgenus *Syrittosylota* Hippa

Diagnosis : Mesonotum with a distinct hairy pattern of longitudinal stripes; hind femur strongly incrassate, its apico-ventral ridge abruptly at base, apex not curved inwards; wings without colour pattern.

57. *Chalcosyrphus (Syrittosylota) annulatus* (Brunetti)

1913. *Xylota annulata* Brunetti, *Rec. Indian Mus.*, 9 : 270.

Material examined : 1 Male, Darjiling, Dist., Andheri Khola, 750m, 9. iv. 1973, Coll. H. S. Sharma.

Diagnosis : Eyes large; antenna dropping; mesonotum shining, with two median stripes of golden yellow hairs from anterior margin nearly to scutellum; scutellum with marginal rim; abdomen constricted medially, segments 2 and 3 each laterally with translucent spots, segment 4 whining; hind femur orange, with a broad black median ring and tip black.

Distribution : India : West Bengal : Darjiling district; Meghalaya. Elsewhere : Laos and Malaya.

Family MICROPEZIDAE

Reference on the fauna of West Bengal : Steyskal 1977. A total of 2 species under 1 genus of 1 subfamily are heretofore known in West Bengal vis-a-vis 10 species under 3 genera of 2 subfamilies in India.

Subfamily TENIAPTERINAE

Diagnosis : Frontal stripe mostly spindle-shaped; antennae widely spaced; maxillary palpi long; capitellum of halteres involute and spindle-shaped, petiole long and fine; distal region of sternum 5 always produced into well-developed copulatory fork; hind margin of katapisternum with dense vertical fan of many long and fine bristle-like hairs, lighter coloured than other shorter and stronger thoracic bristles, epandrium conspicuously compressed, in cross section U-shaped; no surstyli.

Genus *Mimegralla* Rondani

1850. *Mimegralla* Rondani, *Nuovi Annali Sci. nat. Ist. Bologna* (3) 2 : 180. Type-species : *Calobata coerulifrons* Macquart.

Diagnosis : Ocellar plate placed posterior to superior upper orbitals or at most fore ocellus in line with these; frontal stripe more than one-half as wide as total width of frons; anterior upper orbitals stand in tomentose frontal stripe or just on boarder line; postverticals absent.

58. *Mimegralla albimana* (Doleschall)

1856. *Taenioptera albimana* Doleschall, *Natuurk. Tijdschr. Ned-Indie*, 10 (n.s:7) : 413.

Material examined : 1 Female, 24-Parganas Dist. Barrackpore, Nilganj, 22. i. 1986, Coll. P. Parui.

Diagnosis : Antennae bright reddish yellow, maxillary palpi entirely yellow; anepisternum (mesosternum) posteriorly sericeous with silvery to pale, brass-yellow shine; apex of copulatory fork in lateral view conspicuously curved downward; stalk approximately as long as forceps; oviscape very short, only 1.2 times longer than wide.

Remarks : Common in Oriental region including West Bengal, Australian region and Japan.

Family OTITIDAE

References on the fauna of West Bengal : Walker 1849; Steyskal 1977.

Only 1 species under 1 genus of 1 subfamily is heretofore known in West Bengal vis-a-vis 2 species under 1 genus of 1 subfamily in India.

Subfamily ULIDINAE

Diagnosis : Aedeagus bare; without bristles, hairs or denticles; tip sometimes specialized.

Genus *Physiphora* Fallén

1810. *Physiphora* Fallén, *Sp. ent. nov. Dit.* : 11. Type-species : *Chrysomyza splendida* Fallén.

Diagnosis : Head at most a little longer than high; medifrons bare, in upper part with four swellings; antennal segment 3 rounded apically; humeral bristle usually well-developed; wing with basal cell 2 closed by straight or zigzag vein.

59. *Physiphora aenea* (Fabricius)

1794. *Musca aenea* Fabricius, *Ent. Syst.* 4 : 335.

Material examined : 1 Female, Maldah Dist., Bhaluk Station, 26. vi. 1987, Coll. K. P. Mukherjee.

Diagnosis : Epistome, proboscis and palpi black; frontal stripe green or blue; wings with petiolate posterior cell 1; abdomen unicolourous : green or metallic blue; hairs on anterior corners yellowish.

Distribution : India : West Bengal : Northern Districts; Orissa and probably Assam. Elsewhere : Widespread from Seychelles to Samoa; Hawaii to Australia; North and South Americas.

Family SCIOMYZIDAE

References on the fauna of West Bengal : Hendel 1912; Knuston 1977.

A total of 6 species under 3 genera of 1 subfamily are heretofore known in West Bengal vis-a-vis 10 species under 4 genera of 1 subfamily in India.

Subfamily SCIOMYZINAE

Diagnosis : Propleural bristle present; femora with well-developed bristles; median frontal channel usually wanting.

Genus *Sepedon* Latreille

1804. *Sepedon* Latreille, *Nouv. Dict. Hist. nat.*, 24 : 196. Type-species : *Syrphus spequeus* Fabricius.

Diagnosis : Slender flies with practically immaculate wings; frons deeply excavated and ridged; ocellar bristles microscopic or absent; lunule prominent; scutellum with only two approximated apical bristles; hind tibiae without preapicals; pleura and abdomen without characteristic bristles; antennal segment 2 elongate.

60. *Sepedon ferruginosa* Wiedemann

1824. *Sepedon ferruginosus* Wiedemann, *Analecta Ent.*, : 56.

Material examined : 2 Females, Murshidabad Dist., Dhulian, 17. iv. 1987, Coll. K. P. Mukherjee.

Diagnosis : Flies with ferruginous body colour; 2 black spots on frons and 2 narrow black lines, close together, on mesonotum.

Distribution : India : West Bengal : Northern Districts; Andhra Pradesh; Assam; Bihar and Tamil Nadu. Elsewhere : Burma, Malaya, Nepal, Pakistan, Philippines, Sri Lanka, Taiwan and Thailand.

Family SEPSIDAE

References on the Fauna of West Bengal : Brunetti 1910; Zuska 1977; Iwasa 1982.

A total of 13 species under 6 genera of 2 subfamilies are heretofore known in West Bengal vis-a-vis 16 species under 7 genera of 2 subfamilies in India.

Subfamilies SEPSINAE

Diagnosis : Thorax and abdomen usually shining, at least on parts of pleura; mouth opening not large; microsetae present, and often macrosetae on abdomen; mid femur not bent on middle.

Key to the Genera

1. Basal cells 1 and 2 confluent2
 Basal cells 1 and 2 distinct3
2. Scutellum as long as wide, upper surface flat, with 2 pairs of strong apical and strong basal scutellar bristles; fronto-orbital bristles developed*Saltella* Rob. Desv. (1 species only)
 Scutellum shorter than half of width, upper surface slightly convex, with 2 pairs of strong apical and small basal scutellar bristles; fronto-orbital bristles vestigial.....
 *Australosepsis* Malloch (1 species only)
3. Humeral bristles present.....4
 Humeral bristles absent*Decachaetophora* Duda (1 species only)

4. Abdomen in both sexes with distinct macrochatae; epandrial process bifurcate at the tip.....
*Dicranosepsis* Duda (1 species only)
 Abdomen in male, often in female also, with distinct macrochaetae; epandrial process not
 bifurcate at the tip.....*Sepsis* Fallén

Genus *Australopsis* Malloch

1925. *Australosepsis* Malloch, *Proc. Linn. Soc. N. S. W.*, 50 : 314. Type-species : *fulvescens* Malloch.

61. *Australosepsis niveipennis* (Becker)

1903. *Sepsis niveipennis* Becker, *Mitt. zool. Mus. Berl.*, 2 : 143.

Material examined : 3 Females, Maldah Dist., Golapganj, 21. vi. 1987, Coll. K. P. Mukherjee.

Diagnosis : Wing with a diffused dark spot at the end of vein R₂₊₃.

Distribution : India : West Bengal : Bardhaman, Birbhum, Calcutta, Jalpaiguri, Maldah Districts; Andhra Pradesh; Bihar; Delhi; Orissa, Tamil Nadu and Uttar Pradesh. Elsewhere : Borneo, Java, Lesser Sunda Islands, Nepal, Pakistan, Philippines and Taiwan; Japan Mediterranean subregion of Palaearctic region; Australasian region; Ethiopian region.

Genus *Dicranosepsis* Duda

1926. *Dicranosepsis* Duda, *Annl. Naturh. Mus. Wien.*, 39 (1925) : 43 Type-species : *Sepsis bicolor* Wiedemann.

62. *Dicranosepsis bicolor* (Wiedemann)

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

Material examined : 8 Females, Darjiling Dist., Rangpo, 1600m, 14. xi. 1978, Coll. A. N. T. Joseph.

Distribution : India : West Bengal : Calcutta, Darjiling district; widespread in Oriental region. Elsewhere : Australian region, Japan.

Genus *Sepsis* Fallén

1810. *Sepsis* Fallén, *Spec. Ent. Meth. Exh.* : 17. Type-species : *Sepsis cynipsea* Linnaeus.

Key to the Species

1. Wing with an angular-shaped dark spot at the end of vein R₂₊₃*himalayensis* Brunetti
 Wing without a dark spot at the end of vein R₂₊₃.....*nitens* Wiedemann

63. *Sepsis himalayensis* Brunetti

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

Material examined : 6 Females, Darjiling Dist., Sonada, 1660m, 28. ix. 1978, Coll. A. N. T. Joseph.

Distribution : India : West Bengal : Darjiling district; Sikkim. Elsewhere : Burma and Nepal.

64. *Sepsis nitens* Wiedemann

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

Material examined : 2 Females, Maldah Dist., Golapganj, 21. iv. 1987, Coll. K. P. Mukherjee.

Distribution : India : West Bengal : Calcutta, Darjiling, Maldah districts; Andhra Pradesh; Assam; Bihar; Madhya Pradesh; Orissa; Tamil Nadu and Uttar Pradesh. Elsewhere : Java, Lesser and Sunda Islands, Pakistan Philippines, Sri Lanka and Taiwan; Australasian region; Japan.

Genus *Saltella* Rob.-Desv.

1830. *Saltella* Robineau-Desvoidy, *Essai Myodaires* : 746. Type-species : *Saltella nigripes*. Rob.-Desv.

65. *Saltella setigera* Brunetti

1909. *Saltella setigera* Brunetti, *Rec. Indian Mus.*, 3 : 368.

Material examined : 1 Female, Maldah Dist., Golapganj, 21. vi. 1987, Coll. K. P. Mukherjee.

Diagnosis : Fore femur thickened on basal two-thirds, with 6 strong spines on upper side, 6 shorter spines towards inner side; tarsal segments 2 of mid and hind legs black.

Distribution : India : West Bengal : Calcutta, Maldah districts; Kerala. Elsewhere : Nepal.

Genus *Decachaetophora* Duda

1926. *Decachaetophora* Duda, *Annln naturh. Mus. Wein.* 39 (1925) : 27. Type-species : *Sepsis aeneipes* de Meijere.

66. *Decachaetophora aeneipes* (de Meijere)

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

Material examined : 27 Females, Darjiling Dist., Lava, 2100 m, II. ix. 1978, coll. A.N.T. Joseph.

Diagnosis : Vibrissae duplicate; fore tibiae in male with ventral emargination bearing in its middle a broad, scraper-like tooth.

Distribution : India : West Bengal : Darjiling Dist.; Assam; Himachal Pradesh; Punjab; Sikkim and Uttar Pradesh. Elsewhere : China; Nepal; Sri Lanka; Taiwan; Japan; Nearctic region.

Family CHLOROPIDAE

References on the fauna of West Bengal : Becker 1911; Frey 1961; Cherian 1971, 1973, 1976, 1977, 1978.

A total of 30 species under 13 genera of 2 subfamilies are heretofore known in West Bengal vis-a-vis 115 species under 36 genera of 2 subfamilies in India.

Subfamily CHLOROPINAE

Diagnosis : Chloropids with more than 3-4 orbital bristles; humerus with 1 bristles only; costa reaching R₄₊₅ or a little beyond it; abdominal sterna of male symmetrical.

Genus *Pachylophus* Loew.

1858. *Pachylophus* Loew, *Berl. ent. Z.*, 2 : 121. Type-species : *Frontalis* Loew.

Diagnosis : Antennal arista somewhat thickened at least with long dense hairs; hind femur thickened, hind tibia correspondingly curved.

67. *Pachylophus rufescens* (de Meijere)

1904. *Myrmemorpha rufescens* de Meijere, *Bijdr. Dierk.*, 17-18 : 113.

Material examined : 1 Male, 6 Females, Haora Dist., Bally, 8. ix. 1967, Coll. P. Parui.

Diagnosis : Frons not projecting beyond eye in front, frons concolourous with frontal triangle; thorax smooth, with 1 posterior notopleural bristle; halteres white; distance between 2 cross-veins only a little more than length of posterior cross-vein; edite triangular in male genitalia.

Distribution : India : West Bengal : (plains); Assam; Bihar; Himachal Pradesh; Maharashtra; Orissa, Tamil Nadu and Uttar Pradesh. Elsewhere : Burma, China, Java, Nepal, Philippines, Sri Lanka, Sumatra, Thailand and Vietnam, Australia.

Family EPHYDRIDAE

References on the fauna of West Bengal : Cresson 1934; Cogan and Wirth 1977.

A total of 10 species under 7 genera of 4 subfamilies are heretofore known in West Bengal vis-a-vis 52 species under 25 genera of 4 subfamilies in India.

Key to the Subfamilies

1. Dorsocentrals absent or never as long as longest facial.....*Psilopinac* (1 species only)
- Dorsocentral one or more present and as long as or longer than longest facial.....*Notiphilinac*

Genus *Psilopa* Fallén

1823. *Psilopa* Fallén, *Hydromyzides Sveciae* : 6. Type-species : *Notiphila nitidula* Fallén.

Diagnosis : Fore leg not entirely black; mid and hind legs with femora or tibiae black.

68. *Psilopa pollinosa* (Kertész)

1901. *Ephygrobia pillinosa* Kertész, *Termeszetr. Fiiz.*, 24 : 81.

Material examined : 1 Female, Calcutta, Eden Garden, 4. xii. 1959, Coll. A. P. Kapur; 1 Male, 24-Parganas Dist., Birati, 25. i. 1962, Coll. R. K. Varshney; 3 Females, Hugli Dist., Bandel, 28. xi. 1964, Coll. K. R. Rao.

Diagnosis : Frons and vertex shining green, inner vertical larger than outer vertical; one fronto-orbital proclinate, other reclinate; face and cheeks black, grey pollinose; antenna dark brown, segment 3 lighter; mesonotum uniformly shining green; scutellum green with four bristles, apical pair converging; wing yellowtinged; abdomen concolourous with thorax; halteres brownish yellow.

Distribution : India : Throughout West Bengal and other States. Elsewhere : Sri Lanka to Taiwan and Micronesia; Australia; Fiji; New Guinea; Samoa and Tonga.

Key to the genera of NOTIPHILINAE

1. Mid-tibiae with a long ventral bristle at tip*Typopsilopa* Cresson (1 species only)
 Mid-tibiae with three erect dorsal bristles*Paralimna* Loew

Genus *Typopsilopa* Cresson

1916. *Typopsilopa* Cresson, *Ent. News*, 27 : 147. Type species : *flavitaris* Cresson.

69. *Typopsilopa chinensis* (Wiedemann)

1830. *Notiphila chinensis* Wiedemann, *Aussereurop. zweifl. Insekt.*, 2 : 592.

Material examined : 1 Female, 24-Parganas Dist., Basdhani, 14. i. 1960, Coll. S. Ali.; 1 Female, Calcutta, Eden Garden, 1. i. 1965, Coll. S. Ali.; 1 Male, Haora Dist., Botanical Garden, 27. x. 1965; Coll. K. R. Rao; 2 Males, 24-Parganas dist., Ichhapur, 8. xii. 1965, Coll. K. R. Rao.

Diagnosis : Surstylus with portion straight and slightly clavate; hypandrium with a pair of curved filamentous process.

Distribution : India : West Bengal : Calcutta, Haora, 24-Parganas districts; Assam. Elsewhere : China, Nepal, Philippines, Ryukyu Islands, Sri Lanka, Australia and Caroline Islands.

Genus *Paralimna* Loew

1862. *Paralimna* Loew, *Smithsn. misc. Collns*, 6 : 138. Type-species : *appendiculata* Loew.

Key to the Species

1. Ventral surfaces of head and body characteristically white*hirticornis* de Meijere
 Ventral surface of head and body coloured otherwise2
 2. Mesonotal stripe present; abdomen without bands*lineata* de Meijere
 Mesonotal stripe absent; abdomen with grey bands*concors* Cresson.

**70. *Paralimna concors* Cresson

1929. *Paralimna concors* Cresson, *Trans. Am ent. Soc.*, 55 : 189.

Material examined : 2 Males, Hugli Dist., Bhadreswar, 5. xi. 1964, Coll. A. N. T. Joseph.

Distribution : Philippines; Moluccas.

*71. *Paralimna hirticornis* de Meijere

1913. *Paralimna hirticornis* de Meijere, *Bjdr. Diark.*, 19 : 65.

Material examined : 1 Female, Calcutta, Eden Garden, 13. xi. 1959, Coll. A. P. Kapur; 1 Female, Hugli Dist., Uttarpara, 6. x. 1961, Coll. K. D. Chatterjee; 1 Male, Haora Dist., Botanical Garden, 27. x. 1965, Coll. K. R. Rao; 3 Females, Calcutta, Eden Garden, 10. i. 1969, Coll. A. N. T. Joseph.

Distribution : India : West Bengal : Calcutta, Haora Districts. Elsewhere : Pakistan, Philippines, Sri Lanka, Taiwan, New Guinea and West Iran.

***72. *Paralimna lineata* de Meijere**

1908. *Paralimna lineata* de Meijere, *Tijdschr. Ent.*, 51 : 165.

Material examined : 2 Males, 24-Parganas Dist., 4. xiii. 1955, Col. S. Ali.

Distribution : India : Orissa, Tamil Nadu and Uttar Pradesh. Elsewhere : Java, Philippines, Sri Lanka, Taiwan, and Vietnam, Micronesia, Somoa and Seychelles.

Family HIPPOBOSCIDAE

Reference on the fauna of West Bengal : Leach 1817; Ormerod 1895; Maa 1963, 1966, 1969, 1977.

A total of 7 species under 6 genera of 3 sub-families are heretofore known in West Bengal vis-a-vis 25 species under 11 genera of 3 subfamilies in India.

Key to the Subfamilies

1. Trasal claw very deeply bidentate but seemingly tigid; humeral callus very strong, horn-like, distinctly protruding latero-cephalad; parasites on birdsOrinthomyinae (1 species only)
- Trasal claw actually simple but seemingly bifid; humeral callus weak, never horn-like; parasites on certain mammals.....Hippoboscinae (1 species only)

Genus *Pseudolynchia* Bequaert

1926. *Pseudolynchia* Bequaert, *Psyche*, Comb. 32 : 271. Type-species : *Olfersia maura* Bigot = *canariensis* Macquart.

Diagnosis : Hind scutellar margin truncate or subtruncate, sharply edged, with a series of long minute setigerous tubercles at each corner; metaplural process indistinct; metasternal process well-developed, spur-like, overlapping part of hind coxa; inner orbit and anterolateral area of prescutum densely coated with long recumbent setae.

73. *Pseudolynchia canariensis* (Macquart)

1840. *Olfersia canariensis* Macquart, *In Webb and Berthelot, Hist. nat. Iles Canaries*, 2 (2) : Zool. 199.

Material examined : 2 Males, 24-Parganas Dist., Jadavpur, 5. vii. 1988, Coll. P. Mondal.

Diagnosis : Palpus fairly long and apical 1/2 of anterior surface covered with pale soft setae; vibrissal process moderately projecting; anepisternum with soft pale setae in addition to 1-2 black bristles, fore femur with pale soft setae on apical 1/2 of anterior surface.

Distribution : Nearly cosmopolitan.

Genus *Hippobosca* Linnaeus

1758. *Hippobosca* Linnaeus, *Syst., Nat., Ed. 10* : 607. Type-species : *equina* L.

Diagnosis : Hard shining cuticle, sometimes ornamented; head impacted in thorax; antennae very reduced; wings or abdominal segments present; stout legs; proboscis with prestomal teeth, 10 in number, each terminating in 2 denticles.

74. *Hippobosca variegata* Megerle von Mühlfeld

1803. *Hippobosca variegata* Megerle von Mühlfeld, *Appendix Cat. Insect.* : unpaginated.

Material examined : 1 Male, 24-Parganas Dist., Dattapukur, 6. xii. 1966, Coll. A. N. T. Joseph.

Diagnosis : Ectoparasites especially on horses; head not impinged on thorax; wings present; squama and antesquama of wing fringed with short, white pubescence; femora thickly covered with long hairs; tibiae with scanty pubescence scattered all over.

Distribution : Widespread in south-east Asia, including West-Bengal; Ethiopian region.

Family MUSCIDAE

Reference on the fauna of West Bengal : Robineau-Desvoidy 1830; Picard 1908; Austen 1909; Brunetti 1910; Stein 1918; Emden 1965; Pont 1977.

A total of 95 species under 27 genera of 5 subfamilies are heretofore known in West Bengal vis-à-vis 233 species under 37 genera of 6 subfamilies in India.

Key to the Subfamilies

1. Petropleuron hairy on upper embossed part; m_{1+2} strongly upcurved; thoracic setae well-developed.....Muscinae
- Petropleuron bare; m_{1+2} nearly straightway reaching tip; thoracic setae reduced.....
.....Phaoniinae (1 species only)

Key to the genera of Muscinae

1. Thorax and abdomen black or yellow with vittae. Prostigmal bristle present*Musca* L.
- Thorax and abdomen metallic blue, green or purple, without dense pollinosity. Suprasquamal ridge hairy*Orthelia* Rob.-Desv.

Genus *Musca* L.

1758. *Musca* Linnaeus, *Syst. Nat. Ed. 10* : 589. Type-species : *Musca domestica* L.

Key to the subgenera of *Musca*

1. Proboscis soft and weakly sclerotized; mid tibia without an av seta.....
.....*Musca s. str.* (1 species only)
- Proboscis stout and well-sclerotized with strong teeth; mid tibia with an av seta at apical third
.....*Philaematomyia* Austen (1 species only)

75. *Musca (Musca) domestica* Linnaeus

1758. *Musca domestica* Linnaeus, *Syst. Nat. Ed., 10* : 596.

Material examined : 4 Females, Maldah Dist., Nalagola, 18. vi. 1987, Coll. K. P. Mukherjee.

Diagnosis : Propleuron hairy in the depression between humeral callus and propleural bristle; ventrobasal scale setulose; suprasquamal ridge bare; fore tibiae without a submedian pv. bristle; thorax with four black vittae; all post do strong.

Distribution : Nearly cosmopolitan.

76. *Musca (Philaematomyia) crassirostris* Stein

1903. *Musca crassirostris* Stein, *Mitt. Zool. Mus. Berl.*, 2 : 99.

Material examined : 1 Male, 3 Females, Calcutta, Bengal Veterinary College Campus, 31. iii. 1965, Coll. B. Chakraborty.

Diagnosis : Thorax, except for four narrow vittae, which remain separate on each side, and abdomen, except basal part of segment 1, almost eventually covered with dense greyish dust; sides of mesonotum in the supra-alar area, sides of scutellum at base, and a wedge-shaped median spot on the abdominal segments fuscous; vein r_{4+5} with a vew only at base.

Distribution : Widespread in Oriental region including West Bengal; south Palaearctic and Ethiopian regions.

Genus *Orthelia* Rob.-Desv.

1853. *Orthelia* Robineau-Desvoidy, *Hist. nat. Dipt. env. Paris* 2 : 837. Type-species : *cornicina* F.

Key to the species of *Orthelia*

1. Presutural dorsocentral bristles 2 pairs2
 Presutural dorsocentral bristles absent. Discal cell without hairs*lauta* (Wed.)
2. Discal cell entirely hairy; mid tibia without ad. palpi markedly dilated in apical half.....*indica* (Rob.-Desv.)
 Discal cell with a bare longitudinal stripe close to $m_3 + cu_1$; mid tibia with an ad. Inner facets of male eyes marked enlarged*indica* (Rob.-Desv.)

77. *Orthelia indica* (Robineau-Desvoidy)

1830. *Lucilia indica* Robineau-Desvoidy, *Mém. prés. div. Sav. Acad. Sci. Inst. Fr.*, 2 : 453.

Material examined : 2 Females, Maldah Dist., Nalagola, 18. vi. 1987, Coll. K. P. Mukherjee; 2 Males, 3 Females, Parbatidanga, 27. vi. 1987, coll. K. P. Mukherjee.

Distribution : Widespread in south-east Asia, including West Bengal.

78. *Orthelia lauta* (Wiedemann)

1830. *Musca lauta* Wiedemann, *Aussereurop. zweifl. Insekt.* 2 : 410.

Material examined : 4 Females, Maldah Dist., Nalagda, 18. vi. 1987, coll. K. P. Mukherjee; 1 Male, Maldah Dist., Nalagola, 18. vi. 1987, Coll. K. P. Mukherjee.

Distribution : Common in Oriental region including West Bengal; Australia; Iran.

79. *Orthelia timorensis* (Robineau-Desvoidy)

1830. *Lucilia timorensis* Robineau-Desvoidy, *Mém. Prés. div. Sav. Acad. Sci. Inst. Fr.*, 2 : 460.

Material examined : 4 Females, Maldah Dist., Nalagola, 18. vi. 1987, Coll. K. P. Mukherjee.

Distribution : Widespread in Oriental region including West Bengal; Japan; Papuan subregion.

Remarks : The species so far recorded from India Under *O. coerulea* (Wiedemann) is assignable to *O. timorensis* (Rob.-Desv.)

Genus *Atherigona* Rondani

1865. *Antherigona* Rondani, *Dipterol. ital. prodr.* 9 : 97. Type species : *Anthomyia waria* Meigen.

Diagnosis : A single reclinate upper orbital seta; presutural dorsocentral bristles very small, scarcely distinguishable from the setulose hairs; fore femur without or with at most 1 or 2 pv preapically; greater part of cerci free-lying.

Subgenus *Atherigona* s. str.

Diagnosis : A hypopygeal prominence and more specially the tri-foliate process.

*80. *Atherigona (Atherigona) pulla* (Wiedemann)

1830. *Coenosia pulla* Wiedemann, *Aussereurop. zweifl. Insekt.*, 2 : 44.

Material examined : 5 Females, Maldah Dist., Bhaluk Station, 26. vi. 1987, Coll. K. P. Mukherjee.

Diagnosis : Vibrissal bristles, interfrontalia and palpi in both sexes yellow; fore tarsus in males subcosta; hypopygeal prominence small and knob-like; trifoliate process with a short stalk and thickened basal part of median piece.

Distribution : India : West Bengal : Maldah district; Bihar; Karnataka; Orissa and Tamil Nadu. Elsewhere : China and Sri Lanka.

Family CALLIPHORIDAE

References on the fauna of West Bengal : Wiedemann 1819 : Robineau-Desvoidy 1830; Walker 1849, 1852; Townsend 1917; Senior-White 1923; Aubertin 1931; Senior-White, Aubertin and Smart 1940; Séguy 1949; James 1977.

A total of 24 species under 10 genera of 3 subfamilies are heretofore known in West Bengal vis-à-vis 96 species under 26 genera of 4 subfamilies in India.

Key to the Subfamilies

1. Stem-vein of wing setulose on postero-dorsal surface of basal section.....
.....Chrysomyinae (1 species only)
- Stem-vein of wing not setulose on postero-dorsal surface of basal section (Fig. N).....
.....Calliphorinae

Key to the genera of Calliphorinae

1. Supraspiracular convexity with long fine erect hair. Subcostal sclerite with short black bristles; small flies not exceeding 12mm in length*Hemipyrellia* Townsend
- Supraspiracular convexity pubescent2
2. Thoracic squama bare3
- Thoracic squama hairy*Calliphora* Rob.-Desv. (1 species only)

3. Brownish flies; propleuron bare except around propleural bristle.....*Bengalia* Rob.-Desv.
 Brilliant shining green, blue or purple flies; propleuron hairy. Upper half of parafacialia bare...
*Lucilia* (1 species only)

Genus *Bengalia* Rod.-Desv.

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

81. *Bengalia torosa* (Wiedemann)

1819. *Musca torosa* Wiedemann, *Zoll. Mag.*, 3 : 21.

Material examined : 1 Male, Maldah Dist., Golapganj, 21. vi. 1987, Coll. K. P. Mukherjee.

Diagnosis : Body brown but much paler on lateral margins of thorax; gena with short brown setulae beyond anterior half, rest yellowish; parafacialia with black setulae; vibrissae inserted beyond mouth margin; fore femur without fringe on anteroventral surface in males; fore tibia without distinct protuberance; tergum 4 without median marginal bristles.

Distribution : India : Throughout West Bengal and other States. Elsewhere : Indonesia, Malaysia, Pakistan, Philippines, Sri Lanka, Taiwan and Thailand.

Genus *Calliphora* Rob.-Desv.

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

Subgenus *Calliphora* s. str.

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

82. *Calliphora (Calliphora) pattoni* Aubertin

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

Material examined : 1 Male, Murshidabad Dist., Dhulian, 17. vi. 1987, Coll. K. P. Mukherjee.

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

Distribution : India : West Bengal : Darjiling, Murshidabad district; Arunachal Pradesh; Kashmir and Meghalaya. Elsewhere : Burma, Nepal, Taiwan and Thailand.

Genus *Hemipyrellia* Townsend

1918. *Hemipyrellia* Townsend, *Insecutor Insit. menst.* 6 : 154. Type-species : *Lucillia fernandica* Macquart.

Key to the species of *Hemipyrellia*

1. Antennal segment 3 entirely orange; female abdomen with very thick dust, especially on tergum 5; tergum 3 metallic purplish blue, without marginal bristles; sternum 2 of male with a group of extra long hair posteriorly*pulchra* (Wied.)
 Antennal segment 3 entirely dark brown; dust on female abdomen thin; tergum 3 metallic green to cuperous green with weak marginal bristles; sternum 2 of male without group of long hair posteriorly*liquirriens* (Wied.)

83. *Hemipyrellia liquirriens* (Wiedemann)

1830. *Musca liquirriens* Wiedemann, *Aussereurop. zweifl. Insekt.*, 2 : 655.

Material examined : 2 Males, 2 Females, 24-Parganas Dist., Barasat, 13. vii. 1985, Coll. P. Parui; 1 Male, 4 Females, Rajarhat, 21. viii. 1985, Coll. P. Parui.

Distribution : India : West Bengal : Calcutta, 24-Parganas district; Bihar and Tamil Nadu. Elsewhere : Celebes, China, Java, Malaya, Philippines, Sri Lanka, Sumatra and Thailand; Bismarck Islands, Moluccas, New Guinea and Papua.

84. *Hemipyrellia pulchra* (Wiedemann)

1830. *Musca pulchra* Wiedemann, *Aussereurop. zweifl. Insekt.* 2 : 406.

Material examined : 1 Female, Hugli Dist., Kamdevpur. 9. viii. 1965, Coll. M. S. Shisodia; 1 Female, 24-Parganas Dist., Subhasgram, 10. vii. 1965, Coll. K. K. Ray; 2 Females, Howrah Dist., Botanical Garden, 15. ix. 1967, Coll. K. R. Rao; 1 Female, 24-Parganas Dist., Canning, 3. iii. 1986, Coll. B. N. Das

Distribution : India : West Bengal : Haora, Hugli, North Bengal Districts, 24-Parganas Districts; Bihar, Orissa, Pondichery, Punjab, Tamil Nadu and Uttar Pradesh. Elsewhere : Thailand and probably Java.

Genus *Lucilia* Rob.-Desv.

1830. *Lucilia* Robineau-Desvoidy, *Mém. Prés. ddi. Sav. Acad. Sci. Inst. Fr.* : 452. Type-species : *Musca caesar* L.

*85. *Lucilia papuensis* Macquart

1842. *Lucilia papuensis* Macquart, *Mém Soc. Sci. Agric. Lille*, 1842 : 298.

Material examined : 1 Male, Haora Dist., Botanical Garden, 15. ix. 1967, Coll. K. R. Rao.

Diagnosis : Shining purplish green flies; antenna short, not reaching upper margin of epistome; parafacialia bare below antennal bases; wings hyaline, basicostal scale black; upper and lower squamae infuscated; two anterodorsal bristles on mid-tibia.

Distribution : India : West Bengal : Haora district; Arunachal Pradesh; Karnataka and Kerala. Widespread in other parts of Oriental region; Moluccas and Micronesia.

Genus *Chrysomya* Rob.-Desv.

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

Diagnosis : Small to medium-sized flies, usually metallic greenish blue in colour; eyes large and bare; prostigmatic bristle present or absent; propleuron and prosternum hairy; suprasquamal ridge usually with anterior parasquamal tuft; subcostal sclerite hairy; tergum 5 with many fine erect bristles on disc.

Key to the species of *Chrysomya*

1. Eyes of male with the upper facets strongly enlarged and sharply demarcated from small ones in the lower third; in females eyes broadly separated; no prostigmatic bristle ...*megacephala* (F.)
Facets in both sexes small and uniform; in females eyes separated by slightly more than one-quarter total head-length; a prostigmatic bristle present*rufifacies* (Macq.)

86. *Chrysomya megacephala* (Fabricius)

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

Material examined : 1 Male, 24-Parganas Dist., Titagarh, Hyder Ali Road, 19. vii. 1965, Coll. K. K. Ray; 7 Males, 2 Females, Calcutta, 25. viii. 1965, Coll. K. D. Chatterjee; 1 Male, 2 Females, 24-Parganas Dist., Barrackpore, 28. x. 1965, Coll. O. B. Chhotani; 1 Male, 4 Females, Haora Dist., Bally, 30. viii. 1967, Coll. A. N. T. Joseph; 2 Males, Botanical Garden, 15. ix. 1967, Coll. K. R. Rao; 3 Males, 2 Females, Koch Bihar Dist., Jainti, 15. x. 1985, Coll. S. Chattopadhyaya; 2 Males, 6 Females, Darjiling Dist., Siliguri, 10. xi. 1985, Coll. A. K. Paul; 3 Males, 4 Females, 24-Parganas Dist., Canning, 3. iii. 1986, Coll. B. N. Das.

Distribution : India : West Bengal : Calcutta, Darjiling, Haora, Jalpaiguri, 24-Parganas districts; also common in other States in India and in Oriental region. Elsewhere : China and Japan of Palearctic region; Australasian region; Malagasy subregion of Ethiopian region.

87. *Chrysomya rufifacies* (Macquart)

1843. *Lucilia rufifacies* Macquart, *Mém. Soc. Agric. Lille*, 1842 : 303.

Material examined : 1 Male, 24-Parganas Dist., Barrackpore, 28. x. 1965, Coll. O. B. Chhotani.

Distribution : Very common all over Oriental region including West Bengal and also in Australian region.

Family SARCOPHAGIDAE

References on the fauna of West Bengal : Senior-White 1924, 1930; Senior-White, Aubertin and Smart 1940; Nandi 1976 a, b, 1977, 1978, 1979, a, b, c, 1988; Lopes, Kano, Shinonaga and Kurahashi 1977.

A total of 37 species under 15 genera of 1 subfamily are heretofore known in West Bengal vis-a-vis 60 species under 25 genera of 3 subfamilies in India.

Subfamily SARCOPHAGINAE

Diagnosis : Grey sarcophagid flies with three longitudinal stripes on thorax and checkered pattern on abdomen; eyes in both sexes separated but wider in females; arista plumose along basal half; hypopleuron with a vertical row of bristles; inner forceps usually much longer than outer forceps and phallosome very large.

Key to the Genera

1. Acrostical bristles absent *Bercaea* Rob.-Desv. (1 species only)
Acrostical bristles present 2
2. Sternum 4 with profuse thick long hair 3
Sternum 4 with sparse fine short hair *Parasarcophaga* Johnston
3. Apical plate of paraphallus short and rounded *Seniorwhitea* Rohdendorf (1 species only)
Apical plate of paraphallus long and curved *Iranihindia* (1 species only)

Genus *Bercaea* Rob.-Desv.

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

88. *Barcaea haemorrhoidalis* (Fallén)

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

Material examined : 1 Male, Darjiling Dist., Lebong; 1650m, 14. iv. 1975, Coll. B. C. Nandi; 1 Male, Darjiling, 2044m, 22. vii. 1979, Coll. M. Prasad.

Diagnosis : Frontal width equal to an eye; frontal stripe black; propleuron bare; thorax with median longitudinal stripe and two narrow stripes; abdominal segment 2 without marginals; no costal bristle; mid-tibia with an inconspicuous apical fringe; hind-tibia double fringed.

Distribution : India : Widespread in the Himalaya from Himachal Pradesh to Arunachal Pradesh through West Bengal Terai in Darjiling and Jalpaiguri. Elsewhere : Nepal and Thailand, Africa, Americas, Europe, Hawaii, Korea and Seychelles.

Genus *Parasarcophaga* Johnston & Tiegs

1921. *Parasarcophaga* Johnston & Tiegs, *Proc. R. Soc. Qd.* 33 : 86. Type-species : *Sarcophaga omega* Johnston & Tiegs, mototype, *Sarcophaga knabi* Parkar.

Key to the Subgenera of *Parasarcophaga*

1. Ventralia not pedunculated *Liosarcophaga* Enderlein
Ventralia pedunculated *Parasarcophaga* s. str.

Key to the species of *Liosarcophaga*

1. Juxtal process long and slender *dux* Thomson
Juxtal process short and stout *brevicornis* (Ho)

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

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

Material examined : 1 Female, Maldah Dist., Nalagola, 18. vi. 1987, Coll. K. P. Mukherjee.

Distribution : India : West Bengal : Maldah, 24-Parganas districts; Assam; Orissa and Tamil Nadu. Elsewhere : Borneo, China, Hainan Island, Malaya, Ryukyu Islands and Thailand, Japan.

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

1869. *Sarcophaga dux* Thomson, *K. Svenska Fregatten Eugenie Resa*, 2 : 534.

Material examined : 2 Males, Darjiling Dist., Lebong, 1650m, 16 iv. 1975, Coll. B. C. Nandi, 1 Female, Murshidabad Dist., Dhulian 17. vi. 1987, Coll. K. P. Mukherjee.

Distribution : India : West Bengal : Darjiling, Haora, Murshidabad, 24-Parganas district; Assam; Bihar; Kashmir; Maharastra; Orissa; Punjab; Tamil Nadu and Uttar Pradesh. Elsewhere : Bangladesh.

Remarks : Consequent upon synonymisation of *dux* Thomson with *misera* Walker (cf. Lopes *et al.*, 1977), *dux* Thomson *sensu* Senior-White *et al.* (1940) onwards, requires a new specific epithet, calling upon attention to homonymy.

Kry to the species of *Parasarcophaga*

- 1. Palpi orange*orchidea* (Böettcher)
- Palpi dark brown2
- 2. Acrostichals 1 + 1; 1 row of black postocular setae; genae with only few black hair at extreme anterior part; hind femur without fringe; hind tibia without antero-ventral bristle.....
-*knabi* (Parker)
- Acrostichal 0 – 1 + 1; 3 rows of black postocular setae, only first row regular; ganac with numerous black hair anteriorly; hind femur with fringe; hind tibia with 1 antero-ventral bristle
-*albiceps* (Meigen)

91. *Parasarcophaga (Parasarcophaga) albiceps* (Meigen)

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

Material examined : Widespread in Oriental region including West Bengal; nearly so in Palaeartic region; across the Weber's line up to Solomon Islands in Australian region.

92. *Parasarcophaga (Parasarcophaga) knabi* (Parker)

1917. *Sarcophaga knabi* Parkar, *Proc. U.S. nain. Mus.*, 54 : 66.

Material examined : 1 Male, Nadia Dist., Ranaghat, Hizli forest, 3. viii. 1974, Coll. B. C. Nandi.

Distribution : Widespread in Oriental region including West Bengal; Korea, Australia, Caroline Islands, Mariana Islands, Marshall Islands, New Guinea and Society Islands.

93. *Parasarcophaga (Parasarcophaga) orchidea* (Böttcher)

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

Material examined : 2 Males, Maldah Dist., Nalagola, 18. vi. 1987, Coll. K. P. Mukherjee.

Distribution : Widespread from south-east Asia (including West Bengal) to New Guinea and Australia.

Remarks : Lopes and Kano (1979) changed the subgeneric status of *misera* Walker and synonymised with *orchidea* Böettcher but the ventralia of these two species differ greatly (cf. Tumrasvin and Kano, 1979). The species is here considered distinct on the basis of examination of male genitalia.

Genus *Iranihindia* Rohdendorf

1961. *Iranihindia* Rohdendorf, *Stutt. Beitr. Naturk.* 58 : 2. Type-species : *Sarcophaga futilis* Senior-White.

94. *Iranihindia martellatoides* (Baranov)

1931. *Sarcophaga martellatoides* Baranov, *Konowia*, 10 : 114, 115.

Material examined : Antennal arista plumose on basal four-fifths; parafacial golden; ventralia curved and serrated.

Distribution : India : West Bengal : Bankura, Calcutta, Hugli, Nadia, Puruliya, 24-Parganas districts; Bihar; Orissa and Uttar Pradesh. Elsewhere : Sri Lanka.

Genus *Seniorwhitea* Rohdendorf

1937. *Seniorwhitea* Rohdendorf, *USSR, Dipt.* 19 (1) : 297. Type-species : *Sarcophaga orientaloides* Senior-white = *Sarcophaga krameri*. Böettcher.

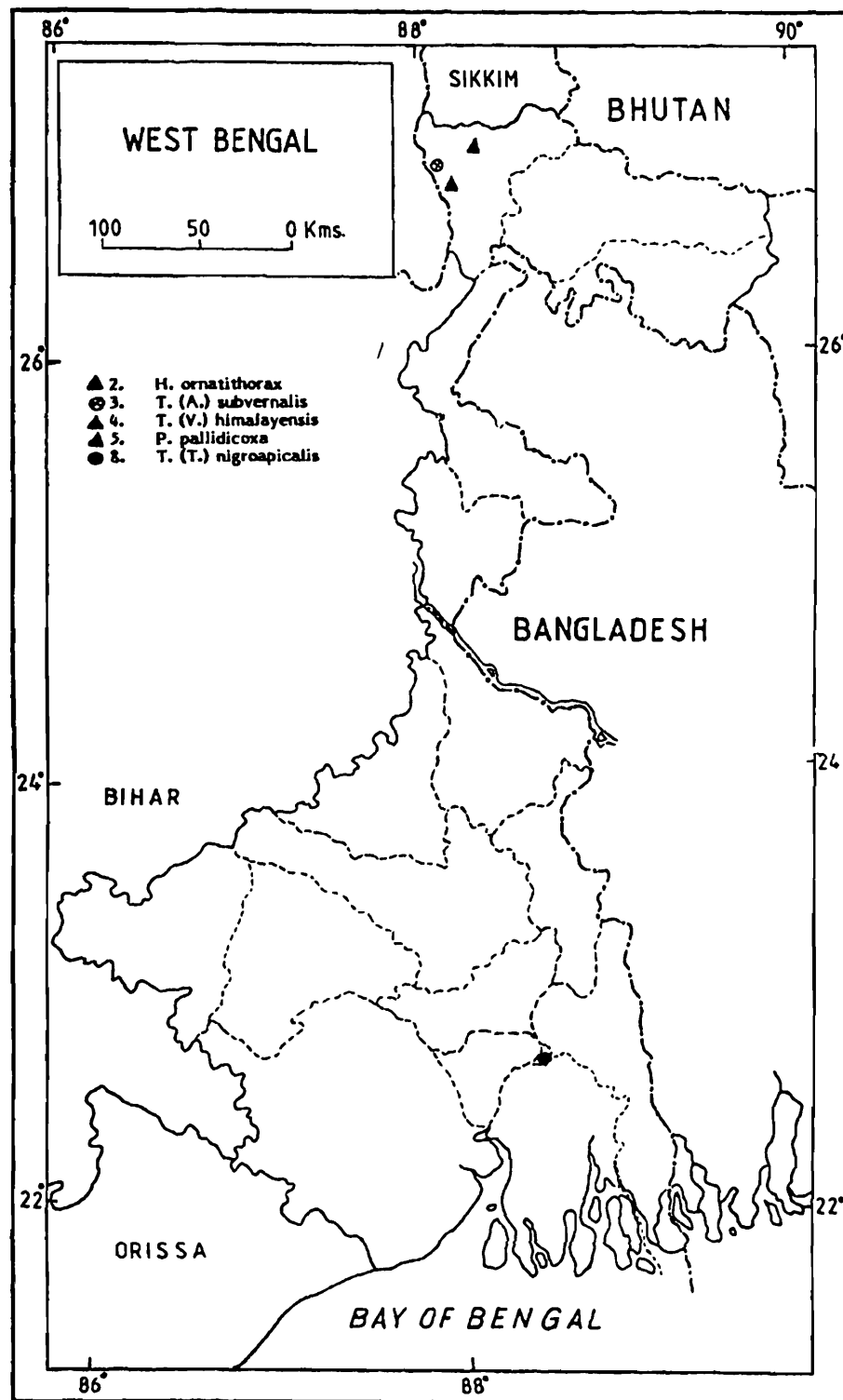
95. *Seniorwhitea krameri* (Böttcher)

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

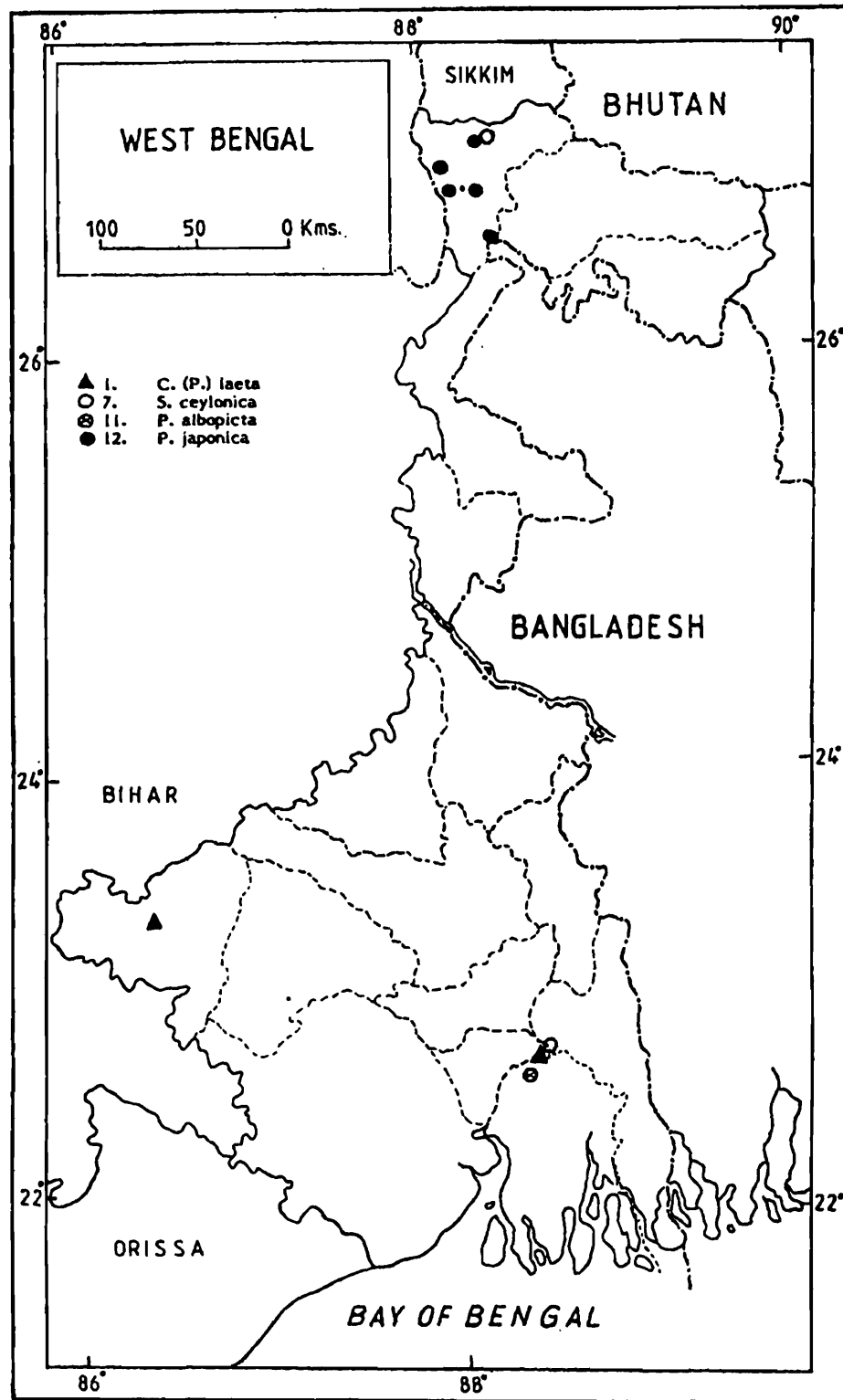
Material examined : 1 Male, 24-Parganas Dist., Basdhani, 1. xii. 1955, Coll. A. Surto; 2 Males, Hugli Dist., Bhadreswar, 5. xi. 1964, Coll. A. N. T. Joseph.

Diagnosis : Antennal arista plumose on basal two-thirds; acrostichals only present as prescutellars; ventralia curved apically.

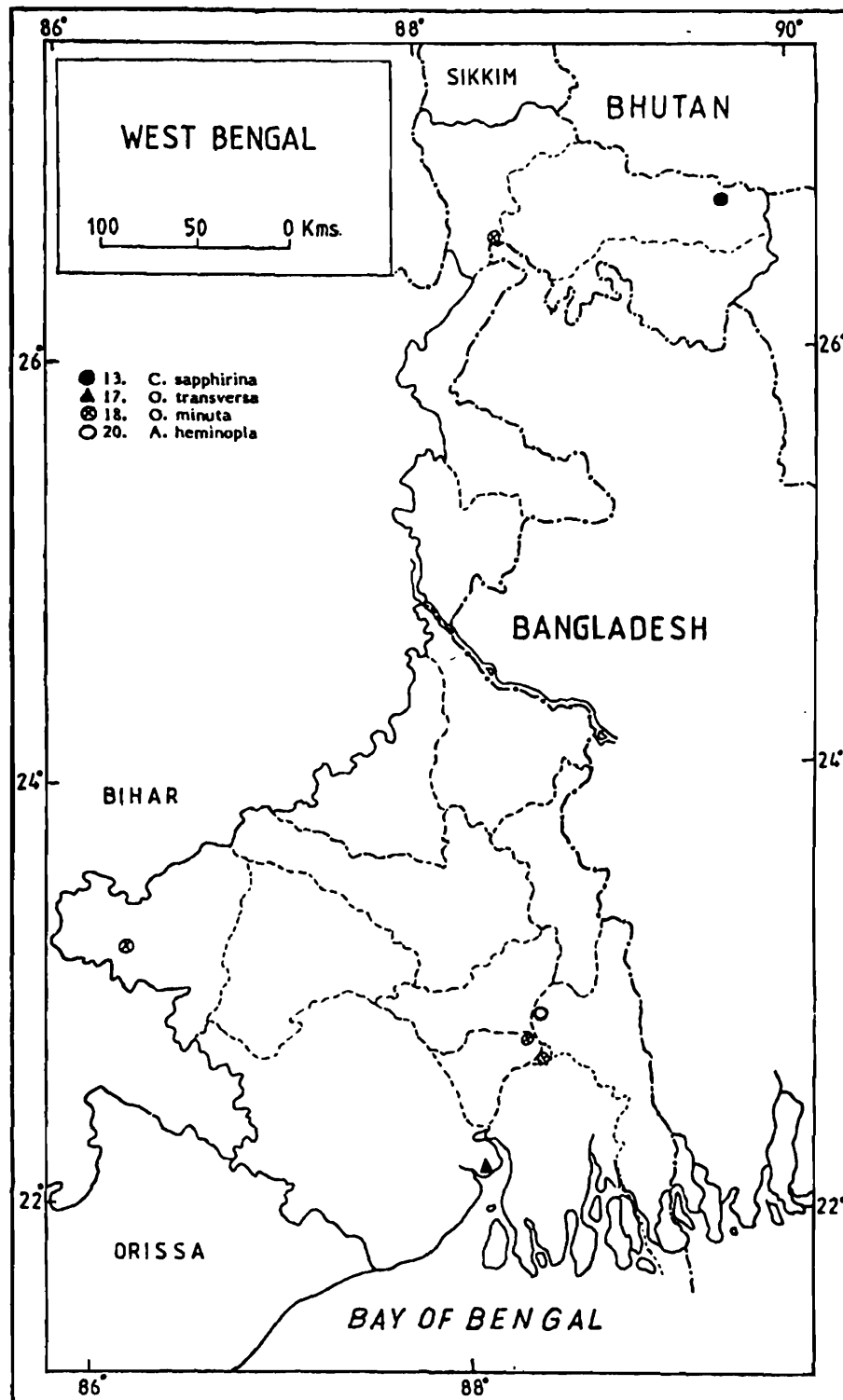
Distribution : India : West Bengal : Hugli, 24-Parganas district; Arunachal Pradesh, Assam, Bihar, Maharashtra, Orissa, Punjab, Tamil Nadu and Uttar Pradesh. Elsewhere : Burma, China, Laos, Malaysia, Nepal, Singapore, Sri Lanka, Taiwan and Thailand, Hawaii.



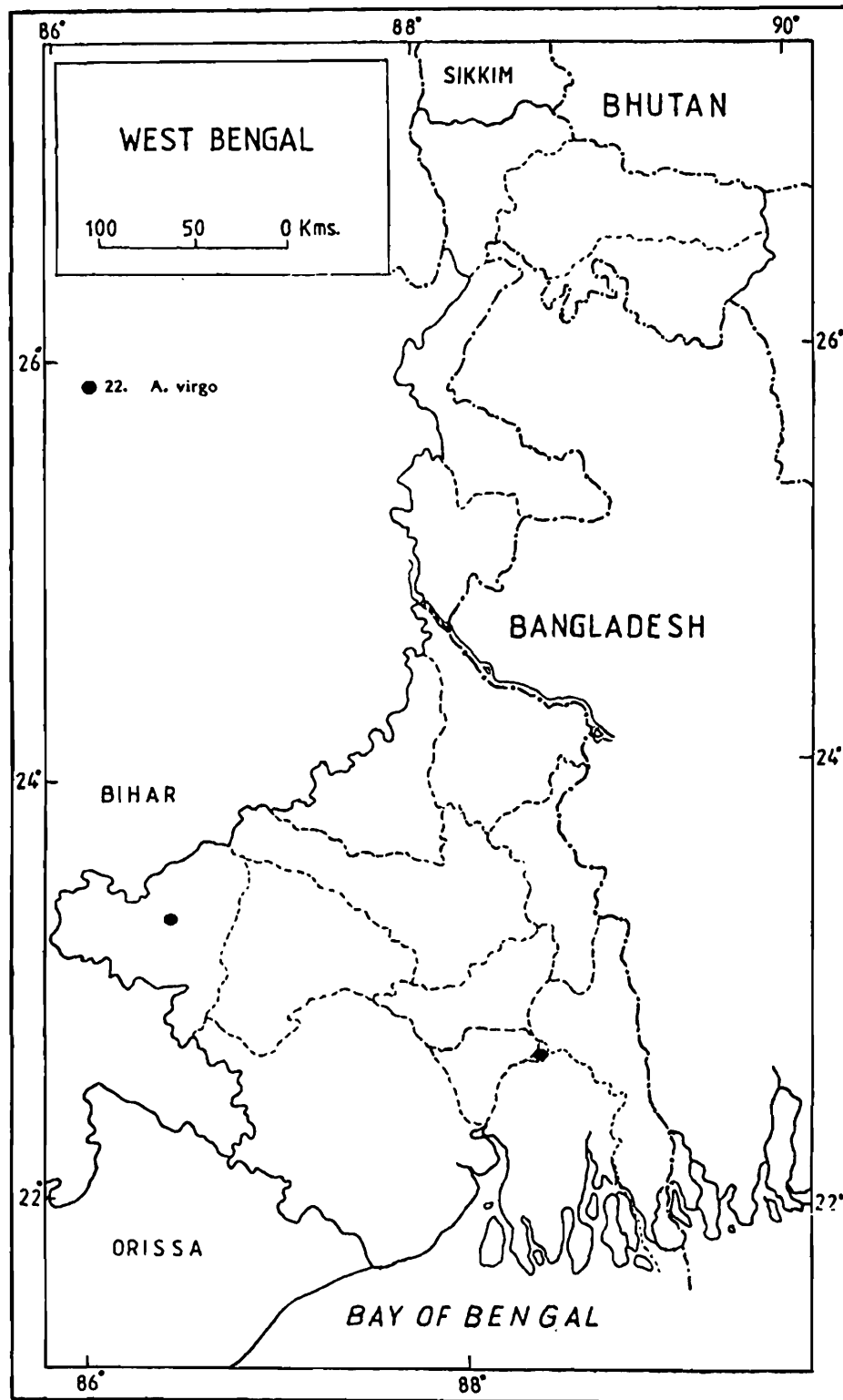
Map 1. Distribution of *H. ornatithorax*, *T. (A.) subvernalis*, *T. (V.) himalayensis*, *P. pallidicoxa* and *T. (T.) nigroapicalis*.



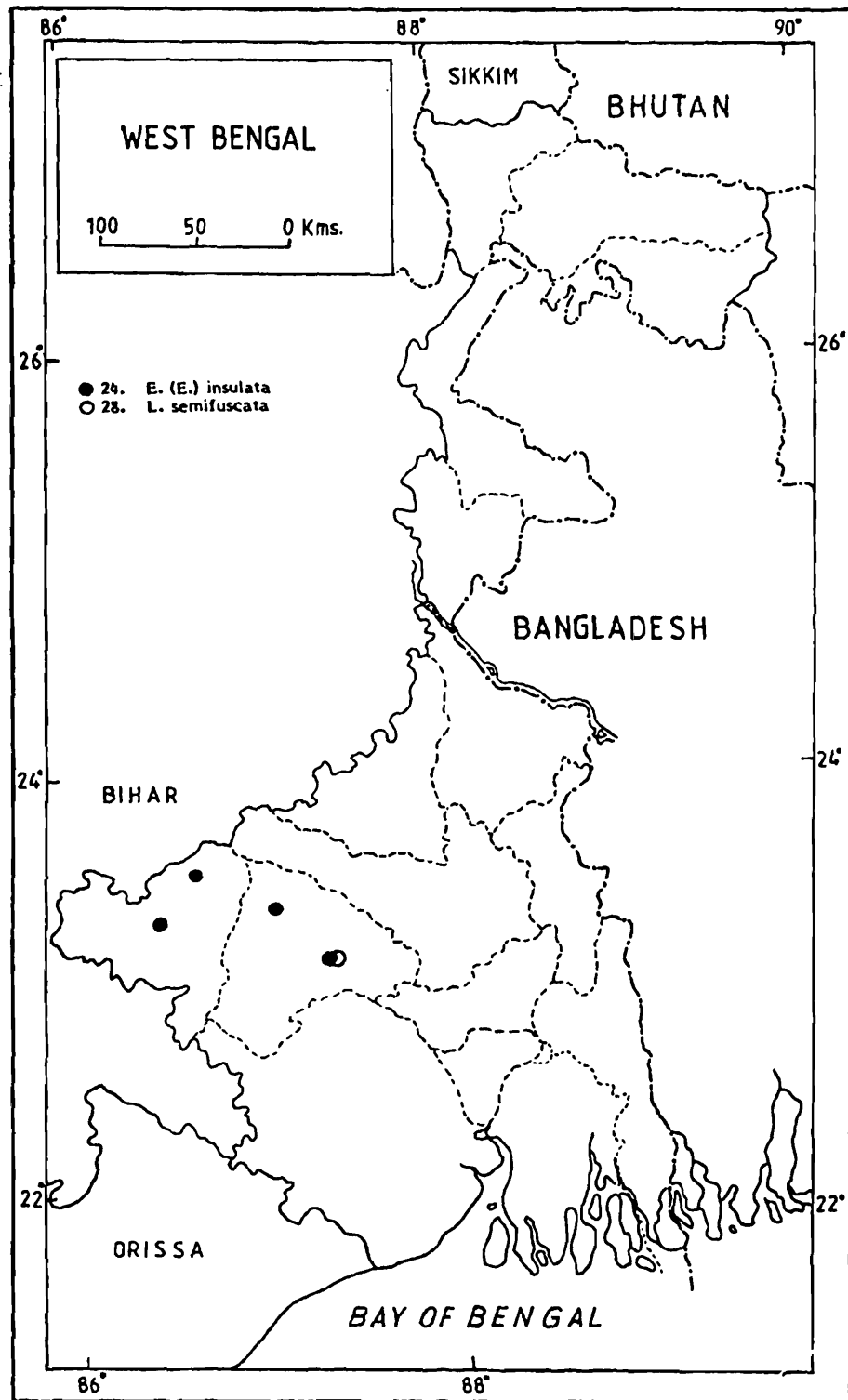
Map 2. Disribution of *C. (P.) laeta*, *S. ceylonica*, *P. albopicta* and *P. japonica*.



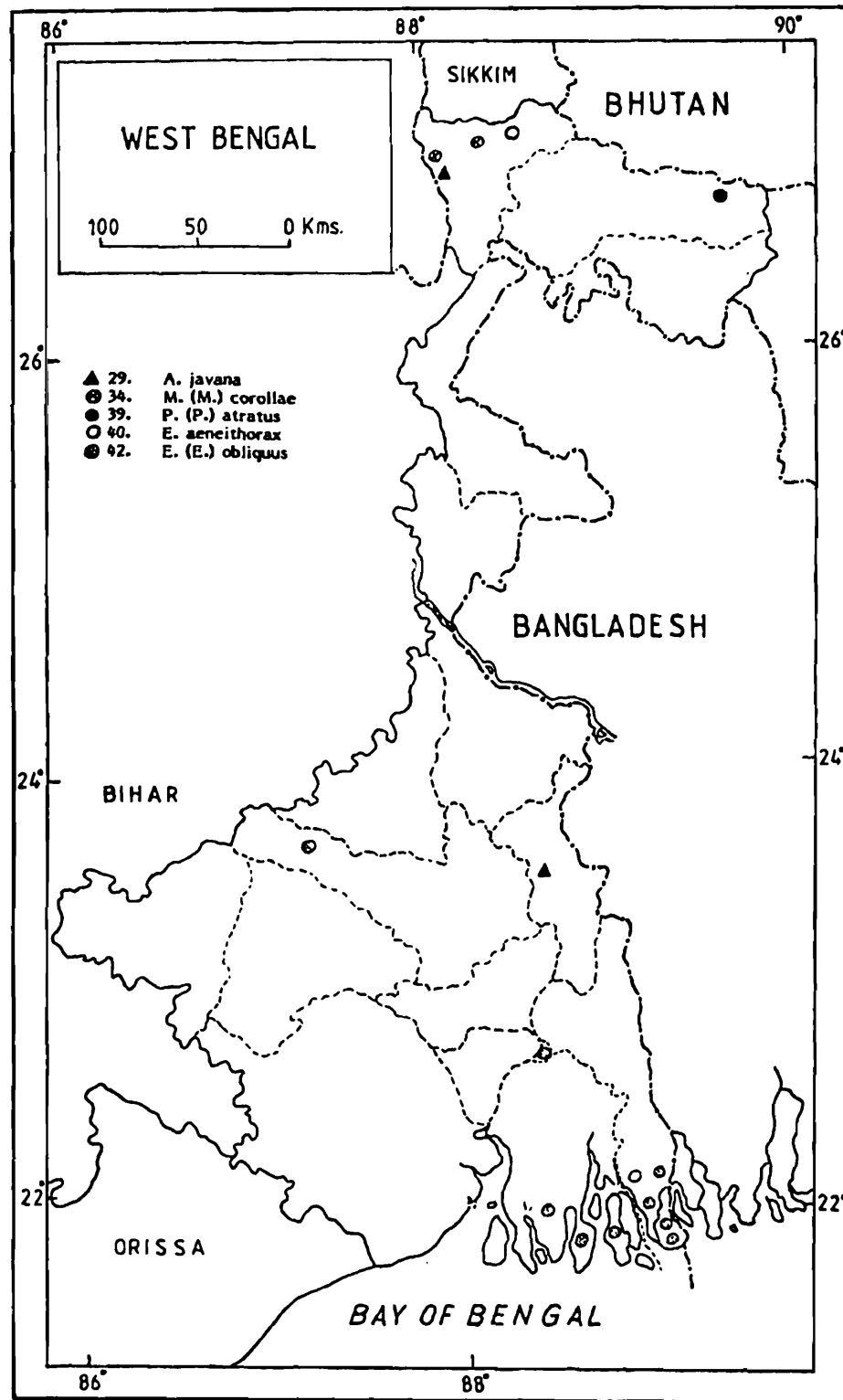
Map 3. Distribution of *C. sapphirina*, *O. transversa*, *O. minieta* and *A. heminopla*.



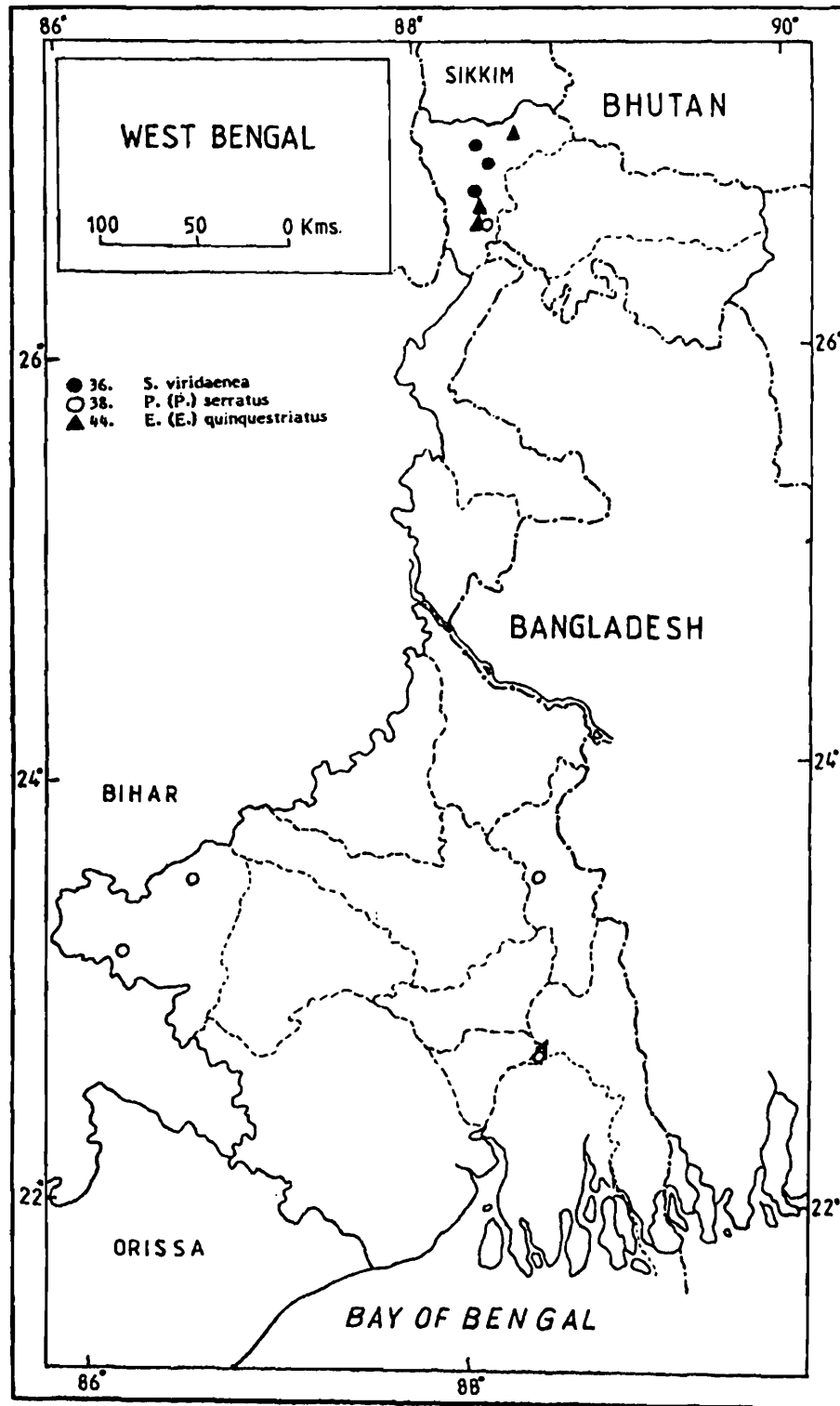
Map 4. Distribution of *A. virgo*.



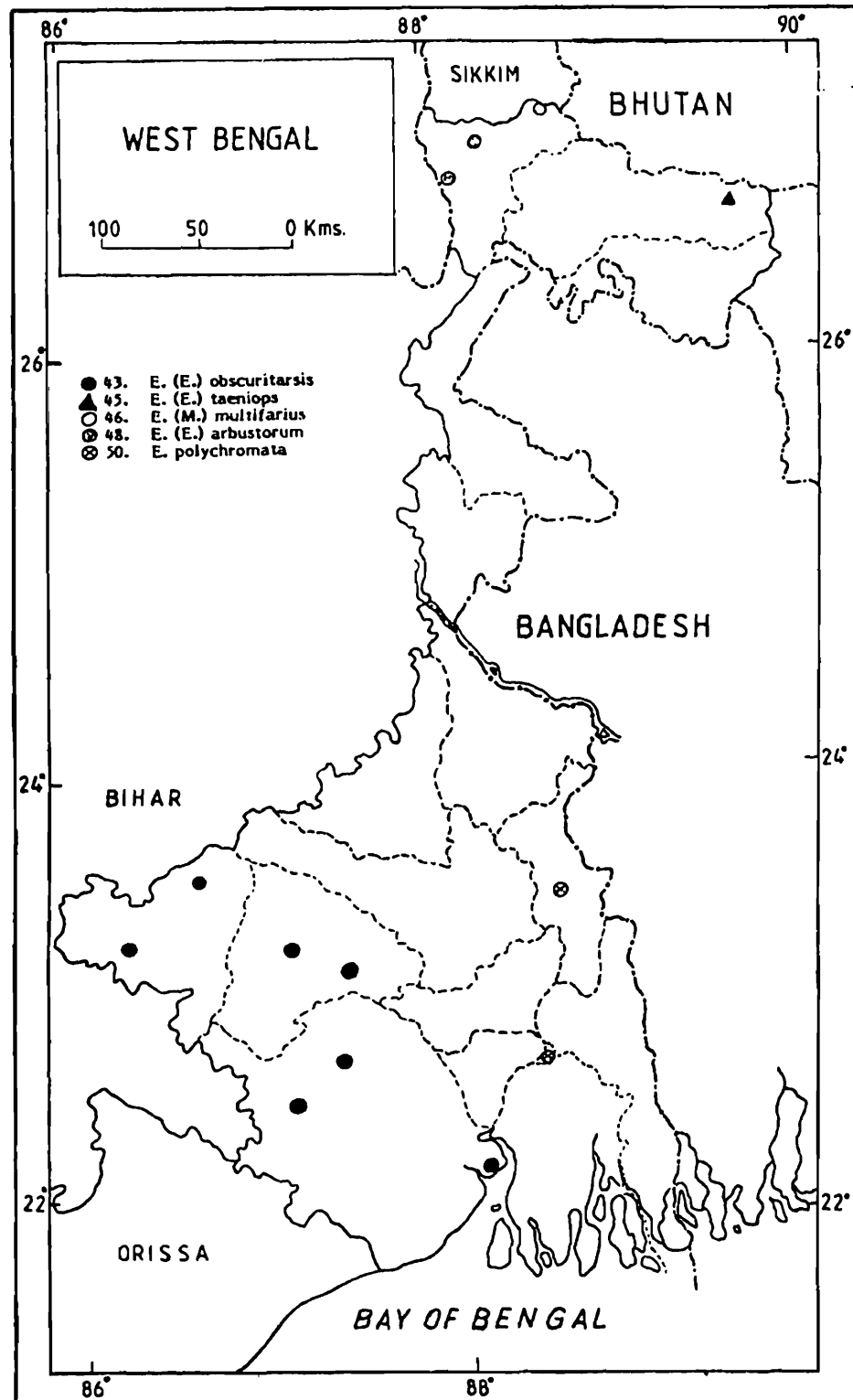
Map 5. Distribution of *E. (E.) insulata* and *L. semifuscata*.



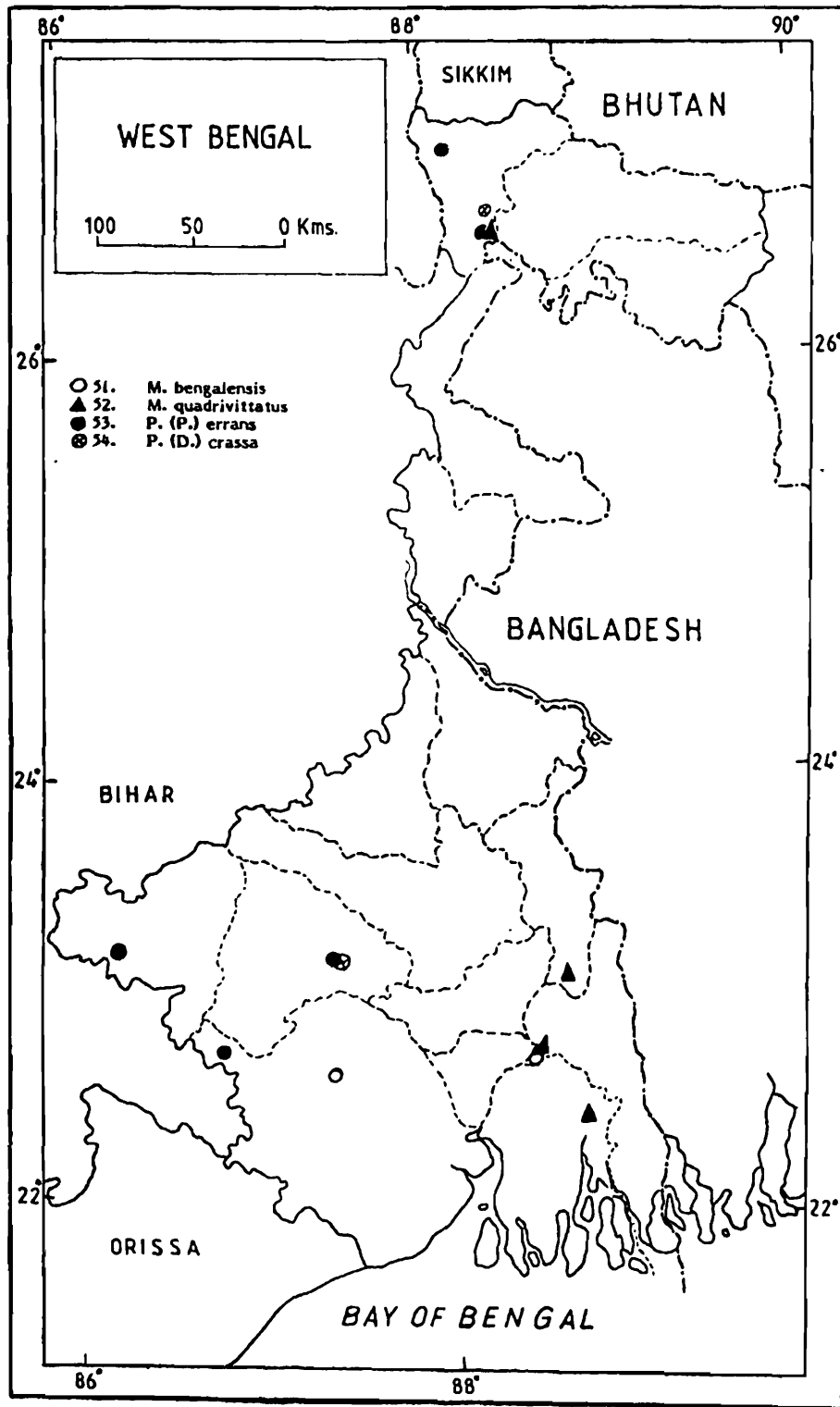
Map 6. Distribution of *A. javana*, *M. (M.) corollae*, *P. (P.) atratus*, *E. aeneithorax* and *E. (E.) obliquus*.



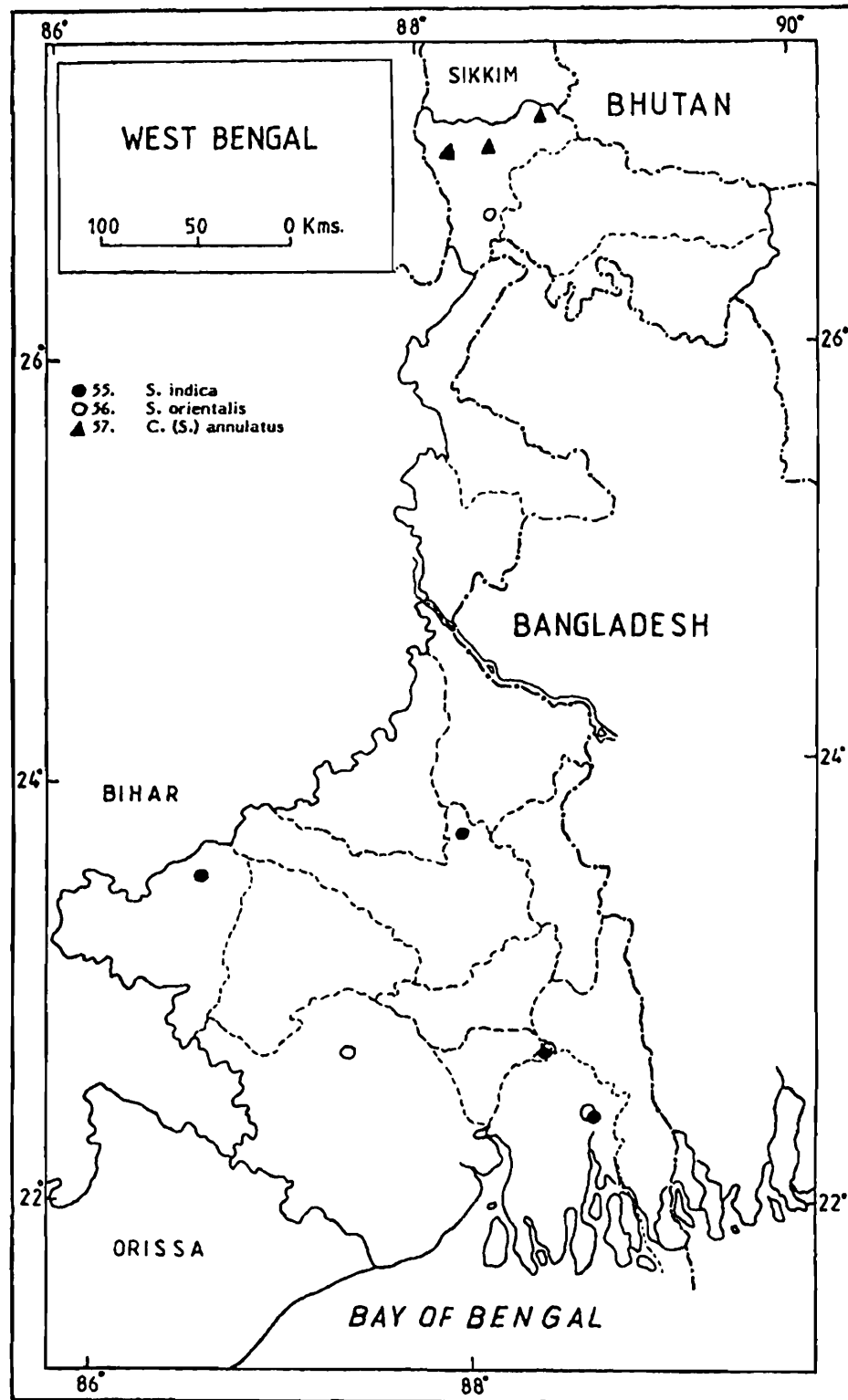
Map 7. Distribution of *S. viridanea*, *P. (P.) serratus* and *E. (E.) quinquestriatus*.



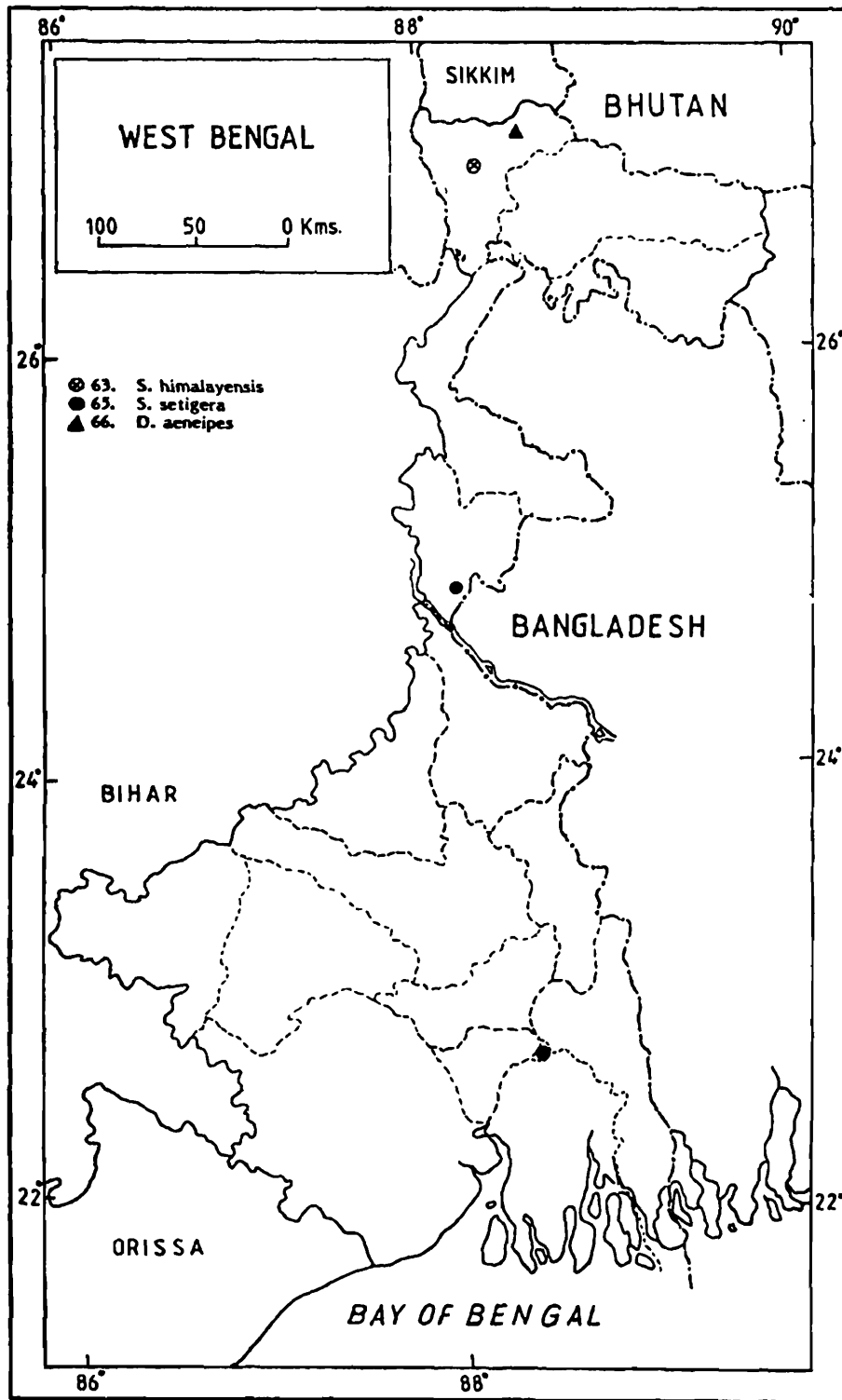
Map 8. Distribution of *E. (E.) obscuritarsis*, *E. (E.) taeniops*, *E. (M.) multifarius*, *E. (E.) arbustorum* and *E. polychromata*.



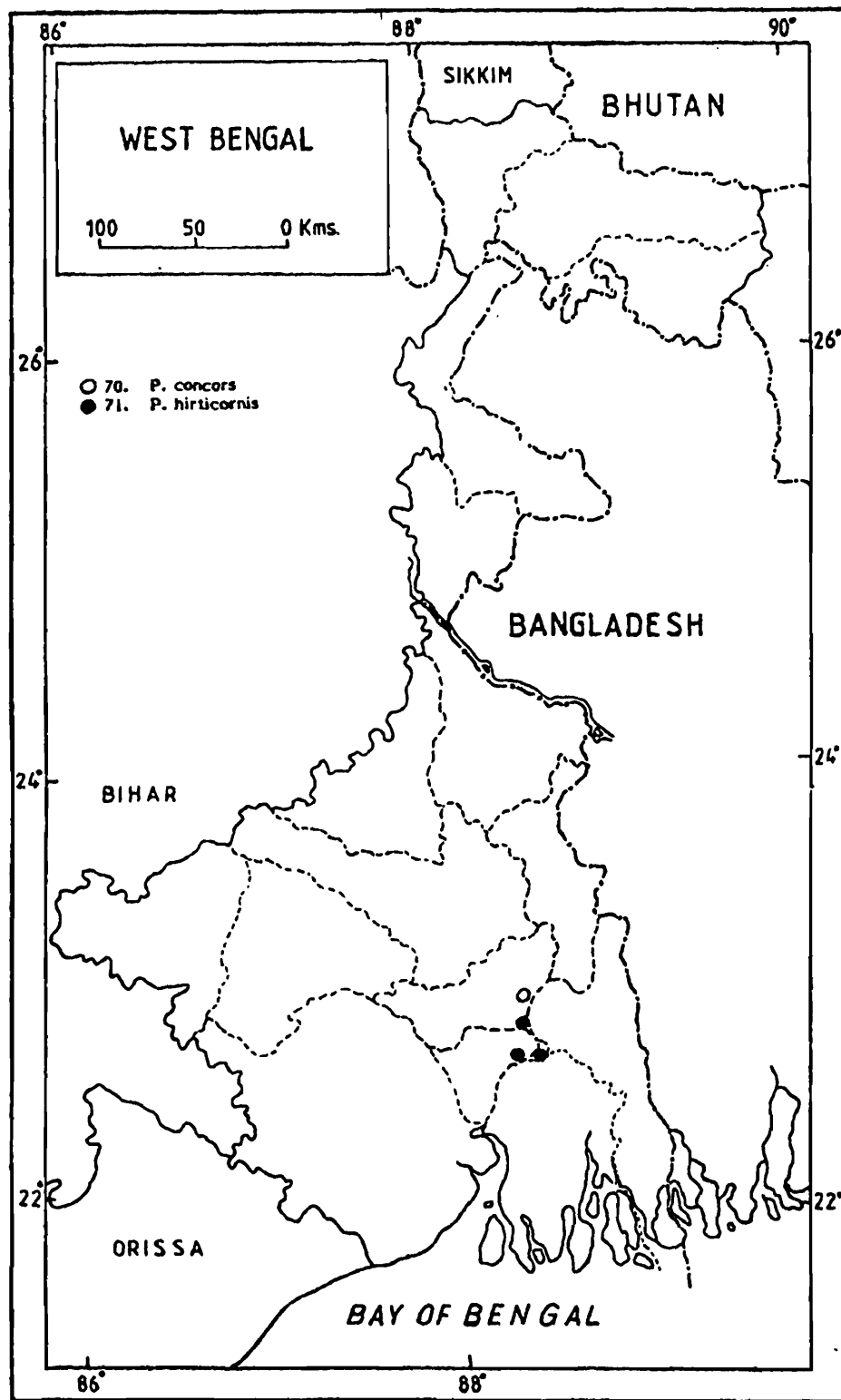
Map 9. Distribution of *M. Bengalensis*, *M. quadrivittatus*, *P. (P.) errans* and *P. (D.) crassa*.



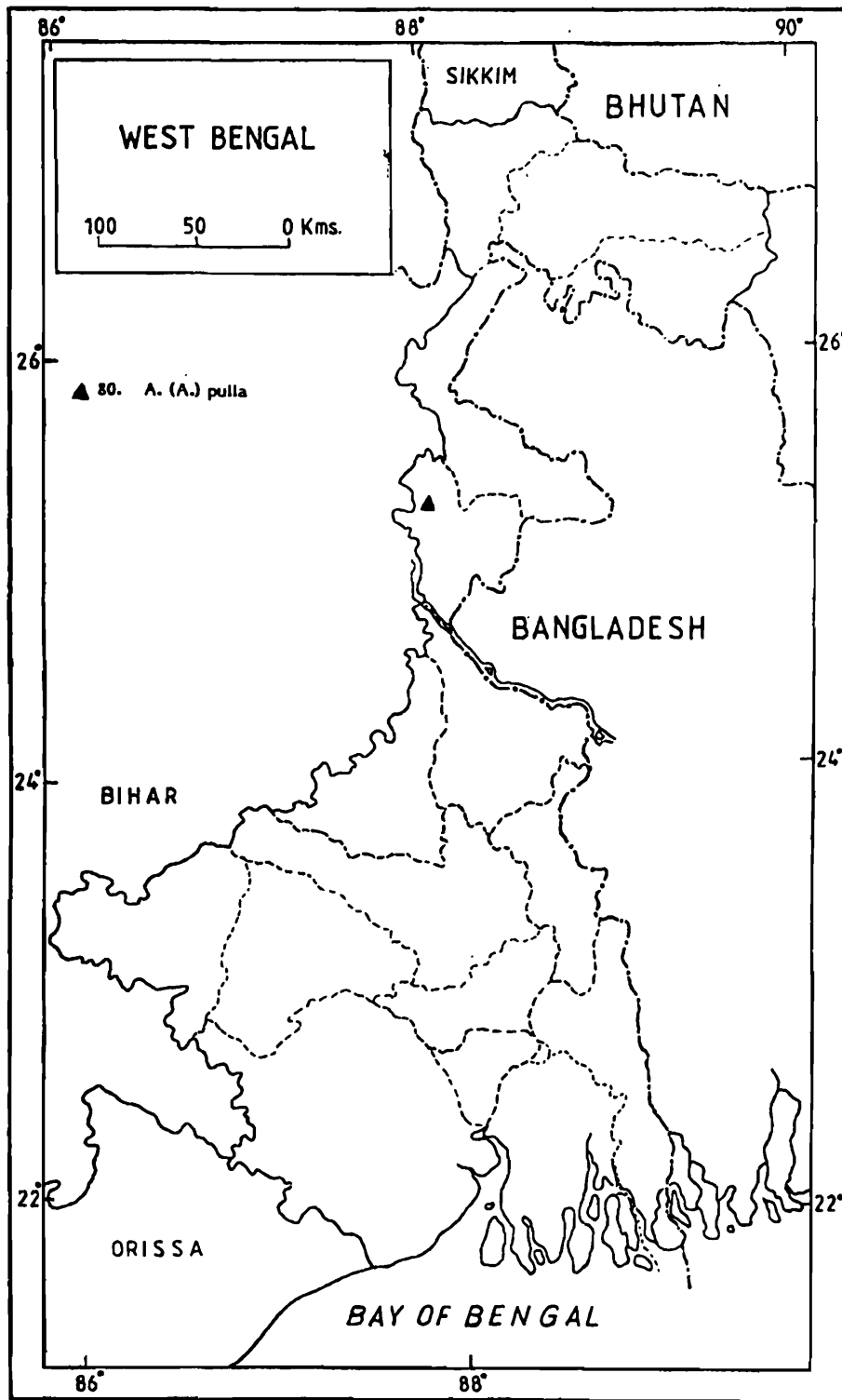
Map 10. Distribution of *S. indica*, *S. orientalis* and *C. (S.) annulatus*.



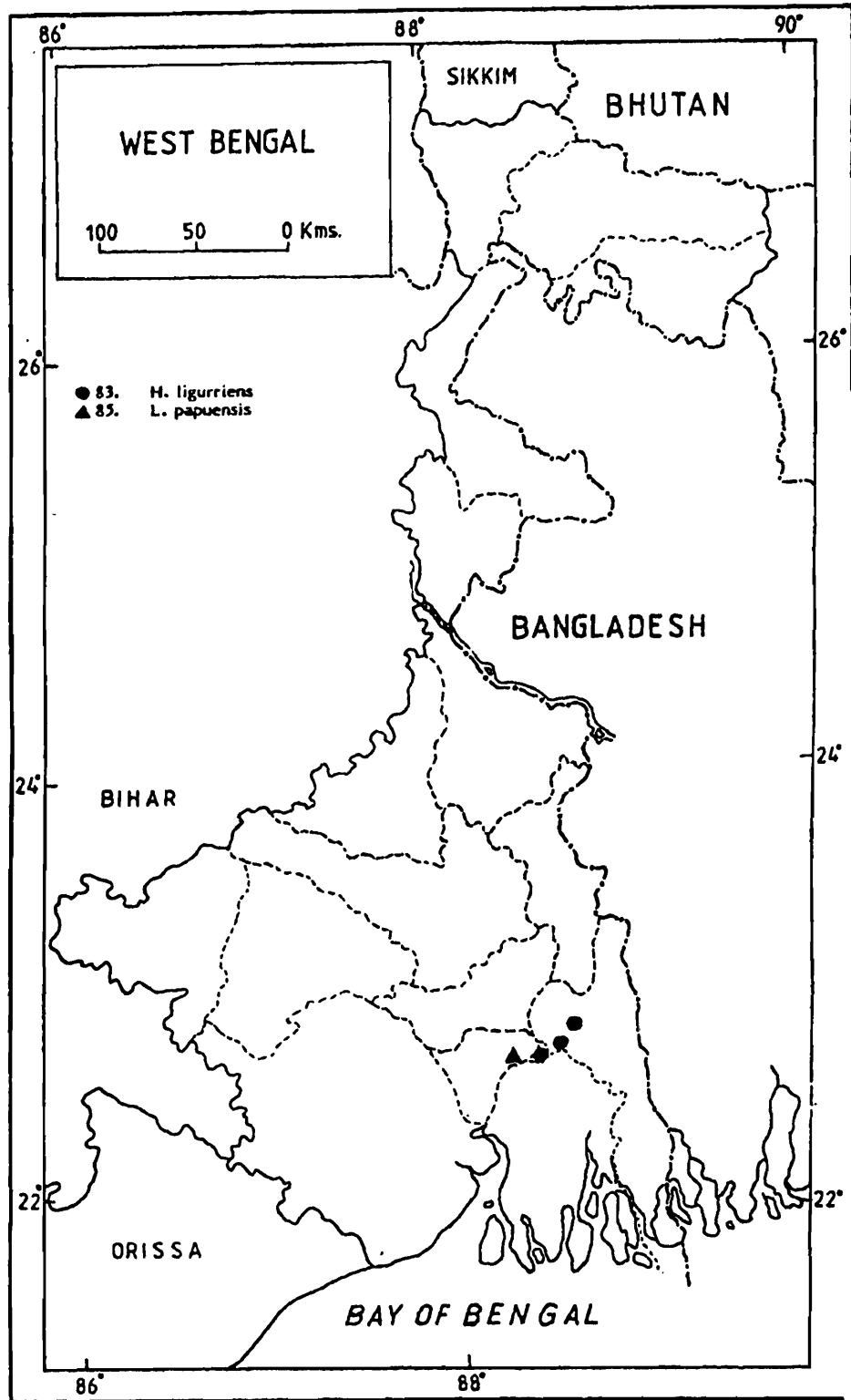
Map 11. Distribution of *S. himalayensis*, *S. setigera* and *D. aeneipes*.



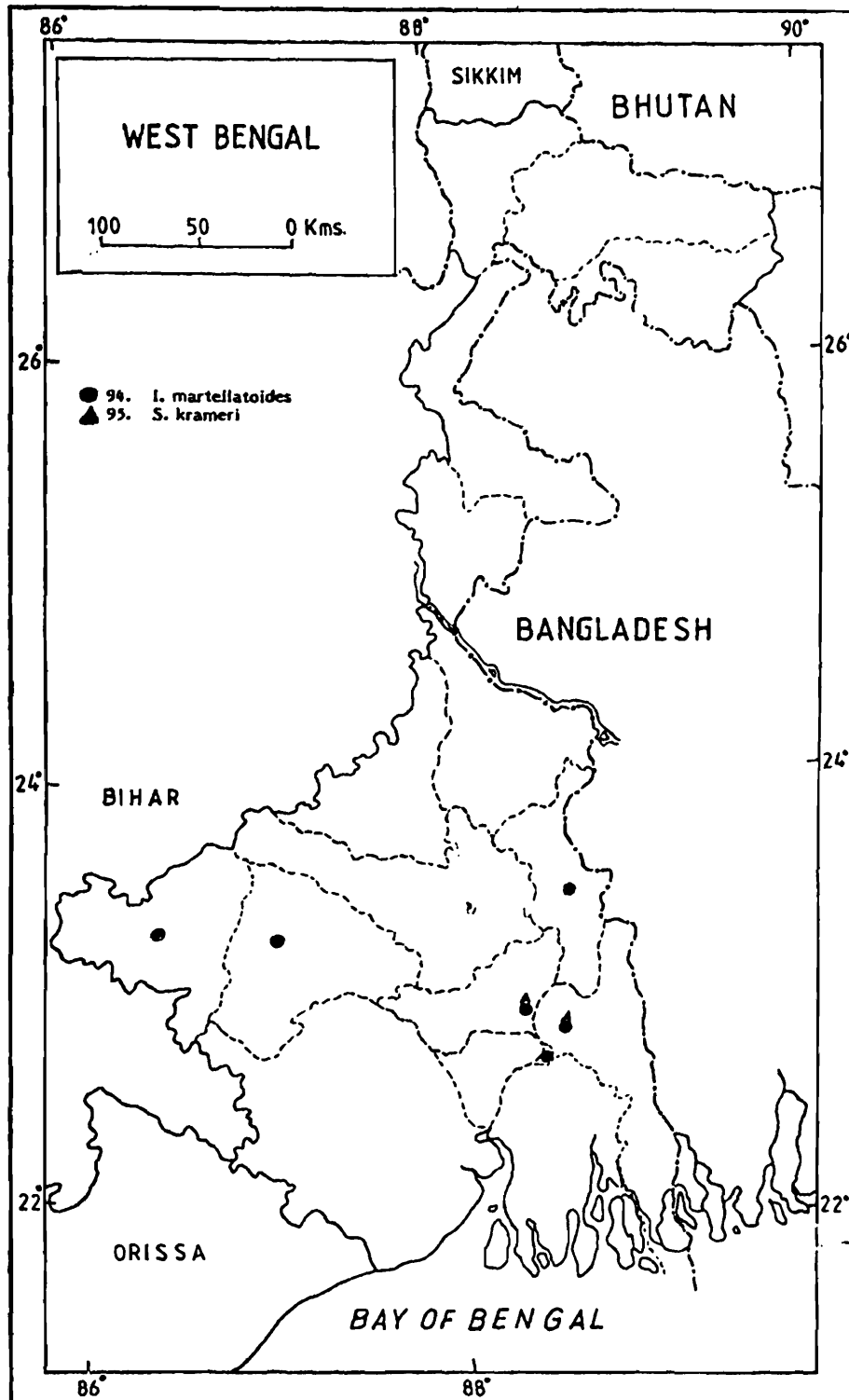
Map 12. Distribution of *P. concors* and *P. hirticornis*.



Map 13. Distribution of *A. (A.) pulla*.



Map 14. Distribution of *H. ligurriens* and *L. papuensis*.



Map 15. Distribution of *I. martellatoides* and *S. krameri*.

GENERAL REMARKS

The most striking feature of West Bengal with its diverse physiography is the sheer representation of nearly all taxonomic elements encountered as in India. The Himalayan fauna is richer than the rest and can be considered "the paradise of speciation" This is the primary abode of the stenothermous dipterans specially Simuliidae etc. Likewise, flower-loving family-groups like Syrphidae show a magnificent array of species in this region. The sub-Himalayan fauna which parts with that of the Himalaya and of plains, largely manifests transitional characteristics rendering an admixture of temperate and tropical species. Keeping aside absolute limitations of a very few and castal and semi-arid species, the fauna of the remaining parts of the State does not vary much in the quality but differs quantitatively. Thus, with the special reservation, certain species of a family-group in the semi-arid region where species of some other groups have been denied invasion, have flourished well with high population as in the case of Bombyliidae. This region further ascertains suitable environment as in the Himalayan and sub-Himalayan regions for certain family-groups like Simuliidae (treated seperately) which inhabit mountains and hills as torrenticoles. In fine, it can be opined from the standpoint of zoogeography that west Bengal with its multiform ecosystems may harbour a few endemic species of Diptera (not reflected from this material) despite dispersal of a great many species even beyond the Orient.

Of the ninety five species reported here, fifty two are known to occur in other zoogeographical regions also; thirty one are confined to the Oriental region only and twelve do not extend beyond the Indian territory. There are two Tipulid species heretofore known only from the Himalayan Darjiling of West Bengal and Kumaon of Uttar Pradesh. There are again two species of the Syrphidae which are known to occur in the Himalayan belt of West Bengal, Sikkim and Himachal Pradesh. The other specis endemic to India are mostly spread over the tropical region of the Indian peninsula.

SUMMARY

The paer deals with 95 species under 62 genera of 26 subfamilies belonging to 17 families of Diptera, of which 18 species are recorded for the first time from West Bengal, inclusive of 1 from India.

ACKNOWLEDGEMENTS

We acknowledge with appreciation the splendid co-operation of Prof. M. S. Jairajpuri, former Director; Drs. A. Singh, Ex-Joint Director-in-Charge; B. S. Lamba, Ex-Joint Director-in-Charge; B. K. Tikader, Ex-Director; S. K. Bhattacharyya, Joint Director, S. K. Tandon, Deputy Director and B. Dutta, Deputy Director for conducting survey and extending facilities for laboratory works. We are especially greatful to Dr. A. K. Ghosh, Joint Director, for his very many generous advice on collecting and preparation of the manuscript. We also express sincere thanks to all who kindly brought the material for studies. We can not pass over without acknoledging the technical help we received from Messrs. Anil Kumar Bhattacharyya and Haradhan Das of this Organisation.

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INSECTA : DIPTERA : ASILIDAE

A.N. T. JOSEPH

*Zoological Survey of India, 100 Santhome High Road
Madras 600028, India*

AND

P. PARUI

*Zoological Survey of India, 'M' Block, New Alipore,
Calcutta 700053, India*

INTRODUCTION

To explore the 'Fauna of West Bengal', extensive surveys were undertaken by the scientists of the Zoological Survey of India, Calcutta, in various districts of West Bengal since 1985. As a result of these surveys a total of 29 species were collected and examined of which 5 species are new to science and 6 species recorded new for West Bengal. The paper deals with a total of 88 species of which 43 species are exclusively known from the state, 12 species only from Northeast India, 10 species common to Northern and Northern India, 13 species common to Northeastern and Southern India and 10 species common for all these parts of India.

Important contributions on Indian Asilidae were by Ricardo (1919-27), Brunetti (1928), Bromley (1935-38) and Oldroyd (1938, 48).

Asilids enjoy world wide distribution and include over 400 genera and about 5000 species. Of these 82 genera of about 800 species are recorded from the Oriental Region. Only 54 genera of over 300 species are so far reported from India. From West Bengal 32 genera of 88 species are recorded in this paper.

MATERIAL AND METHODS

Asilids are common in arid and semi-arid regions of the world. In temperate countries they are of common occurrence in wet or swampy localities and forests. In deep forests they are found rarely but in places adjoining to forests where shrubs are predominant they occur in more numbers. Some genera like *Laxenecera* Macquart, *Promachus* Loew, etc. generally occur in dry areas; *Ommatius* Wiedemann, *Damalis*, Fabricius etc. in humid areas; *Stichopogon* Loew inhabits dried up stream and river beds; and *Phylodicus* Loew on dry sandy areas including sea beaches. Robberflies, in general, are extremely swift and it is difficult to collect them unless one makes special efforts. They are collected by sweeping and as far as possible pinned in the field.

MORPHOLOGY AND TERMINOLOGY

Morphological characters of taxonomic importance are dealt in detail by Joseph and Parui (1983). Some of the terminologies used are from McAlphine (1981), which we are following in our recent papers.

SYSTEMATIC ACCOUNT

Family ASILIDAE

Key to subfamilies

1. Palpus one segmented2
 Palpus two segmented3
2. Elongate and excessively slender species, marginal cell open, alula absent, first flagellomere short, ovoid with long bristle-like aristaLEPTOGASTRINAE
 Less slender or robust bristly species, marginal cell closed, first flagellomere long and slender with short bristle bearing microsegmentASILINAE
3. Marginal cell open, first flagellomere spindle - shaped with apical microsegment, fourth posterior cell generally open or closed in the margin, females generally with circlet of spines on acanthophoritesDASYPOGONINAE
 Marginal cell closed, first flagellomere rod-like or clavate with apical pit, fourth posterior cell generally closed or stalked.....LAPHRIINAE

Key to tribes

1. Marginal cell open2
 Marginal cell closed5
2. Very narrow, elongate flies, first flagellomere short, ovoid, with a long bristle-like arista, alula and pulvilli absentLeptogasterini (Figs. 1,2)
 Usually stout flies of varied shape, pulvilli nearly always present, if absent, first flagellomere well developed with a short, apical style3
3. Prosternum isolated and surrounded by membrane, ninth tergite of female divided into two acanthophoritesSaropogonini (Figs. 3-5)
 Prosternum complete with little or without membranous area4
4. Frons and vertex strongly diverge, at vertex eyes much apart than at antenna, first flagellomere bears plumose arista except in Clinopogon, Stichopogon and Holopogon, which bears apical spineStichopogonini (Figs. 6,7)
 Face and frons small, first flagellomere with bristle-like terminal style, scutum elevated and archedXenomyzini (Fig. 8)
5. First flagellomere club-shaped, blunt, with a tiny apical style, proboscis usually laterally compressedLaphriini (Fig.9-11)
 First flagellomere bears a slender style, proboscis usually dorsoventrally compressedAsilini (Figs. 12,13)

I Tribe LEPTOGASTERINI

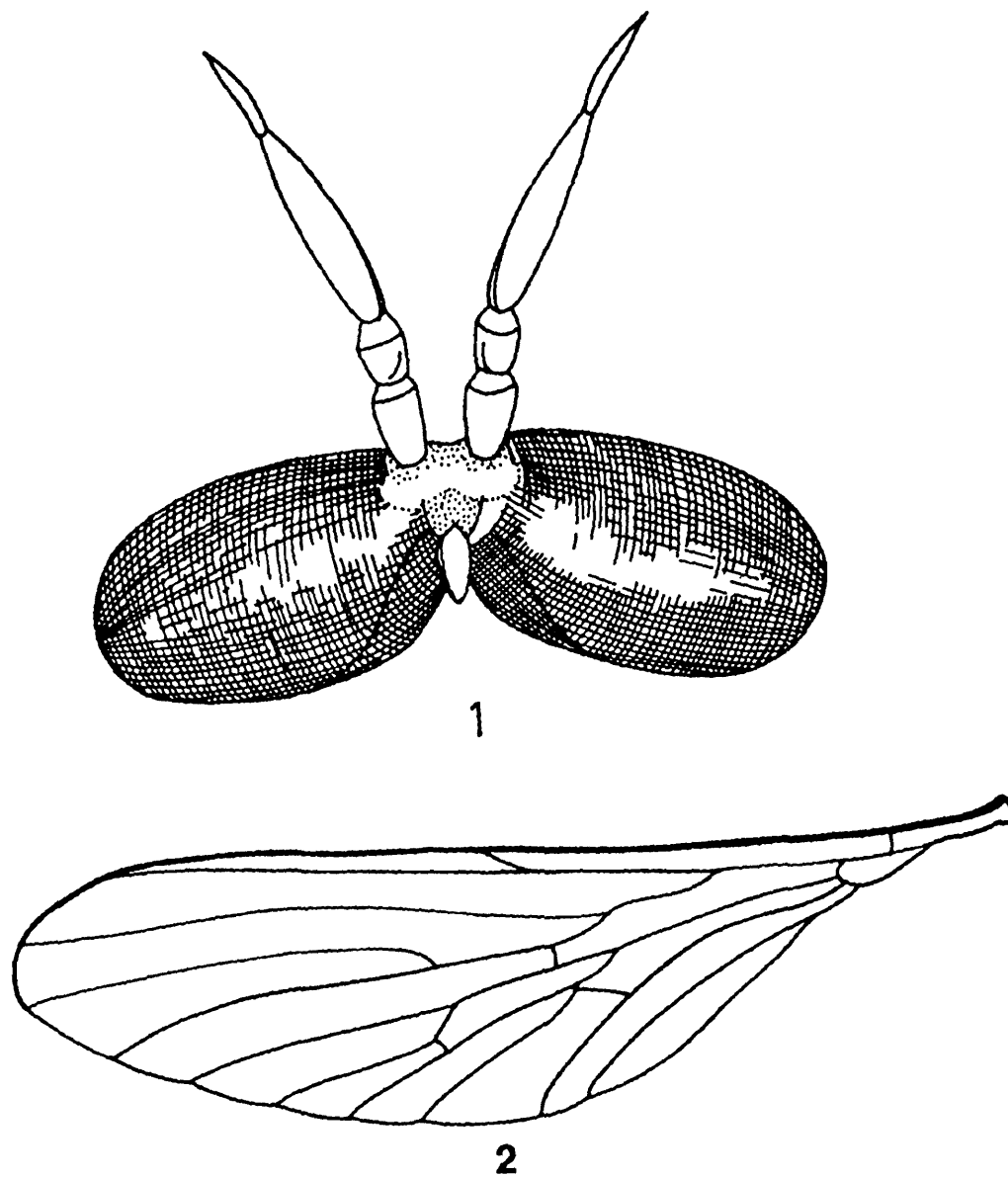
Members of this are elongate, slender and bare flies with one-jointed palpus like Asilini, open marginal cell like Saropogonini, reduced alula and pulvilli absent.

Key to genera of tribe Leptogasterini

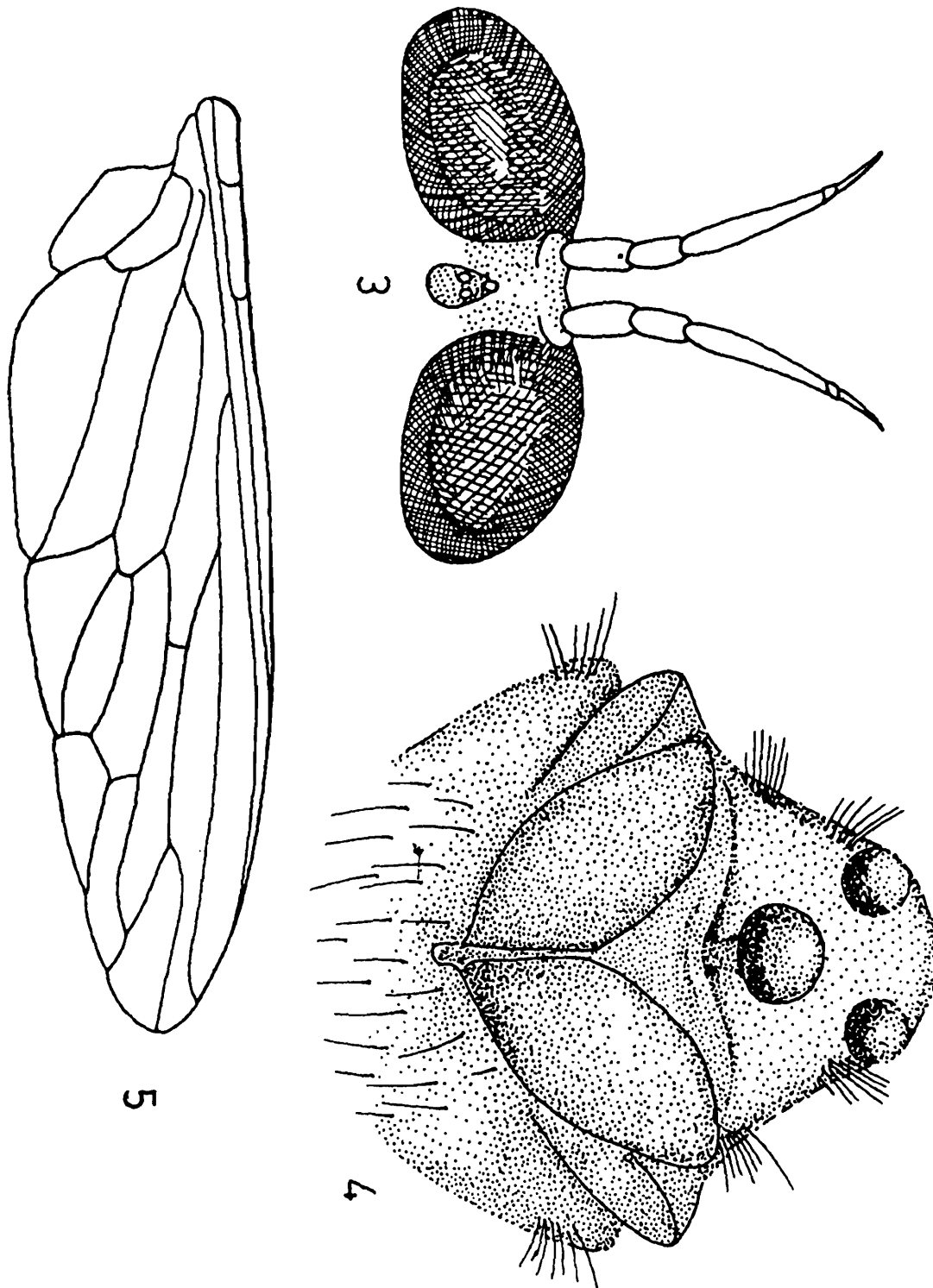
1. Anal cell closed and stalked, generally large species with clavate abdomen, hind femur bears a median isolated hair flock, anterior branch of fourth vein towards base of wing.....
*Ammophilomima* Enderlein
 Anal cell open, mostly small and slender flies2
2. Prothorax without any process arising between the paired anterior process of scutum, scutum not so high as in *Leptogaster*, empodium reduced or absent*Euscelidia* Westwood
 Prothorax without any process between the paired anterior process of scutum, scutum characteristically high, empodium usually well developed*Leptogaster* Meigen

Abbreviations used in figures

Cl, clasper (gonostylus); Ep, epandrium; Go, gonocoxite; L, lamella; Pr. proctiger; 8t, eighth tergum.



Figs. 1, 2 *Leptogaster cheriani* Bromley (Leptogasterini) : 1. head, 2. venation.



Figs. 3-5. *Stenopogon manii* Joseph and Parui (Saropogonini) : 3. head; 4. prostemum; 5. venation

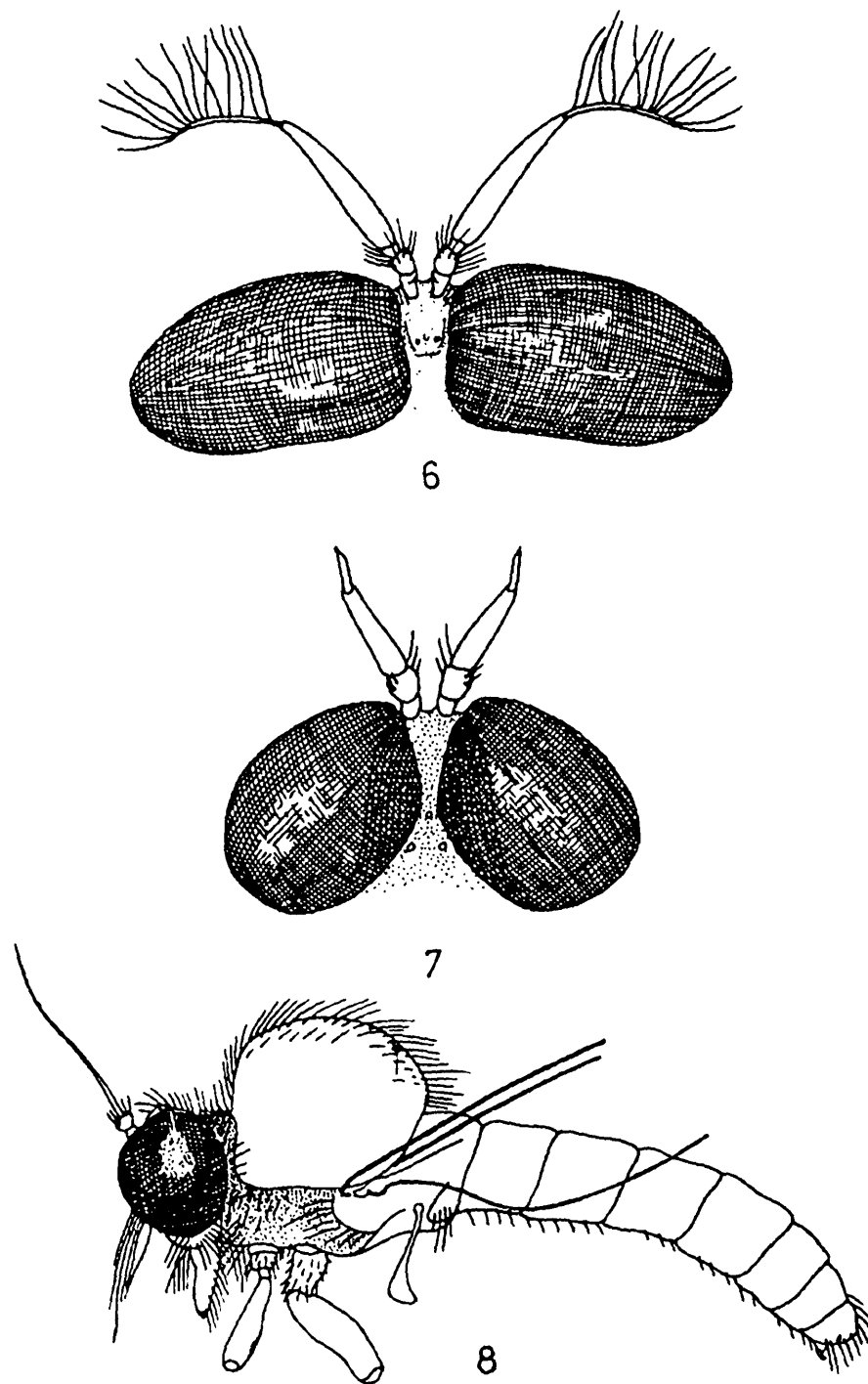
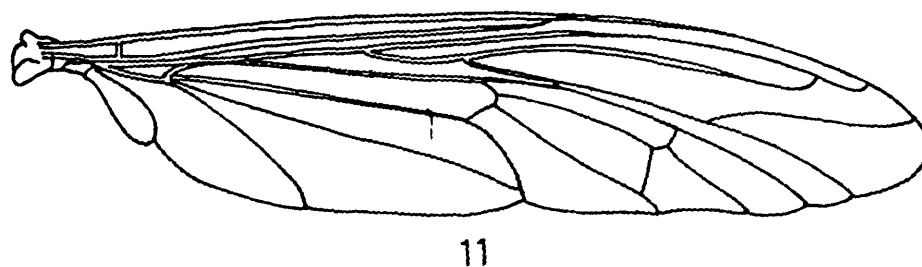
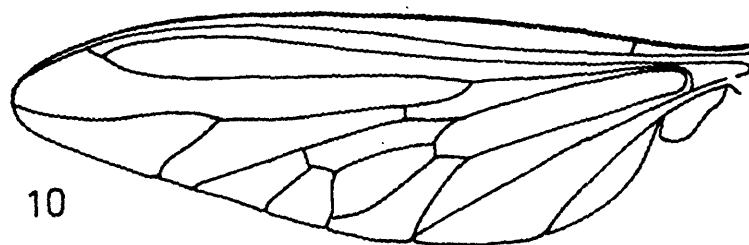
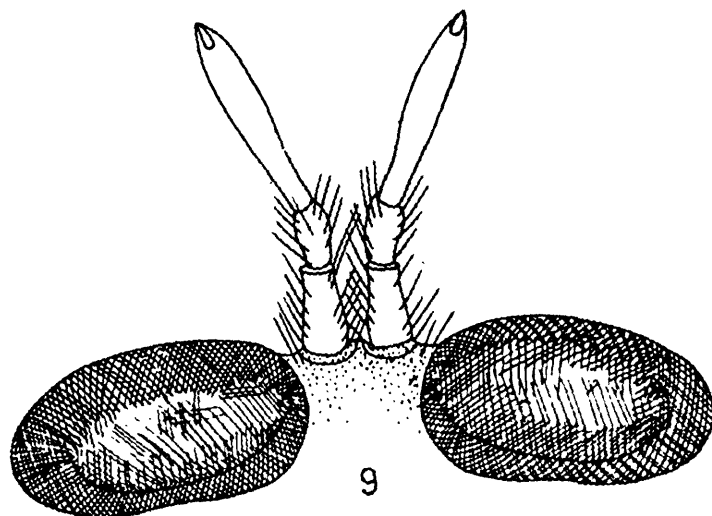
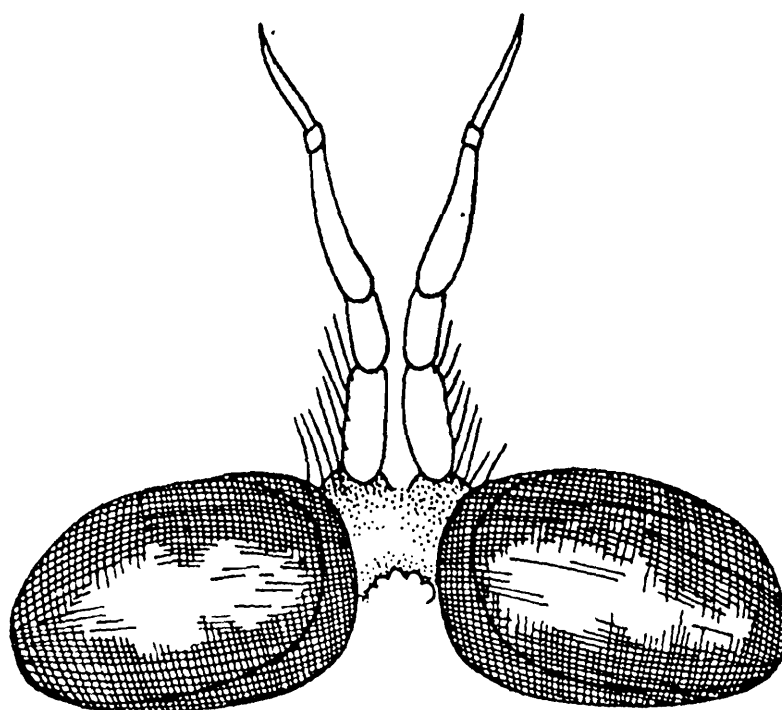


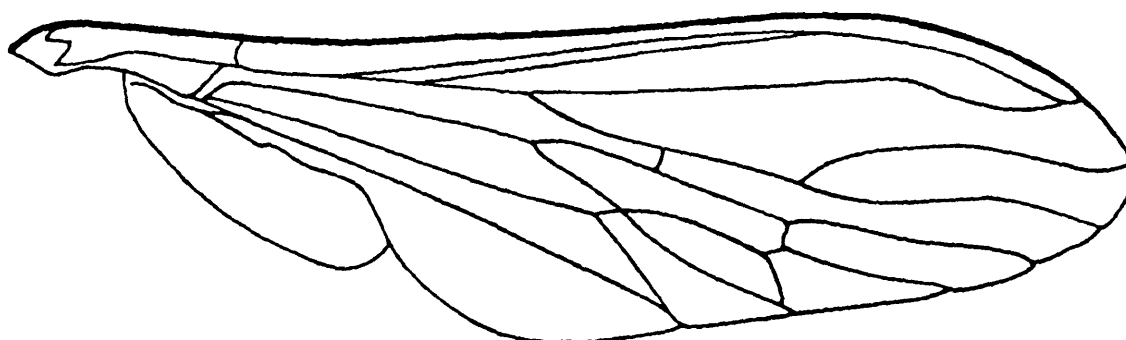
Fig. 6. *Michotamia indiana* Joseph and Parui (Stichopogonini), head showing normal plumose arista. Fig. 7. *Stichopogon indicus* Joseph and Parui (Stichopogonini), head showing antenna with apical spine. Fig. 8. *Damalis artigasi* (Joseph and Parui) (Xenomyzini), lateral view.



Figs. 9, 10. *Laphria indica* Joseph and Parui (Laphriini) : 9. head; 10. venation showing normal curved vein M_3 . Fig. 11. *Orthogonis andamanensis* Joseph and Parui (Laphriini), venation showing exception with straight vein M_3 .



12



13

Figs. 12, 13. *Machimus indicus* Joseph and Parui, (Asilini) : 12. head; 13. venation.

Genus 1. *Ammophilomima* Enderlein

1914. *Ammophilomima* Enderlein, *Wien. ent. ztg.* 33 : 155.

1. *Ammophilomima rufescens* Frey

1937. *Ammophilomima rufescens* Frey, *Notul. ent.* 17:47.

983. *Ammophilomima rufescens* : Joseph & Parui, *Oriental Ins.* 17: 277.

Material examined : Recorded from literature.

Diagnosis : Head yellowish-brown; antenna yellowish, first flagellomere two and-a-half times longer than combined length of scape and pedicel; mystax whitish. Thorax shining reddish-yellow; scutellum and pleura with brass-yellow hairs and bristles. Legs shining yellowish-red. Wing pale yellowish tinged, stigma black. Abdomen long, thin and uniformly broad.

Distribution : West Bengal : Calcutta.

Genus 2. *Euscelidia* Westwood

Euscelidia Westwood, 1850. *Trans. ent. Soc. Lond.* 5 : 232.

2. *Euscelidia marion* (Walker)

1849. *Leptogaster marion* Walker, *List. Dipt. Colln. Br. Mus.* 2 : 484.

1975. *Euscelidia marion* : Oldroyd, *Cat. Diptera Oriental Region* 2 : 100.

Material examined : Recorded from literature.

Diagnosis : Dark brown species. Antenna black, scape and pedicel short, first flagellomere spindle-shaped, much longer than scape and pedicel. Thorax with brick red hairs. First two femora and tibiae black with yellow base. Wing dark, lighter towards tip and hind border.

Distribution : West Bengal.

Genus 3. *Leptogaster* Meigen

1803. *Leptogaster* Meigen, *Magazin Insektdkde* 2 : 269.

Key to species of *Leptogaster* Meigen

1. Stigma distinct, scutellum black haired, abdomen uniformly black*ophionea* Frey
 Stigma indistinct, scutellum white haired, sutures of abdominal segments 2-5 yellow.....
*basilaris* Coquillett

3. *Leptogaster basilaris* Coquillett

1898. *Leptogaster basilaris* Coquillett, *Proc. U.S. natn. Mus.* 21 : 311.

1983. *Leptogaster basilaris* : Joseph & Parui, *Oriental Ins.* 17 : 280.

Material examined : Recorded from literature.

Distribution : From West Bengal only in India. The species was originally described from Japan, and subsequently recorded from Formosa; India; Java; Philippines and Sumatra.

4. *Leptogaster ophionea* Frey

1937. *Leptogaster ophionea* Frey, *Notul. ent.* 17 : 44.

1983. *Leptogaster ophionea* : Joseph & Parui, *Oriental Ins.* 17 : 282.

Material examined : Recorded from literature.

Distribution : West Bengal : Calcutta.

II Tribe LAPHRIINI

Members of the tribe resemble Asilini in having closed marginal cell and Saropogonini, Xenomyzini and Stichopogonini in possessing two jointed palpus.

Key to genera of tribe Laphriini

1. Proboscis laterally flattened like paper knife on edge2
 Proboscis dorsoventrally compressed, shorter and pointed at apex.....3
2. Bare species, scutum and abdomen brilliant metallic green, blue or purple, facial gibbosity medially developed, anterior branch of third vein nearly straight ending at wing tip.....
 *Maira* Schiner
 Comparatively more hairy, scutellum usually not metallic but abdomen partly so, facial gibbosity comparatively well produced, anterior branch of third vein strongly arched, sigmoid, and ending above wing apex.....*Laphria* Meigen
3. Ambient vein absent, costa ends above wing apex, first posterior cell narrow throughout, anterior branch of third vein ends far above wing apex*Nusa* Walker
 Ambient vein complete, first posterior cell not narrowed throughout4
4. First flagellomere slender, elongate with conspicuous long setae, face thickly covered with bristly hairs upto base of antenna*Laxenecera* Meigen
 First flagellomere dilated beyond base and without such setae, face with numerous, long curved, median stout or with short, many spike-like bristles*Andrenosoma* Rondani

Genus 4. *Andrenosoma* Rondani

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

5. *Andrenosoma choprai* Bromley

1935. *Andrenosoma choprai* Bromley, *Rec. Indian Mus.* 37 : 227.

1983. *Andrenosoma choprai*: Joseph & Parui, *Oriental Ins.* 17 : 286.

Material examined : Recorded from literature.

Diagnosis : Black species. Head black, greyish-white pollinose; mystax yellow with black bristles above. Scutum with faint, black stripes; scutellum bears black hairs on disc and a row of black bristles on border. Wings nearly hyaline. Legs black and yellowish-white. Abdomen black with black bristles on side upto first flagellomere; male genitalia black with white and black hairs.

Distribution : West Bengal : Darjiling District and Kerala. Here it is being recorded for the first time from Kerala from the named collection of ZSI.

Genus 5. *Laphria* Meigen1803. *Laphria* Meigen, *Magazin Insektakde* 2 : 270.Key to species of *Laphria* Meigen

1. Wing uniformly yellowish, abdomen blackish-brown with abundant yellow hairs, hind border of scutellum bears orange bristles*alternans* Wiedemann
Wing infuscated at tip and hyaline at base2
2. Abdomen reddish, mystax black with a few reddish hairs, hind margin of scutellum with a row of long, fine, black hristly hairs*furva* van der Wulp

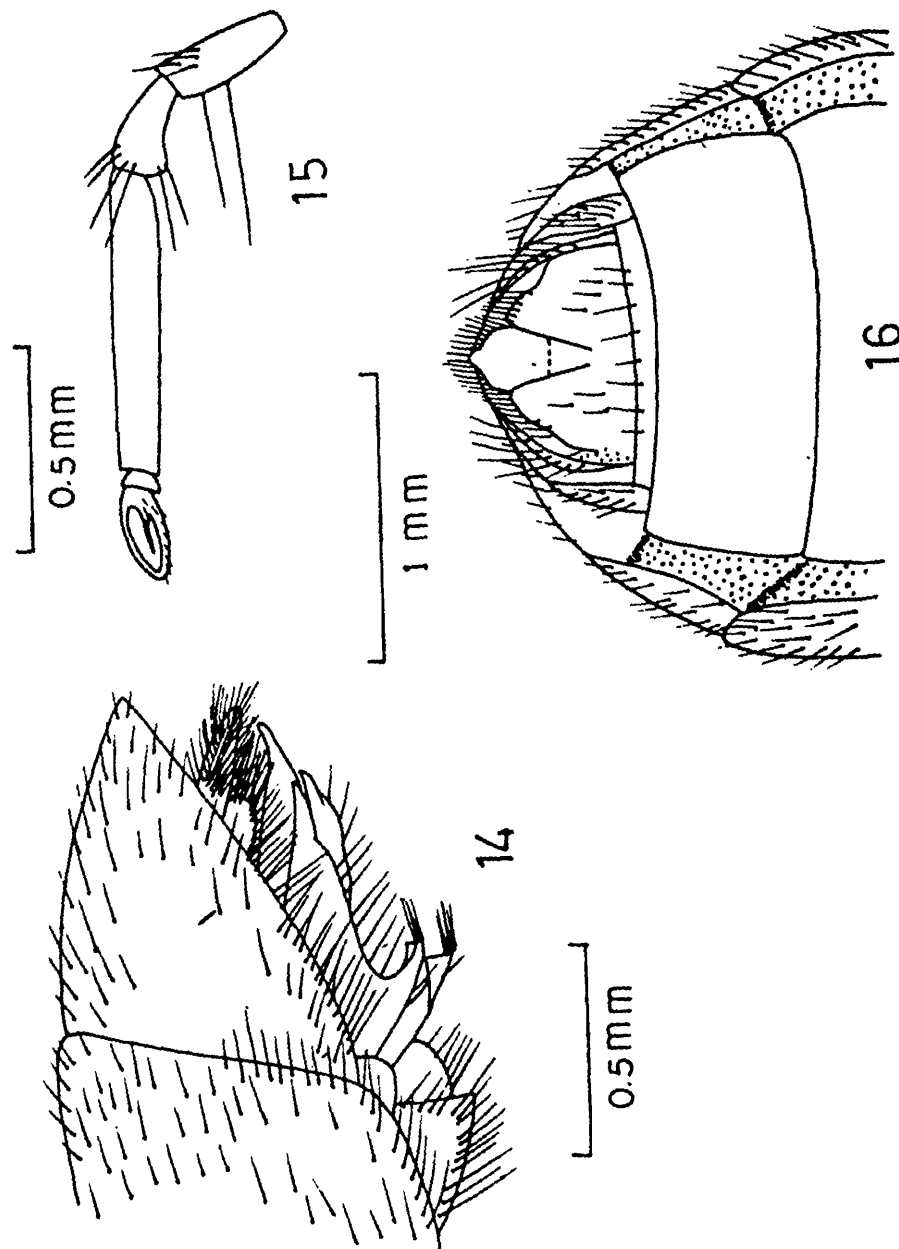
6. *Laphria alternans* Wiedenam1828. *Laphria alternans* Wiedemann, *Aussereurop zweifl. Insekt.* 1 : 511.1838. *Laphria senomera* Macquart, *Dipt. exot.* 1 (2) : 65.1983. *Laphria alternans* : Joseph & Parui, *Oriental Ins.* 17 : 288.*Material examined* : Reported from literature.

Distribution : West Bengal : Assam and Kerala in India. The species was originally described from Java. Subsequently it has been recorded from Borneo; Formosa; India; Philippines (Oldroyd 1975; 107). It is recorded here for the first time from Assam in India and Bangladesh, from the ZSI collection.

7. *Laphria furva* van der Wulp1898. *Laphria furva* van der Wulp, *Tijdschr. Ent.* 41 : 127.1983. *Laphria furva* : Joseph & Parui, *Oriental Ins.* 17 : 297.*Material examined* : Recorded from literature.*Distribution* : West Bengal : Darjiling district.8. *Laphria gilvoides* van der Wulp1898. *Laphria gilvoides* van der Wulp, *Tijdschr. Ent.* 41 : 124.1983. *Laphria gilvoides* : Joseph & Parui, *Oriental Ins.* 17 : 292.*Material examined* : Recorded from literature.*Distribution* : West Bengal : Darjiling district.Genus 6. *Laphystia* Loew1847. *Laphystia* Loew, *Linn. Ent.* 2 : 538.9. *Laphystia indica* n. sp.

(Figs. 14 16)

A dark brown and black, or black species with thorax and abdomen with short, appressed pile, the male small and female medium sized, in male legs pale yellow and wing pale yellow anterodistally, in female legs black and wing brown distally. Male : length 6 mm, wing 6 mm; female : length 9 mm, wing 8 mm.



Figs. 14-16. *Laphystia indica* n. sp. 14. lateral view of male genitalia; 15. antenn; 16. lateral view of female genitalia.

Male : *Head* broader than thorax, dark brown with pale yellow pile, face moderately prominent and nearly straight; mystax a few black bristles above the lower facial margin; face and fronto-orbital plate with pale yellow hairs, postcranium white haired, postocular bristles white and confined to above. Antennae damaged, lost from first flagellomere onwards and so described under female, scape and pedicel black, former with a pair of ventral elongate bristles, pedicel slightly shorter than scape. Palpus dark brown, proboscis yellowish-brown and black, white haired.

Thorax black; pronotum with long white hairs, especially laterally, scutum without mediolongitudinal stripe or lateral spots; chaetotaxy: 2 notopleurals, 2 supra-alars; vestiture short, appressed, white pile, also with a few, moderately long, white hairs on postpronotal lobe and posterior border of scutum, scutellar disc with appressed white hairs, border without bristles, karatergite with some elongate white hairs. Haltere white with yellowish tinge, base brown.

Legs with coxa and trochanter yellowish-brown, remainder pale yellow with varying extent of yellowish-brown on femur, and brown on apex of tarsal segments; fore and mid tibiae with dorsal, anterodorsal and posteroventral row of bristles, hind tibia with anterodorsal and anteroventral row of bristles, vestiture and bristles white.

Wing anterodistally pale yellow, rest hyaline, marginal cell closed with a minute stalk, anterior branch of third vein sigmoid and arched at base, fourth posterior and anal cells closed and stalked.

Abdomen dark brown, tergites 6 only; tergites laterally with white, long, dense hairs on tergites 1-3, tergite 1 with two and 2 with one white bristle, vestiture densely and minutely, short appressed pile. Male genitalia (Fig. 14) dark brown, ventrally placed.

Female : Similar to male but with the following differences: comparatively large, black; antenna (Fig. 15) with the first flagellomere yellowish-brown with dark brown apex, microsegments dark brown, first flagellomere long, slightly shorter than one and-a-half times the combined length of scape and pedicel, microsegment 1 short, 2 long, extended outward obliquely ventrally, spoon-shaped with a concealed minute spine; chaetotaxy: some additional setae present, 2 notopleurals with an additional seta on one side, 2 supra alars, 1 or 2 intra-alars; legs wholly black; wing hyaline basally, brown for more than half distally with hyaline band in marginal cell, 1st submarginal cell, 1st posterior cell, discal cell and fourth posterior cell; abdomen with 8 tergites, tergite 1 with three or more white bristles, tergite 2 with two white bristles; genitalia (Fig. 16) ventrally with an apically notched ventral plate.

Holotype Male, ZSI Reg. No. 7484/H6 India: West Bengal : Malda district: Bamangola, 23.vi.1987, Coll. P. Parui. Paratype Female, Reg. No. 7485/H6, rest of details as in holotype.

The genus *Laphystia* Loew is so far represented by one species, *L. stigmatalis* Bigot, in the Oriental Region (Sri Lanka), from which it differs in the colouration of body, especially in the predominantly black mystax, uniformly black or dark brown abdomen, and pale yellow or black femora and tibia.

Genus 7. *Laxenecera* Macquart

1838. *Laxenecera* Macquart, *Dipt. exot.* 1(2) : 77.

Key to species of *Laxenecera* Macquart

1. Mystax wholly white, scape with long, yellow hairs, legs hyaline with yellow base.....
.....*flavibarbis* Macquart
- Mystax mixed black and white2
2. First two pairs of tibiae yellow with yellow hairs, hind pair black with black and white hairs
.....*albibarbis* Macquart
- All tibiae black with yellowish hairs*bengalensis* (Wiedemann)

10. *Laxenecera albibarbis* Macquart

1838. *Laxenecera albibarbis* Macquart, *Dipt. exot.* 1(2): 195.

1983. *Laxenecera albibarbis* : Joseph & Parui, *Oriental Ins.* 17 : 293.

Material examined : 1 Female, Malda district; Bhaluk station, 26, VI. 1987, coll. K.P. Mukherjee.

Distribution : West Bengal : Malda district; Bihar; Gujarat; Himachal Pradesh; Maharashtra and Uttar Pradesh. The species was originally described from 'Bengal'

11. *Laxenecera bengalensis* (Wiedemann)

1821. *Laphria bengalensis* Wiedemann, *Dipt. exot.* : 237.

1975. *Laxenecera bengalensis*: Oldroyd, *Cat. Diptera Oriental Region 2* : 112.

Material examined : Recorded from literature.

Distribution : 'Bengal'

12. *Laxenecera flavibarbis* Macquart

1838. *Laxenecera flavibarbis* Macquart, *Dipt. exot.* 1(2) : 194.

1983. *Laxenecera flavibarbis*: Joseph & Parui, *Oriental Ins.* 17 : 297.

Material examined : Recorded from literature.

Distribution : West Bengal : Calcutta; Bihar; Gujarat; Maharashtra; Tamil Nadu; and Uttar Pradesh.

The species was described from 'Bengal'

Genus 8. *Maira* Schiner

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

Key to species of *Maira* Schiner

1. Mystax wholly black, scutum metallic purple*ongirostrata* Bromley
- Mystax black and golden yellow, scutum shining black*bicolor* Joseph & Parui

13. *Maira bicolor* Joseph & Parui

1987. *Maira bicolor* Joseph & Parui, *Bull. zool. Surv. India*, 8 (1-3) : 223.

Material examined: 1 Male, Sukna, 55km. s. of Darjiling, v. 1966, coll. J & M. Sedlaeck.

Distribution : West Bengal : Darjiling district.

14. *Maira longirostrata* Bromley1935. *Maira longirostrata* Bromley, *Rec. Indian Mus.* 37 : 227.1983. *Maira longirostrata*: Joseph & Parui, *Oriental Ins.* 17 : 299*Material examined* : Recorded from literature.*Distribution* : West Bengal : Darjiling district; Meghalaya. The species was recorded from Meghalaya by us (1981b : 221).Genus 9. *Nusa* Walker1851. *Nusa* Walker, *Insecta Saundersiana* 1 : 105.Key to species of *Nusa* Walker

1. First flagellomere elongate, vein R₅ and M₁ united well before wing border, mystax white with a few median black bristles, gonopod subtruncate at apex*bengalensis* Joseph & Parui
First flagellomere not elongate2
2. Vein R₅ and M₁ united close to wing border, mystax black with some pale yellow hairs on sides, male genitalia black and yellowish-brown*elva* Walker
Vein R₅ and M₁ united well before the wing border, mystax white, male genitalia black
.....*mukherjeei* n. sp.

15. *Nusa bengalensis* Joseph & Parui1987. *Nusa bengalensis* Joseph & Parui, *Oriental Ins.* 21 : 136.*Material examined* : 1 Male, Darjiling : Khuniamoor: Chapramari Forest, 2.v.1975, coll. B.C. Nandi.*Distribution* : West Bengal : Darjiling district.16. *Nusa elva* Walker1849. *Asilus elva* Walker, *List Dipt. Colln. Br. Mus.* 2 : 445.1975. *Nusa elva* : Oldroyd, *Cat. Diptera Oriental Region 2* : 115.*Material examined* : Recorded from literature.*Distribution* : West Bengal; Assam.

The species was described from 'Bengal'

17. *Nusa mukherjeei* n. sp.
(figs. 17, 18)

A medium black species with black and yellowish-brown legs, brown wings and black with lateral narrow yellowish-brown marked, or wholly black, abdomen. Male : length 12-14 mm, wing 7 mm; female : length 12-13 mm, wing 7-8 mm.

Male : Head broader than thorax, black, sparsely grey tomentose; mystax white with one bristle above may be black, fronto-orbital bristles black and white, ocellar bristles black, postocular setae black and white, postcranium with sparse white hairs, postgena densely white haired. Antenna black or dark brown and yellowish-brown, scape black or dark brown, pedicel basally and distally and first flagellomere distally yellowish-brown, remainder black or dark brown, first flagellomere slightly longer than scape. Palpus and proboscis with white hairs.

Thorax black, sparsely grey tomentose; pronotum with a median transverse row of black bristles, laterally pale yellow haired; scutum with a faint mediolongitudinal black stripe of varying length, extending from anterior border to beyond middle to slightly anterior to scutoscutellar suture, the stripe dividing it indistinct or absent; chaetotaxy: 3 notopleurals, 3 postalars, 4 supra-alars, 2 intra-alars, 4 dorsocentrals of which anterior 1-2 weak; bristles and hairs predominantly black, also with a few pale yellow ones; scutellum with the disc bearing black or black and white hairs, border with a row of black and white bristles; pleura sparsely grey tomentose, karatergite with white bristles and hairs. Haltere pale yellow to dark brown.

Legs black except tibia being yellowish-brown to varying extent, the latter colour decreases from fore to hind tibia so much so it is mostly black, hairs white and golden yellow, bristles black, white and golden yellow, mat of golden yellow pubescent present on fore tibia and basitarsus, and hind basitarsus.

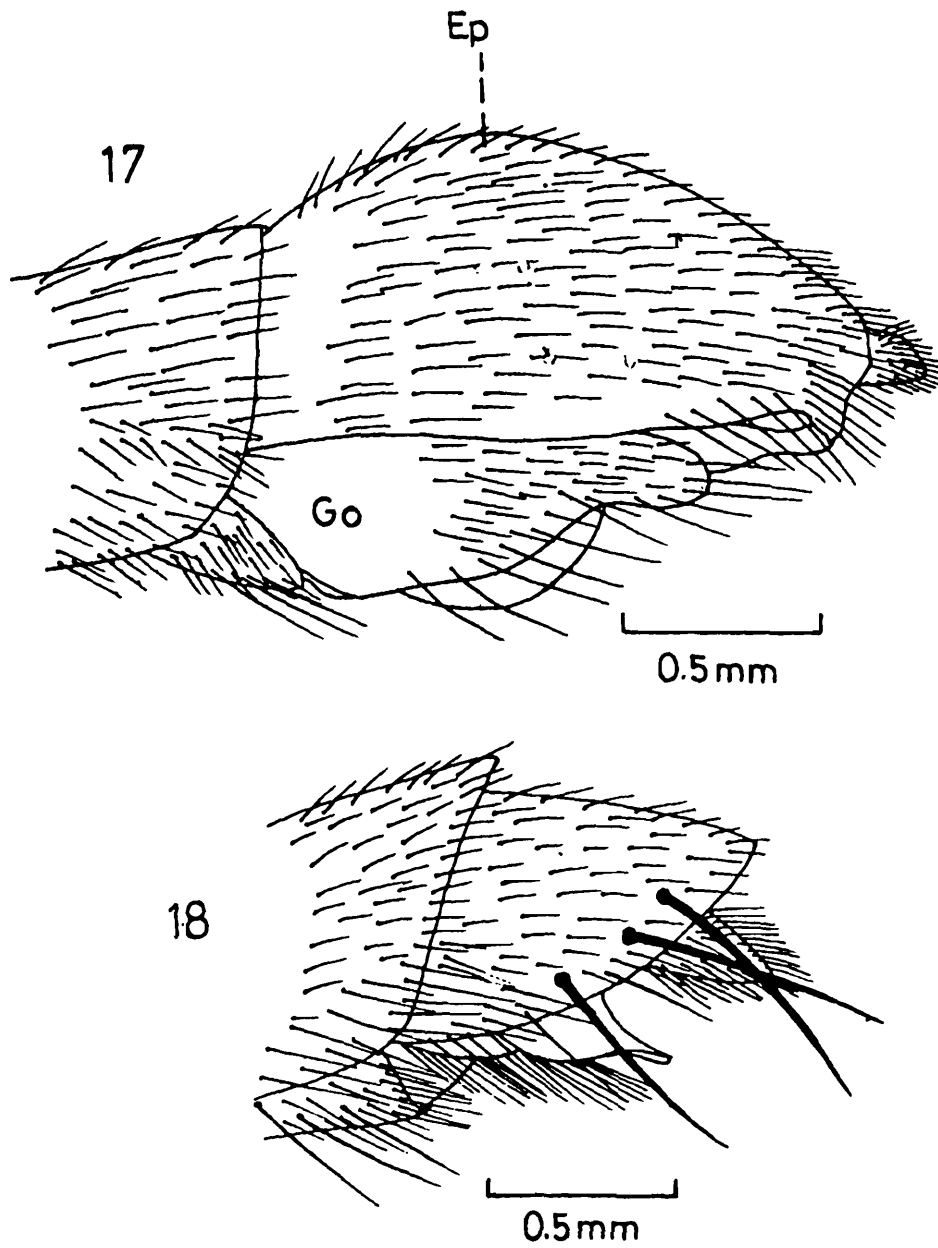
Wing brown, but medially lighter coloured and almost hyaline; R₅ and M₁ united well before the border.

Abdomen black with lateral, narrow, yellowish-brown colour, terga on hind border grey tomentose and laterally bear white bristles, vestiture black and white. Male genitalia (Fig. 17) black with black hairs.

Females : Similar but with the following differences: chaetotaxy, presutural supra-alars and anterior (postsutural) intra-alar weak; scutellar disc white and black haired, bristles of border in one paratype completely black; genitalia (Fig. 18) figured.

Holotype Male, Reg. No. 7570/H6, W. Bengal: Malda District: Gangarampur, 15.vi.1987, coll. K.P. Mukherjee and party. *Paratypes*, 1 Female, Reg. No. 7571/H6, data as in holotype, 1 Male, 1 Female, Reg. No. 7572/H6, 7573/H6, Malda District: Alal, 19.vi.1987. Coll. K.P. Mukherjee and party.

It is closely similar to *Nusa formio* Walker but differs in the shape of epandrium and gonocoxite. A male specimen of *Nusa formio* Walker from Shanghai, China, 1936, Coll. Esuenaon, identified by S.W. Bromley in 1939, was kindly loaned to us by Dr Lloyd Knutson, Director, Insect Identification and Beneficial Insect Introduction Institute, United States Department of Agriculture, Beltsville from the Smithsonian Institution, Washington (Almelander Collection, 1961). It is figured (Fig. 19) for comparison. The female genitalia was figured by us earlier (1987) from the holotype. The species is named in honour of our colleague, Shri K. P. Mukherjee, who collected this interesting species.



Figs. 17, 18. *Nusa mukherjeei* n. sp. 17. lateral view of male genitalia; 18. lateral view of female genitalia.

III Tribe SAROPOGONINI

The tribe resembles Leptogasterini in having open marginal cell and Laphriini in having two-jointed palpus.

Key to genera of Saropogonini

1. Front tibia with a short protuberance and a spine at apex, mystax composed of 2-4 bristles, abdomen elongate, clavate *Pegesimallus* Loew
Front tibia without any protuberance or spine 2
2. End vein of discal cell and of the fourth closed posterior cell in alignment and parallel to the wing margin, base of second posterior cell strongly swollen, karatergite bears a narrow vertical band of stout bristles *Microstylum* Macquart
End vein of discal cell and of the fourth posterior cell not in alignment 3
3. Male with hamate anterior femur, both sexes bear scutal name, exceptionally long, style-like first flagellomere with conspicuously flared apex and subapical spine, karatergite with pile or bristles *Oldroydia* Hull
Without hamate anterior femur, first flagellomere usually less than twice the length of scape and pedicel, epandrium widely separated, karatergite micropubescent..... *Stenopogon* Loew

Genus 10. *Microstylum* Macquart

1838. *Microstylum* Macquart, *Dipt. exot.* 1(2) : 26.

Key to species of *Microstylum* Macquart

1. Fore femur yellowish-brown and black, mystax brown, fore tibia yellow with dark apex.....
..... *apicale* (Wiedemann)
Fore femur uniformly dark brown to black 2
2. Abdomen with white bands, wings blackish grey, legs shining black.....
..... *albolimbatum* van der Wulp
Abdomen without white band 3
3. Wings dark brown with coppery purple iridescence, scutum with two pairs of stripes.....
..... *trimelas* (Walker)
Wings without iridescence 4
4. Wings uniformly brownish-yellow, scutellum bears four black bristles at border, abdomen blackish with basal three segments tomentose *strigatum* Enderlein
Wings brownish, lighter at posterior margin, scutellum\with two black bristles at border.....
..... *brunnipenne* Macquart

18. *Microstylum albolimbatum* van der Wulp

1898. *Microstylum albolimbatum* van der Wulp, *Tijdschr. Ent.* 41 : 118.

1983. *Microstylum albolimbatum*: Joseph & Parui, *Oriental Ins.* 17 : 309.

Material examined : Recorded from literature.

Distribution : West Bengal : Darjiling district; Meghalaya. Besides its type locality Darjiling, it has also been recorded from Meghalaya (Lal, 1960 : 71).

19. *Microstylum apicale* (Wiedemann)

1821. *Dasypogon apicale* Wiedemann, *Dipt. exot.* : 216.

1975. *Microstylum apicale*: Oldroyd, *Cat. Diptera Oriental Region 2* : 119.

Material examined: West Bengal : Darjiling district: Sukna, 55Kms S.of Darjiling, v. 1966, coll. J. & M. Sedlacek.

Distribution : The species was described from 'Bengal' and recorded from Darjiling (Joseph & Parui, 1991 : 244).

20. *Microstylum brunnipenne* Macquart

1849. *Microstylum brunnipenne* Macquart, *Dipt. exot. Suppl. 4* : 62

1983. *Microstylum brunnipenne* : Joseph & Parui, *Oriental Ins. 17* : 309.

Material examined : 1 Male, West Bengal : Darjiling district : Soom, 1000-1166 m, 15. vi. 1914, Coll. F. H. Gravely; 1 Female, Peshok Spur, Coll. R. S. Lister, rest of details as in preceding.

Distribution : West Bengal : Darjiling district.

The species was originally described from Bangla Desh. Subsequently it has been recorded from West Bengal (Joseph & Parui, 1984a : 453).

21. *Microstylum strigatum* Enderlein

1914. *Microstylum strigatum* Enderlein, *Wien, ent. Ztg. 33* : 171.

1983. *Microstylum strigatum* : Joseph & Parui, *Oriental Ins. 17* : 312

Material examined : Recorded from literature.

Distribution : West Bengal : Darjiling district; and Sikkim. The species was described from Sikkim.

22. *Microstylum trimelas* (Walker)

1851. *Dasypogon trimelas* Walker, *Insecta Saundersiana 1* : 97.

1975. *Microstylum trimelas* : Oldroyd, *Cat. Diptera Oriental Region 2* : 121.

Material examined : Recorded from literature.

Distribution : West Bengal : Darjiling district; Assam.

The species was described from 'Eastern India' Subsequently it has been recorded from West Bengal (Bromley, 1935 : 230). The present authors recorded it from Assam (Joseph & Parui, 1989 : 196).

Genus 11. *Pegesimallus* Loew

1858. *Pegesimallus* Loew, *Ofvers. Svenska Vet.-Akad. Forhandl. 14* : 344.

23. *Pegesimallus volcatus* (Walker)

1849. *Neolaparus volcatus* Walker, *List. Dipt. Colln. Br. Mus.* 2 : 349.

1980. *Pegesimallus volcatus* : Londt, *Ann. Natal Mus.* 24(1) : 332-333.

Material examined : 1 Female, West Bengal : Jalpaiguri district : Garumara Forest, 3.v.1975, Coll. B.C. Nandi; 1 Male, Darjiling district : Kalimpong, 7th mile, 1.vi.1980, Coll. R.N. Tiwari.

Diagnosis : Frons with two yellow bristles along with small yellow setae; antennal segments yellowish-brown to dull brown; scutum brownish-yellow with yellow lateral margins; wing pale yellow tinged; legs reddish-brown; abdomen dark red brown distally and pale orange brown basally.

Distribution : West Bengal : Jalpaiguri district and Darjiling district; Andhra Pradesh; Assam; Karnataka; Sikkim; and Uttar Pradesh.

The species was originally described from 'East Indies' It has been subsequently recorded from many countries from the Oriental Region.

Genus 12. *Oldroydia* Hull

1956. *Oldroydia* Hull, *Ann. Mag. nat. Hist.* (12)9 : 398.

24. *Oldroydia scatophagoides* (Walker)

1854. *Dasypogon scatophagoides* Walker, *List. Dipt. Colln. Br. Mus.* 6 : 475.

1975. *Oldroydia scatophagoides* : Oldroyd, *Cat. Diptera Oriental Region* 2 : 123.

Material examined : Recorded from literature.

Distribution : West Bengal : Darjiling district.

The species was described from 'East Indies' and has subsequently been recorded from ? Indonesia and India. From India, so far it has been reported only from West Bengal (Joseph & Parui, in press, a)

Diagnosis : Head whitish tomentose with black bristles and reddish hairs; thorax brown tomentose with a ridge of black bristles and yellowish-brown hairs; abdomen with reddish hairs dorsally and black hairs ventrally; legs black except red tibiae; wings brownish.

Genus 13. *Stenopogon* Loew

1847. *Stenopogon* Loew, *Linn, Ent.* 2 : 453.

Key to species of *Stenopogon* Loew

1. Legs blackish, fore femur bare of bristles, abdomen reddish except last two black segments.....
.....*ambryon* (Walker)
Legs not blackish2
2. Legs red, scape and pedicel reddish, wings dark grey, yellowish-brown along the border of veins*damias* Walker
Legs other than red colour3
3. Hind femur bears a black band in the middle, rest orange brown, small species.....
.....*nigrofasciatus* Brunetti
Hind femur uniformly yellowish, first posterior cell closed, robust species.....
.....*kherai* Joseph & Parui

25. *Stenopogon ambryon* (Walker)1849. *Dasyopogon ambryon* Walker, *List. Dipt. Colln. Br. Mus.* 2 : 311.1975. *Stenopogon ambryon* : Oldroyd, *Cat. Diptera Oriental Region 2* : 124.*Material examined* : Recorded from literature.*Distribution* : West Bengal.26. *Stenopogon damias* (Walker)1849. *Dasyopogon damias* Walker, *List Dipt. Colln. Br. Mus.* 2 : 313.1975. *Stenopogon damias* : Oldroyd, *Cat. Diptera Oriental Region 2* : 124.*Material examined* : Recorded from literature.*Distribution* : West Bengal.27. *Stenopogon kherai* Joseph & Parui1976. *Stenopogon kherai* Joseph & Parui, *Ent. Scand.* 7 : 105.*Material examined* : 1 Female, West Bengal : Darjiling district : Nakshal Bari, 203 m, 23.iv.1975. Coll. B. C. Nandi.*Distribution* : West Bengal : Darjiling district; Andhra Pradesh; Tamil Nadu and Kerala.

It is recorded here for the first time from West Bengal. From outside India it has been recorded from Nepal (Joseph & Parui, 1991 : 244).

28. *Stenopogon nigrofasciatus* Brunetti1928. *Stenopogon nigrofasciatus* Brunetti, *Ann. Mag. nat. Hist.* (10)2 : 76.1983. *Stenopogon nigrofasciatus* : Joseph & Parui, *Oriental Ins.* 17 : 316.*Material examined* : Recorded from literature.*Distribution* : West Bengal : Darjiling district.

IV. Tribe XENOMYZINI

The tribe resembles Saropogonini in having two-jointed palpus and open marginal cell but differs from it by the absence of acanthophorites.

Genus 14. *Damalis* Fabricius1805. *Damalis* Fabricius, *Systema antliatorum* : 147.Key to species of *Damalis* Fabricius

1. Scutum with longitudinal stripe2
- Scutum without longitudinal stripe3
2. Forefemur dark brown to black at apex, scutum with a broad brownish stripe, abdomen brownish with yellow apex*claripennis* Bromley
- Fore femur dark brown to black at base, scutum with three brown stripes, abdomen wholly reddish*prytanis* Walker

3. Legs wholly black, wing light brown, darker along anterior border, scutum grey with unicolourous lateral hairs.....*fusca* Walker
 Legs not wholly black, wings uniformly light brown, scutum reddish-yellow tomentose with unicolourous lateral hairs*planiceps* Fabricius

29. *Damalis claripennis* Bromley

1935. *Damalis claripennis* Bromley, *Rec. Indian Mus.* 37: 229.
 1975. *Xenomyza claripennis* : Oldroyd, *Cat. Diptera Oriental Region 2* : 126.
 1985. *Damalis claripennis* : Opinion 1342, *Bull. zool. Nom.* 42(3) : 264-265

Material examined : Recorded from literature.

Distribution : West Bengal : Darjiling district.

30. *Damalis fusca* Walker

1849. *Damalis fusca* Walker, *List Dipt. Colln. Br. Mus.* 2 : 481.
 1975. *Xenomyza fusca* : Oldroyd, *Cat. Diptera Oriental Region 2*:127.
 1985. *Damalis fusca* : Opinion 1342, *Bull. zool. Nom.* 42(3) : 264-265.

Material examined : Recorded from literature.

Distribution : West Bengal : Darjiling district; Karnataka, Kerela and Uttar Pradesh.

The species was described from West Bengal.

31. *Damalis planiceps* Fabricius

1805. *Damalis planiceps* Fabricius, *Syst. Antliat.*: 148.
 1975. *Xenomyza planiceps* : Oldroyd, *Cat. Diptera Oriental Region 2* : 127.
 1985. *Damalis planiceps* : Opinion 1342, *Bull. zoll. Nom.* 42(3) : 264-265.

Material examined : Recorded from literature.

Distribution : West Bengal : Darjiling district; and Tamil Nadu.

32. *Damalis prytanis* Walker

1849. *Damalis prytanis* Walker, *List Dipt. Colln. Bfr. Mus.* 2 : 363.
 1975. *Xenomyza prytanis* : Oldroyd, *Cat. Diptera Oriental Region 2* : 127.
 1985. *Damalis prytanis* : Opinion 1342, *Bjull. zool. Nom.* 42(3) : 264-265.

Material examined : Recorded from literature.

Distribution : West Bengal.

V. Tribe STICHOPOGONINI

This tribe resembles Saropogonini but differs from it in possessing complete prosternum with a little or without membranous area.

Key to genera of Stichopogonini

1. Arista long with filament2
Arista without filament, ocelli with a pair of well developed bristles, male genitalia downtruned with a hood-like cover formed by ninth tergite*Stichopogon* Loew
2. First flagellomere attenuate, very long, as long as or longer than the basal two segments together, arista shorter than first flagellomere with pectinate hairs clustered at tip.....
.....*Michotamia* Macquart
First flagellomere very short, usually much shorter than combined length of scape and pedicel3
3. Arista plumose in one row, a tuft of stiff hairs present medial to haltere and below metanotal callosity, epandrium with a long, sigmoid, apically hooked process.....*Cophinopoda* Hull
Arista plumose in one or two rows, no such hair tuft present, epandrium well developed, curved and apposed apically*Ommatius* Wiedemann

Genus 15. *Stichopogon* Loew

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

Key to species of *Stichopogon* Loew

1. Lamella with closely matted hairs in a spindle likr tuft*meridionalis* Oldroyd
Lamella without such hair tuft2
2. First flagellomere yellow, all femora pale yellow except upper dark brown marking.....
.....*menoni* n. sp.
First flagellomere black3
3. Fore femur black dorsally on distal two-thirds, rest orange, all tibiae orange except black apex of hind tibia*tomentosus* Oldroyd
Fore femur black except pale yellow base, all tibiae pale yellow with black apex.....
.....*bengalensis* n. sp.

33. *Stichopogon bengalensis* n. sp.

(Figs. 20, 21)

A tiny black species with dense grey tomentum, black and pale yellow legs and lightly infuscated wings. Male : length 3.5 mm, wing 2.5 mm; female : 4.0 mm, wing 3.00 mm.

Female Head broader than thorax, black with dense greyish-white tomentum; mystax white; fronto-orbital hairs white, ocellar bristles pale yellow, postcranium white haired, postocular bristles restricted to above, postgena with dense white hairs. Antennal scape and pedicel dark brown with grey tomentum, the latter white haired, first flagellomere black, slightly longer than the combined length of scape and pedicel. Palpus and proboscis black, almost bare.

Thorax black, densely grey tomentose; pronotum with a few white hairs laterally; scutum with a faint mediolongitudinal black stripe extending from anterior border to beyond the transverse suture, laterally with three large black spots in a longitudinal row; chaetotaxy : 1 notopleural, 1 supra-alar, 1 postalar; vestiture brown or white, bristles pale yellow or white; scutellum sparsely grey tomentose.

hind border with white hairs, a pair of which form bristly hairs; pleura with dense grey tomentum. Haltere white.

Legs black and pale yellow; coxa black, trochanter yellowish-brown, femur black with extreme base pale yellow, tibia pale yellow with black apex which is comparatively extensive on hind tibia, tarsal segments pale yellow with black apex, in hind leg the distal segments completely black, vestiture and bristles white.

Wing lightly infuscated distally and hyaline basally.

Abdomen black with grey tomentum, terga 1, 7 and 8 nearly completely grey, remainder predominantly black with grey tomentum on all sides which is very narrow on hind border, the black medially extends to anterior border, tergum 1 with a few, long, white, posterolateral hairs, vestiture white and brown. Genitalia (Fig. 20) illustrated, lamella without tuft of hairs.

Male : Similar but with the following differences: antenna wholly black, first flagellomere equal to the combined length of scape and pedicel; mediolongitudinal stripe of scutum indistinct, scutellum bare; abdomen with much less grey tomentum. Genitalia (Fig. 21) black.

Holotype Female, Reg. No. 7486/H6, West Bengal : Malda district: Parbatidanga, 27.vi.19876, Coll. P. Parui. *Paratypes* 1 Male, Reg. No. 7487/H6, rest of data as in holotype; 1 ex Reg. No. 7488/H6, broken off from mid of abdomen and sex cannot be ascertained, details as in holotype.

It is closely similar to *Stichopogon indicus* Joseph & Parui (1984b) from which *S. bengalensis* n. sp. can be readily distinguished by the smaller size, black first flagellomere and details of genitalia of both sexes.

34. *Stichopogon menoni* n. sp. (Figs. 22, 23)

A very small black species with yellowish-brown legs with black markings and light brown wings. Male : length 6 mm, wing 4 mm; female: length 6-7 mm, wing 4-6 mm.

Female : *Head* as broad as or slightly broader than thorax; black with greyish-yellow and grey tomentum; mystax white; frontoorbital hairs and ocellar bristles white, postcranium white haired, also with white bristles, postgena white haired. Antennal scape, pedicel and first flagellomere yellowish-brown, remainder brown, pedicel with a few pale yellow bristles, combined length of scape and pedicel slightly longer than half of first flagellomere. Palpus and proboscis black with sparse white hairs.

Thorax black, grey tomentose; pronotum with a transverse row of white bristly hairs; scutum with bristly hairs; scutum with a faint, narrow, mediolongitudinal black stripe, whose length quite variable and extending from almost the entire length to restricted to anterior and posterior parts; chaetotaxy: 1 notopleural, 1 postalar, 1 supra-alar; 1 supra-alar; vestiture white and bristles pale yellow to white; scutellum with disc bare, hind border bearing pale yellow hairs; pleura greyish-white tomentose, karatergite with a few, elongate, pale yellow to white, bristly hairs. Haltere white to pale yellow.

Legs yellowish-brown with black markings; coxa yellowish-brown mostly covered with black, femur yellowish-brown with black marking dorsally which decreases from fore to hind femur, in lighter coloured specimens black colour may be restricted to one femur or all femora almost wholly yellowish-brown, tibia yellowish-brown with black apex, the black colouration increases from fore to hind tibia, tarsus black except basitarsus being yellowish-brown, vestiture and bristles white.

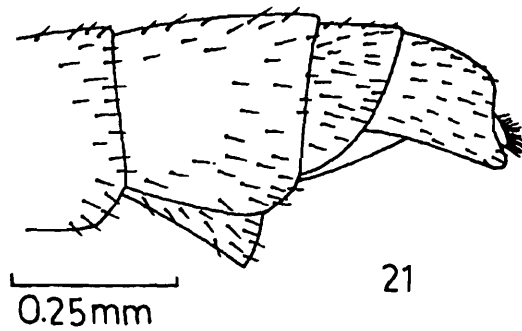
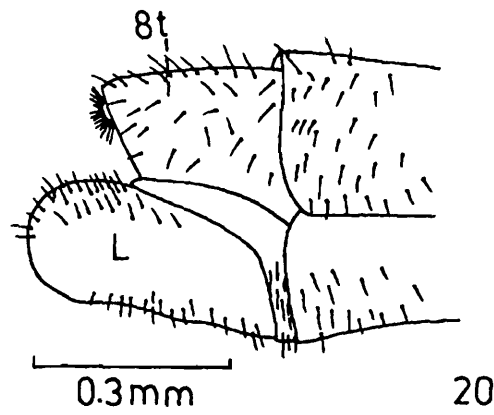
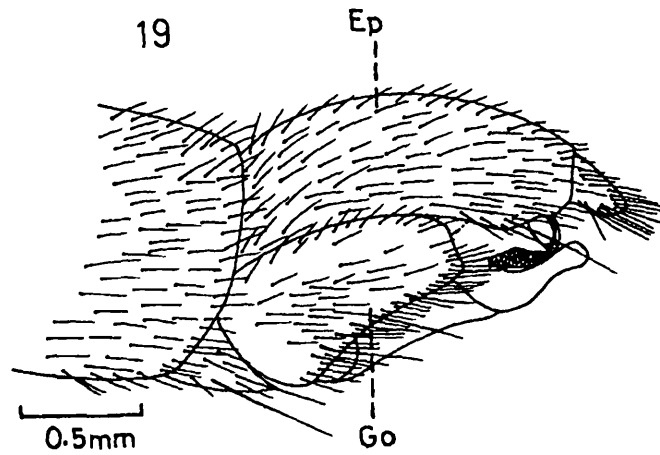
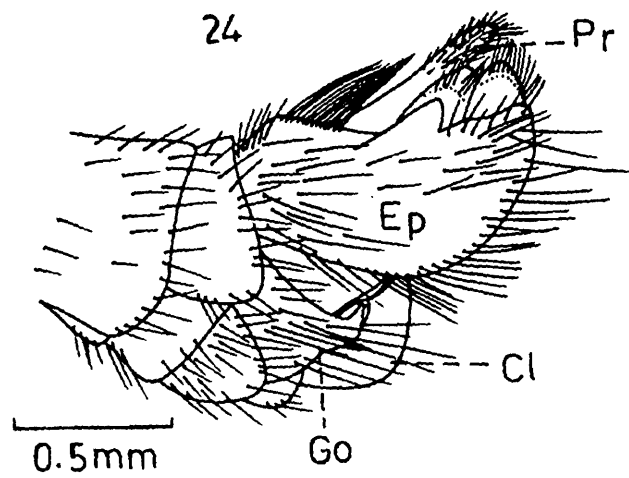
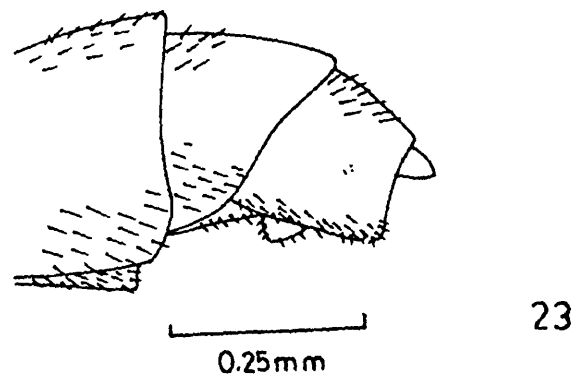
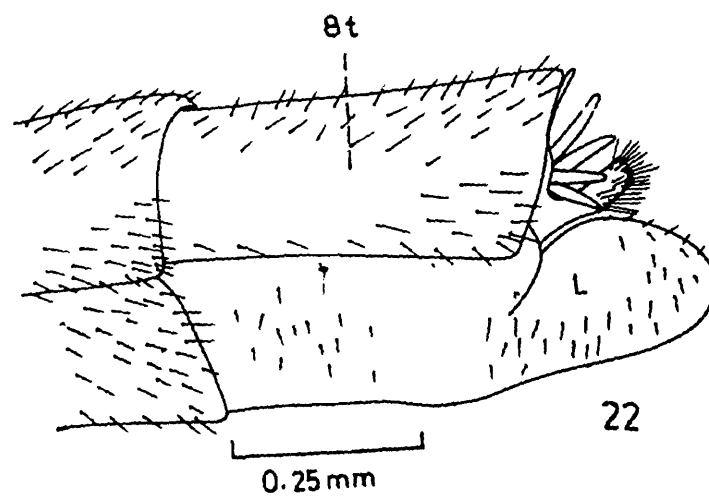


Fig. 19. *Nusa formio* Walker, lateral view of male genitalia. Figs. 20, 21. *Stichopogon bengalensis* n. sp. 20. lateral view of female genitalia; 21. lateral view of male genitalia.



Figs. 22, 23 *Stichopogon menoni* s. sp. 22. lateral view of female genitalia; 23. lateral view of male genitalia. Fig. 24. *Astochia femorata* n. sp. lateral view of male genitalia.

Wing light brown.

Abdomen black, laterally terga comparatively lighter coloured so much so in some paratypes it may be yellowish-brown, tergum 1 lightly grey tomentose with a few elongate, white hairs posterolaterally, terga 2-6 laterally lightly grey tomentose, remainder lightly grey tomentose, vestiture white and black. Genitalia black, illustrated (Fig. 22), lamella without tuft of hairs.

Male: Similar, genitalia black, illustrated (Fig. 23).

Holotype Female, Reg. No. 7564/H6, West Bengal : Malda Town: Mahananda River side, 15.vi.1987, Coll. K.P. Mukherjee. *Paratypes* 1 Male, 4 Females, Reg. No. 7565/H6 to 7569/H6, details as in holotype.

It is similar to *Stichopogon indicus* Joseph & Parui (1984b) and *S. bengalensis* n. sp. described above. It differs from both in the wholly pale yellow first flagellomere, yellowish-brown femur with upper black marking, and distinctive shape of lamella. It is named in honour of Dr M.G. Ramdas Menon, retired Systematist of Indian Agricultural Research Institute, New Delhi, for the many favours received by us during our studies on Diptera.

35. *Stichopogon meridionalis* Oldroyd

1948. *Stichopogon meridionalis* Oldroyd, *Entomologist's mon. Mag.* **84** : 261.

1983. *Stichopogon meridionalis* : Joseph & Parui, *Oriental Ins.* **17** : 325.

Material examined : 4 Females, Malda district : Parbatidanga, 27.vi.1987, Coll. K.P. Mukherjee.

Distribution : West Bengal : Malda district; Andhra Pradesh; Bihar; Karnataka and Tamil Nadu. Also reported from Sri Lanka.

It is recorded here for the first time from West Bengal.

36. *Stichopogon tomentosus* Oldroyd

1948. *Stichopogon tomentosus* Oldroyd, *Entomologist's mon. Mag.* **84** : 263

1983. *Stichopogon tomentosus* : Joseph & Parui, *Oriental Ins.* **17** : 326.

Material examined : 3 Females, Malda district : Parbatidanga, 27.vi.1987, Coll. K.P. Mukherjee.

Distribution : West Bengal : Malda district, and Bihar.

It is recorded for the first time from West Bengal.

Genus 16. *Cophinopoda* Hull

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

37. *Cophinopoda chinensis* (Fabricius)

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

1975. *Cophinopoda chinensis* : Oldroyd, *Cat. Diptera Oriental Region 2* : 129.

Material examined : 1 Male, 1 Female, Darjiling district : Kalimpong 7th mile, 1. vi. 1980, Coll. R.N. Tiwari.

Diagnosis : Mystax yellow; a tuft of yellow hairs on each side of vertex along eye margin and another tuft on either side of antennae; proboscis and palpi black with yellow hairs; scutum black with yellow tomentose, lateral hairs yellow; legs black except yellow tibiae; abdomen black, yellowish tomentose with yellow hairs; epandrium convex with a long curved ventral process; eighth sternum of female notched and with distinct bristles and hairs.

Distribution : West Bengal : Darjiling district; Andhra Pradesh; Assam; Bihar; Kerala; Orissa; Sikkim; Tamil Nadu and Uttar Pradesh. The species was described from China.

Genus 17. *Machotamia* Macquart

Michotamia Macquart 1838. *Dipt. exot.* 1(2) : 72.

38. *Michotamia aurata* (Fabricius)

1794. *Asilus aurata* Fabricius, *Ent. Syst.* 4 : 387.

1878. *Lochites testaceus* Bigot, *Ann. Soc. Ent. Fr.* (10)1 : 425.

1975. *Michotamia aurata* : Oldroyd, *Cat. Diptera Oriental Region 2* : 130.

Material examined : 1 Male, Malda district, Nalagola, 18.vi.1987, Coll. K.P. Mukherjee.

Diagnosis : Mystax yellow; a tuft of yellow hairs on each side of antennae; scape and pedicel yellow, first flagellomere black; scutum black with humeri yellow; abdomen yellow except fifth and sixth segments black; epandrium yellow, broad upto two-thirds and then gradually narrowed towards tip.

Distribution : West Bengal : Darjiling and Malda districts; Andhra Pradesh; Bihar; Kerala; Madhya Pradesh; Orissa; Pondicherry and Tamil Nadu in India. The species is widely distributed in the Oriental Region, and is reported to occur in Bangla Desh; Burma; Pakistan; Sulawasi and Taiwan.

Genus 18. *Ommatius* Wiedemann

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

Key to species of *Ommatius* Wiedemann

1. Hind femur wholly black2
Hind femur yellowish with dark apex, in male wing hyaline with brownish towards tip, male genitalia reddish-brown.....*subgracilis* Bromley
2. Mystax wholly white, hind femur bears anteroventral and posteroventral rows of pale yellow bristles, male genitalia yellowish-brown and dark brown*bengalensis* Joseph & Parui
Mystax mixed coloured3
3. All tibiae orange with an anterior dark stripe, bristles of thorax and legs predominantly white...
.....*conopsoides* Wiedemann
All tibiae yellowish with black tip at least in hind pair but without dark stripe4
4. Antenna yellow and dark brown, epandrium with slender incurved hooks, scutellum bears black hairs on disc and black marginal bristles.....*carmichaeli* Bromley
Antenna wholly black.....5
5. Scutellum with black hairs on disc, hind femur strongly inflated in male*peregrinus* (Wulp)
Scutellum with white hairs on disc6

6. Fore and mid femora ventrally with long, white hairs only, wing deeply infuscated anteriorly...
*gopalpurensis* Joseph & Parui
 Fore and mid femora ventrally with pale hairs and bristles, wing nearly hyaline.....
*singlensis* Oldroyd

39. *Ommatius bengalensis* Joseph & Parui

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

Material examined : 1 Male, Darjiling district : Sukna : 55 Km S. of Darjiling, v. 1960, Coll. J. M. Sedlacek.

Distribution : West Bengal : Darjiling district.

40. *Ommatius carmichaeli* Bromley

1935. *Ommatius carmichaeli* Bromley, *Rec. Indian Mus.* 37 : 225.

1983. *Ommatius carmichaeli* : Joseph & Parui, *Oriental Ins.* 17 : 330.

Material examined : Recorded from literature.

Distribution : West Bengal : Darjiling district.

41. *Ommatius conopsoides* Wiedemann

1828. *Ommatius conopsoides* Wiedemann, *Aussereurop. zweifl. Insekt.* 1 : 422.

1983. *Ommatius conopsoides* : Joseph & Parui, *Oriental Ins.* 17 : 330

Material examined : Recorded from literature.

Distribution : West Bengal. The species was described from Sumatra and subsequently described from Borneo and India.

42. *Ommatius gopalpurensis* Joseph & Parui

1987. *Ommatius gopalpurensis* Joseph & Parui, *Bull. zool. Surv. India* 8 (1-3) : 98.

Material examined : 2 Males, 24 Parganas : Gopalpur, 24. vi. 1983, Coll. P. Parui.

Distribution : West Bengal : 24 Parganas district.

43. *Ommatius peregrinus* (van der Wulp)

1872. *Emphysomera peregrinus* van der Wulp, *Tijdschr. Ent.* 15 : 253.

1975. *Ommatius peregrinus* : Oldroyd, *Cat. Diptera Oriental Region* 2 : 134.

Material examined : Recorded from literature

Distribution : West Bengal : Darjiling district and Arunachal Pradesh. The species was described from Borneo and Moluccas, and subsequently recorded from Sumatra and India. ZSI possesses a specimen from Burma in the named collection.

44. *Ommatius singlensis* Oldroyd

1935. *Ommatius nigrofemorata* Bromley, *Rec. Indian Mus.* 37 : 226 (preoccupied Bigot, 1876).
 1975. *Ommatius singlensis* Oldroyd, *Cat. Diptera Oriental Region 2* : 134.

Material examined : Recorded from literature

Distribution : West Bengal : Darjiling district.

45. *Ommatius subgracilis* Bromley

1935. *Ommatius subgracilis* Bromley, *Rec. Indian Mus.* 37 : 226.
 1983. *Ommatius subgracilis* : Joseph & Parui, *Oriental Ins.* 17 : 337

Material examined : Recorded from literature

Distribution : West Bengal Darjiling district.

VI. Tribe ASILINI

The members of this tribe resemble Laphriini in having closed marginal cell but differs from it in the slender first flagellomere.

Key to genera of tribe Asilini

1. Submarginal cells three2
 Submarginal cells two3
2. Radial fork longer than second posterior cell, apex of marginal cell bulbous, antennae closed together, in female tenth segment with numerous short spines, the apical pair longer, stout...
*Philodicus* Loew
 Radial fork shorter than second posterior cell, apex of marginal cell not bulbous, antennae wide apart, in female tenth segment without spine*Promachus* Loew
3. Metanotal slope pubescent or pollinose, face prominent below but scarcely gibbous, antennal arista much longer than first flagellomere, a long spur vein at the base of anterior branch of third vein.....*Anacinaces* Enderlein
 Metanotal slope bristly pilose4
4. Fourth posterior cell bulged forward so that the discal cell strongly constricted, in male marginal and submarginal cells usually bulged onwards with costa, ovipositor strongly compressed laterally*Clephyroneura* Becker
 Fourth posterior cell not bulged forward, discal cell not constricted, ovipositor of different pattern5
5. Terga with fine pile or bristly hairs except sometimes first tergum, facial gibbosity strong ...6
 Several terga with stout or slender bristles along lateral part of posterior margin, face usually weakly produced7
6. Anterior basitarsus conspicuously swollen and stout, male genitalia pedunculate with a gap between epandrium and gonocoxite, ovipositor of five segments, elongate, slender, terminal three segments laterally compressed*Astochia* Becker
 Anterior basitarsus not conspicuously swollen or stout, epandrium broad at base, apically narrowed, hypandrium well developed and transverse apically, ovipositor of last three segments of which eighth segment bears bristles.....*Asilus* Linne

7. Second submarginal cell developed slenderly and gradually from base, first flagellomere very short, arista quite long and slender, face convex with some bristles above mystax, proctiger directed vertically upward and backward *Senoprosopis* Macquart
Second submarginal cell wide at base and not developed slenderly and gradually 8
8. Occipital bristles strongly proclinate, terga with distinct bristles posteriorly, strong dorsocentral bristles upto transverse suture, epandrium with a deep lateral constriction, ovipositor five segmented, elongate, laterally compressed *Neoitamus* Osten Sacken
Occipital bristles straight or slightly curved, ovipositor not elongate and slender 9
9. Strena and sides of abdomen with usually long and dense piles, whole scutellum exceptionally densely long bristly or bristly pilose, antennal style quite short and stout.....
..... *Trichomachimus* Engel
Scutellum and abdomen not so densely pilose 10
10. Facial tubercle highly developed, extending almost upto antennae, scutellar disc with long bristly hairs, eighth sternum lappet round at apex, aedeagus three pronged ... *Machimus* Loew
Facial tubercle less developed, eighth sternum differently shaped, aedeagus without prongs ... 11
11. Mid femur with a cluster of spinous bristles, mid tibia with a row of bristly spines or hairs...
..... *Hoploheromerus* Becker
Mid femur and tibia without such group of spines and hairs, but isolated, strong hairs may exist 12
12. Epandrium highly developed and complicated, ovipositor small and not laterally compressed, dorsocentral hairs cross behind transverse suture towards the fronts 13
Epandrium less developed and less complicated, ovipositor long and laterally compressed, dorsocentral hairs do not cross beyond transverse suture towards fronts.....
..... *Neomochtherus* Osten Sacken
13. First flagellomere very slender and attenuate, either as long as or little longer than arista, epandrium with a deep lateral terminal notch *Orophotus* Becker
First flagellomere short, oval, epandrium with a deep cleft *Heligmoneura* Bigot

Genus 19. *Anacinaces* Enderlein

1914. *Anacinaces* Enderlein, *Zool. Anz.* 44 : 257.

46. *Anacinaces rufiventris* (Macquart)

1838. *Erax rufiventris* Macquart, *Dipt. exot.* 1 (2) : 108.

1975. *Anacinaces rufiventris* : Oldroyd, *Cat. Diptera Oriental Region 2* : 136.

Material examined : Recorded from literature.

Diagnosis : Face yellowish-grey; mystax black; thorax ventrally yellowish-grey and with black stripes; abdomen broad, depressed, ovipositor short.

Distribution : 'Bengal'

Genus 20. *Asilus* Linnaeus

1958. *Asilus* Linnaeus, *Syst. Nat.* (10) : 605.

47. *Asilus aurimystax* Bromley

1928. *Asilus aurimystax* Bromley, *Amer. Mus. Novit.* 36 : 3.

1983. *Asilus aurimystax* Bromley : Joseph & Parui, *Oriental Ins.* 17 : 342.

Material examined : Recorded from literature.

Diagnosis : *Mystax* golden yellow with a few black bristles above; thorax black with usual median stripe and lateral spots; legs black with black bristles and hairs, also present pale yellow hairs on anterior two pairs; wing nearly hyaline with apex and posterior border grey; abdomen black, hairs and bristles on sides pale yellow; genitalia shining black, eighth sternum narrowly prolonged and covered with dense tuft of black hairs.

Distribution : West Bengal : Darjiling district; and China. The species was originally described from China.

Genus 21. *Astochia* Becker

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

Key to species of *Astochia* Becker

1. Fore femur wholly black2
 Fore femur not wholly black4
2. Scutellum with long yellow hairs on disc and five or more black bristles on margin, epandrium bears spinous bristles below subapically*hindostani* (Ricardo)
 Scutellum with pale and black or only black hairs on disc and two black bristles on margin, epandrium without bristles below subapically3
3. Mid femur with a ventral row of spiny bristles on distal two-thirds, *mystax* white surrounded by black bristles*femorata* n. sp.
 Mid femur without spiny bristles, *mystax* wholly white, male genitalia black and dark brown*guptai* Joseph & Parui
4. Femora yellowish with base as well as apex black, base of hind tibia bears a row of black bristles, *mystax* straw coloured with some black bristles above*jayarami* Joseph & Parui
 Femora reddish with only the base black5
5. Thorax without stripe and uniformly bright reddish-yellow tomentose, abdominal terga one and two bear reddish-yellow tufts of hairs*philus* Walker
 Thorax with usual stripes and golden tomentose, abdominal tergum one only with reddish-yellow tuft of hairs*maculipes* (Walker)

48. *Astochia femorata* n. sp.

(Fig. 24)

A medium sized black species with sparse grey tomentum, black and golden yellow legs, with a ventral row of short, spiny bristles on mid femur, and lightly infuscated wings. Male length 17 mm, wing 9 mm.

Male : *Head* broader than thorax, black, sparsely grey tomentose; mystax white bristles surrounded by black bristles, fronto-orbital hairs black and white, ocellar bristles black, postocular bristles black and confined to above, postcranium white-haired, postgena with dense white hairs. Antenna black, scape and pedicel with black hairs and black bristles, scape slightly longer than pedicel, firsts flagellomere shorter than combined length of scape and pedicel style much longer than first flagellomere. Palpus and proboscis black with white hairs.

Thorax black, grey tomentose; pronotum with a transverse row of black bristles, laterally with dense white hairs; scutum with the mediolongitudinal black stripe indistinctly marked which extends from anterior border to midway between transverse suture and hind border, the grey stripe dividing it faintly visible only anteriorly, lateral black spots indistinctly marked; chaetotaxy : 2 notopleurals, 2 postalars, 1 acrostichal, 6 dorsocentrals, 3 supra-alars; bristles and vestiture black except for a few white hairs on postpronotal lobes and posterolaterally; scutellum with black hairs on disc and a pair of black bristles on posterior border; pleura heavily grey tomentose, karatergite with long white hairs. Haltere white with pale yellow marking.

Legs black and golden yellow; coxa, trochanter and femur black, tibia golden yellow with black apex, the area of black slightly more on mid tibia and about two-thirds on hind femur, basitarsus golden yellow with black apex, remainder black, mid femur with a ventral row of spiny bristles for distal two-thirds, vestiture black and white, bristles black, fore tibia and tarsal segments 1 and 2 anteroventrally with mat of golden yellow hairs, hind tibia and basitarsus similarly haired but much less.

Wing lightly infuscated.

Abdomen black with grey marking, tergum 1 with grey border, tergum 2 with grey marking on sides, on hind border and in a transverse band anterior to the middle, terga 3-5 with U shaped grey band which becomes gradually thinner from anterior to posterior tergum, remaining terga almost uniformly black, tergum 1 with a bunch of lateral, long, white hairs amidst which with 1 or 2 bristles, tergum 2 with long, white hairs laterally, vestiture white and black. Genitalia (Fig. 24) black with black and a few white hairs.

Holotype Male, Reg. No. 7483/H6, West Bengal : Malda district : Bamangola, 23. vi. 1987, Coll. P. Parui.

As regards general colouration, it resembles *Astochia guptai* Joseph & Parui (1981a). *Astochia femorata* n. sp. differs from it in the colouration of mystax and hind tibia, and in the presence of a ventral row of spines on mid femur. Besides both have distinct male genitalia.

49. *Astochia guptai* Joseph & Parui

1981a. *Astochia guptai* Joseph & Parui, *Oriental Ins.* 15 (1) : 20.

Material examined : 1 Male, 1 Female, Calcutta : Salt Lake, 27. vi. 1982, Coll. S. K. Gupta; 1 Male, 25. vii. 1982, other details as in preceding.

Distribution : West Bengal : Calcutta; Delhi; Karnataka and Uttar Pradesh. The species is reported here for the first time from West Bengal.

50. *Astochia hindostani* (Ricardo)1919. *Neoitamus hindostani* Ricardo, *Ann. Mag. nat. Hist.* (9) 3 : 62.1975. *Astochia hindostani* : Oldroyd, *Cat. Diptera Oriental Region 2* : 139.*Material examined* : Recorded from literature.*Distribution* : West Bengal : Darjiling district; and Arunachal Pradesh in India. It has also been reported from Burma and Nepal.51. *Astochia jayarami* Joseph & Parui1981a. *Astochia jayarami* Joseph & Parui, *Oriental Ins.* 15 (1) : 19.*Material examined* : 1 Male, Jalpaiguri district : Rajalok Forest, 8. ix. 1975, Coll. H. K. Bhowmik.*Distribution* : West Bengal : Jalpaiguri district.52. *Astochia maculipes* (Walker)1855. *Trupanea maculipes* Walker, *List Dipt. Colln. Br. Mus.* 7 (Suppl.) 3 : 605.1975. *Astochia maculipes* : Oldroyd, *Cat. Diptera Oriental Region 2* : 139.*Material examined* : Recorded from literature.*Distribution* : West Bengal : Darjiling district; and Assam in India. It is also recorded from China and Hainan Islands.53. *Astochia philus* (Walker)1849. *Asilus philus* Walker, *List Dipt. Colln. Br. Mus.* 2 : 393.1975. *Astochia philus* : Oldroyd, *Cat. Diptera Oriental Region 2* : 139.*Material examined* : Recorded from literature.*Distribution* : West Bengal : Darjiling district; and Assam and Sikkim in India. The other countries from which it is recorded are Bangla Desh; Bhutan; Burma and Nepal.Genus 22. *Clephyroneura* Becker1925. *Clephyroneura* Becker, *Ent. Mitt.* 14 : 68.Key to species of *Clephyroneura* Becker

1. Wing infuscated at tip and along hind margin, infuscation in the fifth posterior cell well marked, epandrium bulbous, subapical projection stout *bengalensis* (Macquart)
Wing not infuscated, though it may have a yellow stain 2
2. Female with seventh abdominal tergum bare and shining in middle, male with both seventh and eighth terga shining *gymnura* Oldroyd
Seventh abdominal tergum of both sexes uniform with the remaining 3
3. Fore femur with a sharply defined longitudinal stripe spreading into a subapical ring, and below it in female with white bristles *duvaucelii* Macquart
Fore femur with a sharply defined longitudinal stripe but without apical ring, ground colour of thorax black, and below it in female with black bristles *flavicornis* (Macquart)

54. *Clephroneura bengalensis* (Macquart)

1838. *Asilus bengalensis* Macquart, *Dipt. exot.* 1 (2) : 141.

1975. *Clephroneura bengalensis* : Oldroyd, *Cat. Diptera Oriental Region 2* : 140.

1977. *Clephroneura bengalensis* : Joseph & Parui, *Newsl. Zool. Surv. India* 3 (5) : 320.

Material examined : Recorded from literature.

Distribution : West Bengal : Darjiling district; Arunachal Pradesh and Tamil Nadu in India. Also recorded from Sumatra, Java and Philippines.

55. *Clephroneura duvaucelii* (Macquart)

1838. *Asilus duvaucelii* Macquart, *Dipt. exot.* 1 (2) : 141.

1975. *Clephroneura duvaucelii* : Oldroyd, *Cat. Diptera Oriental Region 2* : 141.

Material examined : Recorded from literature.

Distribution : West Bengal : Madhya Pradesh and Tamil Nadu. From the ZSI named collection it is recorded here for the first time from Uttar Pradesh in India and Pakistan.

56. *Clephroneura flavicornis* (Macquart)

1938. *Asilus flavicornis* Macquart, *Dipt. exot.* 1 (2) : 142.

1975. *Clephroneura flavicornis* : Oldroyd, *Cat. Diptera Oriental Region 2* : 141.

Material examined : Recorded from literature.

Distribution : West Bengal and Tamil Nadu in India. Also recorded from Sri Lanka (Joseph & Parui in press, a).

57. *Clephroneura gymnura* Oldroyd

1938. *Clephroneura gymnura* Oldroyd, *Ann. Mag. nat. Hist.* (11) 1 : 470.

1983. *Clephroneura gymnura* : Joseph & Parui, *Oriental Ins.* 17 : 347.

Material examined : Recorded from literature.

Distribution : West Bengal; Karnataka and Madhya Pradesh.

Genus 23. *Heligmoneura* Bigot

1858. *Heligmoneura* Bigot, in Thomson, *Arch. ent.* 2 : 356. For details of synonymy please refer to Joseph & Parui, 1983 : 349.

Key to species of *Heligmoneura* Bigot

1. Males with epandrium trifurcate, thorax bears golden yellow bristles ...*ricardo*i Joseph & Parui
Males with epandrium bifurcate2
2. Mystax white or light yellow, epandrium shallow by furcate with the prongs curved inwards, abdomen yellow*venpingensis* (Bromley)
Mystax mixed white and black or yellowish3

3. Epandrium deeply incised, legs brownish-yellow except black apex of middle and hind femora and hind tibia*chaetoprocta* Hull
 Epandrium slightly incised, legs wholly black, hypandrium bears long bristly hairs.....
*bengalensis* Joseph & Parui

58. *Heligmoneura bengalensis* Joseph & Parui

1986. *Heligmoneura bengalensis* Joseph & Parui, *Rec. zool. Surv. India* 83 (3 & 4) : 87.

Material examined : 2 Males, 1 Female, Darjiling, 4. vi. 1917, presented by E. Brumetti to the British Museum (Natural History) London.

Distribution : West Bengal : Darjiling district.

59. *Heligmoneura chaetoprocta* Hull

1962. *Heligmoneura chaetoprocta* Hull, *Bull. U. S. natn. Mus.* 224 : 585.

1975. *Heligmoneura chaetoprocta* : Oldroyd, *Cat. Diptera Oriental Region 2* : 142.

Material examined : Recorded from literature.

Distribution : The species was described from Calcutta, West Bengal.

60. *Heligmoneura ricardoi* Joseph & Parui

1980. *Heligmoneura ricardoi* Joseph & Parui, *Ent. Scand.* 11 (3) : 282.

Material examined : 1 Male, 1 Female, Darjiling district : Lower Ging : Lebong, 1372 m, 9. vi. 1909, Coll. N. Annandale.

Distribution : The species was described from Darjiling district, West Bengal.

61. *Heligmoneura yenpingensis* (Bromley)

1928. *Asilus yenpingensis* Bromley, *Ann. Mus. Novit.* 336 : 2.

1975. *Heligmoneura yenpingensis* : Oldroyd, *Cat. Diptera Oriental Region 2* : 143.

Material examined : Recorded from literature.

Distribution : West Bengal : Darjiling district.

The species was described from China and subsequently recorded from India (Lal, 1960 : 34).

Genus 24. *Hoplopheromerus* Becker

1925. *Hoplopheromerus* Becker, *Ent. Mitt.* 14 : 241.

62. *Hoplopheromerus armatipes* (Macquart)

1855. *Asilus armatipes* Macquart, *Dipt. exot. Suppl.* 5 : 63.

1857. *Asilus shalumus* Walker, *Trans. Ent. Soc. London* 4 : 131.

1975. *Hoplopheromerus armatipes* : Oldroyd, *Cat. Diptera Oriental Region 2* : 143.

Material examined : Recorded from literature.

Diagnosis : Face golden tomentose; mystax yellow with a few black hairs; antenna reddish; thorax dark brown with black pubescence; legs reddish-yellow, fore femur with long yellow and black hairs below; wing yellow tinged; abdomen black with black bristles, last segment bears deep golden yellow pubescence, epandrium bifid, lower tooth longer and stout with concave apex.

Distribution : West Bengal : Darjiling district.

Genus 25. *Machimus* Loew

1849. *Machimus* Loew, *Linn. Ent.* 4 : 1.

Key to species of *Machimus* Loew

1. Eighth sternum produced2
Eighth sternum not produced5
2. All tibiae black3
All tibiae reddish with dark apex, wing basally and anteriorly hyaline and dark shading in centre, eighth sternum ends in two teeth bearing white hairs*rufipes* Ricardo
3. Eighth sternum broadly produced with long hairs at apex4
Eighth sternum narrowly prolonged with a thick tuft of black hairs, mystax golden with a few black bristles above*aurimystax* (Bromley)
4. Mystax medially pale surrounded by black bristles, all femora black dorsally, anteriorly and ventrally, rest yellowish-brown, epandrium yellowish-brown with black apex.....
.....*hirtipes* Ricardo
Mystax black above and pale yellow below, all femora yellowish-brown to dark brown, epandrium uniformly black.....*pallipes* Ricardo
5. All femora wholly black.....6
All femora differently coloured.....10
6. Epandrium with an apical cleft, fore femur bears a dorsal row of long, black hairs, hypandrium produced more than half the length of epandrium.....*bengalensis* Joseph & Parui
Epandrium without apical cleft7
7. Scutellum with two bristles on margin, incisers of abdominal terga narrowly white tomentose*incisularis* Bromley
Scutellum with four to eight bristles on margin, colour pattern of abdominal terga different ...8
8. Posterior branch R₅ of third vein sharply curved, epandrium bulged below medially.....
.....*angularis* (Ricardo)
Posterior branch R₅ of third vein gently curved.....9
9. Mystax pale with a pair of black bristles on either side at the lower border, scutellar disc predominantly pale haired, male genitalia yellowish-brown with pale hairs*dubius* Ricardo
Mystax pale yellow with some black bristles above, scutellar disc predominantly black haired, male genitalia black with black hairs*ricardo* (Bromley)
10. Tip of epandrium prolonged into a downward projecting process, tip of eighth sternum with long hairs*subgenitalis* Bromley
Tip of epandrium round, eighth sternum with long bristles at apex*infrafemoralis* Bromley

63. *Machimus angularis* (Ricardo)

1922. *Tolmerus angularis* Ricardo, *Ann. Mag. nat. Hist.* (9) 10 : 64.

1975. *Machimus angularis* : Oldroyd, *Cat. Diptera Oriental Region 2* : 144.

Material examined : Recorded from literature.

Distribution : West Bengal. The species was described from China.

64. *Machimus aurimystax* (Bromley)

1928. *Tolmerus aurimystax* Bromley, *Ann. Mus. Novit.* 33 (6) : 3

1975. *Machimus aurimystax* : Oldroyd, *Cat. Diptera Region 2* : 144.

Material examined : Reported from literature.

Distribution : West Bengal. The species was described from China.

65. *Machimus bengalensis* Joseph & Parui

1986. *Machimus bengalensis* Joseph & Parui, *Rec. zool. Surv. India occ. paper No. 96* : 11.

Material examined : 1 Male, Darjiling, vi. ix. 1917, presented by E. Brunetti to the British Museum (Natural History), London.

Distribution : West Bengal : Darjiling district; and Uttar Pradesh. The species was described from West Bengal.

66. *Machimus dubius* Ricardo

1919. *Machimus dubius* Ricardo. *Ann. Mag. nat. Hist.* (9)3 : 47.

1983. *Machimus dubius* : Joseph & Parui, *Oriental Ins.* 17 : 355.

Material examined : Recorded from literature.

Distribution : West Bengal: Darjiling district; and Uttar Pradesh.

The species was described from Uttar Pradesh.

67. *Machimus hirtipes* Ricardo

1919. *Machimus hirtipes* Ricardo, *Ann. Mag. nat. Hist.* (9)3 : 49.

1983. *Machimus hirtipes* : Joseph & Parui, *Oriental Ins.* 17 : 355.

Material examined : Recorded from literature.

Distribution : West Bengal: Darjiling district; Assam; Kerala and Tamil Nadu. It was discribed from Assam.

68. *Machimus incisularis* (Bromley)

1935. *Tolmerus incisularis* Bromley, *Rec. Indian Mus.* 37 : 220.

1975. *Machimus incisularis* : Oldroyd, *Cat. Diptera Oriental Region 2* : 145.

Material examined : Recorded from literature.

Distribution : West Bengal: Darjiling district; and Assam. It was discribed from West Bengal.

69. *Machimus infraformalis* Bromley

1935. *Machimus infraformalis* Bromley, *Rec. Indian Mus.* 37 : 221.

1983. *Machimus infraformalis* : Joseph & Parui, *Oriental Ins.* 17 : 356.

Material examined : Recorded from literature.

Distribution : West Bengal: Darjiling district.

70. *Machimus pallipes* Ricardo

1919. *Machimus pallipes* Ricardo, *Ann. Mag. nat. Hist.* (9)3 : 54.

1983. *Machimus pallipes* : Joseph & Parui, *Oriental Ins.* 17 : 356.

Material examined : 1 Male, West Bengal : Darjiling district, 4 Km. South Kurseong, 3. vi. 1985, Coll. K. Ghorpade.

Distribution : West Bengal : Darjiling district : Himachal Pradesh; Meghalaya; Punjab and Uttar Pradesh. Its type locality is Uttar Pradesh. It has been reported from Nepal by Joseph & Parui (1986).

71. *Machimus ricardoi* (Bromley)

1935. *Asilus ricardoi* Bromley, *Rec. Indian Mus.* 37 : 219.

1975. *Machimus ricardoi* : Oldroyd, *Cat. Diptera Oriental Region 2* :146.

Material examined : 1 Male, West Bengal : Darjiling district : Pedong, 1200 m, 10. ix. 1978, Coll. A. N. T. Joseph.

Distribution : West Bengal : Darjiling district; Himachal Pradesh; Sikkim and Uttar Pradesh. The species was described from Himachal Pradesh. Here it is recorded for the first time from West Bengal.

72. *Machimus rufipes* Ricardo

1922. *Machimus rufipes* Ricardo, *Ann. Mag. nat. Hist.* (9)10 : 69.

1983. *Machimus rufipes* : Joseph & Parui, *Oriental Ins.* 17 : 356.

Material examined : Recorded from literature.

Distribution : West Bengal: Darjiling district; Punjab and Uttar Pradesh. It was described from Uttar Pradesh.

73. *Machimus subgenitalis* Bromley

1939. *Machimus subgenitalis* Bromley, *Rec. Indian Mus.* 37 : 221.

1983. *Machimus subgenitalis* : Joseph & Parui, *Oriental Ins.* 17 : 356.

Material examined : Recorded from literature.

Distribution : West Bengal: Darjiling district; and Himachal Pradesh.

Genus 26. *Neoitamus* Osten Sacken

1878. *Neoitamus* Osten Sacken, *Smithson misc. collns.* 16 : 82, 235 (n. name for *Itamus* Loew).

Key to species of *Neoitamus* Osten Sacken

All femora mixed black and yellow coloured, fore and mid femora with a ventral row of long bristles, epandrium bears a concavity dorsally*bengalensis* (Joseph & Parui)

All femora black except tip of fore femur yellowish-brown, fore and mid femora with a ventral row of pale yellow hairs, epandrium without concavity dorsally*calcuttaensis* Joseph & Parui

74. *Neoitamus bengalensis* (Joseph & Parui)

1981. *Astochia bengalensis* Joseph & Parui, *Oriental Ins.* 15 (1) : 21.

1986. *Neoitamus bengalensis* : Joseph & Parui, *Rec. zool. Surv. India* 83 (3 & 4) : 96.

Material examined : 1 Male, West Bengal : Darjiling district, 2134 m, 26. v. 1910, Coll. Brunetti; 1 Male, E. Himalayas : Darjiling, 12. vi. 1914, Coll. F. H. Gravely.

Distribution : West Bengal : Darjiling district.

75. *Neoitamus calcuttaensis* Joseph & Parui

1986. *Neoitamus calcuttaensis* Joseph & Parui, *Rec. zool. Surv. India* 83 (3 & 4) : 97.

Material examined : 1 Male, Calcutta, 6. xi. 1913, presented by E. Brunetti to the British Museum (Natural History), London.

Distribution : West Bengal : Calcutta.

Genus 27. *Neomochtherus* Osten Sacken

1878. *Neomochtherus* Osten Sacken, *Smithson. misc. Colln.* 16 : 82, 235 (n. name for *Mochtherus* Loew)

76. *Neomochtherus himalayensis* Joseph & Parui

1987. *Neomochtherus himalayensis* Joseph & Parui, *Bull. zool. Surv. India* 8 (1-3) : 232.

Material examined : 1 Male, N. E. Darjiling : Tiger Hill, 2250 m, 30. viii. 1959. Coll. J. L. Gressit.

Diagnosis : *Mystax* pale yellow and black; postgena pale yellow haired; thorax grey tomentose, mediolongitudinal black stripe entire, scutellum bears sparse pale yellow hairs on disc and a pair of bristles on border; legs black except dark brown tarsal segments, fore femur densely haired ventrally; wing infuscated along border upto axillary cell; abdomen black, male genitalia with black and pale yellow hairs.

Distribution : So far the species has been recorded only from Darjiling district of West Bengal.

Genus 28. *Orophotus* Becker

1925. *Orophotus* Becker, *Ent. Mitt.* 14 : 240.

77. *Orophotus montanus* (Ricardo)

1922. *Asilus montanus* Ricardo, *Ann. Mag. nat. Hist.* (9)10 : 47.

1975. *Orophotus montanus* : Oldroyd, *Cat. Diptera Oriental Region 2* : 148.

Material examined : Recorded from literature.

Diagnosis : Mystax white; antenna yellow and brown; legs reddish-yellow, knees darker; wing clear, apex and posterior border infuscated; abdomen blackish-brown with yellow hairs, epandrium wide, bifid and the two teeth widely separated, hypandrium small, eighth sternum fringed with yellow hairs.

Distribution : West Bengal: Darjiling district; Meghalaya and Sikkim. The species was described from Meghalaya.

Genus 29. *Philodicus* Loew

1848. *Philodicus* Loew, *Linn. Ent.* 3 : 391.

Key to species of *Philodicus* Loew

1. Legs black and red, anterior and middle femora red below and outside, hairs of fore femur below at base long and many *javanus* (Wiedemann)
 Legs wholly black 2
2. Fore femur armed with weak bristles below, mystax white, scutellum with sparse white and black hairs on disc *femoralis* Ricardo
 Fore femur below with long hairs, mystax black and white, scutellum with black hairs on disc *ceylanicus* Schiner

78. *Philodicus ceylanicus* Schiner

1868. *Philodicus ceylanicus* Schiner, in *Reise der Osterreichischen Fregate Novara Dipt.* : 179.

1983. *Philodicus ceylanicus* : Joseph & Parui, *Oriental Ins.* 17 : 361.

Material examined : 1 Male, 1 Female, West Bengal : Calcutta : Salt Lake, 14. vii. 1983, Coll. B. Dutta.

Distribution : West Bengal : Calcutta; Andaman Islands; Kerala and Tamil Nadu in India. The species was described from Sri Lanka and subsequently recorded from India and Nepal. Here it is recorded for the first time from West Bengal.

79. *Philodicus femoralis* Ricardo

1921. *Philodicus femoralis* Ricardo, *Ann. Mag. nat. Hist.* (9)8 : 190.

1983. *Philodicus femoralis* : Joseph & Parui, *Oriental Ins.* 17 : 361.

Material examined : 2 Males, West Bengal : Malda district : Nalagola, 8. vi. 1987, Coll. K. P. Mukherjee.

Distribution : West Bengal : Malda district; Arunachal Pradesh; Bihar; Goa; Kerala; Meghalaya and Orissa. The species was described from Burma.

80. *Philodicus javanus* (Wiedemann)

1819. *Asilus javanus* Wiedemann, *Zool. Mag. (Wied.)* 1 (3) : 32.

1975. *Philodicus javanus* : Oldroyd, *Cat. Diptera Oriental Region 2* : 149.

Material examined : 1 Female, West Bengal : Jalpaiguri district; Chalsa 1.v.1975, Coll. B. C. Nandi.

Distribution : West Bengal : Calcutta Jalpaiguri district; Assam; Arunachal Pradesh, Bihar; Himachal Pradesh; Karnataka; Tamil Nadu and Uttar Pradesh in India. It has also been recorded from Bangla Desh; Burma; Sri Lanka; Java; Sumatra; Taimor Islands and Pakistan.

Genus 30. *Promachus* Loew

1848. *Promachus* Loew, *Linn. Ent.* 3 : 390.

Key to species of *Promachus* Loew

1. Legs wholly black2
 Legs not wholly black3
2. Eighth sternum produced with short, black bristles on border, an obscure streak present in the marginal and first submarginal cells*duvaucelii* (Macquart)
 Eighth sternum not produced but with a tuft of black hairs, wing clear, all femora and tibiae with long, yellow hairs on under side*binghamensis* Ricardo
3. Male genitalia with a tuft of white hairs4
 Male genitalia without such hair tuft, mystax predominantly black with a few yellow bristles, femora with thick pile and some black bristles and hairs*ghumtiensis* Bromley
4. Fore femur entirely black, abdomen with long, orange red pubescence*leoninus* Loew
 Fore femur red dorsally and black ventrally, abdomen short, yellow haired ...*varipes* (Macquart)

81. *Promachus binghamensis* Ricardo

1921. *Promachus binghamensis* Ricardo, *Ann. Mag. nat. Hist.* (9)8 : 215.

1983. *Promachus binghamensis* : Joseph & Parui, *Oriental Ins.* 17 : 364.

Material examined : Recorded from literature.

Distribution : West Bengal: Darjiling district; and Sikkim.

82. *Promachus duvaucelii* (Macquart)

1838. *Trupanea duvaucelii* Macquart, *Dipt. exot.* 1 (2) : 97.

1975. *Promachus duvaucelii* : Oldroyd, *Cat. Diptera Oriental Region 2* :152.

Material examined : Recorded from literature.

Distribution : 'Bengal'; Delhi; Gujrat; Madhya Pradesh; Punjab and Uttar Pradesh.

83. *Promachus ghumtiensis* Bromley

1935. *Promachus ghumtiensis* Bromley, *Rec. Indian Mus.* 37 : 224.

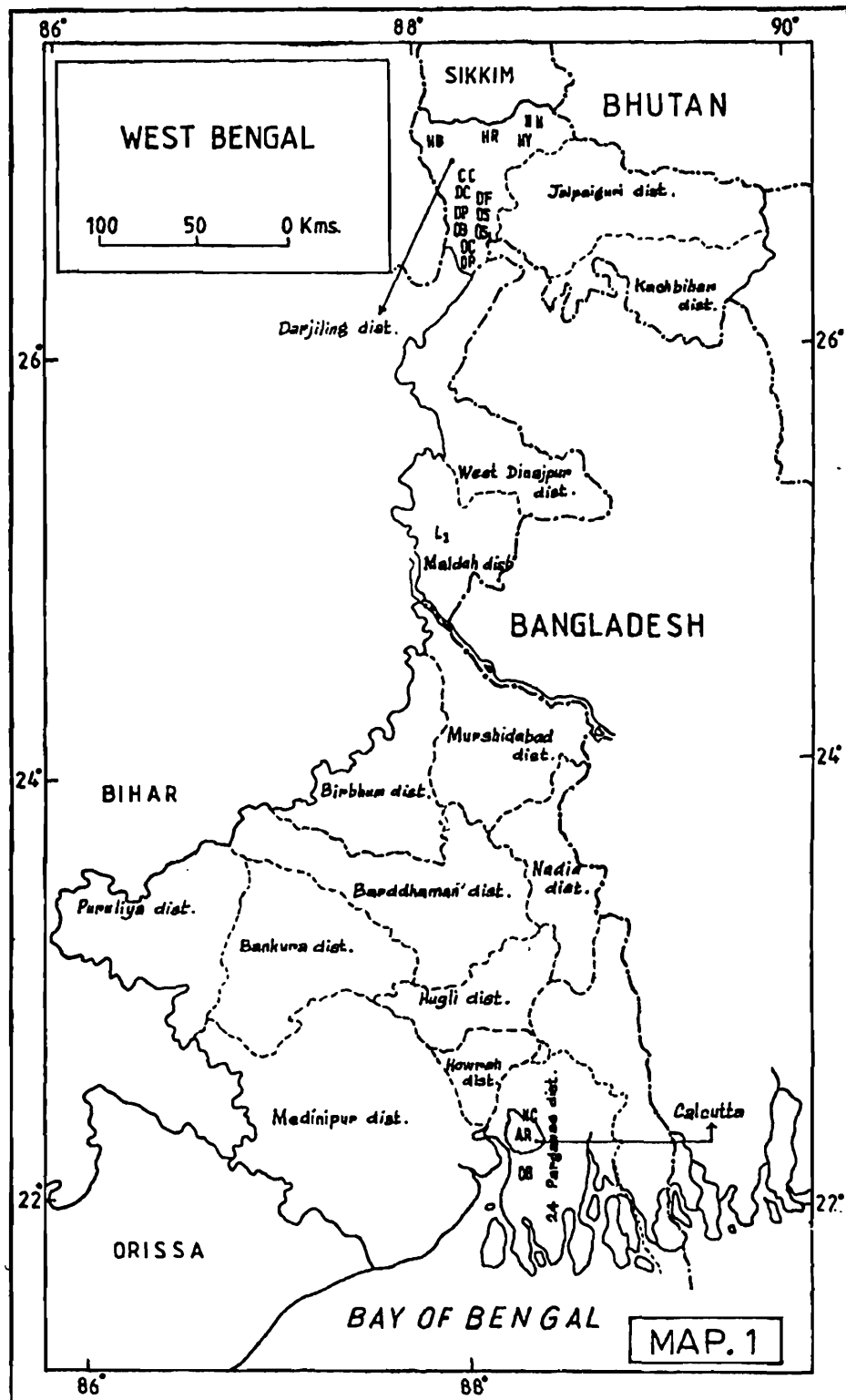
1983. *Promachus ghumtiensis* Joseph & Parui, *Oriental Ins.* 17 : 366.

Material examined : Recorded from literature.

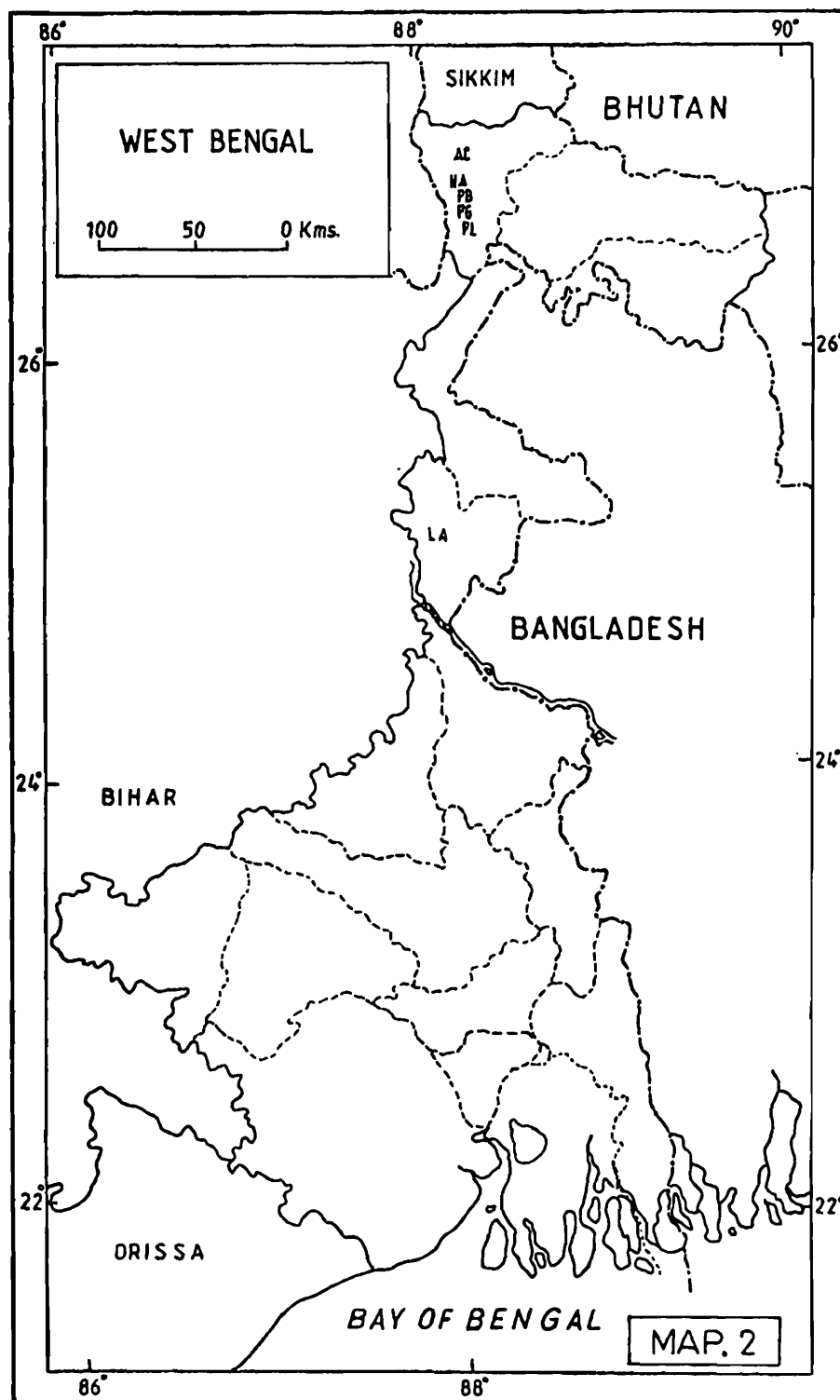
Distribution : West Bengal: Darjiling district; and Karnataka.

The species was described from West Bengal.

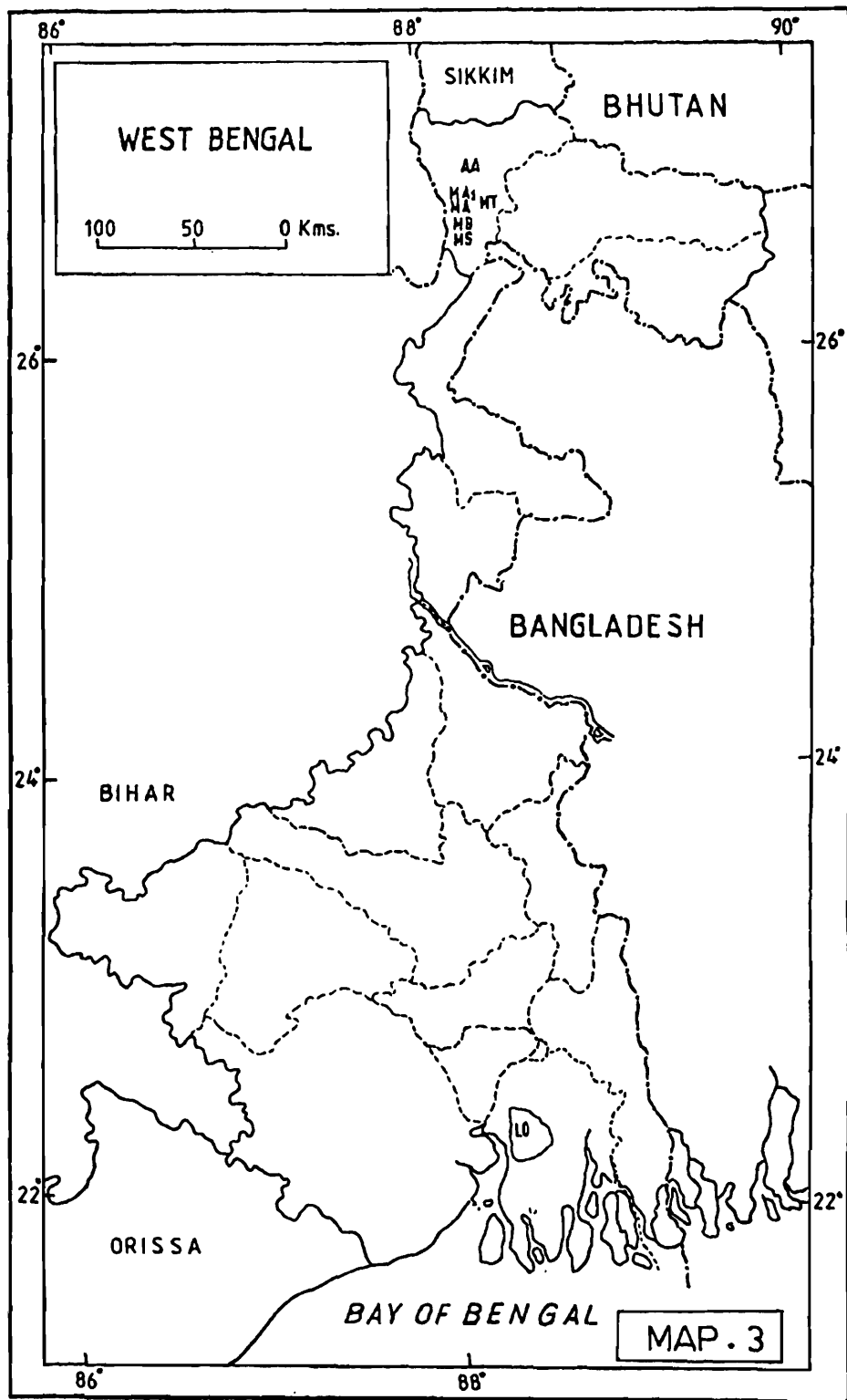
84. *Promachus leoninus* Loew1848. *Promachus leoninus* Loew, *Linn. Ent.* 3 : 404.1983. *Promachus leoninus* : Joseph & Parui, *Oriental Ins.* 17 : 367.*Material examined* : Recorded from literature.*Distribution* : West Bengal: Darjiling district; Arunachal Pradesh and Tamil Nadu in India. Also known to occur from Burma; Greek Islands, Iran and Turkey. The species was described from Greek Islands and Asia Minor.85. *Promachus varipes* (Macquart)1838. *Trupanea varipes* Macquart, *Dipt. exot.* 1 (2) : 97.1975. *Promachus varipes* : Oldroyd, *Cat. Diptera Oriental Region 2* : 155.*Material examined* : Recorded from literature.*Distribution* : 'Bengal' and Tamil Nadu. Its type locality is 'Bengal'Genus 31. *Senoprosopis* Macquart1838. *Senoprosopis* Macquart *Dipt. exot.* 1 (2) : 130.86. *Senoprosopis diardii* Macquart1838. *Senoprosopis diardii* Macquart, *exot.* 1 (2) : 130.1983. *Senoprosopis diardii* : Joseph & Parui, *Oriental Ins.* 17 : 370.*Material examined* : Recorded from literature.*Diagnosis* : Face grey; mystax yellowish; antenna yellow; thorax reddish-grey; femora with yellow base, tibiae black at apex, tarsi black, basitarsi of anterior and middle legs yellow; wing yellowish with brownish extremity.*Distribution* : 'Bengal'Genus 32. *Trichomachimus* Engel1933. *Trichomachimus* Engel, *Ark. Zool. A*, 25 (22) : 10.Key to species of *Trichomachimus* EngelScutellum almost entirely covered with long, yellowish hairs and bristles, fore femur predominantly black haired dorsally, epandrium truncate at apex*pubescens* (Ricardo)Scutellum almost entirely covered with long, black hairs and bristles, fore femur at base with long, black hairs, epandrium pointed at apex*orientalis* (Ricardo)87. *Trichomachimus orientalis* (Ricardo)1922. *Asilus orientalis* Ricardo, *Ann. Mag. nat. Hist.* (9) 10 : 46.1975. *Trichomachimus orientalis* : Oldroyd, *Cat. Diptera Oriental Region 2* : 156.*Material examined* : 1 Male, E. Himalayas; West Bengal : Darjiling district : Kurseong, 1524 m, 13-16. vii. 1907, Coll. Mus. Collr.*Distribution* : West Bengal : Darjiling district; Assam; Delhi; Kashmir; Orissa and Uttar Pradesh. The species was described from Assam.



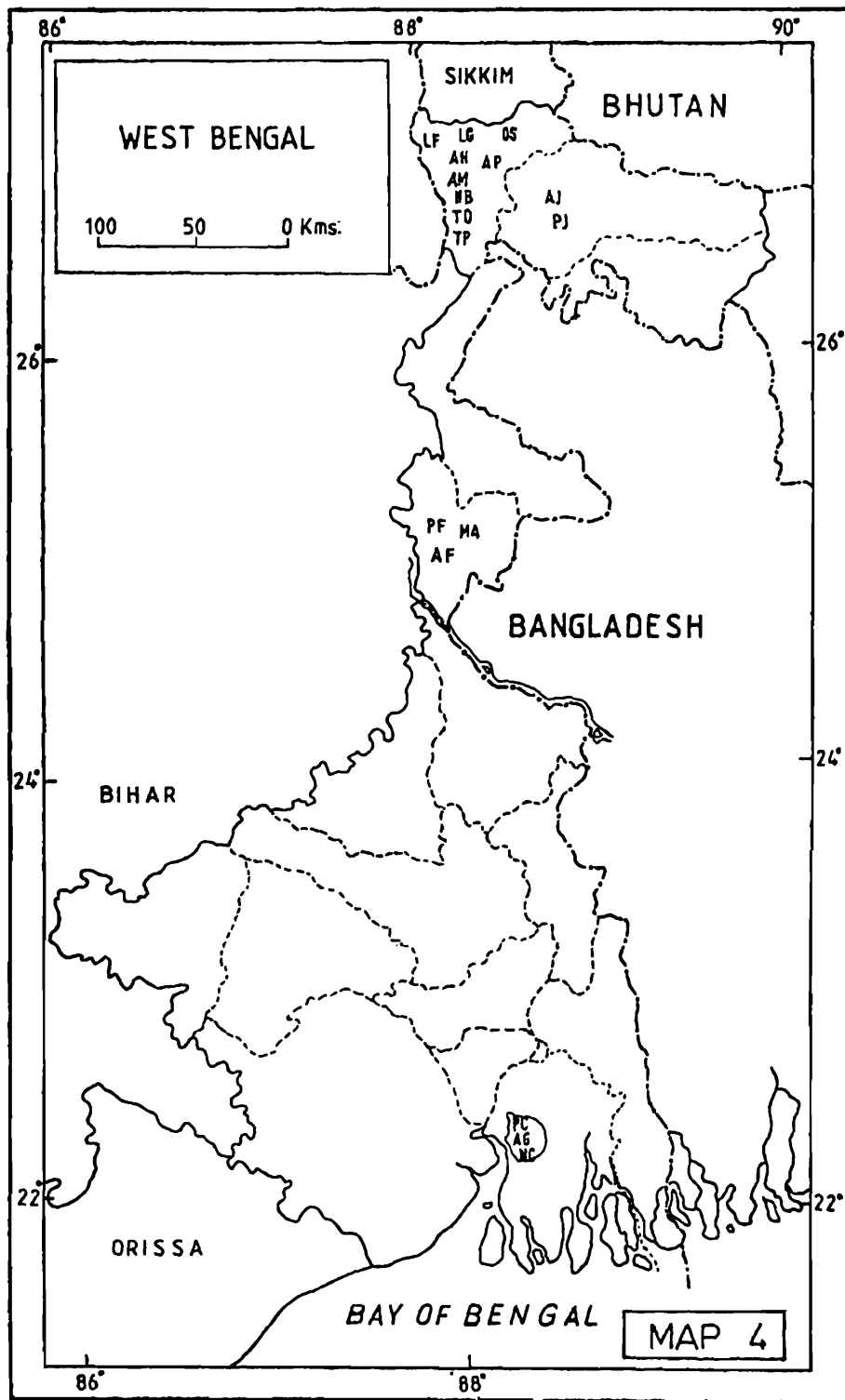
Map 1. Distribution of : AR, *Ammophilomima rufescens*; CC, *Cophinopoda chinensis*; DC, *Damalis claripes*; DF, *D. fuscus*; DP, *D. planiceps*, HB, *Heligmoneura bengalensis*; HC, *H. chaetoprocta*; HR, *H. ricardoi*; HY, *H. yepingensis*; LI, *Laphystia indica*; NH, *Neomochtherus himalayensis*; OB, *Ommatius bengalensis*; OC, *O. carmichaeli*; OG, *O. gopalpurensis*; OP, *O. peregrinus*; OS, *O. singlensis*; OS₁, *O. subgracilis*.



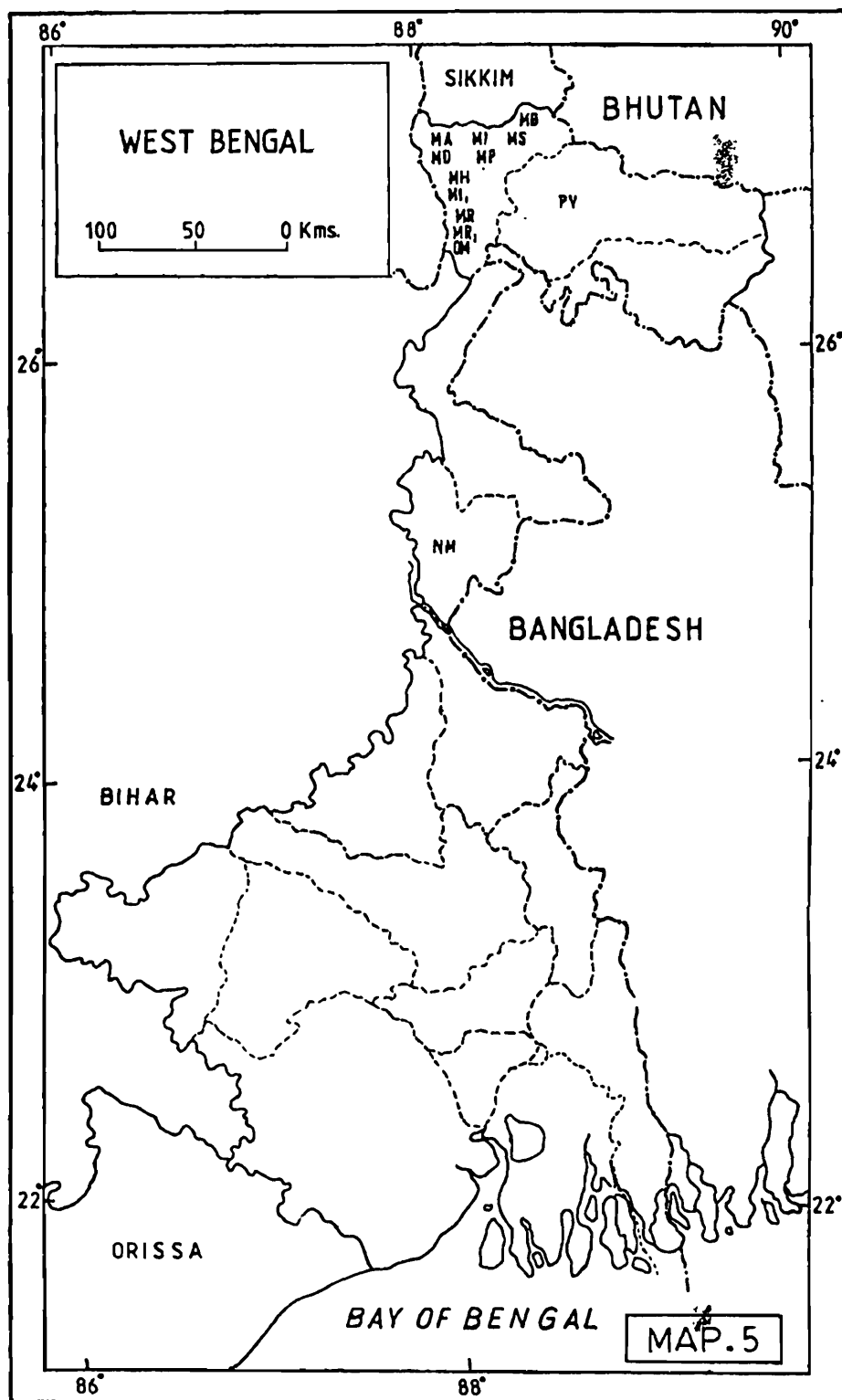
Map 2. Distribution of : AC, *Andrenosoma choprai*; HA, *Hoplopheromerus armatipes*; LA, *Laxenecera albibarbis*; PB, *Promachus binghamensis*; PG, *P. ghumtiensis* : PL, *P. Leoninus*.



Map 3. Distribution of : AA, *Asilus aurimystax*; LO, *Leptogaster ophionea*; MA, *Microstylum albolimbatum*; MA1, *M. trimelas*.



Map 4. Distribution of : AF, *Astochia femorata*; AG, *A. guptai*; AH, *A. hindostani*; AJ, *A. jayarami*; AM, *A. maculipes*; AP, *A. philus*; LF, *Laphria furva*; LG, *L. gilvodes*; MA, *Michotamia aurata*; NB, *Neoitanus bengalensis*; NC, *N. clacuttaensis*; OS, *Oldroydia scaeophagoides*; PC, *Philodicus ceylanicus*; PF, *P. femoralis*; PJ, *P. javanus*; TO, *Trichomachimus orientalis*; TP, *T. pubescens*.



Map 5. Distribution of : MA, *Machimus angularis*; MB, *M. bengalensis*; MD, *M. dubius*; MH, *M. hirtipes*; MI, *M. incisularis*; MI₁, *M. infrafemoralis*; MP, *M. pallipes*; MR, *M. ricardoi*; MR₁, *M. rufipes*; MS, *M. subgenitalis*; NM, *Nusa mukherjeei*; OM, *Orophotus montanus*; PV, *Pegesimallus volcatus*.

88. *Trichomachimus pubescens* (Ricardo)

1922. *Asilus pubescens* Ricardo, *Ann. Mag. nat. Hist.* (9) 10 : 67.

1975. *Trichomachimus pubescens* : Oldroyd, *Cat. Diptera Oriental Region 2* : 156.

Material examined : Recorded from literature.

Distribution : West Bengal : Darjiling district; Arunachal Pradesh and Sikkim in India. It is also known to occur in Afganistan, China and Tibet and the species was described from Tibet.

SUMMARY

It is the first comprehensive report of Asilidae from West Bengal, and 88 species of 32 genera are recorded in this paper. Of these 5 species are new : *Laphystia indica* n. sp., *Nusa mukherjeei* n. sp., *Stichopogon bengalensis* n. sp., *S. menoni* n. sp. and *Astochia femorata* n. sp., and 6 species are first records; *Stenopogon kherai* Joseph & Parui, *Stichopogon meridionalis* Oldroyd, *S. tomentosus* Oldroyd, *Astochia guptai* Joseph & Parui, *Machimus ricardo* (Bromley) and *Philodicus ceylanicus* Schiner. Key to all the 4 subfamilies and to 6 tribes are included. Key is also given under each genus where more than one species is reported. In cases where only one species known of a genus, its diagnostic characters are included.

ACKNOWLEDGEMENTS

We are extremely grateful to Prof. M. S. Jairajpuri, Director, Zoological Survey of India, Calcutta, for encouragements.

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INSECTA : DIPTERA : SIMULIIDAE

M. DATTA

Zoological Survey of India, Calcutta

INTRODUCTION

The family Simuliidae comprising black flies as they are often called, belongs to the suborder Nematocera of the order Diptera. The most remarkable biological fact about black flies is that the immature stages almost always inhabit the clear flowing water and for this reason they occur abundantly in trickles, streams and rivers of hilly regions. West Bengal is hitherto known to nourish the simuliid fauna in the Himalayan and the sub-Himalayan districts (Darjiling, Jalpaiguri and Koch Behar), and the plateau-dominant districts (Bankura and Puruliya). The former areas were extensively explored throughout 1968-1972 during the author's doctoral fellowship and thereafter in 1986-1987 (December-January), while the latter areas were surveyed in 1985 (October-November). All the material are dealt with here. In fact, collections were made by the author himself, if not otherwise mentioned.

Black flies that are habitually haematophagous and disease-carriers causing a lot of distress to mankind, have been much studied in various parts of the world and a considerable literature exists also on the Indian fauna (Datta, 1983). There are, however, some valuable contributions on the fauna of West Bengal by Brunetti (1911), Puri (1932-1933), Datta (1973-1976; 1988; 1991), and Datta and his associates (1975). Consequently, 27 species and 7 ill-defined unnamed taxa under the genus *Simulium* Latreille (with 4 subgenera) of the tribe Simuliini in the subfamily Simuliinae are known from West Bengal vis-a-vis 52 species and 19 ill-defined unnamed taxa under the genus (with 7 subgenera) in India. The species marked with an asterisk are recorded for the first time from West Bengal.

FIELD AND LABORATORY TECHNIQUES

Regarding the collecting of specimens (both adults and immatures), rearing, preservation and mounting, a great deal has been written by Datta and Dasgupta (1972), and Datta (1980), and it is not absolutely imperative to dilate on the subject here. It is, therefore, only intended to follow a brief methodology by Datta (1983).

The adult black flies are mainly collected by (i) sweeping forest canopy near or far off the breeding sites with a collecting net; (ii) providing human and animal baits; and (iii) setting light traps taking advantage of their photophilic habit. Eggs and pupae lying on the vegetation, are collected by cutting the portions of the vegetation by the help of scissors, but those on rocks or stones are removed by careful scraping or if desired, they can be collected along with the substrata. Larvae are collected by lifting the submerged substrata, if possible, and then picking up the larvae with the light forceps. In each and every operation, however, collection-data, viz., sample number or name of species, place of collection, altitude, date, collector's name and reference number, if any, must be provided.

Rearing of pupae to adults is indispensable for species determination. Mature pupae of a given species are reared to adults in vials containing moist cotton bed and loosely plugged with dry cotton. Thus, a good number of specimens of both sexes along with associated pupae and larvae (having the

same number and mode of arrangement of gill filaments, and the common place of occurrence) are obtained for studies.

Specimens preserved in ethyl alcohol are the best for measuring various parts of the body and for making microscopic preparations. Eggs, pupae and adults are preserved in 70% alcohol, whereas larvae in 90% alcohol. Microscopic observations are made with pinned as well as slide-mounted specimens. Specimens are mounted in phenol balsam (saturated phenol solution in absolute alcohol plus Canada balsam in equal proportions) after clearing in saturated phenol solution in absolute alcohol at 60°C.

TAXONOMIC TERMINOLOGY

A general introduction to the morphology of the black fly is not contemplated here since the various parts of the insect are sufficiently well-versed to the students not to require more than a brief citation of taxonomic terms used in the key for identification. A beginner can, however, obtain a good insight into the matter by going through Datta (1983). The following explanatory terminologies with good illustrations on the external anatomy of a black fly will, therefore, help conceive the subject as far as expedient.

abdominal terga and sterna (Fig. J)	anal lobe (47)
anal sclerite (77)	anal veins (29)
antenna : adult (3)	antenna : larva (65)
anterior epimeron (20)	
basal scale (43)	basimere (50)
calcipala (41)	cephalic apotome (59)
cephalic fan (66)	cephalic fan stem (67)
cerci (48)	claw (39)
clypeus (8)	cocoon (Fig. I)
comb-teeth (69)	costa (24)
coxa (34)	cubitus (28)
distimere (51)	
endoparameral hooks (55)	endoparameral organ (54)
eye (1)	eye-spots (72)
femur (36)	flagellum (7)
frons (2)	
genital fork (45)	genital fork stem (49)
gill (56)	
head-spots (58)	hind tarsomere 1 (40)
humeral cross-vein (33)	hypostomial setae (64)
hypostomium (61)	
katepisterum (23)	
labium (14)	labrum (9)
mandible : adult (10)	mandible : larva (68)
mandibular serrations (70)	maxilla : adult (11)
maxilla : larva (71)	maxillary palpus (12)
media (27)	median episterum (21)
median sclerite (53)	
ovipositor lobe (46)	

pedicel (6)	pedisulcus (42)
pleural membrane (19)	pleural tuft (22)
posterior sucker (78)	postgena (60)
postgenal bridge (62)	postgenal cleft (63)
postnotum (17)	proleg (73)
prothorax (18)	pupal abdominal terga and sterna (Fig. J)
pupal eye (57)	
R ₁ vein (26)	radial sector (32)
rectal 'gills' (76)	respiratory histoblast (74)
respiratory organ (56)	
scape (5)	scutellum (16)
scutum (15)	sensory vesicle (13)
stem vein (31)	sternopleuron (23)
sternum 8 (44)	subcosta (25)
submedian fold (30)	
tarsal claw (39)	tarsus (38)
tibia (37)	trochanter (35)
ventral papillae (75)	ventral plate (52)
vertex (4)	

SYSTEMATIC ACCOUNT

Subfamily SIMULIINAE

Diagnosis: Simuliids having costa with spinules intermixed with fine hairs; radial sector unbranched; calcipala usually present; pupal cocoon, often of a very definite shape; larval antenna rarely bicolourous.

Tribe SIMULIINI

Diagnosis: Simuliines having well-developed pedisulcus in hind tarsomere 2.

Genus *Simulium* Latreille

1802. *Simulium* Latreille, *Hist.nat.gen.part. Crust Ins.* 3 : 426. Type-species: *Rhagio colombaschensis* Fabricius.

Diagnosis : Adults- Antenna with 9 flagellomeres; wing without basal cell, basal section of vein R usually distinctly less than one-third as long as distance from base of radial sector to wing-tip; calcipala usually well-developed, pedisulcus deep. **Pupa-** Gill of varied form; last abdominal segment with a pair of small blunt or thorn-like tubercles; abdominal onchotaxy normally with following plan: terga 3 and 4 each with four hooks each side; sternum 5 with two hooks each side, close together; sterna 6 and 7 each with two hooks each side, widely spaced; spine-combs on other terga variable; cocoon well-formed, with or without neck, with or without dorso-median projection. **Larva-** Cephalic fans present; hypostomium with row of nine apical teeth with only median tooth and corner teeth prominent; median tooth not trifid; postgenal cleft of varied form notch-like to large, rarely reaching base of hypostomium; mandible normally with two serrations; cuticle bare or setose; ventral papillae present or absent; anal sclerite with four arms; rectal 'gills' simple or compound.

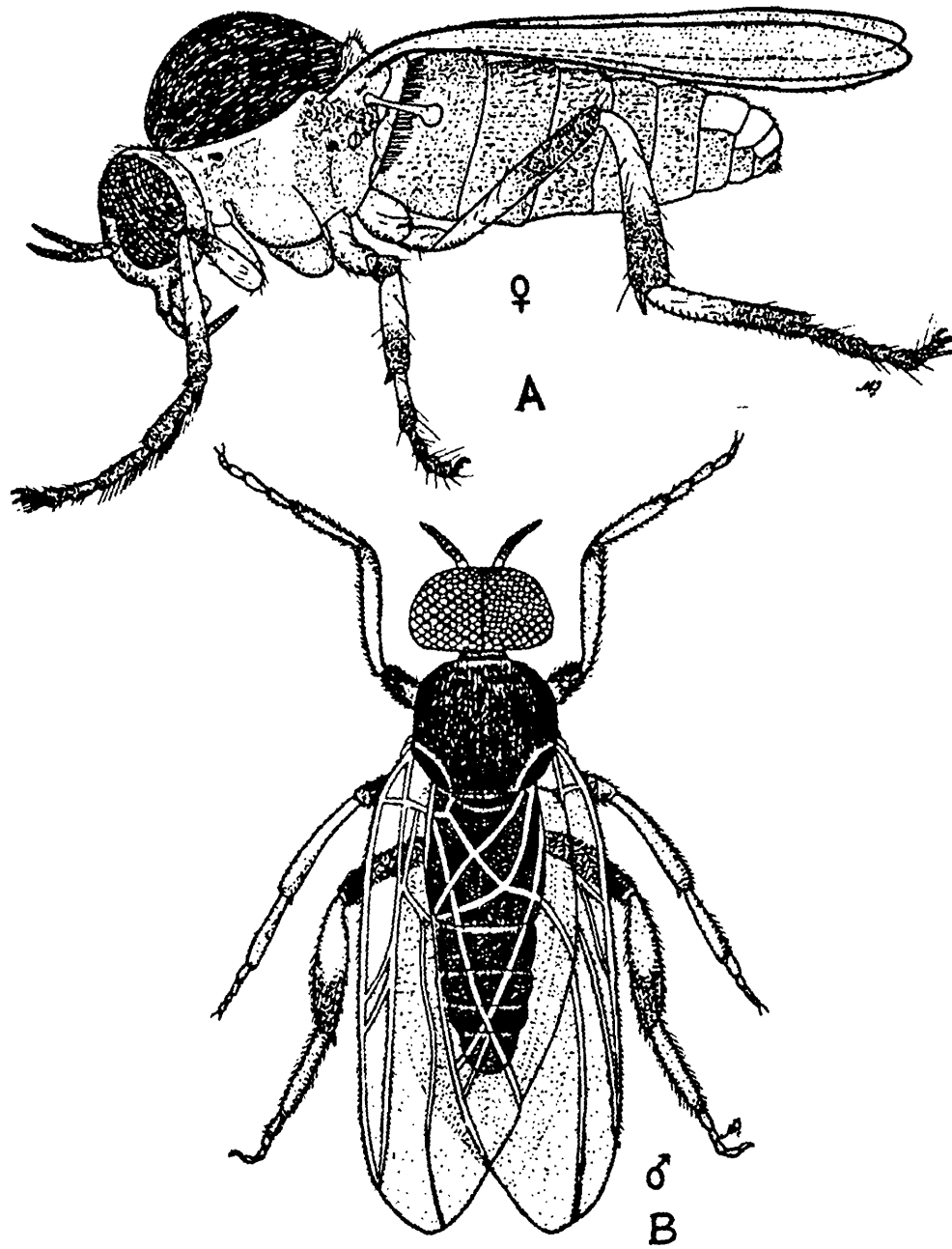


Fig. A & B Adult black fly

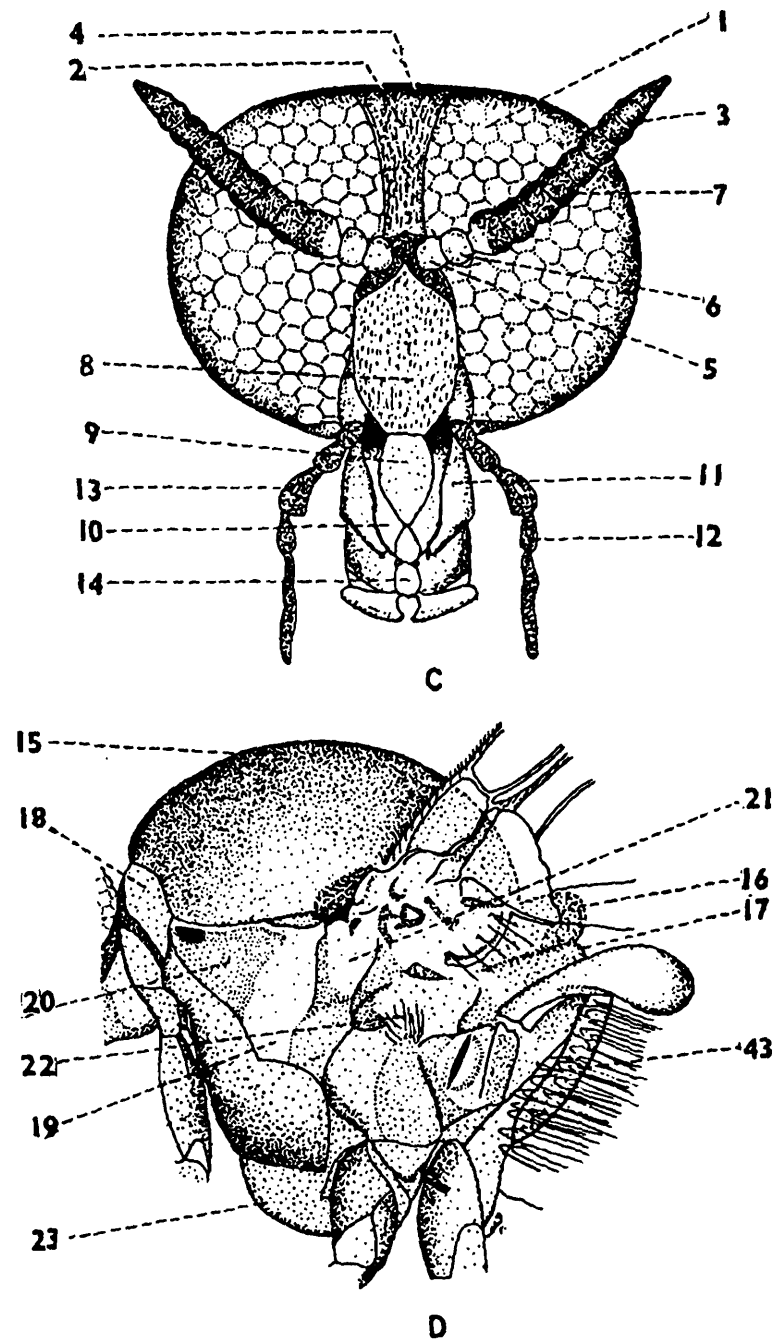


Fig. C Head of a typical *Simulium s. l.* Fig. D Thorax and part of abdomen of *Simulium s. str.*

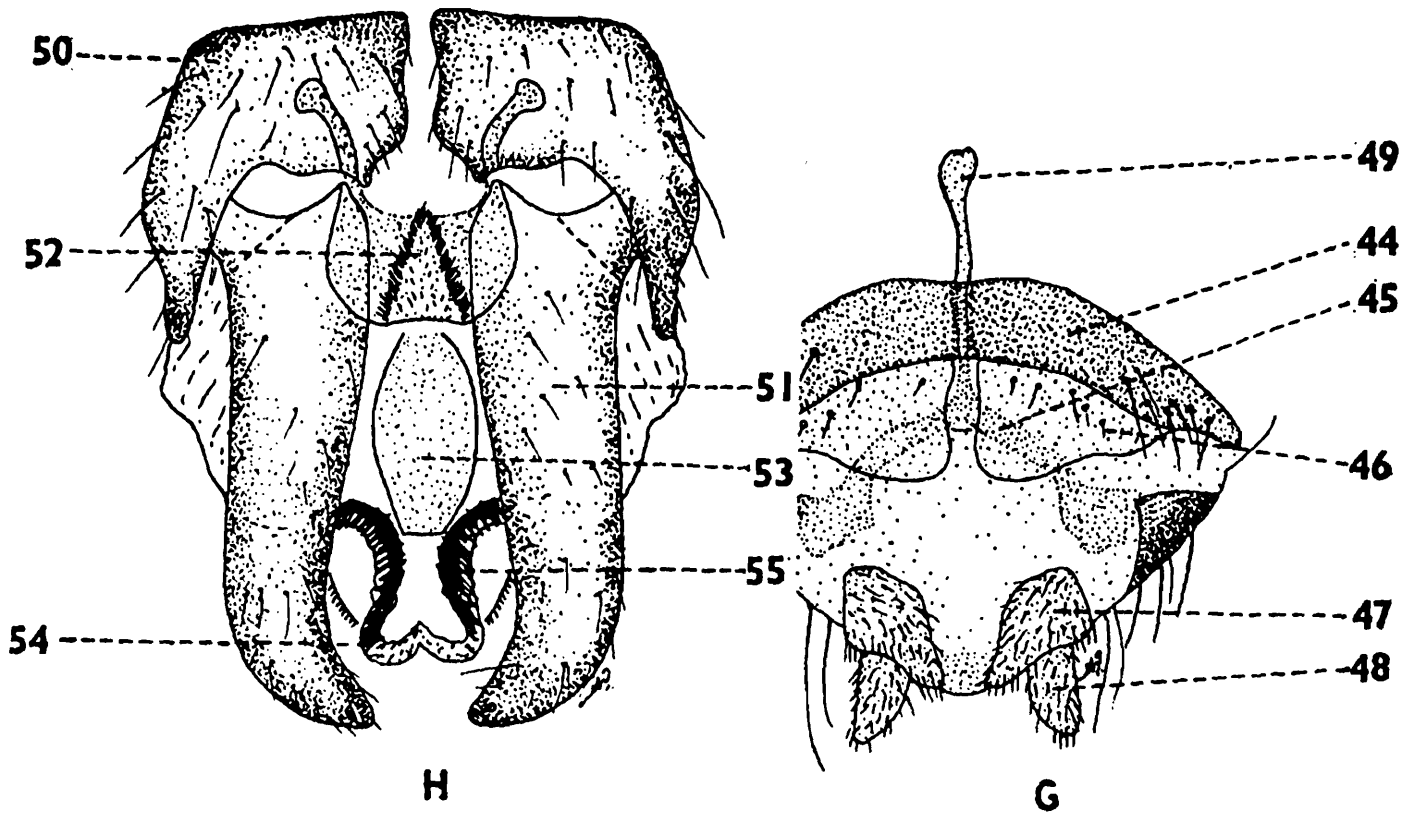
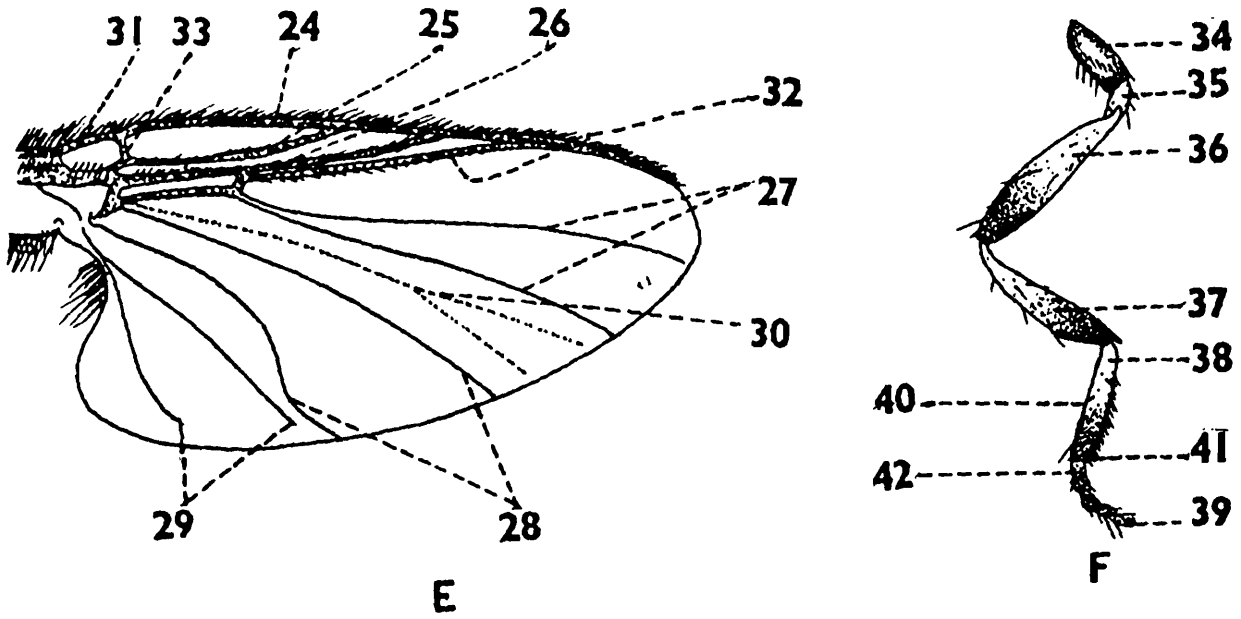


Fig. E Wing of *Eusimulium*d. Fig. F Hine leg of *Simulium* s. str. Fig. G Female terminalia (ventral view) of *Simulium* s. str. Fig. H Male terminalia (ventral view) of *Himalayum*.

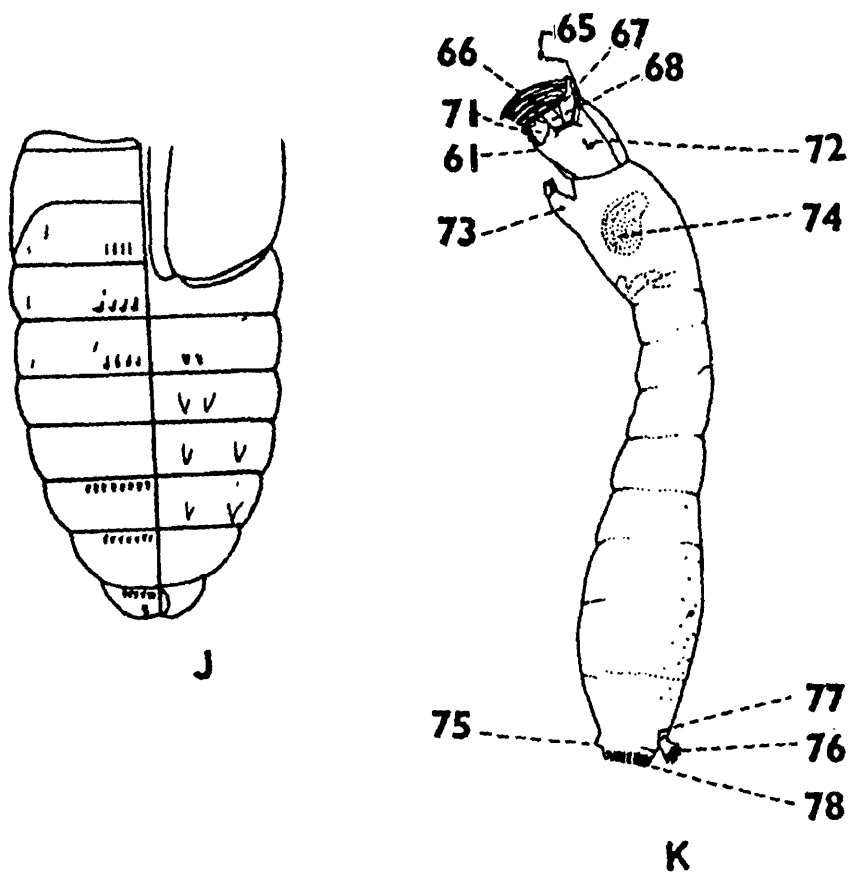
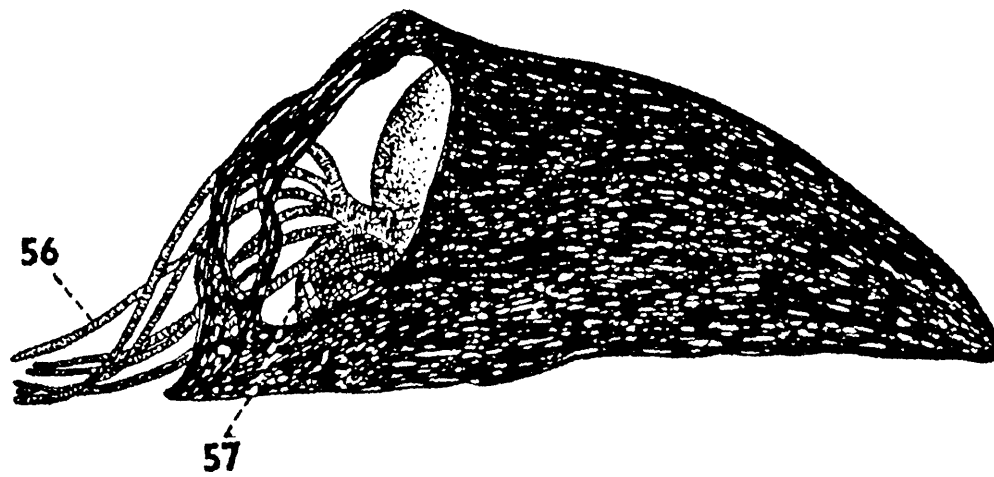


Fig. I Pupa of *Simulium s. str.* Fig. J Onchotaxy of pupal abdomen: dorsal (left side) and ventral (right side) of *Eusimulium*. Fig. K Larva of *Eusimulium*

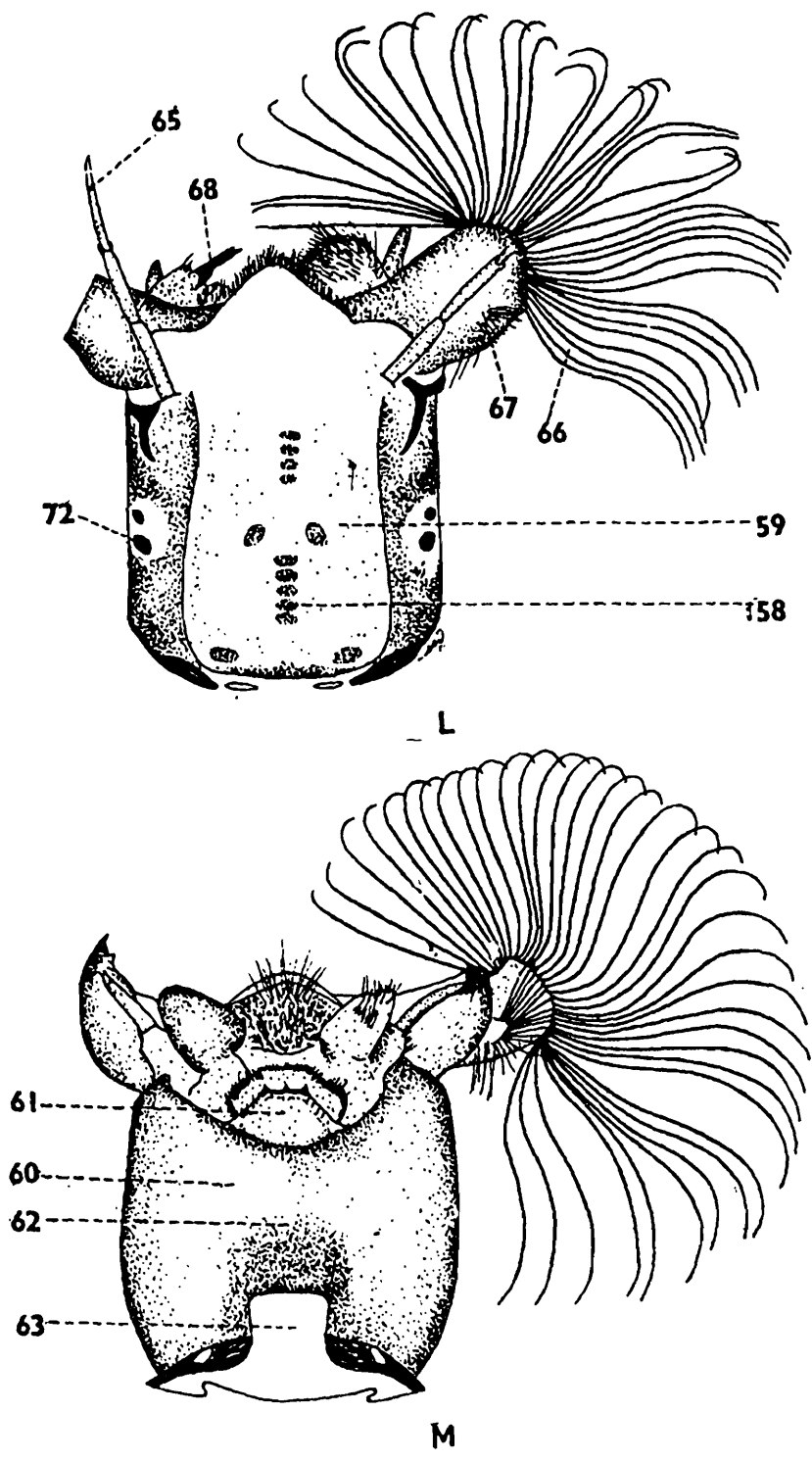


Fig. L&M Head of larva of *Eusimulium* (dorsal & ventral views)

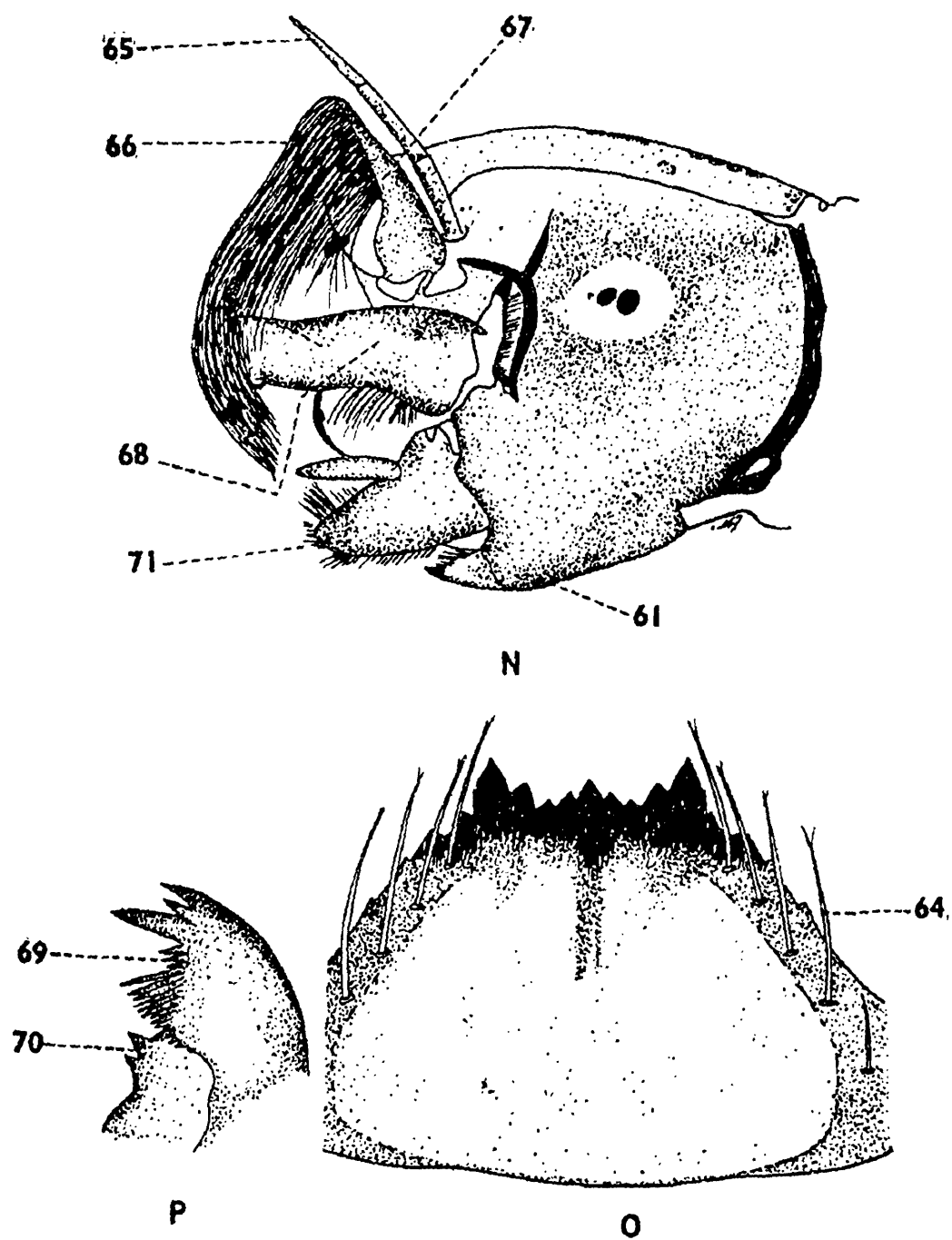


Fig. N Head of larva of *Eusimulium* (lateral view) Fig. O Larva hypostomium of *Eusimulium*.
Fig. P Tip of larval mandible of *Simulium s. str.*

Key to the Subgenera

(Adults)

1. Basal section of vein R bare dorsally (specially in males).....*Simulium* Latreille
Basal section of vein R haired dorsally2
2. Katepisternum bare3
Katepisternum haired*Gomphostilbia* Enderlein
3. Claw of female with stout basal tooth; male distimere with 1 spinule.....
.....*Eusimulium* Roubaud
Claw of female with small basal tooth; male distimere with an accessory spinule.....
.....*Himalayum* Lewis

(Pupae)

1. Tergum 8 invariably without spine-combs.....*Himalayum* Lewis
Tergum 8 invariably with spine-combs2
2. Gill shorter than pupal body; cocoon strongly woven*Simulium* Latreille
Gill as long as or longer than pupal body; cocoon weakly woven3
3. Gill filaments 8, arranged in 3+3+2 or rarely in pairs*Gomphostilbia* Enderlein
Gill filaments 4-14, arranged otherwise*Eusimulium* Roubaud

(Larvae)

1. Ventral papillae present, large and subconical2
Ventral papillae absent (sometimes last abdominal segment swollen like sublateral papillae)...
.....3
2. Postgenal cleft deep, longer than postgenal bridge*Gomphostilbia* Enderlein
Postgenal cleft small, shorter than postgenal bridge.....*Eusimulium* Roubaud
3. Thoracic cuticle bare (rarely with a few spines); rectal scale present*Simulium* Latreille
Thoracic cuticle with fan-shaped scales; rectal scale absent*Himalayum* Lewis

Subgenus *Eusimulium* Roubaud

1906. *Eusimulium* Roubaud, *C. r. hebd. Seanc. Acad. Sci., Paris* 143 : 521. Type- species : *Simulium aurea* Fries.

Key to the Species*

(Females)

1. Antenna reddish orange or reddish brown with dark segment 3: genital complex thinly chitinized*aureohirtum* Brunetti
Antenna coloured otherwise; genital complex fairly chitinized2
2. Alinotum bright orange-red or reddish brown.....3
Alinotum coloured otherwise4

*Sexes or stages hitherto known are placed in the key

3. Thorax unstriped*rufithorax* Brunetti
 Thorax with a median, two lateral and two sub-lateral stripes.....
*S. (E.)* species 'A' of Datta (1973)
4. Frons with a median longitudinal shallow groove*ghoomense* Datta
 Frons without such groove.....5
5. Palpal segment 3 distinctly swollen, with somewhat convex sides; genital fork with large and
 heavily sclerotized external (dorsal) tooth6
 Palpal segment 3 not distinctly swollen, with sub-parallel seids; genital fork with weak
 external tooth 7
6. Ovipositor lobe projected over apex of anal lobe*nemorivagum* Datta
 Ovipositor lobe not at all projected*praelarpum* Datta
7. Scutum with five longitudinal dark stripes forming a somewhat lyre-shaped pattern; sternum 8
 about to cover tip of genital fork*gracile* Datta
 Scutum with three longitudinal dark stripes; sternum 8 covering only half of genital fork.....
*purii* Datta

(Males)

1. Alinotum bright orange red or reddish brown*rufithorax* Brunetti
 Alinotum coloured otherwise, mostly greyish2
2. Antenna reddish orange or reddish brown with dark segment 3: basimere much larger than
 distimere, latter with trapezoid inner surface*aureohirtum* Brunetti
 Antenna coloured otherwise; even if basimere larger than distimere, latter shaped otherwise ...3
3. Presence of a very strong endoparameral hook on each side4
 Presence of several endoparameral hooks on each side5
4. Ventral plate thick dorso-ventrally*purii* Datta
 Ventral plate comparatively thin dorso-ventrally*gracile* Datta
5. Distimere when viewed from end showing a flattened area*nemorivagum* Datta
 Distimere tapering to a point, not truncated in such manner6
6. Subcosta entirely haired; ventral plate dceply excavate apically*ghoomense* Datta
 Subcosta haired only at base; ventral plate with turning base*praelargum* Datta

(Pupae)

1. Gill filaments 42
 Gillfilaments more than 44
2. Cocoon with dorso-median projection3
 Cocoon without dorso-median projectionSpecies A of Datta *et al.* (1975)
3. Dorso-median projection veil-like and often bifid; gill filaments gradually diverging forwards ...
*gracile* Datta
 Dorso-median projection narrow and parallel-sided; gill filaments compact and nearly straight...
*purii* Datta

4. Gill filaments 65
Gill filaments more than 6.....7
5. Gill filaments widely divergent; cocoon with a minute dorso-median projection.....
.....*aureohirtum* Brunetti
Gill filaments nearly compact; cocoon not as above6
6. Cocoon with narrow and parallel-sided dorso-median projection*praelargum* Datta
Cocoon without dorso-median projection.....Species D of Datta *et al.* (1975)
7. Gill filaments 128
Gill filaments 149
8. Cocoon with strong anterior margin; well-developed dorso-median projection.....
.....*qhoomense* Datta
Cocoon without definite anterior margin; dorso-median projection absent ...*nemorivagum* Datta
9. Filaments very delicate, arranged irregularly about a large horn*dasguptai* Datta
Filaments thick, arranged otherwise.....10
10. Gill filaments dichotomous; cocoon without definite anterior margin.....
.....Species B of Datta *et al.* (1975)
Gill filaments adichotomous; cocoon with strong anterior margin.....
.....Species C of Datta *et al.* (1975)

(Larvae)

1. Postgenal cleft minute and notch-like2
Postgenal cleft larger and shaped otherwise4
2. Respiratory histoblast with 12 filaments3
Respiratory histoblast with 14 delicate filaments arranged irregularly about a large horn.....
.....*dasguptai* Datta
3. Antenna 4-segmented without secondary annulations*nemorivagum* Datta
Antenna 4-segmented with secondary annulations*qhoomense* Datta
4. Respiratory histoblast with 4 filaments.....5
Respiratory histoblast with 6 filaments.....7
5. Postgenal cleft nearly subquadrate, much shorter than postgenal bridge; mandible with a
supernumerary serration.....Species A of Datta *et al.* (1975)
Postgenal cleft with round margin, not that much shorter than postgenal bridge; mandible
without supernumerary serration6
6. Respiratory histoblast with bulbous stalk, nearly circular in outline*gracile* Datta
Respiratory histoblast with simple stalk, nearly oblong in outline*purii* Datta
7. Filaments somewhat inflated, texture smooth*aureohirtum* Brunetti
Filaments not inflated, texture spinous.....*praelargum* Datta

1. *Simulium (Eusimulium) aureohirtum* Brunetti

1911. *Simulium aureohirtum* Brunetti, *Rec. Indian Mus.* 4 : 287.

1933. *Simulium (Eusimulium) aureohirtum* Brunetti: Puri, *Indian J. med. Res.* 21 : 1.

Material examined : 14 pupae, 6 larvae, taken on grass-blades covered with muddy deposit in river-bed, 200-300 m, Rangeet, Darjiling District, 9. v. 1971; 6 pupae pupal exuvium, 1 larva, taken on trailing vegetation and grasses in trickles of water, ca. 500 m, Rajabhatkhawa, Jalpaiguri District, 31. xii. 1986; 3 Males, 2 Females (reared), 26 pupae, 6 pupal exuviae, 14 larvae, taken on trailing vegetation in irrigation channels, ca. 50 m, Mukutmanipur, Bankura District, 28. x. 1985; 1 Male (reared), 7 pupae, 4 larvae, taken on grasses in trickles of water, ca. 750 m, Ajodhya Hill, Puruliya District, 2. xi. 1985; 85 pupae, 4 pupal exuviae, 21 larvae, taken on grasses in trickles of water, ca. 700 m, Ajodhya Hill, Puruliya District, 3. xi. 1985; 2 Males, 3 Females (reared), 15 pupae, 2 pupal exuviae, 16 larvae, taken on trailing vegetation in a small stream, ca. 700 m, Ajodhya Hill, Puruliya District, 4. xi. 1985.

Distribution : West Bengal (Bankura, Darjiling, Jalpaiguri, Puruliya), Andhra Pradesh, Arunachal Pradesh, Assam, Haryana, Himachal Pradesh, Karnataka, Maharashtra, Manipur, Meghalaya, Mizoram and Tamil Nadu. Borneo, China, Java, Malaya, Pakistan, Philippines, Ryukyu Islands, Sri Lanka, Sulawesi, Sumatra, Taiwan and Thailand; Japan.

Remarks : The species was originally described from Meghalaya by Brunetti (1911). It was subsequently recorded from West Bengal by Datta *et al.* (1976).

2. *Simulium (Eusimulium) dasguptai* Datta

1974. *Simulium (Eusimulium) dasguptai* Datta, *Orient. Insects* 8 : 459.

Material examined: 1 larva, taken in small trickle of water flowing down the Lebong Cart Road, 1900 m, North Point, Darjiling, 1. v. 1971, Coll. R. K. Dey; 1 pupa, 2 larvae, small trickle of water, 2480m, Ghoom, Darjiling District, 6. vi. 1971, Coll. R. K. Dey; 2 larvae, small trickle of water, 1660 m, Sonada, Darjiling District, 9. i. 1972 & 12. iii. 1972, Coll. A. K. Paul & T. K. Pal.

Distribution : West Bengal (Darjiling) only.

Remarks : Larvae and pupae were found attached only to undersurfaces of stones, rarely in association with *nemorivagum* Datta and *ghoomense* Datta.

3. *Simulium (Eusimulium) ghoomense* Datta

1975. *Simulium (Eusimulium) ghoomense* Datta, *Proc. Indian Acad. Sci. (B)* 81 : 67.

Material examined : 2 Males, 2 Females (reared), 6 pupae, 1 larva, small trickle of water flowing down the Hill Cart Road, 2250 m, Ghoom, Darjiling District, 2. v. 1971; 300, 10 (reared), 8 pupae, 4 larvae, small trickle of water, 2480 m, Ghoom, Darjiling District, 6. vi. 1971, Coll. R. K. Dey; 3 Males, 2 Females (reared), pupae and 3 larvae, small trickle of water, 2380 m, Ghoom, Darjiling District, 19. iii. 1972 and 9. iv. 1972, Coll. A. K. Paul & T. K. Pal.

Distribution: West Bengal (Darjiling) only.

Remarks: Larvae and pupae were taken on decaying leaves or stones, rarely in association with *nemorivagum* Datta and *dasguptai* Datta.

4. *Simulium (Eusimulium) gracile* Datta

1973. *Simulium (Eusimulium) gracilis* Datta, *Orient. Insects* 7: 368.

Material examined : 2 Males, 3 Females, (reared), 14 pupae, 4 larvae, taken on decaying leaves and grasses in a small trickle of water flowing down the Lebong Cart Road, 1900 m, North Point, Darjiling, 26. iv. 1970, 12. ix. 1970, 30. iii. 1971, 12. vi. 1971 & 15. vi. 1972; 9 Males, 5 Females (reared), 14 pupae, 10 larvae, taken on decaying leaves and grasses in small trickle of water flowing down the Lebong Cart Road, 1931-2025 m, Lebong, Darjiling, 15. v. 1970, 3. x. 1970, 12. vi. 1971, 26. viii. 1971 & 14. vii. 1972; 8 Males, 1500 (reared), 21 pupae, 12 larvae, taken on decaying leaves and grasses in small trickles of water, 1735-1850 m, Sukia pokhri, Darjiling District, 5. vii. 1970 and 21. v. 1972.

Distribution: West Bengal (Darjiling) only.

5. *Simulium (Eusimulium) nemorivagum* Datta

1973. *Simulium (Eusimulium) nemorivagum* Datta, *Orient. Insects* 7 : 373.

1974. *Simulium (Eusimulium) nemorivagum* Datta: Datta, *Orient. Insects* 8 : 457.

Material examined: 2 pupae, 1 larva, small trickle of water flowing down the Lebong Cart Road, 1900 m, North Point, Darjiling, 26. iv. 1970 and 1. v. 1971; 1 larva, in a small trickle of water, 2025 m, Lebong, Darjiling, 28. iii. 1971; 1 pupa, 2 larvae, small trickle of water flowing down the Hill Cart Road, 2250 m, Ghoom, Darjiling District, 2. v. 1971; 1 pupa, small trickle of water, 1900 m, North Point, Darjiling, 19. iii. 1972.

Distribution: West Bengal (Darjiling) only.

Remarks: Larvae and pupae were taken on stones and leaves, rarely in association with those of *dasguptai* Datta and *ghoomense* Datta.

6. *Simulium (Eusimulium) praelargum* Datta

1973. *Simulium (Eusimulium) praelargum* Datta, *Orient. Insects* 7: 365.

Material examined : 7 Males, 10 Females (reared), 11 pupae, 5 pupal exuviae, 10 larvae, taken on decaying leaves and grasses in a small trickle of water flowing down the Lebong Cart Road, 1900 m, North point, Darjiling, 26.iv. 1970, 12. ix. 1970, 30. iii. 1971, 12. vi. 1971 & 15. vi. 1972; 12 Males, 15 Females, 14 pupae, 7 pupal exuviae, 17 larvae, taken on decaying leaves in small trickles of water flowing down the Lebong Cart Road, 1931-2025 m, Lebong, Darjiling, 15. v. 1970, 3. x. 1970, 12. vi. 1971, 26. viii. 1971 & 14. vii. 1972; 5 Males, 7 Females, 8 pupae, 16 pupal exuviae, 12 larvae, taken on small trickles of water near Sonada Rly. Station, 1660 m, Sonada, Darjiling District, 12. vi. 1970, 28. iv. 1971 & 5. vii. 1972.

Distribution : West Bengal (Darjiling) only.

7. *Simulium (Eusimulium) purii* Datta

1973. *Simulium (Eusimulium) purii* Datta, *Orient. Insects* 7 : 371.

Material examined : 1 Male, 2 Females (reared), 3 pupae, 1 pupal exuvium, 2 larvae, taken on decaying leaves in a small trickle of water flowing down the Lebong Cart Road, 1900 m, North Point, Darjiling, 26. iv. 1970 & 15. v. 1970; 2 Males, 2 Females (reared), 4 pupae, 3 larvae, taken on

decaying leaves in a small trickle of water flowing down the Darjiling- Sukia Road, 1750 m, Sukia pokhri, Darjiling District, 5. vii. 1970; 10, 10 (reared), 2 pupae, 1 larva, taken on decaying leaves in a small trickle of water, 1360 m, Mungpoo, Darjiling District, 12. ix. 1971.

Distribution: West Bengal (Darjiling) only.

8. *Simulium (Eusimulium) rufithorax* Brunetti

1911. *Simulium rufithorax* Brunetti, *Rec. Indian Mus.* 4 : 282.

1973. *Simulium (Eusimulium) rufithorax* Brunetti: Datta, *Orient. Insects* 7 : 376.

Remarks: Brunetti (1911) described the species from a single male and four female specimens collected both from Bombay and Kurseong (Darjiling). In fact, no material has been subsequently available for further studies.

LITTLE-KNOWN SPECIES

9. *Simulium (Eusimulium) species 'A'*

1973. *Simulium (Eusimulium) species 'A'* Datta, *Orient. Insects* 7 : 375.

Remarks : It was described from a single female specimen collected at light in Darjiling, 2014 m on 19. iv. 1971 by the author.

10. *Simulium (Eusimulium) species A*

1975. *Simulium (Eusimulium) species A*, Datta, Dey and Paul, *Proc. Indian Acad. Sci. (B)* 82 : 92.

Material examined: 2 pupae, 2 larvae, taken on trailing vegetation across a small trickle of water flowing down the Hill Cart Road, 1600 m, Sonada, Darjiling District, 30. v. 1971, Coll. R.K. Dey; 1 pupa, taken on trailing vegetation across a small trickle of water, 2480 m, Ghoom, Darjiling District, 6. vi. 1971, Coll. A. K. Paul.

Remarks: The pupal and larval stages of this species were described but the male and the female are hitherto unknown.

11. *Simulium (Eusimulium) species B*

1975. *Simulium (Eusimulium) species B*, Datta, Dey and Paul, *Proc. Indian Acad. Sci. (B)* 82 : 95.

Material examined : 1 pupa, taken on grass in a small trickle of water, 1100 m, Kurseong, Darjiling District, 5. xi. 1970.

Remarks: The pupa was described, whereas the male, the female and the larva are still unknown.

12. *Simulium (Eusimulium) species C*

1975. *Simulium (Eusimulium) species C*, Datta, Dey and Paul, *Proc. Indian Acad. Sci. (B)* 82 : 96.

Material examined : 1 pupa, taken on undersurface of a stone submerged in a small trickle of water, 2025 m, Lebong, Darjiling, 2. x. 1970.

Remarks : It is also so far known only by the pupal stage that was described.

13. *Simulium (Eusimulium)* species D

1975. *Simulium (Eusimulium)* species D, Datta, Dey and Paul, *Proc. Indian Acad. Sci. (B)* **82** : 97.

1978. *Simulium (Eusimulium)* species D, Datta, Dey and Paul: Datta, *Bull. zool. Surv. India* **1** : 255.

Material examined : 2 pupae, 2 pupal exuviae, taken on decaying leaves in a small stream, 2000 m, Lebong, Darjiling, 11. iii. 1972 & 26. iii. 1972.

Remarks : The species with only the pupa lacking dorso-median projection seems close to *praelargum* Datta, if not conspecific with certain variations.

Subgenus *Gomphostilbia* Enderlein

1921. *Gomphostilbia* Enderlein, *Dt. tierarztl. Wschr.* **29** : 199.

Type-species : *Gomphostilbia ceylonica* Enderlein.

Key to the Species*

(Females)

1. Hind femur gradually with dark pollinosity on outer surface2
Hind femur entirely with dark pollinosity on outer surface*metatarsale* Brunetti
2. Anal lobe produced beyond anal cercus*tenuistylum* Datta
Anal lobe not produced beyond anal cercus*darjeelingense* Datta

(Males)

1. Ventral plate of male terminalia much broader than long2
Ventral plate of male terminalia rather longer than broad*darjeelingense* Datta
2. Basimere twice as long as wide, nearly as long as distimere*tenuistylum* Datta
Basimere less than twice as long as wide, but longer than distimere.....3
3. Hind femur with entirely black hairs on outer surface; hind tarsomere 1 even broader than tibia*metatarsale* Brunetti
Hind femur with a patch of pale hairs basally on outer surface; hind tarsomere 1 much narrower than tibia*sundaicum* Edwards

(Pupae)

1. Gill filaments arranged in pair*darjeelingense* Datta
Gill filaments arranged in 3+3+2 groups2
2. Lower pair of stout filaments nearly twice as long as upper six slender filaments, latter arising close to common stalk; cocoon without dorso-median projection*sundaicum* Edwards
Lower pair of filaments slightly longer and thicker than upper filaments of triplets with well-developed stalks; cocoon with a short dorso-median projection.....3
3. Upper triplet branching almost at a point.....*metatarsale* Brunetti
Upper triplet branching close to base into a single dorsal filament and two ventral filaments on a long stalk*tenuistylum* Datta

*Sexes or stages hitherto known are placed in the key

(Larvae)

1. Abdominal cuticle with dark bands on segments 1-4 and 5-8 dorsally.....
*metatarsale* Brunetti; *sundaicum* Edwards
 Abdominal cuticle with a dark dorsal band with two pairs of dark lateral spots posterior to it...
*tenuistylum* Datta

14. *Simulium (Gomphostilbia) darjeelingense* Datta

1973. *Simulium (Gomphostilbia) darjeelingense* Datta, *Orient. Insects* 7 : 380.

Material examined : 12 Males, 9 Females (reared), 16 pupae, taken on grasses in a number of watercourses flowing down the Lebong Cart Road, 2030 m-2050 m, Darjiling, 16. viii. 1970, 26. ix. 1970, 2. x. 1970, 9. x. 1970, 14. x. 1970 and 26. viii. 1971.

Distribution : West Bengal (Darjiling) only.

15. *Simulium (Gomphostilbia) metatarsale* Brunetti

1911. *Simulium metatarsalis* Brunetti, *Rec. Indian Mus.* 4 : 284.

1934. *Simulium (Gomphostilbia) metatarsale* Brunetti var ? : Edwards, *Arch. F. Hydrobiol.* 13 : 119.

Material examined : 1 Male, 1 Female (dissected), 3 pupae, 1 larva, taken on grasses in a trickle of water, ca 500 m, Rajabhatkhawa, Jalpaiguri District, 31. xii. 1986.

Distribution : West Bengal (Darjiling, Jalpaiguri), Sikkim. China, Java, ? Taiwan.

Remarks : Brunetti (1911) described this species from a unique male specimen collected from Kurseong, Darjiling District. Subsequently, Edwards (1934), Datta (1978), Takaoka (1979), and Davies and Györkös (1987) dealt with the species collected from Java, Sikkim (India), Taiwan and Assam (India) respectively, implying certain differences that had led to some controversy as to its identity. Whether their species is truly *metatarsale* Brunetti remains unresolved until a number of bred adults of both sexes, pupae and larvae from the type-locality are available for studies.

In fact, Brunetti's type specimen was collected by Dr. N. Annandale on 28. iii. 1910 and was deposited in the Indian Museum (the entire collection of which is now in the Zoological Survey of India, Calcutta). Therefore, the male holotype specimen collected on 2. iii. 1910 and deposited in the Institute of Communicable Diseases at Delhi mentioned by Davies and Györkös (*op. cit.*) casts doubt over the status of the specimen (*cf.* Datta, *op. cit.*).

16. *Simulium (Gomphostilbia) ? sundaicum* Edwards

1934. *Simulium (Gomphostilbia) sundaicum* Edwards, *Arch. F. Hydrobiol.* 13 : 122.

Material examined: 1 Male (dissected), 4 pupae, 2 pupal exuviae, 6 larvae, taken on grasses in irrigation channels, ca. 50 m, Mukutmanipur, Bankura District, 28. x. 1985; 2 pupae, 5 pupal exuviae, 3 larvae, taken on grasses in trickles of water, ca. 750 m, Ajodhya Hill, Puruliya District, 2. xi. 1985; 4 pupae, 7 larvae, taken on grasses in trickles of water, ca. 700 m, Ajodhya Hill, Puruliya District, 3. xi. 1985; 1 Male (dissected), 6 pupae, 4 pupal exuviae, 4 larvae, taken on grasses in a small stream, ca. 700 m, Ajodhya Hill nr Youth Hostel, Puruliya District, 4. xi. 1985.

Distribution : West Bengal (Bankura, Puruliya). Java, Malaya and Sumatra.

Remarks : The species was originally described from Java by Edwards (1934) and was recorded from West Bengal in India by Datta, 1991.

17. *Simulium (Gomphostilbia) tenuistylum* Datta

1973. *Simulium (Gomphostilbia) tenuistylum* Datta, *Orient. Insects* 7 : 377.

Material examined : 7 Males, 10 Females (reared), 14 pupae, 3 pupal exuviae, 11 larvae, taken on grasses submerged in a number of watercourses flowing down the Lebong Cart Road, 1931- 2025 m, Darjiling, 2. x. 1970, 9. x. 1970, 14. x. 1970, 12. vi. 1971 & 26. viii. 1971); 3 Males, 2 Females (reared), 5 pupae, 2 pupal exuviae, 3 larvae, taken on grasses in a number of waterways nr Kurseong Rly. Station, 1150 m, Kurseong, Darjiling District, 18. x. 1970 & 5. xi. 1970; 2 Males, 3 Females (reared), 6 pupae, 3 pupal exuviae, 3 larvae, taken on grasses in a small trickle of water, 1450 m, Mungpoo, Darjiling District, 7. vii. 1971 & 12. ix. 1971; 1 pupal exuvium, taken on decaying leaf in the Jayanti river-bed, ca. 450 m, Jayanti, Jalpaiguri District, 29. xii. 1986.

Distribution : West Bengal (Darjiling, Jalpaiguri) and Sikkim.

Subgenus *Himalayum* Lewis

1973. *Himalayum* Lewis, *Bull. ent. Res.* 62 : 460. *Type-species* : *Simulium indicum* Becher.

18. *Simulium (Himalayum) indicum* Becher

1884. *Simulium indicum* Becher, *J. Asiat.Soc. Beng.* 53 : 199.

1973. *Simulium (Himalayum) indicum* Becher: Lewis, *Bull.ent. Res.*62 : 462.

1974. *Simulium (Himalayum) indicum* Becher : Lewis, *Israel J. Ent.* 9 : 25.

Diagnosis : *Female*- Scutum without conspicuous pattern; fore tarsomere 1 flattened, 5.5 times as long as wide; abdomen thickly covered with scales and with first two segments pale; ovipositor lobes simple bluntly rounded; anal lobes rather large. *Male*- Scutum and fore tarsomere 1 as in females; terminalia with distimere much longer than basimere; distimere mainly parallel-sided with tip turning inward, basimere produced beyond edge of distimere; ventral plate not toothed, broader than long, narrowing gradually towards broad apex, with haired median keel, basal arms curved; median sclerite broad but narrowing to blunt tip; endoparameral organ with broad base and numerous hooks of rather uniform size. *Pupa*- Gill with six filaments; abdomen without spine-combs on segments 5-9; cocoon with a neck. *Larva*- Head-spots virtually absent; post/genal cleft very large, reaching hypostomium; single mandibular serration; lateral lobe of rectal "gill" with about 22 lobules; posterior circlet with about 110 rows of about 20 hooks.

Distribution: West Bengal (Darjiling), Arunachal Pradesh, Assam, Himachal Pradesh, Kashmir, Manipur, Meghalaya, Nagaland, Sikkim and Uttar Pradesh. Bangladesh, Bhutan, Burma, China, Nepal and Pakistan.

Remarks: The author could not encounter a single specimen of this species either at Darjiling or at Kurseong during 1970-1971 (*cf.* Lewis, 1974). The species might have dispersed elsewhere due to continuous deforestation and human interference.

Subgenus *Simulium* Latreille (s. str.)

1802. *Simulium* Latreille, *Hist. nat. gen. part. Crust. Ins.* 3: 426. Type-species : *Rhagio colombaschensis* Fabricius.

Key to the Species*

(Females)

1. Claws simple2
Claws with subbasal tooth.....7
2. Scutum unstriped3
Scutum striped5
3. Abdominal sternum 7 with a pair of submedian clusters of fairly long and thick hairs.....
.....*rufibasis* Brunetti; *ramosum* Puri
Abdominal sternum 7 without such clusters but with short scattered hairs4
4. Ovipositor lobe projected ventrally with long stout hairs.....*nodosum* Puri
Ovipositor lobe normal and not projected ventrally, with a few short slender hairs.....
.....*nitidithorax* Puri
5. Abdominal sternum 8 with a deep notch in middle posteriorly.....
.....*grisescens* Brunetti; *kapuri* Datta
Abdominal sternum 8 without such notch in middle posteriorly6
6. Fore tarsomere 1 nearly 5 times as long as its greatest width distally; ovipositor lobe with only 1-3 long stout hairs*novolineatum* Puri
Fore tarsomere 1 little less than 4 times its greatest width distally; ovipositor lobe with 5-9 long slender hairs*dentatum* Puri
7. Ovipositor lobe projected ventrally with long stout hairs.....*asishi* Datta
Ovipositor lobe normal and not projected ventrally, with a large number of stout hairs scattered all over*himalayense* Puri

(Males)

1. Scutum with a velvety pattern of an inverted-V between a sparsely haired narrow strip across anteriorly and a bold median area of iridescent pollinosity posteriorly2
Scutum without such pattern3
2. Angle of V fairly divergent, with broad arms laterally; ventral plate long and narrow, with long basal arms*asishi* Datta
Angle of V slightly divergent, with narrow arms laterally; ventral plate short and fairly broad, with short greatly divergent basal arms*nodosum* Puri
3. Scutum densely covered with golden yellow hairs.....4
Scutum moderately covered with dark brown hairs8
4. Hind tarsomere 1 greatly dilated, nearly 2.7 times as long as its greatest width5
Hind tarsomere 1 moderately dilated, 4 times as long as its greatest width6

* Sexes or stages hitherto known are placed in the key

5. Distimere near its base, with a horn-like toothed process internally*dentatum* Puri
Distimere without any such process*ramosum* Puri
6. Distimere near its base, either with a tubercle or with a horn-like process internally7
Distimere without any protuberance*himalayense* Puri
7. Distimere with a horn-like toothed process*novolineatum* Puri
Distimere with a triangular tubercle, strongly toothed along its free edge*tenuitarsus* Puri
8. Hind tarsomere 1 greatly dilated, nearly 2.7 times as long as its greatest width9
Hind tarsomere 1 moderately dilated, 4 times as long as its greatest width 10
9. Scutum with a pair of crescent-shaped coppery spots on shoulder*nigrifacies* Datta
Scutum with a pair of elongate silvery spots on shoulder*rufibasis* Brunetti
10. Ventral plate triangular in shape viewed ventrally*nitidithorax* Puri
Ventral plate saddle-shaped in ventral view*grisescens* Brunetti; *kapuri* Datta*

(Pupae)

1. Gill with 3 bulbous lobes*nodosum* Puri
Gill filamentous2
2. Gill with 3 tubular filaments*asishi* Datta
Gill with more than 3 slender filaments3
3. Gill filaments 64
Gill filaments more than 6 11
4. Petiole of upper pair of filaments at an obtuse angle to that of lower pair; cocoon with a neck5
Petioles either at a right angle or at an acute angle; cocoon without neck6
5. Trichomes simple*singtamense* Datta & Pal
Trichomes branched*tenuitarsus* Puri
6. Gill filaments of middle pair arising from petiole of upper pair of filaments7
Gill filaments of middle pair independent of upper pair of filaments9
7. Trichomes simple*rufibasis* Brunetti
Trichomes branched8
8. Cocoon with two large antero-lateral apertures*biforamiferum* Datta
Cocoon without such apertures*ramosum* Puri
9. Gill filaments arranged in 3 sessile pairs*nitidithorax* Puri
Gill filaments arranged otherwise 10
10. Gill filaments arranged in 3 pairs, of which middle one sessile*himalayense* Puri
Gill filaments arranged in 3 pairs, of which lower pair sessile*nigrifacies* Datta
11. Gill filaments 8 12
Gill filaments 10*grisescens* Brunetti
12. Gill filaments practically arranged in 4 sessile pairs; cocoon showing a pretty pattern anteriorly*kapuri* Datta
Gill filaments arranged in 4 stalked pairs; cocoon with two antero-lateral apertures 13

*Unpublished work

13. Dorsum of head and thorax with widely spaced tubercles.....*dentatum* Puri
 Dorsum of head and thorax with closely set tubercles14
14. Abdominal sternum 4 without any sensory hair; cocoon without neck.....*novolineatum* Puri
 Abdominal sternum 4 with two sensory hairs each side; cocoon with a very short neck.....
Sp. nr. *novolineatum* Puri of Datta & Pal (1975)

(Larvae)

1. Abdominal cuticle entirely bare2
 Abdominal cuticle at least partly with scales or setae8
2. Cephalic apotome brownish; respiratory histoblast with 6 filaments3
 Cephalic apotome yellowish or greyish; respiratory histoblast with more than 6 filaments ...5
3. Cephalic apotome with greyish spots; postgenal cleft nearly subcordat*himalayense* Puri
 Cephalic apotome without definite spots but only with dark infuscation; postgenal cleft
 subtriangular or spear-shaped4
4. Cephalic apotome with line-markings; lower mandibular serration blunt.....
*biforamiferum* Datta
 Cephalic apotome without line-markings; lower mandibular serration pointed.....
*rufibasis* Brunetti; *ramosum* Puri
5. Postgenal cleft mitre-shaped; respiratory histoblast with 8 filaments6
 Postgenal cleft spear-shaped or so; respiratory histoblast with 10 filaments.....7
6. Mandible with a supernumerary serration*kapuri* Datta
 Mandible without any supernumerary serration.....*dentatum* Puri
7. Postgenal cleft perfectly spear-shaped; antenna without a secondary annulation.....
*grisescens* Brunetti
 Postgenal cleft broadly suspear-shaped; antenna with a secondary annulation.....
Sp.nr *grisescens* Brunetti of Datta & Pal (1975)
8. Metathoracic and abdominal cuticle with tubercles9
 Metathorax and abdomen free from any tubercle*singtamense* Datta & Pal
9. Respiratory histoblast with 3 bulbous lobes.....*nodosum* Puri
 Respiratory histoblast with 3 tubular filaments*asishi* Datta

19. *Simulium (Simulium) asishi* Datta

1988. *Simulium (Simulium) asishi* Datta, *Opusc. zool. flumin.* 31 : 2.

Material examined : 2 Males, 1 Female (reared), 8 pupae, 3 pupal exuviae, 3 larvae, taken on grasses and leaves of trailing vegetation across a stream, ca. 500 m, Rajabhatkhawa, Jalpaiguri District, 28. xii. 1986.

Distribution : West Bengal (Jalpaiguri) only.

20. *Simulium (Simulium) biforamiferum* Datta

1974. *Simulium (Simulium) biforamiferum* Datta, *Orient. Insects* 8 : 463.

Material examined : 1 pupa, 1 larva, taken on stones in a small trickle of water flowing down the Lebung Cart Road, 2031-2050 m, Lebung, Darjiling, 2. x. 1970; 3 pupae, 1 larva, same data as above, 9. x. 1970.

Distribution : West Bengal (Darjiling) only.

21. *Simulium (Simulium) dentatum* Puri

1932. *Simulium (Simulium) dentatum* Puri, *Indian J. med. Res.* **19** : 1135.

1974. *Simulium (Simulium) dentatum* Puri: Datta, *Orient. Insects* **8** : 21.

Material examined : 2 Males, 2 Females (reared), 4 pupae, 3 larvae, taken on decaying leaves and stones in streams and ditches, 2030 m, Lebong, Darjiling, 2. x. 1970; 2 Males, 1 Female (reared), 3 pupae, 2 larvae, taken on decaying laeves and stones in a stream, 1150 m, Kurseong, Darjiling, 18. x. 1970.

Distribution : West Bengal (Darjiling), Meghalaya and Sikkim.

22. *Simulium (Simulium) grisescens* Brunetti

1911. *Simulium grisescens* Brunetti, *Rec. Indian Mus.* **4** : 283.

1932. *Simulium (Simulium) grisescens* Brunetti: Puri, *Indian J. med. Res.* **20** : 523.

1974. *Simulium (Simulium) grisescens* Brunetti: Datta, *Orient. Insects* **8** : 18.

Material examined : 5 Males, 7 Females (reared), 12 pupae, 22 larvae, taken on decaying leaves, twigs or submerged vegetation in the Great Rangeet river, 200-300 m, Rangeet, Darjiling District, 1. v. 1970, 9. v. 1970 & 12. vi. 1970, Coll. M. Datta & R. K. Dey; 2 Males, 4 Females (reared), 8 pupae, 4 larvae, taken on decaying leaves or twigs in a stream, 1270 m, Kurseong, Darjiling District, 30. v. 1971, Coll. R. K. Dey, A. K. Paul & T. K. Pal; 8 Males, 7 Females (reared), 15 pupae, 11 larvae, taken on decaying leaves or submerged vegetation in different watercourses along the Lebong Cart Road, 2025-2250 m, Darjiling, 26. iv. 1970, 22. vii. 1970, 30. vii. 1970, 26. ix. 1970, 14. x. 1970 & 11. iv. 1971, Coll. M. Datta & A. Sherpa.

Distribution : West Bengal (Darjiling), Arunachal Pradesh, Assam, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Manipur, Nagaland, Punjab and Tamil Nadu.

23. *Simulium (Simulium) himalayense* Puri

1932. *Simulium (Simulium) himalayense* Puri, *Indian J. med. Res.* **19** : 885.

1974. *Simulium (Simulium) himalayense* Puri: Datta, *Orient. Insects* **8** : 20.

Material examined : 7 Males, 12 Females (reared), 20 pupae, 8 larvae, taken on decaying leaves or twigs or refused material or rarely stones in the Great Rangeet river, 200-300 m, Rangeet, Darjiling District, 12. iv. 1970, 1. v. 1970 & 28. ix. 1970, Coll. M. Datta & R. K. Dey; 15 Males, 10 Females (reared), 25 pupae, 16 larvae, taken on decaying leaves or twigs in different watercourses along the Lebong Cart Road, 2025-2250 m, Darjiling, 26. iv. 1970, 22. vii. 1970, 30. viii. 1970, 26. ix. 1970, 2. x. 1970, 14. x. 1970 & 11. iv. 1970, Coll. M. Datta & A. Shearpa; 4 Males, 3 Females (reared), 10 pupae, 8 larvae, taken on decaying leaves or stones in a stream, 1150 m, Kurseong, Darjiling District, 18. x. 1970 & 15. iv. 1971, Coll. M. Datta & H. S. Ghatani.

Distribution : West Bengal (Darjiling), Arunachal Pradesh, Bihar, Himachal Pradesh, and Manipur. Pakistan.

*24. *Simulium (Simulium) kapuri* Datta

1975. *Simulium (Simulium) Kapuri* Datta, *Jap. J. sanit. Zool.* **26**: 31.

Material examined : 2 Males, 2 Females (dissected), 10 pupae, 2 larvae in Kaljani river, ca. 550 m, Alipurduar, Jalpaiguri District, 1. i. 1987.

Distribution : West Bengal (Jalpaiguri) and Assam.

25. *Simulium (Simulium) nigrifacies* Datta

1974. *Simulium (Simulium) nigrifacies* Datta, *Orient. Insects* 8: 17.

Material examined : 1 Male (reared), 1 pupa, taken on stone in a small stream, 1900 m, North Point, Darjiling, 25. x. 1970.

Distribution: West Bengal (Darjiling) only.

26. *Simulium (Simulium) nitidithorax* Puri

1932. *Simulium (Simulium) nitidithorax* Puri, *Indian J. med. Res.* 19 : 909.

Distribution : West Bengal (Darjiling) and Arunachal Pradesh. ? Malaysia, Thailand.

Remarks : The species was originally described from Marianbarie, West Bengal by Puri (1932b). No further material was available for studies.

***27. *Simulium (Simulium) nodosum* Puri**

1933. *Simulium (Simulium) nodosum* Puri, *Indian J. med. Res.* 20 : 813.

1974. *Simulium (Simulium) nodosum* Puri: Lewis, *Israel J. Ent.* 9 : 34.

Material examined : 4 Males, 4 Females (reared), 75 pupae, 14 pupal exuviae, 33 larvae, taken on trailing vegetation submerged in a stream, ca. 500 m, Rajabhatkhawa, Jalpaiguri District, 31. xii. 1986 & 4. i. 1987; 2 Males, 5 Females (reared), 17 pupae, 9 pupal exuviae, 2 larvae in Kaljani river, ca. 550 m, Alipurduar, Jalpaiguri District, 1. i. 1987.

Distribution : West Bengal (Jalpaiguri), Assam and Karnataka. China and Thailand.

28. *Simulium (Simulium) novolineatum* Puri

1932. *Simulium (Simulium) lineatum* Puri, *Indian J. med. Res.* 19 : 1125 (pre-occupied).

1933. *Simulium (Simulium) novolineatum* Puri, *Indian J. med. Res.* 20 : 817 (replacement name).

Distribution : West Bengal (Darjiling), Arunachal Pradesh, Karnataka and Uttar Pradesh.

Remarks : The species was originally described from Marianbarie, West Bengal by Puri (1932c). No further material could be available for studies.

29. *Simulium (Simulium) ramosum* Puri

1932. *Simulium (Simulium) ramosum* Puri, *Indian J. med. Res.* 19 : 905.

1974. *Simulium (Simulium) ramosum* Puri : Datta, *Orient. Insects* 8 : 466.

Material examined : 3 Males, 2 Females (reared), 7 pupae, 1 larva, taken on leaves submerged in a stream, 2400 m, Ghoom, Darjiling District, 6. vi. 1971, Coll. R. K. Dey, A. K. Paul & T. K. Pal; 2 pupae, 1 larva, taken on a leaf in a stream, 2550 m, Tiger Hill, Darjiling District, 20. vii. 1970.

Distribution : West Bengal (Darjiling) and Himachal Pradesh. ? Thailand.

30. *Simulium (Simulium) rufibasis* Brunetti

1911. *Simulium rufibasis* Brunetti, *Rec. Indian Mus.* 4 : 285.

1932. *Simulium (Simulium) rufibasis* Brunetti: Puri, *Indian J. med. Res.* 19 : 899.

1974. *Simulium (Simulium) rufibasis* Brunetti: Datta, *Orient. Insects* 8 : 19.

Material examined : 16 Males, 12 Females (reared), 12 pupae, 14 larvae, taken on decaying leaves or twigs or submerged vegetation in different watercourses flowing down the Lebong Cart Road, 2025-2250 m, Lebong, Darjiling, 26. iv. 1970, 22. vii. 1970, 30. viii. 1970, 26. ix. 1970, 2. x. 1970, 14. x. 1970 & 11. iv. 1970, Coll. M. Datta & A. Sherpa; 1 Male (reared), 2 pupae, 2 larvae, taken on submerged vegetation in a ditch, 1500 m, Happy Valley, Darjiling, 15. vi. 1970; 2 Males, 1 Female (reared), 3 pupae, 5 larvae, taken on submerged vegetation in different watercourses flowing down the Hill Cart Road, 1500- 1750 m, Sonada, Darjiling District, 30. v. 1971, Coll. R. K. Dey, A. K. Paul & T. K. Pal; 2 Males, 3 Females (reared), 5 pupae, 5 larvae, taken on decaying leaves or twigs in a fast-flowing stream, 1270 m, Kurseong, Darjiling District, 30. v. 1971, Coll. R. K. Dey, A. K. Paul & T. K. Pal.

Distribution : West Bengal (Darjiling), Arunachal Pradesh, Himachal Pradesh, Manipur, Meghalaya and Sikkim. China, Pakistan, Ryukyu Islands, Taiwan, Thailand, Japan and Korea.

31. *Simulium (Simulium) singtamense* Datta & Pal

1975. *Simulium (Simulium) singtamense* Datta and Pal, *Proc. Indian Acad. Sci. (B)* 81 : 154.

Material examined : 5 pupae, 4 larvae, taken on leaves in a small stream, ca. 750 m, Singtam, Darjiling District, 23. v. 1971, Coll. R. K. Dey, A. K. Paul & T. K. Pal.

Distribution : West Bengal (Darjiling) only.

32. *Simulium (Simulium) tenuitarsus* Puri

1933. *Simulium (Simulium) tenuitarsus* Puri, *Indian J. med. Res.* 20 : 809.

Distribution : West Bengal (Darjiling) only.

Remarks : The species was originally described from Marianbarie, West Bengal by Puri (1933a). No subsequent material could be available for studies.

LITTLE-KNOWN SPECIES

33. *Simulium* sp. nr *novolineatum* Puri

1975. *Simulium* sp. nr *novolineatum* Puri : Datta and Pal, *Proc. Indian Acad. Sci. (B)* 81 : 157.

Material examined : 1 pupa, taken on a decaying leaf in a small stream, ca. 750 m, Singtam, Darjiling District, 23. v. 1971, Coll. R. K. Dey, A. K. Paul and T. K. Pal.

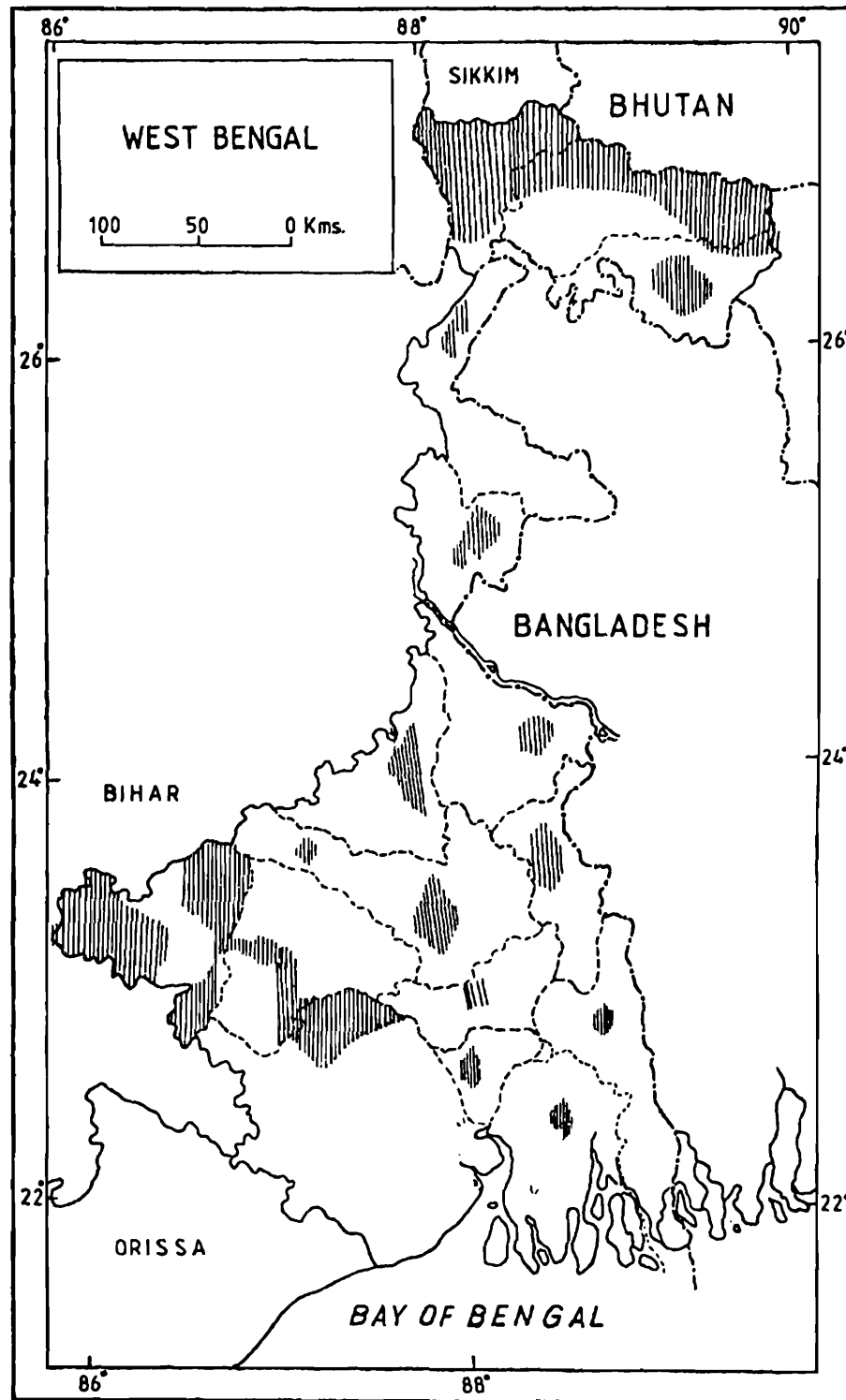
Remarks : It was described from a solitary pupal specimen only.

34. *Simulium* sp. nr *grisescens* Brunetti

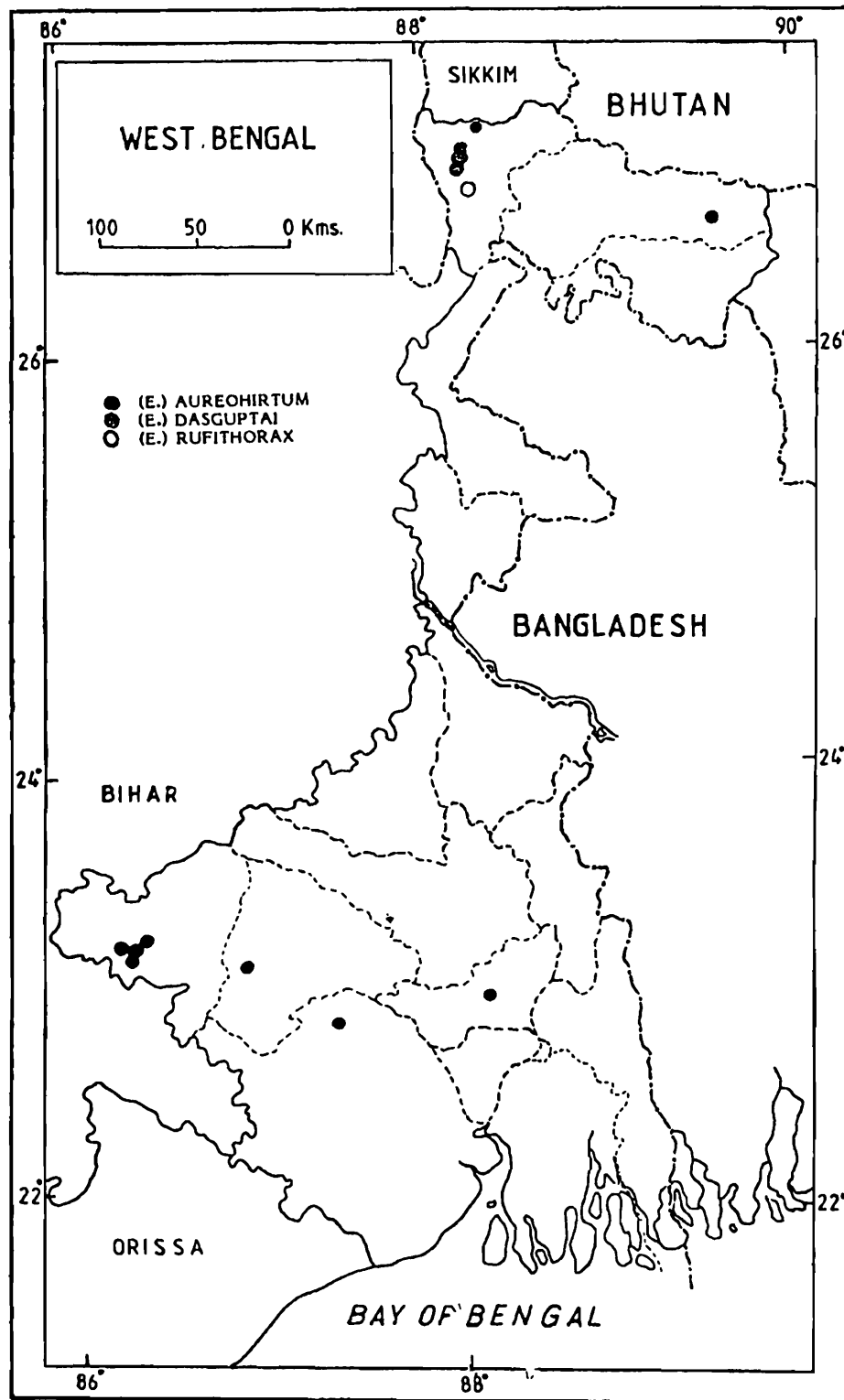
1975. *Simulium* sp. nr *grisescens* Brunetti : Datta and Pal, *Proc. Indian Acad. Sci. (B)* 81 : 159.

Material examined : 1 larva, taken on a decaying leaf in a small stream, ca. 750 m, Singtam, Darjiling District, 23. v. 1971, Coll. R. K. Dey, A. K. Paul and T. K. Pal.

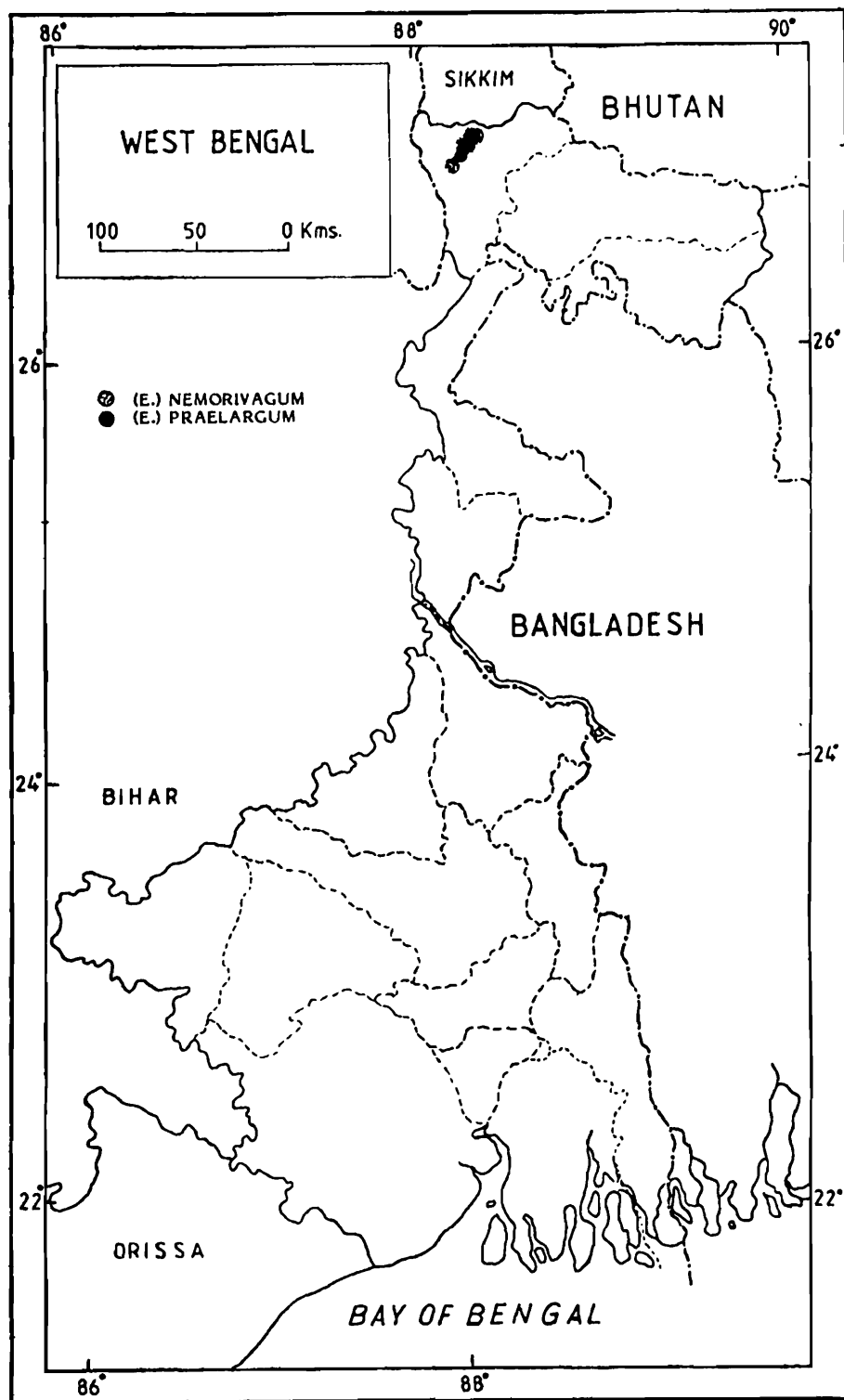
Remarks : It was described from a solitary larval specimen only.



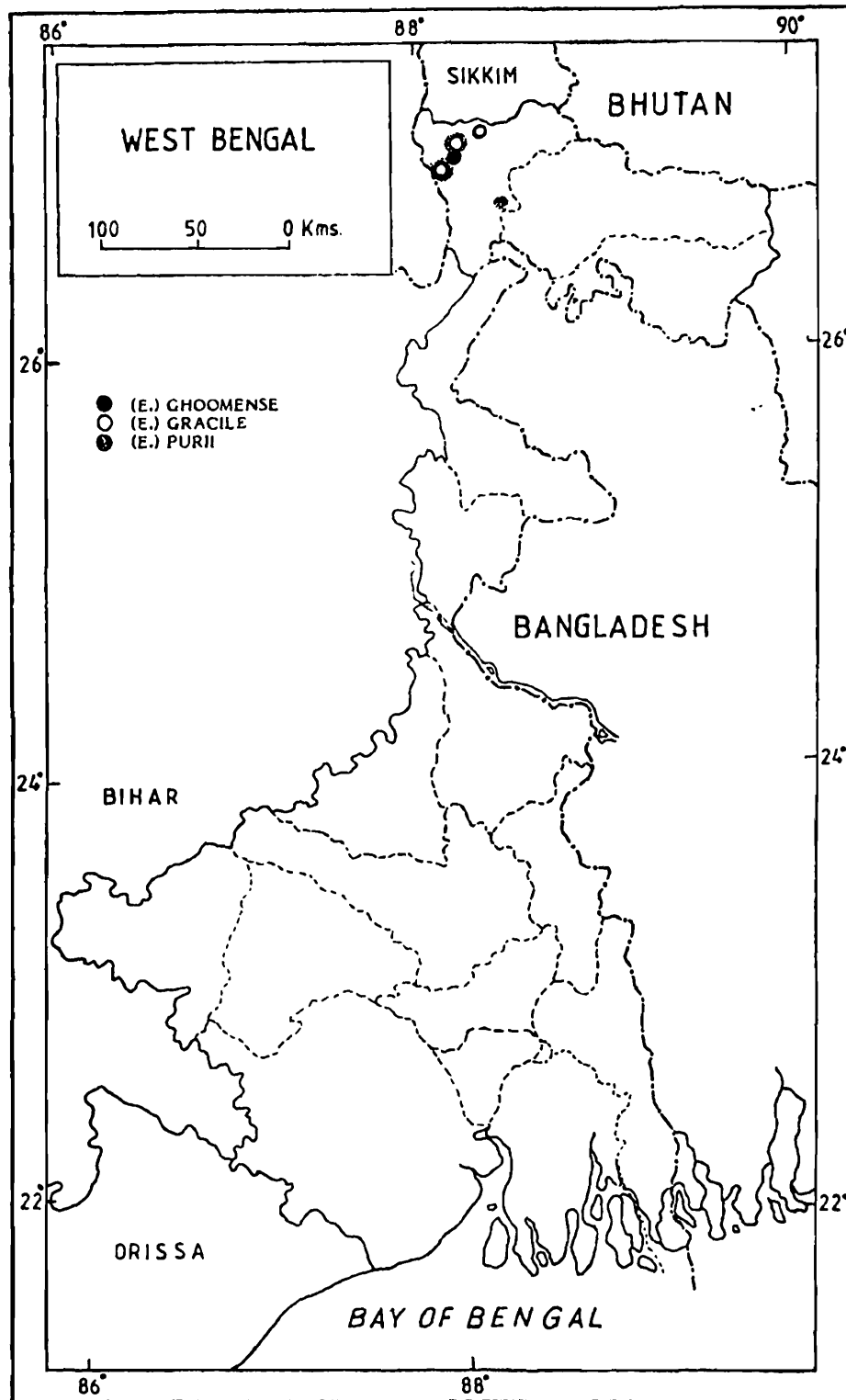
Map 1. Presumed range of distribution of Simuliidae in West Bengal (shaded areas).



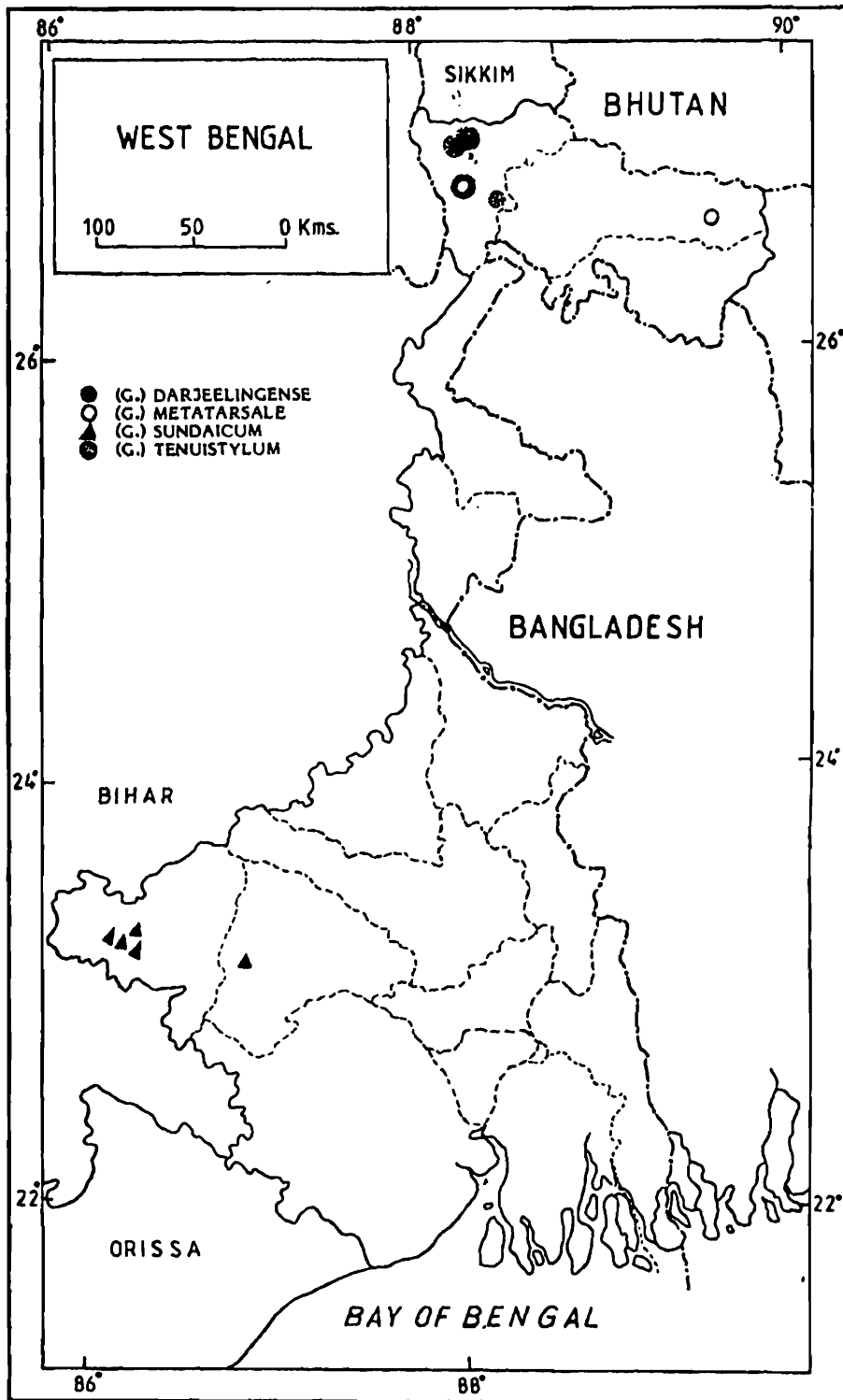
Map 2. Distribution of *(E.) aureohirtum*, *(E.) dasguptai* and *(E.) rufithorax* (shown by symbols).



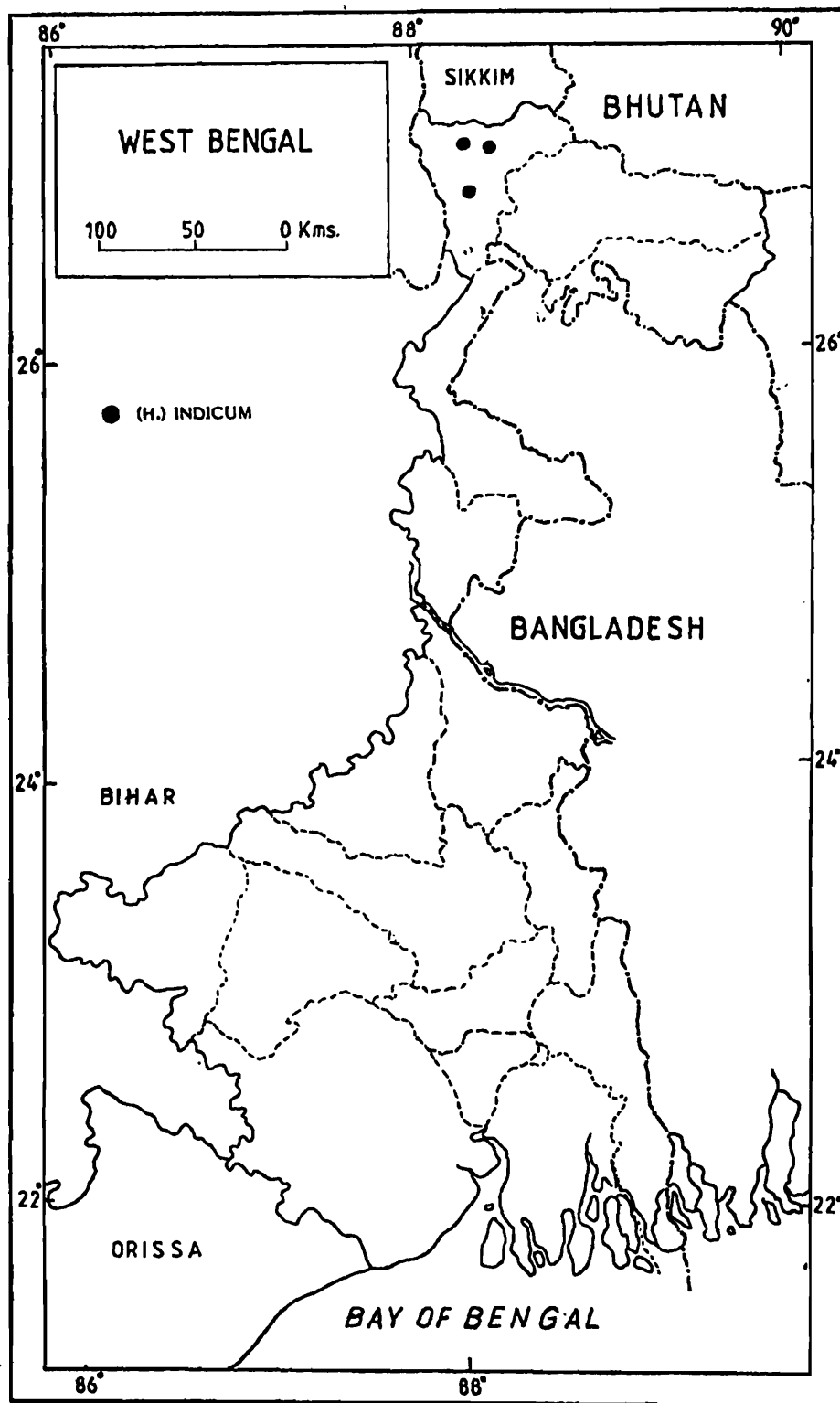
Map3. Distribution of (*E.*) *nemorivagum* and (*E.*) *praelargum*.



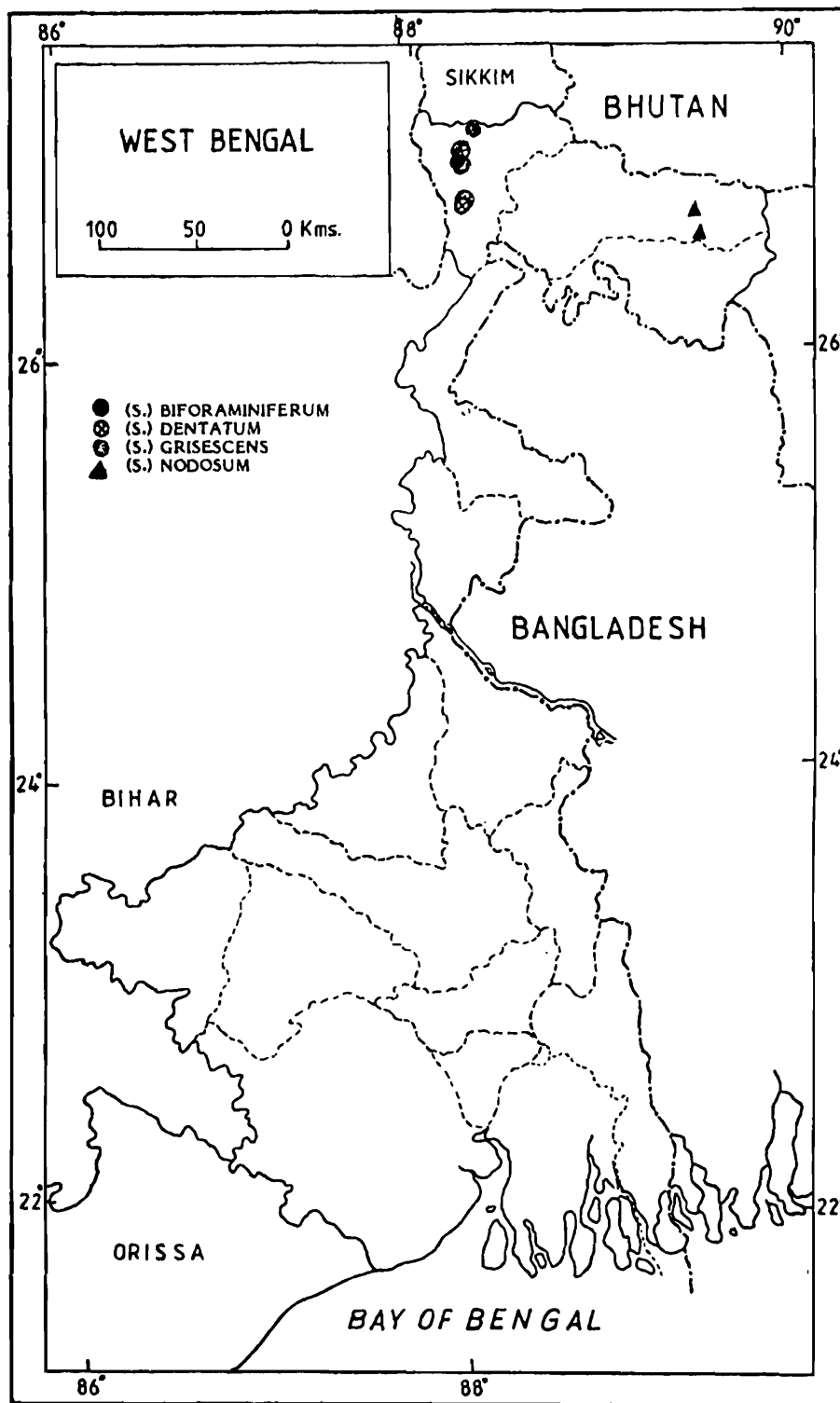
Map 4. Distribution of (*E.*) *ghoomense*, (*E.*) *gracile* and (*E.*) *purii*



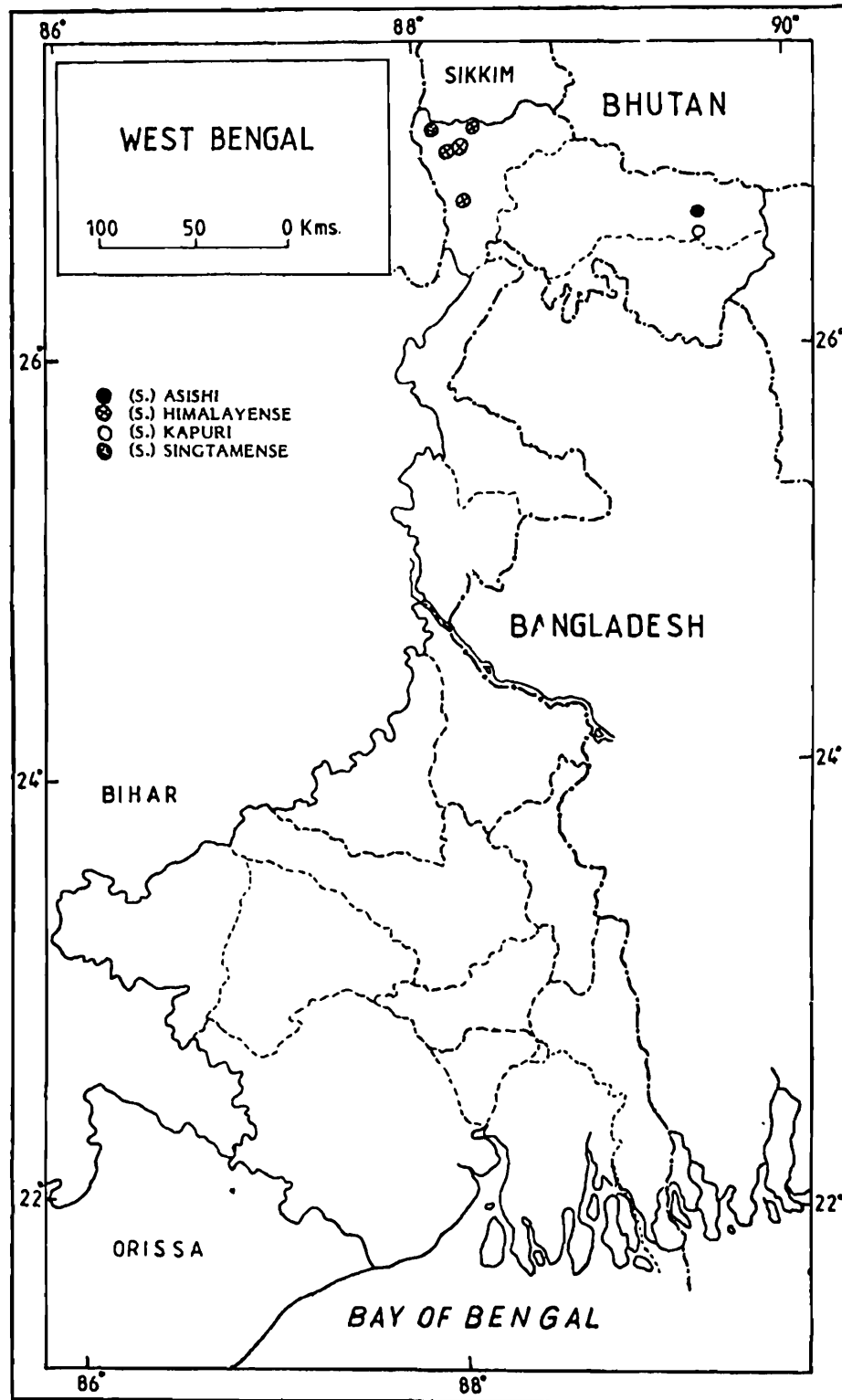
Map 5. Distribution of *(G.) darjeelingense*, *(G.) metatarsale*, *(G.) sundaicum* and *(G.) tenuistylum*.



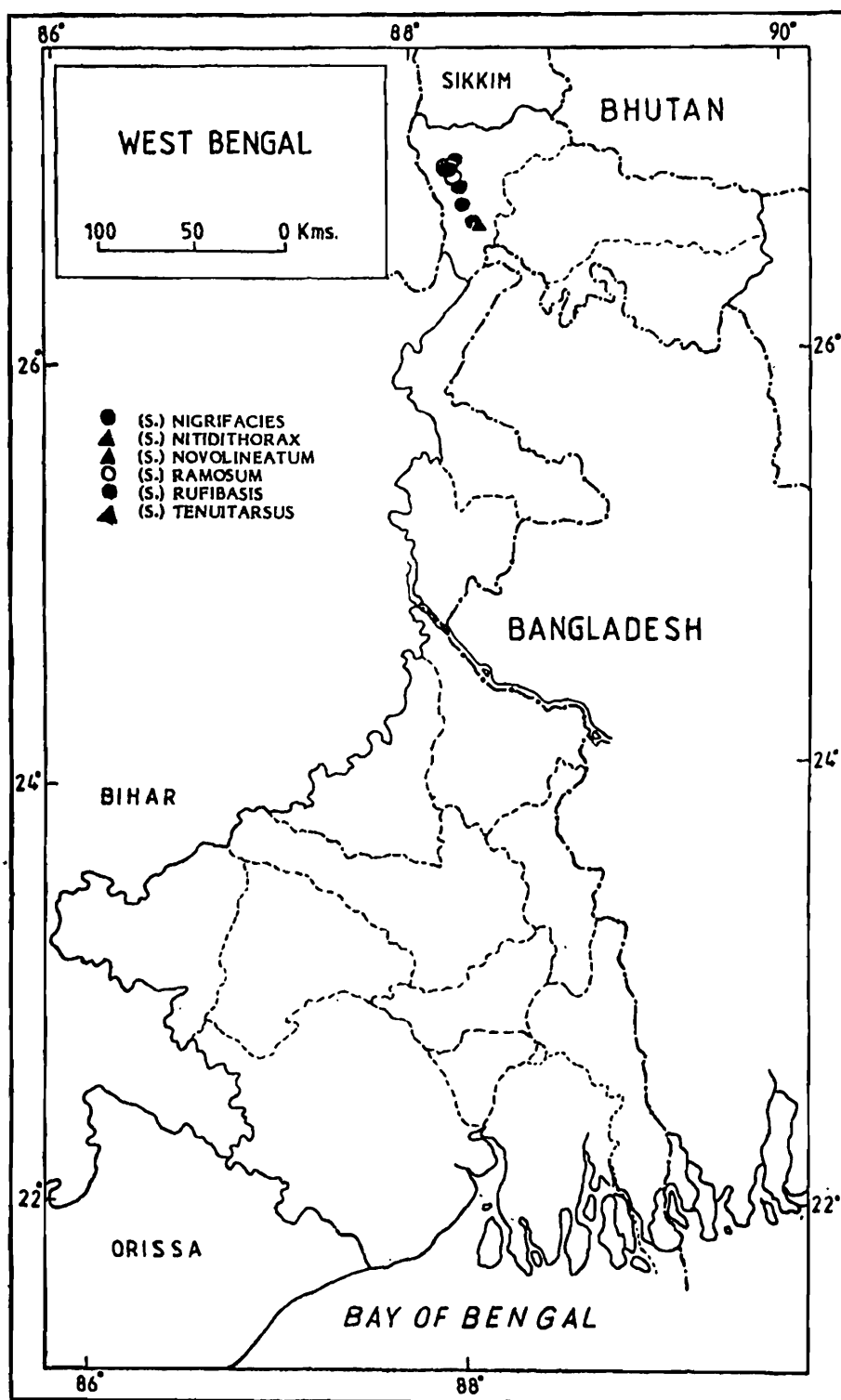
Map 6. Distribution of (H.) indicum.



Map 7. Distribution of (*S.*) *biforamiferum*, (*S.*) *dentatum*, (*S.*) *grisescens* and (*S.*) *nodosum*.



Map 8. Distribution of *(S.) asishi*, *(S.) himalayense*, *(S.) kapuri* and *(S.) singtamense*.



Map 9. Distribution of *(S.) nigrifacies*, *(S.) nitidithorax*, *(S.) novolineatum*, *(S.) ramosum*, *(S.) rufibasis* and *(S.) tenuitarsus*.

DISCUSSION

The simuliid fauna of West Bengal is fairly well-known (*cf.* Datta, 1991). It is only little-diversified and is entirely typical for the Oriental region despite a few species extending their range beyond it. However, the fauna in the Himalayan and the sub-Himalayan areas is evidently much richer than that in the plateau areas on account of wide difference in the physiography.

Of the four subgeneric segregates in West Bengal, *Simulium s. str.* is dominant over the others. Whereas *Eusimulium* is well-represented, *Gomphostilbia* is unusually deficient, though they are very close to each other. *Himalayum* is hitherto known only by a single species (type-species) that occurs in the entire Himalayan range and mountains to the south-east (Lewis, 1973; 1974).

The most widespread species in *Eusimulium* is (*E.*) *aureohirtum* Brunetti (*ruficorne*-group) successfully colonizing a vast area as far as Borneo and Japan in the east (Smart & Clifford, 1969; Ogata & Sasa, 1954), and Pakistan in the west (Puri, 1933 c). Other species are so far known only from West Bengal. It is most interesting to note that this widespread species, together with (*G.*) *sundaicum* Edwards, an exotic species, constitute the total fauna of the plateau area of West Bengal (Datta, *in press*). The only other species in *Gomphostilbia* that has reportedly been encountered elsewhere in the Orient is (*G.*) *metatarsale* Brunetti. The remaining two species are still known only from West Bengal.

The largest segregate accounting for about one-half of the simuliid fauna is represented by the species of *Simulium s. str.* which predominantly breed in the permanent mountain streams or cascades that exist abundantly in the Himalaya. Whereas, most of the species are endemic to the Indian sub-region, some, such as, *rufibasis* Brunetti, *nitidithorax* Puri (both in the *tuberosum*-group), ? *grisescens* Brunetti (*multistriatum*-group), *nodosum* Puri (*nobile*-group) and *himalayense* Puri (*variegatum*-group) have shown to extend their distributional range elsewhere in the Orient or in the Palearctic region (Ogata & Sasa, 1954; Bentinck, 1955; Crosskey, 1973; Lewis, 1973, 1974; Takaoka, 1977, 1979; Takaoka & Suzuki, 1984).

The foregoing discussion thus certainly leads to the conclusion that the simuliid fauna of West Bengal may be looked upon as one of pre-eminently specialized faunas in India.

SUMMARY

The Simuliidae of West Bengal comprise 27 species including 2 new records and 7 recognized unnamed taxa assignable to 4 subgenera : *Eusimulium* Roubaud, *Gomphostilbia* Enderlein, *Himalayum* Lewis and *Simulium* Latreille (*s. str.*) under the genus *Simulium* Latreille (*s. l.*) of the tribe Simuliini in the subfamily Simuliinae. Taxonomic terminology with illustrations, and key, diagnosis (wherever necessary) and distribution are provided with the supra-generic, generic and subgeneric segregates in the adult, pupal and larval stages, along with a brief general discussion as an appendix, and methodology of collection and preservation as an introduction to the study of the Simuliidae.

ACKNOWLEDGEMENTS

The author offers his grateful thanks to Prof. Dr. M. S. Jairajpuri, Director and Drs. S. K. Bhattacharyya, Scientist 'SF', S. K. Tandon, Scientist 'SE' and B. Datta, Scientist 'SE' of the Entomology Division, for conducting survey and extending facilities for works. The author is also

much indebted to Dr. A. K. Ghosh, Scientist 'SF' of this Organisation, for the encouragement and keen interest in this work. The author is also grateful to Prof. Dr. B. Dasgupta, Principal, Darjiling Government College, West Bengal, for the kind consent to utilize the entire material collected by the author and by his students during his fellowship at Darjiling. Grateful acknowledgement is also due to his specialist-colleagues abroad for their generous and invaluable assistance in all possible ways. In fine, sincere thanks are also acknowledged to Messrs Anil Kumar Bhattacharyya and Haradhan Das of this Organization for their immense help in certain technical attainment.

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INSECTA : DIPTERA : CHIRONOMIDAE

P.K.CHAUDHURI AND SAILESH CHATTOPADHYAY
*Entomology Research Unit, Department of Zoology,
Burdwan University, Burdwan 713 104, West Bengal, India.*

INTRODUCTION

On account of ubiquity, abundance and diversity, dipteran flies of the family Chironomidae represent one of the most important groups of aquatic macroinvertebrates. The larvae and pupae of most species occur in freshwater and are also prevalent in marine, brackish water and terrestrial habitats. The range of habitats occupied by the chironomid midges is unparalleled among other insect groups. Their abode includes the littoral and benthic regions of lakes, ponds, temporary pools, bogs, marshes, swamps, pitcher plants, bromeliads, water fall, glacial melt water, swift and slow rivers, hot (44.50-500C) and cold springs marine and littoral, water filled plant axils and tree holes.

Chironomids display an exceptionally wide range of sensitivity to environmental parameters such as DO, pH, salinity, substrate, water current, depth, food, temperature, dehydration, freezing and pollution by organic wastes, heavy metals and contaminants. The usefulness of chironomid communities in environment (assessment has been demonstrated in lake classification system (Brundin, 1949; Saether, 1975, 1979; Warwick, 1980). The worms are also believed to play important role in indicating radioactive pollution (Curry, 1960). Chironomid larvae play a primary role in accumulation and transmission of contaminants because they function at a fundamental level in the food chain (Pinder, 1986). The larvae form an integral link in aquatic food chain and constitute a biological connection between aquatic and terrestrial habitat (Mason, 1973) and ostensibly human is intimately linked to these systems (Warwick, 1990). The larval head capsule is virtually impervious to normal dehydration processes and is incorporated into sedimentary record more or less intact. Paleolimnological changes in freshwater ecosystems are both natural and anthropogenic in nature (Warwick, 1980). The chironomid larvae form an integral part of the natural diet for fish (Dendy and Sublette, 1956; Beck and Beck, 1959; Lellak, 1974; Mackey, 1977; Lindegaard and Jonasson, 1975) and food for diving ducks. By virtue of possession of polytene chromosomes in the salivary glands, they have gained importance in various disciplines of Cytogenetics, Cytochemistry and Molecular biology (Martin, 1979; Michailova 1989). The larvae are also used as experimental material in various disciplines of Life Sciences. The worms are also considered as "test animals" in the study of phylogeny and Zoogeography (Brundin, 1966; Saether, 1979 and Cranston, 1989). Despite their non-biting habit, the midges are implicated in a variety of nuisance problems, health hazards, human diseases and economic Problems. Both larval and adult chironomids have been reported to be involved in human allergic disease causing type I allergic reactions such as bronchial asthma, conjunctivitis, hay fever, seasonal rhinitis and skin hypersensitivity (Cranston et al., 1981, 1983; Kawal and Konishi, 1986, 1988; Edahiro et al., 1989). The principal allergens responsible have been shown to be the larval haemoglobin which can be retained in the adult midges (Baur, 1982; Tee et al., 1985; Prelicz et al., 1986). The larvae have achieved true public health significance by spreading high blood pressure amongst municipal water workers (Beck, 1976). The midge larvae might often serve as mechanical carrier of

pathogens causing diseases from polluted waters such as *Legionella* which cause bronchopneumonia in human Chironomids are reported as agricultural unisance in potatoes (Paich, 1971), crop pests (Cranston, 1987), lettuce and tomatoes, house radish (Ishihara, 1972), leaves of *Brasenia* sp., a favourite chinese dish, rice crops and seedlings (Darby, 1962; Jones, 1969; Sasa and Kikuchi, 1986; Hashimoto *et. al*; 1981; Chaudhuri and Chattopadhyay, 1990).

HISTORICAL RESUME

Wiedemann (1824) recorded the first Indian Chironomid, *Tanytus crux*. The faunistic survey of Kieffer (1906, 1910, 1911, 1913 and 1914), Edwards (1932) and Pagast (1947) contributed 147 species in 21 genera mostly from this state. Later on, Singh (1958), Singh and kulshrestha (1975, 1976, and 1977) and Kulshrestha (1979) added 13 species to the list of Indian chironomids. Sublette and Sublette (1973) in their revision of Oriental Chironomids could determine the systematic position of 56 species from description and illustrations made originally by Kieffer from India. In absence of types and adequate account, bulk of the perviously know species have been remaining unsettled. Significant contribution to the chironomids of India specially of West Bengal in respect to systematics, biology and ecology have been made by Chaudhuri and his co-workers during the last 14 years (1978-1992).

ENVIRONS

The topographical and climatic features of West Bengal are varied so is the faunal composition. The whole regions from the Himalayas to the Ray of Bengal has been divided into 5 or 6 definite zones and each zone has distinctive population of chironomids. The faunistic survey conducted in the last 14 years comprises all the zones of West Bengal such as, montane, submontane, lateritic, palaeoaluvial, neoalluvial and estuarine.

MORPHOLOGY, BIOLOGY AND ECOLOGY OF CHIRONOMIDS

The adults are commonly referred to as "blind mosquitoes" and the larvae of some chironomids known as "red or bloodworms" which is used to bridge the gap between biologist and bon-biologist.

The adult midges are recognised from other dipterans by i) antenna usually long, slender consisting of 13-14 segents (o) and 6 segments (o), ii) costa confined to the anterior wing margin, iii) ocelli absent, iv) vien M simple and v) non-biting mouth parts. The larvae are tubiculous, free living or surface dwelling, their food being mainly diatoms, algae and various aquatic plants whilecarnivore larvae feed on smaller chironomid larvae, *Cladocera*, *Tubifex* and the larvae of other insects. The greate part of life cycle is spent in the larval stages consisting of four instars because the energy required to complete life cycle is built in the form of body tissue during the larval stage since the adults with a few exceptions don't feed. The intermediate pupal stage lasts only for a few hours of a day while the adults live for 2-3 days to one week in some cases. The life cycle is comparatively short, many species are uni-or bivoltine but occurrence of three or more annual generations are not uncommon. The life cycle, various aspects of biology and ecology of species of *Chironomus* Meigen, *Cladotanytarsus* Kieffer, *Clinotanytus* Kieffer, *Cryptochironomus*, Kieffer, *Dicrotendipeds* Kieffer, *Glyptotendipes* Kieffer, *Kiefferulus* Goetghebuer, *Microchironomus* Kieffer, *Polypedilum Strictochironomus* Kieffer, *Tanytus* Meigen and *Tanytarsus* v.d. Wulp from West Bengal have been studied (Chaudhuri and Nandi, 1984; Chaudhuri, Nandi and Ghosh, 1983; Chaudhuri

and Ghosh, 1986; Ali, Chaudhuri and Guha, 1987; Chaudhuri and Chattopadhyay, 1987, 1988, 1990; Chattopadhyay and Dutta, 1988; Chattopadhyay, Dutta and Chaudhuri, 1988 a, 1988 b; Chaudhuri, Nandi and Ghosh, 1988; Chaudhuri and Das, 1988, 1989; Bhattacharyay and Chaudhuri, 1989; Chattopadhyay, Madumdar and Chaudhuri, 1991; Chaudhuri, Das and Sublett, 1992).

CLASSIFICATION

The family Chironomidae is now recognised into 10 subfamilies, Telmetogetoninae Wirth, 1949; Chilenomyiinae Brundin, 1983 a; Tanypodinae Kieffer, 1906; Aphroteniinae Brundin, 1983 b; Podonominae Thienemann, 1937; Buchgonomyiinae Brundin and Saether, 1978; Diamesinae Kieffer, 1983; Prodiamesinae Saether, 1976; Orthoclaudiinae Kieffer, 1911 and Chironominae Macquart in Grunberg, 1910. Of these 10 subfamilies only 4 have so far been recognised from West Bengal so far from this country. Uptil now 197 species in 47 genera from West Bengal have been confirmed. There are quite a good number of species whose systematic position are still obscure due to obvious reasons and for that reason, the species have been treated as 'Nomina dubia' (Chaudhuri and Guha, 1987).

TAXONOMIC ACCOUNT

Family CHIRONOMIDAE

Subfamily DIAMESINAE

Genus I *Diamesa* Meigen in Gistel,

1835. *Diamesa* Gistel, *Fauna* 2:66.

Key to species of Genus *Diamesa* Meigen

1. Haltere setose, gonostylus of male hypopygium with an apical tooth
 *D.edentistyla* Bhattacharyay & Chaudhuri
- Halters bare, gonostylus of male hypopygium without apical tooth
 *D.bicornipes* Chaudhuri & Ghosh

1. *Diamesa Bicornipes* Chaudhuri & Ghosh

1981. *Diamesa bicornipes* Chaudhuri & Ghosh, *Ent. Berich.* 41:92

Material examined: 5(M), Darjeeling, 7.iv. 1979, Coll. Ms. S. Sarkar.

2. *Diamesa edentistyla* Bhattacharyay & Chaudhuri

1991. *Diamesa Edentistyla* Bhattacharyay & Chaudhuri, *Rec. Zool. Surv. Ind.* 89.

Material examined : 3(M), Darjeeling, 23-24.v.1987, Coll. P.K.Chaudhuri.

Subfamily TANYPODINAE

Genus II *Ablabesmyia* Johannsen,

1905. *Ablabesmyia* Johannsen, *Bull. New York State Mus.*, **86**: 135.

Key to species of Genus *Ablabesmyia* Johannsen

1. Tibia with three dark brown bands2
 Tibia with four dark brown bands
 *A. maculotibialis* Chaudhuri, Debnath & Nandi
2. Lateral aelengal lobe of male hypopygium present3
 Lateral aedeagal lobe of male hypopygium absent *A. photophilus* (Kieffer)
3. Abdomen with bands, antepnotum lobed4
 Abdomen without bands, antepnotum not lobed5
4. Lateral aedeagal lobe of male hypopygium shord like, tergites VI-VII with apical whitish are
 *A. ensiceps* Chaudhuri, Debnath & Nandi
 Lateral sedeagal lobe of male hypopygium expanded, tergites VI-VIII with apical pruinosity
 *A. Transversus* Chaudhuri, Debnath & Nandi
5. Wing with 5 dark spots. Abdominal tergites uniformly light brown in colour
 *A. pulchripes* (Kieffer)
 Wing with 4 dark spots. Abdominal tergites uniformly white in colour
 *A. alba* Chaudhuri, Debnath & Nandi.

3. *Ablabesmyia alba* Chaudhuri, Debnath & Nandi

1983. *Ablabesmyia alba* Chaudhuri, Debnath & Nandi, *J. Nat. Hist.* **17** : 902.

Material examined : 10 (M), 10 (F), Chittaranjan, 29. X. 1978, Coll. U. Goswami: 3 (M), 2 (F), Bolpur, 7. vii. 1979, Coll. Ms. S. Nath; 2 (M) 2 (F) Burdwan, 2 v. 1979, Coll. S. Nandi; 2 (M) 2 (F), Calcutta, 26. vii. 1979, Coll. P.K. Chaudhuri; 5 (M) 3 (F), Durgapur, 7. iv. 1979, Coll. R.K. Debnath; 2 (M), 2 (F) Garbeta, 4 v. 1979, Coll. S. Nandi; 1 (M), 1 (F), Kakdwip, 9 v. 1977, Coll. D.K. Guha; 7 (M), 5 (F), Raniganj, 31. iii. 1978, Coll. R.K. Debnath.

4. *Ablabesmyia ensiceps* Chaudhuri, Debnath & Nandi

1983. *Ablabesmyia ensiceps* Chaudhuri, Debnath & Nandi, *J. Nat. Hist.*

Material examined : 1(M), 1(F), Raniganj, 5v. 1978, 17 : 907 Coll. R.K. Debnath; 1(M), Bongaon, 4.viii. 1979, Coll. U. Goswami; 1 (M), 4 (F) Basirhat, 1.viii.1979, Coll. M. Nath; 2(M), 1(F), Burdwan, 12. iv. 1979, Coll. S. Nandi; 2(M), 2(F), Calcutta, 2.v.1979, Coll. D.K. Guha; 2(M), Chittaranjan, 4.iv. 1979, Coll. C. Das.

5. *Ablabesmyia maculitibialis* Chaudhuri, Debnath & Nandi

1983. *Ablabesmyia maculitibialis* Chaudhuri, Debnath & Das, *J. Nat. Hist.* 17 : 907.

Material examined : 6(M), 9(F), Raniganj, 2.viii. 1977, 24-26, viii, 1977, Coll. R.K. Debnath; 2(M), 3(F), Bolpur, 4.vii. 1979, Coll. Ms. S. Nath; 32(M), 5(F), Calcutta, 4.iv. 1978, Coll. P.K. Chaudhuri; 2(M), 2(F), Garia, 4.vii. 1978, Coll. S. Nandi; 2(M), 1(F), Kakdwip, 2.ix. 1978, Coll. D.K. Guha.

6. *Ablabesmyia transversus* Chaudhuri, Debnath & Nandi

1983. *Ablabesmyia transversus* Chaudhuri, Debnath & Nandi, *J. Nat. Hist.* 17:909.

Material examined : 8(M), 8(F), Raniganj, 12.iv. 1978, 20-27, ix. 1980, Coll. R.K. Debnath; 9(M), 5(F) Burdwan, 1-4.iv. 1979, Coll. P.K. Chaudhuri; 3(M), 2(F) Calcutta, 19.v.1980, Coll. D.K. Guha; 3(M), 3(F), Kakdwip, 4.iv. 1978, Coll. D.K. Guha.

7. *Ablabesmyia photophilum* (Kieffer)

1911. *Isoplastus photophilus* Kieffer, *Rec. Ind. Mus.*, 6 : 126.

1973. *Ablabesmyia photophilus* (Kieffer): Sublette & Sublette, *Univ. Hawaii Press Reg.*, 1 : 390: Chaudhuri, Debnath & Nandi, 1983, *J. Nat. Hist.* 17 : 912.

Material examined : 2(M), Durgapur (Dist. Burdwan) 3.viii. 1978, Coll. K.K. Nandi; 5(M), 4(F), Raniganj, 6.X. 1978, Coll. R.K. Debnath; 2(M), 1.viii.1970, Coll. R.K. Chaudhuri; 1(M), 3(F), Habra, Coll. K.C. Das.

Distribution : India : West Bengal and Bihar.

8. *Ablabesmyia pulchripes* (Kieffer)

1910. *Isoplastus pulchripes* Kieffer, *Mem. Indi Mus.* .2 : 214.

1973. *Ablabesmyia pulchripes* (Kieffer) : Sublette & Sublette, *Univ. Hawaii Press*, 1 : 390.

Material examined : 2(M), Calcutta, 2.viii. 1980. Coll. P.K. Chaudhuri

Genus III *Conchapelopia* Fittkau,

1957. *Conchapelopia* Fittkau, *Arch Hydrobiol.* 53 : 313.

9. *Conchapelopia falcistylus* Chaudhuri & Debnath

1983. *Conchapelopia falcistylus* Chaudhuri & Debnath, *Entomon*, 8 (3):297..

Material examined : 5(M), Burdwan, 3.viii. 1978, Coll.S.K. Nandi.

Genus IV *Clinotanypus* Kieffer,

1913. *Conchapelopia falcistylus* Kieffer, *Rec. Ind Mus.* 9 : 157.

Key to species of Genus *Clinotanypus* Kieffer

1. Mesonotum without spot2
- Mesonotum with dark spots3
2. Thorax reddish yellow, wing spots broad, cell C infuscated, cross vein ratio 0.38
..... *C. fumipennis* (Kieffer)
- Thorax blakish. Wing spots narrow, cell C aclear, cross vein ratio 0.14
..... *C.vomerus* Chaudhuri & Debnath
3. Mesonotum with 9 small black spots, wing without cloud or spots
..... *C. novempunctatus* (Kieffer)
- Mesonotum with less than 8 spots. Wing with well developed cloud and spots4
4. Anteprenotum not bilobed, mesonotum with 6 spots Fore tibia without comb
..... *C. ornatissimus* (Kieffer)
- Anteprenotum bilobed, mesonotum with 8 spots. Fore tibia with comb
..... *C.ornatissimus* (Kieffer)

10. *Clinotanypus fuscisignatus* (Kieffer)

1910. *Procladius fuscisignatus* Kieffer, *Mem. Ind. Mus.* 2 : 218

1973. *Clinotanypus fuscisignatus* (Kieffer) : Sublette & Sublette *Univ. Howai Press.* 1.390.

Material examined : 1(M), Paratype (Z.S.I. No.. 63/20), Calcutta, 13.8 viii. 1909; 4(M), Calcutta. 29.IX. 1977, Coll. R.K. Debnath; 1(M) Purulia, 24. VI. 1980, Coll. P. De; 1(M) 2(F), Raniganj; 22. VIII.1977. Col. R.K. Debnath.

11. *Clinotanypus fumipennis* (Kieffer)

1910. *Procladius fumipennis* Kieffer, *Mem. Ind Mus.*, 2 : 271.

1973. *Clinotanypus fumipennis* (Kieffer) : Sublette & Sublette & Sublette, *Univ. Howai Press* : 391.

Material examined : 1(M), Paratype (Z.S.I. No.. 148/9), Calcutta, 29III. 1908; 2(M), Raniganj,. 20.VI. 1979, Coll. R.K. Debnath; 2(M) Calcutta, 2. IX. 1977, Coll.R.K. Debnath.

12. *Clinotanypus novempunctatus* (Kieffer)

1910. *Procladius novempunctatus* Kieffer, *Mem. Ind. Mus.*, 2 : 219.
 1973. *Clinotanypus novempunctatus* (Kieffer) : Sublette & Sublette, *Univ. Howai Press*, 1 : 319.

Material examined : 1(M), Paratype (Z.S.I. No..3733/1+1), Calcutta, 4III.. 1907; 2(M), Burdwan. 4.V. 1977, Coll. S.N. NANDI; 2 (M) Punulia, 20. V. 1979, Coll. M.

13. *Clinctanypus ornatissimus* (Kieffer)

1910. *Procladius ornatissimus* Kieffer, *Mem. Ind., Mus*, 2 : 216.
 1973. *Clinotanypus ornatissimus* (Kieffer) : Sublette and Sublette, *Univ. Howai Press*, 1 : 391.

Material examined : 1(M), Paratype (Z.S.I. No.. 82/20), Calcutta January. 1908; 2(M): Burdwan. 15.IV. 1980, Coll.L.K. Debnath.

14. *Clinotanypus vomerus* Chaudhuri & Debnath

1984. *Clinotanypus vomerus* Chaudhuri & Debnath, *B.U.Jour. S. I*:83

Material examined : 1(M), Raniganj, 14. vii. 1979, Coll. R.K. Debnath; 3(M), Basirhat, 3.v. 1978, Coll.R.K. Debnath; 4(M), Burdwan, 7, iii 1978, Coll. P.K.Chaudhuri; 2(M), Calcutta, 14. vii.1979, Coll. D.K. Nath; 3(M), Garbeta, 5.v. 1980, Coll. S.K. Nandi; 1(M), purulia 24.v. 1979, Coll. R.K.Debanth.

Genus VIII.*Djalmabatista* Fittkau,

1968. *Djalmabaatista* Fittkar, *Amazoniana*. 1:327.

Key to species of Genus *Djalmabatista* Jittkau

Wing with a rounded brown spot over RM. Tibial spur with 2 lateral teeth *D. reidi* (Freeman)

Lateral teeth *D.reidi* (Freeman)

Wing without any spot Tibial spur with 3 lateral teth *D.bifida* (Chaudhuri & Debanath)

15. *Djalmabatista bifida* (Chaudhuri & Debnath)

1983. *Procladius (Calotanypus) bifida* Chaudhuri & Debanath *Zool.Jb. Syst.* 110 : 115

Material examined : 1(M), Raniganj, 24. IV. 1978, Coll, R.K. Debnath; 6(M) 1987.

16. *Djalmabatista reidi* (Freeman)

1955. *Procladius reidi* Freeman, *Bul. Br. Mus. nat. Hist. Ent.*, 4:61.
 1987. *Djalmabatista reidi* (Freeman): Chaudhuri & Guha, *Ent. Scand, Supple* 29:26.

Material examined: 2(M), 2(F), Burdwan, 12.V.1976, Coll. S.Nandi; 4(M), 1(F), Habra, 24.9.1978, Coll. Rani Debi; 3(M), Calcutta.24.7.1978, Coll. D.K.Debanth.

Distribution : India (West Bengal) & Africa.

Genus IX. *Paramerina* Fittkau

1962. *Paramerina* Fittkau, Abh, *Larvalsyst. Insekten*=6: 317.

Key to the species of Genus *Paramerina* Fittkau

1. Wing unmarked, tibial spur bearing 3 teeth *P. quinifolia* Chaudhuri & Debnath
- Wing marked, tibial spur bearing 4 teeth *P. inficia* Chaudhuri & Debnath

17. *Paramerina inficia* Chaudhuri & Debnath,

1985. *Paramerina inficia* Chaudhuri & Debnath, *Spixiana suppl.* 11 : i67.

Material examined : 1(M),1(F) Raniganj, 10 .ii. 1979, Coll. R.K. Debnath; 5(M), 3(F), Basirhat, 9.iv 1978, Coll. M. Nath; 4(M),2(F),Burdwan, 16.ii. 1978, Coll. DK. Nath; 1(M) Rahara,25, ii. 1979, Coll. P.K.Chaudhuri.

18. *Paramerina quinifolia* Chaudhuri & Debnath

1985. *Paramerina quinifolia* Chaudhuri & Debnath, *Spixiana Suppl.* 11:169.

Material examined :1(M), 1(F), Raniganj, 27. ii. 1978, Coll. R.K.Debnath; 5(M), 2(F), bongaon, 24.ix.1979, Coll. C. Bhowmick; 10(M), 3(F), Basirhat, 24. vi 1979, Coll. S.Nath 5(M), 1(F), Durgapur, 27.x. 1977, Coll. P.K.Chaudhuri; 2(M), Naihati, 15. ix.1980.Coll. P.Dutta.

Genus VII *Procladius* Skuse,

1889. *Procladius skuse* *Proc. Linn. Soc. N.S.W.*,4: 283.

Key to species of Genus *Procladius* Skuse

1. Wing with spots. Heel of gonostylus proninant
..... *P. noctivagus* Kieffer
- Wing without spot. Heal of gonostylus not pronounced 2
2. Vein RM thickened. Gonostylus with 1 preapical tooth
..... *P. fuscipes* Chaudhuri & Debnath
- Vein RM ont thickened, Gonostylus with 2 preapical teeth
..... *P.duplexus* Chaudhuri & Debnath

19. *Procladius noctivagus* Kieffer,

1910. *Procladius noctivagus* Kieffer, *Mem. Ind. Mus.*, 2 : 222.

Material examined :2(M), 2(F), Bankura, 2.V. 1977, Coll. S.Nandi; 1(M), 1(F), Calcutta,, 3.iv.1978, Coll. P.K.Chaudhuri; 1(M), 1(F), Habra, 7.VIII 1979, Coll. D.Debnath; 2(M), 4(F), Raniganj,4.31.1986 .Coll. R.K.Debnath.

Distribution : India (West Bengal) and Africa.

20. *Procladius fuscipes* Chaudhuri & Debnath

1983. *Procladius fuscipes* Chaudhuri & Debnath, *Zool. Jb. Syst.* 110:117.

Material examined :1(M), 1(F), Raniganj, 30. viii. 1977, R.K.Debnath; 2(M), Burdwan, 22.iv.1978, Coll. S.Pal; 1(M), 1(F), Chittaranjan, 12. viii. 1979, Coll. U.Goswami; 1(M), Garbeta., 24.i.1979. Coll. M.Dutta.

21. *Procladius duplexus* Chaudhuri & Debnath

1983. *Procladius duplexus* Chaudhuri & Debnath, *Zool.Jb.Syst.* 110:119.

Material examined :6(M), Durgapur, 24, viii. 1978, Coll. R.K.Debnath.

Genus VIII *Tanypus* Meigen,

1983. *Tanypus* Meigen, *Illigers Mag. INsektenk*,2:261.

Key to species fo Genus *Tanypus* Meign

1. Mesonotal tubercle oval. Vein M with sopt 2
 Mesonotal tubercle round or spherical. Vein M without spot
 *T.lucidus* Chaudhuri, Das & Debnath
2. Anteprenotum bilobed. Veir M with 2 spots. Gonostylus with 2 teeth
 *T T. bilobatus* (Kieffer)
- Anteprenotum not bilobed. Vein M with 1 spot. Gonostylus with 1 tooth 3
3. Cell R4+5 with 4 spots. Tarsal segments uniformly dark brown
 *T. tenebrosus* Chaudhuri, Das & Debnath
- Cell R4+5 with 5 spots. Tarsal segments not as above
 *T. tenebrosus* Chaudhuri, Das & Debnath

22. *Tanypus bilobatus* (Kieffer)

1913. *Procladius bilobatus* Kieffer, *Rec. Ind. Mus.*, **9** : 155
 1983. *Tanypus bilobatus* (Kieffer) : Chaudhuri, Nandi & Ghosh, *Arch. Hydrobiol.*, **97** : 122.

Material examined : 1(M), Calcutta, 1909, Coll. J.J. Kieffer (Z.S.I. Regd. No. 1652/20) 5(M) & 2(F), 4.III.1979, Bongaon Coll. R. Bhownick 6(M) 4(F) Purulia, 24. VI. 1979, Coll K.Ee; 2(M)& 2(F), Durgapur, 21.0, 1979, Coll. S. Nandi; 5(M), Bankura, 3.IV, 1986, Coll, Krishana G. Chatterjee

Distribution : India : West Bengal and Assam.

23. *Tauypus grandis* Chaudhuri, Das & Debnath,

1988. *Tauypus grandis* Chaudhuri, Das & Debnath, *Bull. Ent. Pol.* **55** : 100.

24. *Tanypus lucidus* Chaudhuri, Das & Debnath

1988. *Tanypus lucidus* Chaudhuri, Das & Debnath, *Bull. Ent. Pol.* **55** : 105.

Material examined : 5(M),3(F), Raniganj, 31.III. 1978, & 14.III 1980 Coll. R.K. Debnath: 1(M) 1(F), Basihat, 4.vii.1979, Coll. C. Bhownick 1(M) Bongaon, 28. iii. 1978, Coll D. Nath; 5(M) 4(F), Calcutta 2.ii, 1979, Coll. P. K Chaudhuri; 2(M), 3(F), Durgapur, 19.ii.1979, Coll. N. Sarkar.

Genus IX. *Thienemannimyia* Fittkau

1957. *Thienemannimyia* Fittkau *Arch. Hydrobiol.* **53** : 315.

26. *Thienemannimyia (Rheopelopia) tuberculata* Chaudhuri & Debnath

1987. *Thienemannimyia (Rheopelopia) tuberculata* Chaudhuri & Debnath, 36:53;

Proc Zool Soc. Calcutta 36 : 53

Material examined : 5(M),4(F), Jainti, 3.III. 1979, Coll. P.K. Chaudhuri.

Subfamily ORTHOCLADIINAE

Genus X. *Allotrissocladius* Freeman,

1964. *Allotrissocladius* Freeman, *Proc. R. Ent. Soc.*, London, **33**:147.

27. *Allotrissocladius acutus* Chaudhuri & Nandi

- 1979 *Allotrissocladius Acutus* Chaudhuri & Nandi, *J. Bomb. Nat. Hist. Soc.*, **77**:292

Material examined : 6(M), Darjeeling, 6.V 1970, Coll. P.K. Chaudhuri.

Genus XI *Bryophaenocladus* Thienemann,1934 *Bryophaenocladus* Thienemann, *Entomo. Z.* 96:21.Key to species of the Genus *Bryophaenocladus*

Anteprenotum with 3 lateral anteprenotals, outure indistinct. Anal point of male hypopygium short.
 *B. manifestus* Ghosh & Chaudhuri

Anteprenotum with 2 lateral anteprenotals, suture distinct. Anal point of male hypopygium long.
 *B. longipenis* Ghosh & Chaudhuri

28 *Bryophaenocladus longipenis* Ghosh & Chaudhuri1983 *Bryophaenocladus longipenis* Ghosh & Chaudhuri, *J. beng. nat. hist. Soc.* 2 : 28.

Material examined : 5(M), Darjeeling, 16.V.1969, 1.vii. 1977, i.x. 1978, Coll. S.K. Das Gupta and P.K. Chaudhuri.

29 *Bryophaenocladus manifestus* Ghosh & Chaudhuri1983 *Bryophaenocladus manifestus* Ghosh & Chaudhuri, *J. Beng. nat. hist. Soc.* 2 :29.

Material examined : 5(M), Darjeeling, 16.V.1969, 24.x. 1977, Coll. S.K. Das Gupta and P.K. Chaudhuri. 1(M), JOrbanglow, 7v. 1969, Coll. P.K. Chaudhuri.

Genus XII *Chaetocladus* Kieffer,1911. *Chaetocladus* Kieffer, *Bull. Soc. Ent. Fr.*, 8:182.Key to species of the Genus *Chaetocladus* Kieffer

1. Anal point of male hypopygium pointed 2
 Anal point of male hypopygium not pointed 3
2. Vein R₄₊₅ bare. Gonostylus of male hypopygium chopper like
 *C. curvatus* Bhattacharyay, Chattopadhyay & Chaudhuri
 Vein R₄₊₅ setose. Gonostylus of male hypopygium short and swollen
 *C. dilatatus* Bhattacharyay, Chattopadhyay & Chaudhuri
3. Borsal lobe of gonocoxite digitiform, gonostylus spatulate
 *C. tenuiflexus* Bhattacharyay, Chattopadhyay & Chaudhuri

Corsal lobe of gonocoxite triangular, gonostylus slender
 *C. artistylus* Bhattacharyay, Chattopadhyay & Chaudhuri

30 *Chaetocladius artistylus* Bhattacharyay & Chaudhuri

1993 *Chaetocladius artistylus* Bhattacharyay, Chattopadhyay & Chaudhuri, *Eur. J. Entomol.* **90**:87

Material examined : 5(M), Darjeeling, 8.V.1984, Coll. D.K. Guha.

31 *Chaetocladius curvatus* Bhattacharyay & Chaudhuri

1993 *Chaetocladius curvatus* Bhattacharyay, Chattopadhyay & Chaudhuri, *Eur. J. Entomol.* **90**:89.

Material examined : 4(M), Mirik, 28.iii.1988, Coll. S.Chattopadhyay.

32. *Chaetocladius dilatus* Bhattacharyay & Chaudhuri

1993 *Chaetocladius dilatus* Bhattacharyay, Chattopadhyay & Chaudhuri, *Eur. J. Entomol.* **90**:90.

Material examined : 6(M), Darjeeling, 6 ii, 1984, Coll. D.K. Guha.

33. *Chaetocladius tenuiflexus* Bhattacharyay & Chaudhuri

1993 *Chaetocladius tenuiflexus* Bhattacharyay, Chattopadhyay & Chaudhuri *Eur. J. Entomol.* **90**:92.

Material examined : 5(M), Bijanbari, 1.iv..1986, Coll. P.K. Chaudhuri. 4(M), Darjeeling, 30.iii,1986, Coll. S. Chattopadhyay.

Genus XIII *Cricotopus* v.d. Wulp,

1974 *Cricotopus* w. d. Wulp, *Tijdschr. Ent.*, **17**:132.

Key to species of the Genus *Cricotopus* v.d. Wulp

1. Pulvilli absent. Tergites dark brown 2
 Pulvilli present. Tergites not dark brown
 *C. ateritarsus* Bhattacharyay, Ali & Chaudhuri
2. Maxillary palp sufficiently long. Middle of empodium with hook
 *C. anomalus* (Kieffer)
- Maxillary palp moderate. Middle of empodium without hook 3
3. Humerals present. Gonostylus of male hypopygium distad.....
 *C. tenuisetosus* Choudhuri & Ghosh

Humeral absent. Gonostylus of male hypopygium narrowed distad.
 *C. albipes* Choudhuri & Ghosh

34. *Cricotopus anomolus* (Kieffer)

1913. *Trichocladus anomalus* Kieffer, *Rec. Ind. Mus.* 9:124

1973. *Cricotopus anomalus* (Kieffer) Sublette & Sublette, *Univ. Howai Press.*, 396.

Material examined : 45(M), Darjeeling, , Coll. P.K. Chaudhuri. India : West Bengal and Himachal Pradesh.

35 *Cricotopus ateritarsus bhattacharyat*, Ali & Chaudhuri,

1991. *Cricotopus ateritarsus* Bhattacharyat, Ali & Chaudhuri, *Beitr. Ent.* 41 : 333.

Material examined : 3(M) 4(F), Darjeeling, 22 iv..1984, Coll. D.K.Guha.

Distribution : India : Sikkim and West Bengal.

36. *Cricotopus albipes* Chaudhuri & Ghosh

1980 *Cricotopus albipes* Chaudhuri & Ghosh, *Aquatic Ins.* 2:148.

Material examined : 4(M), Darjeeling, 18. x.1969, Coll. S.K. Das Gupta.

37. *Cricotopus tenuisetosus* Chaudhuri & Ghosh

1980 *Cricotopus tenuisetosus* Chaudhuri & Ghosh, *Aquatic INs.* 2:150.

Material examined : 3(M), Darjeeling, 18.x.1969, Coll.T. Sharma.

Genus XIVI *Eukiefferiella* Thienemann,

1926 *Eukiefferiella* Thienemann, *Arch. Hydrobiol.*, 17:325

Key to the species of Genus *Eukiefferiella* Thienemann

1. Anal point of male hypopygium present 2
- Anal point of male hypopygium absent 3
2. Veins without setae. Anal point with 3 setae in each latered
 *E. lehmanni* Bhattacharyay & Chaudhuri
- Veins with setae. Anal point with 1 setae in each laterad
 *E. debilis* Sinharay & Chaudhuri

3. Humerals present, scutellum with a row of 8 setae
 *E. oryza* Chattopadhyay & Chaudhuri

Humerals absent, scutallum with a row of 4 setae
 *E. peculiaris* Sinharay & Chaudhuri

38 *Eukiefferiella debilis* Sinharay & Chaudhuri

1978 *Eukiefferiella debilis* Sinharay & Chaudhuri, *Orient. Ins.* **12**: 349.

Material examined :4(M) 2(F), Darjeeling, 17.vii.1972, Coll. S.K. Das Gupta 2(M), Ghum, 2xi. 1976, Coll. A.K. Banerjee; 2(M) 2(F), Kurseong, 2-3. ix. 1970, Coll. S.K.Das Gutpa; 1(M) 1(F), Pankhabari, 17.vii. 1972, Coll.M.Banerjee.

39 *Eukiefferiella lehmani* Bhattacharyay, Ali & Chaudhuri

1991 *Eukiefferiella lehmani* Bhattacharyay, Ali & Chaudhuri, *Beitr. Ent.* **41**:335.

Material examined :4(M) Darjeeling, 21.vii.1983, Coll. P.k. Chaudhuri

40. *Eukiefferiella peculiaris* Sinharay & Chaudhuri

1978. *Eukiefferiella peculiaris* Sinharay & Chaudhuri, *Orient. Ins.* **12**::351.

Material examined :1(M) Lebong, 15.vii.1973, Coll. D.C.Sinharay; 2(M), Darjeeling, ,22vii., 1974, Coll. S.K. Das Gupta; 1(M), Kurseong, 2.xi. 1974, Coll. S.Mukherjee; 2(M), Tindharia, 7.vii. 1974, Coll.P.K.Chaudhuri; 2(M), Sukia Pukhri, 17. vii. 1975, Coll. D.C. Sinharay.

Distribution : India : Assam, Meghalaya and West Bengal.

41. *Eukiefferiella oryza* Chattopadhyay & Chaudhuri

1991. *Eukiefferiella oryza* Chatopadhyay & Chaudhury, *Reichebachia* **28**:11.

Material examined :4(M) Bankura, 14.i.1990, Coll. S. Chattopadhyay.

Genus XI *Indocladius* Chaudhuri & Bhattacharyay

1989. *Indocladius Clivus* Chaudhuri & Bhattacharyay. *Reichenbachia* **26**:169.

42 *Indocladius clivus* Chaudhuri & Bhattacharyay

1989. *Indocladius clivus* Chaudhuri & Bhattacharyay, *Reichenbachia* **26**:169.

Material examined :6(M) Darjeeling, 20.II.1985, Coll. P.K.Chaudhuri.

Genus XVI *Limnophyes* Eaton,1875. *Limnophyes* Eaton, *Entomologist's monthly Mag.*,12:60Key to species of Genus *Limnophyes* Eaton

1. Lanceolate humeral setae present, acrostichals absent 2
Lanceolate humeral setae absent, acrostichals sometimes present 4
2. Dark brown midges smaller in size. R without setae but squama with 3 setae;
..... *L. brevicorripis* Chaudhuri, Sinharay & DasGupta
Dark brown midges, larger in size. R with 3-4 setae but squama with 1 seta 3
3. Vertex with 4 postocular setae on each side, dorsocentrals 42 in number
..... *L. scutheri* Chaudhuri, Sinharay & Das Gupta
Vertex with 3 postocular setae on each side,
dorsocentrals more than 50 in number *L. puncticellus* Chaudhuri, Sinharay & Das Gupta.
4. Small to medium sized species with uniform colour shade throughout the dorsal aspect of thorax,
lanceolate, prescutellars 10 in number *L. nigripes* Chaudhuri, Sinharay & Das Gupta.
Larger sized species with darker spots on humerals of thorax, lanceolate prescutallars 0-7 in number
..... 5
5. Halteres with 4 setae, its knob yellowish 6
Haltere with 3 or 5 setae, its knob brown 7
6. Acrostichals absent. R without seta but squama with 2 setae
..... *L. mediocris* Chaudhuri, Sinharay & Das Gupta
Acrostichals 6 in number. R with 3 setae but squama with 5 setae
..... *L. maqus* Chaudhuri, Sinharay & Das Gupta
7. Acrostichals absent. R with or without seta 8
Acrostichals present, R with 2 setae 9
8. Medium sized species with brown thorax, darker in the margin. AR 0.17. R without seta
..... *L. fuscimarginalis* Chaudhuri, Sinharay & Das Gupta.
Larger sized species with uniformly brown thorax. AR 0.34. R with setae
..... *L. uniformis* Chaudhuri, Sinharay & DasGupta.

9. Medium sized dark brown species. Lanceolate prescutellars present. Terga VI-VII with dark brown bands. *L. distinctigenitalis* Chaudhuri, Sinharay & Das Gupta

Larger Sized yellow species. Lanceolate prescutellars absent and Terga without any bands
..... *L. flavus* Chaudhuri, Sinharay Das Gupta

43 *Limnophyes brevicorpis* Chaudhuri, Sinharay & Dus Gupta.

1979. *Limnophyes brevicorpis* Chaudhuri, Sinharay & Das Gupta, *Aquatic Ins.* 1 (2):10

Material examined :1(M), Darjeeling, 6.vi.1970, Coll. P.K. Chaudhuri 2(M), Kurseong, 10.v.1972. Coll. D.C. Sinharay.

44. *Limnophyes mediocris* Chaudhuri, Sinharay, Das Gupta.

1979. *Limnophyes mediocris* Chaudhuri, Sinharay & Das Gupta, *Aquatic Ins* 1 (2):115.

Material examined :1(M) 2(M), Darjeeling, 16.vii.1969, Coll. S.K. Das Gupta 9(M) 1(F), Ghum & Darjeeling, 16.v.1972, 22.6.1972, Coll. P.K. Chaudhuri & D.C. Sinharay ; 3(M), Kurseong, 10.v. 1970, Coll. S.K.Das Gutpa.

45. *Limnophyes Fuscimarginelis* Chaudhuri, Sinharay & Das Gupta.

1979. *Limnophyes fuscimarginalis* Chaudhuri, Sinharay & Das Gupta *Ag. Ins.*

Material examined :1(M) Darjeeling, 10.v.1972, Coll. S.K. Das Gupta 2(M), Darjeeling, , 12.v. 1972, Coll. P.K. Chaudhuri; 2(M) Sonada. 11.VI.. 1974, Coll. D.C. Sinharay.

46 *Limnophyes montanus* Chaudhuri, Sinharay & Das Gupta

1979. *Limnophyes montanus* Chaudhuri, Sinharay & Das Gupta, *Aquatic Ins.* 1 (2):116

Material examined :1(M) Darjeeling, 26.VI.1970, Coll. S.K. Das Gupta 12(M) 1(F), Kurseong, 11.X. 1973, Coll. D.C. Sinharay & P.K. Chaudhuri.

Distribution : India : Meghalaya, Sikkim.

47 *Limnophyes flavus* Chaudhuri, Sinharay & DasGupta

1979. *Limnophyes flavus* Chaudhuri, sinharay & Das Gupta, *Aquatic Ins* 1(2):118.

Material examined :4(M) Darjeeling, 6.V.1972, Coll. S.K. Das Gupta 1(M), Kurseong , 10.V. 1972, Coll. S.K.Das Gupta; 8(M) 3(F) Kurseong, Sonada & Ghum, 11.X. 1973, 2, VI. 1974, 20.X. 1975, Coll. D.C. Sinharay & P.K.Chaudhuri, 2(M), Suki = Pukri, 2.IX,1974, Coll. M. Banerjee,

48 *Limnophyes distinctigenitalis* Chaudhuri, Sinharay & Das Gupta

1979. *Limnophyes distinctigenitalis* Chaudhuri, Sinharay & Das Gupta, *Aquatic Ins.* 1(2) 121

Material examined :1(M) , Darjeeling, 27.v.1971, Coll. P.K. Chaudhuri, 5(M)2(F), Kurseong, 10.V. 1972, Coll. P.K. Chaudhuri.

Distribution : India : Meghalaya, Sikkim, Manipur and West Bengal

49 *Limnophyes magnus* Chaudhuri, sinharay & Das Gupta.

1979. *Limnophyes maqnus* Chaudhuri, sinharay & Das Gupta, *Aquatic Ins.* 1(2), 124

Material examined : 1(M), Rug Tong, 2.VI, 1972, Coll. S.K. Das Gupta, 4(M) Darjeeling, 26-28.IX.1972, Coll. D.C. Sinharay & P.K. Chaudhuri; 2(M) Tindharia, 22.X. 1973, Coll. M. Banerjee.

Distribution : India: Sikkim and West Bengal.

50 *Limnophyes puncticellus* Chaudhuri, Sinharay & Das Gupta.

1979. *Limnophyes puncticellus* Chaudhuri, Sinharay & Das Gupta, *Aquatic Ins* 1(2)126

Material examined :4(M) , Darjeeling, 27.VI.1974, Coll. P.K. Chaudhuri, 4(M) 3(F), Sonada, 21.VII. 1974, Coll. P.K. Chaudhuri. & D.C.Sinharay; 2(M), Ghum, 22. VI.1974, Coll. M.Banerjee.

Distribution : India:Maghalaya and West Bengal.

51 *Limnophyes saetheri* Chaudhuri, Sinharay & Das Gupta.

1979. *Limnophyes saetheri* Chaudhuri, sinharay & Das Gupta, *Aquatic Ins*, 1 (2), 129.

Material examined :1(M) Kurseong, 17. VII 1972, Coll. S.K. Guptp; 8(M)Darjeeling, 27-29. VII.1973, Coll. M. BASU:

Distribution : Indian : Meghalaya, Manipur

52 *Limnophyes uniformis* Chaudhuri, Sinharay & Das Gupta.

1979. *Limnophyes uniformis* Chaudhuri, sinharay & Das Gupta, *Aquatic Ins.* 1 (2),131

Material examined :1(M) ,Ghum, 12.VII.1941, Coll.M Banerjee,6(M) Kurecong. 11.IX. 1976, Coll. D.C. Sinharay; 3(M) Darjeeling, 27. IX.1973, Coll. M. Basu.

Genus XVI *Metriocnemus* v.d. Wulp,

1874. *Metriocnemus* v.d. Wulp, *Tijdschr, Ent.*, 17 : 109.

Key to species of Genus *Metriocnemus* v.d. Wulp

1. Dorsal lobe of gonocoxite of male hypopygium absent2
Dorsal lobe of gonocoxite of male hypopygium present3
2. Postorbital 1. Squama with 22-23 setae. Virga present
..... *M. longipalpus* Chaudhuri & Sinharay
Postorbitals 16-18. Squama with more than 23 setae. Virga absent
..... *M. unilinearis* Chaudhuri & Bhattacharyay
3. Anal point long. Transverse sternapodeme with a median depression
..... *M. unilinearis* Chaudhuri & Bhattacharyay
Anal point short or long. Transverse sternapodeme without median depression4
4. AR less than 1. Squama with more than 8 setae. Anal point of male hypopygium not sharply pointed.
..... *M. pseudorostatus* Chaudhuri & Bhattacharyay
AR more than 1. Squama with less than 8 setae. Anal point of male hypopygium sharply pointed.
..... *M. aculeatus* Chaudhuri & Bhattacharyay

53. *Metriocnemus aculeatus* Chaudhuri & Bhattacharyay

1989. *Metriocnemus aculeatus* Chaudhuri, Bhattacharyay & Dutta, *Orient. Ins.* 23:309.

Material examined : 6 (M) Darjeeling, 24. VII.1986, Coll. S. Chattopadhyay

54 *Metriocnemus amplispinus* Chaudhuri & Bhattacharyay

1989. *Metriocnemus amplispinus* Chaudhuri, Bhattacharyay & Dutt *Orient. Ins.* 23:310.

Material examined : 6 (M) 5(F) Darjeeling, Bijanbari, 30. iii.1986, Coll. S. Chattopadhyay

55 *Metriocnemus longipalpus* Sinharayi & Chaudhuri

1978. *Metriocnemus longipalpus* Sinharay & Chaudhuri, *Spixiana* 1:282

Material examined: 1(M) 1(F) Kalimpong, 2.x. 1975, Coll. S. Chattopadhyay 4(M) 3(F), Jorbangla, 27. vii. 1975, Coll. K. Sinha; 6(M), 1(F), Tung, 10, v. 1973, Coll. S. Basak.

Distribution : India : West Bengal and Mizoram

56. *Metriocnemus pseudorostratus* Chaudhuri & Bhattacharyay

1989. *Metriocnemus pseudorostratus* Chaudhuri, Bhattacharyay & Dutta. *Orient. Ins.* **23** :311.

Material examined : 5 (M) Darjeeling, 24. VII.1986, Coll. S. Chattopadhyay

57. *Metriocnemus unilinearis* Chaudhuri & Bhattacharyay

1989. *Metriocnemus unilinearis* Chaudhuri, & Bhattacharyay & Dutta. *Orient. Ins.* **23**.311.

Material examined : 4(M), 3(F), Lepong, , 23. vii.1986, Coll. S. Chattopadhyay 2(M), Kurseong, 24. vii. 1986, Coll. S.Chattopadhyay.

Genus XVIII. *Nanocladius* Kieffer

1913. *Nanochadius* Kieffer, *Result, Scient, Ch. Alluand R. Jeannel Afric. Orient*, **1** : 31

58. *Nanocladius insulatus* Bhattacharyay & Chaudhuri.

1987-1988. *Nanochadius insulatus* Bhattacharyay & Chaudhuri, *B.U.Jour. Sci.* 4-5:60

Genus XIX. *Nasuticladus* Freeman

1961. *Nasuticladus* Freeman, *Aust.J. Zool.* **9**:611.

Key to species of Genus *Nasuticladus* Freeman

Postscutellum bars. Fore trochanters with 3 setae. Spermathecae of female are of equal Size.
..... *N. equalis* Sinharay & Chaudhuri

Postscutellum with lanceolate setae. Fore trochantere with 4 setae. Spermathecae are of unequal size.....
..... *N lanceolatus* Sinharay & Chaudhuri

59. *Nasuticladus equalis* Sinharay & Chaudhuri

1984. *Nasuticladus equalis* Sinharay & Chaudhuri. *J.beng. Nat. Hist. Soc* **3**:57.

Material examined : 6(M) Raniganj, 7.XI. 1977 and 10.XI. 1971. Coll.D.C. Sinharay.

60. *Nasuticlaadius lanceolatus* Sinharay & Chaduhuri

1984. *Nasuticlaadius lanceolatus* Sinharay & Chaduhuri *J. beng. Nat. Hist. Soc.* **3**:59

Material examined : 4(M) Raniganj, 7.11. 1977 Coll.P.K.Chaudhuri

Genus XX *Orthocladus* v.d. Wulp,

1984. *Orthocladus* v.d. Wulp, *Tijdschr. Ent.*, 17:109

Key to species of Genus *Orthocladus* v.d Wulp

1. Anteprenotal absent. R₄₊₅ with setae
..... *O. novostylus* Chaudhuri & Ghosh
- Anteprenotals present. R₄₊₅ bare2
2. Humeral absent. Anal point of male hypopygium minute
..... *O. brevipennis* Chaudhuri & Ghosh
- Humerals present. Anal point of male hypopygium long3
3. Anteprenotal 1. Gonostylus short and broad
..... *O. androgynus* Bhattacharyay, Ali & Chaudhuri
- Anteprenotals more than 1. Gonostylus long4
4. Postorbitals present. Vein R with only 1 seta. Dorsal lobe of gonocoxite nose like
..... *O. uniradialis* Bhattacharyay, Ali & Chaudhuri
- Postorbitals absent. Vein R with only 12 seta. Dorsal lobe of gonocoxite beak like
..... *O. deflectus* Bhattacharyay, Ali & Chaudhuri

61. *Orthocladus (Eudactylocladius) androgynus* Bhattacharyay, Ali & Chaudhuri.

1991. *Orthocladus androgynus* Bhattacharyay, Ali & Chaudhuri. *Beitr. Ent.* 41:338.

Material examined : 1(M) Mungpo, 6.iii. 1984, Coll. D.K. Guha: 6(M), Darjeeling, 16.x. 1983, Coll. T.K.Datta.

62. *Orthocladus (Eudactylocladius) brevipennis* Chaudhuri & Ghosh

1982. *Orthocladus (Eudactylocladius) brevipennis* Chaudhuri & Ghosh *Annl. Zool* 36:492.

Material examined : 1(M) Darjeeling, 30.v. 1970, Coll.P.K. Chaudhuri

63 *Orthocladus (Orthocladus) deflectus* Bhattacharyay, Ali & Chaudhuri.

1991. *Orthocladus (Orthocladus) deflectus* Bhattacharyay, Ali & Chaudhuri. *Beitr. Ent.* 41:340.

Material examined : 1(M) 1(F) Kurseong, 8.iii. 1984, Coll.D.K. Guha. 4(M) 2(F) Mirik, 10.iii. 1984, Coll.D.K Guha.

64 *Orthocladius (Orthocladius) novostylus* Chaudhuri & Ghosh.

1991. *Orthocladius (Orthocladius) novostylus* Chaudhuri & Ghosh. *Anns. Zool.* **36**:497.

Material examined : 18(M) 8(F) Darjeeling, Ghum and Jorbangla, 10-13.ix. 1978, Coll.T. Sharma, S.K. Das Gupta.

65 *Orthocladius (Orthocladius) uniradialis* Bhattacharyay, Ali & Chaduhuri

1991. *Orthocladius (Orthocladius) uniradialis* Bhattacharyay, Ali & Chaduhuri *Beitr. Ent.* **41**:342.

Material examined : 4(M) Darjeeling, 10.iv. 1975, Coll.P.K. Chaudhuri.

Key to species of Genus *Parametriochemus* Goetghebuer.

1. Eyes moderately elongated dorsally. Sensilla clavata absent 2
 Eyes strongly elongated dorsally. Sensilla clavata present
 *brundini*. Sinharay & Chaudhuri
2. C. strongly elongated. Setae on abdomen arranged irregularly
 *fusiger* (Kieffer)
 C. strongly elongated. Setae on abdomen arranged in regular rows 3
3. Inner and outer verticals present. Anal point with bare apex and 7 setae at its base.
 *aduncus* Chaudhuri & Bhattacharyay
 Inner and outer verticals absent. Anal point with 7-8 lateral setae and a pex not bare
 *subnubilus* Sinharay & Chaudhuri

66. *Parametriochemus aduncus* Chaudhuri & Bhattacharyay

1989. *Parametriochemus aduncus* Chaudhuri & Bhattacharyay, *Orient. Ins.* **23**. 314.

Material examined : 6(M), Darjiiling, 6. iv. 1984, Coll.. D.K. Ghua.

67. *Parametriochemus brundini* sinharay & Chaudhuri

1979. *Parametriochemus brundini* Sinharay & Chaudhuri, *Ent. Scand. Suppl.* **10** : 119.

Material examined : 1(M),1(F), Darjiiling, 11. v. 1973, Coll, S.K.Das Gupta; 12(M),4(F). Kurseong, 13-15.v.1973, Coll.P.K. Chaudhuri; 8 (M) 4(F) Sonada, Tung, 8. vii. 1974, Coll. P.K. Chaudhuri.

68. *Parametrioctenus fusiger* (Kieffer)

1911. *Metrioctenus fusiger* Kieffer, *Rec. Ind. Mus.* 6. 348.
 1973. *Parametrioctenus fusiger* (Kieffer). Sublette & Sublette, 19673. *Univ. Howai Press*, 1:399.

Material examined : 2(M), Darjiling, 17. vii. 1989, P.K. Chaudhuri.

69. *Parametrioctenus subnubilus* Sinharay & Chaudhuri

1979. *Parametrioctenus subnubilus* Sinharay & Chaudhuri *Ent. Scand. Suppl.* 10 : 121.

Material examined : 2(M), Jorbanglow, 2. v. 1972, Coll P.K. Chaudhuri. 7(M), Lebong, 12. v. 1973, Coll. K.C. Lahul.

Genus XXII *Paraphaenocladus* Thienemann In : Sparck & Thienemann,

1924. *Paraphaenocladus* Thienemann in Sparck & Thienemann, in Sparck & Thienemann, *Verh. Int. Verein. Theor. angew. Limnol.* 2 : 223.

Key to species of Genus *Paraphaenocladus* Thienemann

1. Ama; pomt wotj ponted apex
 *P. proprius* Chaudhuri & Sinharay
 Anal point with blunt apex 2
2. Anal point without basolateral setae
 *P. albuslatus* Chaudhuri & Sinharay
 Anal point with 6-10 long basolateral setae 3
3. Haltere setose. Sopurs. Spurs of hind tibiae unequal
 *P. trichialis* Chaudhuri & Sinharay
 Haltere without setae. Spurs of hind tibiae equal 4
4. Squama with 1 seta. Dorsal lobe of gonostylus triangular
 *P. triguetrius* Chaudhuri & Bhattacharyay
 Squama with 4-6 setae. Dorsal lobe of gonocoxite rounded 5
5. Postorbitals and antepnotals absent. Gonostylus expanded
 *P. distinctus* Chaudhuri & Bhattacharyay
 Postorbitals and antepnotals present. Gonostylus narrow
 *P. Croceus* Chaudhuri & Bhattacharyay

70. *Paraphaenocladus albusalatus* Chaudhuri & Sinharay

1987. *Paraphaenocladus albuslatus* Chaudhuri & Sinharay, *Bull. Ent.* **28**:95

Material examined : 3(M), Ghum, 14.x. 1970, Coll. P.K.Chaudhuri, 3(M), Darjeeling, 10.v. 1976, Coll. A.K. Bhattacharyay.

Distribution: India: Meghalaya, Sikkim and West Bengal

71. *Paraphaenocladus croceus* Chaudhuri & Bhattacharyay

1989 *Paraphaenocladus croceus* Chaudhuri & Bhattacharyay *Orient. Ins.* **23**:316.

Material examined : 5(M), Darjeeling, 6.iv. 1984, Coll. D.K. Guha

72. *Paraphaenocladus distinctus* Chaudhuri & Bhattacharyay

1989. *Paraphanocladus distinctus* Chaudhuri & Bhattacharyay, *Orient. Ins.* **23** : 317

Material examined : 5(M), Darjeeling, 10.iii. 1985, Coll. P.K Chaudhuri,

73. *Paraphaenocladus proprius* Chaudhuri & Sinharay

1989. *Paraphanocladus proprius* Chaudhuri & Sinharay, *Bull. Ent.* **28**:99

Material examined : 6(M), Rong Tong, 20.ix. 1975, Coll. D.C.Sinharay; 3(M), Gayabari, 22.x.1976, Coll.S.Nandi.

74. *Paraphaenocladus trichialis* Chaudhuri & Sinharay

1989. *Paraphanocladus trichialis* Chaudhuri & Sinharay, *Bull. Ent.* **28**:99

Material examined : 5(M), 4(F), Kurseong, 10.v. 1972, 15-17, ix. 1974 Coll. P.K. Chaudhuri and S.K. Das Gupta ; 5(M), Darjeeling, 7.ix. 1973, Coll.M. Banerjee.

Distribution : India: Meghalaya and West Bngal.

75. *Paraphaenocladus triquetrius* Chaudhuri & Bhattacharyay

1989. *Paraphanocladus triquetrius* Chaudhuri & Bhattacharyay, *Orient. Ins.* **23**:318.

Material examined : 7(M), Darjeeling 8.iv. 1984, Coll. D.K.Guha.

Genus XXIII *Pseudorthocladus* Goetghebuer,

1932. *Pseudorthocladus* Goetghebuer, *Faune de France*, **23**:93

76. *Pseudorthocladus prolixistylus* Bhattacharyay & Chaudhuri

1990. *Pseudorthocladus prolixistylus* Bhattacharyay & Chaudhuri, *Revta. bras. Ent.* **34** : 332.

Material examined : 5(M) West Bengal, Darjeeling, 25. iv. 1984, Coll. D.K.Guha.

Genus XXIV. *Rheocricotopus* Thienemann & Harnisch,

1932. *Rheocricotopus* Thienemann & Harnisch, *Zool. Anz.*, **99**:135.

Key to species Genus *Rheocricotopus*

1. Acrostichals present. Soutellum with a single row of setae. Anal lobe rounded 2
 Acrostichals absent. Scutellum with 2 rows of setae. Anal lobe projecting
 *R. nemoacrostichalis* Chaudhuri & Sinharay
2. AR more than 1. R without seta Fore femur with a dark band at its dorsal one third
 *R. valgus* Chaudhuri & Sinharay
 AR third 3
3. Sensilla clavata present. Scutellum with less than 10 setae. Transverse sternapodeme with less than 10 setae. Transverse sternapodeme without horn 4
 Sensilla clavata absent. Scutellum with more than 10 setae. Transverse sternapodeme with horn ..
 *R. bicornuatus* Bhattacharyay, Ali & Chaudhuri
4. Dorsocentrals uniserial. Vein Cu_2 curved. Anal point with 8 setae. Crista dorsalis ill developed
 *R. himalayansis* Chaudhuri & Sinharay
 Dorsocentrals biserial. Vein Cu_2 straight. Anal point with 3 setae. Crista dorsalis well developed
 *R. frequens* Bhattacharyay, Ali & Chaudhuri

77. *Rheocricotopus (Psilocricotopus) bicornuatus* Bhattacharyay, Ali & Chaudhuri

1991. *Rheocricotopus (Psilocricotopus) bicornuatus* Bhattacharyay, Ali & Chaudhuri, *Beitr. Ent.* **41**:343.

Material examined : 7(M), Kurseong, 26. vii. 1986, Coll. S.Chattopadhyay 2(M), Lebong, 24.vii.1986, Coll. S.Chattopadhyay.

78. *Rheocricotopus (Psilocricotopus) frequens* Bhattacharyay, Ali & Chaudhuri

1991. *Rheocricotopus (Psilocricotopus) frequens* Bhattacharyay, Ali & Chaudhuri, *Beitr. Ent.* **41**:345.

Material examined : 7(M), Darjeeling, 6. iv. 1984, Coll. D.K.Guha.

79. *Rheocricotopus (Psilocricotopus) himalyensis* Chaudhuri & Sinharay

1991. *Rheocricotopus (Psilocricotopus) himalayensis* Chaudhuri & Sinharay, *Ent. Basel* 8:398

Material examined : 3(M), Kurseong, 12. x. 1970, 18.ix.1978, Coll. S.Mukherjee; 7(M), Tindharia, 23.ix. 1973, Coll. D.Sinharay; 6(F), Ghum, 2.x. 1974, Coll. PK. Chaudhuri; 8(M), Darjeeling, 13-15. iii. 1977, Coll. S.K Das Gupta.

80. *Rheocricotopus (Psilocricotopus) nemoacrostichilis* Chaudhuri & Sinharay

1983. *Rheocricotopus (Rheocricotopus) nemoacrostichalis* Chaudhuri & Sinharay, *Ent. Basel*. 8:401.

Material examined : 5(M), Tindharia, 4.ix. 1978 and 12. xi. 1970, Coll., Ms. S.Sarkar and D.C. Sinharay.

Distribution : India : Meghalaya and West Bengal.

81. *Reocricotopus (Rheocricotopus) Valgus* Chaudhuri & Sinharay

1983. *Rheocricotopus (Rheocricotopus) valgus* Chaudhuri & Sinharay, *Ent Basel* 8:402

Material examined : 8 (M), 4(F), Darjeeling, 17. xi. 1978, 3-4. iii. 1977, Coll. S.K Das Gupta and D.C. Sinharay; 6(M), 2(F), Kurseong, 6iii. 1972, Coll. P.K. Chaudhuri.

Genus XXV *Smitti* Holmgren,

1959. *Smitti* Holmgren. *K. Svenska Vetensk. Akad. Handl.*, 8:47

Key to species of Genus *Smittia*

1. Inner margin of gonostylus strongly expanded 2
 Inner margin of gonostylus less expanded 3
2. Anteprenotals present or absent. Anal point long *S. aterrima* (Meigen)
 Anteprenotals present or absent. Anal point short 4
3. Anal point reaching beyond the base of gonocoxite lobe
 *S. avicornata* Chaudhuri & Bhattacharyay
 Anal point not reaching beyond the base of gonocoxite lobe
 *S. indica* Chaudhuri & Bhattacharyay

4. Antepnotals absent. Postorbitals present Gonocoxite with small dorsal lode
*S. unicapitis* Chaudhuri & Bhattacharyay

Anterpronotals present. Postorbitals absent. Gonocoxite with heavy dorsal lobe
*S. tenuispina* Chaudhuri & Bhattacharyay

82. *Sittia aterima* (Meigen)

1818. *Chironomus aterrimus* Meigen Erster Teil Aachan, 47

1856. *Smittia aterrima aaterrima* (Meigen): Brundin, *Rep. Inst. Freshwat. Res.*, 37:146.

Material examined: 4(M), West Bengal, Darjeeling, 23iii, 1986. Coll. S Chattopadhyay.

Distribution : India (West Bengal) : Africa, Europe and Japan.

83. *Smittia Avicorneata* Chaudhuri & Bhattacharyay

1989. *Smittia avicorneata* Chaudhuri & Bhattacharyay *Dtsch. ent. Z.N.F.* 36:414.

Material examined : 15(M), 7(F), Darjeeling, 5.iii. 1984, Coll. D.K. Guha and P.K. Chaudhuri.

84. *Smittia India* Chaudhuri & Bhattacharyay

1989. *Smittia India* Chaudhuri & Bhattacharyay *Dtsch. ent. Z.N.F.* 36:415.

Material examined : 13(M), 5(F), Darjeeling, 5.iii. 1984, Coll. D.K. Guha

85. *Smittia tenuispina* Chaudhuri & Bhattacharyay

1989. *Smittia tenuispina* Chaudhuri & Bhattacharyay *Dtsch. ent. Z.N.F.* 36:417.

Material examined : 5(M), Darjeeling, 5.iii. 1984, Coll. P.K. Chaudhuri; 4(M), Mirik, 26.iii. 1986, Coll. S. Chattopadhyay.

86. *Smittia unicapitis* Chaudhuri & Bhattacharyay

1989. *Smittia unicapitis* Chaudhuri & Bhattacharyay. *Dtsch. ent. Z.N.F.* 36:418.

Material examined : 4 (M), Darjeeling, 8.iv. 1980, Coll, D.C. Sinharay. 2(M), Kurseong, 7.iv. 1986, Coll. S. Chattopadhyay.

Genus XXVI. *Thienemannia* Kieffer

1907. *Thienemannia*, Kieffer, *Bull. Soc. Hist. nat. Metz.* 26:49.

87. *Thiememaunia fuscitheca* Bhattacharyay, Dutta & Chaudhuri

1985. *Thienemannia fuscitheca* Bhaattacharyay, Dutta & Chaudhuri, *J.beng. nat. Hist. Soc.* New scin 4:41.

Material examined : 5(M),3(F) Darjeeling, 27.x.1972, Coll. P.K. Chaudhuri : 3(M),1(F), Kurseong, 1.x.1977, Coll, S.K. Das Gupta : 4(M), 2(F), pankhabari, 7. IX.1979, coll. Ms.S. Sarkar

88. *Thiememaunia lutea* Bhattacharyay, Dutta & Chaudhuri

1985. *Thienemannia lutea* Bhaattacharyay, Dutta & Chaudhuri, *J.beng. nat. Hist. Soc.* New scin 4:43.

Material examined : 1(M),Jorbanglow, 19.vi.1975, Coll. B.Sen : 5(M), 3(F),Darjeeling22-24.v.1975 and 22.VI. 1973, coll. D.C. Sinharay;4M) 3(F), Lebong, 23.vi. 1973, Coll. T. Sharma.

Subfamily CHIRONOMINAE

Key to tribes of Sub family CHIRONOMINAE

Wing without macrotrichia, squama with setae. Hypopygium usually with 1-2 pairs of appendages
..... Tribe Chironomini

Wing with macrotrichia, squama without setae. Hypopygium with 2 pairs of appendages
..... Tribe Tanytarsini

Tribe A CHIRONOMINI

Genus XXVII *Beckidia* Saether,

1979. *Beckidia* Saether, *Wnt. Scand.*, 10:315

88a. *Beckidia nigrotibia* Bhattacharyay, Dutta & Chaudhuri

1985. *Beckidia nigrotibia* Bhattacharyay, Dutta & Chaudhuri, *B.U. Jour. Sci.* 2:177

Material examined : 4(M), Jagatoru (Dist. Burdwan), 8.VII..1984, Coll. D.K. Guha.

Genus XXVIII *Chironomus* Meigen

1803. *Chironomus* Meign, *Magazin Insektenk*, 2:260

Key to species of Genus *Chironomus* Meigen

1. Wing with spots or markings
..... *C. sriatipennis* Kieffer

- Wing without spots or marking2
 *C. ramosus* Chaudhuri, Das & Sublette
- Inferior volsella of male hypopygium without branched apical setae3
3. Anteprenotals 2. Scutellum with 8 setae *C. javanus* Kieffer
- Anteprenotals absent. Scutellum with more than 12 Setae4
4. Corona with 2 setae5
- Corona bare7
5. Gonostylus oblong with blunt apex *C. nudipes* Kieffer
- Gonostylus not as above6
6. Supralar 1. Tergites II-V without such spots
 *C. niger* Chaudhuri, Das & sublette
- Supralar absent Tergites II-V without such spots
 *C. fortistylus* Chaudhuri, Das & Sublette
7. Brachiolum with 3 setae. Haltere setose
 *C. Samoensis* Kieffer
- Brachiolum with 2 setae. Haltere bare8
8. Tergites without median spots *C. pulcher* Wiedermann
- Tergites with median spots9
9. Tergites II-V with grey oval median spots *C. Circumdaus* Kieffer
- Tergites II-IV with brown square median spots *C. filitarsis* Kieffer

88 b. *Chironomus niger* Chaudhuri, Das & Sublette

1992. *Chironomus niger* Chaudhuri, Das & Sublette, *Zool. Jb. Syst.* 119:21.

Material examined:7(M), 6(F), Barasat, 8. xi. 1973, Coll. S.K. Das.

88 c. *Chironomus nudipes* Kieffer

1911. *Chironomus nudipes* Kieffer, *Rec. Ind Mus.*, 6 : 164.

Material examined : 1(M) paratype, (Z.S.I. No. 9839/19) West Bengal, Calcutta, 10. VIIV.1907. Mus. Coll:6(M), West Bengal, Uttarpara, 9.IX.1987, Coll. S. Chattopadhyay.

88 d. *Chironomus pulcher* Wiedemann

1930. *Chironomus pulcher* Wiedemann. *Aus. Zweif. Ins. Hamm.* 1: 615

Material examined:6(M), West Bengal, Burdwan. 8. x. 1984, Coll. P.K. Chaudhuri

Distribution : India (West Bengal) and Sumatra

88 e. *Chironomus ramosus* Chaudhuri, Das & Sublette

1992. *Chironomus ramosus* Chaudhuri, Das & Sublette, *Zool. JB. syst.* 119: 35

Material examined : 12(M), 10(F), Satgachia, 9. viii. 1983, Coll. S.K. Das: 8(M), 7(F). Hooghly. 4.v. 1984, Coll. S.K.Das.

88 f. *Chironomus samoensis* Edwards

1928. *Chironomus samoensis* Edwards, *Bull.Br. Mus, Nat. Hist.*, 6 : 67.

Material examined : 4(M), 4(F), West Bengal, Berhampore, 2., i. 1988, Coll. S. Chattopadhyay.

Distribution : India (West Bengal) : Caroline Islands, Japan, Java, Korea, Marshal Islands, Somos and Maniana Islands.

89. *Chironomus circumdatus* Kieffer

1916. *Chironomus circumdatus* Kieffer, *Annl. Hist. Nat. Mus. Natn. Hung.*, 14 : 110.

Material examined : 11(M), West Bengal, Howrah, 4 IX. 1987, Coll. S. Chattopadhyay, 6(M), West Bengal, Burdwan, 7IX 1987, Coll. S. Chattopadhyay; 6(M), West Bengal, Haldia (Dist. Midnapore), 16.x. 1987, Coll. X. Chattopadhyay.

Distribution : India (West Bengal). Japan, Korea, Taiwan and Thailand.

90. *Chironomus filitarsis* Kieffer

1916. *Chironomus filitarsis* Kieffer, *Rec. Ind Mus.* 6: 18 160

Material examined ; 1(M), paratype (Z.S.I. NO. 9722/19), Calcutta, 31. VII. 1907, Coll. N. Anandale: 6(M), West Bengal, Burdwan, 30. V. 1986, Coll. S. Chattopadhyay.

91. *Chironomus fortistylus* Chaudhuri, Das & Sublette,

1992. *Chironomus fortistylus* Chaudhuri, Das & Sublette, *Zool. Jb. Syst.* 119:10.

Material examined: 7(M),5(F), Darjeeling, 23. ix. 1977 23-27. x. 1978, Coll. S.k..Das Gupta 3 (M), Jorbangla, 7. viii. 1978, Coll. P.K. Chaudhuri; 3(M), Kurseong, 2.x. 1978, Coll.S.Pal.

92. *Chironomus Javanus* Kieffer

1924. *Chironomus javanus* Kieffer. *Anal. Soc. Scient. Brux.*, 43:283

Material examined : 5 (M) , 4 (F) ,West Bengal, Bankura, 7.v. 1984 Coll, S. K. Das; Col. S.Chattopadhyay; 9(M), West Bengal, Howrah, 4 IX. 1987, Coll. S. Chattopadhyay

93. *Chironomus striatipennis* Kieffer

1910. *Chironomus striatipennis* Kieffer, *Mem. Ind Mus.*, 2:236

Material examined ; 1(M) paratype (Z.X.I.N0.980/15), Uttarpradesh, Bhimtal 12. X. 1982; Coll. GC.Brown, 6(M), 3(F), West Bengal, Burdwan, 12 X. 1986, Coll. S. Chattopadhyay; 3(M), West Bengal, Uttarpara 24. 11. 1987, Coll. S. Chattopadhyay.

Distribution : India West Bengal, and Uttarpradesh

Genus XXIX *Cladopelma* Kieffer,

1921. *Cladopelma* Kieffer, *Annl. Soc. Scient Brux.*, 40 : 277

94. *Cladopelma indica* Bhattacharyay, Dutta & Chaudhuri,

1921. *Cladopelma indica* Bhattacharyay, Dutta & Chaudhuri, *B.U. Jour. Sci*, 2 :179.

Material examined : 3(M), Burdwan, 8.VII. 1984, Coll. D.K. Guha.

Genus XXX *Cryptochironomus* Kieffer,

1918. *Cryptochironomus* Kieffer, *Ent. Mitt.*, 7:46

Key to species of Genus *Cryptochironomus* Kieffer

1. Scutellum with 6-10 setae 2
- Scutellum with 17-26 setae 3
2. Frontal tubercle with an apical knob. Superior volsella more or less globular, inferior volsella small and superposed on superior volsella *C. fulvus* (Johannson)
- Frontal tubercle without apical knob. Superior volsella short.digitiform, inferior volsella absent *C. subovatus* Freman

3. Haltere setowe. Inferior volsella absent *C. judicious* choudhuri & Chattopadhyay
 Haltere bare inferior volsella present *C. rostratus* (Kieffer)

95. *Cryptochironomus fulvus* (Johannsen)

1905. *Chironomus fulvus* Johannsen, *Bull. N.Y. St. MUS.*, **86**:224
 1945. *Cryptochironomus fulvus* (Johannesen) : Townes, *am. Midl. Nat.* **34** :98

Material examined : 5(M), West Bengal, Berhampore, 17. VIII.1986, Coll. S. Chattopadhyay.

Distribution : India (West Bengal Japan, Thailand and U.S. A

96. *Cryptochironomus Judicious* Chaudhuri & Chattopadhyay

1990. *Cryptochironomus judicious* Chaudhuri & Chattopadhyay *Tijdscl. ent* : **133**: 154.

Material examined : 6(M), Uttarpara, 9. IX. 1987. Coll. S. Chattopadhyay.

97. *Cryptochironomus rostratus* (Kieffer)

1911. *Chironomus rostratus* Kieffer. *Rec. Ind Mus*, **6** : 164.
 1978. *Cryptochironomus rostratus* (Kieffer):pinder. *Freshwat. Biol. Assoc. Sci publ.* **37** : 116.

Material examined : 6(M), West Bengal, Howrah, 4.IX. 1987, Coll. S. chattopadhyay

Distribution : India (West Bengal), Belgium, England, Germany, Korea and The Netherland.

98 *Cryptochironomus subovatus* Freeman

1954. *Chironomus subovatus* Freeman, *Proc. R. Ent. Soc. Lond.*, **23** : 20.
 1955. *Cryptochironomus subovatus* Freeman, *S. Afr. Animal Life*, **2** : 375.

Material examined : 1(M)paratype, (Z.S.I. No. Chir. 437 B), Cape province, 27. III. 1953. Coll. R. Berg. 5(M), West Bengal, Berhampore, 17. VIII. 1986, Coll. S. Chattopadhyay

Distribution : India(West Bengal); Cape province, Niger, Nigeria, South Africa., Upper Volta and Zaire.

Genus XXXI *Dicrotendipes* Kieffer,

1913. *Dicrotendipes* Kieffer, *Result Scient. Insectes Dipteres*, **1**:23

Key to species of Genus *Dicrotendipes* Kieffer

1. Wing with spots *D. Sepemmaculatus* (Becker)
 Wing without spots 2
2. Anal point of male hypopygium short and pointed 3
 Anal point of male hypopygium well developed and bulbous 4
3. Thorax with 1 dorsomedian and 2 dorsolateral bands. Anal point highly sclerotized and peg like. Superior volsella sickle shaped *D. paxillus* Guha, Chaudhuri & Nandi
 Thorax without any band. Anal point less sclerotized and simple; superior volsella arched and club like *D. tenuiforceps* (Kieffer)
4. Corona and antepnotum bare. Scutellum with 6-7 setae in a rows. Inferior volsella short
 *D. pelochloris* (Kieffer)
 Corona and antepnotum setose 5 cutellum with 22 setae in two rows. Inferior volsella long ...
 *D. socionotus* Guha, Chaudhuri & Nandi

99 *Dicrotendipes pelochloris* (Kieffer)

1912 *Tendipes pelochloris* Kieffer, *Supplta. Ent.*, 1:39

1988. *Dicrotendipes pelochloris* (Kieffer) ; Epler; *Mem Amer. Ent. Soc.*, 36 : 234

Material examined : 4(M) West Bengal, Burdwan, 7. IX. 1987, coll. S Chattopadhyay; 2(M), West Bengal, Durgapur, 16. IX. 1987, Coll. S., Chattopadhyay

Distribution : India (West Bengal) Formosa, Indonesia, Japan, Korea, Pakistan, Philippine and Thailand.

100. *Dicrotendipes septemmaculatus* (Becker)

1908. *Chironomus septemmaculatus* Becker, *Mitt. Zool. Mus. Berl.*, 4 :77.

1988. *Dicrotendipes septemmaculatus* (Becker) : Epler *Mem, Amer. Ent. Soc.*, 36 : 42.

Material examined : 4(M), West Bengal, Burdwan, 6. VII.1987. Coll. S. Chattopadhyay, 5 (M), 4(F), West Bengal, Garakka, 29. IX. 1986, Coll. S. Chattopadhyay.

Distribution : India (West Bengal,), Algeria, Australia, Bangladesh, Belgian Congo, Burama, Canary Islands, Egypt, Ethiopia, Formosa, Israel, Japan, Kenya, Lebanon, Malagasy, Malaysia, N. Rhodesia, S. Rhodesia, Spain, Sri Lanka, Sudan, Sumatra, Thailand, Transvaal, Uganda, Yemen and Zaire.

101. *Dicrotendipes paxillus* Guha, Chaudhuri & Nandi

1982. *Dicrotendipes paxillus* Guha, Chaudhuri & Nandi, *Proc. Zool. Soc. Calcutta* 33:33.

Material examined : 24(M) Burdwan, 4, IX. 1977, 2-4. VII. 1977. Coll. D. K. Guha 10 (M), Bolpur, 15. VII. 1977, Coll. D. Chatterjee; 10(M); Calcutta, 2. x. 1978, Coll. D. K. Guha.

102. *Dicrotendipes socionotus* Guha, Chaudhuri & Nandi.

1982. *Dicrotendipes socionotus* Guha, Chaudhuri & Nandi, *proc. Zool. Soc. Calcutta* 33:35.

Material examined : 7(M), 8(M), Darjeeling 12. VIII. 1977, Coll. P.K. Chaudhuri, 1(M), Jornagla, IX. 1977, Coll. J. Sinha; 2 (M), Burdwan, 15. ix. 1978, Coll. A. Nandi; 1(M), Ranighanj, 2. viii. 1978, Coll. D. C. Sinharay.

103. *Dicrotendipes tenuiforceps* (Kieffer)

1913. *Chironomus tenuiforceps* tenuiforceps Kieffer, *Rec. Ind. Mus*, 9 : 131.

1973. *Dicrotendipes tenuiforceps* (Kieffer) : Sublette & Sublette, *Univ. Howai press.*, 1: 404.

Material examined : 2(M), West Bengal, Burdwan, 6. VII. 1987, Coll. S. Chattopadhyay

Genus XXXI *Endochironomus* Kieffer,

1918. *Endochironomus* Kieffer, *Annl. Hist. Nat. Mus. Natn. Hung.*, 16 : 69

104. *Endochironomus pekanus* (Kieffer)

1916. *Tendipes pekanus* Kieffer, *annls Hist. Nat. Mus. Hung.*, 14:105.

1981. *Endochironomus pekanus* (Kieffer) Rec & Kim. *Proc. Coll. Natur. Sci.*, 6 :146.

Material examined : 2(M), West Bengal, Farakka, 29. IX. 1988; Coll, S. Chattopadhyay 5(M), West Bengal Naihati 16. IX. 1987, Coll. S. Chattopadhyay.

Distribution : India (West Bengal) Korea and Taiwan.

Genus XXXII *Gillotia* Kieffer,

1921. *Gillotia* Kieffer, *Annl. Soc. Scient. Brux.*, 40 : 272.

105. *Gillotia figida* Bhattacharyay, Dutta & Chaudhuri,

1985. *Gillotia figida* Bhattacharyay, Dutta & Chaudhuri, *B.U. Jour. Sci.*, 2. 181.

Material examined : 3(M), West Bengal, Mungpo 28. II. 1984, Coll. D. K. Guha.

Genus XXXIII *Glyptotendipes* Kieffer,

1913. *Glyptotendipes* Kieffer, *Biol. Zbl.*, 33:255

106. *Glyptotendipes barbipes* (Staeger)

1839. *Chironomus barbipes*, Staeger, *Ent. Sc. Suppl.*, 14:561.
 1905. *Glyptotendipes barbipes* (Staeger), Johannsen, *Bull. N.Y.St. Mus.*, **88** ; 76

Material examined: 6(M), West Bengal, Burdwan, 10.x. 1985, Coll. S. Chattopadhyay

Distribution : India (West Bengal)Europe andNorth America

Genus XXXIV *Harnischia* Kieffer,

1921. *Hamiachia* Kieffer, *Bull. Soc. Hist. Nat. Metz.*, **29** : 68

Key to species of Genus *Hamischia* Kieffer

1. Male hypopygium without well developed marked gonocoxite and gonostylus
 *H. viridula* (Linnaeus)
- Male hypopygium with well marked gonocoxite and gonostylus 2
2. Haltere bare *H. tenuitubercula* Chaudhuri & Chattopadhyay
- Haltere setose 3
3. Brachiolum with 2 setae Superior volsella bearing 3 long spical setae, inferior volsella rudimentary
 with ling setae *H. acuta* (Goetghebuer)
- Brachiolum with 1 seta. Superipr volsella bearing 1 apical seta, inferior volsella absent
 *H. incidata* Townes

107. *Harnischia acuta* (Goetghebuer)

1936. *Chironomus acutrs* Goetghebuer, *Revue. Zool.. Bot. Afr.* **25** : 470
 1983. *Hamischia Acuta* (Goetghebuer) Sasa & Hassgawa, *Jap. J. Sanit. Zool.*, **34** : 323

Material examined : 1(M) paratype (B.M. 1957-264), Transvall Neispruit, Coll. G.h. Frank (C/O British Museum of Natural History, England); 1(M), West Bengal, Kalyani 21. VIII. 1986, Coll. S. Chattopadhyay : 4(M), West Bengal, Burdwan, 6. IX. 1987. Coll. S. Chattopadhyay

Distribution : India (West Bengal), Belgian Congo, Cape province, Japan, New Zealand and Nigeria

108. *Harnischia Incidata* Townes

1945. *Hamischia incidata* Townes, *Am. Midl. Nat.*, **24**:166

Material examined : 5(M), West Bengal, Berhampore, 17. VIII. 1986, Coll. S. Chattopadhyay 3(M) West Bengal, palasi 18. VIII. 1986, Coll. S. Chattopadhyay.

Distribution : India (West Bengal) North America and Thailand.

109. *Harnischia tuberculata* Chaudhuri & Chattopadhyay

1990. *Harnischia tuberculata* Chaudhuri & Chattopadhyay, *Tijdschr ent.* 133:158

Material examined : 4(M), Farakka, 29. IX. 1986, Coll S. Chattopadhyay

110. *Harnischia viridula* (Linnaeus)

1967. *Hamischia viridula* Linnaeus. *Systema Naturae*, 1 : 975.

1981. *Hamischia viridula* (Linnaeus) : Hashimoto et al., *Tech. Bull. agr. Dept.*, Bangkok, 7 : 21.

Material examined : 5(M), West Bengal, Burdwan, 30. V. 1986. Coll. S. Chattopadhyay ; 3(M), West Bengal, Chinsura, 5. 11. 1987, Coll. S. Chattopadhyay.

Distribution : India (West Bengal); England, Japan, North America, Sweden and Thailand.

Genus XXXV. *Kiefferulus* Goetghebuer,

1922. *Kiefferulus* Goetghebuer, *Annl. Biol. Lacustr.* 11:40

Key to species of Genus *Kiefferulus* Goetghebuer

1. Gonostylus short and broad: superior volsella with rounded notched apes
..... *K. inciderus* Chattopadhyay & Chaudhuri
2. Gonostylus long and slender: superior volsella without notched apex 2
Soutellum with 20 setae in two transverse rows. Brachiolum with 4 setae. Anal point well
developed, tongue like *K. barbatitarsis* (Kieffer)
- Soutellum with 6 setae in one transverse rows. Brachiolum with 2 setae. Anal point dark. more. or
less peg like. *K. calligaster* (Kieffer)

111. *Kiefferulus barbatitarsis* (Kieffer)

1911. *Chironomus barbatitarsis* Kieffer, *Rec. Ind. Mus.*, 6: 154

1986. *Kiefferulus barbatitarsis* (Kieffer) : Chaudhuri & Ghosh, *Syst Ent.*, 11:277

Material examined : 1(paratype, West Bengal, Calcutta. 24. III. 1907. Mus. Coll. (NSC. Zoological Survey of India, Calcutta); 4 (M), West Bengal, Burdwan. 24. VIII. 1983. Coll. P. K. Choudhuri; 5(M), West Bengal, Hoogly. 4, IX. 1987, Coll. S. Chattopadhyay 4(M), West Bengal Howrah. 4. IX. 1987. Coll. S.

Chattopadhyay; 4(M), West Bengal, Kalyani, 10. II. 1988, Coll. S. Chattopadhyay.

112. *Kiefferulus calligaster* (Kieffer)

1911. *Chironomus Calligaster* Kieffer, *Rec. Ind. Mus* 6 : 160

1986. *Kiefferulus celligaster* (Kieffer): Chaudhuri & Ghosh, *Syst. Ent.*, 11: 285. 5(M), West Bengal, Burdwan, 14. IX. 1986, Coll. S. Chattopadhyay; 2(M), West Bengal, Kalyani, 26. X. 1986, Coll. S. Chattopadhyay; 5(M), West Bengal, Kalna, 4. 11. 1988, Coll. S. Chattopadhyay.

113. *Kiefferulus incerdus* Chattopadhyay & Chattopadhyay & Chaudhuri

1991. *Kiefferulus incedus* Chattopadhyay & Chaudhuri. *Hexapoda* 3 : 24

Material examined : 10(M), Bankura, 9.XII. 1989, Coll. S. Chattopadhyay.

Genus XXXVI *Microchironomus* Kieffer,

1918. *Microchironomus* Kieffer, *Annl. Hist. Nat. Mus. Natn. Hung.*,

Key to species of Genus *Microchironomus* Kieffer

1. Anal point with hyaline apex *M. Clariatus* Guha & Chaudhuri
- Anal point without hyaline apex 2
2. Anal point with small setaceous basolateral lobes. Superior volsella little curved with 1 apical seta
..... *N. fuscitarsus* (Guha & Chaudhuri)
- Anal point with large setaceous basolateral lobes. Superior volsella long slender with 2-3 apical
setae *M. tener* (Kieffer)

114. *Microchironomus fuscitarsus* Guha & Chaudhuri,

1981. *Microchironomus clarillatus* Guha & Chaudhuri, *Bull. Zool. Surv. India* 4 : 143

115. *Microchironomus fuscitarsus* (Guha & Chaudhuri)

1979. *Cryptochironomus fuscitarsus* Guha & Chaudhuri, *Bull. Zool. Surv. India* 2:95.

1988. *Microchironomus fuscitarsus* (Guha & Chaudhuri) : Chaudhuri & Chattopadhyay, *Orient. Ins.* 22:175.

Material examined : 10 (M), 7(F), Bolpur, 18. viii. 1977, Coll. D. Chatterjee.

116. *Microchironomus tener* (Kieffer)

1981. *Chironomus tener* Kieffer, *Ent. Mitt.*, 7 : 48

1988. *Microchironomus tener* (Kieffer) : Saether: *Bull. fish. Res. Bd. Can.*, 195:101.

Material examined : 4(M) West Bengal, Kalyani, 17. II. 1987, Coll. S. Chattopadhyay

Distribution : India (West Bengal), Australia, Chad, Gana, Madagascar, Rhodesia, Sough Africa, Zaire.

Genus XXXVII *Paracladopelma* Hamisch,

1923. *Paracladopelma* Hamisch, *Zool. Jb. Abs. Syst. Eckol. Geogr.* 47 : 307.

Key to species of Geunus *Paracladopelma* Hamisch

Frontal tubercles present. Present. Prescutellar absent. Spurs of hind tibia unequal. Anal point with saccular tip *P. sacculifera* Chaudhuri & Chattopadhyay

Frontal tubercles absent. prescutellar present. Spurs of hind tibia equal. Anal point tubular.
..... *P. aratra* Chaudhuri & Chattopadhyay

117. *Paracladopelma aratra* Chaudhri & Chattopadhyay

1990. *Paracladopelms aratra* Chaudhuri & Chattopadhyay, *Tijdschr. ent.* 133: 160.

Material examined : 5(M), Bally, S.iii.1987, Coll. S.Chattopadhyay.

118. *Paracladopelma sacculifera* Chaudhuri & Chattopadhyay

1990. *Paracladopelma sacculifera* Chaudhuri & Chattopadhyay *Tijdschr. ent.* 133 : 161.

Material examined : 6(M), Kalyani, 17. ii. 1987, Coll. S. Chattopadhyay. *Tijdschr. ent.* 133 ; 161.

Genus XXXVIII *Pentapedillum* Kieffer,

1913. *Pentapedilum* Kieffer, *Bull. Soc. Hist Nat. Matz.*, 28 : 25

Key to species of genus *Pantapedilum* Kieffer

1. Brachiolum with 1-4 setae. Scutellum with 26 setae in two transverse rows
..... *P. robusticeps* Guha & Chaudhuri

Brachiolum with 1 seta. Scutellum with 10-12 Setae in one transverse row 2

2. Brachiolum 9 with 4 setae. Fore tibial scale pointed
..... *P. macrotrichium* Guha & Chaudhuri

Brachiolum with 1 weta. Fore tibial scale blunt *P. uncinatum* Goetghebuer

124. *Pentapedilum macrotrichium* Guha & Chaudhuri1981. *Pentapedilum macrotrichium* Guha & Chaudhuri, *Bull. Zool. Surv. India*, 3:161.*Material examined* : 12(M), Burdwan, 11. ii. 1978, Coll. A. Chatterjee.125 *Pentapedilum robusticeps* Guha & Chaudhuri1990. *Pentapedilum robusticeps* Guha & Chaudhuri *Bull. Zool. Surv. India* 7 : 195.*Material examind* : 9(M), Palasi, 18. viii. 1986, Coll. S. Chattopadhyay126. *Pentapedilum uncinatum* Goetghebuer1921. *Pantepedilum unciatum* Goetghebuer, *Bull. Soc. Ent. Belg.*, 3:167.*Material examined* : 1(M), paratype (B. M. 1973 345), Spain, Levida, 6. VII. 1973, coll. P. S. Cranston (C/C British Museum of Natural History, London, England), 7 (M), West Bengal, Kalyani, 17. II. 1987. Coll. S. Chattpopadhyay.*Distribution* : India (West Bengal), Belgium, England, Germany, Japan and Spain.Genus XXXIV *Polyopedilum* Kieffer,1912. *Polyopedilum* Kieffe, *Supplta Ent.* 1 :41.Key to species of Genus *Polypedilum* Kieffer

- | | | |
|----|--|----|
| 1. | Wing with spots or markings and Clouds | 2 |
| | Wing without spots or markings | 14 |
| 2. | Thorax with bands or markings | 3 |
| | Thorax without bands or markings | 8 |
| 3. | Superior volsella short and broad and with setae | 4 |
| | Superior volselle long and slender and without setae | 6 |
| 4. | AR less than 1. Abdomen with markings or bands | |
| | <i>P. lineatum</i> Chaudhuri, Guha & Das Gupta | |
| | AR more than 1. Abdomen without markings or bands | 5 |

5. Fore tibial scale pointed. Anal pointed tongue like, Constricted at the middle
 *P. griseoguttatum* Kieffer
- Fore tibial scale blunt. Anal point narrow with pointed apex *P. annulatipes* Kieffer
6. Abdominal tergite I-VII with alternate dark brown and pale bands
 *P. flagellatum* Chaudhuri, Guha & Das Gupta
- Abdominal without such bands 7
7. Thorax yellow in colour, Corona setose. Inferior volsella with a long seta
 *P. flagellatum* Chaudhuri, Guha & Das Gupta
- Thorax red in colour, Corona Bare. Inferior volsella with normal setae
 *P. rufomarginalis* Chaudhuri, Guha & Das Gupta
8. Anal point trifid 9
- Anal point simple 11
9. Fore femur with dark brown apical band. Superior volsella flattened 10
- Fore femur without dark brown apical band. Superior volsella narrow
 *P. Choudhuri* Guha & Das Gupta
10. Anal point lanceolate, lateral branches of anal point short and blunt
 *P. lucidum* Chaudhuri, Guha & Das Gupta
- Anal point long and tubular, lateral branches of anal point long and pointed
 *P. tripunctatum* Chaudhuri, Guha & Das Gupta
11. Superior volsella club shaped with numerous setae
 *P. numerus* Chaudhuri, Guha & Das Gupta
- Superior Volsella simple with a few setae 12
12. Anal point hood like and inturned
 *P. albipalpus* Chaudhuri, Guha & Das Gupta
- Anal point simple 13
13. Frontal tubercle absent *P. milnet* Kieffer
- Frontal tubercle present *P. nubifer* (Skuse)

14. Thorax with bands or Marking 15
 Thorax without bands or markings 16
15. Mid and hind tibiae with brown apical band, abdominal segments II, III, V and VI with darkbrown bands *P. fasciatipennis* (Kieffer)
 Mid and hind tibiae without bands. Abdominal segments with out such bands
 *P. ascium* Chaudhuri, Guha & Das Gupta
16. Haltere setose 17
 Haltere bare 18
17. Superior volsella curved with blunt tip and 1 long lateral seta near the base
 *P. Circulum* Chaudhuri & Chattopadhyay
 Superior volsella scimitar like without lateral setac 18
18. Presutellar present *P. suturalis* (Johanseen)
 Prescuteller absent 19
19. Tergites without bands. Superior volsella with 1 long Seta behind tip
 *P. yapensis* Tokunaga
 Tergites with bands. Superior volsella without such setae
 *P. nudiceps* Chaudhuri, Guha & Das Gupta

127. *Polypedilum aegyptum* Kieffer

1925. *Polypedilum aegyptum* Kieffer, *Bull. Soc. Ent. Egypte*, 8:276

Material examined : 2(M), West Bengal, Burdwan, 4. IV. 1980, Coll. P.K. Chaudhuri 5(M), West Bengal Chinsura. 6.11. 1982. Coll. S. Chattopadyay.

Distribution : India : West Bengal (Burdwan and Chinsura). Africa And Egypt.

128. *Polypedilum alticola* Kieffer

1913. *Polypedilum altiocla* Kieffer, *Voy. All. and. Jean. Afr.* 1:2

Material examined : 4(M), West Bengal, Raniganj, 2.V.1972, Coll. P. K. Chaudhuri.

Distribution: India (West Bengal) Hungary and Africa.

129. *Polyedilum annulatipes* Kieffer,

1921. *Polyedilum annulatipes* Kieffer, *Bul. Soc. Hist. Nat. Meta.*, **29** :100.

Material examined.: 1(M) Paratype, India, Orissa, Barkuda Is., 1.1.1922., Coll. N. Annandale (C/O Z. S. I., Calcutta); 5(M), West Bengal, Burdwan, 11.3.1978, Coll. A. Chatterjee : 3(M), West Bengal, Bankura, 27.9.1977, Coll. S. Basak; 6(M), West Bengal, Bally (Dist. Howrah) 13.3.1986, Coll. S. Chattopadhyay.

Distribution : India (West Bengal) Orissa; Africa Egypt, Pakistan and Zaire.

130. *Polypedilum albipalpus* Chaudhria, Guha & Das Gupta

1981. *Polypedilum albipalpus* Chaudhuri, Guha & Das Gupta, *Tijdschr. Ent.* **124** : 112.

Material examined : 3(M), 4(F) , Ranigaj, 10.v.1977, 10. viii. 1978, Coll. D.K. Guha and P. K. Chaudhuri 1(M), 1(F), Memari, 23. vii. 1978, Coll. P.K.Chaudhuri.

131. *Polypedilum ascium* Chaudhuri, Guha & Das Gupta,

1981. *Polypedilum ascium* Chaudhuri, Guha & Das Gupta, *Tijdschr. Ent.***124**:117.

Material examined : 20(M), Bolpur, 18-20, viii. 1977, Coll. D.Chatterjee; 1(M) Burdwan 3.iii.1978, Coll. S. K. Nandi; 4(M), Calcutta, 23.i. 1978, Coll. D. K. Guha; 3(M), Rampurhat, 29.iv. 1978, Coll. D. Ray.

132. *Polypedilum choudhurii*, Chaudhuri, Guha & Das Gupta,

1981. *Polypedilum choudhurii*, Chaudhuri, Guha & Das Gupta *Tijdschr. ent.* 124:119.

Material examined : 8(M), 3(F), Burdwan, 11. ii. 1978, Coll. A. Chatterjee; 2(M), Calcutta, 7. iii. 1972, Coll. D. K. Guha; 1(M), Chinsura, 7. iii. 1972, Coll. P. K. Chaudhuri 2(M), Durgapur 7--8, iii. 1978, Coll. S.Chaudhuri.

133. *Polypedilum circulum* Chaudhuri & Chattopadhyay

1990. *Polypedilum circulum* Chaudhyri & Chattopadhyay, *Tijdschr. ent* **133**:162.

Material examined : 9(M), Kalyani, 25.x. 1986, Coll. S. Chattopadyhyay.

134. *Polypedilum fasciatipennis* Kieffer

1910. *Chironomus fasciatipenni* Kieffer, *Mem. Ind. Mus.* **2**:238.

1973. *Polypedilum fasciatipennis* (Kieffer) : Sublette & Sublette: *Univ.Hawai Press.*, **1** : 408.

Material examined: 1(M), West Bengal, Burdwan 5. IV. 1982, Coll. P.K. Chaudhuri.

135. *Polypedilum flagellatua* Chaudhuri, Guha & Dasgupta

1981. *Polypedilum flagellatua* Chaudhuri, Guha & Das Gupta *Tijdschr. Ent.* 124 : 122.

Material examined : 4(M), 3(F), Raniganj, 25.iv. 1977, Coll. 3. C. Sinharay; 4(M), 3(F), Bipur, 18.VIII.. 1977, Coll. D. Chattopadhyay.

136. *Polypedilum griseoguttatum* Kieffer

1921. *Polypedilum Griseoguttatum* Kieffer, *Bull. Soc. Hist. Nat. Metz.*,

Material examined : 2(M), West Bengal, Burdwan, 28. i. 1978, Coll. D. K. Guha; C(M), West Bengal, Calcutta, 12. ii. 1979, Coll. P., K. Chaudhuri.

137. *Polypedilum insolitum* Chaudhuri, Guha & Das Gupta

1981. *Polypedilum insolitum* Chaudhuri, Guha & Das Gupta, *Tijdschr. ent.* 124 :127.

Material examined : 6(M), Digha, 15. iv. 1975, Coll. P. K. Chaudhuri.

138. *Polypedilum Lineatum* Chaudhuri, Guha & Das Gupta

1981. *Polypedilum lineatum* Chaudhuri, Guha & Das Gupta, *Tijdschr. ent.* 124 : 129.

Material examined : 1(M), Ranighanj, 28. x. 1977, Coll. D. K. Guha 8(M). Burdwan 28-30. x. 1977. A. Chatterjee 4(M), Siliguri, 21-22.iv. 1979, Coll. S. K. Das Gupta; 3(M), Triveni 4. iv. 1979, Coll. S. Sarkar.

139. *Polypedilum lucidum* Chaudhuri, Guha & Das Gupta

1981. *Polypedilum lucidum* Chaudhuri, Guha & Das Gupta *Tijdschr. ent.* 124 : 131

Material examined: 11(M), Burdwan, 12. iii. 1978, Coll. S.K. Nandi, 2(M), Calcutta, (reared in the laboratory) ; 2(M), Panagar 7. iv. 1978, Coll. K. Chatterjee.

140 *Polypedilum medivittatum* Tokunaga

1964. *Polypedilum medivittatum* Tokunaga, *Bernice P. Bishop Mus.* 12 : 588.

Material examined : 6(M), West Bengal. Kalyani, 26.X. 1986, Coll. S. Chattopadhyay.

Distribution : India (West Bengal) Caroline Islands, Japan. S. Mariana Islands and South Sumatra

141. *Polypedilum milnei* Kieffer

1913. *Polypedilum milnei* Kieffer *Rec. Ind. Mus.* 9 : 148.

Material examined : 4(M), West Bengal, Berhampore, 5. VI. 1989, Coll. S. Chattopadhyay.

142. *Polypedilum nubifer* (Skuse)

1989. *Chironomus nubifer* Skuse *Proc. Linn. Soc. N. S. W.* 4 : 249

1961. *Polypedilum nubifer* (Skuse) : Freeman, *aus. J. Zool.*, 9:107.

Material examined : 2(M), West Bengal, Burdwan, 14. IX. 1988, Co.,, S. Chattopadhyay; 2(M), West Bengal, Kalyani, 10.11. 1986, Coll. S. Chattopadhyay 3 (M) West Bengal, Chinsura, 6.11.1987, Coll. S. Chattopadhyay; 2(M) West Bengal, Uttarpara, 9. X. 1987, Coll. S. Chattopadhyay.

Distribution : India (West Bengal), Africa, Australia, Egypt, Formosa, Indonesia, Iraq, Japan, Korea, Micronesia, MOrocco, and Sri Lanka.

143. *Polypedilum numerus* Chaudhuri, Guha & Das Gupta

1981. *Polypedilum numerus* Chaudhuri, Guha & Das Gupta *Tijdschr. ent.* 124 :135

Material exmined: 4(M), Darjeeling, 27. x. 1977. Coll. P. K. Chaudhuyri, 3(M), Jorbangla, 3. xi.1978, Coll. P. Chaudhuri : 1(M) Kurseong, 22.x. 1977, Coll. S.K. Das Gupta.

144. *Polypedilum rufomarginalis* Chaudhuri, Guha & Das Gupta

1981. *Polypedilum rufomarginalis* Chaudhuri, Guha & Das Gupta *Tijdschr. ent.* 124 :140.

Material examined : 9(M), 5(F), Burdwan, 3-4. IX.1978, Coll, A. Chatterjee, 3(M). Berhampur, 22. IX. 1976, Coll. P. K. Chaudhuri; 4(M), 1(F). Malda,15. VIII. 1974, Coll. S. Chatterjee; 3(M), 1(F), Raniganj, 11-12-111.1926, Coll. D. C. Sinharay; 2(M), Tiveni, 7.111. 1975, Coll. S. Das.

145. *Polypedilum suturalis* (Johannsen)

1932. *Chironomus suturalis* Johannsen *Arch. Hydrobiol. Suppl.*, 11:552

1973. *Polypedilum suturalis* (Johannsen) : Sublette & Sublette, *Univ. Howai Press*, : 408.

Material examined : 6(M), Haldia 16. X. 1987, Coll, S. Chattopadhyay.

Distribution : India (West Bengal), South Sumatra and Thailand.

146. *Polypedilum tripunctun* Chaudhuri, Guha & Das Gupta

1981. *Polypedilum tripunctun* Chaudhuri, Guha & Das Gupta *Tijdschr. ent.* 124 :142.

Material examined : 5(M), Darjeeling, 25. X. 1970, 2.3.IX. 1973, Coll. S. K. Das Gupta; 1(M). Tindhata, 17.x. 1974, Coll. T. Sharma.

147. *Polypedilum yapensis* Tikunaga1964. *Polypedilum yapensis* Tikunaga Bernce *P. Bishop Mus.*, 12 : 596*Material examined* : 9(M), West Bengal, Howrah, 8.III. 1987, Coll. S. Chattopadhyay,*Distribution* : India(West Bengal); Caroline Island and Thailand.Genus XL *Stenochironomus* Kieffer,1919. *Stenochironomus* Kieffer, *Ent. Mitt.*, 8 : 44Key to species of genus *Stenochironomus* KiefferScutellum with 30 setae in two transverse rows. Wing with pale median and apical band
..... *S. hilaris* (Walker)Scutellum With 14 setae in one transverse row. Wing unmarked. *S. longipalpis* (Kieffer)148. *Stenochironomus hilaris* (Walker)1848. *Chironomus hilaris* Walker, *List. Dipt. Ins. b. London*, 1: 171943. *Stenochironomus hilaris* (Walker) : Townes, *Am. Midl. Nat.*,*Material examined* : 4(M), West Bengal, Farakka, 29. IX. 1986, Coll. S. Chattopadhyay,*Distribution* : India (West Bengal), Canada and U. S. A.149. *Stenochironomus longipalpis* (Kieffer)1913. *Tendipes longipalpis* (Kieffer) ; *Rec. Indi, Mus.*, 9 : 132.1973. *Stenochironomus longipalpis* (Kieffer) Sublette & Sublette, *Univ. Howai Press.* :448*Material examined* : 2(M), West Bengal, palasi, 18. VIII. 1986, Coll. S. Chattopadhyay.*Distribution*: India (West Bengal)Genus XLI *Stictochironomus* Kieffer,1919. *Stictochironomus* Kieffer, *Ent. Mitt.*, 8 : 44.Key to species of Genus *Stictochironomus* Kieffer,Corona setose. Anal point with an apical knob *S. obscurus* (Guha & Chaudhuri)

Corona bare. Anal point without arical knob *S. affinis* (Johannsen)

150. *Stictochironomus affinia* (Johannsen)

1932. *Chironomus affinis* Johannsen, *Arch. Hydrobiol. Suppl.*, **11** : 525

1987. *Stictochironomus affinis* (Johannsen) : Ali, Chaudhuri & Ghua, *Florida Ent.*, **70** ; 260

Material examined : 8 (M), Katwa (Dist Burdwan), 8.11. 1987, Coll. S. Chattopadhyay : 6 (M) Uttarapara 24.11. 1987, Coll. S. Chattopadhyay; 3 (M), Berhampore, 2, i. 1988. Coll. S. Chattopadhyay.

Distribution : India (West Bengal) and Indonesia.

151. *Stictochironomus obseurus* Guha & Chaudhuri

1983. *Stictochironomus obseurus* Guha & Chaudhuri, *J. Bomb.nat. Hist. Soc.* **79** ; 637.

Stictochironomus obseurus Guha & Chaudhuri: Chaudhuri & Chattopadhyay, 1990. *Tijdschrent.* **133** : 165.

Material examined ; 1 (M) 1 (F) , Kakdwip 11. XI. 1976, Coll. A. K. Chatterjee 5 (M), 3 (F), Burdwan, 23-26. X. 1879, Coll. M. Ghosh

152 *Xenochironomus flaviventris* (Kieffer)

1911. *Chironomus flaviventris* Kieffer *Rec. Ind. Mus.*, **6** : 139

1987. *Xenochironomus flaviventris* (Kieffer) : Chaudhuri & Guha, *Ent. Scand. Suppl.*, **29**:29.

Material examined : 1 (M) , paratype (Z. S. I. No. 9731/19) India, Puri, (Orissa), 20-21.i. 1909 , 29. IV. 1986, Coll. S. Chattopadhyay; 1 (M), West Bengal, Hooghly, 4. IX. 1987, 16. IX. 1987, Coll. S. Chattopadhyay.

Distribution : India : West Bengal, Orissa.

Tibe B TANYTARSINI

Genus XLIII *Bernhardia* Chaudhuri & Datta., 1992.

1992. *Bernhardia* Chaudhuri & Datta, *J. Beng. Nat. Hist. Soc.*

153 *Bernhardia unispinosa* Chaudhuri & Datta

1992. *Bernhardia unispinosa* Chaudhuri & Datta , *J. Beng. Nat. Hist. Sc.*

Material examined : 4(M), West Bengal, Birpara 10.V. 1988, Coll. d. Sai.

Genus XLIV *Cladotany tarsus* Kieffer,

1921. *Cladotany tarsus* Kieffer, *Annl. Soc. Scient. Bruz.*, **40** : 227.

Key to the species of Genus *Cladotanytarsus* Kieffer

1. Mesonotum with 3 brown vittae. Abdominal tergites with bands2
 Mesonotum unicolour. abdominal tergites with bands6
2. Anal point with spinulae3
 Anal point without spinulae *C. conversus* (Johannsen)
3. Anal point with 6-10 spinules4
4. Anal point nipple like. Superior volsella apically incurved *C. unagisexts* (Sasa)
 Anal point inverted bell shaed. Superior volsella not incurved apically
 *C. gloveri* Chaudhuri & Das
5. Eyes with dorsal extension. Mid. tibia single supered. Anal point board.
 *C. pseudonancus* (Goetghebuer)
 Eyes without dorsal extension. Mid. tibia double supered. Anal point small.
 *C. multispinulus* Guha, Das, Chaudhuri & Choudhuri
6. Scutellum with 4 setae. Superipr volsella spically curbed7
 Scutellum with 2 setae. Superipr volsella curved apically8
7. Brachiolum with setae. Inderior volsella short *C. fustistylus* Chaudhuri & Datta
 Brachiolum with 1 seta. Inferior volsella long *C. unilinearis* Glover
8. Acrostichals biserial. Hind tibia single spurred *C. acinatus* Chaudhuri & Datta
 Acrostichals uniserial *C. flexus* Chaudhuri & Datta

154. *Cladotenytarsus acinatus* Chaudhuri & Datta

1992. *Cladotanytarsus acinatus* Chaudhuri & Dulli, *Revta Bras. Ent.*

Material examined : 4(M), Polempur (Burdwan), 20. XI. 36 ;672, 1988, Coll, A. K. De.

155 *Cladotanytarsus Conversus* (Johannsen)

1932. *Tanytarsus conversus* Johannsen, *Arch. Hydrobiol. Suppl.* 11:543.

1973. *Cladctanytarsus coversus* (Johannsen) : Sublette & Sublette, *Univ. Hawai Press* :416.

Material examined : 8(M), West Bengal Kalyani, 25.Z. 1986, Coll. S. Chattopadhyay.

Distribution : India (West Bengal) and Sumatra

156. *Cladotanytarsus flexus* Chaudhri & Datta

1992. *Cladotanytarsus flexus* Chaudhri & Datta *Revta. Bras. Ent.* **36** : 674.

Material examined : 4(M), polempur 20.XI. 1988, Coll. A. K. De

Material examined : 6(M), 3(F), alipurduar, 15. IV. 1987, Coll, A. K. De, 1(M), Burdwan, I. V. 1987, Coll. T. K Datta.

157 *Cladotanytarsus fustistylus* Chaudhri & Datta

1992. *Cladotanytarsus fustistylus* Chaudhri & Datta *Revta. Bras. Ent.* **36** : 676

Material examined : 6(M), 3(F), alipurduar, 15. IV. 1987, Coll, A. K. De, 1(M), Burdwan, I. V. 1987, Coll. T. K Datta.

158. *Cladotanytarsus gloveri* Ghosh Chaudhuri

1988. *Cladotanytarsus gloveri* Ghosh Chaudhuri *Proc. Zool. Soc., Calcutta* **38** : 15.

Material examined : 8(M), Jhargram, 31.X. 1982, Coll. S.K. Das

159. *Cladotanytarsus multispinulus* Guha, Das Chaudhuri

Cladotanytarsus multispinulus Guha, Das Chaudhuri & Chaudhuri, *Proc. nat. Acad. Sci. India B* **55** : 31

Material examined : 3(M), Burdwan, 6.IX. 1987, 10 (M), Kalyani, 17. 11.1987,, 2(M) Uttarpara, 24. 11. 1987, Coll. S. Chattopadhyay.

Distribution : India : Andaman Is. and West Bengal

160 *Cladotanytarsus pseudomancus* (Goetghebuer)

1934. *Tanytarsus pseudomancus* Goetghebuer, *Rev. Zool. Bot. Afr.* **25** : 200

1980. *Cladotanytarsus pseudomancus* (Goetghebuer) : Rreeman & Cranston, *Trust. Brit. Mus. Nat.Hist.* **1** : 200.

Material examined : 1(M), West Bengal, Hasimara, 29.Vi. 1984. Coll. D. Sai.

161. *Cladotanytarsus unagisextrs* (Sasa)

1985. *Tanytarsus unagisextrs* Sasa. *Kankyo Eisei*, **83** : 46.

1992. *Cladotanytarsus unagisextrs* (Sasa) : Chaudhuri & Datta

Material examined: 3(M), Ghatal, 14. XI.X 1988, Coll. D.Sai.

Distribution : India (West Bengal) and Japan

162. *Cladotanytarsus unilinearis* Glover

1973. *Cladotanytarsus unilinearis* Glover, *Aus. J. Zool. Suppl. Scr.*, **23** ;437.

Material examined : 3(M), West Bengal, Sedarghat, Burdwan, 20. VII. 1988, Coll. T. Datta.

Distribution : India : West Bengal (Asansol and Jalpaiguri) : Australia.

Genus XLV *Micropsecta* Kieffer,

1909. *Microsectra* Kieffer, *Bull. Soc. Hist. Nat. Metz.*, **26** ; 50,

Key to species of Genus *Micropoetra* Kieffer,

1. Abdominal tyergites with bands, wing with a very few macrotrichia.
..... *M. confundeda* (Kieffer)
- Abdominal tergites without bands. Macrotrichia distributed all over the wing membrane 2
2. Brachiolum with 3 setae Anal point acute Superior Volsella broad at base and narrowed towards the tip *M. nepalensis* Sawadal
- Brachiolum with 2 setae Anal point bent Superior Volsella club like 3
3. Eyes with dorsal expansion. vertex with 11-14 setae. Anal point Digitus finger like
..... *M. candida* Chaudhuri & Datta
- Eyes without dorsal expansion. vertex with 22 setae. Anal point Digitus small and narrow
..... *M. clava* Chaudhuri Guha & Ghosh,

163. *Micropsectra confundeda* (Kieffer).

1911. *Tanytarsus confundendus* Kieffer, *Rec. Ind. Mus.*, **6** :169

1973. *Micropsectra confundeda* (Kieffer) ; Sublette & Sublette, *Univ. Howai Press* ; 416.

Material examined : 1 (M) paratype (C/O Z. S.I. , Calcutta) Canning 21. vii. 909, Coll N. Annandale.

164. *Micropsectra candida* Chaudhuri & Datta

1991. *Micropsectra candida* Chaudhuri & Datta, *Proc. Zool. Soc. Calcutta* **44**:29.

Material examined : 5(M), Darjeeling, 11.iv. 1984, Coll. T.K. Dutta.

165. *Micropsectra candida* Chaudhuri & Guha & Ghosh

1984. *Micropsectra candida* Chaudhuri & Guha & Ghosh, *Orient Ins.* 18 ; 31.

Material examined : 3(M), Burdwan, 7.VII.1977, Coll. S.K. Nandi; 3(M), Bolpur, 4. VII. 1977, Coll. D. Chatterjee, 2 (M), Ranigang, 23.III. 1977, Coll. P.K. Chaudhuri.

166. *Micropsectra nepalensis* Sawedal

1976. *Micropsectra nepalensis* Sawedal *Ent, Scand.*, 7 : 134

Material examined: 2(M), West Bengal, Darjeeling, 6. VIII. 1984, Coll. D. K. Guha

Distribution : India : West Bengal and Nepal.

Genus XLVI *Paratanytarsus* Thienemann & Bause

1913. *Paratanytarsus* Thienemann & Bause , *Arch. Hydrobiol. suppl.* 2 :120

Key to species of Genus *Paratanytarsus* Thienemann & Bause

1. Larger in size. Acrostichals uniserial. Haltere setose Inferior volsella long
..... *P. albus* Chaudhuri, Guha & Ghosh
- Smaller in size. Acrostichals biserial. Haltere bare. Inferior volsella short 2
2. Brachiolum with 1 seta. Mid and hind tibia doubled spurred Digitus quadrate
..... *P. papillatus* Chaudhuri & Datta
- Brachiolum with 2 setae. Mid and hind tibia single spur spurred. Digitus beak - like.
..... *P. gressitti* (Tokunaga)

167. *Paratanytarsus albus* Chaudhuri, Guha & Ghosh

1984. *Paratanytarsus albus* Chaudhuri, Guha & Ghosh *Orient. Ins.* 18:32

Material examined : 6(M), Burdwan, 4.IX. 1977, Coll. B.K. Chaudhuri.

168. *Paratanytarsus gressitti* (Tokunaga,)

1964. *Tanytarsus gressitti* Tokunaga, *Bernice P. Bishop Mus.*, 12 : 635.

1992. *Paratanytarsus gressitti* (Tokunaga,); Chaudhuri & Datta. *Aquatic Ins.*, 14 ; 122

Material examined: 2(M), West Bengal, Falakata, 26.VIII. 1988, D. Sai

Distribution : India (West Bengal) Caroline Islands (Midronesia)

169. *Paratanytarsus papillatus* Chaudhuri & Dutta

1992. *Paratanytarsus papillatus* Chaudhuri & Dutta & Mazumdar, *Aquatic Ins.* **14** : 124.

Material examined : 6 (M), Burdwan, 25. IX. 1987, Coll. T. K. Dutta: 5 (M), Hetampur, 30.IV.1988, Coll. A. K. De.

Genus XLVII *Rheotanytarsus* Thienemann & Bause,

1913. *Rheotanytarsus* Thienemann & Bause. *Arch. Hydrobiol. Suppl.*, **2** :120.

170. *Rheotanytarsus acerbus* Johannsen

1932. *Rheotanytarsus acerbus* Johannsen, *Arch. Hydrobiol. Suppl.*,

Material examined : 2(M), West Bengal, Mongpoo, 5.11.1984, coll. D.K. Guha.

Distribution : India (West Bengal) South Sumatra.

171. *Rheotanytarsus johnstoni* Glover

1973. *Rheotanytarsus johnstoni* Glover, *Aus. J. Zool. Suppl. Ser.*, **23** : 86.

Material examined : 1 (M), paratype, ANIC, Devlin, S. A., 27.3.1970, Coll, B. Glover, 1 (M), West Bengal, Jalpaiguri, 22.3.1988, coll. D. Sai; 1(M), West Bengal, Asansol 12.2.1986, Coll.T.K. Dutta.

Distribution : India (West Bengal) & Australia

Genus XLVIII *Tanytarsus* vander Wulp

1984. *Tanytarsus* van der Wulp. *Tijdschr. Ent.*, **17** : 134.

Key to species of Genus *Tanytarsus* van der Wuop

- | | | |
|----|---|----|
| 1. | Anal point with spinulae | 2 |
| | Anal point without spinulae | 22 |
| 2. | R ₄₊₅ ends proximal or distal or at the level of Cu1. abdomen banded | 9 |
| | R ₄₊₅ ends distal to Cu1. Abdomen without babds | 3 |

3. Eyes with or without dorsal extension. Median volsella without long setae 4
 Eyes without dorsal extension. Median volsella with 3-4 very long setae 21
4. Eyes with dorsal extension 5
 Eyes without dorsal extension 20
5. Wings entirely covered with macrotrichia. Bands of IXth tergite extending into anal point. Median volsella bulb like *T. atroxitarsus* Chaudhuri & Datta
 Wings with macrotrichia only in the apical portion. Bands of IXth tergite not extending into anal point. Median volsella brush like or short 6
6. Digitus knife like. Inferior volsella short and stout. Median volsella short with incurved tip 7
 Digitus not knife like. Inferior volsella long. Median volsella brush like 8
7. Brachiolum with 2 setae. Anal point widest at the base and apically rounded bearing 6-8 spinulae. Superior volsella drum like *T. okuboi* Sasa and Kikuchi
 Brachiolum with 1 setae. Anal point narrowly coniform usually with 3 spinulae. Superior volsella oval *T. cultellus* Choudhuri & Datta
8. Superior volsella oval without mediobasal projection. digitus appearing as projection from the superior volsella ÈSkuse
9. R_{4+5} ends distal to Cu_1 12
 R_{4+5} ends at the same level of or proximal to Cu_1 10
10. Scutellum with 8 setae. Bands of IXth tergite narrowly separated. superior volsella conical without mediobasal projection *T. aculeus* Chaudhuri, Nandi & Ghosh
 Scutellum with 2 setae. Bands of IXth tergite widely separated. Superior volsella with mediobasal projection 11
11. Frontal tubercles absent *T. flaviradialis* Guha, Das, Chaudhuri & Choudhuri
 Frontal tubercles large and prominent
 *T. magnituberculatus* Guha, Das Chaudhuri & Choudhuri
12. Apex of IXth tergite broadly truncate 13
 Apex of IXth tergite not truncate 14

13. Anil point elongated, thickened laterally, Constricted near the rounded apex. Digitus quadrate ..
..... *T. infundibulus* Chaudhuri & Choudhuri
- Anil point stout, apically attenuated. Digitus small *T. vinculus* Chaudhuri Guha & Ghosh
14. Digitus inconspicuous 17
- Digitus conspicuous 15
15. Scutellum with 2-4 setae. Bands of IXth tergite not extending into the anil point Anal point
with 8 spicules *T. dycei* Glover
16. Median volsella bulb like, Superior volsella without mediiodistal projection
..... *T. fuscibdominalis* Guha, Das, Chaudhuri & Choudhuri
- Median volsella brush like. Superior volsella with mediiodistal projection
..... *T. fuscimarginalis* Chaudhuri, Guha, & Ghosh
17. Anal point with 5-6 spinulae. Inferior volsella of uniform thickness 18
- anal point with 8-9 spinulae. Inferior volsella strongly capitate apically 1
18. Large specimens (2.41 mm.) Mesonotum without vittae abdomen with median longitudinal
dark bands in addition to posterior bands. Width of anal point/width of superior volsella 1.4
..... *T. parvistylus* Chaudhuri & Datta.
- Smaller specimens (1.14 mm.) Mesonotum with brown vittae. Abdomen with posterior bands
only. Width of anal point/width of superior volsella 0.55 *T. nichollsi* Golve
19. AR 1.2. Anal point broadly round with irregularly arranged spinulae
..... *T. agraeensis* Sinha and Kulshrestha
- AR 1.45. Anal point with nipple-like nipple-like apical projection with spinulae arranged in a
row apical projectio with spinulae arranged in a row
..... *T. ungulituberculus* Singha and Kulshrestha
20. Mosonotum with 3 brown wittae Acrostichals 14-16. Anal point bulbous subterminally and
pointed apically with 2 spinulae *T. comoni* Glover
- Mosonotum light brown acrostichals 8-10 Anal point stout and apically rounded bearing 3.
spinulae *T. pollexus* Chaudhuri & Datta
21. Macrotrichia dense in the apical portion of the wing. Targite IX with widely separated bands.
Anal point dark and stout *T. rectistylus* Chaudhuri & Datta

- Macrotrichia very few on the wing membrane. Tergite IX with widely separated bands. Anal point pointed *T. gracilistylus* Chaudhuri & Datta
22. R_{4+5} ends at the level of Cu1 23
- R_{4+5} ends distal to Cu1 24
23. Anal point spatula like *T. quinspinosus* Chaudhuri & Datta
- Anal point bifurcated *T. bifurcus* Freeman
24. Abdomen with bands. anal point short or linear 5
- Abdomen without bands. Anal point broad, short, rounded bearing numerous stiff, minute setae and 2 apical setae *T. balteatus* Freeman
- Spurs of mid and hind tibia equal except cristatus n. sp. Median volsella short without fan like arrangement of setae. Digitus without mediobasal lobe 26
26. Macrotrichia in the apical portion wing. Digitus distinct *T. glabrascens* Edwards
- Macrotrichia very few. Digitus absent appearing only as an outgrowth of superior volsella *T. cristatus* Chaudhuri & Datta

172. *Tanytarsus agraensis* Singh & Kulsrestha

1975. *Tanytarsus agraensis* Singh & Kulsrestha, *Orient, Ins.*, 9 : 421

Material examined : 1 (M), West Bengal, Bolpur, 18. VIII. 1979, Coll. D. Chatterjee, 1 (M), Burdwan, 2.VI. 1976, Coll. P.K. Chaudhuri.

Distribution : India: West Bengal & UttarPradesh

173. *Tanytarsus aculeus* Chaudhuri, Nandi & Ghosh

1988. *Tanytarsus aculeus* Chaudhuri, Nandi & Ghosh, *Acta Hydrobiol.* 30 : 240.

Material examined : 11(M), 10(F), Burdwan 6.VI. 1983, Coll S.K.Nandi.

174. *Tanytarsus atroxitarsus* Chaudhuri & Datta

1992 *Tanytarsus atroxitarsus* Datta. Mazumdar & Chaudhuri *Orient Ins.* 26 : 42.

Material examined : 1 (M), Jalpaiguri : 22, iii. 1988, Coll. A.K. De; 4 (M), Birpara, 14.X. 1984, Coll. T.K. Dutta.

175. *Tanytarsus balteatus* Freeman

1955. *Tanytarsus balteatus* Freeman, *Bull. Br.Mus. Nat. Hist. Ent.* 4 : 36

Material examined : 2(M), Gotan, 26. i. 1987, Coll. A.K. De.

Distribution : India (West Bengal) and Africa.

176. *Tanytarsus bifurcus* Freeman

1956. *Tanytarsus bifurcus* Freeman, *Bull. Br. Mus. Nat. Hist. Ent.*,

Material examined : 5 (M), Farakka, 29.IX.1986, COLL. S. Chattopadhyay; 2 (M), Bolpur, 18. VII. 1988, Coll. D. K. De : 5(M), Asansol, 25. VI.1980, Coll. T. K. Dutta.

Distribution : India (West Bengal) and Africa.

177. *Tanytarsus commoni* Gover

1973. *Tanytarsus commoni* Glover, *Aus. J. Zool. Suppl. Ser.*, 23 : 458

Material examined : 1 (M), paratype (Aus. Nat. ins. Coll.,Australia), Clyde Mtn. Eastern foot hills, 400 ft N.S.W., 15. VIII.19687, Coll. z Liepa. 2(M), polempur, 26. XI. 1988, Coll. D. Sai; 6(M), Kalna, 25. X. 1986, Coll. S. Chattopadhyay.

Distribution : India (West Bengal) and Australia

178. *Tanytarsus cristatus* Chaudhuri & Dutta

1992. *Tanytarsus cristatus* Chaudhuri & Dutta, Mazumdar & Chaudhuri *Orint Ins.* 26 : 43.

Material examined : 4(M), Mungpu, 8.XI. 1984, Coll. D.K. Guha

179. *Tanytarsus cristatus* Chaudhuri & Dutta

1992. *Tanytarsus cristatus* Chaudhuri & Dutta, Mazumdar & Chaudhuri *Orint Ins.* 26 : 44.

Material examined : 1(M), Alipurduar, 15. IV. 1987, Coll. A.K. De; 5(M), Gotan, 26-2.1.1987, Coll. T.K. Dutta.

180. *Tanytarsus dycei* Glover,

1973. *Tanytarsus dycei* Glover, *Aust J. Zool. Suppl. Ser.*, 23 : 444

Material examined : 4(M), 5(F), Burdwan 31.i. 1987, Coll. A.K. De.

Distribution : India (West Bengal) and Australia.

181. *Tanytarsus fuscithorax* Skuse

1889. *Tanytarsus fuscithorax* Skuse *Proc.Linn. Soc. N. S. A.*, 2 : 272

Material examined : 6(M), 4(F), Burdwan, 7. VII. 1980, Coll. M. Ghosh.

Distribution : India (West Bengal) and Australia.

182. *Tanytarsus flaviradialis* Guha, Das, Chaudhuri & Chudhuri

1985. *Tanytarsus flaviradialis* Guha, Das, Chaudhuri & Chudhuri *Proc. nat. Acad. Sci. India B* 55 : 32.

Material examined : 3(M), Kakdwip, 10. VIII. 1989, Coll. S. Chattopadhyay.

183. *Tanytarsus fuscibdominalis* Guha, Das, Chaudhuri & Choudhuri.

1985. *Tanytarsus fuscibdominalis* Guha, Das, Chaudhuri & Choudhuri. *Proc. nat. Acad. Sci. India* 55 : 34.

Material examined : 4(M), Kakdwip. 10. VIII. 1989, Coll. S. Chattopadhyay.

184. *Tanytarsus fuscibdominalis* Chaudhuri Guha & Ghosh

1984. *Tanytarsus fuscibdominalis* Chaudhuri Guha & Ghosh *Orient. Ins.* 18 : 33.

Material examined : 5(M), 3(F), Bolpur, 18. VIII. 1977, Coll. D. Chatterjee; 6(M), 3(F), Burdwan. 2-4. VII. 1978, Coll. C. Ghosh; 2(M), Durgapur, 13. VIII. 1978, 3(M), 2(F) Raniganj, 27, III. 1978, Coll. P.K. Chaudhuri.

185. *Tanytarsus glabrescens* Edwards

1929. *Tanytarsus glabrescens* Edwards, *Trans. R. Ent. Soc. Lond.*, 77 : 426

Material examined : 2(M), Burdwan, 25.X. 1988, Coll. D. Sai

Distribution : India (West Bengal) and Europe.

186. *Tanytarsus gracilistylus* Chaudhuri & Dutta

1992. *Tanytarsus gracilistylus* Dutta, Mazumdar & Chaudhuri, *Orient. Ins.* 26 : 46

187. *Tanytarsus infundibulus* Chaudhuri & Dutta

1992. *Tanytarsus infundibulus* Dutta Mazumdar & Chaudhuri, *Orient. Ins.* 26 : 47.

Material examined : 3(M), 3(F), Gangasagar, 21.i. 1987, Coll. A. K. De; 4(M), 2(F), Jalpaiguri, 28. ii. 1987, Coll. A.K. DE; 1(M), DANKURA, 17.II 1988. Coll. A.K. De:

188. *Tanytarsus maqnituberculus* Guha, Das, Chaudhuri & Choudhuri

1985. *Tanytarsus maqnituberculus* Guha, Das, Chaudhuri & Choudhuri *Proc. nat. Acad. Sci. India B* 55 :35

Material examined : 3(M), Kakdwip, 18.iii. 1988. Coll. T. K. Dutta.

189. *Tanytarsus nichollsi* Glover

1973. *Tanytarsus nichollsi* Glover . *Aust. J. Zool. Suppl. Ser.*, 23 : 450

Material examined : 2(M), West bengal, Jalpaiguri, 29. III. 1988, Coll. D. Sai.

Distribution : India (west Bengal), Australia.

190. *Tanytarsus okuboi* Sasa & Kikuchi

1989. *Tanytarsus okuboi* Sasa & Kikuci, *Jap. J. Sanit. Zool.*, 37:28

Material examined : 5(M), Hetampur, 9. XII, 1987, Coll. A. K. De. 1(M), West Bengal, Gotan, 26.i.1987, Coll. A.K.De.

Distribution : India (West Bengal) & Japan

191. *Tanytarsus ponapensis* Tokunaga

1964. *Tanytarsus ponapensis* Tokunaga, Bernice. P. Bishop Mus., 12 :612

Material examined : 2(M), Burdwan, 29,III. 1988, coll. D. sai.

Distribution: India (West Bengal) Caroline Islands & Thailand

192. *Tanytarsus parvistylus* Chaudhuri & Dutta

1992. *Tanytarsus parvistylus* Dutta, Mazumdar&Choudhuri, *Orient. Ins.* 26 : 49.

Material examined : 4(M), Polempur, 26, xi.1988, Coll. A. K.De.

193. *Tanytarsus pollexus* Chaudhuri & Dutta

1992. *Tanytarsus pollexus* Dutta, Mazumdar & Chaudhuri, *Orient. Ins.* 26 :51

Material examined : 5(M), Mungpu, 8. iv. 1984. Coll D. K. Guha

194. *Tanytarsus guinspinosus* Chaudhuri & Dutta

1992. *Tanytarsus guinspinosus* Dutta, Mazumdar & Chaudhuri, *Orient. Ins.* 26 : 52

Material examined : 5(M), Dalmani, 22.v. 1989, Coll. D. Sai.

195. *Tanytarsus redistylus* Chaudhuri & Dutta

1992. *Tanytarsus redistylus* Chaudhuri & Dutta. *Orient, Ins.* 26 : 53.

Material examined : 3(M), Hetampur, 13. xi. 1987, Coll. A.K. De; 3(M), Bankura, 13. vii. 1987, Coll. A. k. de. 2(M), Jhilimili, 20. x. 1987, Coll. A. K. De.

196. *Tanytarsuys ungulituberculus* Singh & Kulshrstha

1975. *Tanytarsuys ungulituberculus* Singh & Kulshrstha *Orient. Ins.* 9.: 419.

Material examined : 3(M), Burdwan, 7,x. 1988, Coll. S. Chattopadhyay

197. *Tanytarsus viculus* Chaudhuri, Guha & Ghosh

1984. *Tanytarsus viculus* Chaudhuri, Guha & Ghosh *Orient, Ins* 18 : 34.

Material examined : 4(M), Burdwan, 4. ix. 1977, Coll. S.K. Nandi: 1(M), Panagar 13. iv. 1975, Coll. A. Sarkar. 2(M), Sodepur, 20. iii. 1978, Coll, S. K. Das Gupta

ACKNOWLEDGEMENT

We are grateful to Dr. J. R. B. Alfred, Acting Director, Zoological Survey of India, Calcutta for advice and meaningful counsel to write this account. Sincere thanks are due to Mr. Abhijit Mazumdar and Ms. Alpana Mazumdar (nee Saha), Research collaborators for technical assistance.

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INSECTA : LEPIDOPTERA : ZYGAENIDAE

D. P. BHATTACHARYA

Zoological Survey of India, Calcutta

INTRODUCTION

The present work deals mainly with the systematic account of the Zygaenidae of West Bengal based on the collections made by different survey parties of the Zoological Surveys of India from time to time and materials received from other sources. These faunistic survey include the collections of Darjiling district (F. Braganza, Sept. 1950; H.K. Bhowmik, Sept. 1974 and B.C. Das, Sept. 1980), Calcutta (K.V. Lakshminarayan, Nov. 1962), Nadia (S.Pal, Oct. 1985), Jalpaiguri (A.K. Hazra, March, 1986), Maldah (K.P. Mukherjee, June, 1987) and the old collections present in the National Zoological Collection mostly from Darjiling and Calcutta districts since November, 1900 by H.G. Elwes and C. Duncan. Many of the districts (12) as such remain unexplored till date.

More (1965 and 1967) first published three papers on the lepidopterous insects of the - then undivided Bengal. Hampson (1892-96) reported 155 species of Zygaenidae in *Fauna British India* of which six species were recorded from West Bengal. Jordan (1908) about 320 species and subspecies from Indo-Australian region while Fletcher (1952) included nearly 315 species and subspecies in *Catalogue of Indian Insects* of which 139 species and subspecies were recorded from India and 31 species and subspecies from West Bengal. Sevastopulo (1945-56) reported a good number of species of lepidoptera from Darjiling and Calcutta districts.

The family Zygaenidae includes four subfamilies. Of these, about 52 species and subspecies in 14 genera are known under the subfamily Zygaeninae from India, of which 6 species and subspecies under 6 genera are recorded from West Bengal. The largest subfamily Chalcosiinae includes about 80 species and subspecies under 26 genera from India, of which 29 species and subspecies under 15 genera are reported from West Bengal. Of the remaining two subfamilies, Phaudinae includes 4 species under 3 genera and Himantopterinae 4 species under one genus from India. No representative of any of these subfamilies are so far known from the state of West Bengal.

Collection and Methodology : The day flying moths are generally collected with the help of a net while night flying moths are best collected by light traps. These are killed either by Cyanide bottles or treating with Benzene. The dead specimens are kept in oil-paper envelopes or triangular packets and preserved with Naphthaline and Paradichloro Benzene. A mixture of Carbolic acid and Camphor in the proportion of 3 : 1 is used for protection against fungal growth.

Family ZYGAENIDAE Burnets

Key to the subfamilies of ZYGAENIDAE

1. Mouth parts usually absent 2
Mouth parts usually present 3
2. Retinaculum and frenulum aborted. Hind wing produced into a long, thin tail Himantopterinae Jordan
Retinaculum and frenulum present. Hind wing not produced into a long, thin tail Phaudinae Hampson
3. Fore tibiae without spur. Antennae flabellate at tip Chalcosiinae Hampson
Fore tibiae with spur. Antennae not flabellate at tip Zygaeninae Hampson

Subfamily ZYGAENINAE Hampson

Key to the genera of ZYGAENINAE

1. Fore wing R_2 , R_3 and R_4 arising from cell 2
Fore wing R_2 , R_3 and R_4 not arising from cell *Thyrassia* Butler
2. Hind wing with M_1 absent 3
Hind wing with M_1 present 4
3. Hind wing M_2 remote from R_5 *Artona* Walker
Hind wing M_2 close to R_5 *Arachotia* Moore
4. Abdomen with lateral tufts of hair on terminal segments *Lophosoma* Swinhoe
Abdomen without lateral tufts of hair on terminal segments 5
5. Hind wing broad and rounded *Clelea* Walker
Hind wing narrow and long *Illiberis* Walker

1. Genus *Artona* Walker

1854. *Artona* Walker, *Cat. Lep. Het. Brit. Mus.*, 2 : 439-440.

17 species under this genus are represented from India of which only one is known from West Bengal.

1. *Artona postvitta* Moore

1879. *Artona postvitta* Moore, *Lep. Atkins.*, p. 13.

1925. *Artona postvitta*, Fletcher, *Cat. Indian Ins., Zygaenidae*, pt. 9, p.5.

Material examined : Material reviewed from the literature.

Diagnostic characters : Dark brown. Hind wing with a broad medial white streak. Cilia whitish. Legs ringed with white. Wing exp. 20 mm.

Distribution : India : West Bengal (Calcutta and Darjiling) and Sikkim.

Remarks : Due to the non-availability of the material for study the species has been reviewed from the literature.

2. Genus *Clelia* Walker

1854. *Clelia* Walker, *Cat. Lep. Het. Brit. Mus.*, 2 : 465.

Eight species under this genus are known from India of which one species is reported from West Bengal.

2. *Clelia discriminis* Swinhoe

1891. *Clelia discriminis* Swinhoe, *Trans. ent. Soc. Lond.*, p. 475.

1925. *Clelia discriminis* Fletcher, *Cat. Indian Ins., Zygaenidae*, pt.9, p.8.

Material examined : Two examples, Kurseong, Darjiling dist., (purchased collection from NZC.).

Diagnostic characters : Body black. Antennae, head and legs metallic blue. Fore wing with a green streak at the base, two subapical markings and a spot below it. Underside, fore wing with a streak on median nervure and several streaks on hind wing. Wing exp. 27 mm.

Distribution : India : West Bengal (Kurseong, Darjiling dist.); Meghalaya (Cherrapunji, Khasi hills, Shillong); Nagaland; North India and Sikkim.

Remarks : This is the first specific record of the species from Kurseong, Darjiling dist., West Bengal.

3. Genus *Illiberis* Walker

1854. *Illiberis* Walker, *Cat. Lep. Het. Brit. Mus.*, 2 : 280.

Two species are known under this genus from India of which one is recorded from West Bengal.

3. *Illiberis fuliginosa* (Moore)

1879. *Artona fuliginosa* Moore, *Lewp. Atkins.*, p. 14.

1925. *Illiberis fuliginosa*, Fletcher, *Cat. Indian Ins.*, Zygaenidae, pt. 9, p. 12.

Material examined : Material reviewed from the literature.

Diagnostic characters : Dark brown without markings. Antennae on the female with small pectinations. Hind tibiae with one pair of spur. Wing exp. 15 mm(M)., 17 mm (F).

Distribution : India : West Bengal (Calcutta and Darjeeling).

Remarks : The species is not represented in the National Zoological collection and not available for study also. However, Fletcher (1925) raised a doubt about the record of the species from Calcutta by Hampson (1892).

Genus *Lophosoma* Swinhoe

1892. *Lophosoma* Swinhoe, *Cat. Het. Mus. Oxon.*, 1 : 58.

Two species under this genus are known from India of which one is recorded from West Bengal.

4. *Lophosoma quadricolor* (Walker)

1856. *Syntomis quadricolor* Walker, *Cat. Lep. Het. Brit. Mus.*, 7:1959.

1925. *Lophosoma quadricolor*, Fletcher, *Cat. India Ins.*, Zygaenidae, pt. 9, p.16.

Material examined : Material reviewed from the literature.

Diagnostic characters : Head and collar blue. Thorax and fore wing brown shot with green. Abdomen golden-copper. Hind wing hyaline with the costa fuscous. Wing exp. 20 mm.

Distribution : India : West Bengal, Orissa (Ganjam) and North India.

Remarks : Due to the paucity of material at hand it is not possible to examine the species.

5. Genus *Arachotia* Moore

1879. *Arachotia* Moore, *Lep. Atkins.*, p. 14.

Three species under this genus are recorded from India of which one is known from West Bengal.

5. *Arachotia flaviplaga* Moore

1879. *Arachotia flaviplaga* Moore, *Lep. Atkins.*, p. 14.

1925. *Arachotia flaviplaga*, Fletcher, *Cat. Indian Ins.*; *Zygaenidae*, pt.9, p. 17.

Material examined : One (M), Darjiling dist., Topkhana, Kalimpong, 21.ix.1980 (B.C. Das and party coll.).

Diagnostic characters : Body shining blue-green. Antennae banded with white at tips. Fore wing with three hyaline spots at the end of the cell and seven beyond. Hind wing mostly hyaline. Wing exp. 35 mm. (M), 44mm. (F).

Distribution : India : West Bengal (Darjiling); Meghalaya (Cherrapunji); Nagaland and Sikkim.

6. Genus *Thyrassia* Butler

1876. *Thyrassia* Butler, *J. Linn. Soc.*, 12:355, pl. 28, fig.6.

Two species under this genus are known from India of which one species with subspecies is known from West Bengal.

6. *Thyrassia subcordata subcordata* (Walker)

1854. *Syntomis subcordata* Walker, *Cat. Lep. Het. Brit. Mus.*, 1 : 132.

1925. *Thyrassia subcordata subcordata*, Fletcher, *Cat. Indian Ins.*, *Zygaenidae*, pt. 9, p. 19.

Material examined : Two (M), Ratua, Maldah dist., 13. vi.1987 (K.P. Mukherjee and party coll.) and 4(M) and 1(F), Calcutta, 30.viii.1962 (K.V. Lakshminarayan and party coll.). Wing exp. 24-25 mm.

Diagnostic characters : Body and wings dark brown. Abdomen with a yellow ring. Fore wing with a whitish hyaline spot at end of cell, a trifold spot below it and a bifid or trifold subapical spot. Hind wing with a basal orange patch.

Distribution : India : West Bengal (Akra, South 24-Parganas, Calcutta and Maldah); Bihar (Chapra and Pusa); Gujrat (Surat); and Plains of North India.

Remarks : The subspecies is recorded for the first time from Calcutta and Maldah districts of West Bengal.

Subfamily CHALCOSIINAE Hampson

Key to the Genera of CHALCOSIINAE

1. Wings uniformly semi-transparent 2
 Wings not uniformly semi-transparent 3

2. Fore wing R_1 anastomosing with S_c *Philopator* Moore
 Forewing R_1 not anastomosing with S_c *Agalope* Walker
3. Wings long and Zygaeniform 4
 Wings very short and broad *Arbudas* Moore
4. Hind wing with M_1 absent *Trypanophora* Kollar
 Hind wing with M_1 present 5
5. Fore wing M_2 and M_3 stalked and straight 6
 Fore wing M_2 and M_3 from the cell, if stalked curved 7
6. Fore wing with M_1 absent *Phlebohecta* Hampson
 Fore wing with M_1 present *Eterusia* Hope
7. Wings long but broad *Pidorus* Walker
 Wings normal and rounded 8
8. Fore wing R_1 anastomosing with S_c *Cyclosia* Hubner
 Fore wing R_1 not anastomosing with S_c 9
9. Fore wing M_2 and M_3 nearly straight 10
 Fore wing M_2 and M_3 much curved 11
10. Fore wing R_2 proximal to R_4 *Chalcophaedra* Jordan
 Fore wing R_2 distal to R_4 *Chalcosia* Hubner
11. Fore wing Cu_a not stalked with M_2 and M_3 12
 Forewing Cu_{1a} stalked with M_2 and M_3 13
12. Forewing R_2 stalked with R_3 , R_4 and R_5 *Cadphises* Moore
 Fore wing R_2 not stalked with R_3 , R_4 and R_5 *Erasmia* Hope
13. Fore wing without veinlets between S_c and costa *Campylotes* westwood

- Fore wing with veinlets between S_c and costa 14
14. Hind wing outer margin rounded *Gynautocera* Guerin
- Hind wing outer margin produced into a long tail *Histia* Hubner

7. Genus *Arbudas* Moore

1879. *Arbudas* Moore, *Lep. Atkins.*, pp. 19-20.

Three species under this genus are known from India of which one is recorded from West Bengal.

7. *Arbudas bicolor* Moore

1879. *Arbudas bicolor* Moore, *Lep. Atkins.*, p. 20, pl. 2, fig. 19.

1925. *Arbudas bicolor*, Fletcher, *Cat. Indian Ins., Zygaenidae*, pt.9, pp. 26-27.

Material examined : Material reviewed from the literature.

Diagnostic characters : Both wings pale greenish brown with a white discocellular spot distinct on the underside. Hind wing in female pure white with a broad dark outer margin. Wing exp. (M) 22mm. (F) 32mm.

Distribution : INDIA : West Bengal (Darjiling); Meghalaya (Shillong); Sikkim; also Bhutan.

Remarks : The species has been reviewed from the literature as no material is available for examination.

8. Genus *Trypanophora* Kollar

1844. *Trypanophora* Kollar, in *Hugel' Kashmir*, 4(2) : 457.

One species under this genus is recorded from India as well as West Bengal which is represented here.

8. *Trypanophora semihyaltina* Kollar

1844. *Trypanophora semihyaltina* Kollar, In *Hugel's Kashmir*, 4(2) : 457, pl. 19, fig. 1-4.

1908. *Trypanophora semihyaltina* Jordan In *Seitz's Macrolep. World*, 10:14-16.

Material examined : One (M), 5(F), Calcutta, 23.xi.1900, (Coll. not known) and 1(M). Kalyani, Nadia dist., 15.x.1985(S. Pal coll.).

Diagnostic characters : Body blue-black. Abdomen with yellow bands. Both wings with hyaline streaks. Wing exp. (M) 31-36, (F) 38-50 mm.

Distribution : India : West Bengal (Calcutta, Kalyani, Nadia Dist.); Himachal Pradesh (Kangra); Jammu & Kashmir; Meghalaya (Shillong); Orissa (Ganjam); Sikkim; also Bangladesh (Dacca) and Burma (East Pegu).

Remarks : The species is recorded for the first time from Nadia district, West Bengal.

9. Genus *Cyclosia* Hubner

1822. *Cyclosia* Hubner, *Verz. bek. Schmett.*, p. 177.

Five species and subspecies are known under this genus from India of which two are presently recorded from West Bengal.

Key to the species of *Cyclosia*

Male and female different. Fore wing dark coppery red with a white maculate band at the apex of cell in male. Female with long white streaks *papilionaris* (Drury)

Male and female similar. Fore wing brownish black with apex and outer margin brilliant blue and spotted with white. Female less shot with blue, without white streak
..... *midamia* (Herrich-Schaffer)

9. *Cyclosia papilionaris venaria* (Fabricius)

1793. *Phalaena venaria* Fabricius, *Ent. Syst.*, 3(2) : 156.

1925. *Cyclosia papilionaris venaria*, Fletcher, *Cat. Indian Ins., Zygaenidae*, pt. 9, p. 34.

Material examined : One (M), Paltanpura forest, Jalpaiguri dist., 21.iii.1986 (A.K. Hazra coll.) and 4 exs., Darjiling, (Date and coll. nil.). Wing exp. 40-46 mm.

Diagnostic characters : Vide key.

Distribution : India : West Bengal (Darjiling and Jalpaiguri); Assam; Meghalaya; Sikkim; also Bhutan.

Remarks : This is the first specific report of this species from Darjiling and Jalpaiguri district of West Bengal..

10. *Cyclosia midamia midamia* (Herrich-Schaffer).

1853. *Epyrgis midamia* Herrich-Schaffer, *Aussereur. Schmett.*, 1, pl. 2, fig.7.

1925. *Cyclosia midamia midamia*, Fletcher, *Cat. Indian Ins., Zygaenidae* pt. 9, p. 32.

Material examined : 2 exs., Darjiling, (Date and coll. nil). Wing exp. 74-86 mm.

Diagnostic characters : Vide key.

Distribution : India : West Bengal (Darjiling); Assam; Meghalaya; Nagaland, Sikkim; also Bangladesh; Bhutan; Burma and Sri Lanka.

Remarks : This is the first specific report of the species from Darjiling, West Bengal.

10. Genus *Gynautocera* Guerin

1830. *Gynautocera* Guerin, *Mag. Zool.*, p. 12.

One species under this genus is known from India as well as West Bengal.

11. *Gynautocera papilionaria* Guerin

1830. *Gynautocera papilionaria* Guerin, *Mag. Zool.*, p. 12.

1925. *Gynautocera papilionaria*, Fletcher, *Cat. Indian Ins., Zygaenidae*, pt. 9, p.36.

Material examined : One (F), Darjiling, (Date and coll. not available). Wing exp. 94 mm.

Diagnostic characters : Body and wings black. Vertex of head and end of abdomen crimson. Hind wing shot with blue and a large white patch between veins Cu_{1b} and M_2 . Underside base of the wings crimson. Wing exp. 84 mm - 96 mm.

Distribution : India : West Bengal (Calcutta, Darjiling, Kalimpong); Assam; Jammu & Kashmir, Meghalaya (Khasis, Shillong); Nagaland; Uttar Pradesh (Kumaon); also Bangladesh (Sylhet); Burma (Bassein, Pegu, Tenasserim); South China (Hainan) and Vietnam (Annam, Tong King).

11. Genus *Histia* Hubner

1822. *Histia* Hubner, *Verz. bek. Schmett.*, p. 198.

Three species under this genus are known from India of which one is reported from Darjiling district West Bengal.

12. *Histia rhodope rhodope* (Cramer)

1775. *Bombyx rhodope* Cramer, *Pap. exot.*, 1, pl. 30, fig. F.

1925. *Histia rhodope rhodope*, Fletcher, *Cat. Indian Ins., Zygaenidae*, pt. 9, p. 37.

Material examined : Two examples, Darjiling, (No other data available).

Diagnostic characters : Body blackish brown. Abdomen marked with blue. Wings narrow and elongated. Fore wing black with brownish blue tinge. Hind wing metallic bluish green upto end of cell. beyond black with blueish tinge. Underside, head, thorax and abdomen crimson. Wing exp. 70-80 mm.

Distribution : India : West Bengal (Darjiling); Assam (Guahati); Meghalaya (Khasis); Nagaland and Sikkim; also Bhutan; Burma and Hong Kong.

12. Genus *Campylotes* Westwood

1839. *Campylotes* Westwood, *Royle's Ill. Himalayas Lep.*, p. 53.

Four species and subspecies belonging to this genus are known from India of which two species are recorded from West Bengal.

Key to the species of *Campylotes*

Larger. Fore wing with a series of six white spots beyond the cell *Histrionicus* Westwood

Smaller. Fore wing with a series of four white spots beyond the cell *Atkinsoni* Moore

13. *Campylotes histrionicus* Westwood

1839. *Campylotes histrionicus* Westwood, *Royle's Ill. Himalayas Lep.*, p. 53, pl. 10, fig.1.

1925. *Campylotes histrionicus*, Fletcher, *Cat. Indian Ins., Zygaenidae*, pt. 9, p. 41.

Material examined : One example Darjiling; (no other data available).

Diagnostic characters : Body blue black. Abdomen below, pectus and tegulae potted with yellow. Wings long and black and with reddish yellow streaks. Wing exp. 80 mm.

Distribution : India : West Bengal (Darjiling); Jammu & Kashmir; Meghalaya (Cherrapunji, Khasis, Shillong); Sikkim; Uttar Pradesh (Musourie, Jeolikota, Kumaon); Throughout the Himalayas; also Afganistan; and West China.

14. *Campylotes atkinsoni* Moore

1879. *Campylotes atkinsoni* Moore, *Lep. Atkinson.*, p. 17.

1925. *Campylotes atkinsoni*, Fletcher, *Cat. Indian Ins., Zygaenidae*, pt. 9, p. 40.

Material examined : One (M), Mirik, Darjiling dist., 21.ix.1974 (*H.K. Bhowmik* and party coll.), Wing exp. 70 mm.

Diagnostic characters : Vide key for distinguishing characters from *histrionicus*.

Distribution : India, West Bengal (Darjiling) and Sikkim.

Remarks : Both the species *histrionicus* and *atkinsoni* are very similar in respect of their morphological characters except those mentioned in the keys.

13. Genus *Erasmia* Hope

1840. *Erasmia* Hope. *Trans. Linn. soc.*, 18:446.

Three species and subspecies under this genus are known from India as well as West Bengal. The distribution of a fourth species *namouna*, according to Jordan (1908) and Fletcher (1925) is strictly Malayan and not Indian. As such it is not included here.

Key to the species of *Erasmia*

1. Abdomen black. Hind wing black with broad brilliant blue marginal band 2
 Abdomen white. Hind wing pale yellow with narrow black marginal band
 *pulchella* Hope
2. Fore wing with veins broadly edged with purple rust colour from almost before the middle of the wings *sanguiflua* (Drury)
 Fore wing with veins not edged with purple rust colour *aliris* (Doubleday)

15. *Erasmia sanguiflua sanguiflua* (Drury)

1773. *Noctua snguiflua* Drury, Ill. *Exot. Ent.*, 2 : 55, pl. 20, fig.1,2.
 1892. *Amesia sanguiflua*, Hampson, *Fauna Brit. India, Moths*, 1:272, fig.180.
 1925. *Erasmia sanguiflua sanguiflua*, Fletcher, *Cat. Indian Ins., Zygaenidae*, pt. 9, p.44.

Material examined : One very old specimen from Darjiling in National Zoological collection. No other data available except collector Elwes.

Diagnostic character : Vide key Wing. exp. 100-110 mm.

Distribution : India : West Bengal (Darjiling); Meghalaya (Khasis, Shillong); Sikkim also Bangladesh (Sylhet) and Burma.

Remarks : This is the first record of the species and subspecies from Darjiling, West Bengal.

16. *Erasmia aliris aliris* (Doubleday)

1847. *Gynautocera aliris* Doubleday, *Ann. Nat. Hist.*, 19:74.
 1892. *Amesia aliris*, Hampson, *Fauna Brit. India. Moths*, 1:272-273.
 1925. *Erasmia aliris aliris*, Fletcher, *Cat. Indian Ins., Zygaenidae*, pt. 9, pp. 42-43.

Material examined : Material reviewed from the literature.

Diagnostic characters : Vide key. Wing exp. 86-92 mm.

Distribution : India : West Bengal (Darjiling). Assam; Nagaland; Sikkim; also Bangladesh (Sylhet); and Burma ((Karen Hills).

Remarks : The species has been reviewed from the literature.

17. *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., Zygaenidae*, pt. 9, pp. 43-44.

Material examined : Material reviewed from the literature.

Diagnostic characters : Vide key Wing exp. 80-99 mm.

Distribution : India : West Bengal (Darjiling); Assam; Meghalaya (Khasis); Nagaland; Sikkim; also Bangladesh (Sylhet); Nepal (Kathmandu); and Burma.

Remarks : Due to nonavailability of the species it has been reviewed from the literature.

14. Genus *Agalope* Walker

1854. *Agalope* Walker, *Cat. Lep. Het. Brit. Mus.*, 2:437.

Five species under this genus are known from India of which four are reported from Darjiling, West Bengal. The National Zoological Collection in ZSI, Calcutta is represented by only one species *hyalina* from Kulu, Himachal Pradesh and Sikkim.

Key to the species of the genus *Agalope*

1. M_2 and M_3 on a shorter stalk in fore wing *hyalina* (Kollar)
 M_2 and M_3 on a longer stalk in fore wing 2
2. Terminal segments of abdomen red brown *eroniodes* (Moore)
 Terminal segments of abdomen not red brown 3
3. Fore wing with base chestnut. Hind wing with a series of pale spots beyond cell
 *basiflava* (Moore)
 Fore wing with base olive brown. Hind wing with a fuscus spot at end of cell
 *glacialis* (Moore)

18. *Agalope basiflava* (Moore)

1879. *Chelura basiflava* Moore, *Proc. zool. Soc. Lond.*, p. 391.
 1925. *Agalope basiflava*, Fletcher, *Cat. Indian Ins., Zygaenidae*, pt.9, p. 45.

Material examined : Material reviewed from the literature.

Diagnostic characters : Body black. Fore wing mostly black brown; two narrow, black brown

bands at the base. Hind wing with the distal margin and veins black brown. Abdomen yellowish brown. Wing exp. 68 mm.

Distribution : India : West Bengal (Darjiling); also from Sikkim.

Remarks : The species is not represented in the collection, hence it has been reviewed from the literature.

19. *Agalope eronioides eronioides* (Moore)

1879. *Chelura eronioides* Moore, *Lep. Atkinson.*, p.15.

1925. *Agalope eronioides*, Fletcher, *Cat. Indian Ins., Zygaenidae*, pt. qpp.46-47.

Material examined : Material reviewed from the literature.

Diagnostic characters : Body black. Fore wing with a small white spot on the black patch at the base, a subbasal orange band, marginal area with some pale spots. Wing exp. 64 mm.

Distribution : India : West Bengal (Darjiling); Assam Meghalaya (Cherrapunji, Shillong) and Sikkim.

Remarks : The species is not represented in the collection, hence it has ben reviewed from the literature.

20. *Agalope glacialis glacialis* (Moore)

1872. *Chelura glacialis* Moore, *Proc. zool. Soc.*, p. 570.

1925. *Agalope glacialis glacialis* Fletcher, *Cat. Indian Ins., Zygaenidae*, pt. 9, p. 47.

Material examined : Material reviewed from the literature.

Diagnostic characters : Body olive-brown. Abdomen medial segments whitish. Fore wing with a medial black-brown irregular band, apical marginal area fuscous with some pale spots. Wing exp. 57 mm.

Distribution : India : West Bengal (Darjiling) also Sikkim; and Burma.

Remarks : The species is not represented in the collection, hence it has been reviewed from the literature.

21. *Agalope hyalina* (Kollar)

1844. *Chalcosia hyalina* Kollar, *Hugel's Kaschmir*, 4(2) : 462.

1925. *Agalope hyalina*, Fletcher, *Cat. Indian Ins., Zygaenidae*, pt.9, pp. 47-48.

Material examined : Material reviewed from the literature.

Diagnostic characters : Body black. Wings yellowish hyalina. Fore wing with a brown-yellow basal spot, a medial irregular blackish band, apical marginal area fuscous. Hind wing uniform yellowish hyaline. Wing exp. (M) 42 mm., (F) 50 mm.

Distribution : India : West Bengal (Darjiling); Himachal Pradesh (Simla); Jammu & Kashmir; Manipur; Sikkim; Uttar Pradesh (Mussourie, Kumaon); also Afghanistan; Bhutan and Burma.

Remarks : The species has been reviewed from literature.

15. Genus *Philopator* Moore

1865. *Philopator* Moore, *Proc. zool. soc. Lond.*, p. 800.

Two species under this genus are known from India of which one is recorded from West Bengal.

22. *Philopator basimaculata* Moore

1865. *Philopator basimaculata* Moore, *Proc. zool. Soc. Lond.*, p. 880, pl. 42, fig. 6.

1925. *Philopator basimaculata*, Fletcher, *Cat. Indian Ins., Zygaenidae*, pt. 9, p. 50.

Material examined : Material reviewed from the literature.

Diagnostic characters : Body yellow. Fore wing with the base yellow and two series of black spots on it, rest of the wing white in male, fuscous in female; two fuscous spots at the end of the cell. Wing exp. (M) 50 mm, (F) 44-58 mm.

Distribution : India : West Bengal (Darjiling); Manipur; Meghalaya (Cherrapunji); Nagaland and Sikkim.

Remarks : The species has been reviewed from the literature.

16. Genus *Cadphises* Moore

1865. *Cadphises* Moore, *Proc. zool. Soc. Lond.*, p. 800.

Two species under this genus are known from India as well as West Bengal of which one species is represented in the National Zoological Collection at Calcutta.

Key to the species of *Cadphises*

1. Hind wing bright yellow from inner margin to 1A + 2A and without any spots
 *maculata* Moore
- Hind wing purplish black from inner margin to 1A + 2A and with white spots..... *moorei* Butler

23. *Cadphises maculata* Moore1865. *Cadphises maculata* Moore, *Proc. zool. Soc. Lond.*, p. 801, pl. 42, fig. 7.1925. *Cadphises maculata*, Fletcher, *Cat. Indian Ins., Zygaenide*, pt. 9, p. 51.*Material examined* : Material reviewed from the literature.*Diagnostic characters* : Body purplish black, spotted with white. Wings long, purplish black and spotted with white throughout. Wing exp. 70-90 mm.*Distribution* : India : West Bengal (Darjiling); Meghalaya (Khasis) and Sikkim.*Remarks* : The species is not represented in collection, so it has been reviewed from the literature.24. *Cadphises moorei moorei* Butler1875. *Cadphises moorei* Butler, *Proc. zool. Soc. Lond.*, p. 392.1925. *Cadphises moorei moorei*, Fletcher, *Cat. Indian Ins., Zygaenidae*, pt. 9, p. 51.*Material examined* : One (M), 1(F) Kurseong, Darjiling dist., 10.ix.1950 (F. Braganza coll.). Wing exp. 78-80 mm.*Diagnostic characters* : Vide Key. Wing exp. 70-88 mm.*Distribution* : India : West Bengal: (Darjiling and Kurseong); Meghalaya (Khasis); Nagaland; and Bhutan.*Remarks* : The species *moorei* differs from *maculata* only in the characters of the hind wing.17. Genus *Eterusia* Hope1840. *Eterusia* Hope, *Trans. Linn. soc.*, 18:445.

Fifteen species and subspecies under this genus are known to occur in India of which five species and subspecies are recorded from West Bengal.

Key to the species of *Eterusia*

1. Fore wing vein M_1 from the cell 2
- Fore wing vein M_1 stalked to R_3 , R_4 and R_5 3
2. Collar crimson. Abdomen black in male white with metallic blue bands in female
..... *pulchella* (Kollar)

- Collar not crimson. Abdomen blackish brown with lateral yellow bands
 *shahama* Moore
3. Abdomen blue green above. Fore wing bright green *raja* Moore
- Abdomen yellow above. Fore wing not bright green 4
4. Fore wing with a broad medial band with two irregularly superposed spots
 *lativitta* Moore
- Fore wing with a long medial band with five broken up spots *aedea* (Clerck)

25. *Eterusia aedea edocla ab. magnifica* Butler

1759. *Papilio aedea* Clerck, *Icones*, pl. 4, fig. 2.
 1847. *Heterusia edocla* Doubleday, *Zoologist*, 3 : 469.
 1879. *Eterusia magnifica* Butler, *Trans. ent. Soc.*, p.5.
 1925. *Eterusia aedea edocla ab. magnifica*, Fletcher, *Cat. Indian Ins., Zygaenidae*, pt. 9, p. 59.

Material examined : One (M), Kurseong, Darjiling dist., West Bengal (Old collection in NZC with no other data).

Diagnostic characters : Fore wing purplish brown with greenish tinge. Medial band with the veins blue. Hind wing yellow, marginal area black shot with blue at the apex. Wing exp. 60-80 mm.

Distribution : India : West Bengal (Darjiling, Kurseon); Assam(Duars); Meghalaya; (Khasis); Nagaland; and Bangladesh.

Remarks : The larvae of the species is reported to be a pest of tea plantations.

26. *Eterusia pulchella pulchella* (Kollar)

1844. *Chalcosia pulchella* Kollar, In *Hugel's Kaschmir*, 4(2) : 461.
 1925. *Eterusia pulchella pulchella*, Fletcher, *Cat. Indian Ins., Zygaenidae*, pt. 9, pp. 64-65.

Material examined : One (F), Kurseong, (No date, old collection in NZC, C. Duncan coll.); 1(M), Mirik, Darjiling, 21.x.1974 (H.K. Bhowmik and party coll.) and 1(F), Kalinbag, Darjiling, 18.ix.1980 (B.C. Das and party coll.).

Diagnostic characters : Male fore wing dark brown with a narrow yellow streak at the base and two or more white spots beyond. Hind wing yellow with the outer margin black. Female wings bright yellow. Fore wing inner margin with a black streak and a few black spots or streas at the outer margin. Wing exp. 32-50 mm.

Distribution : India : West Bengal (Darjiling, Kurseong and Mirik); Jammu & Kashmir; Meghalaya

(Cherranpunji, Khasis, Shillong); Uttar Pradesh (Mussourie, Kumaon hills); also Afghanistan; Bangladesh (Sylhet) and Burma.

27. *Eterusia lativitta* (Moore)

1879. *Eterusia lativitta* Moore, *Lep. Atkins.*, p. 15.

1925. *Eterusia lativitta*, Fletcher, *Cat. Indian Ins., Zygaenidae*, pt. 9, pp. 63-64.

Material examined : Material reviewed from the literature.

Diagnostic Characters : Fore wing dark brownish green with pale yellow patch at the base in females, absent in males; a broad yellow band just before the middle and five to six subapical white spots. Hind wing deep blackish brown with two to three metallic blue spots. Wing exp. 70 mm.

Distribution : India : West Bengal (Darjiling); Meghalaya (Khasis, Shillong); Nagaland; Sikkim; Bangladesh (Sylhet); and Burma (Tenasserim).

Remarks : The species is not represented in collections, hence it has been reviewed from the literature.

28. *Eterusia raja* Moore

1859. *Eterusia raja* Moore, *Cat. Lep. East India Comp. Mus.*, 2:320, pl. 8, fig.2.

1925. *Eterusia raja*, Fletcher, *Cat. Indian Ins., Zygaenidae*, pt. 9, p.65.

Material examined : Material reviewed from the literature.

Diagnostic characters : Fore wing bright green with an oblique yellow band in the middle. Hind wing yellowish brown, veins black, inner area bluish green. Wing exp. 65-70 mm.

Distribution : India : West Bengal (Darjiling); Assam and Sikkim.

Remarks : The species is not represented in collections, hence it has been reviewed from the literature.

29. *Eterusia shahama* Moore

1865. *Eterusia shahama* Moore, *Proc. zool.Soc. Lond.*, p. 801;

1925. *Eterusia shahama*, Fletcher, *Cat. Indian Ins., Zygaenidae*, pt. 9, p. 66.

Material examined : Material reviewed from the literature.

Diagnostic characters : Fore wing dark brown with four white postmedial spots. Both wings with a white spot at end of the cell. Hind wing with the basal area white in female and yellow in male. Wing exp. 58 mm.

Distribution : India : West Bengal (Darjiling); and sikkim.

Remarks : The species is not represented in the collections, hence it has been reviewed from the literature.

18. Genus *Pidorus* Walker

1854. *Pidorus* Walker, *Cat. Lep. Het. Brit. Mus.*, 2 : 424.

Six species under this genus are known from India of which two are reported from West Bengal. The National Zoological collection in Calcutta is not represented by any of these two species from West Bengal.

Key to the species of *Pidorus*

1. Fore wing with an oblique white band from near middle of costa to outer angle. Hind wing without any fascia *glaucopis* (Drury)
- Fore wing with a yellow fascia from base below the costa to end of cell and up to middle of outer margin. Hind wing with a broad red fascia along the costa *miles*. (Butler)

30. *Pidorus glaucopis glaucopis* (Drury)

1773. *Bombyx glaucopis* Drury, *Ill. Ent.*, 2:pl.6, fig.4.

1925. *Pidorus glaucopis glaucopis*, Fletcher, *Cat. Indian Ins., Zygaenidae*, pt. 9, p.69.

Material examined : Material reviewed from the literature.

Distribution : India : West Bengal (Darjiling); Meghalaya; Nagaland; Sikkim ; also Bangladesh; Burma and Vietnam (Tong King).

Diagnostic characters : Vide key. Wing exp. 50-60 mm.

Remarks : The species is not represent in the collection, hence it has been reviewed from the literature.

31. *Pidorus miles* (Butler)

1881. *Laurion miles* Butler, *Ill. Het. Brit. Mus.*, 25, pl.34, fig.3.

1925. *Pidorus miles*, Fletcher, *Cat. Indian Ins., Zygaenidae*, pt. 9, p. 70.

Material examined : Material reviewed from the literature.

Diagnostic characters : Vide key. Wing exp. 32 mm.

Distribution : India : West Bengal (Darjiling); Sikkim; also; Bhutan.

Remarks : The species is not represented in the collections, hence it has been reviewed from the literature.

19. Genus *Chalcosia* Hubner

1822. *Chalcosia* Hubner, *Verz. bek. Schmett.*, p. 173.

Five species under this genus are known to occur in India of which two are reported from West Bengal.

Key to the species of *Chalcosia*

1. Fore wing white with black vein streaks. Hind wing marginal area yellow
 *adalifa* (Doubleday)
- Fore wing white with black spots in the middle. Hind wing marginal area black
 *argentata* Moore

32. *Chalcosia adalifa adalifa ab. cardinalis* (Moore)

1847. *Gynautocera adalifa* Doubleday, *Ann. Nat. Hist.*, 19:76.

1879. *Cyclosia cardinalis* Moore, *Lep. Atkins.*, p. 18.,

1925. *Chalcosia adalifa adalifa ab. cardinalis*, Fletcher, *Cat. Indian Ins., Zygaenidae*, pt.9, pp. 70-71.

Material examined : Material reviewed from the literature.

Diagnostic characters : Vide key. Wing exp. 64 mm.

Distribution : India : West Bengal (Darjiling); also Sikkim. (*adalifa* from Darjiling; Meghalaya; also Bangladesh; Bhutan; Burma; W. China and Vietnam (Tong-King).

33. *Chalcosia pectinicornis argentata* Moore

1879. *Chalcosia argentata* Moore, *Lep. Atkins.*, pp. 17-18.

1925. *Chalcosia pectinicornis argentata*, *Cat. Indian Ins., Zygaenidae*, pt.9, p.74.

Material examined : One (M), Darjiling, West Bengal (Very old Collection in NZC with no other data). Wing exp. 60 mm.

Diagnostic characters : Vide Key. Wing exp. (M) 60, (F) 72 mm.

Distribution : India : West Bengal (Darjiling); also North East Assam and Sikkim.

Remarks : This is the first specific report of the species from Darjiling, West Bengal.

20. Genus *Chalcophaedra* Jordan

1908. *Chalcophaedra* Jordan, *In Seitz's Macrolep. World*, 10:39.

One species under this genus is known from India and West Bengal. The National Zoological collection is represented by two very old specimens from Darjiling.

34. *Chalcophaedra zuleika* (Doulbeday)

1847. *Gynautocera zuleika* Doublday, *Ann. Nat. Hist.*, 19:76, pl. 7, fig.4.

1925. *Chalcophaedra zuleika* Fletcher, *Cat. Indian Ins., Zygaenidae*, pt.9, p.77.

Material examined : One (M) and 1(F), Darjiling, West Bengal (Very old collection in NZC, with no other data).

Diagnostic characters : Body blue green, fore wing a median orange band with blue black spots, marginal area blue black. Hind wing pale yellow with large apical blue patch. Wing exp. (M) 50 mm. (F) 60 mm.

Distribution : India : West Bngal (Darjiling); also Meghalaya (Khasis, Cherrapunji, Shillong); Sikkim; and Bangladesh (Sylhet); Bhutan; Burma.

Remarks : This is the first specific report of the species from Darjiling and West Bengal.

21. Genus *Phlebohecta* Hampson

1892. *Phlebohecta* Hampson, *Fauna Brit. India, Moths*, 1 : 251, fig. 167.

Three species under this genus are known from India of which one is recorded from West Bengal.

35. *Phlebohecta fuscescens* (Moore)

1879. *Soritia fuscescens* Moore, *Lep. Atkins.*, p. 16.

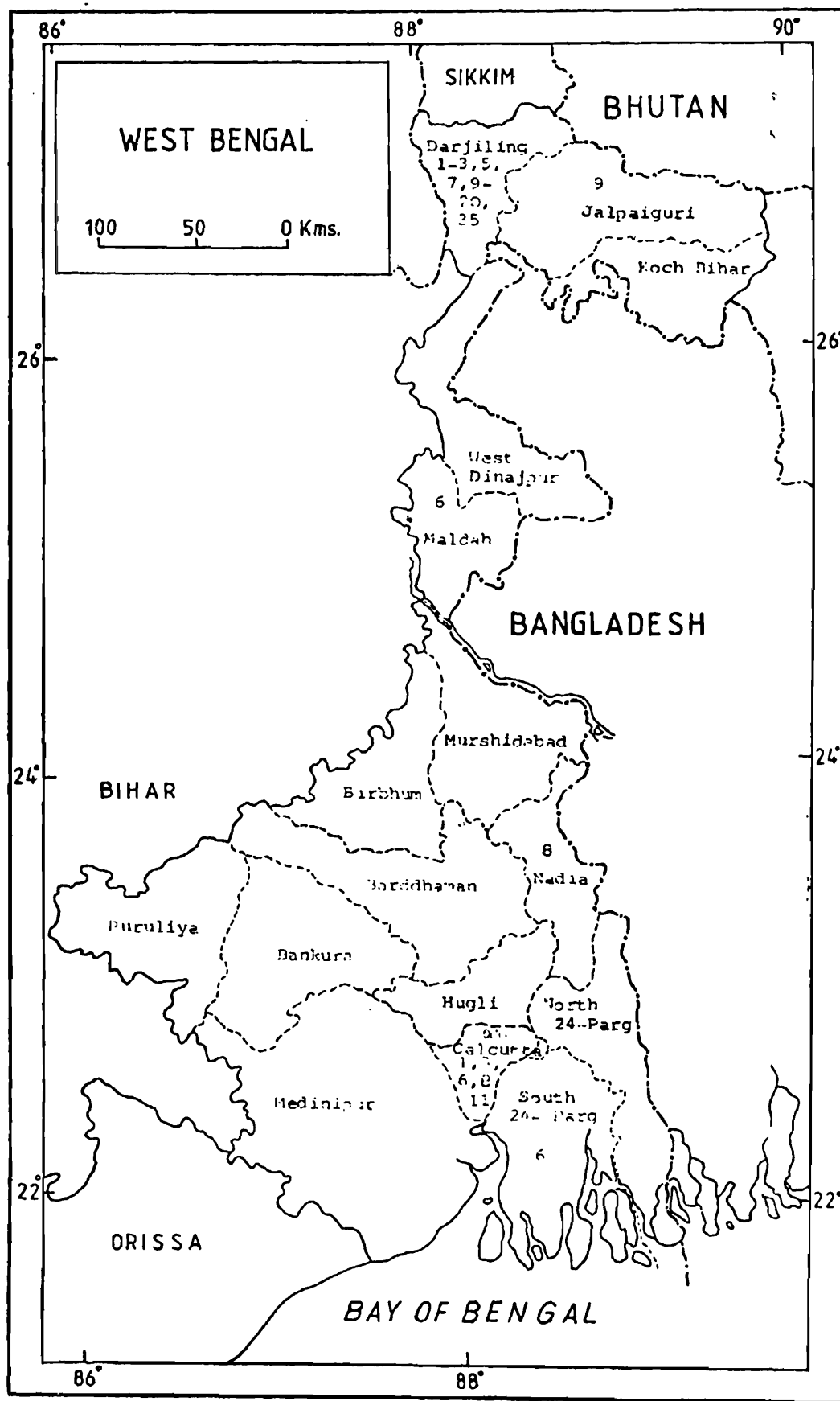
1925. *Phlebohecta fuscescens*, Fletcher, *Cat. Indian Ins., Zygaenidae*, pt. 9, p. 79.

Material examined : Material reviewed from the literature.

Diagnostic characters : Body and wings deep black brown, collar broadly pale red. Hind wing underside in male white except a broad streak behind the costa; in female both sides of the wing white from the cell to the hind margin. Wing exp. (M) 29 mm. (F) 36 mm.

Distribution : India : West Bengal (Darjiling); Meghalaya (Shillong); Sikkim; and Bhutan.

Remarks : Due to the paucity of the material at hand the species has been reviewed from the literature.



Map 1

SUMMARY

The paper incorporates a systematic account of 35 species and subspecies under 21 genera of Zygaenidae from West Bengal, of which 8 species and subspecies are new records from different districts of West Bengal. Keys to the subfamilies, genera and species, diagnostic characters and distribution of the species have also been included.

ACKNOWLEDGEMENTS

The author is grateful to the Director, Zoological Survey of India, Calcutta, for providing necessary facilities in connection with this work and for publication of the paper.

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INSECTA : LEPIDOPTERA : ARCTIIDAE

S. K. GHOSH & M. CHAUDHURY
Zoological Survey of India, Calcutta

INTRODUCTION

Zoological Survey of India has undertaken a series of faunistic surveys in all the sixteen districts of West Bengal. During this project, quite a large number of lepidopterous specimens including the family Arctiidae have been brought by different survey parties of Zoological Survey of India.

The present work is an attempt to provide a comprehensive account of the family Arctiidae from West Bengal based on the recent collections made by different party members and also the old collections present in the Zoological Survey of India. The account deals with a brief note on earlier investigations, keys to taxa, geographical distribution of each species, new locality records (marked*) and literature references. The species which recorded from the literature and are not available for study have been included in the paper (marked **). Maps showing the distribution of 36 species examined from various districts of West Bengal have also been included in the paper.

The classification of the family has been mainly adopted after Hampson (1900-1901) and for the division of the subfamilies Daniel (1943-1954) has been followed.

EARLIER INVESTIGATION

The Indian Arctiidae are known through the works of Butler (1875, 1877), Cotes & Swinhoe (1887-89), Hampson (1894, 1900, 1901), Seitz (1913), Draudt (1914), Rothschild (1914), Strand (1919-1922), Bryk (1937), Roepke (1944), Arora and Chaudhury (1982) and Arora (1983).

Key to Subfamilies of ARCTIIDAE

1. Body stoutly-built in one or both sexes 2
Body slender-built 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 NYCTEMERIINAE
Wings usually blackish antennae of variable texture in male 4

4. Fore wing markings usually in form of bands CALLIMORPHINAE
Forewing markings reduced to dots SPILOSOMINAE
5. Head usually broad; fore wing very long and hindwing uncommonly large ..LITHOSINAE
Head not broad as above and hindwing moderately largeMICRARCTIINAE

Subfamily CALLIMORPHINAE

Genus *Callimorpha* Latreille

Key to species of the Genus *Callimorpha* Latreille

- 1 Headthorax and abdomen orange2
Head and abdomen crimson but thorax orange*principalis* (Kollar)
2. Hindwing orange without black streak on veins *plagiata* Walker
Hindwing pure white, veins slightly tinged with black*nyctemerata* Moore

* 1. *Callimorpha principalis* (Kollar)

1844. *Euprepia principalis* Kollar, In : *Hugels Kashmir und das Reich der seik*, 4 (2) : 465, pl.20, Fig.2.
1937. *Callimorpha principalis*, Bryk, *Lep. Catalogus, Pars* 82, p. 18.

Material examined : West Bengal, Darjiling District, Meadow Bank Compound, 2050 m., 1(M), 25.iv.1973 (Coll. H.S. Sharma & party).

Wing expanse : (M) 84.

Distribution : India : West Bengal (Darjiling), Arunachal Pradesh, Sikkim, N.W. Himalayas; Burma and China.

*2. *Callimorpha plagiata* (Walker)

1855. *Hypercompa plagiata* Walker, *List Lep. Insects Brit. Mus.*, 3 : 655.
1937. *Callimorpha plagiata*, Bryk, *Lep. Catalogus, Pars* 82, p. 17.

Material examined : West Bengal, Darjiling District, Kalimpong, 1250 m., 1(M), 1(F), 19.ix.1980, Mirik, 1(M), 18.iv.1986 (Coll. B.C. Das & party). Bankura district, In and around F.R.H. Compound, 1(F), 20.xii.1985 (Coll. D.K. Mandal & party).

Wing expanse : (M) 70 mm., (F), -83 mm.

Distribution : India : West Bengal (Bankura, Darjiling), Assam, Meghalaya (Khasis), Arunachal Pradesh, Jammu & Kashmir; Bangladesh and China.

3. *Callimorpha nyctemerata* (Moore)

1879. *Hypercompa nyctemerata* Moore, *Descr. Indian Lep. Atk.*, 1:38.

1937. *Callimorpha nyctemerata*, Bryk, *Lep. Catalogus, Pars*, 82, p. 17.

Material examined : West Bengal, Darjiling district, Kalimpong, 1250m., 1(F), 18.ix.1980 (Coll. B.C. Das & party).

Wing expanse : (F) 53 mm.

Distribution : India : West Bengal (Darjiling), Sikkim.

Subfamily NYCTEMERINAE

Genus *Nyctemera* Hubner

4. *Nyctemera adversata* (Schaller)

1788. *Phalaena (Geometra) adversata* Schaller, *Naturforscher*, 23:52.

1937. *Nyctemera adversata*, Bryk, *Lep. Catalogus, Pars*, 82, p. 49.

Material examined : West Bengal, Darjiling, District, Police Station, Sukia, 2130m., 2(F), 17.v.1971 (Coll. A.R. Bhowmik & party), 2km. E. of Rongpo F.R.H., 400 m., 1(M), 6.iv.1973, 6km. E. of Rongpo F.R.H., 700m., 1(F), 8.iv.1973, 8km. S.E. of Rongpo F.R.H., 1(M), 10.iv.1973, 3 km. E. of Rongpo F.R.H., 600(M), 1(F), 5.x.1973 (Coll. H.S. Sharma & party), Rongpo, on way to F.R.H., 600m., 1(M), 5.x.1973 (Coll. H.S. Sharma & party), Bijanbari, Hariyana Bhawan, 900m., 2(F), 20.v.1974 (Coll. J.K. Jonathan & Party), Singla, 400m., 2(F), 2.1.1976 (Coll. G.S. Arora & party), Rongpo, 450 m., 2(M).15.iv.1976 (Coll. A.R. Bhowmik & party).

Wing expanse : (M) 49 mm., (F) 45 55 mm.

Distribution : Throughout India, including West Bengal (Darjiling); Bangladesh, Hong Kong, Tonkin, South China, Indo-China, Japan, Sumatra and Malaysia.

**5. *Nyctemera cenis* (Cramer)

1779. *Phalaena cenis* Cramer, *Papil. Exot.*, 2:82, pl.147, Fig.E.

1982. *Nyctemera cenis*, Arora & Chaudhury, *Tech. Monograph*, no.6, pl.8.

Distribution : India ; West Bengal, Assam, (Sibsagar), Meghalaya (Khasis), Arunachal Pradesh, Sikkim, Uttar Pradesh, Himachal Pradesh, Jammu & Kashmir; China, Burma, Bangladesh.

Subfamily ARCTIINAE

Key to genera of the Subfamily ARCTIINAE

1. Forewing with an areole *Baroa* Moore
- Forewing without areole 2
2. Fore tibiae with curved apical claw 3
- Fore tibiae without apical claw *Diacrisia* Hübner
3. Hind tibiae with medial spurs absent *Amsacta* Walker
- Hind tibiae with medial spurs present *Estigmene* Hübner

Genus *Baroa* Moore*6. *Baroa vatata* Swinhoe

1894. *Baroa vatata* Swinhoe, *Ann. Mag. Nat. Hist.* (6) 14:336.

Material examined : West Bengal, Darjiling District, Rongpo, F.R.H., 1(F), 15.iv.1973 (Coll. H.S. Sharma & party).

Wing expanse : (F) 37 mm.

Distribution : India : West Bengal (Darjiling), Assam, Meghalaya (Khasis), Sikkim; Bhutan and Hong Kong.

Genus *Diacrisia* HübnerKey to species of the genus *Diacrisia* Hübner

1. Forewing with series of white spots 2
- Forewing with series of black spots *multiguttata* (Walker)
2. Hindwing with the ground colour white *fulvohirta* (Walker)
- Hindwing with the ground colour pale yellow *impleta* (Walker).

*7. *Diacrisia multiguttata* (Walker)

1855. *Hypercompa multiguttata* Walker, *List Lep. Het. Brit. Mus.* 3 : 657

1919. *Diacrisia multiguttata*. Strand, *Lep. Catalogus, Pars.* 2, p. 203.

Material examined : West Bengal, Darjiling District, Ghoom Bhanjan, Deputy Forest Rangers Office, 7000 ft., 1(F), 28.v.1975 (Coll. J.K. Jonathan & party).

Wing expanse : (F) 54 mm.

Distribution : India : West Bengal (Darjiling), Sikkim, N.W. Himalayas, (Simla, Kulu, Dalhousie, Kashmir); Nepal, Burma, Campuchia.

*8. *Diacrisia fulvohirta* (Walker)

1855. *Alphaea fulvohirta* Walker, *List Lep. Het. Brit. Mus.*, 3:684.

1919. *Diacrisia fulvohirta*, Strand, *Lep. Catalogus, Pars. 22*, p.179.

Material examined : West Bengal, Darjiling District, Hariyana Bhavan, 900 m., 2(M), 21.v.1974 (Coll. J.K. Jonathan & party).

Wing expanse : (M) - 50 56 mm.

Distribution : India : West Bengal (Darjiling), Sikkim; Bhutan and Western China.

*9. *Diacrisia impleta* Walker

1864. *Hypercompa impleta* Walker, *List Lep. Het Brit. Mus.* 31:286.

1919. *Diacrisia impleta*, Strand, *Lep. Catalogus, Pars 22*, p. 181.

Material examined : West Bengal, Darjiling District, Manibhanjan, 1 Km. N. of Youth Hostel, 6400 ft., 1(F), 19.v.1975 (Coll. J.K. Jonathan & party).

Wing expanse : (F) 57 mm.

Distribution : India : West Bengal (Darjiling), Assam, Meghalaya (Khasis) and Sikkim.

Genus *Amsacta* Walker

10. *Amsacta lineola* (Fabricius)

1793. *Bombyx lineola* Fabricius, *Ent. Syst.*, 3(1) : 465.

1919. *Amsacta lineola*, Strand, *Lep. Catalogus, Pars. 22*, p. 252.

Material examined : West Bengal. Darjiling District, Rombi F.R.H. Compound. 2150m.. 1(F), 14.iv.1973 (Coll. H.S. Sharma & party). Murshidabad District, C.S.R.S. Compound, Berhampur. 1(F), 4.xi.1974 (Coll. A.K. Hazra), Jiyaganj, 2(F), 6.ii.1986 (Coll. I.J. Gupta & party). Birbhum District. Santiniketan 1(F), 10.ix.1974 (Coll. B.N. Das & G.C. Dey). Burdwan District, Guscara, 1(M), 10.ix.1988 (Coll. K.K. Roy & party).

Wing expanse : (M) 28mm., (F) 35 mm.

Distribution : India : West Bengal (Calcutta, Burdwan, Birbhum, Murshidabad, Darjiling), N.W. Himalayas (Kulu), Jammu & Kashmir, Punjab, Bombay, Gujarat (Kutch), Madhya Pradesh, (Jabalpur) Karnataka (Belgaum, Bangalore, Mysore), Tamil Nadu, (Coimbatore), Kerala, (Tranvancore); Nepal and Sri Lanka.

Genus *Estigmene* Hübner

*11. *Estigmene vittata* (Moore)

1879. *Rajendra vittata* Moore, *Proc. zool. Soc. Lond.*, p. 396, tab. 32, fig. 12.
1919. *Estigmene vittata*, Strand, *Lep. Catalogus, Pars. 22*, p.258.

Material examined : West Bengal, Bankura District, Churamanipur, R.H., Sonamukhi, 1(M), 2.ix.1986 (Coll. P. Mukherjee & party).

Wing expanse : (M) 34 mm.

Distribution : India : West Bengal (Bankura), Tamil Nadu (Nilgiris, Madras), Kerala (Travancore); Burma.

**12. *Estigmene perrotteti* (Guer.)

1844. *Chelonia perrotteti* Guer., *Icon. R. Anim. Ins.*, p. 515.
1901. *Estigmene perrotteti*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, 3:348.

Distribution : India : West Bengal, Bihar (Paresnath), Punjab, Himachal Pradesh (Simla), Madhya Pradesh (Jabalpur, Bombay), Tamil Nadu (Nilgiris, Coimbatore), Karnatak; and Western Slopes.

**13. *Rhodogastria astreus* (Drury)

1773. *Sphinx astreus*, Drury, 111. *Exot. Ent.*, 2:50, pl. 28, fig.4.
1901. *Rhodogastria astreus*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, 3:504-505.

Distribution : India : West Bengal, Arunachal Pradesh, Maharashtra, Tamil Nadu; West Sri Lanka, China, Burma Indonesia, the Philippines, New Guinea.

Subfamily MICRARCTIINAE

Key to genera of the Subfamily MICRARCTIINAE

1. Palpi upturned, forewing vein R_2 and R_5 from a long areole *Argina* Hübner
Palpi porrect, forewing vein R_2 and R_5 from a short areole *Utetheisa* Hübner

Genus *Argina* HübnerKey to species of the genus *Argina* Hübner

1. Head, thorax and abdomen bright greyish red. Forewing with white edges black spots
 *argus* (Kollar)

Head, thorax and abdomen yellowish. Forewing with light edges quite large black spots
 *astrea* (Drury)

14. *Argina argus* (Kollar)

1844. *Euprepia argus* Kollar, In, *Hugels kasehmir und das Reich der siek*, 4:467, pl. 21. Fig. 3.

1937. *Argina argus*, Bryk, *Lep. Catalogus*, Pars. 82., p. 27.

Material examined : West Bengal, Darjiling District, Teesta Valley, 1(F), 30.iii.1953 (Coll. *M.B. Kripalani*); Kurseong, in and around Singell T.E., 1435 m., 1(F), 1.v.1971 (Coll. *A.R. Bhowmik & party*).

Wing expanse : (F) 61 mm.

Distribution : Throughout India including West Bengal (Darjiling); Sri Lanka, Burma and Eastern Asia.

15. *Argina astrea* (Drury)

1773. *Phalaena astrea* Drury, *Illust. nat. Hist. exot. Insects*, 2:11, pl.6, Fig.3.

1983. *Argina astrea*, Arora, *Rec. Zool. Surv. India*, Occ. paper no. 60, p.9-10.

Material examined : West Bengal, Nadia District, Rajaghat Jila Parishad 1B., 1(F), 4.ii.1986 (Coll. *A.R. Lahiri & party*). Burdwan District, Burdwan Univ. Campus, 2(F), 3.ix.1986 (Coll. *K.K. Roy & party*). Bankura District, Susunia, 1(M), 25.ix.1981 (Coll. *H.K. Bhowmik & party*), Heeraparbat, 1(M), 25.viii.1986 (Coll. *P. Mukherjee & party*).

Wing expanse : (M) 40 mm., (F)-36-40 mm.

Distribution : Throughout India including West Bengal (Burdwan, Nadia, Bankura), Andaman & Nicobar Islands; China, Sri Lanka, New Guinea, Samon Island, (Pacific Ocean), Mauritius (Indian Ocean), the Philippines.

Genus *Utetheisa* Hübner16. *Utetheisa pulchella* (Linnaeus)

1758. *Tinea pulchella* Linnaeus, *Syst. Nat.*, 1 : 534.

1901. *Utetheisa pulchella*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, 3:483-485.

Material examined : West Bengal, Darjiling District, 4 km. S.E. of Goke F.R.H., Singla, 400m., 1(M), 18.iv.1973 (Coll. *H.S. Sharma* & party). Malda District, Gour, 1(M), 19.ix.1975 (Coll. *H.K. Bhowmik* & party). Bankura District, Heeraparat 1(F), 29.viii.1986 (Coll. *P. Mukherjee* & party). Calcutta, Horticulture Garden, 1(F), 23.vi.1961 (Coll. *H.K. Bhowmik* & party). 24-Parganas Malbari, N. Salt Lake, 1(M), 13.vi.1964 (Coll. *B. Biswas*).

Wing expanse : (M), (F) – 30 mm.

Distribution : Throughout India including West Bengal (Calcutta, 24 Parganas, Bankura, Malda, Darjiling); Europe, Africa, Sri Lanka, the Philippines, Malay Archipeloge, New Guinea, Australia and Pacific groups.

Subfamily SPILOSOMINAE

Key to genera of the Subfamily SPILOSOMINAE

1. Antennae ciliate in both sexes. Hind legs with one pair of tibial spurs2
 Antennae minutely serrate or pectinate in male. Hind legs with two pairs of tibial spurs, rarely the middle pair extremely reduced3
2. Thorax marked. Legs with coxae and femora pale yellow above, tibiae and tarsi dark brown but unmarked *Cretonotos* Hübner
 Thorax unmarked. Legs with coxae and femora yellow, tibiae and tarsi ivory white, marked with dark brown stripe *Phissama* Moore
3. Fore tibiae with curved apical claw, hind legs with the medial spurs shorter than terminal spurs *Aloa* Walker
 Fore tibiae without curved apical claw4
4. Head, Thorax and abdomen with large wooly hair. Antennae about half the length of costa. Proboscis extremely short not extending the width of head *Spilarctia* Butler
 Head, thorax and abdomen smoothly scaled. Antennae less than half the costa. Proboscis extending the width of head5
5. Labial palpi long projecting beyond the frons. Proboscis twice the width of head *Areas* Walker
 Labial papi short not projecting beyond the frons. Proboscis less than twice the width of head *Olepa* Watson

Genus *Cretonotos* Hübner

17. *Cretonotos gangis* (Linnaeus)

1764. *Phalaena gangis* Linnaeus, *Ameon. Acad.*, 6 : 410.

1919. *Cretonotos gangis*. Strand, *Lep. Catalogus, Pars*, 22, p. 245.

Material examined : West Bengal, Jalpaiguri District, Rydak Forest, 2(M), 10.ix.1975 (Coll. *H.K. Bhowmik* & party). Coochbehar, District, Atia mochar, 1(F), 4.ix.1983 (Coll. *A.K. Mandal*). Murshidabad District, Dumkal, 1(M), 17.x.1983 (Coll. *A.K. Hazra* & party). Burdwan District, Burdwan Univ. Campus, 1 (M), 5.ix.1986, Guscara 1 (M), 10.ix.1986 (Coll. *K.K. Roy* & party). Bankura District, Joypur F.R.H., 1 (M), 20.xii.1985 (Coll. *D.K. Mandal* & party). Midnapur District, Belpahari, F.R.H., 1(F), 4.ix.1966 (Coll. *S.S. Saha*). 24-Parganas District, Barapareash, West of Hat Gachia, 1(F), 22.xi.1964 (Coll. *B. Biswas*), Canning, 1(M), 26.ix.1973 (Coll. *S.K. Biswas*). Calcutta, Dumdum, 1 (M), 7.ii.1959 (Coll. *A.R. Bhowmik*).

Wing expanse : (M) 35 42mm., (F) 42 mm.

Distribution : Throughout India including West Bengal (Calcutta, 24 Parganas, Howrah, Midnapur, Burwan, Bankura, Murshidabad, Jalpaiguri, Coochbehar); Sri Lanka, Malaysia (Singapore), Nepal, Pakistan, Eastern Asia; China (Formosa), N. Australia,

Genus *Phissama* Moore

18. *Phissama transiens* (Walker)

1855. *Spilosoma transiens* Walker, *List Lep. Insects Brit. Mus.*, 3 : 675.

1982. *Phissama transiens*, Arora and Chaudhury, *Tech. Monograph.*, no. 6, p. 15-16.

Material examined : West Bengal, Darjiling District, Bamonpokri, 1 (M), 1 (F). 25.viii.1975, Sukna, 1 (M), 15.ii.1974 (Coll. *H.K. Bhowmik* & party). Rongpo, 450m., 1(M), 19.iv.1976, Sukna, 161m., 1(M), 12.v.1978 (Coll. *A.R. Bhowmik* & party), Teesta, 1 (M), ii. 1953 (Coll. *M.B. Kripalini*), Reyang, F.R.H., 275m., 8(M), 5 (F), 28.iii. 1973 (Coll. *H.S. Sharma* & party), Bijanbari, in and around Phulbazar, 900m., 1(M), 20.v.1974 (Coll. *J.K. Jonathan* & party). Jalpaiguri District, Sulkapara, 1(M), 28.viii.1975 (Coll. *H.K. Bhowmik* & party). Nadia District, Ranaghat Jila Parisad I.B., 2 (M), 4.ii.1986 (Coll. *A.R. Lahiri* & party). Bankura District, Kotalpur, 1(F), 24.ix.1986 (Coll. *T.R. Mitra*).

Wing expanse : (M) 38 48 mm., (F) 48 55 mm.

Distribution : India : West Bengal (Nadia, Bankura, Jalpaiguri, Darjiling), Assam, Arunachal Pradesh, Sikkim; China (Formosa). Indonesia (Borneo, Sulawesi), the Philippines.

Genus *Aloa* Walker

19. *Aloa lactinea* (Cramer)

1777. *Bombyx lactinea* Cramer, *Pap. Exot.*, 2:58, 149, pl. 133, Fig. D.

1982. *Aloa lactinea*, Arora & Chaudhury, *Tech. Monograph*, no. 6, p. 16-17.

Material examined : West Bengal, Bankura District, Mukutmanipur, 1(F), 20.ix.1981 (Coll. *A.R. Bhowmik* & party). Midnapur District, Jhargram, Jambani Forest, 1(F), 3.x.1983 (Coll. *A.K. Hazra* & party), Belpahari, 1(M), 8.ix.1985 (Coll. *S. Biswas* & party).

Wing expanse : (M) 46 mm., (F) - 50-61:

Distribution : India : West Bengal (Midnapur, Bankura), Assam, Arunachal Pradesh, Jammu & Kashmir, Maharashtra, Kerala and Tamil Nadu; Sri Lanka, Japan, China, E. Asia, Indonesia (Java and Sumatra).

Genus *Spilarctia* Butler

Key to species of the genus *Spilarctia* Butler

1. Palpi dark at base Antennae pale brown but strongly bipectinate *casigneta* (Kollar)
 Palpi crimson at base. Antennae dark but weakly bipectinate *obliqua* (Walker)

*20. *Spilarctia casigneta* (Kollar)

1844. *Euprepia casigneta* Kollar, In : *Hugels kaschmir und das Reich der siek*, 4(2) : 469.
 1982. *Spilarctia casigneta*, Arora & Chaudhury, *Tech Monograph*, no. 6, p. 19-20.

Material examined : West Bengal, Darjiling District, Tukdah F.R.H. Compound, 1500m., 1(M), 26.iii.1973 (Coll. H.S. Sharma & party). Midnapur District, Belpahari, F.R.H., 2(F), 8.ix.1985 (Coll. S. Biswas). Howrah District, Botanical Garden, 1(M), 19.viii.1986 (Coll. S. Ghosh & party).

Wing expanse : (M) 38 mm. (F) 49 mm.

Distribution : India : West Bengal (Howrah, Midnapur, Darjiling), Assam, Arunachal Pradesh, Manipur, Nagaland, Sikkim, Tamil Nadu (Nilgiris), N.W. Himalayas; Bhutan, Western China, East Asia.

21. *Spilaretia obliqua* (Walker)

1855. *Spilosoma obliqua* Walker, *List Lep. Insect Brit. Mus.*, : 3:679.
 1982. *Spilarctia obliqua*, Arora & Chaudhuri, *Tech. Monograph*, no.6, p. 19.

Material examined : West Bengal, Darjiling District, Rangiroom F.R.H., 6275 ft., 1(M), 1(F), 8.vi.1975 (Coll. J.K. Jonathan & party). Murshidabad District, Jangipur, Dhanpat Nagar, 2(F), 1.ii.1986 (Coll. I.J. Gupta & party). Hooghly District, Bandel, 1(F), 31.xii.1966 (Coll. H.C. Ghosh). Howrah District, Bally, Nischinda, 1 (M), 4.ix.1966 (Coll. S.S. Saha). Calcutta, Belgachia, 1(M), 24.vii.1950 (Coll. B. Biswas). 24-Parganas District, Salt Lake, 1(F), 20.ii.1966 (Coll. M.B. Rao).

Wing expanse : (M) 35 45 mm, (F) 42 47 mm.

Distribution : Throughout India including West Bengal (Calcutta, 24-Parganas, Howrah, Hooghly, Burdwan, Murshidabad, Darjiling); Nepal, Bhutan, China, Japan, Eastern Asia.

****22. *Spilarctia rubitincta* (Moore)**

1865. *Spilosoma rubitincta* Moore, *Proc. zool. Soc. Lond.*, p. 809.
 1982. *Spilarctia rubitincta*, Arora & Chaudhury, *Tech. Monograph*, no. 6, p.18-19.

Distribution : India : West Bengal (Darjiling), Arunachal Pradesh, Sikkim; Bhutan.

Genus *Areas* Walker**23. *Areas galactina* (Höeüen)**

1840. *Chelonia galactina* Höeüen, *Tijdschr. Nat. Ges. Phys.*, 7:280, pl.vi.Fig.5.
 1982. *Areas galactina*, Arora & Chaudhury, *Tech. Monograph*, No.6., p.20-21.

Material examined : West Bengal, Darjiling District, Rongiroom F.R.H., 6275 ft., 1(M), 10.v.1975 (Coll. J.K. Jonathan & party), Kurseong, 1427 m., 3 (M), 15.v.1979 (Coll. M.S. Shishodia & party), Lebong, 1(F), 16.v.1980 (Coll. R.N. Tiwari & party).

Wing expanse : (M) 75 80 mm. (F) 85 mm.

Distribution : India : West Bengal (Darjiling), Assam, Meghalaya (Khasis) Naga Hills, Arunachal Pradesh, N.W. Himalayas; Indonesia (Borneo), Sarawak, Western China, Eastern Asia, South America.

Genus *Olepa* Watson***24. *Olepa ricini* (Fabricius)**

1775. *Bombyx ricini* Fabricius, *Syst. Entom.*, : 583.
 1982. *Olepa ricini*, Arora & Chaudhury, *Tech. Monograph*, no.6, p. 21-22.

Material examined : West Bengal, Malda District, Tulshihata, 1 (M), 25.vi.1987 (Coll. K.P. Mukherjee & party). Calcutta, Dhapa, 1(F), 14.vii.1962 (Coll. R.K. Varshney), Baranagar, at light, 2(F), 15.ii.1967 (Coll. H.C. Ghosh & party).

Wing expanse : (M) 44 mm., (F) 52 60 mm.

Distribution : India : West Bengal (Calcutta, Malda), Assam, Arunachal Pradesh, Sikkim, Punjab, Madhya Pradesh, Karnataka, Tamil Nadu, Bangla Desh, (Sylhet) and Sri Lanka.

Subfamily LITHOSIINAE

Key to genera of the subfamily LITHOSIINAE

1. Forewing without vein M_2 2

- Forewing with vein M_2 3
2. Forewing in male with secondary sexual character or both wings without secondary sexual character *Eilema* Hübner
- Both wings with secondary sexual character *Zadadra* Moore
3. Forewing with areole, vein R_2 stalked with R_3 *Agylla* Walker
- Forewing without areole, vein R_2 free 4
4. Forewing with vein R_3 - R_5 stalked in female, R_3 and R_4 absent in male *Cyana* Walker
- Forewing with vein R_3 - R_5 stalked in both sexes 5
5. Forewing with vein R_1 anastomosing with Sc. Hindwing with vein R_5 - M_1 stalked *Asura* Walker
- Forewing with vein R_1 free. Hindwing with vein R_5 - M_1 on a long stalked *Miltochrista* Hübner

Genus *Eilema* Hübner

Key to species of the genus *Eilema* Hübner

1. Forewing orange yellow, without costal fascia. Legs black *vagesa* (Moore)
- Forewing leaden grey with yellow costal fascia, Legs leaden grey *vicaria* (Walker)

*25. *Eilema vagesa* (Moore)

1859. *Lithosia vagesa* Moore, *Lepid. East Ind. Comp.*, p. 304.
1922. *Eilema vagesa*, Strand, *Lep. Catalogus, Pars*, 26, p. 591.

Material examined : West Bengal, Darjiling District, Tindhoria, 856 m., 1(M), 14.v.1979 (Coll. M.S. Shishodia & party).

Wing expanse : (M) - 38 mm.

Distribution : India : West Bengal (Darjiling), Assam, Sikkim, N.W. Himalayas, (Mussorie, Kangra and Kashmir); Nepal and Burma.

26. *Eilema vicaria* (Walker)

1854. *Lithosia vicaria* Walker, *List Lep. Het. Brit. Mus.* 2:505.
1922. *Eilema vicaria*, Strand, *Lep. Catalogus, pars*, 26, p. 592.

Material examined : West Bengal, Bankura District, Churamanipur R.H., Sonamukhi, 2(F), 2.ix.1986 (Coll. P. Mukherjee & party).

Wing expanse : (F) 27 32mm.

Distribution : India : West Bengal (Calcutta, Bankura), Assam, Arunachal Pradesh, Sikkim, Maharashtra, (Bombay), Andamans; Bhutan, Sri Lanka, Indonesia (Java and Borneo), Malayasia (Sarawak) China (Formosa, Kuangtung and Ussurigebid).

****27. *Eilema auriflua* (Moore)**

1878. *Systropha auriflua* Moore, *Proc. zool. Soc. Lond.*, p. 18.

1900. *Ilema auriflua*, Hampson, *Cat. Lep. Phal. Brit.*, Mus.2:143.

Distribution : West Bengal, Assam, Meghalaya (Khasis) and Sikkim.

Remarks : Following Hampson (1900) the species is kept under the genus *Eilema* which is spelled by Hampson as *Ilema* (Walker).

Genus *Zadadra* Moore

***28. *Zadadra distorta* (Moore)**

1872. *Lithosia disorta* Moore, *Proc. zool. Soc. Lond.*, p. 572.

1982. *Zadadra distorta*, Arora & Chaudhury, *Tech. Monograph*, no.6, p. 39-40.

Material examined : West Bengal, Darjiling District, Tindharia, 856 m; 1(F), 14.v.1979 (Coll. M.S. Shishodia & party).

Wing expanse : (F) 38 mm.

Distribution : India : West Bengal (Darjiling), Assam, Meghalaya, Nagaland (Naga Hills), Arunachal Pradesh, Sikkim; Nepal, China (Likiang, Szetschwan).

Genus *Agylla* Walker

***29. *Agylla ramelana* (Moore)**

1865. *Lithosia ramelana* Moore, *Proc. zool. Soc. Lond.*, p. 798.

1922. *Agylla ramelana*, Strand, *Lep. Catalogus*, Pars. 26, p. 612.

Material examined : West Bengal, Darjiling District, Balsone Bush, 3 Kms. E-of Sukia Pokri, 2(M), 19.iii.1973 (Coll. P.K. Maiti & party). Calcutta, 16 km. N. of Calcutta, 2(M), 2.viii.1964 (Coll. B. Biswas). 24-Parganas District, Canning, 1(F), 25.ix.1973 (Coll. R. Rahaman & S.K Biswas).

Wing expanse : (M), (F) 34 46 mm.

Distribution : India : West Bengal (Calcutta, 24-Parganas, Assam, Darjiling), Assam, Arunachal Pradesh and Sikkim; Indonesia (Borneo, Java).

****30. *Agylla maculata* (Moore)**

1878. *Vamuna maculata*, Moore, *Proc. Zool. Soc. Lond.*, p. 10.

1900. *Agylla maculata*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, 2:211-212.

Distribution : India : West Bengal (Darjiling), Arunachal Pradesh, Sikkim; Bhutan.

Genus *Cyana* Walker

Key to species of the genus *Cyana* Walker

1. Forewing of female with vein M_2 and M_3 stalked *catorhoda* Hampson
Forewing of female with vein M_2 and M_3 from cell 2
2. Forewing with scarlet band *adita* (Moore).
Forewing with orange band 3
3. Forewing without spot at end of cell. Hindwing underside without discoidal lunule
..... *gazella* (Moore)
Forewing with three black spots at end of cell. Hindwing underside with a discoidal lunule
..... *arama* (Moore)

***31. *Cyana catorhoda* Hampson**

1897. *Cyana catorhoda* Hampson, *Journ. Bombay Nat. Hist. Soc.*, 11:296.

Material examined : West Bengal, Darjiling District, Charonti Hill, 1(F), 12.iii.1974 (Coll. H.K. Bhowmik & party).

Wing expanse : (F), 23 mm.

Distribution : India : West Bengal (Darjiling), Assam, Meghalaya (Khasis), Burma.

***32. *Cyana adita* (Moore)**

1854. *Bizone adita* Moore, *Cat. Lep. East India Comp.*, p. 306, tab. 7a, Fig. 1.

Material examined : West Bengal, Darjiling District, Mirik, 3500ft., 1(M), 3(F), 23.ix.1974 (Coll. H.K. Bhowmik & A.R. Bhowmik).

Wing expanse : (M) 34 mm. (F) - 40 mm.

Distribution : India : West Bengal, (Darjiling), Sikkim, N.W. Himalayas, (Kangra, Dalhousie, Simla); Tibet (Moupin).

Remarks : The genus *Cyana* Walker has a priority over *Chionaema* Herrich Schaffer so all the species including the species *adita* described under *Chionaema* have been transferred to *Cyana*.

*33. *Cyana gazella* (Moore)

1872. *Bizone gazella* Moore, *Proc. zool. Soc. Lond.*, p. 572, tab. 33, Fig. 4.

1894. *Cyana gazella* Hampson, *Fauna Brit. India, Moths*, 2 : p. 61.

Material examined : West Bengal, Darjiling District, Ghoom Bhanjan, 1 (M), 29.v.1976 (Coll. A.R. Bhowmik & party).

Wing expanse : (M) 42 mm.

Distribution : West Bengal, (Darjiling), Sikkim, N.W. Himalayas (Kangra).

*34. *Cyana arama* (Moore)

1895. *Bizone arama* Moore, *Cat. Lep. East India Comp.*, p. 306, tab. 7a, Fig. 10.

1894. *Cyana arama*, Hampson, *Fauna Brit. India* 2 : p. 62.

Material examined : West Bengal, Darjiling District, Mirik, 3500ft., 1(M), 1(F), 23.ix.1974 (Coll. H.K. Bhowmik & A.R. Bhowmik).

Wing expanse : (M) - 42 mm., (F) 50 mm.

Distribution : India : West Bengal (Darjeeling), Assam, Meghalaya, Nagaland (Naga Hills) and Sikkim.

Genus *Asura* Walker

Key to species of the genus *Asura* Walker

1. Forewing with the postmedial line highly and irregularly dentate *undulosa* (Walker)
- Forewing with the postmedial line not dentate 2
2. Forewing with medial line strongly incurved *conjunctana* (Walker)

Forewing with medial line more or less straight *strigipennis* (Herrich-Schaffer)

***35. *Asura undulosa* (Walker)**

1854. *Cyllene undulosa* Walker, *List Lep. Insect Brit. Mus.*, 2 : p. 545.

1900. *Asura undulosa* Hampson, *Cat. Lep. Phal. Brit. Mus.*, 2:440-41.

Material examined : West Bengal, Darjiling District, Tiger Hill area, 1(F), 9.x.1974 (Coll. *H.K. Bhowmik & A.R. Bhowmik*). Kurseong, 1880m., 1(F), 14.v.1979 (Coll. *M.S. Shishodia & party*), 24-Parganas District, Canning, 1(M), 25.ix.1973 (Coll. *R.Rahaman & S.K. Biswas*).

Wing expanse : (M) 22 mm., (F) 28 mm.

Distribution : India : West Bengal (24-Parganas, Darjiling), Assam, Arunachal Pradesh, Sikkim; Bhutan and Burma.

***36. *Asura conjunctana* (Walker)**

1866. *Conchylis conjunctana* Walker, *List Lep. Insect Brit. Mus.*, 35:1788.

1922. *Asura conjunctana*, Strand, *Lep. Catalogus, Pars*, 26, p. 780.

Material examined : West Bengal, Darjiling District, Bijanbari, Hariyana Bhavan, 1(M), 12.v.1974 (Coll. *J.K. Jonathan & party*), Sukna, 161m., 1(M), 12.v.1978 (Coll. *A.R. Bhowmik & party*).

Wing expanse : (M) 20 mm.

Distribution : India : West Bengal, (Darjiling), Assam, Meghalaya, Nagaland (Nagas), Arunachal Pradesh and Sikkim; Bhutan.

***37. *Asura strigipennis* (Herrich-Schaffer)**

1855. *Paidia strigipennis* Herrich-Schaffer, *Ausserens. Schmett.*, : p. 21, pl. 437.

1922. *Asura strigipennis*, Strand, *Lep. Catalogus, Pars*, 26, p. 798.

Material examined : West Bengal, Darjiling District, Bijanbari Hariyana Bhawan, 900m., 2(F), 12, 20.v.1974 (Coll. *J.K. Jonathan & party*).

Wing expanse : (F) 28 mm.

Distribution : India : West Bengal (Darjiling), Assam, Meghalaya (Khasis), Arunachal Pradesh, and Sikkim; China (Formosa) Bhutan, Burma (Tenasserim) and Indonesia (Borneo and Java).

****38. *Asura congerens* (Felder)**

1874. *Cymella congerens* Felder, *Reis Nov.*, pl. 106, Fig. 14.

1900. *Asura congerens*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, 2:454.

Distribution : West Bengal (Calcutta), Sikkim and N.W. Himalayas.

****39. *Asura obsoleta* (Moore)**

1878. *Lyclene obsoleta* Moore, *Proc. zool. Soc. Lond.*, p. 32, pl.3., Fig. 7.

1900. *Asura obsoleta*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, 2:441.

Distribution : India : West Bengal (Darjiling), Assam, Arunachal Pradesh, Sikkim, South India, Bhutan, South China (Formosa).

Genus *Miltochrista* Hübner

Key to species of the genus *Miltochrista* Hübner

1. Forewing with cilia blackish 4
Forewing cilia not blackish 2
2. Forewing with crimson spots and streaks in the interspaces *gratiosa* (Guerin-Meneville)
Forewing with black streaks 3
3. Forewing with an irregular and highly dentate post medial line and the black streaks broader *prominens* (Moore)
Forewing with curved postmedial line and the streaks shorter *radians* (Moore)
4. Forewing costal margin dark fuscous, interrupted at medial area *cuneonotata* (Walker)
Forewing costal margin black and uninterrupted *inflexa* (Moore)

***40. *Miltochrista gratiosa* (Guerin-Meneville)**

1843. *Euchelia gratiosa* Guerin-Meneville, In. *Deless Souvo Inde*, 2:p.90, Pl.26, Fig.1.

1922. *Miltochrista gratioa*, Strand, *Lep. Catalogus, Pars*, 26, p. 812.

Material examined : West Bengal, Darjiling District, D.I. Fund Rest House, Jorpokri, 2220 m., 1(M), 23.v.1971 (Coll. A.R. Bhowmik & party), 1 Km. S.W. of Reyang F.R.H, on the way to Rambi, 1(F), 31. iii.1973, Rambi F.R.H. Compound, 2150m., 1(M), 12.vv.1973 (Coll. H.S. Sharma & party). Chunaboti, 2(M), 1(F), 9.iii.1974 (Coll. H.K. Bhowmik & party).

Wing expanse : (M) 36 mm., (F) 40 mm.

Distribution : India : West Bengal (Darjiling), Assam, Arunachal Pradesh, Sikkim and Andamans; Indonesia (Borneo), Burma, Sri Lanka, Bhutan, China, Eastern Asia, Japan.

*41. *Miltochrista prominens* (Moore)

1878. *Lyclene prominens* Moore, *Proc. zool. Soc.; Lond.*, p 31, pl. III, Fig. 3.
 1922. *Miltochrista prominens*, Strand, *Lep. Catalogus, Pars*, 26, p. 821.

Material examined : West Bengal, Darjiling District, Bijanbari, 900m., 1(F), 21.v.1974 (Coll. J.K. Jonathan).

Wing expanse : (F) 32 mm.

Distribution : India : West Bengal (Darjiling), Meghalaya (Cherrapunji), Arunachal Pradesh and Sikkim.

*42. *Miltochrista cuneonotata* (Walker)

1855. *Ammatho cuneonotata* Walker, *List Lep. Insect Brit. Mus.* 3:759.
 1922. *Miltochrista cuneonotata*, Strand *Lep. Catalogus, Pars* 26,p.808.

Material examined : West Bengal, Darjiling District, Kurseong, Gouri Shankar T.E. Factory, 1429m., 1(M), 1(F), 30.iv.1973 (Coll. A.R. Bhowmik) Darjiling, Chunaboti, 1(M), 9.iii.1974 (Coll. H.K. Bhowmik & party).

Wing expanse : (M) 31 mm., (F) - 30 mm.

Distribution : India : West Bengal (Darjiling), Meghalaya, Naga Hills, Arunachal Pradesh and Sikkim; Sri Lanka, Malaysia (Malaya, Singapore), Indonesia (Nias, Borneo & Sumatra), the Philippines.

43. *Miltochrista inflexa* (Moore)

1878. *Barsine inflexa* Moore, *Proc. Zool. soc. Lond.*, p. 29, pl. III, Fig. 17.
 1922. *Miltochrista inflexa*, Strand, *Lep. Catalogus, pars*, 26, p.814.

Material examined : West Bengal, Darjiling District, 9123 m., 1(F), 17.v.1979 (Coll. M.S. Shishodia & party).

Wing expanse : (F) 24 mm.

Distribution : West Bengal (Darjiling), Assam, Meghalaya (Khasis), Arunachal Pradesh and Sikkim:

44. *Miltochista radians* (Moore)

1878. *Lyclene radians* Moore, *Proc. zool. Soc. Lond.*, p.30, pl.3, Fig. 2.
 1900. *Miltochista radians*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, 2 : 491.

Material examined : West Bengal, Burdwan District, Barakar, 1(F) date Nil.

Wing expanse : (F) 21 m.

Distribution : India : West Bengal (Calcutta, Burdwan), Upper Assam and Sikkim.

****45. *Lexis fulveola* Hampson**

1900. *Lexis fulveola* Hampson, *Cat., Lep. Phal. Brit. Mus.*, 2 : 119 pl. 21, Fig. 10.

Distribution : West Bengal (Calcutta, 24-Parganas, Barackpur), Sikkim.

****46. *Narasodes punctana* (Walker)**

1863. *Tospitis punctana* Walker, *Cat. Lep. Het. Brit. Mus.*, 28:431.

1900. *Narasodes punctana*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, 2:265.

Distribution : India : West Bengal (Calcutta) Sri Lanka (Pundalaya) & Hambantota.

**** 47. *Eurosia annulata* Hampson**

1900. *Eurosia annulata* Hampson, *Cat. Lep. Phal. Brit. Mus.*, 2:332 pl. 28, Fig. 11.

Distribution : India : West Bengal (Calcutta).

****48. *Rhangana punctata* Moore.**

1878. *Rhangana punctata* Moore., *Proc. zool. Soc. Lond.*, p. 22. pl. Fig. 12.

Distribution : India : West Bengal (Calcutta).

****49. *Nishada flabrifera* Moore**

1878. *Nishada flabrifera* Moore, *Proc. zool. Soc. Lond.* p. 23.

Distribution : India : West Bengal (Calcutta). Tamil Nadu (Nilgiris), Kerala, (Travancore); Sri Lanka, Tenasserim, Dawnat Hills.

****50. *Chrysorabdia viridata* (Walker)**

1864. *Lithosia viridata* Walker, *List Lep. Insects Brit. Mus.*, 31:225.

1900. *Chrysorabdia viridata*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, 2 : 183.

Distribution : India : West Bengal (Darjiling), Assam, Arunachal Pradesh, Sikkim, Himachal Pradesh, Simla; Bhutan, China, and Bangladesh.

****51. *Teulisna protuberans* (Moore)**

1878. *Tegulata protuberans* Moore, *Proc. zool. Soc. Lond*; p. 23, pl.II., Fig. 6.
 1982. *Teulisna protuberans*, Arora & Chaudhury, *Tech. Monograph*, no. 6, p. 37.

Distribution : India ; West Bengal (Darjiling), Arunachal Pradesh, Sikkim; Bhutan.

****52. *Prabhasa venosa* Moore**

1878. *Prabhasa venosa* Moore, *Proc. zool. Soc. Lond* ; p. 26, pl. II, Fig. 16.

Distribution : India : West Bengal (Darjiling), Assam, Arunachal Pradesh, Sikkim; Bhutan, China, Burma.

SUMMARY

The paper incorporates the account of 52 species in 29 genera distributed over six subfamilies from 14 districts (*vide* Maps) except Purulia and West Dinajpur from West Bengal, 22 species amongst a total of 36 species examined constitute the new locality records for West Bengal. Besides, keys to taxa, geographical distribution, references to the original literature have also been provided. Over and above, the species which are recorded from literature but not studied at present have been included in this paper.

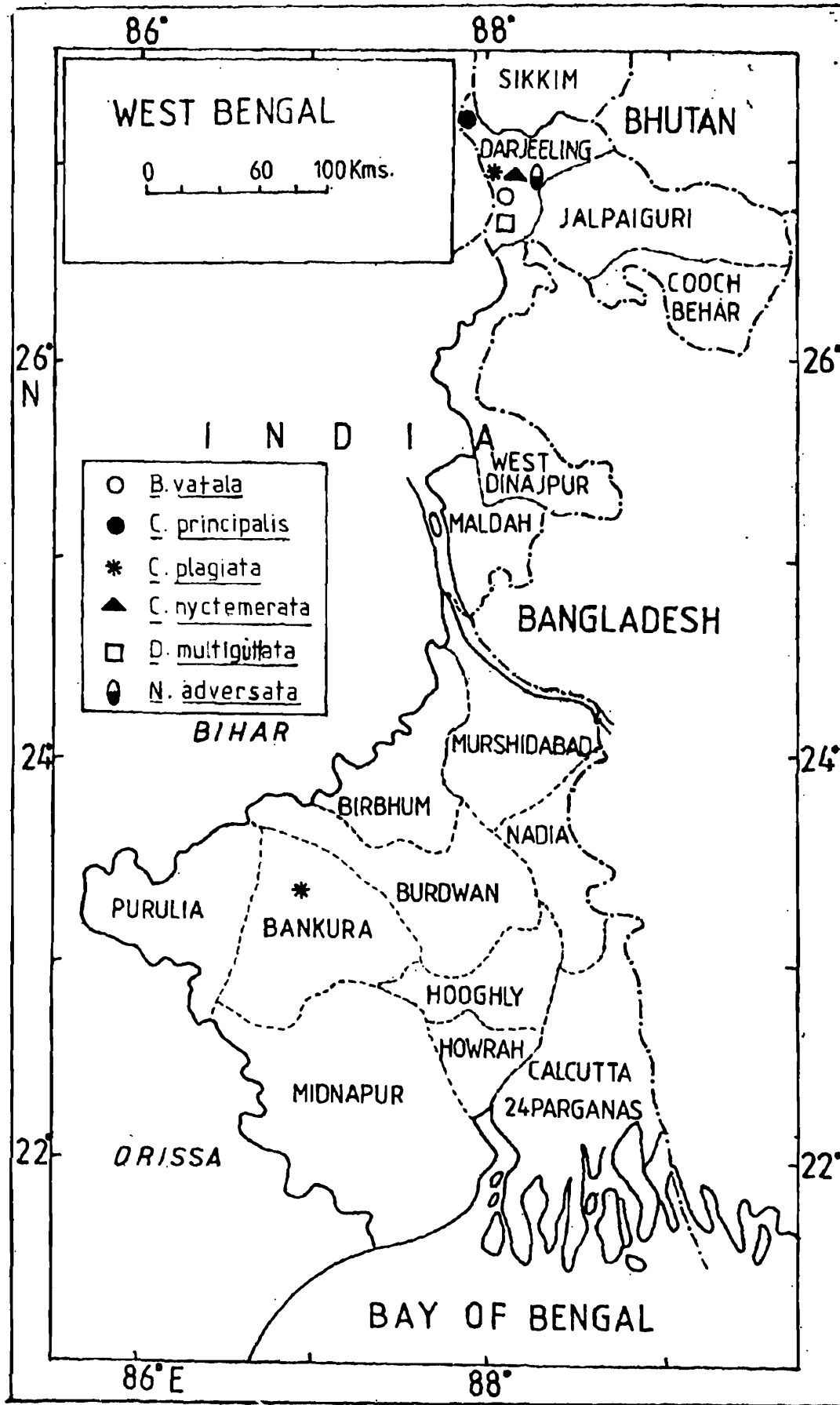
ACKNOWLEDGEMENT

The authors are highly grateful to the Director, Zoological Survey of India for providing laboratory facilities.

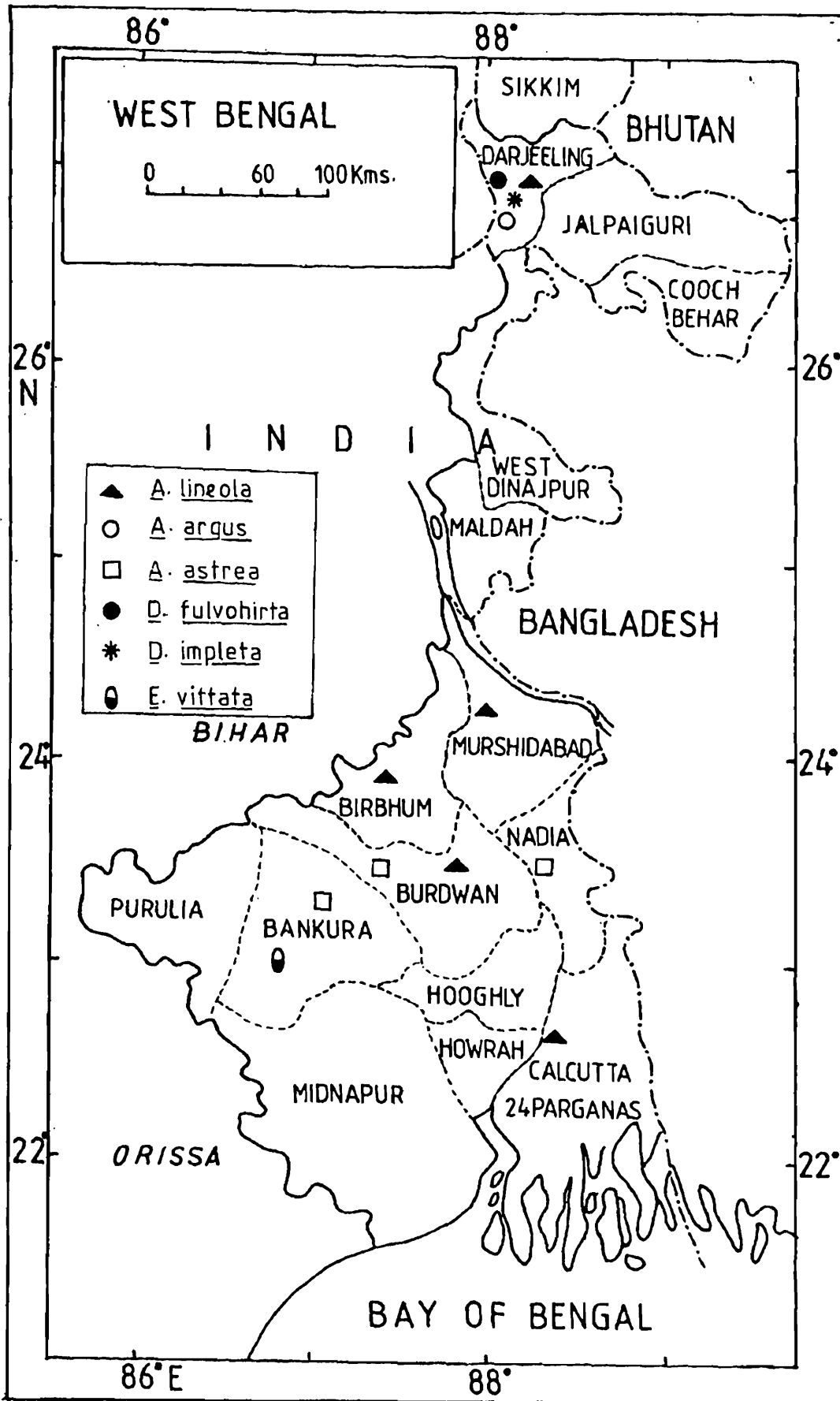
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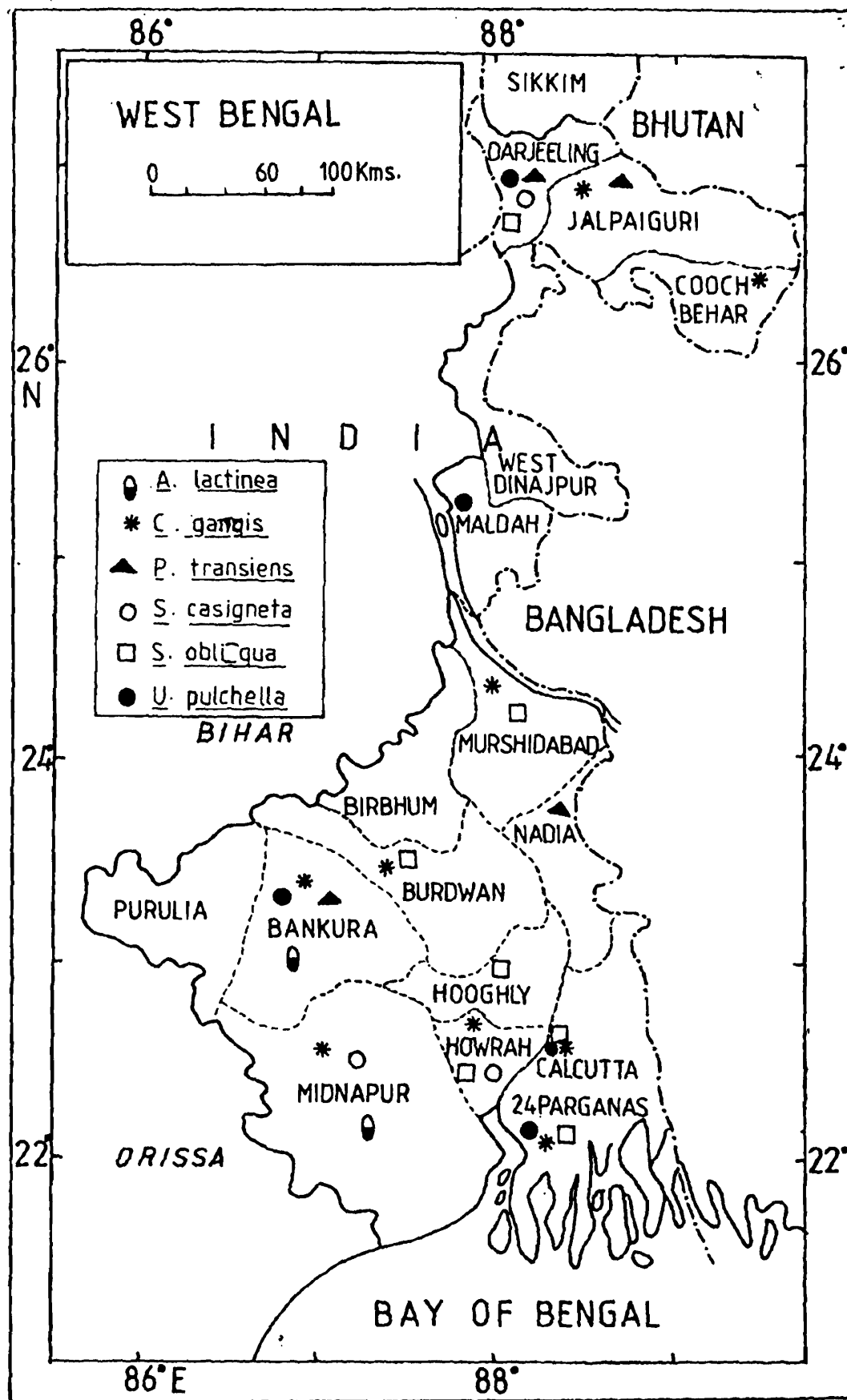
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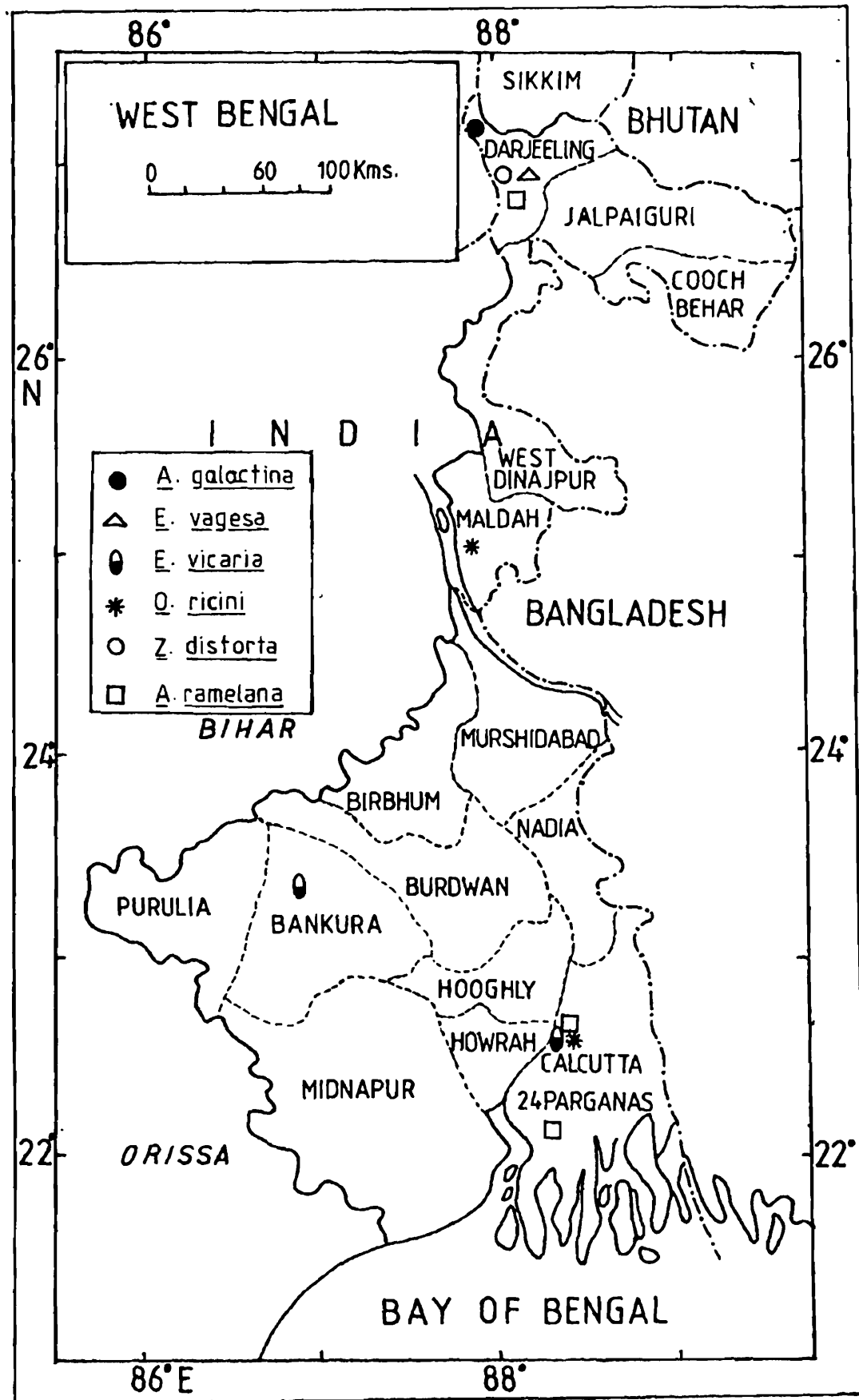
Map 1



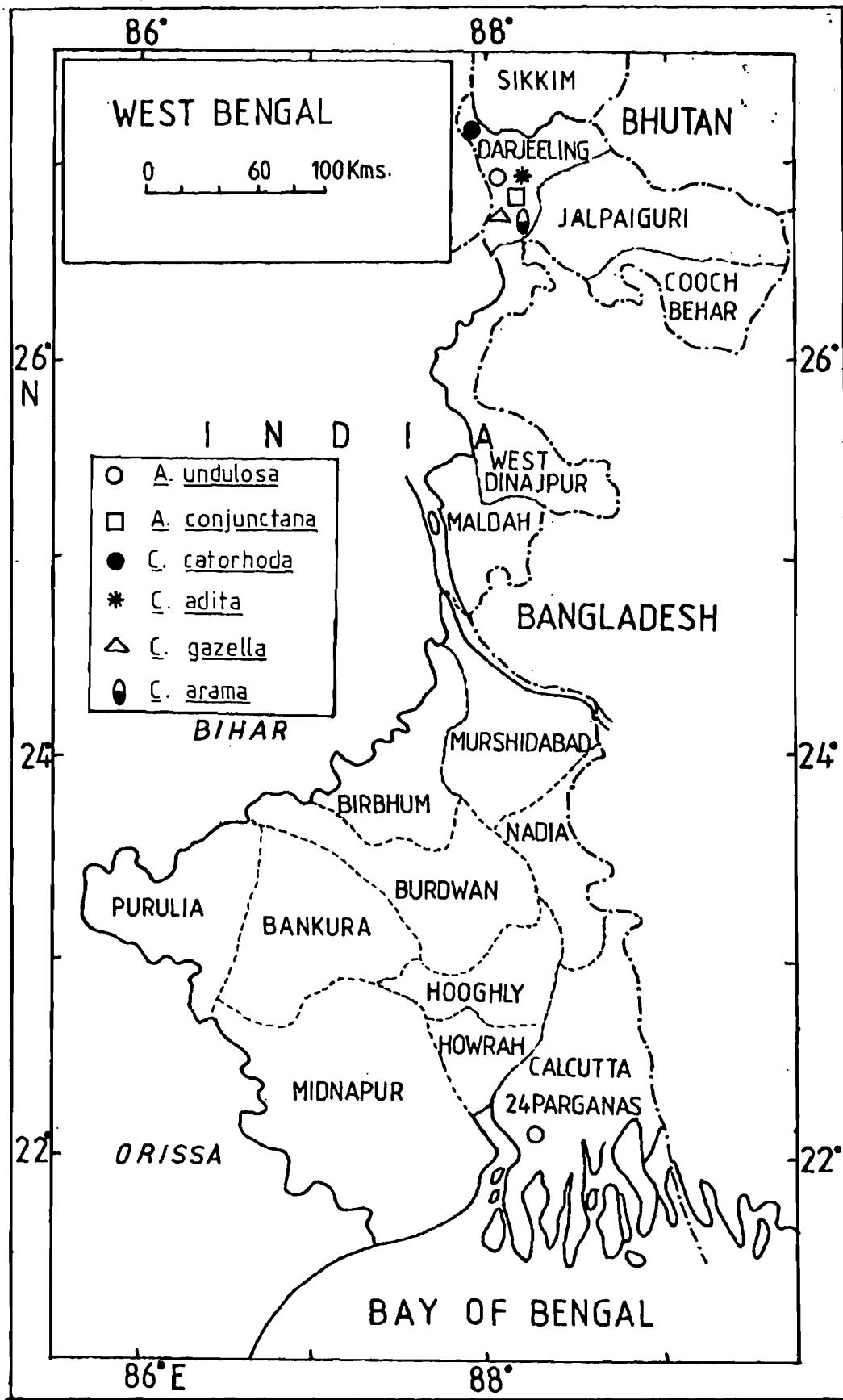
Map 2



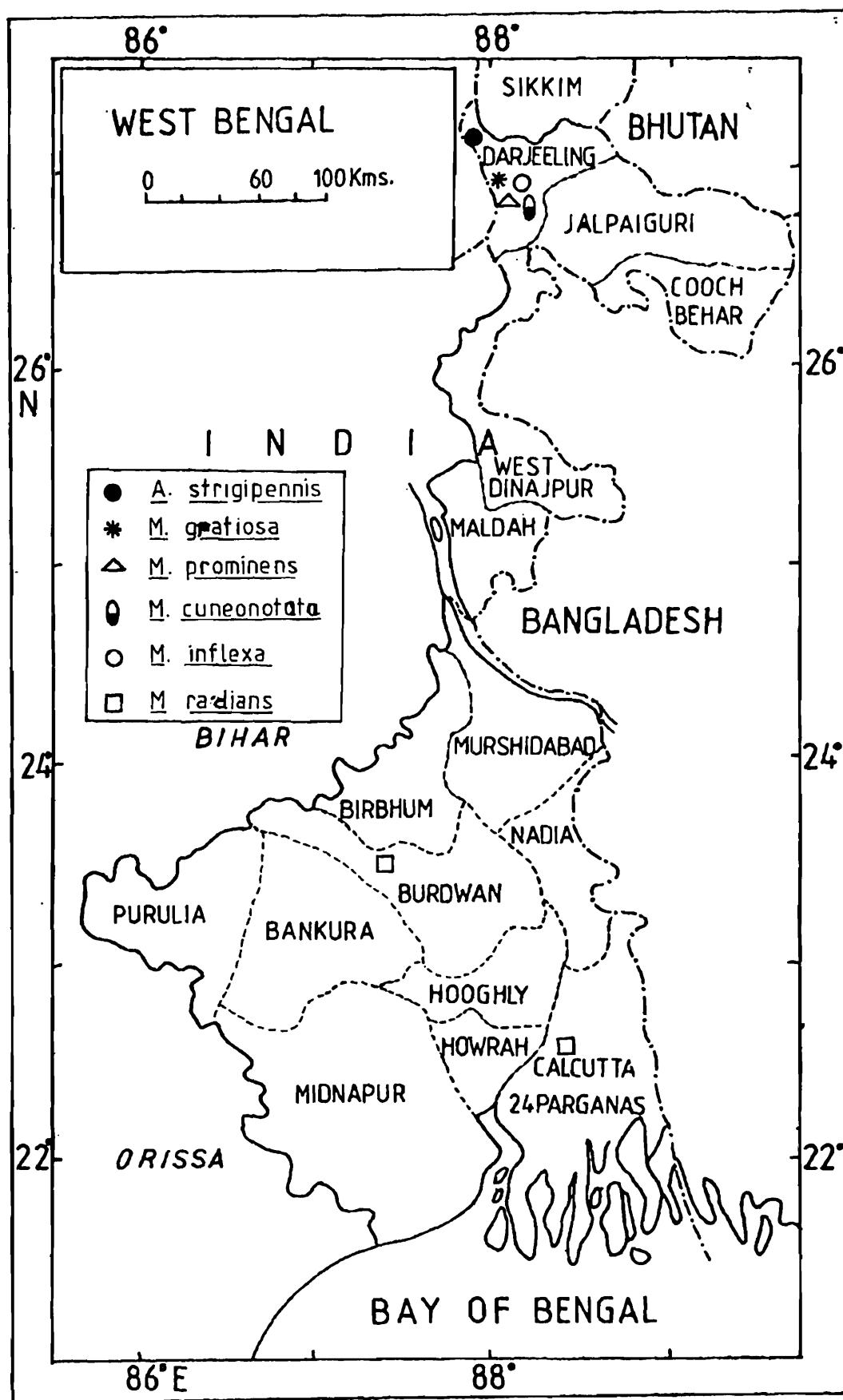
Map 3



Map 4



Map 5



Map 6

INSECTA : LEPIDOPTERA : HESPERIIDAE

S. K. GHOSH & MRIDULA CHAUDHURY
Zoological Survey of India, Calcutta

INTRODUCTION

The hesperiid butterflies are popularly called 'Skippers' because of their short jerky flight. This group of butterflies is known from India through the valuable works of Bell (1909), de Niceville (1885, 1902), Elwes and Edwards (1898), Evans (1932, 1949), Hemming (1967), Maude (1949), Moore (1865, 1878, 1881, 1890-1901), Seitz (1927), Sevastopulo (1944-45, 1951-52), Swinhoe (1890, 1893), Watson (1891) and Wynter-Blyth (1957). Evans (1949) laid down a fair basis of classification which contains a large number of species from the oriental region. Therefore, in this paper, the authors have adopted the arrangement of taxonomic categories as based by Evans (1949). In the identification of the fauna, due importance has been given to all the morphological characters including specially the genitalic characters of males for confirming the specific identity.

The present study has been envisaged to provide an account of the hesperiid fauna from 14 out of 16 districts (*Vide* map) present in the National Zoological Collections and also collected from time to time by different survey parties from Zoological Survey of India and also to highlight the concise statement of diagnostic characters of each category, geographical distribution of the fauna together with brief taxonomical note related to each species or subspecies if necessary. Besides, keys to different taxa, suitable illustrations, wherever necessary, along with original and current references have also been given.

As a result of such study 32 species with subspecies belonging to 29 genera under three subfamilies have been reported herewith of which 13 species with subspecies have been established as new locality records.

DIAGNOSTIC CHARACTERS

Head broad, with bases of antennae widely separate. Antenna with a terminal club which may be straight, arcuate, hooked or angled; barred portion of the club is nudum. Forewings : with or without 2A; all branches of Rs arising separately from cell. Hind wings : 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.

SYSTEMATIC ACCOUNT

Key to subfamilies

1. Forewing with M_2 closer to M_1 than M_3 at origin from cell. Hind tibiae often with hair pencil in male. Abdomen shorter than anal margin of hind wing2
 Forewing with M_2 closer to M_3 than M_1 at origin of cell. Hind tibiae never with hair pencil in male. Abdomen often equal to anal margin of hind wing 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

(A) Subfamily COELIADINAE

Labial palpi : second segment erect, appressed to face, third segment long, slender and owl-shaped. Antennae : half as long as costa, club slender and long, apiculus long, arcuate and sharply pointed. Eye : lash absent.

Wings : With rounded termen; fore wing : dorsally with a band, M_2 arising at middle between M_1 and M_3 ; hind wing : lobed, M_2 oblique, nearer to M_3 at termen and M_1 at base, Cu_{1b} arising nearer to base, Cu_{1a} decurved towards Cu_{1b} . Legs : mid tibiae generally not spined. Secondary sexual character present.

Remarks : Amongst four Indian genera only one is so far reported Presently, three genera are dealt with here under.

Key to genera

1. Forewing cell shorter than dorsum2
 Forewing cell longer than dorsum *Badamia* Moore
2. 1A in fore wing slightly bisinuate, usually without hyaline spot dorsally *Bibasis* Moore
 1A in forewing actually bisinuate near base, often with hyaline spot dorsally *Hasora* Moore

Genus *Badamia* Moore

Type species : *Papilio exclamationis* Fabricius

Diagnostic characters : Fore wing : Cell longer than dorsum, narrow and its greatest width equal to three fourth of the length of termen, Cu_{1b} arising near base of cell. Hind wing : termen deeply and almost semicircularly concave from Cu_{1a} to 2A, Cu_{1a} arising well before the end of cell. Legs : hind tibiae fringed in male.

Remarks : The genus is distributed from India to Australia and Marquesas Island. So far only a single Indian species is recorded which is presently dealt with.

1. *Badamia exclamationis* (Fabricius)

1775. *Papilio exclamationis* Fabricius, *Syst. Ent.*, : 530.

1881. *Badamia exclamationis* Moore, *Lep. Ceyl.*, 1:157, pl. 66, figs. 2a,b.

Diagnostic characters : Wings : dorsally dark brown and pale at base. Fore wing : dorsally with large whitish hyaline spots in spaces M_3 and Cu_{1a} , Cu_{1a} and Cu_{1b} and also in cell. Hind wing : ventrally pale brown with a dark brown tornus surmounted by a whitish subternal spot.

Material examined : India : 2(F) : Calcutta, Eden Garden, 29.vii.1964 (G. Prasad & Party coll.); 1(M) : Malda (In exchange from W.H. Irvine).

Measurement : Length of fore wing, 28 mm.

Distribution : Oriental including India (Sikkim, Assam, Meghalaya, West Bengal, (Calcutta Malda), Andamans. Papuan, Australian and Hawaiian regions.

Remarks : Apical spots on the fore wing in females, as mentioned by Evans (1949) are not present in the examined material. However, the species is being recorded for the first time from West Bengal.

Genus *Bibasis* Moore

1881. *Bibasis* Moore, *Lep. Ceyl.*, 1:160.

Type-species. *Goniloba sena* Moore

Diagnostic characters. Fore wing : Cell shorter than dorsum, dorsally with a discal stigma or brands along the veins but without hyaline spots, Cu_{1a} decurved, A_1 slightly bisinuate. Legs : Mid tibiae not spined; hind tibiae in male thickly scaled above and each one bearing a hair pencil.

Remarks : The genus is distributed throughout India, China to Sulawesi and Timor. Altogether there are eight species hitherto recorded from India, out of which only one is presently dealt with.

2. *Bibasis harisa* (Moore)

1865. *Ismene harisa* Moore, *Proc. zool. Soc. Lond.*, : 782.

1949. *Bibasis harisa* (Moore), Evans, *A Catalogue of the HesperIIDae from Europe, Asia and Australia in .. the Brit. Mus. (nat. Hist.)*, p.48.

Diagnostic characters. Fore wing : Cu_{1a} normal nearer to M_3 than to Cu_{1b} ; Cu_{1a} with its origin opposite that of R_2 , ventrally discal striping not reaching termen at apex. Hind wing : Ventrally more or less striped, small black spot at base of space $Sc+R_1$.

Distribution Oriental-region including India (Sikkim, Assam, West Bengal and Andamans.

Remarks : Only the nominal subspecies is recorded from India, which is dealt with here under.

2(a) *Bibasis harisa harisa* (Moore)

1949. *Bibasis harisa harisa* (Moore), Evans, *A Catalogue of the Hesperidae from Europe, Asia and Australia in the Brit. Mus. (nat. Hist.)*, p. 48.

Diagnostic characters : Wings : Dorsally variegated and ventrally with yellow stripes. Male genitalia : Claspers at the top sloping and with serration.

Material examined : 3(M), 1(F) : Darjeeling (Purchased : Moore's collections).

Measurement. Length of fore wing, 24 mm.

Distribution Same as for the species.

Remarks The sub-species was reported both from North Eastern Himalayas and Insular belts of India.

Genus *Hasora* Moore

1881. *Hasora* Moore, *Lep. Cyl.*, 1 : 159.

Type-species. - *Goniloba badra* Moore

Diagnostic characters Fore wing : Cell shorter than dorsum, Cu_{1a} decurved, A_1 acutely bisinuate near base. Hind wing : prolonged at tornus, dorsally with hyaline spots.

Remarks : It is distributed throughout India, China to New Hebrides and Australia. Altogether eight Indian species have reported so far, but none of them reported from West Bengal. Presently, only two species from the state dealt with here under.

Key to species

1. Dorsally broken discal stigma present in male and style of clasper undivided; white dorsal spots in spaces Cu_{1a} and Cu_{1b} present and hind wing ventrally brown in female
 *chromus* (Cramer)

Dorsally discal stigma absent in male and style of claspers divided; pale yellow hyaline dorsal spots in spaces between Cu_{1a} and Cu_{1b} and M_1 and R_s present and hind wing ventrally not brown in female *vitta* Butler

3. *Hasora chromus* (Cramer)

1782. *Papilio chromus* Cramer, *Pap. Exot.*, 3, pl. 284 (CCLXXXIV), fig.E.

1894. *Hasora chromus* Lech. Butt. *China, & C.*, p. 638, pl. 39, fig.7.

Diagnostic characters. Wings : bases conspicuously paler dorsally. Fore wing : length of dorsum equal to termen, dorsally with broken discal stigma, oblique, more or less crescentic dorsal white spots in spaces Cu_{1a} and Cu_{1b} in female. Hind wing : ventrally brown suffused with gloss purple or indigo; band narrow, bluish white and diffused on its outer edge and discontinuous in space 2A. Male genitalia : uncus quadrifid, ventrally divided and each arm split up laterally, style of clasper undivided.

Distribution : Palaearctic, Oriental, Papuan, Australian and Hawaiian region.

Remarks : The nominal subspecies which is recorded so far for India is presently dealt with.

3(a) *Hasora chromus chromus* (Cramer)

1949. *Hasora chromus chromus* (Cramer), Evans, *A Catalogue of the Hesperiiidae from Europe, Asia and ... Australia in the Brit. Mus. (Nat. Hist.)*, p. 60.

Diagnostic characters : Smaller in size. Hind wing : ventrally with conspicuous purple lustre.

Material examined : 1(M), Calcutta, date & coll. Nil.

Measurement : Length of fore wing, 21 mm.

Distribution : Oriental including India (West Bengal, Calcutta), Papuan and Australian region.

Remarks : It is for the first time recorded from West Bengal. The male genitalic structures (figs. 1-4) have been given for the confirmation of the identity.

4. *Hasora vitta* Butler

1870. *Hasora vitta* Butler, *Trans. ent. Soc. Lond.*, p. 498.

Diagnostic characters : Fore wing : dorsally with white apical dot in space between M_1 and R_s and discal stigma absent in male. Hind wing : Ventrally not brown but with two pale spots and a white band, basal area dark indigo, more or less covered with brown scales. Male genitalia : uncus quadrifid, ventrally divided and each arm split up laterally, tip of clasper broad, serrate and style divided.

Distribution : Palearctic, Oriental including India (Sikkim, Assam, West Bengal, South India,

Andamans), Papuan, Australian region.

Remarks : Only two subspecies hitherto recorded from India but none of them are reported from West Bengal. However, only one subspecies from the state dealt with here under.

4(a) *Hasora vitta indica* Evans

1932. *Hasora vitta indica* Evans, *Identification of Indian Butterflies*, 2nd. ed., p. 315.

Diagnostic characters : White band broken in space between 2A and 1A and outwardly diffused on hind wing.

Material examined : 1(M) : Darjiling, date nil, (purchased Moore's collns.).

Distribution : Oriental region including India (Sikkim, Assam, West Bengal (Darjiling) and South India).

Remarks : This is a first record for West Bengal.

(B) Subfamily PYRGINAE

Labial Palpi : Second segment erect and third segment short, stout and conical. Fore wing : M_2 at its origin nearer to M_1 . Hind wing : M_2 straight, but oblique nearer to M_3 at termen and M_1 at its origin. Abdomen : Larger than dorsum.

Remarks : Amongst 21 genera containing in three groups, 10 are so far reported from West Bengal, of which only 6 under two generic groups are presently dealt with.

Key to the groups

1. Second segment of labial palpus erect and third segment short, stout and also conical; fore wing cell long *Celaenorrhinus* group.
- Second segment of labial pulpus more or less porrect and third often long; fore wing cell short *Tagiades* group.

Celaenorrhinus Group

Labial palpi : Second segment slender and erect, third segment stout, usually short and bent down. Wings : broad, fore wing : cell generally long; M_2 straight; hind wing : M_2 always well marked, straight, oblique, nearer to M_3 at termen and M_1 at its origin. Secondary sexual character : hind tibiae with hair pencil in some genera.

Distribution : The group has certain representatives in both the old and new world.

Remarks ; Amongst a total of four Indian genera, only a couple is presently dealt with.

Key to genera

1. M_2 in hind wing tubular, clasper trifid, facies rufous to dark brown *Capila* Moore
 M_2 in hind wing not tubular, clasper not trifid, facies typically brown
 *Celaenorrhinus* Hubner

Genus *Capila* Moore

1865. *Capila* Moore, *Proc. zool. soc. Lond.*, p. 785.

Type-species. *Capila jayadeva* Moore

Diagnostic characters : antennae : Shorter in length than half of costa. Fore wing : cell long and usually shorter than dorsum, usually with a white band or spots. Hind wing : M_2 tubular. Legs : hind tibiae more or less swollen in male, a dense hair pencil at back of tibiae, spurs unequal. Male genitalia : clasper large and trifid.

Remarks : It is distributed throughout North India and China to Borneo. Altogether six Indian species were reported so far, out of which only one species was reported from West Bengal. Presently, only a couple of species is dealt with here under.

Key to species

1. Dorsum of fore wing as long as termen; head, thorax and base of wings orange; wings produced
jayadeva Moore
 Dorsum of fore wing longer than termen; head, thorax and base of wings brown; wings not
 produced but quadrate *zennara* Moore

5. *Capila jayadeva* (Moore)

1857. *Ismene jayadeva* Moore, *Cat. Lep. E. I.C.*, 1 : 248.

1865. *Capila jayadeva* (Moore), *Proc. zool. Soc. Lond.*, : 785.

Diagnostic characters : Head, thorax and base of both wings orange. Wings : produced. Fore wing : without distinctly separated hyaline spots dorsally, costal fold absent dorsally in male, generally not white but with grey streaks between the veins which are narrow and reaching the termen in male. Dorsally with white band in female. Hind wing : Dorsal striping conspicuous.

Material examined : 1(M) : Darjiling (Moore's collns. purchased).

Measurement : Length of fore wing, 30 mm.

Distribution : Oriental region including India (Sikkim, Assam, Meghalaya, West Bengal (Darjiling).

Remarks : The species is restricted in the Indian subregion of the oriental region.

6. *Capila zennara* (Moore)

1865. *Pisola zennara* Moore, *Proc. zool. Soc. Lond.* : 786.

1897. *Capila zennara* (Moore), Elwes & Edwards, *Trans. R. ent. Soc. Lond.*, **14**, pt. 4 (No.1) : 107.

Diagnostic characters : Head, thorax and base of both wings brown, Fore wing : dorsum greater than termen. Hind wing : without striping.

Material examined ; 1(M) : Darjiling (Moore's collns. purchased).

Measurement : Length of fore wing, 32 mm.

Distribution : Oriental region including India (Sikkim, Manipur and West Bengal (Darjiling).)

Remarks : Like the preceding species this one is also restricted in the Indian subregion of the Oriental region.

Genus *Celaenorrhinus* Hiibner

1819. *Celaenorrhinus* Hiibner, *Verz. bek. Schmett.*, 106.

Type-species : *Papilio eligius* Stoll.

Diagnostic characters : Labial palpi : appressed, third segment suberect. Antennae : club slender. Fore wing : costa evenly arched, dorsum longer than termen, dorsally with hyaline white spot, M_2 straight arising nearer to M_1 than to M_3 . Hind wing : rounded, termen not excavated before tornus, with tawny spots both dorsally and ventrally. Legs : Hind tibiae with two pair of spurs and bearing a hair pencil in male.

Remarks : It is distributed throughout India and China to Sulawesi. It is also reported from Tropical Africa and America. Altogether 21 Indian species were reported so far, out of which a couple of species were reported from West Bengal. With the addition of the present species dealt with here the total number of species from West Bengal will be three.

7. *Celaenorrhinus leucocera* (Kollar)

1848. *Hesperia leucocera* Kollar, In Hugel, *Kaschmir*, 4:454, pl 18, figs. 3,4.

1897. *Celaenorrhinus leucocera* (Kollar), Elwes & Edward, *Trans. R. ent. soc. Lond.*, **14**, pl. 4(No.1) : 116.

Diagnostic characters : Antennae : shaft white in male but club white in both sexes. Wings : not produced. Fore wing : dorsum greater than termen, dorsally cell spot continuing above radius. Hind wing : cilia outwardly white, basally yellow and with alternation of colours at end of veins.

Abdomen : unstriped. Male genitalia : style and cuiller of claspers subequal.

Material examined : 2(M), 1(F) : Darjiling D.F.O's office compound, 125 m., 3.iv.1973. (Coll. H.S. Sharma & party); 1(M) : Teesta Bazar, 214 m., 18.iv.1976 (Coll. A.R. Bhowmik & party); 1(M) : Burdwan, Asansol, 18.x.1985 (S.K. Ghosh & party); 1(F) : Jalpaiguri, Santallbari, 19.viii.1986 (T.K. Pal. & party).

Measurement : Length of fore wing, 21-23 mm.

Distribution : Oriental region including India (Sikkim, Assam, West Bengal [Darjiling, Jalpaiguri, Burdwan], Madhya Pradesh, South India, North West Himalaya and Andamans).

Remarks : The species is recorded for the first time from West Bengal.

Tagiades group

Labial palpi : second segment slender and pored, third segment stout and blunt. Antennae : club not flattened or twisted. Fore wing : cell usually short. Hind wing : angled at Cu_{1a} in *Coladenia* Moore and M_3 and Rs in *Caprona* Wallengren, cell as long as half of the wing, M_2 well marked dorsally nearer M_3 at termen and M_1 at its origin.

Distribution : The group is mainly found in the oriental region though some genera of the group are represented in Australia, Africa and also in America.

Remarks : Amongst a total no of 14 Indian genera only 4 are dealt with here under.

Key to genera

1. Apiculus tapered to a fine point; Sc in fore wing usually ending over end of cell; male genitalia symmetrical in uncus and claspers 2

Apiculus blunt; Sc in forewing ending well before end of cell; male genitalia usually assymetrical in uncus and claspers *Caprona* Wallengren
2. Club angled or hooked to apiculus; fore wing dorsally with large hyaline spots; hind wing dorsum as long as costa *Coladenia* Moore

Club arcuate or obtuse 3
3. Hind wing generally with large central white area dorsally; dorsum greater than costa; uncus ending like broad flattened mushroom *Sesaria* Matsumura

Hind wing without white central area dorsally; dorsum not greater than costa; uncus broad but not ending like mushroom *Tagiades* Hiibner

Genus *Caprona* Wallengren

1857. *Caprona* Wallengren, *K. svenska Vetensk. Akad. Handl.*, 2 No. 4 : 51.

Type species : *Caprona pillaana* Wallengren.

Diagnostic characters : Palpi : Long. Antennae : shorter than half costa, apiculus blunt. Fore wing : apex truncate upto the tip of M_3 ; Sc ending well before end of cell. Hind wing : produced at termination of Rs and M_3 . Legs : male with a long, thin and prominent hair pencil on fore coxae. Abdomen : with dense anal tuft in female. Male genitalia : uncus and clasper asymmetrical, the former tapered and undivided.

Remarks : It is distributed throughout India and Sri Lanka, extending to Sulawesi and Timor in East and Africa in West. Altogether three Indian species were reported so far, out of which only one is dealt with here.

8. *Caprona ransonnetti* (Felder)

1868. *Pterygaspidea ransonnetii* Felder, *Verh. zool. bot. Gesellsch Wien.*, p. 284.

1987. *Caprona ransonnetii* (Felder), Elwes & Edwards, *Trans. R. ent Soc. Lond.*, 14, pt. 4(No. 1) :: 150-151.

Diagnostic characters : Fore wing : produced in male. Hind wing : dorsum greater than costa. Abdomen : Male genitalia with asymmetrical claspers of which the right one bifid at tip and the left simple; aedeagus enlarged at tip and inwardly serrate.

Distribution : Oriental region including India.

Remarks : Only one subspecies is so far recorded from India. The nominal subspecies earlier reported from Sri Lanka, is for the first time recorded from India is being dealt with here under.

8(a) *Caprona ransonnetii ransonnetii* (Felder)

1949. *Caprona ransonnetii ransonnetii* (Felder), Evans, *A Catalogue of the Hesperidae from Europe, Asia and Australia in the Brit. Mus. (nat. Hist.)*, p. 166.

Diagnostic character : Fore wing : dorsally without hyaline spots. Hind wing : dorsally with crowded yellow spots near end of cell and a broad grey border, ventrally white and unmarked except inner round black spot in spaces between Sc + R_1 and Rs.

Material examined : 1(M) : India, West Bengal, Bholaghat, Date - nil, coll. nil.

Measurement : Length of forewing : 18 mm.

Distribution : Oriental region including India (West Bengal).

Remarks : It is for the first time doubtfully recorded from West Bengal.

Genus *Coladenia* Moore

1881. *Coladenia* Moore, *Lep. Ceyl.*, 1 : 180.

Type-species. *Plesioneura indrani* Moore

Diagnostic characters : Vide 'Key'

Remarks : It is distributed in India and China and also extending to Sulawsi and Phillipines. Altogether five Indian species were reported so far, out of which only one is presently dealt with.

9. *Coladenia indrani* (Moore)

1865. *Plesioneura indrani* Moore, *Proc. zool. Soc. Lond.*, 789.

1891. *Coladenia indrani*, Watson, *HesperIIDae indicae*, p. 118.

Diagnostic characters : Fore wing : With an ochreous discal spot in space 1A and 2A and also near termen ventrally; Cilia white. Hind wing : without hyaline spots; with black spots dorsally and ventrally. Legs : hind tibiae in male with a recumbent hair pencil. Abdomen : male genitalia with uncus undivided and without back shield.

Distribution : Palaearctic, Oriental including India (Sikkim, Assam, Manipur, West Bengal, [Calcutta] Orissa, Tamil Nadu, Karnataka, Madhya Pradesh, Uttar Pradesh and Himachal Pradesh) regions.

Remarks : Only three subspecies have so far been reported from India of which the nominal one is presently dealt with.

(a) *Coladenia indrani indrani* (Moore)

1949. *Coladenia indrani indrani* (Moore), Evans, *A Catalogue of the HesperIIDae from Europe, Asia and.... Australia in Brit. Mus. (nat. Hist)*, p. 115.

Diagnostic characters : Fore wing : dorsally with quadrate cell spot which is equal in length and breadth.

Material examined ; 3(M), 1(F) : India, Calcutta, Date nil. (coll. de Niceville and L.I.N. collns : Purchased).

Measurement : Length of fore wing, 19 mm.

Distribution : Oriental region including India (Sikkim, Assam, West Bengal, [Calcutta]. Uttar Pradesh and Himachal Pradesh).

Genus *Seseria* Matsumura

1919. *Seseria matsumura*, *Thous. Ins. Japan, Addit.*, 3 : 683.

Type-species *Suastus nigroguttatus* Matsumura.

Diagnostic characters : Antennae : apiculus long. Wings : fore wing without dorsal cell spot but with hyaline spot cell not produced. Hind wing : dorsum greater than costa and with a large central white area dorsally. Legs : hind tibiae of male without hair pencil.

Remarks : It is distributed in North India and extended to Java and Borneo. Only two Indian species were reported so far, out of which only one is dealt with here under.

10. *Seseria sambara* (Moore)

1857. *Goniloba sambara* Moore, *Cat. Lep. Mus. E.I.C.*, 1 : 246.

1949. *Seseria sambara* (Moore), Evans, *A Catalogue of the Hesperiidæ from Europe, Asia and Australia ... in Brit. Mus. (nat. Hist.)*, p. 124.

Diagnostic characters : Hind wing : ventrally with a row of dark discal spot, which is curved upwards, so that the spot in space between Cu_{1a} and Cu_{1b} is nearer to end cell than to termen; dorsally with white band, Genitalia : claspers long and narrow.

Distribution : Oriental region including India (Sikkim, Assam, Manipur and West Bengal: Darjiling).

Remarks : Only two subspecies were reported from India, of which the nominal one is dealt with here under.

10(a) *Seseria sambara sambara* (Moore)

1949. *Seseria sambara sambara* (Moore), Evans, *A Catalogue of the Hesperiidæ from Europe, Asia and Australia in Brit. Mus. (nat. Hist.)*, p. 124.

Diagnostic characters : Fore wing : between Cu_{1b} and 1A with narrow dorsal white spot which is outwardly excavated; the connecting white bar to dorsum obscure in the wet season form. Abdomen : centrally white.

Material examined ; 1(M) : Darjiling, Singhtan, 600m., 17.viii.1979 (Coll. M. Prasad & party).

Measurement : Length of fore wing 22 mm.

Distribution : As for the species.

Remarks : The species is recorded for the first time from West Bengal.

Genus *Tagiades* Hiibner

1816. *Tagiades* Hiibner, *Verz. bek. Schmett.*, p. 108.

Type-species. *Papilio japetus* Stoll.

Diagnostic characters : Antennae : apiculus short, finely pointed; culb arcuate or obtuse from the thickest part. Fore wing : Sc normally terminating over end cell. Hind wing : dorsum either equal or greater than costa; dorsally with small hyaline spots which are present at tornus also; without pale central area dorsally; 1A either equal to or greater than Sc+R₁. Legs : hind tibiae without hair pencil in male. Abdomen : anal tuft present in female.

Remarks : The genus is reported to be distributed in India, China to Australia, Solomons, Africa and Malagasy. So far only five species are represented from India of which only one is dealt with here under.

11. *Tagiades japetus* (Stoll)

1870. *Papilio japetus* Stoll, *Ent. man. Mag.*, 7 : 99.

1949. *Tagiades japetus* (Stoll), Evans, *A Catalogue of the HesperIIDae from Europe, Asia and Australia in Brit. Mus. (nat. Hist.)*, p. 134.

Diagnostic characters : Forewing : dorsally with two hyaline discal spots in spaces between Cu_{1a} and Cu_{1b}; without hyaline spot in space R₁ over cell spot; Legs : hind tibiae without hair pencil in male. Genitalia : uncus apically bilobed.

Distribution : Indo-Australian region.

Remarks : So far six subspecies are reported from India of which only one is presently dealt with.

11(a) *Tagiades japetus ravi* (Moore)

1865. *Pterygospidia ravi* Moore, *Proc. zool. Soc. Lond.*, p. 779.

1949. *Tagiades japetus ravi* (Moore), Evans, *A Catalogue of the HesperIIDae from Europe, Asia and Australia in Brit. Mus. (nat. Hist.)*, p. 135.

Diagnostic characters : Hind wing : dorsally with brown cilia and ventrally bluish white.

Material examined : 3(MM) : Calcutta, date Nil, (Coll. A.E. Pratt).

Measurement : Length of fore wing, 21 mm.

Distribution : Oriental region including India (Sikkim, Assam, Meghalaya, West Bengal : Calcutta, Orissa and Uttar Pradesh).

Remarks : The male genetalic structures (figs. 5-8) have been given for further confirmation of the identity.

(C) Subfamily HESPERIINAE

Antennae : club not constricted before the apiculus, Fore wing : M₂ nearer to M₃ than to M₁;

dorsally with a brand. Hind wing : cell normal.

Remarks : Amongst 79 genera containing in five groups, only 58 genera are reported from India, of which only 22 are presently dealt with.

Key to groups

1. Antennal club not constricted before apiculus; M_2 of fore wing generally straight at its origin; M_2 of hind wing well marked2.
- Antennal club constricted before apiculus; M_2 of fore wing decurved at its origin; M_2 of hind wing not traceable4
2. Antennal apiculus finely pointed3
- Antennal apiculus absent, obtuse or hooked. Palpi porrect *Astictopterus* group
3. M_2 in hind wing decurved at origin. Palpi erect *Ancistroides* group
- M_2 in hind wing not decurved at origin; wings generally much produced *Plastngia* group
4. Apiculus absent or minute; facies yellow or orange; fore wing with dorsal white spots
..... *Taractocera* group
- Apiculus present, prominent and usually right angled; facies dark brown; fore wing with dorsal hyaline spots *Gegenes* group

Astictopterus group

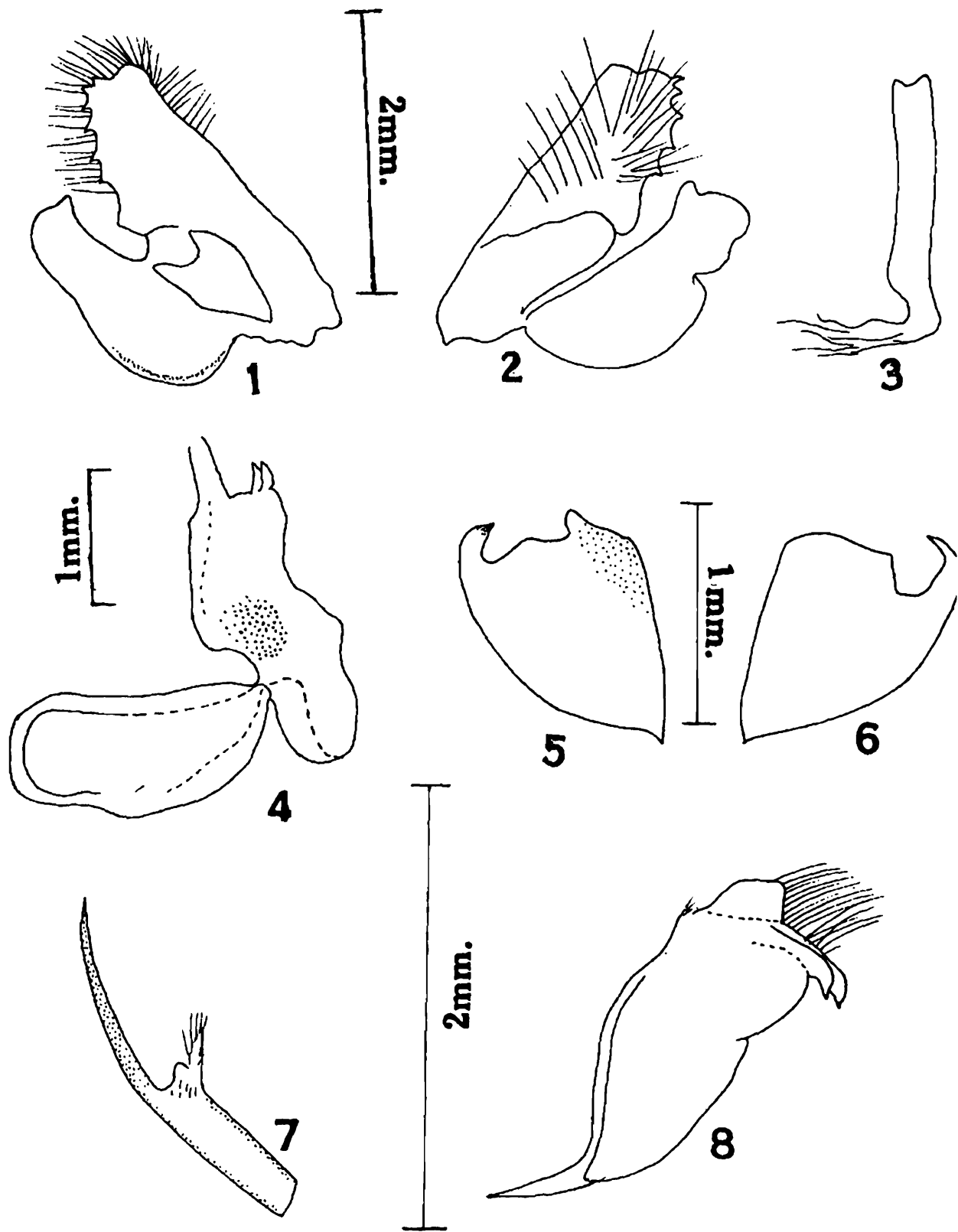
Labial palpi : well separated; third segment comparatively stout, always porrect. Antennae : not greater than half of the costa; apiculus absent, obtuse or hooked. Wings : broad to elongate; no well developed lobe to hind wing. Fore wing : cell never long nor much produced, Cu_{1b} generally nearer to end of cell than to base; M_2 always nearer to M_3 and more or less curved. Hind wing : cell generally shorter than half of the wing; lower end of cell not upturned and cubitus collinear with M_3 in female.

Distribution : The group is distributed mainly in the Oriental and also in the Ethiopian region.

Remarks : Amongst a total number of 58 Indian genera, only two genera are dealt with here under.

Key to genera

1. Cu_{1b} in fore wing well before R_1 and far away from Cu_{1a} ; palpi long and porrect; apiculus obtuse *Astictopterus* Felder
- Cu_{1b} in fore wing opposite to R_1 or beyond it and far from Cu_{1a} ; palpi erect and flattened; apiculus like a fish hook *Halpe* Moore



Figs. 1-8. *Hasora chromus* (Cramer) Fig.1. Clasper, ventral 2. Clasper, dorsal, 3. Aedeagus. 4. Uncus, tegumen, vinculum, lateral; *Tagiades jâpetus ravi* (Moore). 5. Clasper, Ventral. 6. Clasper, dorsal. 7. Aedeagus. 8. Uncus, tegumen, vinculum, lateral.

Genus *Astictopterus* Felder

1860. *Astictopterus* Felder, *Wien. ent. Monatsb.*, 4 : 401.
 Type species : *Astictopterus jama* Felder

Diagnostic characters : Antennae : apiculus obtuse, Wing : broad. Fore wing : costa arched; unmarked excepting for some dorsal hyaline spots, R_1 and Sc approximate. Hind wing : Costa greater than dorsum of fore wing; ventrally with dark bands.

Remarks : The genus is distributed in North East-India and China to Java. Some species have also been reported from Africa. Only one species has so far been reported from India which is dealt with here under.

12. *Astictopterus jama* Felder

1860. *Astictopterus jama* Felder, *Wien. ent. Monatsb.*, 4 : 401.
 1949. *Astictopterus jama* Felder, Evans, *A Catalogue of the Hesperiiidae from Europe, Asia and Australia...* in *Brit. Mus. (nat. Hist.)*, p. 233.

Diagnostic characters : Wings : both sides blackish brown with a slight reddish reflection ventrally. Fore wing : unmarked, excepting for small apical white spot; Cu_{1b} arising just before R_1 . Hind wing : ventrally with obscure ferruginous bands.

Distribution : Oriental region including India (Sikkim, Meghalaya, Nagaland, West Bengal: Calcutta and Andamans).

Remarks : Only two subspecies are hitherto reported from India of which only one is presently dealt with.

12(a) *Astictopterus jama olivascens* Moore

1878. *Astictopterus olivascens* Moore, *Proc. zool. Soc. Lond.*, : 692.
 1949. *Astictopterus jama olivascens* Moore, Evans, *A Catalogue of the Hesperiiidae from Europe, Asia and Australia in Brit. Mus. (nat. Hist.)* p. 234.

Diagnostic characters : Wings : apex of fore wing and tornus of hind wing more produced; ventrally amber-brown. Male without hyaline spot but female usually with hyaline spots in cell, R_4 , R_5 and M_1 .

Material examined : 2(M), Calcutta (Purchased L.I.N. collns.).

Measurement : length of fore wing, 17 mm.

Distribution : Oriental region including India (Sikkim, Assam, Meghalaya, Nagaland and West Bengal : Calcutta).

Remarks : The subspecies is for the first time recorded from West Bengal.

Genus *Halpe* Moore

1879. *Halpe* Moore, *Proc. zool. soc. Lond.*, p. 689.

Type species : *Halpe moorei* Watson

Diagnostic characters : Palpi : erect and flattened. Antennae : apiculus like a fish-hook. Wings : fore wing at apex and hind wing at tornus more produced. Fore wing : yellow or white hyaline spots dorsally; end of cell more or less produced and M_2 decurved at origin; Cu_{1b} arising beyond origin of R_1 and never far away from Cu_{1a} ; a band of large loosely packed scales from the base of space Cu_{1b} extending to 1A where it is curved inwards. Hind wing : cell upturned at lower end and shortened; Cu_{1a} , Cu_{1b} and M_3 closed together. Genitalia : uncus divided with more or less conspicuous side process and with a broad scalloped end when viewed ventrally, the side process long and often hooked; clasper generally with a foot stalk which is curved round the aedeagus; gnathos absent or incomplete.

Remarks : The genus is reported to be distributed in India, China to Sulawesi. So far nine species are reported from India, of which only one species dealt with here.

13. *Halpe porus* (Mabille)

1876. *Hesperilla porus* Mabille, *Bull. soc. Ent. Fr.*, (5) 6:199.

1949. *Halpe porus* (Mabille), Evans, *A Catalogue of the Hesperiidae from Europe, Asia and Australia in Brit. Mus. (nat. Hist.)*, p. 260.

Diagnostic characters : Antennae : club without whitish rings before apiculus above. Fore wing : with one or separated two cell spots across cell dorsally Hind wing : central band white and sharply defined ventrally.

Material examined : 16(M), 4(F) : Calcutta (Purchased L.I.N. collns.); 1(M), 1(F), Calcutta (coll. de Niceville); 1 (F) Malda (Exchange W.H. Irvine).

Measurement : Length of fore wing, 16 mm.

Distribution : Oriental region including India (Assam, West Bengal: Calcutta and Malda, Kerala, Karnataka and the Andamans).

Remarks : So far the species is recorded from Calcutta. The present record confirms its distribution from West Bengal.

Ancistroides group

Labial palpi : Second segment erect, third segment long and acicular or short, stout and conical. antennae : length equal to half of costa; club not constricted before apiculus and finely pointed. Wings : broad with tornus rounded and generally without hyaline spots. Fore wing : cell shorter than dorsum; M_2 generally straight at its origin. Hind wing : costa and dorsum subequal; cell equal to half wing

approximately; lower end of cell not upturned and cubitus collinear to M_3 ; Cu_{1b} usually before or opposite to R_s ; M_2 central and decurved at its origin. Abdomen : equal to or shorter than dorsum of hind wing.

Distribution : The group is distributed mainly in the Oriental region excepting for the genus *Notocrypta* which extends to the Papuan region.

Remarks : Amongst a total number of seven Indian genera only three are dealt with here under.

Key to genera

1. M_2 of fore wing straight ; M_3 and M_1 at origin, R_1 and Sc separate; costa of fore wing arched and short..... *Iambrix* Watson
- M_2 of fore wing more or less decurved at origin where it is always nearer to M_3 than to M_1 2
2. Cell of hind wing greater than half of the costa; fore wing with hyaline band dorsally; radius abnormally angled at origin of R_1 where the cell is much wider than usual *Notocrypta* de Niceville
- Cell of hind wing shorter than half of the wing; antennae shorter than half of the costa; fore wing dorsally with large hyaline spots; *Udaspes* Moore

Genus *Iambrix* Watson

1893. *Iambrix* Watson, *Proc. zool. Soc. Lond.*, p. 76, pl. 111, fig.25.
Type-species. *Nisoniades salasala* Moore

Diagnostic character : Fore wing : arched and without spot dorsally and ventrally; M_2 straight; M_3 and M_1 at origin; R_1 and Sc separated.

Remarks : The genus is hitherto known from India to Borneo. Only single species is so far reported from India which is presently dealt with.

14. *Iambrix salsala* (Moore)

1865. *Nisoniades salasala* Moore, *Proc. zool. Soc. Lond.*, p. 786.
 1949. *Iambrix salsala* (Moore), Evans, *A Catalogue of the Hesperiidæ from Europe, Asia and Australia in Brit. Mus. (nat. Hist.)*, p. 272.

Diagnostic characters : Fore wing : without a red band dorsally; rarely a spot in the cell ventrally but with an obscure band along the cubitus between the origin of Cu_{1a} and Cu_{1b} in male; Cu_{1b} near to Cu_{1a} than base. Hind wing : with ochreous super scaling and a few silver dots ventrally but the silver spots in space M_2 placed much nearer to end of cell than termen.

Distribution : Oriental region including India (Sikkim, Assam, West Bengal: Calcutta, Hooghly, Malda and Darjiling, and Himachal Pradesh.

Remarks : Only two subspecies are so far reported from India, of which only one is presently dealt with.

14(a) *Iambrix salsala salsala* (Moore)

1949. *Iambrix salsala salsala* (Moore), Evans, *A Catalogue of the HesperIIDae from Europe, Asia and Australia in Brit. Mus. (nat. Hist.)*, p. 272.

Diagnostic characters : Fore wing : male with smaller and duller ochreous spots dorsally which may be numerous or absent; costa not ochreous, female dorsally with less numerous white dots or absent and when present nearly reaching space 2A.

Material examined : 9(M), 1(F) : Calcutta, 3(M), 1(F) : Malda (all collns. exchange W.H. Irvine); 2(M) : Darjiling, Teesta Bazar, 214 m., 18.iv.1976; 1(M) : Dist., Andul Town, North Railway Station, 28.ix.1964 (coll. G.S. Arora & party).

Measurement : Length of forewing, 14 mm.

Distribution : As for the species.

Genus *Notocrypta* de Niceville

1889. *Notocrypta* de Niceville, *J. Bombay nat. Hist. Soc.*, p. 188.

Type-species : *Plesioneura curvifascia* Felder.

Diagnostic characters : Antennae : greater than half of costa, white at beginning of club and under apiculus. Fore wing : dorsally with hyaline white band and markings; radial vein abnormally angled at the origin of R_1 where cell is much wider than usual; M_2 more or less decurved at origin where it is always nearer to M_3 than to M_1 . Cu_{1a} opposite to R_3 and M_3 much nearer to Cu_{1a} to M_2 . Hind wing : cell equal to half of wing.

Remarks : The genus is recorded mainly from Indo – Australian region. Out of three Indian species only one is dealt with here under.

15. *Notocrypta curvifascia* (Felder)

1862. *Plesioneura curvifascia* Felder, *Wien. ent. Mon.*, 6:29.

1949. *Notocrypta curvifascia* (Felder) Evans, *A Catalogue of the HesperIIDae from Europe, Asia and Australia in Brit. Mus. (nat. Hist.)* p. 286.

Diagnostic characters : Body : brown yellow. Antennae : usually ringed white or yellow at base of club. Fore wing : band not entering or just entering base of space Cu_{1a} and usually not extended

above radius to costa dorsally. M_3 nearer to origin of Cu_{1a} than to M_2 ; both side with at least traces of spots in spaces R_4 to M_1 and sometimes also in spaces M_2 to Cu_{1a} , central band ventrally not produced above the radius towards costa.

Distribution : Palaeactic and Oriental including India (Assam, West Bengal (Murshidabad), South India and the Andamans) regions.

Remarks : Only one subspecies is hitherto recorded from India, which is presently dealt with.

15(a) *Notocrypta curvifascia curvifascia* (Felder)

1949. *Notocrypta curvifascia curvifascia* (Felder), Evans, *A Catalogue of the Hesperiiidae from Europe, Asia and Australia in Brit. Mus. (nat. Hist.)*, p. 286.

Diagnostic characters : Fore wing : apical area usually fully spotted dorsally including a dot in space Cu_{1a} .

Material examined : 3(M) : Murshidabad, Farakka, 15.v.1975 (coll.S. Banerjee & party).

Measurement : Length of fore wing, 19-22 mm.

Distribution : As for the species.

Remarks : The species is recorded for the first time from West Bengal. The male genitalic structures (figs. 9-14) have been given for confirmation of the identity.

Genus *Udaspes* Moore

1881. *Udaspes* Moore, *Lep. Ceyl.*, 1:177.

Type-species. *Papilio folus* Cramer

Diagnostic characters : Antennae : Shorter than half of costa; white at the beginning of the club and under apiculus. wings : dorsally with large hyaline spots. Fore wing : with hyaline white marking; M_2 more or less decurved at origin where it is always nearer to M_3 than to M_1 . Cu_{1a} opposite to R_3 and M_3 much nearer to Cu_{1a} than to M_2 . Hind wing : cell shorter than half wing.

Remarks : The genus is distributed in China and India to Lombok. So far single species is reported from India which is presently dealt with here.

16. *Udasdes folus* (Cramer)

1775. *Papilio folus* Cramer, *Pap. Exot.* 1 : 118. pl. 74, fig.F.

1949. *Udasdes folus* (Cramer), Evans, *A Catalogue of the Hesperiiidae from Europe, Asia and Australia in Brit. Mus. (nat. Hist.)*, p. 292.

Diagnostic characters : Wings : Dorsally with marginal white spots. Fore wing : dorsally with large white markings. Hind wing : dorsally with large white area and ventrally with variegated white patches; with brown patches between Cu_{1b} to M_3 ; another small white spot present between R_s and $Sc+R_1$.

Material examined : 3(M) : Calcutta (Purchased L.I.N.); 1 ex., Calcutta (Mus. Collns.); 3 (M); Malda (Exchange W.H. Irvine); 2(M), Howrah, Bally, Nischinda, 4.ix.1966 (Coll. S.S. Saha).

Measurement : Length of forewing, 19 mm.

Distribution : Palaearctic and Oriental including India (Sikkim, Assam, West Bengal: Calcutta, Howrah and Malda, Orissa, South India, Madhya Pradesh and North West Himalaya) regions.

Plastingia group

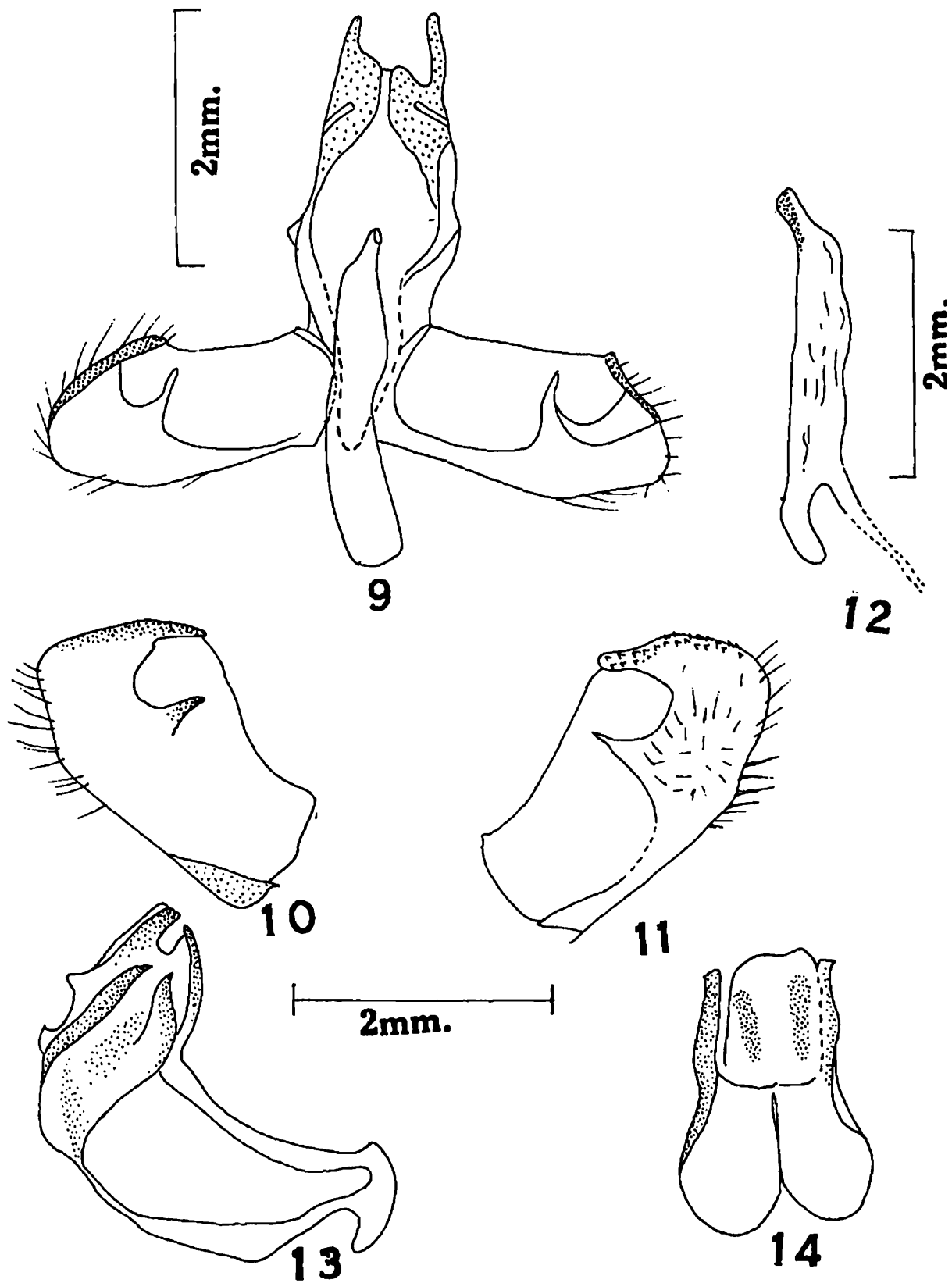
Labial Palpi : second segment erect; third segment long, acicular or short, stout and conical. Antennae : club not constricted before the apiculus which is finely pointed, hooked or obtuse. Wings : often much produced. Fore wing : M_2 at its origin straight and tending to be nearer to M_3 than to M_1 ; dorsum often with a band or stigma dorsally in male. Hind wing : cell normal lower end of usually not upturned, M_2 well marked and not decurved at origin. Legs. : Hind tibiae without hair pencil. Abdomen : equal to dorsum.

Distribution : The group is distributed mainly in the Oriental region.

Remarks : Out of a total 18 of enera represented in India, five are presently dealt with from West Bengal.

Key to genera

1. Antennal apiculus not longer than twice width of club; palpi generally with second segment long, third pointed and more or less protruding 2
- Antennal apiculus longer than twice width of club; palpi generally with second segment short, quadrantic; third very short, stout, bluntly conical, not usually protruding 3
2. Dorsum of hind wing not longer than costa; palpi with third segment long and fore wing usually with dorsal white spots *Suastus* Moore
- Dorsum of hind wing longer than costa; palpi with third segment short; fore wing unmarked or with hyaline spots *Hyarotis* Moore
3. Cell of hind wing shorter than half wing; M_2 of fore wing straight *Gangara* Moore
- Cell of hind wing equal to half wing 4



Figs.9-14. *Notocrypta curvifascia curvifascia* (Felder) Fig.9.(M) Genitalia, ventral, 10. Clasper, dorsal. 11. Clasper, ventral, 12. Aedeagus, 13. Uncus, tegumen, vinculum, lateral, 14. Uncus, tegumen, ventral.

4. Apex of cell of fore wing not produced; M_3 opposite to R_4 or R_5 ; fore wing with large, usually separated yellow or white hyaline spots *Erionota* Mabille
- Apex of cell of fore wing produced; M_3 opposite to R_3 ; fore wing unmarked and hind wing cilia about tornus orange to pale-yellow; eyes red *Matapa* Moore

Genus *Suastus* Moore

1881. *Suastus* Moore, *Lep. Ceyl.*, 1 : 168.
Type-species. *Hesperia gremius* Fabricius

Diagnostic characters ; Palpi : third segment long and thin. Forewing : M_2 straight; M_3 equidistant to M_2 and Cu_{1a} ; Sc and R_1 apart; usually with white spots dorsally. Hind wing : dorsum not longer than costa; partly white dorsally; grey or white with dark spots ventrally.

Remarks : It is distributed in North India and China to Borneo. Altogether two species are known from India of which only one is dealt with hereunder from West Bengal.

17. *Suastus gremius* (Fabricius)

1798. *Hesperia gremius* Fabricius, *Ent. Syst. Suppl.*, p. 433.
1881. *Suastus gremius* Moore, *Lep. Ceyl., E.I.C.*, 1:168.

Diagnostic characters : Forewing : ventrally tornus dark beyond a central white area in space 2A, which may be absent; always with a white spot ventrally at middle of space 2A. Hindwing : ventrally with a conspicuous black cell spot, which is at least as large as any discal spot.

Distribution : Oriental region including India (Sikkim, Assam, West Bengal: Calcutta, 24-Parganas, Hooghly and Darjiling, South India, Central India North and West Himalayas.

Remarks : The nominal subspecies which is hitherto known from India, is presently dealt with from West Bengal.

17(a) *Syastus gremius gremius* (Fabr.)

1949. *Suastus gremius gremius* (Fabricius) Evans, *A Catalogue of the HesperIIDae from Europe, Asia and Australia in the Brit. Mus. (nat. Hist.)*, p. 296.

Diagnostic characters ; Fore wing : dorsally with white spots, ventrally both the wings paler.

Material examined : 2(F) : Calcutta (Purchased de n.); 1(M), 3 (F) : Darjiling (Purchased Moore's collections); 1(M), 2(F) : Calcutta, 28.xi.1967 (G.S. Arora coll.); 1(M) sonarpur, 19.iii.1966 (G.S. Arora coll.); 1(M) : Hooghly, Srirampore, Barabally, 2.xi.1965 (P. Parui coll.); 1(M) : Calcutta Eden Gardens, 7.v.1965 (S. Ali & D.K.M. coll.); 1(M) Eden Garden, 20.viii.1966 (R.S.P. & G.P. coll.); 1(F) : Eden Garden, 6.xii.1958 (A.P. Kapur coll); 1(F) : 19972/H9.

Measurement : Length of Fore wing, 12-17 mm.

Distribution : As for the species.

Genus *Hyarotis* Moore

1881. *Hyarotis* Moore, *Lep. Ceyln.*, 1:174.

Type-species. *Papilio adarastus* Cramer

Diagnostic characters : Palpi : third segment short. Antennae : shorter than half of costa and cell of fore wing. Fore wing : with dorsal hyaline spots or unmarked; Cu_{1a} opposite to R_3 rather than R_2 ; M_2 straight. Hindwing : dorsum longer than costa.

Remarks : The genus is reported from India, Borneo and Philippines. Out of two species, only one is presently dealt with from West Bengal.

18. *Hyarotis adrastus* (Stoll)

1780. *Papilio adrastus* Stoll, In Cramer, *Pap. Exot.* 4(27) : 62, pl. 319, figs. f, g.

1881. *Hyarotis adrastus* (Stoll), Moore, *Lep. Ceyln.* 1:174, pl. 67, figs. 5,5a.

Diagnostic characters : Antennae : club ringed with white before apiculus. Forewing : conspicuous hyaline spots dorsally and a spot in space between 1A and Cu_{1b} usually present; ventrally without tuft on dorsum in male.

Distribution : Oriental region including India (Sikkim, Assam, West Bengal: Calcutta and Malda, North West Himalayas and the Andamans).

Remarks ; Only one subspecies is so far reported from India, which is presently dealt with.

18(a) *Hyarotis adrastus praba* (Moore)

1949. *Hyarotis adrastus praba*, Evans, *A Catalogue of the Hesperiiidae from Europe, Asia and Australia in Brit. Mus. (nat. Hist.)*, p. 303.

Diagnostic characters : Fore wing : dorsally with spot in space between 1A and Cu_{1b} immediately below and adjoining the cell spot. Hind wing : ventrally with central white band in W.S.F.

Material examined : 6(M), 2(F) : Calcutta (Purchased L.I.N. collns.); 1(M) : Malda (Exchange W.H. Irvine).

Measurement : Length of fore wing, 19 mm.

Distribution : As for the species.

Remarks ; Though the date of collection is not known, but the hind wing is provided with central white band ventrally as that of W.S.F.

Genus *Gangara* Moore

1881. *Gangara* Moore, *Lep. Ceyl.*, 1 : 164.
Type species. Papilio thyrsis Fabricius

Diagnostic characters ; Palpi : generally with second segment stout, quadrantic and third very short, stout, bluntly conical not usually protruding. Wings : dorsally with glandular streaks along veins. Forewing : dorsally with or without large yellow spots in male but present in female; cell not as long as dorsum of hind wing; M_2 straight. Hind wing : with hair tufts on both sides; ventrally with spars white scaling; dorsally with hair tufts, cell shorter than half of the wing.

Remarks : The genus is distributed to India to Borneo and Philippines. Out of two species, only one is presently dealt with from West Bengal.

19. *Gangara thyrsis* (Fabricius)

1775. *Papilio thyrsis* Fabricius, *Syst. Ent.*, p. 532.
 1881. *Gangara thyrsis* (Fabricius), Moore, *Lep. Ceyl.*, 1 : 165, pl. 66, figs. 3, 3a.

Diagnostic characters : Forewing : dorsally with well marked subapical spots as well as large central spots; ventrally with an oblong patch of yellow hairs near the dorsum in male.

Distribution : Oriental region including India (Sikkim, assam, West Bengal: Calcutta, North West Himalayas, the Andamans and South Nicobars).

Remarks : The nominal subspecies which is recorded so far for India, is presently dealt with.

19(a) *Gangara thyrsis thyrsis* (Fabricius)

1949. *Gangara thyrsis thyrsis* (Fabricius), Evans, *A Catalogue of the HesperIIDae from Europe, Asia and ... Australia in the Brit. Mus. (nat. Hist.)*, p. 325.

Diagnostic character : Fore wing : without small spot above vein 1A.

Material examined ; 6(M), 1(F) : Calcutta (Purchased L.I.N. collns.).

Measurement : Length of fore wing, 32-40 mm.

Distribution : As for the species.

Remarks : The present finding confirms its distribution in West Bengal.

Genus *Erionota* Mabille

1878. *Erionota* Mabille, *Ann. Soc. Ent. Belg.*, 21:34.
Type species : *Papilio thrax* Linnaeus

Diagnostic characters : Palpi : generally with second segment stout and quadrantic, third very short, stout, bluntly conical, not usually protruding. Antennae : not greater than half of costa; apiculus longer than twice width of club, hooked or obtuse. Fore wing : dorsally with large separated, yellow, hyaline spots; cell not as long as dorsum of hind wing; Cu_{1b} nearer to base than to end of cell. Hind wing : cell equal to half of wing.

Remarks : The genus is reported from India to Philippines and Sulawesi. Out of three species from India, only one is dealt with here under.

20. *Erionota thrax* (Linnaeus)

1867. *Papilio thrax* Linnaeus, *Syst. Nat.*, 1:794.

1878. *Erionota thrax* (Linnaeus), Mabille, *Ann. Soc. Ent. Belg.*, 21:35.

Diagnostic characters : Antennae : only basal half or two thirds of club white in both sexes. Forewing : dorsally without spot between Cu_{1b} and 1A; apical spot absent or insignificant; ventrally with a pale area over the spot in space between Cu_{1a} and Cu_{1b} ; apex acute and termen straight in both sexes; 1A equal to Rs.

Distribution : Oriental including (Sikkim; Assam, and West Bengal (Calcutta) and Australian regions.

Remarks : The nominal subspecies which is recorded so far for India, is presently dealt with from West Bengal.

20(a) *Erionota thrax thrax* (Linnaeus)

1949. *Erionota thrax thrax* Linnaeus, Evans, *A Catalogue of the Hesperidae from Europe, Asia and Australia in the Brit. Mus. (nat. Hist.)*, p. 327.

Diagnostic characters : Fore wing : with 5 mm. long cell spot dorsally in male.

Material examined : 1(M) : Calcutta, 7.iv.1950(A.P. Kapur coll.).

Measurement : Length of forewing, 34 mm.

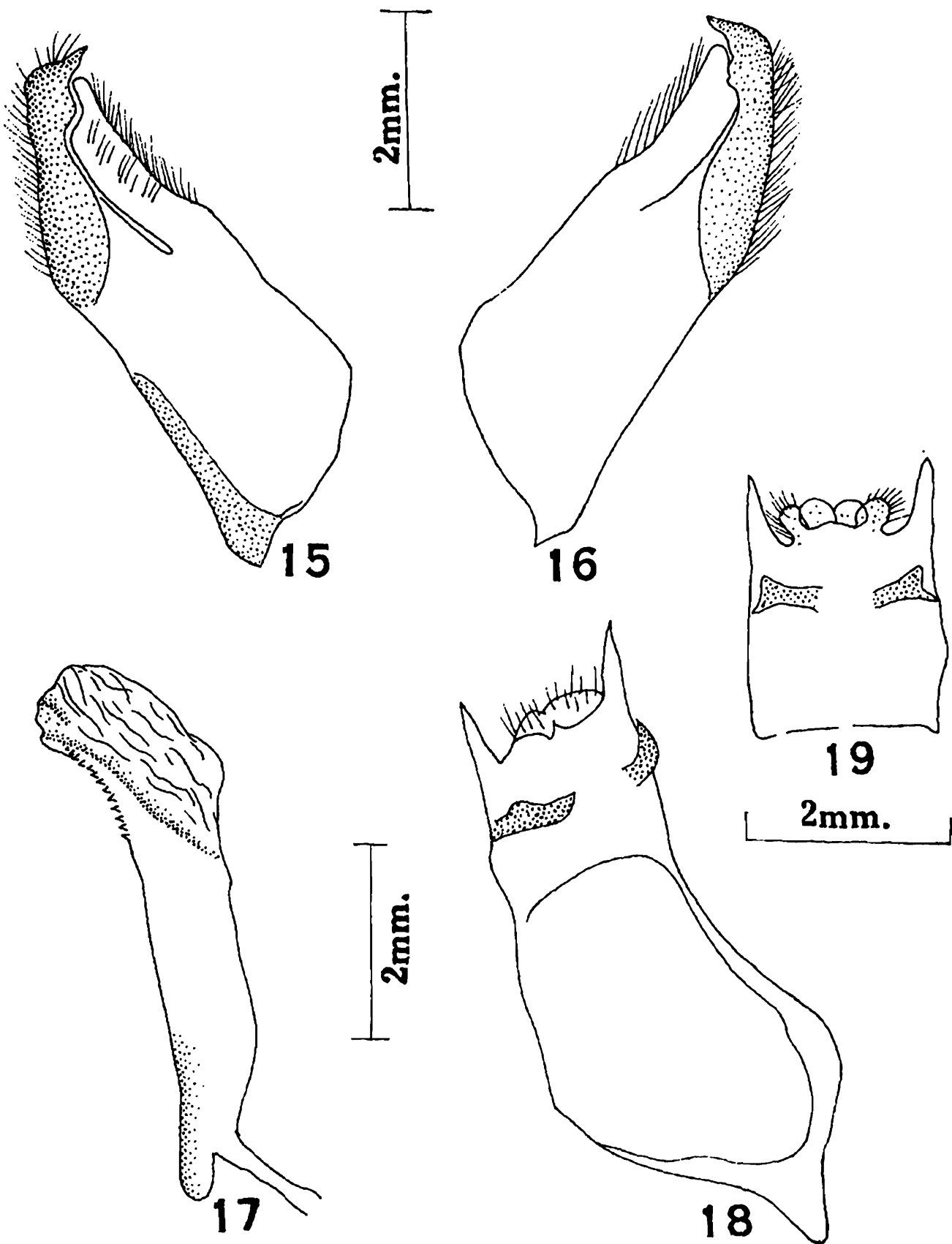
Distribution : Oriental region including India (Sikkim, Assam and West Bengal: Calcutta).

Remarks : The species is for the first time recorded from West Bengal. The male genitalic structures (figs. 15-19) have been given for confirming the identity.

Genus *Matapa* Moore

1881. *Matapa* Moore, *Lep. Ceyl.*, 1 : 163.

Type-species. *Ismene aria* Moore



Figs. 15-19. *Erionota thrax thrax* (Linnaeus). Fig. 15. Clasper, ventral, 16. Clasper, dorsal, 17. Aedeagus. 18. Uncus, tegumen, vinculum. 19. Uncus, ventral.

Diagnostic characters : Antennae : apiculus at right angle to the stout club and nearly equal to it in length. Eyes: red. Forewing : apex of cell produced; M_3 opposite to R_3 . Hind wing : cell equal to half wing; lower apex of cell abnormally produced and M_1 is nearly opposite to Cu_{1b} ; cilia about tornus orange to pale yellow; male with a broken discal stigma.

Remarks : The genus is hitherto recorded from India to Celebes. Amongst a total of five species from India, only one from West Bengal presently dealt with.

21. *Matapa aria* (Moore)

1865. *Ismene aria* Moore, *Proc. zool. Soc. Lond.*, p. 784.

1881. *Matapa aria* Moore, *Lep. Ceyli.*, 1 : 164, pl. 66, figs. 1, 1a.

Diagnostic characters : Wings : uniformly dark brown dorsally. Fore wing : dorsally with a narrow black inconspicuous stigma in male. Hind wing : Dorsally not yellow excepting for cilia, which may be white or very pale yellow. Abdomen : tip brown and with brown scale overlying densely packed grey scale in female.

Material examined : 1(M), 1(F) : Cooch Behar, Falkata, 14.ix.1974 (H.K.Bhowmik coll.); 1(M) : Hooghly, Chandan Nagar, 16.iv.1965 (H.C. Ghosh & H.L. Pal coll.); 11(M), 5(F) : Calcutta (Purchased L.I.N.coll.); 1(M) : Malda (Exchange W.H. Irvine).

Measurement : Length of fore wing, 17-19 mm.

Distribution : Oriental region including India (Sikkim, Assam, West Bengal: Calcutta and Hooghly, Coochbehar and Malda, south India, Madhya Pradesh and Uttar Pradesh).

Taractocera group

Palpi : second and third segment erect. Antennae : moderate to very long; club more or less constricted before the apiculus which may be absent or whip like. Facies : generally tawny. Forewing : M_2 generally decurved at origin, dorsally often with discal stigma in male. Hind wing : Lower end of cell upturned and M_2 usually untraceable; tornus more or less produced and 1A usually as long as Cu_{1b} ; cell equal to half of wing. Abdomen equal to or shorter than dorsum of hind wing. Legs : mid tibiae smooth. Genitalia : gnathos absent; clasper with only one lamina and without overlying cuiller.

Distribution : The group is mainly represented in the Oriental region.

Remarks : Amongst five Indian genera, four are presently dealt with from West Bengal.

Key to genera

1. Labial palpi with third segment long and thin as antennal shaft2
- Labial palpi with third segment short, stout and never thin as antennal shaft3

2. Antennal club flattened; labial palpi needle like; apiculus absent or minute *Taractocera* Butler
 - Antennal club not flattened; labial palpi not as above; apiculus present and hooked *Potanthus* Scudder
3. Fore wing Cu_{1b} nearer to end cell than base and dorsally always with unbroken discal stigma in male; uncus deeply divided *Telicota* Moore
 - Forewing Cu_{1b} nearer to base than to end cell and dorsally without brand or stigma in male; uncus undivided *Cephrenes* Waterhouse & Lyell

Genus *Taractocera* Butler

1869. *Taractocera* Butler, *Cat. Lep. Fabr.*, p. 279.
 Type-species. *Hesperia maevius* Fabricius

Diagnostic characters : Palpi : needle like; third segment long, protruding, thin as antennal shaft. Antennae : club flattened to a hollow disc; apiculus absent or minute. Facies : generally tawny or with white spots.

Remarks : The genus is hitherto recorded from India and China to Australia. Amongst a total of three species from India, only one is dealt with from West Bengal.

22. *Taractocera maevius* (Fabricius)

1793. *Hesperia maevius* Fabricius, *Ent. Syst.*, 3 : 352
 1869. *Taractocera maevius* (Fabricius), Butler, *Cat. Lep. Fabr.*, p. 279, pl. 3, fig. 13.

Distribution : Oriental region including India (Sikkim, Assam, West Bengal: Howrah, South India, Madhya Pradesh and North West India).

Remarks : Only two subspecies are hitherto recorded from India of which one is dealt with hereunder from West Bengal.

22 (a) *Taractocera maevius sagara* Moore

1865. *Taractocera sagara* Moore, *Proc. zool. Soc. Lond.*, p. 792.
 1949. *Taractocera maevius sagara*, Moore, Evans, *A Catalogue of the Hesperidae from Europe, Asia and Australia in Brit. Mus. (nat. Hist.)*, p. 358.

Diagnostic characters : Hind wing : grey ventrally, veins white.

Material examined : 1 (F) : Howrah, Botanical Garden, 31.viii.1965 (K.V. Laxminarayana coll.); 1 ex., abdomen missing, loc. same as above, 28.vi.1965 (P. Parui coll.).

Measurement : length of forewing, 12 mm.

Distribution : As for the species.

Genus *Potanthus* Scudder

1872. *Potanthus* Scudder, 4th Ann. Peabody Acad. Sci., p. 75.
Type-species.-*Hesperia omaha* Edwards

Diagnostic characters : Palpi : third segment long and protruding. antennae : club not flattened, length equal to half costa, apiculus hooked and not longer than width of club. Fore wing : generally with a brand over the middle of 1A dorsally, Cu_{1b} nearer end cell than base and M_3 not nearer to Cu_{1a} than to M_2 .

Remarks : The genus is hitherto recorded from India and China to Moluccas. Amongst a total of fifteen species so far recorded from India, only two species from West Bengal are dealt with here under.

Key to species

1. Uncus tapered to a sharp triangular point; dorsal spots in spaces M_2 and M_3 detached from discal band; hind wing ventrally yellow *pallida* Evans
- Uncus with the end rounded or slightly scalloped; dorsal spots in spaces M_2 and R_5 always confluent with discal band; hind wing ventrally brown *confucius* Felder

23. *Potanthus pallida* Evans

1932. *Potanthus psudomaesa pallida* Evans, The Identification of Indian Butterflies, *Bombay nat. Hist. Soc., Rev. Ed.*, p. 402.
1949. *Potanthus pallida* Evans, A Catalogue of the Hesperidae from Europe, Asia and Australia in *Brit. Mus. (nat. Hist.)*, p. 375.

Diagnostic characters : Fore wing : usually with a small brand over 1A dorsally in male, the brand in male unusually long extending nearly to the outer edge of the discal band, other markings yellow, spots in spaces between M_2 and M_3 detached from the band. Hindwing : generally yellow ventrally the band yellow defined by black dots; sometimes the wing shaded by black dots. Genitalia: claspers with a projecting cuiller, uncus tapered to a sharp triangular point.

Material examined ; 1(F) : Darjiling, 6km. east of Rongpo Forest Rest House, 700 m., 8.iv.1973;
 1(M) : 1 km. east of Goke Forest Rest House, Singla, 400m., 17.iv.1973 (H.S. Sharma & party coll.).

Measurement : length of fore wing, 13 mm.

Distribution : Oriental region including India (Sikkim, Assam, West Bengal: Darjiling, South India and North West Himalaya).

Remarks : The species is reported for the first time from West Bengal.

24. *Potanthus confucius* (Felder)

1862. *Pamphila confucius* Felder, *Wien. Ent. Mon.*, vi., p. 62.

1949. *Potanthus confucius* (Felder), Evans, *A Catalogue of the Hesperiiidae from Europe, Asia and Australia in the Brit. Mus. (nat. Hist.)*, p. 382.

Diagnostic characters : Small species with broad markings. Fore wing : spots in spaces M_3 and R_5 with the discal band and generally with apical spots. Hind wing : ventrally brown. Genitalia : clasper with a projecting slender and pointed cuiller; uncus width one fourth of its length, with rounded shoulders and the end rounded or slightly scalloped and also not tapered laterally.

Distribution : Palaearctic and Oriental region including India (Sikkim, Assam, West Bengal: Howrah and Darjiling, South India, Madhya Pradesh and the Andamans).

Remarks : Amongst a total of two subspecies so far reported from India, only one from West Bengal is dealt with here under.

24(a) *Potanthus confucius dushta* (Fruhstorfer)

1911. *Padraona dushta* Fruhstorfer, *Iris*, p. 39.

1949. *Potanthus confucius dushta* (Fruhstorfer), Evans *A Catalogue of the Hesperiiidae from Europe, Asia... and Australia in the Brit. Mus. (nat. Hist.)*, p. 382.

Diagnostic characters : Fore wing : markings broad and apically conjoined dorsally.

Material examined : 1(M); Darjiling 1 km. South of Reyang river, 28.iii.1973; 1(M) : 6 kms. east of F.R.H.; Rangpo, 700 m., 8.iv.1973; 1(F) : 1km. east of Goke, F.R.H., Singla, 400 m., 17.iv.1973; 1(M) : Howrah, Botanical Garden, 1/2 km. West of Meadus band, 1950 m., 25.iv.1973. (all H.S. Sharma & party coll.); Rangpo, on way to F.R.H., 29.v.1974 (J.K. Jonathan & party coll.).

Measurement : Length of fore wing, 12-14 mm.

Distribution : Oriental region including India (Sikkim, Assam and West Bengal : Howrah and Darjiling).

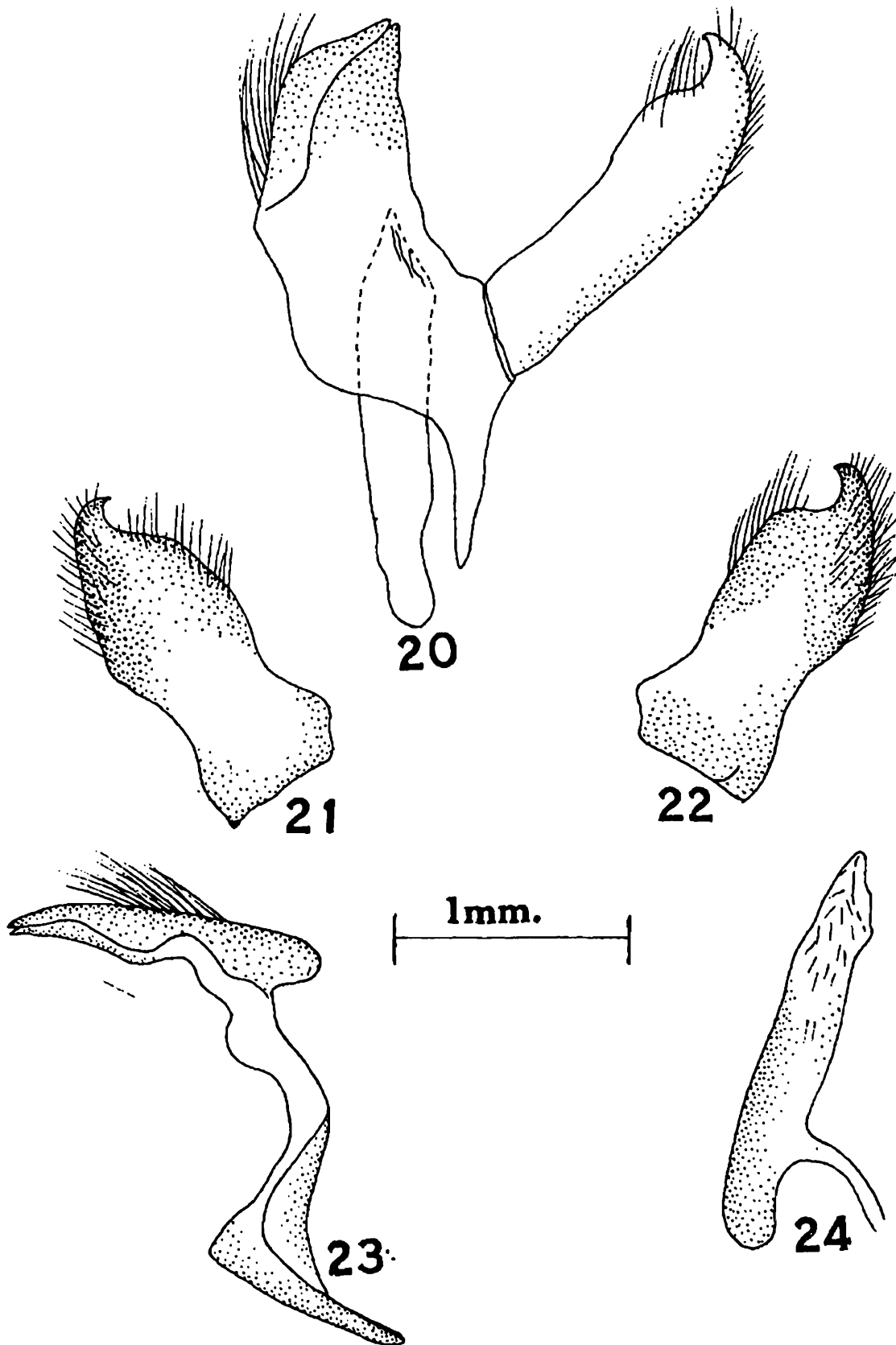
Remarks : The subspecies is for the first time reported from West Bengal. The male genitalic structures (figs. 20-24) have been included for confirming the identity.

Genus *Telicota* Moore

1881. *Telicota* Moore, *Lep. Ceyl.*, 1 : 169.

Type-species : *Papilio colon* Fabricius.

Diagnostic characters : Palpi : third segment short and stout never so thin as the antennal shaft.



Figs.20-24. *Potanthus confucius dushta* Fruhstorfer. Fig. 20.(M) Genitalia, lateral. 21. Clasper, dorsal. 22. Clasper, ventral. 23. Uncus, tegumen, vinculum, lateral. 24.Aedeagus.

Antennae : not longer than half costa. Wings : generally produced specially in male. Fore wing : upper apex of cell acutely produced, M_2 opposite to R_3 ; Cu_{1b} nearer end cell than base, dorsally always with an unbroken discal stigma in male. Hind wing : cell equal to half wing in length. Genitalia : uncus usually deeply divided.

Remarks : The genus is hitherto recorded from India and China to New Guinea, Australia and Solomons. Amongst a total of five species known from India, only one from West Bengal is dealt with hereunder.

25. *Telicota ancilla* Herrich-Schaffer

1869. *Telicota ancilla* Herrich-Schaffer, *Stett. Ent. Ztg.*, p.79.

Diagnostic characters : Fore wing : in male origin of Cu_{1a} not nearer to origin of Cu_{1b} than to origin of M_3 and also further from base than the origin of R_1 , dorsally lower end of stigma lying at 1A in male but in female broad stigma reaching to base of space Cu_{1a} and M_3 and inner edge of tawny band lying central between termen and base. Genitalia : cuiller of claspers more or less protruding but not beyond valva, uncus divided at its base but the back of uncus without a protruberance.

Distribution : Palaearctic, Oriental including India (Sikkim, West Bengal : Calcutta, 24-Parganas, Howrah, Hooghly, Birbhum & Murshidabad, Orissa, South India, Madhya Pradesh and North West Himalayas), Papuan and Australian regions.

Remarks : Only one subspecies is so far known from India which is presently dealt with.

25(a) *Telicota ancilla bambusae* (Moore)

1878. *Pamphila bambusae* Moore, *Proc. zool. Soc. Lond.*, p. 691.

1949. *Telicota ancilla bambusae* (Moore), Evans, *A Catalogue of the HesperIIDae from Europe, Asia and ... Australia in Brit. Mus. (nat. Hist.)*, p. 397.

Diagnostic characters : Fore wing : black spotting at apex less developed ventrally. Genitalia cuiller protrudes as a blunt triangle; valva short and broad.

Material examined : 1 ex. (Abdomen lost), Calcutta, Naktala, 24.xi.1955 (S. Ali coll.); 1 (F), Calcutta, Andul Town, Howrah Dist., 28.ix.1964 (G.S. Arora coll.); 1(F) : Hooghly, Chandannagar, 4.xii.1965 (P. Parui & J.R. Singh coll.); 1(M) : Bandel, Debanandapur, 28.x.1965 (P. Parui coll.); 1(F) : 24-Parganas, Sonarpur, 19.iii.1965 (G.S. Arora coll.); 2(M) : Birbhum, Santiniketan, 5&14.x.1974. (B.N. Das & G.C. Das coll.); 4(F) : Murshidabad, Sagardighi, 14.ii.1980 (I.J. Gupta & party coll.).

Measurement : Length of fore wing, 15 mm.

Distribution : Oriental region including India (Sikkim, Assam, West Bengal: Calcutta, 24-Parganas, Howrah, Hooghly Birbhum & Murshidabad, Orissa, South India, Madhya Pradesh and North West Himalayas).

Genus *Cephrenes* Waterhouse & Lyell

1914. *Cephrenes* Waterhouse & Lyell, Butterflies of Australia, p. 206.
Type-species *Hesperia sperthias* Felder

Diagnostic characters : Palpi : third segment short and stout. Antennae not longer than half costa. Wings : generally much produced in male. Fore wing : upper apex of cell acutely produced, M_2 opposite R_3 ; Cu_{1b} nearer to base than to end cell, without band or stigma in male. Hind wing : cell equal to half wing. Genitalia : uncus undivided.

Remarks : The genus is hitherto recorded from India to Australia and Solomons. Only one species is known from India which is dealt with here under.

26. *Cephrenes chrysozona* (Plotz)

1883. *Telicota chrysozona* Plotz, *Stett. Ent. Ztg.*, 44:228.
 1949. *Cephrenes chrysozone* (Plotz), Evans, *A Catalogue of the Hesperiidæ from Europe, Asia and Australia in Brit. Mus. (nat. Hist.)*, p. 407.

Diagnostic characters : Hindwing : tornus not dark ventrally. Genitalia : end of uncus tridentate.

Distribution : Oriental regions including India (Sikkim, Assam, West Bengal : Howrah, Andaman and Nicobar Islands).

Remark : Amongst a total of two subspecies only one is dealt with here under.

26(a) *Cephrenes chrysozona oceanica* (Mabille)

1904. *Telicota oceanica* Mabille, *Genera Insect.*, 17:143.
 1949. *Cephrenes chrysozona oceanica* (Mabille) Evans, *A Catalogue of the Hesperiidæ from Europe, Asia and Australia in Brit. Mus. (nat. Hist.)*, p. 407.

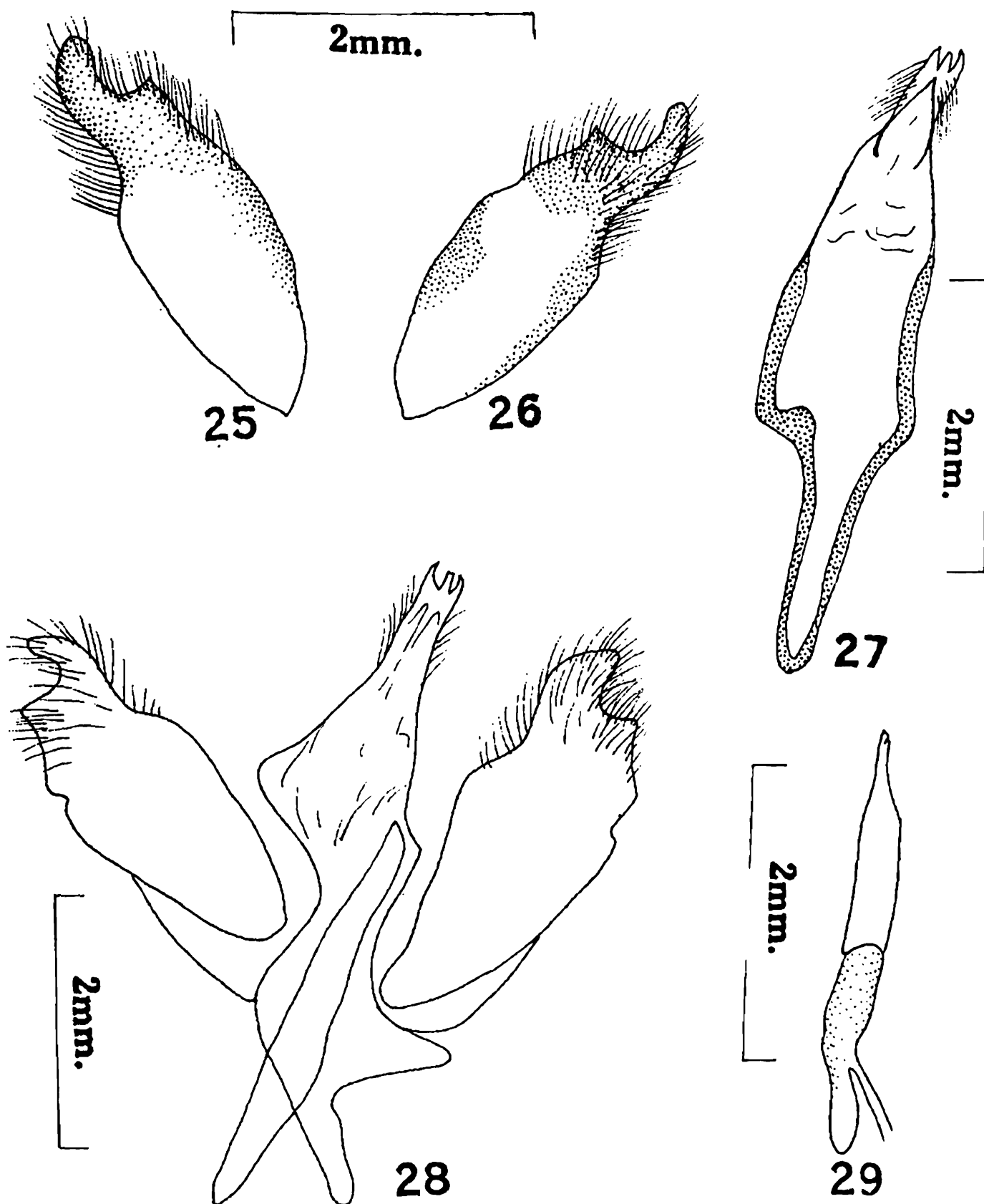
Diagnostic characters : Forewing : dorsally tawny coloured with central dark band solid throughout in male, tawny markings suffused with dark scaling in female. Hindwing : ventrally yellow to ochreous brown.

Material examined : 2(M) : Howrah, Santragachi, 19.i.1964 (K. Rai & party coll.).

Measurement : Length of forewing, 17 mm.

Distribution : Oriental region including India (Sikkim, Assam, West Bengal: Howrah and the Andamans). Burma. Yunnan, Indo China, Hainan.

Remarks : The present findings confirm the distribution of subspecies in West Bengal. The male genitalic structures (figs. 25-29) have been included for confirming the identity.



Figs. 25-29. *Cephrenes chrysozona oceanica* (Mabille). Fig. 25. Clasper, dorsal. 26. Clasper, Ventral. 27. Uncus, tegumen, vinculum. 28.(M) Genitalia, ventral. 29. Aedeagus.

Gegenes group

Palpi : Second segment flattened and appressed to face, third erect short and pointed, Antennae : not greater than half costa, club generally short and stout, apiculus usually right angled, constricted after its commencement and sharply pointed tip upturned. Facies : dark brown. Fore wing : produced at apex, upper apex of cell acutely angled, cell shorter than dorsum, M_2 decurved at origin, origin of Cu_{1b} nearer to end of cell than to base, internal cell veinlet extended upto origin of Cu_{1a} , 1A bisinuate. Hindwing : tornus produced, lower end of cell upturned from the origin of Cu_{1b} so that cubitus and M_3 are not in line, end cell inclined and directed to end of Cu_{1b} ; Rs before Cu_{1b} ; 1A as long as Cu_{1b} and longer than $Sc+R_1$, M_2 generally untraceable. Legs : normal, sometime mid-tibiae spined. Abdomen : equal to dorsum of hindwing.

Key to genera

1. Antennae with more segments of the nudum on the club than apiculus2
Antennae with at least as many segments on the apiculus as on the club3
2. Antennae very short, one third of costa; mid tibiae heavily spined *Gegenes* Hübner
Antennae shorter than half costa; mid tibiae smooth.....*Parnara* Moore
3. Antennae not reaching to mid costa; Cu_{1b} of fore wing opposite to R_1 4
- Antennae nearly equal to half of costa; origin of Cu_{1b} of fore wing before origin of R_1 5
4. Hind wing ventrally without cell spot; mid-tibiae unspined or with a few inconspicuous spines *Borbo* Evans
- Hind wing ventrally with cell spot; mid-tibiae heavily spined *Pelopidas* Walker
5. Mid tibiae heavily spined, with a 'paint brush' in male in hind wing dorsally *Baoris* Moore
- Mid tibiae without spine, without a 'paint' brush' in male in hind wing dorsally *Caltoris* Swinhoe

Genus *Gegenes* Hübner

1816. *Gegenes* Hübner, Verz., p. 107.

Type-species : *Papilio pumilio* Hoffmanssegg

Diagnostic characters : Antennae : very short, one-third of the costa, club with more segments than minute apiculus. Forewing : Cu_{1b} nearer to upper end cell than to base. Leg : mid-tibiae heavily spined.

Remarks : The genus is reported to be distributed from Mediterranean to India and Africa. Two species are known from India of which only one is dealt with.

27. *Gegenes nostradamus* (Fabricius)

1793. *Papilio nostradamus* Fabricius, *Ent. Syst.*, 3 (pt.1) : p. 323.

1927. *Gegenes nostradamus* (Fabricius), Seitz, *Macrolepidoptera of the World*, subfamily Hesperidae, 9 : 1083.

Diagnostic characters : Antennae : Shaft plain white ventrally. Wings : pale brown. Genitalia : curved ventral edge of cuiller evenly and finely serrate throughout.

Material examined : 1(F) : Calcutta, Eden Gardens, 30.vii.1963 (S. Ali coll.).

Measurement : Length of fore wing, 19 mm.

Distribution : Palaearctic and Oriental including India (West Bengal: Calcutta, Gujarat, Rajasthan, Punjab and Uttar Pradesh) regions.

Remarks : The present record from West Bengal confirms its distribution in the state.

Genus *Parnara* Moore

1881. *Parnara* Moore, *Lep. Ceyl.*, 1 : 166.

Type-species.- *Eudamus guttatus* Bremer & Grey

Diagnostic characters : Antennae : shorter than half of the costa. Fore wing : Cu_{1b} nearer to upper end cell than to base. Leg : mid-tibiae smooth.

Remarks : The genus is reported to be distributed in the Indo-Australian region. Three species are known from India of which only one is dealt with here under.

28. *Parnara naso* (Fabricius)

1798. *Hesperia naso* Fabricius, *Ent. Syst., Supplement.* : 431.

1949. *Parnara naso* (Fabricius), Evans, *A Catalogue of the Hesperidae from Europe, Asia and Australia in the Brit. Mus. (nat. Hist.)*, p. 434.

Diagnostic characters : Forewing : dorsally the inner edge of the spot in space between Cu_{1a} and Cu_{1b} lying beneath or after the origin of Cu_{1b} . Genitalia : ventral edge of valva strongly bowed outwards, so that the claspers being much wider at middle than at the ends.

Distribution : Palaearctic, Oriental including India (Sikkim, Assam, West Bengal, (Calcutta, 24-Parganas, Hooghly, Bankura and Birbhum, South India, Central India and Kashmir) and Australian regions.

Remarks : Only one subspecies is so far reported from India which is dealt with here.

28(a) *Parnara naso bada* (Moore)

1878. *Hesperia bada* Moore, *Proc. zool. Soc. Lond.*, p. 685.

1949. *Parnara naso bada* Moore, Evans, *A Catalogue of the Hesperidae from Europe, Asia and Australia in Brit. Mus. (nat. Hist.)*, p. 435.

Diagnostic characters : Fore wing : dorsally with apical spot. Hind wing : generally with spots ventrally.

Material examined : 1(F) : Calcutta, 31.x.1957 (A.P. Kapur coll.); 1(M), 1(F) : Sonarpur, 24-Parganas, 28.xi.1961 (R.K. Varshney coll.); 1(F) : Hooghly, Chandannagar, 28.ix.1961 (K.S. Pradhan & party coll.); 1(F) : Calcutta, Manikganj, 6.xii.1962 (M.M. G & S. Ali coll.); 1(M) : Birbhum dist., Santiniketan, 5.x.1974 (B.N. Das & party coll.); 2(M), 1(F) : Calcutta (de Nicville coll.); 1(F), Bankura, Bishnupur sericulture nursery, 26.x.1985 (M. Dutta & party coll.)

Measurements : Length of fore wing, 16 mm.

Distribution : Palaearctic and Oriental regions including India (Sikkim, West Bengal : Calcutta, 24-Parganas, Hooghly, Bankura, Birbhum, South India, Central India and Kashmir).

Remarks : The present record confirms the distribution of the species from West Bengal.

Genus *Borbo* Evans

1949. *Borbo* Evans, *A Catalogue of the Hesperidae from Europe, Asia and Australia in Brit. Mus. (nat. Hist.)*, 44, 436.

Type-species :- *Hesperia borbonica* Boisduval

Diagnostic characters : antennae : number of segments of club equal to the segments on the apiculus; not reaching mid costa. forewing : Cu_{1b} nearer to upper end cell than to base. Hind wing : ventrally without cell spot. Leg : mid tibiae without spine.

Remarks ; It is reported to be distributed in the Indo-Australian region and Africa.

29. *Borbo cinnara* (Wallace)

1866. *Hesperia cinnara* Wallace, *Proc. zool. Soc. Lond.*, p. 361.

1949. *Borbo cinnara* (Wallace), Evans, *A Catalogue of the Hesperidae from Europe, Asia and Australia in Brit. Mus. (nat. Hist.)*, 437.

Diagnostic characters : Palpi : appressed, third segment short, erect, inconspicuous. Antennae : club angled. Wings ; produced. Forewing : dorsally with a conspicuous non-hyaline spot in space between Cu_{1a} and Cu_{1b} and discal series of spots in spaces between M_1 to R_4 and also on upper cell spot. Hind wing : dorsally with 1-2 dots, ventrally with olive ochreous scaling and spots in space between Cu_{1b} and M_1 .

Material examined ; 1(M) : Calcutta, no other data.

Measurement : Length of forewing, 15 mm.

Distribution : Palaearctic, Oriental including India (Sikkim, Manipur, West Bengal: Calcutta, South India, Madhya Pradesh, Himachal Pradesh, the Andamans and Nicobars), Papuan and Australian regions.

Remarks : The present record confirms the distribution of the species in West Bengal.

Genus *Pelopidas* Walker

1870. *Pelopidas* Walker, *Ent.*, 5 : 56.

Type-species. *Pelopidas midea* Walker

Diagnostic characters : Antennae : number of segments of club equal to the segments on the apiculus, antennal length not reaching midcosta. Fore wing : Cu_{1b} nearer to upper end cell than to base. Hind wing : ventrally with a cell spot. Legs : mid-tibiae heavily spined.

Remarks : The genus is reported to be distributed from Turkey to Australia. Amongst a total of six species only two are represented here.

30. *Pelopidas mathias* (Fabricius)

1798. *Hesperia mathias* Fabricius, *Ent. Syst. Suppl.*, p. 433.

1949. *Pelopidas mathias* (Fabricius), Evans, *A Catalogue of the HesperIIDae from Europe, Asia and Australia in the Brit. Mus. (nat. Hist.)*, p. 441.

Diagnostic characters : Fore wing : dorsally with discal stigma in male, lower end of stigma nearer to base than termen and situated well before the origin of Cu_{1b} , a line joining the cell spot centres. Genitalia : claspers and valva not extending below the cuiller, ends of gnathos and uncus connivent.

Distribution : Palaearctic, Oriental including India (Sikkim, Assam, West Bengal : Calcutta, 24-Parganas, Howrah, Bankura, Midnapur, Birbhum, Malda and Darjiling, South India, Maharashtra, Central India, Rajasthan, Punjab, Uttar Pradesh, Jammu and Kashmir and Central Nicobars), Papuan and Australian regions.

Remarks : Only one subspecies is so far known from India which is dealt with here.

30(a) *Pelopidas mathias mathias* (Fabricius)

1949. *Pelopidas mathias mathias* (Fabricius), Evans, *A Catalogue of the HesperIIDae from Europe, Asia and Australia in Brit. Mus. (nat. Hist.)*, p. 441.

Diagnostic characters : Wings : pointed. Fore wing : dorsally with well marked spots, the spot between Cu_{1b} and Cu_{1a} quadrate. Hindwing : ventrally grey and spots minute.

Material examined : 2(M) : Bansdroni, Calcutta, 13.xi, 24.xii.1955 (S. Ali coll.); 1(M).1(F) : Calcutta Eden Garden. 21.xi.1959, 7.xi.1960 (A.P. Kapur coll.); 1(F), Calcutta, Kharberia. 9.xi.1962 (Poran singh coll.); 1(F) : Calcutta, Salt Lake, Bartala, 16 km. East of Calcutta, 6.ix.1964 (B. Biswas coll.); 1(M) : Howrah Dist., Andul Town, North Railway Stn., 28.ix.1964 (G.S. Arora coll.); 1(F) : Nadia, Kalyani, 20.xi.1965, (H.C. Ghosh & party coll.); 2(M), 3(F) : Calcutta, Eden Garden. 19.x.1966,

19.viii.1968, 20.viii.1968 (H.C. Ghosh, G.S. Arora, K.S. Pradhan & G. Prasad coll.); 3(M), 2(F), Birbhum, Santiniketan, 14. ix., 5,10.x.1974 (B.N. Das coll.); 1(M), 1(F) : Malda Dist., Sahapur, 17,18.ix.1975 (H.K. Bhowmik coll.); 1(M): Darjiling, Teesta Bazar, 214m., 18.iv.1976 (A.R. Bhowmik coll.); 1(M): Bankura, Junglemahal, 5 kms. south of Jaipur F.R.H., 20.xii.1985 (D.K. Mandal & party coll.); 3(F) : Midnapur, Belpahari, 11.ix.1985 (S. Biswas coll.); 1(F) : Midnapur, Haldia, 4.viii.1985 (B.C. Das & party coll.).

Measurement : Length of forewing, 17-20 mm.

Distribution : Oriental including India (Sikkim, Assam, West Bengal : Calcutta, 24-Parganas, Howrah, Bankura, Midnapur, Birbhum, Malda and Darjiling, Orissa, South India, Central India, Rajasthan, Punjab, Himachal Pradesh, Jammu and Kashmir and the Central Nicobars) and Australian regions.

Remarks : The present record confirms the distribution of the species in West Bengal.

Genus *Baoris* Moore

1881. *Baoris* Moore, *Lep. Ceyl.*, 1 : 165.

Type-species.- *Hesperia oceia* Hewitson

Diagnostic characters : Palpi : short and stout, second segment quadrantic, third short and conical. Antennae : number of segments of nudum equal to that on the right angled apiculus. Forewing : Cu_{1b} slightly nearer to upper end of cell, dorsally with a paint brush and ventrally with a brand in male. Hindwing : unmarked.

Remarks : It is reported to be distributed from India to Java and Philippines. Altogether three species are known from India of which only one is dealt with here.

31. *Baoris farri* (Moore)

1878. *Hesperia farri* Moore, *Proc. zool. Soc. Lond.*, p. 688.

1949. *Baoris farri* (Moore), Evans, *A Catalogue of the Hesperiidæ from Europe, Asia and Australia in Brit. Mus.*, (nat. Hist.), p. 448.

Diagnostic characters : Forewing : dorsally with white hyaline spots, cell spots not conjoined, ventrally with a polished grey dorsal area in the centre of which lying an oval brand in male and without pale supper scaling. Hindwing : dorsally with a black recumbent paint brush overlying a scent pouch in the cell in male. Genitalia : claspers with a spur at the back of cuiller, top of cuiller rounded, aedeagus spined on right side.

Distribution : Oriental region including India (Sikkim, Assam, West Bengal : Calcutta, Hooghly and Nadia, South India, Central India, Uttar Pradesh, the Andamans and Nicobars).

Remarks : Only two subspecies are so far known from India of which only one is dealt with below.

31 (a) *Baoris farri farri* (Moore)

1949. *Baoris farri farri* (Moore), Evans, *A Catalogue of the HesperIIDae from Europe, Asia and Australia in Brit. Mus. (nat. Hist.)*, p. 448.

Diagnostic characters : Forewing : dorsally with fully developed spots, two in cell, three discal, Hindwing : rather pale silky brown.

Material examined : 1(M) : Bansdrani, Calcutta, 4.xii.1955 (A. Suroto coll.); 2(F) : Nadia, Kalyani, 20.viii.1965 (H.C. Ghosh & party coll.) 1(M) : Hooghly Dist., Chandannagar, 14.xii.1965 (P. Parui & party coll.).

Measurements : Length of fore wing, 17-21 mm.

Distribution : As for the species.

Remarks : The present record confirms the distribution of the species from West Bengal.

Genus *Caltoris* Swinhoe

1893. *Caltoris* Swinhoe, *Trans. ent. Soc. Lond.*, p. 323.

Type-species.- *Hesperia kumara* Moore

Diagnostic characters : Palpi : much stouter, second segment quadrantic, third short, stout and conical. antennae : number of segments on the club equal to right angled apiculus; longer and nearly equal to half costa. Forewing : Cu_{1b} originating before R_1 and nearer to upper end of cell than to base. Hindwing : ventrally without a cell spot, generally unmarked. Legs : mid tibiae unspined.

Remarks : It is reported to be distributed from India to New Guinea. Altogether eleven species are known from India of which only one is dealt with.

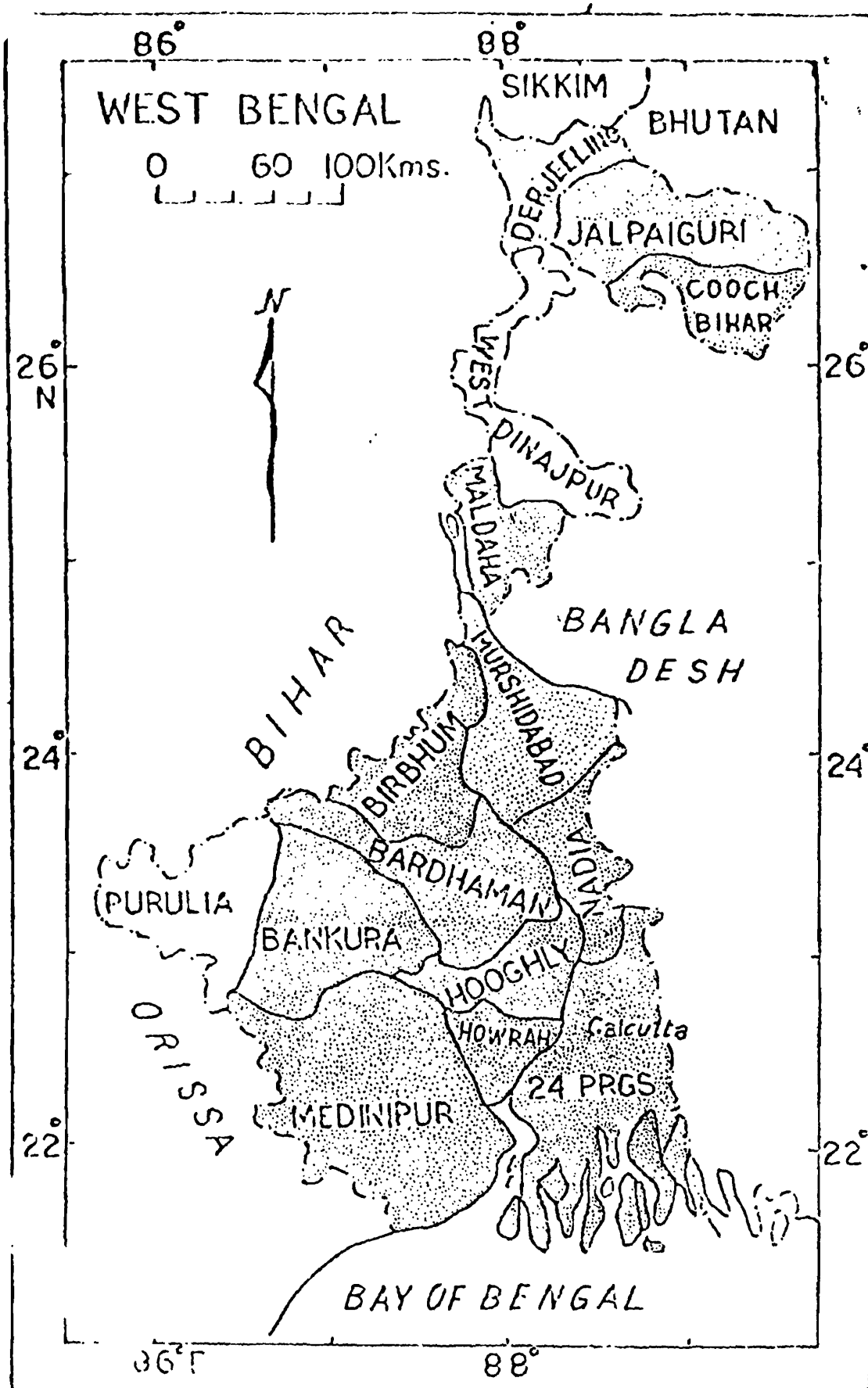
32. *Caltoris cahira* (Moore)

1877. *Parnara cahira* Moore, *Proc. zool. Soc. Lond.*, 593.

1949. *Caltoris cahira* (Moore), Evans, *A Catalogue of the HesperIIDae from Europe, Asia and Australia in Brit. Mus. (nat. Hist.)*, p. 452.

Diagnostic characters : Wings : broad and dark brown. Forewing : dorsally with well marked cell spots and without discal stigma, upper cell spot, if present, always smaller than lower spot, termen even. Hindwing : scaled ochreous brown ventrally. Genitalia : top of cuiller rounded and valva projecting, cuiller and valva subequal in length and also deeply divided, aedeagus not tapered, ends of gnathos not expanded at all.

Distribution : Oriental region including India (Sikkim, Assam, West Bengal : Calcutta, Meghalaya, Manipur the Andamans and Central Nicobars).



Map 1

Remarks : Only two subspecies are known from India of which only one is dealt with here.

32 (a) *Caltoris cahira cahira* (Moore)

1949. *Caltoris cahira cahira* (Moore), Evans, *A Catalogue of the Hesperiiidae from Europe, Asia and Australia in Brit. Mus. (nat. Hist.)*, p. 453.

Diagnostic characters : Dark and large. Forewing : dorsally with well marked cell spot but discal spot in space between Cu_{1a} and M_3 absent in males.

Material examined : 1(M) : Collns. Indian Museum, no other data.

Measurements : Length of fore wing, 17 mm.

Distribution : Oriental region, including India (West Bengal : Calcutta and the Andamans and Nicobars).

Remark : The sub-species is for the first time recorded from West Bengal.

SUMMARY

The paper incorporates the taxonomic account of the fauna belonging to the family Hesperiiidae collected by different survey parties from Zoological Survey of India and also those lying identified in the National Zoological Collections. Amongst a total of 32 species and subspecies examined, 13 subspecies have been established as new locality records for the area under consideration. Running keys to all the taxa, a brief taxonomical note, wherever necessary, relevant illustrations and references have been provided. Besides, the distribution of the species/subspecies in West Bengal and also in different zoogeographical realms of the world has also been included.

ACKNOWLEDGEMENTS

The authors are grateful to the Director, Zoological survey of India, Calcutta, for providing the laboratory facilities and Dr. B. Dutta, Superintending Zoologist (Retd.) for helping us in many ways.

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INSECTA : PYRALIDAE

D. P. Bhattacharya
Zoological Survey of India, Calcutta.

INTRODUCTION

The present work deals mainly with the systematic account, keys diagnostic characters, distribution etc. of the family Pyralidae of West Bengal and is based on the material collected by different survey parties of the Zoological Survey of India and also the specimens received from other sources. This also includes the old collections present in the National Zoological Collection (NZC) at Zoological Survey of India, Calcutta. Material reviewed from the literature are based mainly on *Fauna British India* by Hampson (1896).

The faunistic surveys conducted by different survey parties from ZSI mainly include : *Calcutta* (A.P. Kapur, August 1957, Oct. 1949, '57, '60, G.S. Arora, June, Nov. 1965, A.R. Bhaumik, Feb. 1959, H.C. Ghose, Feb., May, 1967, Oct. 1966, S.K. Ghosh, Oct., 1962, B. Biswas, April, 1950, Dr. Roychaudhury, Sept. 1939, Mrs. C. Sarkar, July, 1985, K.S. Pradhan and K.V. Lakshminarayan, Aug., 1965, H.L. Paul, Oct. 1965, K.R. Rao, Nov. 1961, S. Ali, Aug. 1958, Z.S.I. Survey Party, Nov. 1961 and old collections present in NZC by N. Annandale, No. date; A.W. Alcock, No. date; Young, July, 1901; Indian Museum collections, Jan. 1871, April, 1890, 1907, June, 1890, July, 1891, Aug. 1894, '95, Sept.-Oct. 1901, Nov. 1900, Dec. 1891). *Haora* (K.R. Rao, Oct. 1965). *North 24-Parganas* (A.R. Bhaumik, Feb. 1959, O.B. Chhotani, Sept. 1965, H.C. Ghose, Feb. 1966, K.V. Lakshminarayanan and K.D. Chatterjee, Oct. 1961). *South 24-Parganas* (R.K. Varshney and S. Ali, Dec 1961, G.S. Arora, June, Nov. 1965, Survey Party of Z.S.I. Nov. 1961 and Old collections of NZC, April, 1907). *Hugli* (Baboo Girish Chandra Chakraborty, Jan, 1895, A.N.T. Joseph, Oct. 1964, K.S. Pradhan, Sept. 1965, H.L. Paul, Sept. 1966, K.R. Rao, Dec. 1961 N.C. Chatterjee, June, Sept. 1950). *Nadia* (N. Ghosh, Feb. 1980). *Murshidabad* (I.J. Gupta, Feb. 1986). *Maldah* (M.S. Shishodia, July, 1986). *Bankura* (K.K. Roy, July, 1988, Oct. 1985). *Purulia* (S.Sen, Nov. 1985, A.K. Hazra, Oct. 1983). *Medinipur* (K.K. Roy, March, 1984). *Darjiling* (E.J. Elwes, Aug. 1886, Lord Carmichael, July, 1912, C. Duncan, No. date, S. Mukherji, Feb., 1928. A.R. Bhaumik, May, 1971, J.K. Jonathan, May-June, 1974 and June 1975 and old collections present in NZC of 1901, 1904, 1912 and 'Purchased' collections with incomplete data.

The pioneering work of the family Pyralidae was done mainly from the then undivided Bengal by Moore (1867), though Walker (1856-66) published a list of specimens of lepidopterous insects present in the collection of the British Museum including India (Hindusthan). Hampson (1896) in *Fauna of British India* described about 1136 species of Pyralidae. Swinhoe and Cotes (1889) and Swinhoe (1900) published Catalogues on the family Pyralidae from India and Eastern and Australian regions respectively. Meyrick (1906, '09, '14) described Indian Micro-lepidoptera including the family Pyralidae. Stebbing (1903) published a note on the pests from the Entomological Section. Indian

Museum, Calcutta. Klima (1937, '39) published Catalogues on the subfamilies Scoparinae, Nymphulinae and Pyraustinae. Sevastopulo (1945-56) also published some papers on the lepidoptera of Darjiling and Tukdah.

According to Hampson (1896) the family Pyralidae includes 12 subfamilies. In each of the subfamilies the present records of species from the state are indicated. Under subfamily Galleriinae out of 8 species in 7 genera known from India, 4 species in 4 genera are recorded from West Bengal. Subfamily Crambinae includes 61 species in 13 genera from India of which 8 species in 8 genera are reported from West Bengal. Under subfamily Schoenobiinae 25 species in 10 genera are recorded from India, of these 7 species in 5 genera are reported from West Bengal. 27 species under 8 genera and 4 species in 2 genera are recorded respectively from India and West Bengal under subfamily Anerastiinae. Subfamily Phycitinae 61 includes species under 19 genera from India of which 12 species in 8 genera are reported from West Bengal. 32 species under 6 genera and 5 species in 4 genera are recorded from India and West Bengal respectively under the subfamily Epipaschiinae. Subfamily Chrysauginae has no records from West Bengal but one species is reported from Andamans. Out of 21 species in 9 genera from India only 2 species in 1 genus are recorded from West Bengal under the subfamily Endotrichinae. Subfamily Pyralinae includes 82 species in 27 genera from India of which 7 species under 5 genera are recorded from India, 16 species in 10 genera are reported from West Bengal under the subfamily Hydrocampinae. Scopariinae includes 11 species in 3 genera from India of which 3 species in 2 genera are recorded from West Bengal. With the record of about 441 species in 87 genera from India and 72 species in 35 genera from West Bengal Pyraustinae represents the largest of all the subfamilies.

Sevastopulo (1935) listed 91 species of Pyralidae from Calcutta of which 44 species are not included in the present study due to paucity of material at hand. However a list of such species has been furnished subfamilywise with earlier locality records (vide Appendix).

Collection Methodology : Pyralidae are collected best by 'light trap'. For other collection methods please vide earlier papers of the author.

SYSTEMATIC ACCOUNT

Subfamily GALLERIINAE

Key to the Genera of GALLERIINAE from West Bengal.

1. Hind wing with three veins arising from median nervure 2
 Hind wing with four veins arising from median nervure *Galleria* Fabricius
2. Hind wing R_5 anastomosing with $Sc + R_1$ to about two-thirds of wing, cell open 3
 Hind wing R_5 anastomosing with $Sc + R_1$ almost to apex, cell closed
 *Achroia* Hubner

3. Fore wing R_2 arising from cell *Corcyra* Ragonot
 Fore wing R_2 not arising from cell *Trachylepidia* Ragonot

Genus 1. *Trachylepidia* Ragonot

1887. *Trachylepidia* Ragonot, *Ann. Soc. Ent. France*, p. 260.
 One species under this genus is known from India and West Bengal.

1. *Trachylepidia fructicassiella* Ragonot

1887. *Trachylepidia fructicassiella* Ragonot, *Ann. Soc. Ent. France*, p. 260.
 1896. *Trachylepidia fructicassiella*, Hampson, *Fauna Brit. India*, Moths, 4 : 4, fig. 2.

Material examined : Ten (MM), 4 (FF), Hugly district, 2.i. 1895 (Baboo G.C. Chakraborty Coll.), 1 (F), Kurseong, Darjiling dist., (Purchased, no other data). Wing exp. (M) 21-28 mm; (F) 30-33 mm.

Diagnostic characters : Brownish grey. Fore wing median area clothed with rough, dark erect scales; a marginal series of specks. Hind wing dull brown. The larva bores in the pods of the seed of *Cassia fistula* Linn., commonly known as sondal.

Distribution : India : West Bengal (Darjiling, Hugly), Punjab; also Africa (Egypt) and Lebanon (Beirut).

Remarks : This is the first specific report of the species from West Bengal.

Genus 2. *Achroria* Hubner

- 1819 (1816-1826). *Achroria* Hubner, *Verz. bek. Schmett.*, p. 163.
 One species under this genus is known from India as well as West Bengal.

2. *Achroria grisella* (Fabricius)

1794. *Tinea grisella* Fabricius, *Ent. Syst.*, 3 (2) : 289 (no.10).
 1986. *Achroria grisella*. Clarke, *Smithson. Contrbn. Zool.*, No. 416, pp. 21-23, fig. 16.

Material examined : Ten (MM), 9 (FF), Calcutta (bred in Indian Mus.), 18.vi.1890, (No other details). Wing exp. 18-20 mm.

Diagnostic characters : Uniform greyish brown. Head yellow. Fore wing short and rounded; a glandular fold fringed with hair at base of below costa in male. Hind wing with the apex acute.

Distribution : India : West Bengal (Calcutta); Sikkim; also Africa; Australia; Europe; Japan; Madagascar; Marquesas Island; North America and Sri Lanka.

Remarks : The larva feeds on the comb of honey-bee, dried fruits like apples and raisins and is commonly known as lesser wax moth.

Genus 3. *Corcyra* Ragonot

1885. *Corcyra* Ragonot, *Ent. mon. mag.*, 22 : 23.

One species under this genus is known from India and West Bengal.

3. *Corcyra cephalonica* (Stainton)

1866. *Melissoblaptes cephalonica* Stainton, *Ent. mon. Mag.*, 2 : 172.

1985. *Corcyra cephalonica*, Rose and Pajni, *Res. Bull. (Sci.) Panjab Univ.*, 36(3-4), 215.

Material examined : Five (M), 6 (F), Calcutta, Aug-Nov. 1975 (G. Joshi Coll.)

Diagnostic characters : Colour brownish grey. Fore wing elongate and narrow; rough erect scales towards costa. Hind wing pale. Wing exp. 17-20 mm.

Distribution : India : West Bengal (Calcutta), Uttar Pradesh (Dehra Dun) and throughout India also in warm and tropical countries of the world. Cosmopolitan.

Remarks : Commonly known as 'Rice Meal Moth', it is a well known pest of stored products of rice, wheat, ragi, tur, jola, gram, dried fruits etc. also a predator of lac insect, *Kerria lacca* (Kerr.)

Genus 4. *Galleria* Fabricius

1798. *Galleria* Fabricius, *Ent. Syst. Suppl.*, p. 492.

One species under this genus is known from India and also from West Bengal.

4. *Galleria mellonella* (Linnaeus)

1766. *Phalaena (Tinea) mellonella* Linnaeus, *Syst. Nat.*, (ed.10), 1 : 537.

1935. *Galleria mellonella*, Sevastopulo, *J. Bombay nat. Hist. Soc.*, 38(1) : 204-205.

Material : Material reviewed from the literature.

Diagnostic characters : Colour pale yellowish brown. Fore wing grey tinged with black and purple, outer margin angled. Hind wing fuscous brown. Wing exp. 20-40 mm.

Distribution : India : West Bengal (Calcutta), Maharashtra (Poona); also from Europe; Syria and West Indies.

Remarks : The larva is parasitic in bee-hives and the species is commonly known as wax moth.

Subfamily CRAMBINAE

Key to the genera of CRAMBINAE

1. Hind wing with M_1 from upper angle of cell 2
 Hind wing with M_1 from below angle of cell 3
2. Fore wing R_5 present 4
 Fore wing R_5 absent *Culladia* Moore
3. Fore wing R_5 stalked with R_3 and R_4 *Ancylolomia* Hubner
 Fore wing R_5 not stalked with R_3 and R_4 *Charltona* Swinhoe
4. Fore wing R_5 from cell 5
 Fore wing R_5 not from cell 7
5. Frons rounded and not produced *Platytes* Guenee
 Frons not rounded but produced 6
6. Fore wing M_1 and R_5 stalked *Stenochilo* Hampson
 Fore wing M_1 and R_5 not stalked *Chilo* Zincken
7. Fore wing R_2 from cell *Crambus* Fabricius
 Fore wing R_2 stalked with R_3 , R_4 and R_5 *Macrochilo* Hampson

Genus 5. *Culladia* Moore

1886. *Culladia* Moore, *Lep. Ceyl.*, 3 : 383.

Two species under this genus are known from India of which one is recorded from West Bengal.

5. *Culladia admigratella* (Walker)

1863. *Araxes admigratella* Walker, 27 : 192.

1900. *Culladia admigratella*, swinhoe, *Cat. East. Aust. Lep. Het.*, pt.2 : 416.

Material examined : One (M), Kurseong, Darjiling dist., (Purchased Coll.)

Diagnostic characters : Body pale fuscous white. Fore wing with an indistinct postmedial line.

Hind wing whitish. Wing exp. 16 mm.

Distribution : India : West Bengal (Kurseong); also Borneo; China and Sri Lanka.

Remarks : This is the first specific report of the species from Kurseong, Darjiling district, West Bengal and also from India.

Genus 6. *Crambus* Fabricius

1798. *Crambus* Fabricius, *Ent. Syst. Suppl.*, p. 464.

Sixteen species under this genus are reported from India of which one species is recorded from West Bengal.

6. *Crambus atkinsoni* (Zeller)

1863. *Calamotropha atkinsoni* Zeller, *Monogr. Chilo et Cramb.*, p. 9.

1896. *Crambus atkinsoni*, Hampson, *Fauna Brit. India*, Moths, 4 : 12.

Material examined : Material reviewed from the literature.

Diagnostic characters : Body and fore wing brownish grey; a fuscous streak along median nervure, a black discocellular spot. Hind wing pure white. Wing exp. (M) 28mm., (F) 28-34 mm.

Distribution : India : West Bengal (Calcutta); also Borneo; Burma (Thayetmyo) and Sri Lanka.

Remarks : The species is known in India from Calcutta only.

Genus 7. *Platytes* Guenee

1845. *Platytes* Guenee, *Eur. Microlep. Ind. Meth.*, p. 86.

Ten species under this genus are recorded from India of which one is reported from Kurseong, West Bengal.

7. *Platytes paralella* (Zeller)

1867. *Crambus parallelus* zeller, *Stettin. ent. Zeit.*, p. 389, pl.2, fig. 1.

1896. *Platytes paralella*, Hampson, *Fauna Brit. India*, Moths, 4 : 20.

Material examined : Three (M), 1 (F), Kurseong, Darjiling dist., (Purchased Coll.).

Diagnostic characters : Head white. Thorax white striped with rufous. Abdomen pale fuscous. Fore wing whitish rufous, a dark line from costa beyond middle, a black discocellular speck, a dark postmedial line. Hind wing whitish. Wing exp. 20 mm.

Distribution : India : West Bengal (Darjiling, Kurseong), Meghalaya (Khasis) and Sikkim.

Remarks : The species is known to occur in Darjiling and Kurseong in West Bengal.

Genus 8. *Stenochilo* Hampson

1895. *Stenochilo* Hampson, *Proc. zool. Soc. Lond.*, p. 950.

One species under this genus is known from India and West Bengal.

8. *Stenochilo canicostalis* Hampson

1895. *Stenochilo canicostalis* Hampson, *Proc. zool. Soc. Lond.*, p. 950.

Material examined : Material reviewed from the literature.

Diagnostic characters : Brownish red. Fore wing with a white spot in the middle of the cell. Hind wing white hyaline. Wing exp. 29-30 mm.

Distribution : India : West Bengal (Calcutta); and Pakistan, Sind.

Remarks : From India the species is recorded from Calcutta.

Genus 9. *Macrochilo* Hampson

1895. *Macrochilo* Hampson, *Proc. zool. Soc. Lond.*, p. 950.

One species under this genus is known from India and West Bengal.

9. *Macrochilo ambiguellus* (Snellen)

1890. *Chilo ? ambiguellus* Snellen, *Trans. ent. Soc. Lond.*, p. 642, pl. 20, fig. 4.

1896. *Macrochilo ambiguellus*, Hampson, *Fauna Brit. India*, Moths, 4 : 25, fig. 16.

Material examined : One (M), Darjiling, vii. 1886 (E.J. Elwes coll.).

Diagnostic characters : Yellowish brown. Fore wing with a spot at middle of cell, another below it, a small annulus in upper angle; a sinous postmedial series of dark spots. Hind wing white. Underside with a black spot at upper angle of cell on both wings.

Distribution : India : West Bengal (Darjiling), Meghalaya (Khasis) and Sikkim.

Remarks : The species is recorded from Darjiling district of West Bengal.

Genus 10. *Chilo* Zincken

1817. *Chilo* Zincken, *Germar's Mag. Ent.*, 2 : p. 33.

Nine species under this genus are known from India of which four are recorded from West Bengal. Due to paucity of material only one species is described here. The other species are *Chilo auricilius* Dudg., *C. polychrysa* (Meyr.) and *C. partellus* (Swinhoe) all major pests of cereals.

10. *Chilo suppressalis* (Walker)

1863. *Crambus suppressalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 27 : 166.

1963. *Chilo suppressalis*, Singh, *Plant Prot. Bull.*, New Delhi, 11 (1-4) : 2.

Material examined : Two (F), Berhampur, Murshidabad dist., (No other details), 3 (M), 4 (F), Calcutta, 10.ii.1959 (A. R. Bhaumick Coll.), 1 (F), Calcutta, 26.x.1949 (A. P. Kapur coll.).

Diagnostic characters : Head and thorax brownish white. Abdomen pale brown. Fore wing brownish white with a streak below median nervure and a patch in cell; silvery spots on a sinous rufous median line on discocellulars and below M_2 , a similar line on outer edge, a marginal series of black specks; cilia rufous. Hind wing white. Female deep orange fulvous; the tines almost absolute one or two silvery spots below the cell; post medial area irrorated with silvery scales. Wing exp. 18-20 mm.

Distribution : India : West Bengal (Calcutta, Murshidabad), Assam (Sibsagar); also Burma; China; Japan; Korea; Malaya; Pakistan; Philippines; Sri Lanka, Taiwan and USSR (East Siberia).

Remarks : The species, a rice stem borer is commonly known as 'Striped stalk borer' or 'Striped borer' or 'Rice Chilo'.

Genus 11. *Ancylolomia* Hubner

1818-25. *Ancylolomia* Hubner, *Verz. bek. Schmett.*, p. 363.

Four species under this genus are known from India of which one is recorded from West Bengal.

11. *Ancylolomia chrysographella* (Kollar)

1844. *Chilo chrysographellus* Kollar, *Hugel's Kachmir*, 4 : 494.

1964. *Ancylolomia chrysographella*, Kapur, *Symp. Major Ins. Pests Rice Phillip.*, p. 9A.

Material examined : One (M), Puruliya, 21.xi.1985 (S. Sen and Party Coll.); 1 (M), Calcutta, 10.viii. 1957 (A.P. Kapur Coll), 1 (M), Calcutta, 20.v.1967 (H.C. Ghosh Coll.) and 1 (M), July, 1901 (Young Coll.).

Diagnostic characters : Brownish pale yellow. Fore wing with black streaks on silvery and yellow fasciae in cell and interspaces beyond and below the cell; a submarginal silvery line and marginal white band with black streaks; cilia silvery white. Hind wing whitish brown. Wing exp. (M) 20-30; (F) 30-45 mm.

Distribution : India : West Bengal (Calcutta and Puruliya), throughout India; also Burma; China; Japan; Malaya (Penang); South Africa; Southern Yemen (Aden) and Sri Lanka.

Remarks : The species is a major insect pest of rice, a rice stem borer.

Genus 12. *Charltona* Swinhoe

1885. *Charltona* Swinhoe, *Proc. zool. Soc. Lond.*, p. 878.

Six species under this genus are known from India of which one is recorded from West Bengal.

12. *Charltona consociella* (Walker)

1863. *Crambus consociellus* Walker, *Cat. Lep. Het. Brit. Mus.*, 27:159.

1896. *Charltona consociella*, Hampson, *Fauna Brit. India, Moths*, 4 : 36.

Material examined : Material reviewed from the literature.

Diagnostic characters : Pale yellow. Fore wing yellowish brown; costa brown, two black fascia one below median nervure, another from the end of cell to outer margin; a series of black marginal specks. Hind wing white. Wing exp. (M) 34 mm. (F) 44 mm.

Distribution : India : West Bengal (Calcutta); also North America.

Remarks : The species is recorded from Calcutta only.

Subfamily SCHOENOBIINAE

Key to the genera of SCHOENOBIINAE of West Bengal

1. Fore wing R_2 stalked with R_3 and R_4 *Patissa* Moore
 Fore wing R_2 free from R_3 and R_4 2
2. Fore wing Sc and R_1 running straight 3
 Fore wing Sc and R_1 anastomosed or R_1 not running straight 4
3. Labial palpi once to twice the length of head *Scirpophaga* Treitschke
 Labial palpi three to four times length of head *Schoenobius* Duponchel
4. Labial palpus with apical segment less than one third the length of second segment
 *Niphadoses* Common.
 Labial palpus with apical segment more than one half the length of second segment
 *Tryporyza* Common.

Genus 13. *Patissa* Moore

1886. *Patissa* Moore, *Lep. Ceyl.*, 3 : 388.

Six species under this genus are known from India of which only one species is recorded from West Bengal.

13. *Patissa luteifrons* Hampson

1896. *Patissa luteifrons* Hampson, *Fauna Brit. India*, Moths, 4 : 45.

Material examined : Material reviewed from the literature.

Diagnostic characters : Silky white. Antennae serrated, basal joint fulvous yellow. Palpi and frons dull yellow. Abdomen and legs tinged with yellow. Legs brown above. Fore wing costa narrowly dull yellow. Wing exp. 28 mm.

Distribution : India : West Bengal (Calcutta).

Remarks : The species is recorded from Calcutta, West Bengal.

Genus 14. *Scirpophaga* Treitschke

1832. *Scirpophaga* Treitschke, Schmett. *Eur.*, 9(1) : 55.

Four species are known under this genus from India of which one is reported from West Bengal.

14. *Scirpophaga bisignata* (Swinhoe)

1885. *Schoenobius bisignata* Swinhoe *Proc. zool. Soc. Lond.*, p. 878.

1896. *Scirpophaga bisignata*, Hampson, *Fauna Brit. India*, Moths, 4 : 47.

Material examined : Material reviewed from the literature.

Diagnostic characters : Brownish pale yellow. Fore wing with traces of a speak on anal vein towards outer angle and with black spots at lower angle of cell. Hind wing whitish. Wing exp. 16 mm.

Distribution : India : West Bengal (Calcutta, Barrackpore, North 24-Parganas) also Madhya Pradesh (Mhow), Maharashtra; and Pakistan (Karachi).

Remarks : The species is known to occur at Calcutta and Barrackpore in West Bengal.

Genus 15. *Schoenobius* Duponchel

1844. *Schoenobius* Duponchel, *Cat. Lep. Eur.*, p. 312.

Four species under this genus are known from India of which three are recorded from West Bengal.

Key to the species of *Schoenobius* from West Bengal

1. Second joint of labial palpus about twice the length of head..... *immeritalis* (Walker)
 Second joint of labial palpus about three times the length of head.2
2. Fore wing with dark specks below middle of cell..... *adjurellus* (Walker)
 Fore wing without dark specks below middle of cell. *bipunctifer* (Walker)

15. *Schoenobius immeritalis* (Walker)

1859. *Dasara immeritalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 19:830.

1896. *Schoenobius immeritalis*, Hampson, *Fauna Brit. India*, Moths, 4 : 47-48.

Material examined : Material reviewed from the literature.

Diagnostic characters : Male bright pale yellow. Hind wing paler yellow. Female pale yellow or straw yellow. Hind wing whitish. Wing Exp. (M) 14-20 mm., (F) 14-28 mm.

Distribution : India : West Bengal (Calcutta), Himachal Pradesh (Dharmasala); also Sri Lanka and Thailand.

16. *Schoenobius adjurellus* (Walker)

1863. *Catagela adjurella* Walker, *Cat. Lep. Het. Brit. Mus.*, 27:191.

1896. *Schoenobius adjurellus*, Hampson, *Fauna Brit. India*, Moths, 4 : 48.

Material examined : One (M), Dum Dum, North 24-Parganas dist., 10.ii.1959 (A.R. Bhaumick Coll.) and 1 (M), Calcutta, Eden Gardens, 13.xi.1959 (A.P. Kapur Coll.).

Diagnostic characters : Head and thorax reddish brown. Fore wing with dark specks at lower angle of cell and below middle of cell; a dentate dark line from costa before apex; marginal series of dark specks. Hind wing pale brown. Wing exp. 20-24 mm.

Distribution : India : West Bengal (Calcutta, North 24-Parganas), Assam; and Sri Lanka.

Remarks : From West Bengal the species is recorded from Calcutta and Dum Dum only.

17. *Schoenobius bipunctifer* (Walker)

1863. *Tapanaea bipunctifera* Walker, *Cat. Lep. Het. Brit. Mus.*, 28:523

1896. *Schoenobius bipunctifera*, Hampson, *Fauna Brit. India*, Moths, 4 : 48, fig. 32 (F).

Material examined : One (M), 10 (F), Calcutta, 24.x.1962 (S. K. Ghosh and Party Coll.), 1 (F), Calcutta, 16.xi.1961, (ZSI Survey Party Coll.), 1 (F), Canning, South 24-Parganas, 18.vi.1965 (G. S.

Arora and Party Coll.).

Diagnostic characters : Body yellowish white. Fore wing orange yellow; a black spot at lower angle of cell. Hind wing white. Wing exp. 24-36 mm.

Distribution : India : West Bengal (Calcutta, South 24-Parganas); Maharashtra (Bombay, Poona); and Borneo; Burma; China; Java; Sri Lanka; Sumatra and Taiwan.

Remarks : Hampson (1896) reported the distribution of the species as throughout India.

Genus 16. *Niphadoses* Common

1960. *Niphadoses* Common, *Austr. J. zool.*, 8 (2) : 330.

One species under this genus is recorded from India as well as West Bengal.

18. *Niphadoses gilviberbis* (Zeller)

1863. *Scirpophaga gilviberbis* Zeller, *Monogr. Chilo et Cramb.*, p.2.

1960. *Niphadoses gilviberbis*, Common, *Austr. J. Zool.*, 8(2) : 331.

Material examined : Material reviewed from the literature.

Diagnostic characters : Both wings pure white in male, fore wing brownish in female; the outer hairs of the anal tuft white; underside of fore wing suffused with brown in male. Wing exp. (M) 16-18 mm, (F) 18-24 mm.

Distribution : India : West Bengal (Calcutta), Kerala and Tamil Nadu (Nilgiris); also Burma and Sri Lanka.

Remarks : The species is recorded as a pest of rice *Oryza sativa*.

Genus 17. *Tryporyza* Common

1960. *Tryporyza* Common; *Austr. J. Zool.*, 8(2) : 339.

One species under this genus is recorded from India as well as West Bengal.

19. *Tryporyza incertulas* (Walker)

1863. *Chilo incertulas* Walker, *Cat. Lep. Het. Brit. Mus.*, 27:143.

1964. *Tryporyza incertulas*, Kapur, *Taxonom. Rice Stem Borers*, p. 30A.

Material examined : Two (MM), Calcutta, 24.x.1962 (S.K. Ghosh Coll.); 1 (M), Calcutta

26.x.1949 (A.P. Kapur Coll.); 2 (FF), Dum Dum, North 24-Parganas, 10.ii.1959 (A.R. Bhaumik Coll.); 2 (MM); Calcutta, 9.iv.1907 (Collector not mentioned), 2 (MM), 1 (F), Canning, South 24-Parganas, 18.xi.1965 (G.S. Arora and Party Coll.); 1 (F), Calcutta, 23.ix. 1950 (B. Biswas Coll.); 13 (MM), Chandannagar, Hugli Dist., 28.ix.1965 (K.S. Pradhan Coll.); 1 (F), Calcutta, 19.x.1966 (H.C. Ghosh Coll.); 1 (F), Calcutta, 16.xi. 1961 (Survey Party ZSI); 9 (MM), 1 (F), Barrackpore, N. 24-Parganas, 29.xi.1965 (O.B. Chhotani Coll.); 3 (FF), Jhargram, Medinipur dist., 6.iii. 1984 (K.K. Ray Coll); 1 (M), 3 (FF), Calcutta, 24.x.1962 (S.K. Ghosh Coll.); 1 (F), Uttarpara, Hugli dist., 6.ix.1960 (H.L. Paul Coll.); 1 (M) Dum Dum; North 24-Parganas, 10.ii.1959 (A.R. Bhaumik Coll.); 1 (F), Bishnupur, South 24-Parganas, 16.xi.1961; 2 (MM), Champahati; South 24-Parganas, 16.xi.1961 (Survey Party of ZSI); 1 (F), Bankura town, Bankura dist., 8.x.1985 (K.K. Roy and Party Coll.). Wing exp. (M) 18-22 mm. (F) 34 mm.

Diagnostic characters : Male colour brownish yellow. Fore wing with a black spot at lower angle of cell; a pale oblique line from apex to vein Cu_{1B} ; a marginal series of black specks. Hind wing pale yellowish white. Female colour brownish. Hind wing pale brown. Wing exp. (M) 18-22 mm (F) 34 mm.

Distribution : India : West Bengal (Bankura, Calcutta, Hugli, Medinipur, North and South 24-Parganas; Nagaland; also Borneo; Burma (Rangoon); Java and Sri Lanka.

Remarks : The species is a serious pest of rice, *Oryza sativa*.

Subfamily ANERASTIINAE

Key to the genera of ANERASTIINAE from West Bengal

Fore wing with three veins arising from median nervure, M_3 absent *Hypsotropha* Zeller

Fore wing with four veins arising from median nervure, M_3 present *Poujadia* Ragonot

Genus 18. *Hypsotropha* Zeller

1848. *Hypsotropha*, Zeller, *Isis*, p. 591,

Four species under this genus are known from India of which two are recorded from West Bengal.

Key to the species of *Hypsotropha* from West Bengal

1. Fore wing with a white costal fascia narrowing to apex *laterculella* (Zeller)

Fore wing without a white costal fascia *sceletella* (Zeller)

20. *Hypsotropha laterculella* (Zeller)

1867. *Anerastia laterculella* Zeller, *Stettin ent. Zeit.*, p. 403.

1896. *Hypsotropha laterculella*, Hampson, *Fauna Brit. Mus.*, Moths, 4 : 55.

Material examined : Material reviewed from the literature.

Diagnostic characters : Head and thorax brownish red. Palpi porrect. Abdomen whitish brown. Fore wing yellowish red; a discocellular and postmedial series of dark specks. Hind wing whitish yellow. Wing exp. 26 mm.

Distribution : India : West Bengal (Calcutta).

Remarks : The species is recorded from Calcutta only.

21. *Hypsotropha sceletella* (Zeller)

1867. *Anerastia sceletella* Zeller, *Stettin ent. Zeit.*, p. 404.

1896. *Hypsotropha sceletella*, Hampson, *Fauna Brit. India*, Moths, 4 : 54.

Material examined : Material reviewed from literature.

Diagnostic characters : Head and thorax pale pinkish red. Abdomen pale yellowish brown. Fore wing white with veins defined by pale pinkish lines. Hind wing white in female. Brown in male. Wing exp. (M) 22-24 mm. (F) 30 mm.

Distribution : India : West Bengal (Calcutta) also Himachal Pradesh (Kulu).

Remarks : Hampson (1896) reported the males of the species as unknown. The National Zoological collection in ZSI have several male examples of this species from Kulu, Himachal Pradesh, collected by Young. The males are smaller in size (22-24 mm) than the females (30 mm) also the veins are strongly defined by pink lines in males.

Genus 19. *Poujadia* Ragonot

1888. *Poujadia* Ragonot. *Nouv. Gen.*, p. 42.

Eight species are known from India under this genus of which two are recorded from West Bengal.

Key to the species of *Poujadia* from West Bengal

1. Fore wing with a dark discocellular speck. Hind wing pure white. *opificella* (Zeller)

Fore wing without any discocellular speck. Hind wing with a yellowish tinge.
..... *paucigraphella* (Ragonot)

22. *Poujadia opificella* (Zeller)1867. *Anerastia opificella* Zeller, *Stettin. ent. Zeit.*, p. 406.1896. *Poujadia opificella*, Hampson, *Fauna Brit. India*, Moths, 4 : 60.*Material examined* : Material reviewed from literature.*Diagnostic characters* : Head, thorax and abdomen pale yellow. Fore wing ochreous tinged with pink and very narrow; sometimes with ante and postmedial pale lines on inner area. Hind wing pure white. Wing exp. 24 mm.*Distribution* : India : West Bengal (Calcutta); also from Burma.*Remarks* : Hampson (1896) described only the female of the species.23. *Poujadia paucigraphella* (Ragonot)1883. *Baroda paucigraphella* Ragonot, *Nouv. Gen. Expec. Phyc. Gall.*, p. 42.1896. *Poujadia paucigraphella*, Hampson, *Fauna Brit. India*, Moths, 4 : 60.*Material examined* : Material reviewed from literature.*Diagnostic characters* : Vide key for the distinguishing characters from *opificella*. Wing exp. 18-26 mm.*Distribution* : India : West Bengal (Calcutta); Maharashtra (Bombay); also from Pakistan (Sind).

Subfamily PHYCITINAE

Key to the Genera of PHYCITINAE from West Bengal

- | | | |
|----|---|------------------------------|
| 1. | Hind wing with three veins arising from median nervure..... | 2 |
| | Hind wing with four veins arising from median nervure. | 5 |
| 2. | Fore wing with R ₃ absent. | 3 |
| - | Fore wing with R ₃ present and stalked with R ₄ | 4 |
| 3. | Fore wing with M ₃ absent | <i>Cadra</i> Walker |
| - | Fore wing with M ₃ present | <i>Homoeosoma</i> Curtis |
| 4. | Hind wing with Cu _{1b} from or from close to angle of Cell | <i>Heterographis</i> Ragonot |
| - | Hind wing with Cu _{1b} from well before angle of cell..... | <i>Euzophera</i> Zeller |

5. Hind wing with M_2 stalked with M_3 6
 Hind wing with M_2 from angle of cell *Spatulipalpia* Ragonot
6. Hind wing with Cu_{1a} approximated to or stalked with M_2 and M_3 7
 Hind wing with Cu_{1a} not approximated to or stalked with M_2 and M_3 *Phycita* Curtis
7. Fore wing with M_2 and M_3 approximated for some distance at origin
 *Nephoptyx* Hubner
- Fore wing with M_2 and M_3 well separated at origin. *Epicrocis* Zeller

Genus 20. *Cadra* Walker

1864. *Cadra* Walker, *Eur. Microlep. Ind. Meth.*, p. 81.

Two species under this genus are known from India of which one is record from West Bengal.

24. *Cadra cautella* (Walker)

1863. *Pempelia cautella* Walker, *Cat. Lep. Het. Brit. Mus.*, 28 : 73.

1986. *Cadra cautella*, Clarke, *Smith. Contr. Zool.*, No. 416 : 47-49.

Material examined : Four (MM), Calcutta, ix. 1939 (Dr. Ray Chaudhury Coll.) and 2 (MM), Calcutta, 9.vii.1955 (Mrs. C. Sarkar Coll.).

Diagnostic characters : Grey brown in colour. Fore wing with traces of an antemedial brown band and a dentate submarginal line. Hind wing semihyaline white with brownish tinge. Wing exp. (M) 14-16; (F) 18 mm.

Distribution : India : West Bengal (Calcutta); also Bhutan; Indonesia (Sumbawa); Marquesas Is. (Pacific Is.); Southern Yemen (Aden) and Sri Lanka.

Remarks : The species is commonly known as 'the fig moth', 'the dried currant moth' or 'the almont moth' and is a serious pest of dry fruits and vegetables. It is also a pest of rice and wheat in India.

Genus 21. *Homoeosoma* Curtis

1833. *Homoeosoma* Curtis, *Ent. Mag.*, 1 : 190.

Four species under this genus are known from India of which one is recorded from West Bengal.

25. *Homoeosoma goliathella* Ragonot

1888. *Homoeosoma goliathella* Ragonot, *Nouv. Gen. Espèces Phyc. Gall.*, p. 35.
 1896. *Homeosoma goliathella*, Hampson, *Fauna Brit. India*, Moths, 4 : 68.

Material examined : Material reviewed from the literature.

Diagnostic characters : Body olive brown or dark brown. Fore wing with traces of an antemedial and a postmedial dark line angled below and beyond the cell; two black discocellular spots; marginal series of black specks. Hind wing pale brown with marginal line brown. Wing exp. (F) 40 mm.

Distribution : India : West Bengal (Calcutta).

Remarks : Hampson (1896) described only the female of the species.

Genus 22. *Heterographis* Ragonot

1885. *Heterographis* Ragonot, *Ent. Mo. Mag.*, 22 : 31.

Five species under this genus are known from India of which three are recorded from West Bengal.

Key to the species of *Heterographis* from West Bengal

1. Fore wing with M_2 and M_3 from cell. *mysorella* Ragonot
 - Fore wing with M_2 and M_3 stalked 2
 2. Fore wing with costal half olive green and white, inner half vinous red.
 *bengalella* Ragonot
 - Fore wing brownish black, basal area more black. *resticula* Hampson

26. *Heterographis mysorella* Ragonot

1888. *Heterographis mysorella* Ragonot, *Nouv. Gen. Espèces Phyc. Gall.*, p. 29.
 1896. *Heterographis mysorella*, Hampson, *Fauna Brit. India*, Moths, 4 : 69.

Material examined : Three (MM), 1 (F), Kurseong, Darjiling dist., (very old purchased coll.).

Diagnostic characters : Brownish yellow in colour. Fore wing with a white costal fascia not reaching the apex. Two discocellular dark spots. Hind wing yellowish grey. Wing exp. 15 mm.

Distribution : India : West Bengal (Kurseong, Darjiling dist.) and South India.

Remarks : In West Bengal the species is recorded from Kurseong only.

27. *Heterographis bengalella* Ragonot

1891. *Heterographis bengalella* Ragonot, *Indian Mus. Notes*, 3 : 107.

1896. *Heterographis bengalella*, Hampson, *Fauna Brit., India, Moths*, 4 : 70.

Material examined : Four (MM), Calcutta, 10.viii. 1984; 1 (M), 7.ix. 1892, 7 (MM), 2 (FF), Calcutta, (No other details available).

Diagnostic characters : Head and collar olive green; thorax purplish; abdomen yellowish, basal segment whitish, second joint brownish. Hind wing semi-hyaline; the veins, a marginal line and a line through the cilia brown. Wing exp. 24 mm.

Distribution : India : West Bengal (Calcutta); and Bhutan.

Remarks : The species is a pest of custard apple. The larva bores in the fruit.

28. *Heterographis resticula* Hampson

1896. *Heterographis resticula* Hampson, *Fauna Brit. India, Moths*, 4 : 70.

Material examined : Material reviewed from the literature.

Diagnostic characters : Brownish black. Abdomen pale brown. Fore wing with an oblique antemedial line, angled on median nervure; a sinous pale yellow submarginal and a marginal line. Hind wing pale brown. Wing exp. 12 mm.

Distribution : India : West Bengal (Calcutta); and Sri Lanka.

Remarks : From India the species is recorded only from Calcutta.

Genus 23. *Euzophera* Zeller

1867. *Euzophera* Zeller, *Trans. Ent. Soc.*, (3) 5 : 456.

Two species under this genus are known from India and also from West Bengal.

Key to the species of *Euzophera* from West Bengal

1. Maxillary palpi triangularly scaled. Hind wing Cu_{1a} and M_2 stalked.
 *perticella* Ragonot
- Maxillary palpi filiform. Hind wing Cu_{1a} and M_2 from angle of cell
 *plumbeifasciella* Hampson

29. *Euzophera perticella* Rogonot1888. *Euzophera perticella*, Ragonot, *Nouv. Gen. Especies Phyc. Gall.*, p. 32.1896. *Euzophera perticella*, Hampson, *Fauna Brit. India*, Moths, 4 : 73, fig. 48.*Material examined* : One (M), Sheorafuly, Hugli district, 29.xii.1961, (K.R. Rao and Party Coll.).*Diagnostic characters* : Body pale reddish grey. Fore wing with a black dentate line from middle of costa to base of wing and terminating on inner margin before the middle; a pale discocellar mark; a post medial minutely dentate line. Hind wing whitish, the marginal area tinged with brown in female. Wing exp. (M) 26 mm. (F) 32 mm.*Distribution* : India : West Bengal (Calcutta); also Tamil Nadu and Kerala (Nilgiris); and Sri Lanka.*Remarks* : From West Bengal the species is available from Calcutta only.30. *Euzophera plumbeifasciella* Hampson1896. *Euzophera plumbeifasciella* Hampson, *Fauna Brit. Indian*, Moths, 4 : 73.*Material examined* : Material reviewed from the literature.*Diagnostic characters* : Body brown. Fore wing with antemedial, medial, postmedial, submarginal and marginal bands of scattered bluish-white scales. Hind wing pale brown. Wing exp. 16 mm.*Distribution* : India : West Bengal (Calcutta).*Remarks* : From India the species is recorded from Calcutta only.Genus 24. *Nephopteryx* Hubner1818-25 *Nephopteryx* Hubner, *Verz. bek. Schmett.*, p. 370.

Eleven species under this genus are known from India of which two are recorded from West Bengal.

Key to the species of *Nephopteryx* from West Bengal

1. Antennae of male not thickened. Palpi with second joint not excised
 *eugraphella* Ragonot
- Antennae of male thickened. Palpi with second joint excised *leucophaeella* Zeller

31. *Nephoptyx eugraphella* Ragonot

1888. *Nephoptyx eugraphella* Ragonot, *Nouv. Gen. Especies Phyc. Gall.*, p. 15.

1896. *Nephoptyx eugraphella*, Hampson, *Fauna Brit. India*, Moths, 4 : 77.

Material examined : Five (MM), Calcutta, 30.vii.1891, and 6 (MM), Calcutta, ix-x.1901 (Reared in Indian Museum).

Diagnostic characters : Head, thorax and abdomen grey. Fore wing brown irrorated with black; an oblique antemedial band and a postmedial line; two black discocellular specks. Hind wing semihyaline white. Wing exp. 22 mm.

Distribution : India : West Bengal (Calcutta) and Punjab.

Remarks : The larva feeds on cured Tobacco and Bakul tree (*Mimusops elengi*).

32. *Nephoptyx leucophaeella* Zeller

1867. *Nephoptyx leucophaeella* Zeller, *Stettin. ent. Zeit.*, p. 390.

1896. *Nephoptyx leucophaeella*, Hampson, *Fauna Brit. India*, Moths, 4 : 83.

Material examined : Material reviewed from the literature.

Diagnostic characters : Head, thorax and abdomen brownish black. Fore wing blackish brown, a black spot below cell. Hind wing pure white. Wing exp. 24 mm.

Distribution : India : West Bengal (Calcutta).

Remarks : From India the species is recorded from Calcutta only.

Genus 25. *Epicrocis* Zeller

1848. *Epicrocis* Zeller, *Isis*, p. 878.

Five species under this genus are known from India of which one is recorded from West Bengal.

33. *Epicrocis aegnusalis* (Walker)

1859. *Pyralis aegnusalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 19 : 905.

1896. *Epicrocis aegnusalis*, Hampson, *Fauna Brit. India*, Moths, 4 : 85-86, fig. 53 (F).

Material examined : One (M), Canning, South 24-Parganas, 18.xi.1965 (G. S. Arora Coll.); 2 (M), Debanandapur, Bandel, Hugli dist., 26.x.1964 (A.N.T. Joseph and Party Coll.); 1 (M), Botanical Garden, Haora dist., 27.x.1965 (K. R. Rao and Party Coll.).

Diagnostic characters : Colour pale olive brown. Head and shoulders with pink suffusion. Fore wing with a pink fascia from base, a curved antemedial pink band and a pink discocellular patch. Hind wing pale yellow; the apex suffused with brown. Wing exp. 18-20mm.

Distribution : India : West Bengal (Haora, Hugli and South 24-Parganas) also Madhya Pradesh (Mhow) and Maharashtra (Bombay and Poona); Australia; Burma; China; Madagascar; Sri Lanka and Sumatra.

Remarks : This is the first specific report of the species from West Bengal.

Genus 26. *Phycita* Curtis

1840. *Phycita* Curtis, *Brit. Ent.*, 6 : 233.

Fifteen species under this genus are known from India of which one is recorded from West Bengal.

34. *Phycita clientella*. (Zeller)

1867. *Nephoptyx clientella* Zeller, *Stett. Ent. Zeit.*, p. 396.

1896. *Phycita clientella*, Hampson, *Fauna Brit. India*, Moths, 4 : 94.

Material examined : Material reviewed from the literature.

Diagnostic characters : Body pale red brown. Fore wing with a sinous medial line, an indistinct discocellular lunule, a black speck at lower angle of cell and short black streaks beyond the angle; a submarginal grey line and marginal series of black specks. Hind wing semihyaline. The form *clientella* is brown and grey without any red-brown suffusion. Hind wing greyish white. Wing exp. 22 mm.

Distribution : India : West Bengal (Calcutta) also Maharashtra (Bombay); and Sri Lanka.

Remarks : From West Bengal the species is recorded from Calcutta.

Genus 27. *Spatulipalpia* Ragonot

1894. *Spatulipalpia* Ragonot, *Mon. Phyc.*, p. 19.

Out of three species known from India under this genus only one species is recorded from West Bengal.

35. *Spatulipalpia erythrina* Hampson

1896. *Spatulipalpia erythrina* Hampson, *Fauna Brit. India*, Moths, 4 : 103.

Material examined : Material reviewed from the literature.

Diagnostic characters : Body dark reddish brown. Fore wing with a sinous medial line and a

dark postmedial line. Hind wing tinged with ferruginous red. Wing exp. 14 mm.

Distribution : India : West Bengal (Calcutta).

Remarks : The species is recorded from Calcutta only.

Subfamily EPIPASCHIINAE

Key to the Genera of EPIPASCHIINAE from West Bengal

1. Both wings with M_2 and M_3 approximated for about one third length *Macalla* Walker
Both wings with M_2 and M_3 diverging from angle of cell 2
2. Palpi with second joint reaching far above vertex of head *Stericta* Lederer
Palpi with second joint hardly reaching vertex of head 3
3. Antennae of male non-Pectinate *Orthaga* Walker
Antennae of male pectinate *Coenodomus* Walsingham

Genus 28. *Macalla* Walker

1858. *Macalla* Walker, *Cat. Lep. Het. Brit. Mus.*, 16 : 155.

Out of eleven species known from India, one is recorded from West Bengal.

36. *Macalla moncusalis* (Walker)

1858. *Lamida moncusalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 16 : 252.

1896. *Macalla moncusalis*, Hampson, *Fauna Brit. India*, Moths, 4 : 113.

Material examined : Four (MM), 1 (F), Calcutta, ix-x. 1901, (No other details).

Diagnostic characters : Colour dark-brown. Fore wing with a blackish dentate antemedial line; a fan of scales at end of cell; a black discocellular speck; a pale postmedial line. Underside hind wing with traces of discocellular lunule and a postmedial line. Female pale olive-green in colour. Wing exp. (M) 26 mm; (F) 26-32 mm.

Distribution : India : West Bengal (Calcutta), Manipur, Nagaland and Sikkim; Bhutan.

Remarks : This is the first specific report of the species from Calcutta, West Bengal.

Genus 29. *Coenodomus* Walsingham1887. *Coenodomus* Walsingham, *Trans. Linn. Soc. Lond.*, p. 49.

Two species under this genus are known from India of which one is recorded from India.

37. *Coenodomus hockingi* Walsingham1889. *Coenodomus hockingi* Walsingham, *Trans. Linn. Soc. Zool.*, 5 : 49, pl. 5.1896. *Coenodomus hockingi*, Hampson, *Fauna Brit. India*, Moths, 4 : 117, fig. 68.

Material examined : Material reviewed from the literature.

Diagnostic characters : Head, thorax and abdomen greyish black, tinged with reddish hair. Fore wing greyish brown; a curved antemedial line; a sinous postmedial band edged by black lines. Hind wing greyish brown; a pale postmedial band edged by black lines. Wing exp. (M) 35-40 mm, (F) 36-50 mm.

Distribution : India : West Bengal (Calcutta), Andhra Pradesh (Vizagapatnam), Bihar, (Hazaribagh), Himachal Pradesh (Kangra, Simla, Solan); also from Java.

Remarks : The species is a pest of the fruit 'Kalojam' *Eugenia jambolana* Lamk.

Genus 30. *Stericta* Lederer1863. *Stericta* Lederer, *Wien. ent. Mon.*, 7 : 340.

Nine species under this genus are known from India of which two are recorded from West Bengal.

Key to the species of *Stericta* from West Bengal1. Antennae of male minutely ciliated *haraldusalis* (Walker)Antennae of male thickened and flattened *pyraliata* (Moore)38. *Stericta haraldusalis* (Walker)1858. *Locastra* (?) *haraldusalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 16 : 160.1896. *Stericta haraldusalis*, Hampson, *Fauna Brit. India*, Moths, 4 : 121. fig. 70.

Material examined : One (M), Kurseong, Darjiling dist., Purchased Coll. (No other data available).

Diagnostic characters : Body pale yellowish black; anal tuft pinkish yellow. Fore wing with an obliquely curved antemedial line, the middle area pink, an orange band below the cell; a postmedial

black line with orange band beyond it. Hind wing yellowish black. Wing exp. (M) 24 mm, (F) 30 mm.

Distribution : India : West Bengal (Darjiling dist.), Himachal Pradesh (Dharmsala, Kulu, Simla) and Sikkim; also Borneo; Burma (Tenasserim); Japan and USSR (Amur).

Remarks : From West Bengal the species is recorded from Darjiling district only.

39. *Stericta pyraliata* (Moore)

1887. *Scopocera pyraliata* Moore, *Descr. Ind. Lep. Atk.*, p. 202.

1896. *Stericta pyraliata*, Hampson, *Fauna Brit. India, Moths*, 4 : 122-123.

Material examined : One (M), Darjiling, June, 1912 (No other details).

Diagnostic characters : Body olive green tinged with reddish brown. Fore wing with tufts of black scales; a pale waved antemedial line; a dark discocellular spot; a pale post-medial line. Hind wing pale brown. Wing exp. 24mm.

Distribution : India : West Bengal (Darjiling) and Sikkim.

Remarks : From India the species is recorded from Darjiling and Sikkim only.

Genus 31. *Orthaga* Walker

1858. *Orthaga* Walker, *Cat. Lep. Het. Brit. Mus.*, 16:191.

Eight species under this genus are known from India of which one is recorded from West Bengal.

40. *Orthaga euadrusalis* Walker

1858. *Orthaga euadrusalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 16:191.

1896. *Orthaga euadrusalis*, Hampson, *Fauna Brit. India, Moths*, 4 : 125-126.

Material examined : One (M), Calcutta, August 1895 (No other details).

Diagnostic characters : Head and thorax grey, abdomen greyish brown. Fore wing olive yellowish white; black specks at base and in middle of cell; a large spot on costa; a curved postmedial line. Hind wing brown. Wing exp. 32 mm.

Distribution : India : West Bengal (Calcutta) and Sikkim; also Borneo; Java and Sri Lanka.

Remarks : The larva of the species is recorded as a defoliator of mango tree. This is the first specific report of the species from Calcutta, West Bengal.

Subfamily ENDOTRICHINAE

Genus 32. *Endotricha* Zeller1847. *Endotricha* Zeller, *Isis*. p. 593.

Ten species under this genus are known from India of which two are recorded from West Bengal.

Key to the species of *Endotricha* from West BengalWings pale yellow suffused with pink..... *albicilia* HampsonWings deep yellow and brown and not suffused with pink..... *loricata* Moore41. *Endotricha albicilia* Hampson1891. *Endotricha albicilia* Hampson, *Ill. Typ. Spec. Lep. Het. Brit. Mus.*, pt. 8, p. 130, pl. 154, fig. 22.1896. *Endotricha albicilia*, Hampson, *Fauna Brit. India*, Moths, 4 : 133.*Material examined* : One (M), 1 (F), Kurseong, Darjiling dist., Purchased collection, (No other details). Wing exp. (M) 25 mm, (F) 22 mm.*Diagnostic characters* : Pale brown tinged with pink. Fore wing with small brown spots at regular intervals; an antemedial line; a dark speck at end of cell and a submarginal line. Hind wing much pinker. Wing exp. (M) 25-30 mm. (F) 20-22 mm.,*Distribution* : India : West Bengal (Darjiling dist.), also Kerala and Tamil Nadu (Nilgiris), Sikkim; and Sri Lanka.*Remarks* : This is the first specific report of the species from Kurseong, Darjiling district, West Bengal.42. *Endotricha loricata* Moore1887. *Endotricha loricata* Moore, *Descr. Indian Lep. Atk.*, p. 206.1896. *Endotricha loricata*, Hampson, *Fauna Brit. India*, Moths, 4 : 134.*Material examined* : Material reviewed from the literature.*Diagnostic characters* : Deep yellowish brown. Fore wing with a series of dark specks on costa; a dark brown band at base : A dark spot in cell; a marginal series of black specks. Hind wing deep brown except a medial pale band. Wing exp. 16 mm.*Distribution* : India : West Bengal (Calcutta) also Sri Lanka.*Remarks* : From India the species is recorded from Calcutta, West Bengal.

Subfamily PYRALINAE

Key to the genera of PYRALINAE from West Bengal

1. Palpi long and reaching vertex of head2
 Palpi short and not reaching vertex of head..... *Sacada* Walker
2. Palpi with the 3rd joint upturned3
 Palpi with the 3rd joint porrect*Herculia* Walker
3. Hind wing with M_2 and M_3 not stalked*Larice* Ragonot
 Hind wing with M_2 and M_3 stalked4
4. Fore wing with R_5 arising from R_4 after R_3*Hypsopygia* Hubner
 Fore wing with R_5 arising from R_4 before R_3*Pyralis* Linnaeus

Genus 33. *Hypsopygia* Hubner

1818-25.*Hypsopygia* Hubner, *Verz. bek. Schmett.*, p. 348.

Four species under this genus are known from India of which one is recorded from West Bengal.

43. *Hypsopygia mauritialis* (Boisduval)

1834. *Asopia mauritialis* Boisduval, *Fauna Ent. Madag. Lep.*, p. 119, pl. 16, fig. 8.

1896. *Hypsopygia mauritialis*, Hampson, *Fauna Brit. India, Moths*, 4 : 148, fig. 86.

Material examined : Eight (M), 2 (F), Calcutta, 28.xii.1891, (Coll. not known).

Diagnostic characters : colour purplish pink. Bothwings with sinous pale lines; the cilia and marginal area bight orange. Wing exp. (M) 20 mm. (F) 24 mm.

Distribution : India : West Bengal (Calcutta); Himachal Pradesh (Kulu; Solan); Madhya Pradesh (Mhow); Maharashtra (Poonā); Manipur and North West Himalayas; also Burma; Celebes; China; java; Madagascar and Sumatra.

Remarks : This is the first specific report of the species from Calcutta, West Bengal.

Genus 34. *Pyralis* Linnaeus

1767. *Pyralis* Linnaeus, *Syst. Nat.*, 12 : 881.

Eight species under this genus are known from India of which three are recorded from West Bengal.

Key to the species of *Pyralis*

1. Fore wing with the area beyond postmedial line red *pictalis* (Curtis)
Fore wing with the area beyond postmedial line not red 2
2. Fore wing with a marginal series of dark specks *elongalis* Kollar
Fore wing without a marginal series of dark specks *funnebralis* Warren

44. *Pyralis pictalis* (Curtis)

1834. *Asopia pictalis* Curtis, *Brit. Ent.*, 11 : pl. 503.

1896. *Pyralis pictalis*, Hampson, *Fauna Brit. India*, Moths, 4 : 150.

Material examined : Six (M), 5 (F), Kurseong, Darjiling dist., No date, (C. Duncan Coll.) and 1 (F), Calcutta, 12.ii.1928 (S. Mukherji Coll.).

Diagnostic characters : Thorax and abdomen brown. Fore wing with the base black; medial area pale brown; a black cell-spot. Hind wing with the base black; outer area whitish brown. Wing exp. 18-22 mm.

Distribution : India : West Bengal (Kurseong, Darjiling dist.); Nagaland; North West Himalayas; also Borneo; Burma; Europe; Gilbert Islands; Japan; Sri Lanka; Sumatra and West Africa.

Remarks : This is the first specific report of the species from Calcutta and Darjiling districts of West Bengal.

45. *Pyralis funnebralis* Warren

1853. *Pyralis funnebralis* Warren, *Ann. Mag. Nat. Hist.*, (6) 16 : 464.

1896. *Pyralis funnebralis*, Hampson, *Fauna Brit. India*, Moths, 4 : 150-151.

Material examined : Two (M), Kurseong, Darjiling dist., No date, (C. Duncan Coll.)

Diagnostic characters : Brownish with a grey tinge. Fore wing basal area black; a dark discocellular spot; white specks on medial part of costa and a white patch at the origin of the post medial line. Hind wing basal area dark, antemedial and postmedial white lines; outer area greyish. Wing exp. (M) 14-20 mm, (F) 30 mm.

Distribution : India : West Bengal (Kurseong, Darjiling dist.) and Meghalaya (Khasis).

Remarks : The species is recorded for the first time from Kurseong, Darjiling district of West Bengal.

46. *Pyralis elongalis* Kollar

1848. *Pyralis elongalis* Kollar, *Hugel's Kaschmir.*, 4 : 493.

1896. *Pyralis elongalis*, Hampson, *Fauna Brit. India*, Moth, 4 : 151.

Material examined : One (M), Kurseong, Darjiling dist. (No date and Collector), Purchased collection.

Diagnostic characters : Fuscous brown. Cilia of antennae in male long. Fore wing basal area black; medial area fuscous brown; postmedial line excurved and minutely dentate. Hind wing pale fuscous. Wing exp. (M) 20-24 mm, (F) 26-30 mm.

Distribution : India : West Bengal (Kurseong, Darjiling dist.); Uttar Pradesh (Mussourie) and North West Himalayas.

Remarks : The species is recorded for the first time from Kurseong, Darjiling district, West Bengal.

Genus 35. *Larice* Ragonot

1891. *Larice* Ragonot, *Ann. Soc. Ent. France*, p. 640.

One species under this genus is known from India as well as West Bengal.

47. *Larice phycidalis* (Guenee)

1854. *Pyralis phycidalis* Guenee, *Delt. et Pyral.*, p. 121.

1896. *Larice phycidalis*, Hampson, *Fauna Brit. India*, Moths, 4 : 158.

Material examined : One (M), Kurseong, Darjiling Dist., No date, (C. Duncan Coll.).

Diagnostic characters : Greyish brown. Fore wing basal area reddish brown; medial area grey; outer area reddish brown; postmedial line white. Hind wing greyish brown. Wing exp. 16 mm.

Distribution : India : West Bengal (Kurseong, Darjiling dist.); Himachal pradesh (Kulu), also Burma (East Pegu).

Remarks : This is the first record of the species from Kurseong, Darjiling district, West Bengal).

Genus 36. *Herculia* Walker

1859. *Herculia* Walker, *Cat. Lep. Het. Brit. Mus.*, 19 : 807.

Out of eleven species known under this genus from India one species is recorded from West Bengal.

48. *Herculia suffusalis* (Walker)

1865. *Pyralis suffusalis* Walker, *Cat. Lep. Het. Brit. Mus.*, **34** : 1235.

1896. *Pyralis suffusalis*, Hampson, *Fauna Brit. India*, Moths, **4** : 162.

Material examined : Material reviewed from the literature.

Diagnostic characters : Colour purplish brown; anal tuft orange. Both wings ante and postmedial lines indistinct. Wing exp. 26 mm.

Distribution : India : West Bengal (Calcutta) and Maharashtra (Poona); also Burma (Rangoon) and Pakistan (Sind, Tatta).

Remarks : From West Bengal the species is recorded from Calcutta only.

Genus 37. *Sacada* Walker

1862. *Sacada* Walker, *J. Linn. Soc.*, **6** : 136.

Nine species under this genus are known from India of which one is recorded from West Bengal.

49. *Sacada discinota* (Moore)

1865. *Paravetta discinota* Moore, *Proc. zool. Soc. Lond.*, p. 814, pl. 43, fig. 3.

1896. *Sacada discinota*, Hampson, *Fauna Brit. India*, Moths, **4** : 170-171, fig. 100.

Material examined : One (M), Darjiling, July, 1912, (Lord Carmichael coll.)

Diagnostic characters : Colour dark purplish red. Fore wing with a patch below base of cell; a pale antemedial and postmedial line; the middle area pinkish with reniform spot. Hind wing pale orange-yellow. Wing exp. (M) 32-40 mm, (F) 36-46 mm.

Distribution : India : West Bengal (Darjiling), Nagaland and Sikkim.

Remarks : From West Bengal this species is recorded from Darjiling.

Subfamily HYDROCAMPINAE (Nymphulinae)

Key to the genera of HYDROCAMPINAE from West Bengal

- | | | |
|----|---|---|
| 1. | Labial palpus upturned | 2 |
| - | Labial palpus porrect | 8 |
| 2. | Palpi with the third joint long and pointed | 3 |

- Palpi with the third joint short and blunt5
3. Maxillary palpi filiform and of moderate length..... *Cataclysta* Hubner
 Maxillary palpi long and dilated with scals at extremity4
4. Hind wing with the outer margin evenly rounded*Nymphula* Schrank
 Hind wing with the outer margin excised below apex and lobed at middle
 *Oligostigma* Guenee
5. Palpi with a small triangular tuft in front of third joint *Hymenoptychis* Zeller
 Palpi with the third joint naked6
6. Fore wing with Cu_{1a} and M_3 stalked *Stegothyris* Lederer
 Fore wing with Cu_{1a} and M_3 from cell7
7. Antennae with the shaft annulate and not as long as fore wing *Bradina* Lederer
 Antennae with shaft smooth and somewhat longer than fore wing *Piletocera* Lederer
8. Palpi one to two times the length of head and not downcurved at the end9
 Palpi three times the length of head and downcurved at the end *Clupeosoma* Snellen
9. Hind wing with M_3 absent *Diathrausta* Lederer
 Hind wing with M_3 present *Hyaloplaga* Warren

Genus 38. *Nymphula* Schrank

1802. *Nymphula* Schrank, *Fauna Boica*, 2 (2) : 162.

Out of fourteen species known under this genus from India seven are recorded from West Bengal. The report of two more species *N. enixalis* (Siwnehoe) and *N. crisonalis* (Walker) from Calcutta being doubtful are not included in the present study.

Key to the species of *Nymphula*

1. Ground colour other than white2
 Ground colour white3

2. Hind wing with a dark spot near base of inner area *responsalis* (Walker)
 Hind wing without a dark spot near base of inner area *votalis* (Walker)
3. Abdomen with paired black spots on basal segments *foedalis* (Guenee)
 Abdomen without paired black spots on basal segments 4
4. Hind wing with dark discocellular speck or spot 5
 Hind wing without dark discocellular speck or spot *fluctuosalis* Zeller
5. Hind wing with postmedial line not broken up 6
 Hind wing with postmedial bands broken up into spots *depunctalis* (Guenee)
6. Hind wing with antemedial line from cell to inner margin *diminutalis* (Snellen)
 Hind wing with antemedial series of dark specks *fuscicostalis* Hampson

50. *Nymphula foedalis* (Guenee)

1854. *Isopteryx foedalis* Guenee, *Delt. et Pyral.*, p. 228, pl.4, fig.7.

1937. *Nymphula foedalis*, Kilma, *Lep. Cat.*, pt. 84, pp. 76-77.

Material examined : One (F), Calcutta, 21.xi.1954 (A. P. Kapur Coll.); 1(F), Calcutta, 10.xi.1961 (K. R. Rao coll.), 2 (F), Calcutta, 13.xi.1959 (A. P. Kapur coll.) and 1 (F), Puruliya, 6.x.1983 (A. K. Hazra coll.)

Diagnostic characters : Head, thorax, abdomen white and brown spotted with black. Fore wing white with four black spots near base, subbasal and antemedial lines; a black spot in cell and discocellular band; brownish suffusion beyond. Hind wing with discocellular black spot; brownish suffusion beyond. Both wings with a series of triangular black spots on the margin enclosed by a white dentate line. Wing exp. 16 mm.

Distribution : India : West Bengal (Calcutta and Puruliya); also Australian, Ethiopian and Oriental regions.

Remarks : This is the first specific report of the species from Calcutta and Puruliya districts of West Bengal.

51. *Nymphula responsalis* (Walker)

1865. *Diasemia responsalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 34 : 1326.

1937. *Nymphula responsalis*, Klima, *Lep. Cat.*, pt. 84, p. 84.

Material examined : One (M), Calcutta, 5.viii.1958, (S. Ali coll.)

Diagnostic characters : Head, thorax, abdomen white tinged with black brown. Fore wing blackish brown with subbasal; antemedial, medial and postmedial white lines; a submarginal white band; marginal lunulate blackish brown band. Hind wing with a dark spot near base; antemedial dark band, a postmedial line; a marginal yellowish black lunulate band. Wing exp. 18-20 mm.

Distribution : India : West Bengal (Calcutta); throughout India; also Australia; Borneo; Burma; Celebes; Japan; Java; Sri Lanka and South China.

Remarks : This is the first specific report of this species from Calcutta, West Bengal.

52. *Nymphula diminutalis* (Snellen)

1880. *Parponyx diminutalis* Snellen, *Tijds. v. Ent.*, 23 : 242.

1937. *Nymphula diminutalis*, *Klima*, pt. 84, p. 85.

Material examined : One (M), Canning, South 24-Parganas, 12.iv.1907 (No Collector). Wing exp. 12-16 mm.

Diagnostic characters : Vide key.

Distribution : India : West Bengal (Canning, S. 24-Parganas), Maharashtra (Bombay) and Punjab; also Borneo; Celebes; China; Java; Lombok; Philippines; Sri Lanka; Sumatra; South Africa and Vietnam (Tongking).

Remarks : This is the first specific report of the species from Canning, South 24-Prganas of West Bengal.

53. *Nymphula fluctuosalis* Zeller

1852. *Nymphula fluctuosalis* Zeller, *Lep. Micropt. Caffr.*, p. 27.

1937. *Nymphula fluctuosalis*, *Klima, Lep Cat.*, pt. 84, p. 81.

Material examined : One (M), Puruliya, 7.x.1983, (A. K. Hazra and Party Coll.), 1 (M) Bongna, N. 24-Parganas, 15.ii.1966 (H. C. Ghosh and Party Coll.); 1(F), Uttarpara, Hugli dist. 6.iii.1966 (H. L. Paul Coll.), 1 (F), Dhapa, Calcutta, 2.ii.1961, 1 (F), Calcutta, 6.viii.1950 (A. P. Thakur Coll.) and 1 (F), Calcutta, 25.xi.1965 (G. S. Arora Coll.)

Diagnostic characters : Vide key, Wing exp. 16-20 mm.

Distribution : India : West Bengal (Calcutta, Hugli, 24-Parganas and Puruliya). throughout the tropical and sub-tropical zones, on the north from Taiwan, West China and Sandwich Islands to Australia in the South also South Africa (Natal).

Remarks : Wood-Mason (1885) reported the species (syn. *oryzalis*) as a pest of rice in Burma and Calcutta. This is the first specific report of this species from Hugli, N. 24-Parganas and Puruliya districts of West Bengal.

54. *Nymphula votalis* (Walker)

1859. *Oligostigma votalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 17 : 433.

1937. *Nymphula votalis*, *Klima*, pt. 84, p. 85.

Material examined : Material reviewed from the literature.

Diagnostic characters : Ground colour brownish. Abdomen with black rings. Markings of the wings as compared to *fluctuosalis* are darker or black. Hind wing with the cilia brownish. Wing exp. 16 mm.

Distribution : India : West Bengal (Calcutta);-Kerala and Tamil Nadu (Nilgiris); also Burma (Rangoon); Sri Lanka; and Vietnam (Tongking).

Remarks : The species is recorded from Calcutta, West Bengal.

55. *Nymphula fuscicostalis* Hampson

1896. *Nymphula fuscicostalis* Hampson, *Fauna Brit. India, Moths*, 4 : 195.

1937. *Nymphula fuscicostalis*, *Klima*, pt. 84 : 85-86.

Material examined : Material reviewed from the literature.

Diagnostic characters : Vide key. Wing exp. 28 mm.

Distribution : India : West Bengal (Calcutta).

Remarks : The species is recorded only from Calcutta, West Bengal.

56. *Nymphula depunctalis* (Guenee)

1884. *Hydrocampa depunctalis* Guenee, *Delt. et Pyral.*, p. 274.

1937. *Nymphula depunctalis*, *Klima*, pt. 84 : 81-83.

Material examined : One (F), Calcutta, 13.xi.1959 (A. P. Kapur Coll.) and 1 (F), Calcutta, 24.xi.1965 (G. S. Arora Coll.).

Diagnostic characters : Vide key, Wing exp. 16-17 mm.

Distribution : India : West Bengal (Calcutta); throughout India; also Australia; Borneo; Burma; Celebes; Java; Maldives; Morocco; Philippines; Portugal; Spain (Gibraltar); South America; South China; Sri Lanka; Taiwan and Vietnam (Tokin).

Remarks : This is the first specific report of the species from Calcutta, West Bengal.

Genus 39. *Cataclysta* Hubner

1826. *Cataclysta* Hubner, *Verz. bek. Schmett.*, 5 : 363.

Three species under this genus are known from India of which one is recorded from West Bengal.

57. *Cataclysta blandialis* Walker

1859. *Cataclysta blandialis* Walker, *Cat. Lep. Het. Brit. Mus.*, 17 : 448.

1937. *Cataclysta blandialis*, Klima, *Lep. Cat.*, pt. 84 : 94-95.

Material examined : Material reviewed from the literature.

Diagnostic characters : Brownish yellow. Fore wing with the base fuscous and silvery; a large conical medial patch edged by silvery white lines; a triangular silvery postmedial mark and a submarginal band. Hind wing with the base brownish silvery and yellow; a discocellular black-edged yellow spot; a yellow and orange marginal band with four metallic blue-centered black spots. Wing exp. 16-20 mm.

Distribution : India : West Bengal (Calcutta), Himachal Pradesh (Dharmasala), Maharashtra (Bombay); Kerala and Tamil Nadu (Nilgiris); also Africa; Amboina; Borneo; Celebes; Fiji; Java; New Guinea; Sri Lanka and Sumatra.

Remarks : The species is recorded from Calcutta, West Bengal.

Genus 40. *Oligostigma* Guenee

1854. *Oligostigma* Guenee, *Delt. et Pyral.*, p. 260.

Fourteen species under this genus are known from India of which one is recorded from West Bengal.

58. *Oligostigma bilinealis* Snellen

1876. *Oligostigma bilinealis* Snellen, *Tijds. v. Ent.*, 19 : 196, pl. 8, fig. 1 (a-c).

1937. *Oligostigma bilinealis*, Klima, *Lep. Cat.*, pt. 84; 117.

Material examined : 3 (M), 2 (F), Calcutta, 24.xi.1965 (G. S. Arora Coll.)

Diagnostic characters : Head and thorax white. Abdomen white banded with brown. Fore wing white, basal two-thirds brown at the costa, a brownish line to upper angle of cell joined with the postmedial dark band; a submarginal dark band conjoined with postmedial band. Hind wing with the base white; black subbasal and antemedial lines; outerhalf yellow; a black-edged postmedial line; margin with four white patched black spots. Wing exp. 14 mm.

Distribution : India : West Bengal (Calcutta) also Himachal Pradesh (Dharmasala) and Punjab.

Remarks : The species is recorded from Calcutta, West Bengal.

Genus 41. *Hymenoptychis* Zeller

1852. *Hymenoptychis* Zeller, *K. Vet. Akad. Handl. Lep. Caffr.*, p. 63.

One species under this genus is known from India as well as West Bengal.

59. *Hymeoptychis sordida* Zeller

1852. *Hymenoptychis sordida* Zeller, *K. Vet. Akad. Handl. Lep. Caffr.*, P. 65.

1937. *Hymenoptychis sordida*, *Klima, Lep. Cat.*, pt. 84 : 137.

Material examined : Material reviewed from the literature.

Diagnostic characters : Ground colour dull red-brown. Fore wing with very small semihyaline streaks. Traces of dark ante and postmedial dentate lines in both wings. Wing exp. (M) 28 mm, (F) 30 mm.

Distribution : India : West Bengal (Calcutta); also Australia; Borneo; Burma; Buru; Ellice Is; Celebes; Fiji, Madagascar; Philippines; Sri Lanka and South Africa.

Remarks : From India the species is recorded only from Calcutta.

Genus 42. *Stegothyris* Lederer

1863. *Stegothyris* Lederer, *Wien Ent. Monatschr.*, 6 : 427.

One species under this genus is known from India as well as West Bengal.

60. *Stegothyris diagonalis* (Guenee)

1854. *Salbia diagonalis* Guenee, *Delt. etc. Pylal.*, p. 201.

1937. *Stegothyris diagonalis*, *Klima, Lep. Cat.*, pt. 84 : 134.

Material examined : One (F), 3 (M), Haldia, Medinipur dist., 4.iii.1984 (K. K. Ray and party coll.).

Diagnostic characters : Ground colour white. palpi above and frons black; collar and abdomen yellowish brown. Fore wing costal area and outer area of both wings golden brown; an oblique line from costa of fore wing beyond middle area to anal angle of hind wing. Wing exp. 24 mm.

Distribution : India : West Bengal (Haldia, Medinipur) also Eastern and North Western Himalayas; Burma; Java; Lombok; Sambawa; Sumatra; South China and Taiwan.

Remarks : This is the first record of the species from Haldia, Medinipur district of West Bengal.

Genus 43. *Bradina* Lederer

1863. *Bradina* Lederer, *Wien. Ent. Monatschr.*, 7 : 424.

Five species under this genus are known from India of which one is reported from West Bengal.

61. *Bradina admixtalis* (Walker)

1859. *Borys admixtalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 18 : 665.

1937. *Bradina admixtalis*, Klima, *Lep. Cat.*, pt. 84 : 150.

Material examined : Two (M), 2 (F) Calcutta, (Museum Coll., No date).

Diagnostic characters : Ground colour pale yellowish brown. Abdomen of male very long and slender, palpi white below. Fore wing with a discocellular lunule and a dark speck in cell. Both wings with brown curved postmedial and marginal lines; a brown line at base of cilia. Hind wing with discocellular speck; cilia whitish. Wing exp. 24 mm.

Distribution : India : West Bengal (Calcutta) and throughout India including Nicobar Islands; Australia; Bali; Burma; Celebes; Japan; Java; Sri Lanka; South Africa; Taiwan; West and South China and Vietnam (Tongking).

Remarks : This is the first specific report of the species from Calcutta, West Bengal, Clarke (1986) has mentioned all the species recorded in Marquesas Archipelago of the genus *Bradina* under the subfamily Pyraustinae.

Genus 44. *Diathrausta* Lederer

1863. *Diathrausta* Lederer, *Wien. Ent. Monatschr.*, 7 : 438.

Three species under this genus are known from India of which one is recorded from West Bengal.

62. *Diathrausta profundalis* Lederer

1863. *Diathrausta profundalis* Lederer, *Wien. Ent. Monatschr.*, 7 : 438, pl. 17, fig.7.

1937. *Diathrausta profundalis*, Klima, *Lep. Cat.*, pt. 84, p. 160.

Material examined : One (M), Kurseong, Darjiling dist., No date, (Purchased. C. Duncan Coll.)

Diagnostic characters : Ground colour brownish black; palpi white below; abdomen ringed with white. Fore wing with a postmedial triangular white patch. Hind wing with a white postmedial line. Cilia of both wings tinged with black and white. Wing exp. 18 mm.

Distribution : India : West Bengal (Kurseong, Darjiling district) also Meghalaya (Khasis), Kerala and Tamil Nadu (Nilgiris) and Sikkim; Amboina; Buru; South China; Sri Lanka; Sumbawa; Taiwan and Vietnam (Tongking).

Remarks : This is the first specific report of the species from Kurseong, Darjiling district of West Bengal.

Genus 45. *Hyaloplaga* Warren

1892. *Hyaloplaga* Warren, *Ann. Mag. Nat. Hist.*, (6) 9 : 432.

One species under this genus is recorded from India as well as West Bengal.

63. *Hyaloplaga pulchralis* (Moore)

1867. *Hydrocampa pulchralis* Moore, *Proc. zool. Soc. Lond.*, p. 869.

1937. *Hyaloplaga pulchralis*, *Klima, Lep. Cat.*, pt. 84 : 187.

Material examined : One (M) Darjiling, (No other data, old collection present in the National Zoological Collection at Z.S.I. Calcutta).

Diagnostic characters : Ground colour brown and yellow. Fore wing with basal and two subbasal yellow spots and a speck in cell, a quadrate yellow spot in end of cell and a large patch below end of cell, an oval patch beyond the cell; two submarginal specks. Hind wing yellow; a black discocellular spot and a postmedial brown line; an apical and marginal brown band with a series of yellow spots. Cilia of both wings tinged with brown and white. Wing exp. 24 mm.

Distribution : India : West Bengal (Darjiling) and Sikkim; also China.

Remarks : This is the first report of the species from Darjiling, West Bengal.

Genus 46. *Piletocera* Lederer

1863. *Piletocera* Lederer, *Wien. Ent. Monatschr.*, 7 : 431.

Nine species under this genus are known from India of which one is recorded from West Bengal.

64. *Piletocera aegimiusalis* (Walker)

1859. *Desmia aegimiusalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 19 : 929.

1937. *Piletocera aegimiusalis*, *Klima*, pt. 84 : 172.

Material examined : One (F), Kurseong, Darjiling dist., (No other data available, from old collection of NZC).

Diagnostic characters : Ground colour brownish black. Base of palpi, frons, shoulder and base of abdomen whitish. Fore wing white spots at middle of cell and end of cell another on costa before apex. Hind wing with postmedial white spot on inner margin. Wing exp. 22 mm.

Distribution : India : West Bengal (Kurseong, Darjiling dist.); Andamans, Assam (Margharita),

Meghalaya (Khasis), Sikkim; also Borneo; Buru; Japan; Mysol; New Guinea; South China; Syria; Sumatra and Taiwan.

Remarks : This is the first specific report of the species from Darjiling, West Bengal. Clarks (1986) reported *Piletocera* under subfamily Pyraustinae with reference to the species *signiferalis* (Wallengren) from Marquesas archipelago Islands.

Genus 47. *Clupeosoma* Snellen

1880. *Clupeosoma* Snellen, *Tijds. v. Ent.*, 23 : 203.

Two species under this genus are known from India of which one is recorded from West Bengal.

65. *Clupeosoma bicolor* Moore

1887. *Clupeosoma bicolor* Moore, *Descr. Lep. Ins. Atkinson*, p. 207.

1896. *Hydrorybina bicolor*, Hampson, *Fauna Brit. India*, Moths, 4 : 240.

1937. *Clupeosoma bicolor*, Klima, *Lep. Cat.*, pt. 84 : 183.

Material examined : Material reviewed from the literature.

Diagnostic characters : male brownish. Fore wing tinged with black; a black speck at lower angle of cell; a post medial line highly excurved below costa. Female head, thorax and fore wing crimson with purple tinge; cilia purple; yellow at tips; abdomen and hind wing pale brown. Wing exp. (M) 14 mm, (F) 16-22 mm.

Distribution : India : West Bengal (Calcutta), Meghalaya (Khasis); and Sri Lanka.

Remarks : Munroe (1961) reported the genera *Clupeosoma* and *Hydrorybina* under the new subfamily Odontiinae.

Subfamily SCOPARIINAE

Key to the genera of SCOPARIINAE

1. Palpi upturned; 2nd joint reaching vertex of head and slightly fringed with hair in front, 3rd well developed and acuminate *Micraglossa* Warren
- Palpi porrect; 2nd joint not reaching vertex of head and with long projecting hair below, 3rd short and naked *Scoparia* Haworth

Genus 48. *Micraglossa* Warren

1891. *Micraglossa* Warren, *Ann. Mag. Nat. Hist.*, (6) 8 : 65.

Two species under this genus are known from India of which one is recorded from West Bengal.

66. *Micraglossa scoparialis* Warren

1891. *Micraglossa scoparialis* Warren, *Ann. Mag. Nat. Hist.*, (6) 8 : 65-66 (F).
 1937. *Micraglossa scoparialis*, Klima, *Lep. Cat.*, pt. 84 : 8.

Material examined : Material reviewed from the literature.

Diagnostic characters : Ground colour greyish black with an olive yellow tinge. Fore wing with a pale black basal patch and black antemedial band; a discocellular black X-shaped spot. Hind wing pale greyish black. Wing exp. 16 mm.

Distribution : India : West Bengal (Darjiling); Meghalaya (Khasis), Sikkim; and South China.

Remarks : This is the first specific report of the species from Darjiling, West Bengal.

Genus 49. *scoparia* Haworth

1812. *Scoparia* Haworth, *Lep. Brit.*, 3 : 498.

Fourteen species under this genus are known from India of which two are recorded from West Bengal.

Key to the species of *Scoparia*

- Hind wing M_2 and M_3 from angle of cell *pulveralis* Snellen
 Hind wing M_2 and M_3 shortly stalked *murificalis* Walker

67. *Scoparia pulveralis* Snellen

1890. *Scoparia pulveralis* Snellen, *Trans. Ent. Soc. Lond.*, p. 570.
 1937. *Scoparia pulveralis*, Klima, *Lep. Cat.*, pt. 84 : 30.

Material examined : Material reviewed from the literature.

Diagnostic characters : Ground colour black brown. Head thorax and fore wing tinged with bluish white scales. Fore wing with a streak below median nervure and a broad medial band; a dark quadrate patch in end of cell, a blue grey band beyond; postmedial and submarginal lines; cilia whitish with specks. Hind wing almost pure white. Wing exp. 22 mm.

Distribution : India : West Bengal (Darjiling) and Sikkim.

Remarks : The species was described from Darjiling by Snellen (1890).

68. *Scoparia murificalis* Walker

1859. *Scoparia murificalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 19 : 826.

1937. *Scoparia murificalis*, Klima, *Lep. Cat.*, pt. 84 : 30-31.

Material examined : Two (M), 1 (F), Kurseong, Darjiling district, (No date, old purchased collection of NZC).

Diagnostic characters : Ground colour grey tinged with black and reddish brown. Fore wing with ante and postmedial lines edged with black; pale black spots in and below middle of cell and a X-shaped black discocellular mark; marginal series of black specks in grey patches. Hind wing pale brownish white. Wing exp. 16–20 mm.

Distribution : India : West Bengal (Kurseong, Darjiling dist.), Himachal Pradesh (Dharmasala, Simla) also Sri Lanka and West China.

Remarks : This is the first specific report of the species from Kurseong, Darjiling district, West Bengal.

Subfamily PYRAUSTINAE

Key to the genera of PYRAUSTINAE

- | | | |
|----|---|----------------------------|
| 1. | Palpi upturned | 2 |
| | Palpi porrect | 22 |
| 2. | Palpi with tufts of hair at end of first and second joints | <i>Crocidolomia</i> Zeller |
| | Palpi without tufts of hair at end of first and second joints | 3 |
| 3. | Palpi with third joint porrect | 19 |
| | Palpi with third joint not porrect | 4 |
| 4. | Palpi with third joint normal in length | 5 |
| | Palpi with third joint not normal in length | 6 |
| 5. | Palpi with a triangular tuft in front of 3rd joint | 7 |
| | Palpi without a triangular tuft in front of 3rd joint | 13 |
| 6. | Palpi with 3rd joint long and acuminate | 15 |
| | Palpi with 3rd joint short and obtuse | 17 |

7. Palpi with tuft on 3rd joint long *Synclera* Lederer
 Palpi with tuft on 3rd joint short 8
8. Hind wing Rs anastomosing with Sc+R₁ to about three-fourths of wing 9
 Hind wing Rs anastomosing with Sc+R₁ almost at apex 12
9. Antennae with shaft not annulate 10
 Antennae with shaft annulate *Syngamia* Guenee
10. Frons flat and oblique *Diastictis* Hubner
 Frons rounded 11
11. Fore wing with R₅ curved and approximated to R₃+R₄ *Pilocrosis* Lederer
 Fore wing with R₅ straight and well separated from R₃+R₄ *Lamprosema* Hubner
12. Fore wing R₂ free and not stalk to R₁ *Marasima* Lederer
 Fore wing R₂ not free and stalked to R₁ *Cnaphalocrosis* Lederer
13. Frons without prominence 14
 Frons with a rounded prominence *Filodes* Guenee
14. Fore wing with R₅ curved and approximated to R₃+R₄ for about one third length
 *Phostria* Hubner
 Fore wing with R₅ nearly straight and well separated from R₃+R₄
 *Dichocrocis* Lederer
15. Palpi with 2nd joint not reaching vertex of head 16
 Palpi with 2nd joint reaching vertex of head *Pycnarmon* Lederer
16. Antennae with shaft annulate; hind wing with outer margin *Massepha* Walker
 Antennae with shaft smooth excised below apex *Spoladea* Guenee
17. Maxillary palpi dilated with scales *Eurrhyarodes* Snellen
 Maxillary palpi filiform 18

18. Palpi with second joint broadly rounded with scales in front..... *Botyodes* Guenee
 Palpi with second joint not broadly rounded with scales in front *Sylepta* Hubner
19. Maxillary palpi strongly dilated with scales 20
 Maxillary palpi filiform..... *Pygospila* Guenee
20. Hind wing with M_2 and M_3 not approximated towards origin..... 21
 Hind wing with M_2 and M_3 approximated for a short distance towards origin
 *Agathodes* Guenee
21. Labial palpi with third segment exposed *Glyphodes* Guenee
 Labial palpi with third segment scarcely visible *Diaphania* Hubner
22. Palpi with third joint naked *Sameodes* Snellen
 Palpi with third joint hidden by hair 23
23. Palpi rostriform, 3rd joint downcurved 24
 Palpi triangularly scaled 26
24. Hind wing with M_2 and M_3 not approximated towards origin..... *Calamochrous* Lederer
 Hind wing with M_2 and M_3 approximated for a short distance 25
25. Maxillary palpi with a pointed tuft at extremity *Noorda* Walker
 Maxillary palpi dilated with scales at extremity *Boeotarcha* Meyrick
26. Antennae from one to one and a half times length of fore wing *Tetridia* Warren
 Antennae shorter than fore wing 27
27. Maxillary palpi strongly dilated with scales at extremity 28
 Maxillary palpi filiform or hardly dilated with scales at extremity 30
28. Antennae with shaft annulate. Hind wing with outer margin excised below apex
 *Diasemia* Guenee
 Antennae with shaft not annulate. Hind wing outer margin not excised below apex 29

29. Legs of moderate length *Pionea* Guenee
 - Legs very long and slender *Antigastra* Lederer
30. Hind wing with M_2 and M_3 approximated for a short distance towards origin 31
 - Hind wing with M_2 and M_3 not approximated towards origin 34
31. Fore wing long and narrow; Cu_{1a} from well before angle of cell *Nomophila* Hubner
 - Fore wing subtriangular; Cu_{1a} from close to angle of cell 32
32. Tibiae fringed with hair; built stout *Polygrammodes* Guenee
 Tibiae smoothly scaled; built slender 33
33. Frons flat and oblique *Crocidophora* Lederer
 - Frons rounded *Psara* Snellen
34. Hind tibiae with spurs all long and equal *Hyalobathra* Meyrick
 Hind tibiae with outer medial spur not more than two thirds the length of inner
 *Pyrausta* Schrank

Genus 50. *Massepha* Walker

1859. *Massepha* Walker, *Cat. Lep. Het. Brit. Mus.*, 17 : 488.

Three species under this genus are known from India of which two are recorded from West Bengal.

Key to the species of *Massepha* Walker

- Ochreous white. Fore wing without any black spots on basal area *absolutalia* Walker
 Pure white. Fore wing with three series of black spots on basal area *bengalensis* (Moore)

69. *Massepha absolutalis* Walker

1859. *Massepha absolutalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 17 : 489.

1898. *Masepha absolutalis*, Hampson, *Proc. zool. Soc. Lond.*, p. 616.

Material examined : Material reviewed from the literature.

Diagnostic characters : Body yellowish white and thickly striated with brown. Fore wing with a dark spot below middle of cell; some dark specks on costa; a pale submarginal line, the area beyond it darker; both wings with a marginal series of dark specks. Hind wing with the apical area darker. Wing exp. 16-22 mm.

Distribution : India : West Bengal (Calcutta) and Punjab; also Bhutan; Celebes; Java and Sri Lanka.

Remarks : Specimens from Bhutan with the basal area of fore wing, marginal area and apical area of hind wing prominently dark (Hampson, 1896).

70. *Massepha bengalensis* (Moore)

1887. *Hydrocampa bengalensis* Moore, *Descr. Indian Lep. Atk.*, p. 211.

1898. *Massepha bengalensis*, Hampson, *Proc. zool. Soc. Lond.*, p. 616.

Material examined : Material reviewed from the literature.

Diagnostic characters : Body pure white; thorax with black brown spots; legs and abdomen banded with black. Fore wing with a discocellar spot and a postmedial band; a submarginal and a marginal band. Wing exp. 20 mm.

Distribution : India : West Bengal (Calcutta) and Meghalaya (Khasis).

Remarks : From West Bengal the species is recorded from Calcutta.

Genus 51. *Pycnarmon* Lederer

1863. *Pycnarmon* Lederer, *Wien. Ent. Monatschr.*, 7 : 441.

Eleven species under this genus are known from India of which two are recorded from West Bengal.

Key to the species of *Pycnarmon* Lederer

Fore wing outer margin with a maculate black line becoming a fine line at vein M_3
 *meritalis* (Walker)

Fore wing outer margin with yellow band from apex to vein M_3 *lactiferalis* (Walker)

71. *Pycnarmon meritalis* (Walker)

1859. *Zebonia meritalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 17 : 479.

1939. *Pycnarmon meritalis*, Klima, *Lep. Cat.*, pt. 89 : 23-24.

Material examined : One (F), Calcutta (very old collection in NZC, no other data available).

Diagnostic characters : Body pure white; tegulae each with a black spot; fore and mid legs black spotted; abdomen with pairs of lateral black spots near base. Fore wing with a black speck in the cell and a small discocellular spot; the antemedial and two postmedial faint yellow lines. Hind wing with discocellular black speck; postmedial line faint and yellow; both wings with fine marginal line and line through cilia also faint and yellow. Wing exp. 16-18 mm.

Distribution : India : West Bengal (Calcutta); Sikkim; also Amboina; Aru Is.; Australia; Borneo; Buru Is; Celebes; Ceram Is.; China; Java; Sri Lanka; Sumatra; Sumbawa; South America (Venezuela) and Taiwan.

Remarks : Klima (1939) reported the species from Calcutta, West Bengal.

72. *Pycnarmon lactiferalis* (Walker)

1859. *Zebronia lactiferalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 17 : 480.

1939. *Pycnarmon lactiferalis*, Klima, *Lep. Cat.*, pt. 89 : 21-22.

Material examined : One (M), Kurseong (old purchased collection in NZC with no other data).

Diagnostic characters : White. Fore wing with black spots near base of costa, in cell and on discocellulars larger than *meritalis*. The ante- and postmedial lines of both wings developed into faint yellow bands. Wing exp. 24 mm.

Distribution : India : West Bengal (Kurseong, Darjiling dist.) also East and North West Himalayas; also Borneo; Burma; Celebes; Japan; Korea; New Guinea; South and West China; Sri Lanka and Taiwan.

Remarks : This is the first specific report of the species from Kurseong, Darjiling district, West Bengal.

Genus 52. *Spoladea* Guenee

1854. *Spoladea* Guenee, *Delt. et Pyral.*, p. 224.

Two species under this genus are known from India of which one is recorded from West Bengal.

73. *Spoladea recurvalis* (Fabricius)

1775. *Phalaena recurvalis* Fabricius, *Syst. Ent.*, p. 644.

1986. *Spoladea recurvalis*, Clarke, *Smithson. Conrb. Zool.*, No. 416 : 50-52, fig.34 (M, gent.)

Material examined : Five (M), 6 (F), Calcutta (very old collection in NZC of Museum collection. 3 exs. dated Jan-Feb. 1911) also 2 (M), 1 (F) Kurseong, Darjiling dist. (Purchased collection with no

other data); 2 (M), 2(F), Calcutta, 24.xi.1965 (G. S. Arora and Party Coll.); 3 (M), 2 (F), Calcutta, 19.i.1967 (K. Rai and Party Coll.); 1 (M), Barddhaman dist. 11.xii.1985 (B. N. Das & party Coll.); 2 (M), Calcutta, 13.xi.1959 (A. P. Kapur Coll.), 1 (F), Calcutta, 27.vii.1964 (G. Prasad Coll.); 2(M), 3 (F), Diamond Harbour, S. 24-Parganas dist., 19.xii.1961 (R. K. Varshney and Party Coll.).

Diagnostic characters : Colour brown. Fore wing with a medial black edged white band not reaching costa; a post medial white band from costa to near upper angle of cell. Hind wing with medial white band narrowing to inner margin. Wing exp. 24 mm.

Distribution : India : West Bengal (Barddhaman, Calcutta and South 24-Parganas dists.) also Cosmopolitan except in very cold climates.

Remarks : The species is widely distributed throughout the world.

Genus 53. *Eurrhyarodes* Snellen

1880. *Eurrhyarodes* Snellen, *Tijd. v. Ent.*, 23 : 215.

Three species under this genus are recorded from India of which two are reported from West Bengal.

Key to the species of *Eurrhyarodes* Snellen

Fore wing of male without postmedial glandular swelling below costa *tricoloralis* (Zeller)

Fore wing of male with a large postmedial glandular swelling below costa
..... *bracteolalis* (Zeller)

74. *Eurrhyarodes tricoloralis* (Zeller)

1852. *Botys tricoloralis* Zeller, *Kgl. Vet. Akad. Handl. Lep. Micropt. Caffr.*, p. 31.

1939. *Eurrhyarodes tricoloralis*, Klima, *Lep. Cat.*, pt. 89 : 37.

Material examined : Material reviewed from the literature.

Diagnostic characters : Colour yellow. Fore wing with the costa brownish; two conjoined spots in cell; subbasal post-medial and marginal brownish bands. Hind wing with discocellular and medial spots; a postmedial costal patch. Wing exp. 20 mm.

Distribution : India : West Bengal (Calcutta), Andamans, Nilgiris, Punjab and Uttar Pradesh (Lucknow); throughout India; also Amboina; Australia; Fiji; Java; Kamerun; Moreton Bay; Philippines; Sangir; Southern and Western Africa; Southern China; Sri Lanka; Sula; Sumatra and Taiwan.

Remarks : From West Bengal the species is recorded from Calcutta only.

75. *Eurrhyarodes bracteolalis* (Zeller)

1852. *Botys bracteolalis* Zeller, *Kgl. vet. Akad. Handl. Lep. Microt. Caffr.*, p. 30.

1939. *Eurrhyarodes bracteolalis*, Klima, *Lep. Cat.*, pt. 89 : 36-37.

Material examined : One (M), 1 (F) Calcutta, January 1871 and 1 (F), Kurseong, Darjiling dist. (Purchased Collection).

Diagnostic characters : Colour deep brown and white. Whole fore wing occupied by cojoined patches of brownish striae; a small yellow antemedial and a large postmedial band. Hind wing also occupied by cojoined brownish patches. Wing exp. 20 mm.

Distribution : India : West Bengal (Calcutta and Kurseong, Darjiling dist.), throughout India; also Australia; Burma; Buru; Celebes; Japan; Java; Kamerun; Madagascar; Malacca; Philippines; Sangir; Sri Lanka; Sula; Sumatra; Taiwan; Vietnam (Tong-King); West and South Africa; West. Middle and South China.

Remarks : This is the first specific report of the species from Kurseong, Darjiling district of West Bengal.

Genus 54. *Synclera* Lederer

1863. *Synclera* Lederer, *Wien. Ent. Mon.*, 7 : 444.

Three species under this genus are known from India, of which two are recorded from West Bengal.

Key to the species of *Synclera* Lederer

Fore wing with conjoined lines forming an irregular postmedial patch on inner margin
 *subtessellalis* (Walker)

Fore wing with conjoined lines not forming an irregular post-medial patch on inner margin
 *traducalis* (Zeller)

76. *Synclera subtessellalis* (Walker)

1865. *Botys subtessellalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 34 : 1406.

1901. *Synclera subtessellalis*, Swinhoe, *Cat. East. Austra. Lep. Het.*, pt. 2 : 461.

Material examined : Material reviewed from the literature.

Diagnostic characters : Colour yellow hyaline. Head, thorax and abdomen brownish yellow. Fore wing with the cojoined lines forming an irregular postmedial patch on inner margin. Hind wing with a fascia on inner area joining the medial line. Wing exp. (M) 22 mm; (F) 28 mm.

Distribution : India : West Bengal (Darjiling) also Sikkim; and Burma (Karen Hills, Tenasserim).

Remarks : The type locality of the species is from Darjiling, West Bengal.

77. *Synclera traducalis* (Zeller)

1852. *Eudiptis traducalis* Zeller, *Kgl. Vet. Akad. Handl. Lep. Micropt. Caffr.*, p. 54.

1956. *Synclera traducalis*, Munroe, *Rev. Fr. Ent.*, 23 (2) : 122.

Material examined : Material reviewed from the literature.

Diagnostic characters : Colour brownish yellow with pale markings. Fore wing with two brownish subbasal lines; an antemedial line with a band beyond with conjoined annuli; a medial patch with a discocellular yellow line and a sinous postmedial line. Hind wing with a medial and a postmedial line and a marginal band with white spots and specks. Wing exp. 22 mm.

Distribution : India : West Bengal (Calcutta) also Assam, Bombay, Punjab (Chandigarh), Uttar Pradesh (Dehra Dun), Sikkim and throughout India; also Amboina; Burma; Java; Celebes; Palestine; Philippines; Sri Lanka; South America; South Africa; South Yamen (Aden) and Syria.

Remarks : The species is recorded from Calcutta, West Bengal.

Genus 55. *Cnaphalocrocis* Lederer

1863. *Cnaphalocrocis* Lederer, *Wien. Ent. Monat.*, 7 : 384.

One species under this genus is known from India as well as West Bengal.

78. *Cnaphalocrocis medinalis* (Guenee)

1854. *Salbia medinalis* Guenee, *Delt. et Pyral.*, p. 201.

1939. *Cnaphalocrocis medinalis*, Klima, *Lep. Cat.*, pt. 89 : 60.

Material examined : Four (M), 2 (F), Diamond Harbour, South 24-Parganas, 19.xii.1961 (R. K. Varshney and S. Ali coll.); 2 (M), 2 (F), Calcutta, 24-25.xi.1965 (G. S. Arora Coll.); 2 (F), Calcutta, 31.x.1957 (A. P. Kapur Coll.).

Diagnostic characters : Colour pale yellow. Head and collar brown; palpi white below; abdomen ringed with brown and white towards end; anal tuft black. Fore wing costal and outer areas broadly brownish, curved antemedial, discocellular and postmedial lines. Hind wing with discocellular speck, post-medial line bent to anal angle; black marginal line through cilia. Wing exp. 20 mm.

Distribution : India : West Bengal (Calcutta, South 24-Parganas) also Assam (Guwahati), Haryana (Kalka, Kurukshetra), Jammu and Kashmir (Srinagar), Maharashtra (Bombay, Poona), Punjab (Chandigarh), Rajasthan, (Khandela), Sikkim, Tamil Nadu and Uttar Pradesh (Dehra Dun); also Japan; throughout the Oriental and Australian region.

Remarks : The species is recorded from Calcutta, West Bengal.

Marasmia Lederer

Six species under this genus are known from India of which three are recorded from West Bengal.

Key to the species of *Marasmia*

1. Maxillary palpi filiform. Fore wing less produced at apex 2
 Maxillary palpi triangularly dilated with scales. Fore wing more produced at apex
 *trapezalis* (Guenee)
2. Fore wing with costal and marginal areas broadly fuscous *trebiusalis* (Walker)
- Fore wing with costal and marginal areas narrowly fuscous *bilinealis* Hampson

79. *Marasmia trapezalis* (Guenee)

1854. *Salbia trapezalis* Guenee, *Delt. et Pyral.*, p. 200.

1939. *Marasmia trapezalis*, Klima, *Lep. Cat.*, pt. 89, p. 65.

Material examined : Material reviewed from the literature.

Diagnostic characters : Colour pale yellow suffused with brown; palpi black white below; anal tuft with white stripes. Fore wing costal and marginal areas suffused with brown, subbasal and antemedial lines indistinct; two dark discocellular specks; postmedial line excurved between M_1 and Cu_{1b} and a pale curved line beyond. Hind wing with antemedial and medial oblique lines upto anal angle; a postmedial line from costa to Cu_{1b} , outer area suffused with brown. Both wings with dark marginal line and line through cilia. Wing exp. 22 mm.

Distribution : India : West Bengal (Calcutta), Nilgiris and Sikkim; Uttar Pradesh (Dehra Dun and Mussourie); also Australian, Ethiopian; Oriental and Neotropical regions.

Remarks : The species has been recorded earlier from Calcutta, West Bengal.

80. *Marasmia trebiusalis* (Walker)

1859. *Botys trebiusalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 18 : 718.

1939. *Marasmia trebiusalis*, Klima, *Lep. Cat.*, pt. 89 : 64. •

Material examined : Material reviewed from the literature.

Diagnostic characters : Colour pale yellow. Abdomen with two black spots on terminal segment.

Fore wing with the costal and marginal areas broadly brownish; antemedial line curved and dark; a discocellular black lunule; mid costa with series of black specks; postmedial line nearly straight from costa to Cu_{1b} . Hind wing with a oblique line from costa before middle to anal angle; postmedial line from costa to cu_{1a} ; marginal brown area narrowing to anal angle. Both wings with dark line through the cilia. Wing exp. 18 mm.

Distribution : India : West Bengal (Calcutta), Himachal Pradesh (Dharamsala); also Borneo; Fiji; Flores; Samoa; Salomon Is.; Sri Lanka; Sumatra; South China; Vietnam (Tong-King) and West africa.

Remarks : The species has been recorded earlier from Calcutta, West Bengal.

81. *Marasmia bilinealis* Hampson

1891. *Marasmia bilinealis* Hampson, *Ill. Typ. Spec. Het. Brit. Mus.*, 8 : 139, pl. 155, fig. 25.

1939. *Marasmia bilinealis*, Klima, *Lep. Cat.*, pt. 89 : 64-65.

Material examined : Ten (M), 2 (F) Behala, Calcutta, 24-25.xi.1965 (G. S. Arora Coll.)

Diagnostic characters : Differs from *trebiusalis* with having no medial costal dark spots; the marginal dark area of both wings somewhat narrow and of nearly even width throughout. Wing exp. (M) 16 mm, (F) 16-22 mm.

Distribution : India : West Bengal (Calcutta) also Assam and Nilgiris; Borneo; Celebes; Java; Malacca; Sri Lanka; Sumatra and West China.

Remarks : This is the first report of the species from Calcutta, West Bengal.

Genus 56. *Syngamia* Guenee

1854. *Syngamia* Guenee. *Delt. et Pylal.*, p. 187.

Seven species under this genus are known from India of which two are recorded from West Bengal.

Key to the species of *Syngamia*

1. Both wings with outer area purplish black 2
Both wings with outer area without purplish black *abruptalis* (Walker)
2. Anal tuft with paired white lines and a black line between them *latimarginalis* (Walker)
Anal tuft without paired white lines and a black line between them 3
3. Hind wing base fiery red *floridalis* (Zeller)
Hind wing base dark brown *falsidicalis* (Walker)

82. *Syngamia latimarginalis* (Walker)

1859. *Asopia latimarginalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 17 : 370.

1939. *Syngamia latimarginalis*, Klima, *Lep. Cat.*, pt. 89 : 73.

Material examined : One (M), 1 (F), Calcutta (Old Museum collection in NZC with no other data available).

Diagnostic characters : Colour yellow brown. Fore legs and abdomen banded with black; outer area of both wings beyond the postmedial line purplish brown. Hind wing with the antemedial line terminating near anal angle; a black spot just above anal angle. Wing exp. 20-22 mm.

Distribution : India : West Bengal (Calcutta), Meghalaya (Khasis), throughout India; also Burma; Java; Sri Lanka; Taiwan; Vietnam (Tong-King); West and East tropical Africa.

Remarks : This is the first specific report of the species from Calcutta, West Bengal. Rose and Pajni (1985) described the species as *Leucochroma latimarginalis* (Walker) Comb. Nov.

83. *Syngamia abruptalis* (Walker)

1859. *Asopia abruptalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 17 : 371.

1939. *Syngamia abruptalis* Klima, *Lep. Cat.*, pt. 89 : 73.

Material examined : One (M), Bongaun, North 24-Parganas, 15.ii.1966 (H. C. ghose and Party Coll.).

Diagnostic characters : colour bright yellow. Frons with white lines on sides; palpi and abdomen below, pectus and legs white. Fore wing with curved brown antemedial line; a discocellular lunule; postmedial line excurved between M_2 and Cu_{1b} , then recurved again. Hind wing with antemedial line oblique and fuscous; post medial line from costa to Cu_{1b} . Both wings with marginal line black and a line through the cilia. Wing exp. 18 mm.

Distribution : India : West Bengal (North 24-Parganas), also Andaman, Himachal Pradesh (Kulu, Solan), Punjab (Chandigarh), Uttar Pradesh (Dehra Dun), throughout India; Australia; Burma; Fiji; Java; Mauritius; Sri Lanka; Taiwan; and West Africa.

Remarks : This is the first specific report of the species from Bongaun, North 24-Parganas, West Bengal.

84. *Syngamia floralis* (Zeller)

1852. *Stenia floralis* Zeller, *Kgl. Vet. Akad. Handl. Lep. Micropt. Caffr.*, p. 60.

1939. *Syngamia floralis*, Klima, *Lep. Cat.*, pt 89 : 71-72.

Material examined : One (M), 1 (F) Kurseong, Darjiling dist., (Old purchased collection in NZC with no other details available).

Diagnostic characters : Colour fiery red and yellow. Fore wing with the costal base purplish black; antemedial line straight; outer half of both the wings purplish black, fore wing with a large yellow oval postmedial patch extending from costa to Cu_{1b} . Hind wing with a black discocellular speck. Wng exp. 18 mm.

Distribution : India : West Bengal (Kurseong, Darjiling dist.), throughout India; also Burma; Celebes; Ceram; Duke of York Is., Malayan subregion; New Hebrides; Sri Lanka and Tahiti.

Remarks : This is the first specific report of the species from Kurseong, Darjiling district West Bengal. Rose and Pajni (1985) described the species as *Athaloessa calidalis tiphalis* (Walker).

85. *Syngamia falsidicalis* (Walker)

1859. *Asopia falsidicalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 17 : 370.

1939. *Syngamia falsidicalis*, Klima, *Lep. Cat.*, pt. 89 : 74.

Material examined : Three (M), 1 (F) Kurseong, Darjiling dist. (old purchased collection of NZC with no other details available).

Diagnostic characters : Colour deep brown; palpi white below; frons and abdomen marked with white; anal tuft brownish black and white. Fore wing with black antemedial line curved; discocellular lunule yellow; postmedial line straight from costa to Cu_{1b} , retracted to origin of Cu_{1b} and excurved again. Hind wing ante and postmedial lines almost meeting near anal angle. Wing exp. 22 mm.

Distribution : India : West Bengal (Kurseong, Darjiling dist.), Meghalaya (Khasis), Nilgiris and North West Himalayas; also Sri Lanka; Taiwan and West, Middle and South China.

Remarks : This is the first specific report of the species from Kurseong, Darjiling district, West Bengal.

Genus 57. *Diastictis* Hubner

1818. *Diastictis* Hubner, *Zutr. z. Sammlg. exot. Schmett.*, 1 : 21.

Out of twelve species known from India only one is recorded from West Bengal.

86. *Diastictis artificialis* Lederer

1863. *Botys artificialis* Lederer, *Wien. Ent. Monatschr.*, 7 : 370, 463, pl.8, fig. 16.

1939. *Diastictis artificialis*, Klima, *Lep. Cat.*, pt. 89 : 87.

Material examined : Material reviewed from the literature.

Diagnostic characters: Colour fuscous brown with a purplish tinge. Fore wing with a dark-edged hyaline spot in cell, a sinous hyaline line from it to inner margin; a hyaline spot in end of cell and

another below; a postmedial line with a trifid hyaline mark beyond. Hind wing with the basal half hyaline white; a sinous medial line and a postmedial line bent outwards. Both wings with a faint marginal series of dark specks. Females without white band at base of abdomen as present in male also the hyaline marks of fore wing are smaller in female specimens wing exp. 22 mm.

Distribution : India : West Bengal (Calcutta), Himachal Pradesh (Dharmsala, Solan), Uttar Pradesh (Dehra Dun).

Remarks : The species is already recorded from Calcutta, West Bengal. Rose and Pajni (1985) described the species under *Bocchoris artificialis* (Lederer).

Genus 58. *Filodes* Guenee

1854. *Filodes* Guenee, *Delt. et Pyral.*, p. 317.

Three species under this genus are known from India of which two are recorded from West Bengal.

Key to the species of *Filodes*

Fore wing with a black spot at middle of cell and a larger one on discocellulars
..... *fulvidorsalis* (Geyer)

Fore wing without black spot at middle of cell and on discocellulars *sexpunctalis* Snellen

87. *Filodes fulvidorsalis* (Geyer)

1832. *Pinacia fulvidorsalis* Geyer, In Hubn., *Zutrage Samml. Exot. Schm.*, 4 : 15.

1932. *Filodes fulvidorsalis*, Klima, *Lep. Cat.*, pt. 89 : 113-114.

Material examined : Four (M), 5 (F), Calcutta and 2 (M), Kurseong, Darjiling dist. (all old collections of NZC, no other data available) and 1 (F), Darjiling, May-June, 1974 (J. K. Jonathan and party Coll.).

Diagnostic characters : Thorax and abdomen orange scarlet, the latter with dorsal series of black spots, and steel blue rings. Wings blackish brown. Fore wing basal area orange, a steel blue fascia on basal half of costa; a black spot at origin of Cu_{1b} and a discocellular spot. Underside, fore wing with a steel blue subcoastal fascia; hind wing with a black lunule on discocellular. Wing exp. 30-44 mm.

Distribution : India : West Bengal (Calcutta and Kurseong), Darjiling dist.) also Andaman Is., Assam, Meghalaya (Khasis), Nicobar Is., throughout India; Amboina; Australia (Queensland); Borneo; Burma; Celebes; Java; Malacca; Philippines; Reunion; Sumatra and Sumbawa.

Remarks : This is the first record of the species from Kurseong and Darjiling of West Bengal.

88. *Filodes sexpunctalis* Snellen

1890. *Filodes sexpunctalis* Snellen, *Trans. ent. Soc. Lond.*, p. 603, pl. 20, fig. 6, 6a.
 1939. *Filodes sexpunctalis*, Klima, *Lep. Cat.*, pt. 89 : 114.

Material examined : Material reviewed from the literature.

Diagnostic characters : Differs from the previous species in the colour being deeper orange-red of the thorax, abdomen and base of fore wing and underside of fore wing without black spots. Wing exp. 46 mm.

Distribution : India : West Bengal (Darjiling) and Sikkim.

Remarks : The species is reported earlier from Darjiling, West Bengal.

Genus 59. *Phostria* Hubner

1819. *Phostria* Hubner, *Verz. bek. Schmett.*, p. 130.

Twentyone species are known under this genus from India of which two are recorded from West Bengal.

Key to the species of *Phostria*

- Patagia of male without long tufts of hair. Mid tibiae smoothly scaled *imbecilis* Moore
 Patagia of male with long tufts of hair extending far beyond the metathorax. Mid tibiae clothed with rough hair on outer side *analis* (Snellen)

89. *Phostria imbecilis* Moore

1887. *Phostria imbecilis* Moore, *Descr. N. India Lep. Ins. Atkinson*, p. 219, pl. 7, fig. 23.
 1939. *Phostria imbecilis*, Klima, *Lep. Cat.*, pt. 89, p. 128.

Material examined : Material reviewed from the literature.

Diagnostic characters : Dark brown with a purplish tinge. Fore wing with antemedial line black; a spot in cell and on discocellular; postmedial line dentate from costa to Cu_{1a} retracted to below end of cell and excurved again. Hind wing with a discocellular black spot; a postmedial line dentate and excurved between M_2 and Cu_{1a} . Wing exp. 38 mm.

Distribution : India : West Bengal (Darjiling), Himachal Pradesh (Kasauli), Sikkim, Uttar Pradesh (Dehra Dun) and Meghalaya (Khasis); also South China and Sumatra.

Remarks : The species is recorded earlier from Darjiling West Bengal. Rose and Pajni (1985) described the species as *Sylepta imbecilis* (Moore) Comb. Nov.

90. *Phostria analis* (Snellen)1880. *Omiodes analis* Snellen, *Tidjs. v. Ent.*, 23 : 227.1939. *Phostria analis*, Klima, *Lep. Cat.*, pt. 89 : 126.*Material examined* : Material reviewed from the literature.*Diagnostic characters* : Colour brown. Underside of head, thorax and abdomen whitish, patagial tufts with a dull yellow tinge. Fore wing with ante- and postmedial lines dentate and well defined. Hind wing with a medial sinous line. Cilia of both wings with white tips. Wing exp. 30 mm.*Distribution* : India : West Bengal (Calcutta), Nagaland, Sikkim; also Amboina; Borneo, Celebes; Duke of York Island; Java; Pulo Laut; South China and Sumatra.*Remarks* : The species is earlier recorded from Calcutta, West Bengal.Genus 60. *Dichocrocis* Lederer1863. *Dichocrocis*, Lederer, *Wien. Ent. Monatsch.*, 7 : 447.

Twentyfive species under this genus are known from India of which two are recorded from West Bengal.

Key to the species of *Dichocrocis*Hind wing of male with a small tuft of scales on upperside at origin of Cu_{1b} only
..... *evaxalis* (Walker)Hind wing of male with long hairs on underside of the cell *bistrigalis* (Walker)91. *Dichocrocis evaxalis* (Walker)1859. *Botys evaxalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 19 : 995.1939. *Dichocrocis evaxalis*, Klima, *Lep. Cat.*, pt. 89 : 143-144.*Material examined* : Material reviewed from the literature.*Diagnostic characters* : Bright straw yellow; palpi black at sides; abdomen with dorsal and lateral series of black spots. Fore wing with black spots at base of costa and a series of subbasal spots; antemedial spots conjoined into a sinous line; medial spots conjoined as a sinous line to the line on discocellulars, postmedial spots forming an almost complete line. Both wings with a series of submarginal spots. Wing exp. (M) 24-30 mm, (F) 26-34 mm.*Distribution* : India : West Bengal (Calcutta), Meghalaya (Khasis); Sikkim; also Buru; Ceram; Java; New Guinae; Sri Lanka; Sumatra and Vietnam (Tong-King).*Remarks 7* : The species is recorded earlier from Calcutta, West Bengal.

92. *Dichocrocis bistrigalis* (Walker)

1865. *Zebronia bistrigalis* Walker, *Cat. Lep. Het. brit. Mus.*, 34 : 1348.
 1939. *Dichocrocis bistrigalis*, Klima, *Lep. Cat.*, pt. 89 :

Material examined : Material reviewed from the literature.

Diagnostic characters : Bright yellow; collar, patagia and abdomen spotted with black. Fore wing with two basal and three subbasal spots; a spot in cell and a line from median nervure to inner margin; two lunules on discocellulars and a spot above them on the postmedial line. Hind wing with a discocellular spot and a triangular spot below the costa, a round spot near Cu_{1a} ; a line from Cu_{1b} to inner margin and a submarginal line from costa to M_2 . Bothwings with fine black marginal line. Wing exp. 30 mm.

Distribution : India : West Bengal (Darjiling), Sikkim; and Bhutan.

Remarks : The type locality of the species is from Darjiling, West Bengal.

Genus 61. *Lamprosema* Hubner

1823. *Lamprosema*, Hubner, *Zutr. z. Sammlg. exot. Schmett.*, 2 : 21.

Fortytwo species under this genus are known from India of which two species are recorded from West Bengal.

Key to the species of *Lamprosema*

- Colour brownish red. Fore wing postmedial line excurved from below costa to Cu_{1b}
 *niphealis* (Walker)
- Colour brownish yellow. Fore wing postmedial line nearly straight from below costa to Cu_{1b}
 *indicata* (Fabricius)

93. *Lamprosema niphealis* Walker

1859. *Botys niphealis* Walker, *Cat. Lep. Het. Brit. Mus.*, 18 : 638.
 1939. *Lamprosema niphealis*, Klima, *Lep. Cat.*, pt. 89 : 161-162

Material examined : Material reviewed from the literature.

Diagnostic characters : Brownish red; palpi white below in male, abdomen with long lateral tufts from base, anal tuft black. Fore wing antemedial line obliquely curved; a speck in cell and line on discocellulars; postmedial line dentate, excurved from below costa to Cu_{1b} and retracted to angle of cell. Hind wing with a discocellular speck; postmedial line curved to Cu_{1b} and retracted to angle of cell. Cilia of both wings black at base and white at tips. Wing exp. 24 mm.

Distribution : India : West Bengal (Calcutta), Maharashtra (Bombay), Nagaland, Nicobar is., Sikkim; also Chagos; Maldives; Minicoy; Seychelles; Sri Lanka; Vietnam (Tong-King) and West Africa (Sierra Leone).

Remarks : From West Bengal the species is recorded from Calcutta only.

94. *Lamprosema indicata* (Fabricius)

1775. *Phalaena indicata*, Fabricius, *Syst. Ent.*, p. 640.

1939. *Lamprosema indicata*, Klima, *Lep. Cat.*, pt. 89, pp. 156-157

Material examined : One (M), Hugli, 8.ix.1950 (N. C. Chatterjee Coll.).

Diagnostic characters : Brownish yellow; abdomen with white rings. Fore wing antemedial line curved and black; a speck in cell and discocellular spot; postmedial line from a spot on costa nearly straight to Cu_{1b} then retracted. Hind wing with discocellular spot; postmedial line excurved between M_2 and Cu_{1b} then retracted; marginal black lines on both wings; line at base of cilia brownish on fore wing white on hind wing. Wing exp. 20 mm.

Distribution : India : West Bengal (Hugli), Cosmopolitan, throughout the Ethiopian, Oriental and Neotropical regions.

Remarks : This is the first specific report of the species from Hugli district, West Bengal.

Genus 62. *Pilocrocis* Lederer

1863. *Pilocrocis* Lederer, *Wien. Ent. Monatschr.*, 7 : 430.

One species under this genus is known from India as well as West Bengal.

95. *Pilocrocis barcalis* (Walker)

1859. *Botys barcalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 19 : 1001.

1939. *Pilocrocis barcalis*, Klima, *Lep. Cat.*, pt. 89 : 92.

Material examined : Material reviewed from the literature.

Diagnostic characters : Greyish brown in colour. Fore wing antemedial line curved and black; a discocellular speck; a black postmedial line diffused outwards, straight from costa to Cu_{1a} and incurved to origin of Cu_{1b} and excurved again. Hind wing with discocellular speck; postmedial line excurved and reduced to small specks between M_2 and Cu_{1b} . Cilia brownish white on fore wing and whitish on hind wing. Wing exp. 36 mm.

Distribution : India : West Bengal (Calcutta) also Maharashtra (Bombay, Poona), Meghalaya (Khasis), Nilgiris; and Borneo; Burma; Flores; Sri Lanka.

Remarks : The species is recorded earlier from Calcutta, West Bengal.

Genus 63. *Botyodes* Guenee

1854. *Botyodes* Guenee, *Delt. et Pyral.*, p. 320.

Six species under this genus are known from India of which two are recorded from West Bengal.

Key to the species of *Botyodes*

Hind wing of male with the inner area clothed with long rough hair*flavibasalis* Moore

Hind wing of male with the inner area not clothed with any rough hair *caldusalis* (Walker)

96. *Botyodes flavibasalis* Moore

1867. *Botyodes flavibasalis* Moore, *Proc. zool. Soc. Lond.*, p. 96.

1939. *Botyodes flavibasalis*, Klima, *Lep. Cat.*, pt. 89 : 184.

Material examined : Material reviewed from the literature.

Diagnostic characters : Orange yellow; black spots on palpi, collar and two basal segments on abdomen; anal tuft pale yellow. Forewing with a spot at base; antemedial line black; discocellular band greyish brown edged with black; marginal band broad vinous grey brown. Hind wing with a similar marginal band. Wing exp. 86 mm.

Distribution : India : West Bengal (Calcutta), Assam, Sikkim; also Bismark Archipelago; Burma; Malacca; New Guinea, Nias; Philippines; Sumatra and Vietnam (Tong-King).

Remarks : The species is recorded earlier from Calcutta, West Bengal.

97. *Botyodes caldusalis* (Walker)

1859. *Botys caldusalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 18 : 659.

1939. *Botyodes caldusalis*, Klima, *Lep. Cat.*, pt. 849 : 184.

Material examined : One (F), Kurseong, Darjiling dist. (C. Duncan Coll.) (old collection from NZC with no other data available).

Diagnostic characters : Orange yellow. Fore wing with two thirds of basal costal area suffused with brown; antemedial line faint sinous; a speck in cell and discocellular lunule; post-medial and submarginal lines maculate. Hind wing with discocellular spot; postmedial line maculate and diffused below costa; a sinous sub-marginal maculate line; cilia of both wings brownish. Wing exp. 34 mm.

Distribution : India : West Bengal (Kurseong, Darjiling dist.), Assam, Sikkim; also Burma; Java; Singapore; Taiwan; Vietnam (Tong-King) and West and South China.

Remarks : This is the first record of the species from Kurseong, Darjiling district, West Bengal.

Genus 64. *Sylepta* Hubner

1825. *Sylepta* Hubner, *Verz. bek. Schmett.*, p. 356.

About fifty five species are known from India under this genus of which three species are recorded from West Bengal.

Key to the species of *Sylepta*

1. Wings with the markings deep and prominent 2
 Wings with the markings faint and indistinct *sabinusalis* (Walker)
2. Hind wing with the submarginal band sending a spur inwards along cu_{1b} towards the medial line *gastralis* (Walker)
 Hind wing with the submarginal line bent outwards to anal angle *derogata* (Fabricius)

98. *Sylepta sabinusalis* (Walker)

1859. *Botys sabinusalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 18 : 708.

1939. *Sylepta sabinusalis*, Klima, *Lep. Cat.*, pt. 89 : 205-206.

Material examined : Four (M), 5 (F), Kurseong, Darjiling dist., (C. Duncan Coll.), (Old collection from NZC with no other data).

Diagnostic characters : Yellowish with a brownish tinge. Fore wing with the antemedial line fuscous and outwardly oblique; a speck in cell and discocellular lunule; postmedial line nearly straight from costa to M_2 . Hind wing with discocellular spot; postmedial line dentate and highly bent outwards; marginal area fuscous. Wing exp. 32-36 mm.

Distribution : India : West Bengal (Kurseong, Darjiling dist.), Maharashtra (Bombay), Meghalaya (Khasis), Nilgiris, Sikkim, North West and East Himalayas; also Borneo; Buru; Camerun; Celebes; Ceram; Fiji; Java; Solomon; South Africa; Sri Lanka; Sumatra; Sumbawa; Taiwan; and West and Middle China.

Remarks : This is the first specific report of the species from Kurseong, Darjiling district, West Bengal.

99. *Sylepta gastralis* (Walker)

1865. *Glyphodes gastralis* Walker, *Cat. Lep. Het. Brit. Mus.*, 34:1356.

1939. *Sylepta gastralis*, Klima, *Lep. Cat.*, pt. 89:204.

Material examined : One (M), Darjiling (Old collection from NZC with no other data).

Diagnostic characters : Pale yellow. Fore legs with black marks; thorax with black spots; abdomen orange with paired black spots on basal segments and before anal tuft; subbasal area with two black spots; discocellular lunule pale and large; medial line excurved above inner margin and joins with the antemedial line with a fascia; a brown fascia joins the submargin and marginal bands above middle. Hind wing with the submarginal band sending a spur towards median line along Cu_{1b} . Wing exp. 36 mm.

Distribution : India ; West Bengal (Darjiling) also Himachal Pradesh (Dharmasala), Meghalaya (Khasis) and Sikkim.

Remarks : The species is recorded earlier from Darjiling district, West Bengal.

100 *Sylepta derogata* Fabricius

1775. *Phalaena derogata* Fabricius, *Syst. Ent.*, p. 641.

1939. *Sylepta derogata*, Klima, *Lep. Cat.*, pt. 89 : 193-196.

Material examined : One (M), Calcutta, 8.viii. 1901 (No name of collector).

Diagnostic characters : Yellowish white; head and thorax spotted with black and brown; abdomen ringed with brown. Fore wing antemedial line oblique; an annulus in cell; postmedial line highly bent outward between M_2 and Cu_{1b} , veins of outer area streaked with brown; submarginal line minutely dentate and a marginal line. Hind wing with discocellular annulus touching the antemedial line; postmedial line dentate and highly excurved between M_2 and Cu_{1b} ; submarginal and marginal line. Wing exp. 28-40 mm.

Distribution : India ; West Bengal (Calcutta), Andaman Is., throughout India; also Australian region; Burma; China, Fiji, Japan; Korea; Malayan subregion; Sri Lanka; Taiwan; USSR (E. Siberia); West and South Africa.

Remarks : This is the first specific report of the species from Calcutta, West Bengal.

Genus 65. *Agathodes* Guenee

1854. *Agathodes* Guenee, *Delt. etc. Pyral.*, p. 207.

One species under this genus is known from India as well as West Bengal.

101. *Agathodes ostentalis* (Hubner)

1838. *Perinephela ostentalis* Hubner, *Geyer, Zutr. Samml. exot. Schmett.*, 5 : 11, figs. 833, 834.

1985. *Agathodes ostentalis*, Rose and Pajni, *Res. Bull. (Sci.) Punjab Univ.*, 36(3-4) : 204.

Material examined : One (F), Darjiling (old collection from NZC with no other details available).

Material examined : One (F), Darjiling (Old collection from NZC with no other details available).

Diagnostic characters : Pale brownish red colour; head and thorax marked with white; abdomen with white rings. Fore wing with the costa white, discocellular lunule white; a medial broad white edged pink band from cell to inner margin and continued as a diffused patch to middle of outer margin; apical mark large, semicircular and white edged; cilia pink. Hind wing pale yellow. Wing exp. 26-40 mm.

Distribution : India : West Bengal (Darjiling), Andamans, Himachal Pradesh (Mandi), Maharashtra (Bombay), Nilgiris, Sikkim, Uttar Pradesh (Mussourie, Dehra Dun), throughout India; also Burma; Ceram; Java; Sri Lanka and Sumbawa.

Genus 66. *Glyphodes* Guenee

1854. *Glyphodes* Guenee, *Delt. etc. Pyral.*, p. 292.

This genus is represented by twenty eight Indian species of which four are recorded from West Bengal.

Key to the species of *Glyphodes*

1. Fore wing with antemedial line white or spotted with white2.
Fore wing with antemedial band yellow or fulvous yellow 3
2. Fore wing with upper edge of the dark edged hyaline white medial patch indented
..... *canthusalis* Walker
Fore wing with upper edge of the dark edged hyaline white medial patch not indented
.....*pyloalis* Walker
3. Fore wing with antemedial band formed of two black edged pale yellow patches
..... *caesalis* Walker
Fore wing with antemedial band not formed of two black edged pale yellow patches
..... *naralis* Felder

102. *Glyphodes canthusalis* Walker

1859. *Glyphodes canthusalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 17 : 505.

1896. *Glyphodes canthusalis* Hampson, *Fauna Brit. India, Moths*, 4 : 357.

Material examined : One (F), Darjiling, 3.iv. 1975 (J.K. Jonathan and Party Coll.) and 3 (MM), 3 (FF), Calcutta, 30.x.1907 (Name of collector not available).

Diagnostic characters : Yellowish red spotted with white; abdomen with paired white spots on basal segments. Fore wing with antemedial white spots; a large dark edged hyaline white middle patch

with indented upper edge; a large post medial dark-edged hyaline white patch. Hind wing with postmedial patch dark edged hyaline white, margin dark. Wing exp. 30-36 mm.

Distribution : India : West Bengal (Calcutta, Darjiling), Andamans, Assam, Karnataka (Karwar), Maharashtra (Bombay), Sikkim; also Sumatra and Taiwan.

Remarks : This is the first specific report of the species from Darjiling, West Bengal.

103. *Glyphodes pyloalis* Walker

1859. *Glyphodes pyloalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 19:973.

1898. *Glyphodes pyloalis*, Hampson, *Proc. zool. Soc. Lond.*, p. 746.

Material examined : One (F), Darjiling, 3.vi.1975. (J.K. Jonathan and Party Coll.).

Diagnostic characters : Brown hyaline-white; vertex of head, patagia and sides of abdomen striped with white. Fore wing pale yellow, inner margin white, basal area brown; antemedial line white, a black-edged dull yellow band beyond it followed by a black-edged medial hyaline white patch and a yellowish band, discocellular lunule and ring spot on Cu_{1b} ; a large black-edged hyaline white triangular patch with its apex on 1A+2A; a submarginal black-edged white line. Hind wing hyaline white; marginal band broad pale fulvous. Wing exp. 26 mm. with black inner edge; submarginal band diffused fuscous; margin white with a fine black line.

Distribution : India : West Bengal (Darjiling), throughout India; also Burma; China; Japan and Sri Lanka.

Remarks : This is the first specific record of the species from Darjiling, West Bengal.

104. *Glyphodes caesalis* Walker

1859. *Glyphodes caesalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 17 : 499.

1896. *Glyphodes caesalis*, Hampson, *Fauna Brit. India, Moths*, 4 : 356.

Material examined: 2 (MM), Darjiling, (Old collection of NZC with no other data available).

Diagnostic characters : Yellowish hyaline in colour. Male with the anal tuft black. Fore wing sbbasal line black; antemedial band formed of two black edged pale yellow patches; medial patch large subtriangular dark edged yellow; postmedial band formed of two irregular black edged patches; submarginal patch also blackedged. Hind wing semihyaline with the discocellular line black; medial black line double with yellow inside. Post medical line block with its outer area yellow. Wing exp. 26-34 mm.

Distribution : India : West Bengal (Darjiling), Andamans, Sikkim; also Burma and Sri Lanka.

Remarks : This is the first specific report of the species from Darjiling, West Bengal.

105. *Glyphodes naralis* Felder

1874. *Glyphodes naralis* Felder, *Reise. Nov. Lep.*, pl. 136, fig. 38.

1898. *Glyphodes naralis*, Hampson, *Proc. zool. Soc. Lond.*, p. 744.

Material examined : 1 (M), Darjiling, August, 1912 (No collectors name, old collection from NZC).

Diagnostic characters : Pale yellow; palpi and vertex of head and collar striped with black. Fore wing with the base yellow; antemedial band yellow; medial patch triangular dark-edged; beyond a brownish yellow band with a silvery discocellular line and a spot on Cu_{1b} ; postmedial patch dark triangular. Hind wing semihyaline yellow; discocellular lines brownish yellow. Both wings marginal area brownish yellow. Wing exp. 28-32 mm.

Distribution : India : West Bengal (Darjiling), Sikkim; and Borneo.

Remarks : This is the first specific report of the species from Darjiling, West Bengal.

Genus 67. *Diaphania* Hubner.

1818. (1818-1837). *Diaphania* Hubner, *Zutr. Samml. exot. Schmett.*, 1 : 20, pl. 18, figs. 101-102.

About 16 species are known under this genus from India of which nine are reported from West Bengal.

Key to the genus of *Diaphania* from West Bengal.

1. Antennae of male with basal joint dilated 2
 Antennae of male with basal joint not dilated 3
2. Antennae with the base of shaft somewhat thickened and then contorted
 *laticostalis* (Guenee)
 Antennae with the base of shaft not thickened but excised *negatalis* (Walker)
3. Hind wing of male with tufts of hair on inner area below 4
 Hind wing of male without tufts of hair on inner area below 5
4. Hind tibiae of male without tufts of hair on inner area below 5
 Hind tibiae of male with large thick tufts of black hair *vertumnalis* (Guenee)

5. Abdomen with anal tuft developed into a large brush of long spatulate scales *indica* (Saunders)
 6
- Abdomen with anal tuft not developed into a large brush of long spatulate scales 6
6. Body and wings red-brown or black-brown 7
- Body and wings other than red brown or black-brown 8
7. Fore wing with an oblique hyaline striga at middle of cell *crithealis* (Walker)
- Fore wing without an oblique hyaline striga at middle of cell *bicolor* Swainson
8. Large (46-50 mm). Glaucous green in colour *glauculalis* (Guenee)
- Small (36-40 mm). Pure white in colour *unionalis* (Hubner)

106. *Diaphania laticostalis* (Guenee)

1854. *Margarodes laticostalis* Guenee, *Delt. et Pyral.*, p. 303.

1939. *Diaphania laticostalis*, Klima, *Lep. Cat.*, 94 : 247-248.

Material examined : Two (MM), 1 (F), Calcutta, 14-15.ii.1967 (H.C. Ghosh Coll.).

Diagnostic characters : Pure white in colour. Fore wing with a broad, dark cupreous brown coal band; palpi white below; fore tibiae banded with cupreous brown. Wing exp. 40-46 mm.

Distribution : India : West Bengal (Calcutta), Andamans, Himachal Pradesh (Dharmasala), Sikkim, Uttar Pradesh (Dehra Dun), throughout India; also Burma; Ceram; New Hebrides; Pulo Laut; Sri Lanka and Sumbawa.

Remarks : This is the first specific report of this species from Calcutta, West Bengal. Rose and Pajni (1985) described the species as *Hoidodes laticostalis* (Guenee) Comb. nov.

107. *Diaphania negatalis* (Walker)

1859. *Phalangiodes? negatalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 17 : 458.

1985. *Diaphania negatalis*, Rose and Pajni, *Res. Bull. (Sci.) Punjab Univ.*, 36 (3-4) : 209.

Material examined : Two (FF), Calcutta 8, 14.xii.1900, 1 (F), Calcutta, 19.ix.1901, 3 (MM), Calcutta 24.xi.1900 (collectors name not available).

Diagnostic characters : Grey and white in colour; anal tuft black. Fore wing with subbasal, antemedial, medial, postmedial and marginal sinous, black-edged, pale fulvous bands; a black speck in cell. Hind wing hyaline white with some black and yellow marks near lower angle of cell. Wing

exp. 28-30 mm.

Distribution : India : West Bengal (Calcutta), Himachal Pradesh (Kulu, Manali, Solan), Jammu and Kashmir (Srinagar), Maharashtra (Bombay, Mahabaleshwar, Poona), Meghalaya (Cherrapunji), Sikkim, Uttar Pradesh (Dehra Dun), throughout India; also Australia; Burma and Sri Lanka.

Remarks : This is the first specific report of the species from Calcutta, West Bengal.

108. *Diaphania marginata* (Hampson)

1893. *Cenocnemis marginata* Hampson, *Ill. Typ. Spec. Lep. Het. Brit. Mus.*, 9 : 169, pl. 173, fig. 23.

1939. *Diaphania marginata*, Klima, *Lep. Cat.*, 94 : 251-252.

Material examined : Two (FF), Calcutta and 1 (M) Kurseong, Darjiling dist. (Old collection of NZC with no other details).

Diagnostic characters : Colour yellowish green; palpi with the tips fulvous; anal tuft of male large and black. Fore wing with the costa fulvous; small discocellular specks on both wings. Hind wing with the inner area yellowish. Wing exp. 40 mm.

Distribution : India : West Bengal (Calcutta, Kurseong, Darjiling dist.), Assam (Cachar), Jammu and Kashmir (Srinagar), Kerala (Travancore), Nicobar Is., Orissa (Ganjam), Sikkim, South Andamans, Uttar Pradesh (Dehra Dun and Hardawar); also Solomons and Sri Lanka.

Remarks : This is the first specific report of the species from Kurseong, Darjiling district, West Bengal. Rose and Pajni (1985) described the species as *Parotis marginata* (Hampson) comb. nov.

109. *Diaphania vertumnalis* (Guenee)

1854. *Margarodes vertumnalis* Guenee, *Delt. et Pylal.*, p. 309.

1939. *Diaphania vertumnalis*, Klima, *Lep. Cat.*, 94 : 250-251.

Material examined : Two (MM), 1 (F), Calcutta, 25.x.1960 (A.P.Kapur Coll.) and 4 (MM), 1 (F), Calcutta (A.W.Alcock Coll., no other data available).

Diagnostic characters : Colour yellowish green. Anal tuft of male large and black. Similar to *marginata* but smaller in size. Wing exp. 26 mm.

Distribution : India : West Bengal (Calcutta), Andamans, Great Nicobar Is., Himachal Pradesh (Simla), Madhya Pradesh, Maharashtra (Bombay), Nicobar, Sikkim, Tamil Nadu, Uttar Pradesh (Chakrata, Dehra Dun), throughout India; also Australia; Borneo; Burma (Tenasserim); Ceram; Java; Malaya; Philippines and Sri Lanka.

Remarks : This is the first specific report of the species from Calcutta, West Bengal. Rose and Pajni (1985) described the species as *Parotis vertumnalis* (Guenee) comb. nov.

110. *Diaphania glauculalis* (Guenee)

1854. *Margarodes glauculalis* Guenee, *Delt. et Pyral.*, p. 306.
 1939. *Diaphania glauculalis*, Klima, *Lep. Cat.*, **94**:p. 225-384.

Material examined : Four (MM), 7 (FF), Calcutta, 31.x.1901 (Collector's name not available).

Diagnostic characters : Colour glaucous green; palpi bright yellow, white below; male with the anal tuft black. Fore wing with a fulvous costal fascia on the basal part with white below; discocellular speck minute dark; both wings with marginal series of black specks. Wing exp. 34-50 mm.

Distribution : India : West Bengal (Calcutta), Himachal Pradesh (Simla), Assam (Dansiri, Sibsagar), Karnataka (Belgaum, Kurg), Kerala (Travancore), Maharashtra (Bombay, Poona), Meghalaya (Northern Khasis), Nagaland, Sikkim, Tamil Nadu, Uttar Pradesh (Mussourie); also Borneo; Burma; Java; Malaya; Sri Lanka; Sumatra and Ternate.

Remarks : From West Bengal the species is recorded from Calcutta. Rose and Pajni (1985) described the species as *Parotis glauculalis* (Guenee) comb. nov.

111. *Diaphania unionalis* (Hubner)

1805. *Pyralis unionalis* Hubner, *Samml. Eur. Schmett. Pyr.*, p. 21, pl. 20, fig. 132.
 1939. *Diaphania unionalis*, Klima, *Lep. Cat.*, **94** : 225-384.

Material examined : One (M), 1 (F), Darjiling, (Old collection from NZC with no other data).

Diagnostic characters : Colour pure white, palpi yellow, white below; fore tibiae banded with yellow; anal tuft with black hairs; both wings semithyaline white; fore wing with the costa yellowish. Wing exp. 36-40. mm.

Distribution : India ; West Bengal (Darjiling), throughout India; also Aden; Australia; Madagascar; Mauritius; Pakistan (Karachi); Sri Lanka; South and West Africa and South Europe.

Remarks : This is the first specific report of the species from Darjiling, West Bengal. Rose and Pajni (1985) described the species as *Palpita unionalis* (Hubner).

112. *Diaphania crithealis* (Walker)

1859. *Desmia crithealis* Walker, *Cat. Lep. Het. Brit. Mus.*, 17 : 458.
 1985. *Diaphania crithealis*, Rose and Pajni, *Res. Bull. (Sci.) Punjab Univ.*, **36**(3-4) : 204.

Material examined : One (F), Darjiling (Old collection from NZC, 17.iv.1904, with no other data).

Diagnostic characters : Colour reddish brown suffused with yellow. Fore wing with a hyaline

striga at middle of cell; a hyaline white patch with black edged in and below end of cell; another postmedial hyaline white patch. Hind wing with the base hyaline white; a black speck or spot on discocellulars; inner area brown; postmedial line black and dentate on Cu_{1b} ; both wings with marginal black line. Wing exp. 32-36 mm.

Distribution : India : West Bengal (Darjiling), Himachal Pradesh (Simla); Uttar Pradesh (Dehra Dun); North West and East Himalayas; also China.

Remarks : This is the first specific record of the species from Darjiling, West Bengal.

113. *Diaphania bicolor* (Swainson)

1821. *Botys bicolor* Swinson, *Zool. Illustr.*, (1) 2 : 77, fig. 2.

1939. *Diaphania bicolor*, Klima, *Lep. Cat.*, 94 : 256-257.

Material examined : One (M), Calcutta, 8.x.1965 (H.L. Paul Coll).

Diagnostic characters : Colour black-brown; anal tuft black. Fore wing inner margin with two white marks on basal part; medial band black-edged semihyaline white not reaching costa; a spot in cell often obsolete; postmedial patch large oval black-edged hyaline white with a small white triangular spot on costa beyond it. Hind wing with the basal area hyaline white; outer area black brown. Wing exp. 22 mm.

Distribution : India : West Bengal (Calcutta), Andamans, Kerala (Travancore), Maharashtra (Poona), Sikkim, throughout India; also Australia; Burma; Celebes; Java; Malayan subregion; Sri Lanka and South Africa.

Remarks : From West Bengal the species is recorded from Calcutta.

114. *Diaphania indica* (Saunders)

1851. *Eudiptes indica* Saunders, *Trans. ent. Soc. Lond.*, (2) 1 : 163, pl. figs. 5-7.

1985. *Diaphania indica*, Rose and Pajni, *Res. Bull. (Sci.) Punjab Univ.*, 36 (3-4) : 203-216.

Material examined : One (M), Barrackpore, N-24 Parganas dist., 14.xi.1961 (K.V. Lakshminarayan and K.D. Chatterjee Coll.); 1 (M), Bankura dist., 6.vii. 1988 (K.K. Roy and Party Coll.), 1 (M), Calcutta, 25.x.1960 (A.P. Kapur Coll.); 1 (F), Calcutta, 2.ii. 1961 (A.P. Kapur Coll.), 1 (F), Kurseong, Darjiling dist., (Purchased old collection of NZC with no other data).

Diagnostic characters : Colour hyaline white and black; abdomen white, anal tuft with segments 7 and 8 brown and black. Fore wing with the costal and marginal areas broadly black, rest hyaline white. Hind wing hyaline white with the marginal black band broad at costa. Wing exp. 24-28 mm.

Distribution : India ; West Bengal (Calcutta, Darjiling dist.), andamans, Bihar (Pusa, Ranchi), Great Nicobar, Haryana (Ambala, Chandigarh), Himachal Pradesh (Solan), great Nicobar, Madhya Pradesh (Mhow), Mharashtra (Bombay, Poona), Nilgiris, Punjab, Sikkim, Tamil Nadu; also Australia;

Burma (Rangoon); Celebes; China; Java; Pakistan (Karachi) : throughout the Australian, Ethiopian and Oriental regions.

Remarks : The larva feeds on cotton. This is the first record of the species from Bankura, Darjiling and North 24-Parganas district of West Bengal.

Genus 68. *Pygospila* Guenee

1854. *Pygospila* Guenee, *Delt. et Pyral.*, p. 312.

Four species under this genus are known from India of which one is recorded from West Bengal.

115. *Pygospila tyres* (Cramer)

1779. *Phalaena (Pyralis) tyres* Cramer, *Pap. Exot.*, 3 : pl. 263, fig. C.

1898. *Pygospila tyres*, Hampson, *Proc. zool. Soc. Lond.*, p. 750.

Material examined : One (F), Jiyaganj, Murshidabad dist., 6.ii.1986 (I.J. Gupta and Party Coll.) 1 (M), Calcutta, 31.viii. 1965 (K.S. Pradhan and K.V. Lakshminarayanan Coll.

Diagnostic characters : Colour black shot with purple; palpi white below; abdomen with paired dorsal and lateral series of white spots. Fore wing with two oblique whitish subbasal lines; an oblique antemedial series of three white spots; a speck in cell; a spot in end of cell another large spot below the end; a bidentate, spot beyond the cell and another towards apex. Hind wing with streaks in and below cell. Both wings with a pair of spots between origin of Cu1a and M2, three submarginal smaller spots and a spot below vein Cu1b. Wing exp. 42-46 mm.

Distribution : India ; West Bengal (Calcutta, Murshidabad dist.), Bihar (Buxar, Ranchi), Himachal Pradesh (Kulu), Madhya Pradesh (Mhow), Maharashtra (Bombay, Poona), Nilgiri hills, Rajasthan (Khandela), throughout India; also Borneo; Burma; Java, Pakistan (Karachi) and Sri Lanka.

Remarks : Rose and Pajni (1985) described the species as *Phlyctaenia tyres* (Cramer). This is the first specific report of the species from Murshidabad district, West Bengal.

Genus 69. *Crocidolomia* Zeller

1854. *Crocidolomia* Zeller, *Lep. Caffr.*, p. 65.

Three species under this genus are known from India of which one is recorded from West Bengal.

116. *Crocidolomia binotalis* Zeller

1854. *Crocidolomia binotalis* Zeller, *Lep. Caffr.*, p. 65.

1985. *Crocidolomia binotalis*, Rose and Pajni, *Res. Bull. (Sci.) Punjab Univ.*, 36 (3-4) : 211.

Material examined : One (M), Darjiling (Old collection from NZC with no other available data),

1 (M) Chakda, Nadia district, 1.ii.1980 (N. Ghosh Coll.).

Diagnostic characters : Colour pale yellow and white; palpi with brown bands. Fore wing suffused with brown; male with the costal tuft pale yellow and black; antemedial line highly dentate in and below cell; dark-edged white spots at the angles of cell; postmedial line highly curved and dentate with a series of black specks on it and indistinct line beyond it; a submarginal line. Hind wing semihyaline pale yellowish white with the apical area suffused with brown. Wing exp. 26 mm.

Distribution : India : West Bengal (Darjiling, Nadia), throughout India; also Australia; Burma; Java; Norfolk Islands; Pakistan (Karachi); Sri Lanka; South Africa and Taiwan.

Remarks : This is the first specific report of the species from Darjiling and Nadia districts of West Bengal.

Genus 70. *Sameodes* Snellen

1880. *Sameodes* Snellen, *Tijdschr. v. Ent.*, **23**, 217.

Four species under this genus are known from India of which one is recorded from West Bengal,

1852. *Botys cancellalis* Zeller, *K. vet.-AK. Handl.*, p. 34.

1985. *Sameodes cancellalis*, Rose and Pajni, *Res. Bull (Sci.) Punjab Univ.*, **36**(3-4), 203-216.

Material examined : Two (MM), 3 (FF), Calcutta, 29.x.1966 (H.C. Ghosh Coll.), 1 (F), Calcutta, 21.x.1959 (A.P. Kapur Coll.), 1 (M), Diamond Harbour, S. 24-Parganas, 9.xii.1961 (R.K. Varshney and S. Ali Coll.) , 2 (FF), Calcutta, 24.xi.1965 (G.S. Arora Coll.) and 1 (M), 1 (F), Calcutta, No date (Museum collection).

Diagnostic characters : Colour yellowish. Abdomen whitish. Fore wing costa black, male with a costal lobe; a quadrate hyaline spot in cell and spots below middle and in end of cell and a series of large hyaline spots in the inter spaces; postmedial line sinous. Hind wing hyaline with dark specks in and below cell; postmedial line waved; both wings with marginal black line; cilia black and white. Wing exp. 22 mm.

Distribution : India : West Bengal (Calcutta, South 24-Parganas), Andamans, Himachal Pradesh (Solan), Haryana (Kurukhetra), Punjab (Chandigarh), Uttar Pradesh (Dehra Dun), throughout India also from Africa; Australia; Burma; Fiji; Java and Sri Lanka.

Remarks : This is the first specific report of the species from West Bengal.

Genus 71. *Hyalobathra* Meyrick

1886. *Hyalobathra* Meyrick, *Trans. ent. Soc.*, p. 445.

Seven species are known under this genus from India of which two are recorded from West Bengal.

Key to the species of *Hyalobathra* from West Bengal

Fore wing with a large fuscous discocellular patch *Coenostolalis* Snellen

Fore wing without large fuscous discocellular patch *opheltesalis* Walker

118. *Hyalobathra coenostolalis* (Snellen)

1890. *Botys coenostolalis* Snellen, *Trans. ent. Soc. Lond.*, p. 582.

1985. *Hyalobathra coenostolalis* Rose and Pajni, *Res. Bull. (Sci.) Punjab Univ.*, 36 (3-4) : 203-216.

Material examined : One (M), Kurseong, Darjiling dist, (Old collection from NZC, Purchased, no other data available).

Diagnostic characters : Colour yellow suffused with brown. Fore wing antemedial line indistinct dark curved; discocellular patch large brown with a highly waved band curved; discocellular patch large brown with a highly waved band from it to inner margin, a postmedial outwardly oblique line and a submarginal line; the apical area from beyond the postmedial line golden orange. Hind wing with indistinct dark patch at lower angle of cell; postmedial and submarginal lines also indistinct; cilia of both wings black at base, pure white at tips. Wing exp. 26 mm.

Distribution : India : West Bengal (Kurseong, Darjiling dist.), Meghalaya (Khasis), Nilgiris, Sikkim, Uttar Pradesh (Mussourie); and Burma.

Remarks : This is the first specific record of the species from Kurseong, Darjiling district, West Bengal.

119. *Hyalobathra opheltesalis* (Walker)

1859. *Ebulea opheltesalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 19 : 1000.

1985. *Hyalobathra opheltesalis*, Rose and Pajni, *Res. Bull. (Sci.) Punjab Univ.*, 36(3-4) : 203-216.

Material examined : One (M), Kurseong, Darjiling district, (Old collection from NZC, Purchased, with no other data available).

Diagnostic characters : Colour orange yellow. Fore wing with antemedial line curved; postmedial line oblique outwardly from costa to M_2 , then excurved to Cu_{1b} and retracted to inner margin. Hind wing with the postmedial line bent outwards between M_2 and Cu_{1b} ; both wings with the cilia black at base, pure white at tips. Wing exp. 22 mm.

Distribution : India : West Bengal (Kurseong, Darjiling district), Bihar (Paresnath), Nilgiris, Punjab, Uttar Pradesh (Dehra Dun); and Burma (Moulmein).

Remarks : This is the first specific report of the species from Kurseong, Darjiling district, West Bengal.

Genus 72. *Crocidophora* Lederer

1863. *Crocidophora* Lederer, *Wien. ent. Mon.*, p. 386.

Twenty species under this genus are known from India of which three are recorded from West Bengal.

Key to the species of *Crocidophora* from West Benga.

1. Fore wing with apex greatly produced and subfalcate 2
 Fore wing with apex less produced and not subfalcate *ptyophora* Hampson
2. Colour red brown. Wings broader *limbata* (Moore)
 Colour straw-yellow suffused with brown. Wings narrower *pallida* (Moore)

120. *Crocidophora limbata* (Moore)

1887. *Circobotys limbata* Moore, *Descr. Indian Lep. Atk.*, p. 220, pl. 7, fig.24.

1899. *Crocidophora limbata*, Hampson, *Proc. zool. Soc. Lond.*, p. 193.

Material examined : Material reviewed from the literature.

Diagnostic characters : Colour red-brown. Fore wing with the costa white for three-fourths length, with a yellow fascia below it, the outer margin bright yellow. Hind wing brownish with a reddish tinge; the costal and inner areas whitish; the margin bright yellow from apex to vein Cu_{1b} . Wing exp. 34 mm.

Distribution : India : West Bengal (Darjiling), also Sikkim; and Bhutan.

Remarks : The species is recorded from Darjiling, West Bengal.

121. *Crocidophora pallida* Moore

1887. *Chobera pallida* Moore, *Descr. Ind. Lep. Atk.*, p. 220.

1899. *Crocidophora pallida*, Hampson, *Proc. zool. Soc. Lond.*, p. 193.

Material examined : Material reviewed from the literature.

Diagnostic characters : Straw-colour suffused with brown. Fore wing with the base and costa tinged with yellow, apex produced and falcata, a faint postmedial line; marginal area slightly darker. Hind wing yellowish semihyaline brown; postmedial line faint; both wings with the cilia white at tips. Wing exp. 32 mm.

Distribution : India : West Bengal (Calcutta), also Meghalaya (Khasis).

Remarks : The species is recorded from Calcutta, West Bengal.

122. *Crocidophora tyophora* Hampson

1896. *Crocidophora tyophora* Hampson, *Fauna Brit. India*, Moths, 4 : 389.

1899. *Crocidophora tyophora*, Hampson, *Proc. zool. Soc. Lond.*, p. 192.

Material examined : One (M) Darjiling (Old collection from NZC with no other data available).

Diagnostic characters : Colour yellowish orange, abdomen ringed with white, anal tuft tipped with white. Fore wing bright yellow; the costal area brownish; antemedial line sinous orange; post medial line from costa to Cu_{1a} then retracted to origin of Cu_{1b} ; marginal band broad purplish-fuscous. Hind wing bright yellow with an orange fascia along median nervure; an oblique postmedial line from costa; marginal band purplish fuscous and series of marginal black specks. Wing exp. 30mm.

Distribution : India : West Bengal (Darjiling, Sikkim; South Andaman; and Burma (Tenasserim)).

Remarks : From West Bengal the species is recorded from Darjiling district.

Genus 73. *Tetridia* Warren

1890. *Tetridia* Warren, *Ann. Mag. Nat. Hist.*, (6) 6: 477.

One species under this genus is known from India as well as West Bengal.

123. *Tetridia caletoralis* (Walker)

1859. *Botys caletoralis* Walker, *Cat. Lep. Het. Brit. Mus.*, 18:651.

1889. *Tetridia caletoralis*, Hampson, *Proc. zool. Soc. Lond.*, p. 196.

Material examined : One (M), Jiyaganj, Murshidabad dist., 6.ii.1986 (I.J. Gupta and party Coll.), 1 (M) Kotulpur, Bankura dist.), 23.xi.1986 (T.R. Mitra and party Coll.), 1 (F), Darjiling, May-June, 1974 (J.K. Jonathan and party Coll.).

Diagnostic characters : Colour reddish brown with a vinous tinge in male. Abdomen with a white streak on anal tuft. Fore wing with waved antemedial black line and a discocellular line; both wings with postmedial line nearly straight from costa to Cu_{1a} ; a marginal series of black specks. In female the colour is pale reddish. Fore wing with the costa brownish; the margin and cilia of both wings brownish and legs not marked with white as in male. Wing exp. 34 mm.

Distribution : India : West Bengal (Bankura, Darjiling and Murshidabad), Andamans, Assam (Sibsagar), Meghalaya (Khasis), Sikkim; also from Borneo; Burma; Celebes and Sri Lanka.

Remarks : This is the first report of the species from West Bengal. Rose and Pajni (1985) described the species as *Sylepta Caletoralis* (Walker) comb. nov.

Genus 74. *Polygrammodes* Guenee

1854. *Polygrammodes* Guenee, *Delt. et Pyral.*, p. 318.

Seven species under this genus are known from India of which two are recorded from West Bengal.

Key to the species of *Polygrammodes* Guenee

Fore wing with blue-black basal and postmedial patches *spilosomoides* (Moore)

Fore wing without blue-black basal and postmedial patches *sabelialis* (Guenee)

124. *Polygrammodes spilosomoides* (Moore)

1886. *Pitacanda spilosomoides* Moore, *Lep. Ceylon*, 3 : 334, pl. 183, fig 10.

1899. *Polygrammodes spilosomoides*, Hampson, *Proc. zool. Soc. Lond.*, p. 198.

Material examined : Material reviewed from the literature.

Diagnostic characters : Colour yellowish white. Abdomen with lateral black patches on first segment, dorsal and paired lateral quadrate blue-black patches on second to fifth segments and a dorsal spot on seventh and last segments. Fore wing bright yellow with a basal and a postmedial blue-black patch; four subbasal spots. Hind wing yellowish white; male with a black patch on middle of inner margin. Wing exp. 46 mm.

Distribution : India : West Bengal (Calcutta), Karnataka (Bangalore), Kerala and Tamil Nadu (Nilgiris), Rajasthan (Khandela), Sikkim and Sri Lanka.

Remarks : From West Bengal the species is recorded from Calcutta.

125. *Polygrammodes sabelialis* (Guenee)

1854. *Botys sabelialis* Guenee, *Delt. et Pyral.*, p. 413.

1899. *Polygrammodes sabelialis*, Hampson, *Proc. zool. Soc. Lond.*, p. 197.

Material examined : Material reviewed from the literature.

Diagnostic characters : Colour orange-yellow. Abdomen with the basal half vinous red. Fore wing with the basal area and costal area, suffused with purple; antemedial line curved and fuscous; a purplish patch at lower angle of cell; postmedial and submarginal lines bent outwards. Hind wing pale yellow; medial line brownish; a postmedial and a submarginal line. Wing exp. 32 mm.

Distribution : India : West Bengal (Calcutta), Andamans, Himachal Pradesh (Simla); also Burma,

China (Amoy), East Africa (Kilimanjaro).

Remarks : From West Bengal the species is recorded from Calcutta.

Genus 75. *Nomophila* Hubner

1816. *Nomophila* Hubner, *Verz. bek. Schmett.*, p. 368.

One species under this genus is known from India and is recorded from West Bengal also.

126. *Nomophila noctuella* (Schiffermuller)

1776. *Tinea noctuella* Schiffermuller, *Wien. Verz.*, p. 136.

1899. *Nomophila noctuella*, Hampson, *Proc. zool. Soc. Lond.*, p. 20.

Material examined : One (M) Kurseong, Darjiling district, Purchased collection, (Old collection from NZC, no other data available).

Diagnostic characters : Colour greyish brown. Abdomen with paired sublateral white stripes. Fore wing brown or suffused with grey; a black streak below basal half of cell; a brown dark-edged orbicular stigmata in and below middle of cell and a reniform discocellular stigma; a postmedial and a submarginal dentate line; a dark line through the cilia. Hind wing pale brown or grey. Wing exp. 24-34 mm.

Distribution : India : West Bengal (Kurseong, Darjiling district), Kerala and Tamil Nadu (Nilgris); and Universally distributed.

Remarks : From West Bengal the species is recorded from Kurseong, Darjiling district.

Genus 76. *Psara* Snellen

1875. *Psara* Snellen, *Tijdschr. Ent.*, 18 : 239.

Twelve species are known under this genus from India of which three are recorded from West Bengal.

Key to the species of *Psara* Snellen

1. Mid femora dilated and clothed with large smooth scales on inner side in male
..... *licarsisalis* (Walker)
- Mid femora not dilated and clothed with large scales on inner side in male 2
2. Patagia of male with a tuft of long hair and scales extending beyond the metathorax
..... *stultalis* (Walker)

- Patagia of male without a tuft of long hair and scales extending beyond the metathorax
 *bipunctalis* (Fabricius)

127. *Psara bipunctalis* (Fabricius)

1974. *Phalaena bipunctalis* Fabricius, *Ent. Syst.*, iii, 2 : 227.

1939. *Psara bipunctalis*, Klima, *Lep. Cat.*, 94 : 225-384.

Material examined : 2 (MM), Calcutta, February, 1911, (Old Museum collection from NZC).

Diagnostic characters : Colour white with a pale yellowish tinge. Abdomen with a pair of black spots on 3rd segment. Fore wing with the cost a yellowish and the base brownish; a black speck near base of inner margin; antemedial line outwardly oblique and sinuous; a black speck in cell; both wings with a large discocellular spot; postmedial line minutely dentate and bent outwards between M_1 and Cu_{1b} . The form *rudis* from Japan, China and India is dark fuscous in colour. Wing exp. 22-30 mm.

Distribution : India : West Bengal (Calcutta), Kerala and Tamil Nadu (Nilgiris); also China; Japan, Java; Sri Lanka and South and West Africa.

Remarks : From West Bengal the species is recorded for the first time from Calcutta.

128. *Psara licarsisalis* (Walker)

1859. *Botys licarsisalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 18 : 686.

1939. *Psara licarsisalis* Mandal and Bhattacharyya, *Rec. zool. Surv. India*, 77 : 335.

Material examined : Five (MM), 1 (F), Calcutta, 19.x.1966 (H.C. Ghosh Coll.), 2 (MM), 2 (FF), Calcutta, 30-31.x.1957 and 4 (MM), 2 (FF), Calcutta, 13.xi.1954 (A.P. Kapur Coll.), 6 (MM), 2 (FF), Calcutta, 25.xi.1965 (G.S. Arora Coll.); 3 (MM), 1 (F), Sonada, Darjiling dist., 9.v. 1971 (A.R. Bhaumik Coll.), 1 (F), Haldibari, Maldah dist., 16. vii. 1986 (M.S. Shishodia coll.), 4 (MM), 2 (FF), Calcutta, (Old Museum collection from NZC with no other available data).

Diagnostic characters : Colour brownish. Fore wing antemedial line dark sinuous and oblique outwardly; a speck in cell and a lunule on the discocellular. Postmedial line minutely dentate. Hind wing with discocellular speck; postmedial line indistinct, both wings with pale marginal line. Wing exp. 24-26 mm.

Distribution : India : West Bengal (Calcutta, Darjiling and Maldah). Andamans, Bihar (Ranchi), Himachal Pradesh (Solan), Madhya Pradesh (Mhow), Maharashtra (Bombay, Mahabaleswar, Poona), Sikkim, Tamil Nadu and Kerala (Nilgiris), Uttar Pradesh also Australia; (Borneo; China; Fiji; Java; Malacca, Marshall Islands; Pakistan (Chitral, Karachi); Sri Lanka and Syria.

Remarks : Rose and Pajni (1985) described the species as *Herpetogramma licarsisalis*, (Walker). From West Bengal the species is recorded from Calcutta, Darjiling and Maldah districts.

129. *Psara stultalis* (Walker)

1859. *Borys stultalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 18 : 669.

1980. *Psara stultalis*, Mandal and Bhattacharya, *Rec. zool. Surv. India*, 77 : 336.

Material examined : Five (MM), 1 (F), Calcutta (No date, Museum collection), 1 (M), Kurseong, Darjiling dist., (No date, Purchased collection).

Diagnostic characters : Colour uniformly dark and suffused with brown. Fore wing antemedial line prominent; postmedial line of both wings with the pale outer edge more prominent. Other characters are almost same as *bipunctalis*. Wing exp. 22-28 mm.

Distribution : India : West Bengal (Calcutta, Kurseong), Great Nicobar, Haryana (Ambala), Andamans, Himachal Pradesh (Kulu, Solan), Jammu and Kashmir (Jammu), Karnataka (Coorg), Madhya Pradesh (Mhow), Maharashtra (Bombay, Poona), Punjab (Hoshiarpur), Tamil Nadu; also Australia; Borneo; Burma (Rangoon); Celebes; Java; Pakistan (Karachi); Sri Lanka and Sumatra.

Remarks : From West Bengal the species is recorded from Calcutta and Kurseong, Darjiling district.

Genus 77. *Diasemia* Guenee

1854. *Diasemia* Guenee, *Delt. et Pyral.*, p. 233.

Three species under this genus are known from India of which two are recorded from West Bengal.

Key to the species of *Diasemia* Guenee

Hind wing postmedial line from costa to Cu_{1b} angled inwards at M_2 *litterata* (Scopoli)

Hind wing postmedial line oblique from costa to M_2 , then bent outwards at Cu_{1b}
 *ramburialis* (Duponchel)

130. *Diasemia ramburialis* (Duponchel)

1831. *Hydrocampa ramburialis* Duponchel, *Lep. France*, 8(2) : 343, pl. 233, fig. 6.

1899. *Diasemia ramburialis*, Hampson, *Proc. zool. Soc. Lond.*, p. 213, fig. 116.

Material examined : Three (MM), Kurseong, Darjiling dist., Purchased collection, (Old collection in NZC with no other data).

Diagnostic characters : Colour black with yellow spots. Abdomen with the basal segment pale. Fore wing with white spots at end of cell, two below the angle; postmedial line oblique. Hind wing subbasal and medial bands broad and white; postmedial line oblique. Cilia of both wings black and

white. Wing exp. 16-18 mm.

Distribution : India : West Bengal (Kurseong, Darjiling district). Universally distributed.

Remarks : This is the first specific report of the species from Kurseong, Darjiling district, West Bengal. Munroe (1957) erected a new genus *Diasemiopsis*, with the type species *Hydrocampa ramburialis* Duponchel, based on specimens from Southern Europe. According to him *D. leodocusalis* Walker is the North American species, whereas *D. ramburialis* ranges well into the temperate zone.

131. *Diasemia litterata* (Scopoli)

1763. *Phalaena litterata* Scopoli, *Ent. Carn.*, p. 229.

1899. *Diasemia litterata*, Hampson *Proc. zool. Soc. Lond.*, p. 213.

Material examined : One (M), Kurseong, Darjiling dist., Purchased collection, (Old collection from NZC with no other data).

Diagnostic characters : Colour brown or yellowish black. Abdomen ringed with white. Fore wing antemedial band white and extended from medial nervure to inner margin; a spot in end of cell conjoined to a triangular patch below the cell; postmedial line white; a series of small dentate dark marks on the margin. Hind wing with white spot in cell and beyond the discocellulars and a band to inner margin; a postmedial line angled inwards at M_2 ; cilia white and brown, a dark line through it. Wing exp. 14-20 mm.

Distribution : India : West Bengal (Kurseong, Darjiling dist.), Sikkim; also Europe; Japan and Sri Lanka.

Remarks : This is the first specific report of the species from Kurseong, Darjiling district, West Bengal.

Genus 78. *Antigastra* Lederer

1863. *Antigastra* Lederer, *Wien. ent. Monat.*, p. 419.

One species under this genus is known from India as well as West Bengal.

132. *Antigastra catalaunalis* (Duponchel)

1830. *Boys catalaunalis* Duponchel, *Hist. Nat. Lep. Fr.*, 8 : 330. pl. 232, fig.8.

1985. *Antigastra catalaunalis*, Rose and Pajni, *Res. Bull. (Sci.) Punjab Univ.*, 36 (3-4) : 210.

Material examined : One (M), 1 (F), Chinsura, Hooghly dist., June, 1950. (N.C. Chatterjee Coll.) and 1 (M), Calcutta, 25.xi.1965 (G.S. Arora Coll.).

Diagnostic characters : Colour yellowish, head and thorax suffused with lateral white lines. Fore wing with the veins suffused with orange-red; traces of a spot in cell; a spot on discocellular; antemedial and postmedial lines curved; marginal area orange-red. Hind wing reddish towards outer margin. Wing exp. 20 mm.

Distribution : India : West Bengal (Calcutta and Chinsura, Hooghly dist.), Andamans, Madhya Pradesh (Gwalior, Mhow), Maharashtra (Bombay, Poona), Rajasthan (Khandela), throughout India; also Burma; Eastern and Western Africa; Europe; Mexico; Pakistan (Karachi); Sri Lanka; Southern Yemen (Aden) and Syria.

Remarks : From West Bengal the species is recorded from Calcutta and Chinsura, Hooghly district. It is a serious pest of oil seeds, commonly known as the *Sesamum* leaf webber.

Genus *Noorda* Walker

1859. *Noorda* Walker, *Cat. Lep. Het. Brit. Mus.*, **19** : 978.

Two species under this genus are known from India of which one is recorded from West Bengal.

133. *Noorda blitealis* Walker

1859. *Noorda blitealis* Walker, *Cat. Lep. Het. Brit. Mus.*, **19** : 979.

1899. *Noorda blitealis* Hampson, *Proc. zool. Soc. Lond.*, p. 221.

Material examined : One (M), Calcutta, Museum collection (Old NZ Collection with no other data).

Diagnostic characters : Colour dark-brown and white. Abdomen segments 3 to 8 with lateral metallic-blue and black patches. Fore wing base of inner area with white patch; antemedial line black and curved; two discocellular spots; postmedial line also black; submarginal line with some blue-black scales; a black line at the base of cilia. Hind wing hyaline with marginal band broad and black; cilia white at tips. Wing exp. 24 mm.

Distribution : India : West Bengal (Calcutta), Maharashtra (Alibagh, Bombay and Poona), throughout of India; also Pakistan (Karachi); Sri Lanka and South Yemen (Aden.).

Remarks : This is the first specific report of the species from Calcutta, West Bengal. Munroe (1961) described the genus *Noorda* under subfamily Odontiinae.

Genus *Boeotarcha* Meyrick

1884. *Boeotarcha* Meyrick, *Trans. ent. Soc. Lond.*, p. 305.

Two species under this genus are known from India of which one is recorded from West Bengal.

134. *Boeotarcha martinalis* (Walker)

1859. *Scopula* (?) *martinalis* Walker, *Cat. Lep. Het. Brit. Mus.*, **18** : 791.

1899. *Boeotarcha martinalis*, Hampson, *Proc. zool. Soc. Lond.*, p. 225.

Material examined : One (F), Calcutta, (Old collection from NZC with no other data).

Diagnostic characters : Colour chestnut brown suffused with purplish. Abdomen whitish brown. Fore wing with bright yellow reddish band; marginal area paler and with a series of dark specks. Hind wing whitish, with the inner and outer area suffused with brown. Wing exp. 26 mm.

Distribution : India : West Bengal (Calcutta); also Burma (Moulmein and Rangoon).

Remarks : This is the first report of the species from Calcutta, West Bengal and also from India. Munroe (1961) described the genus under the subfamily Odontiinae.

Genus 79. *Calamochrous* Lederer

1863. *Calamochrous* Lederer, *Wien. ent. Mon.*, p. 386.

Five species under this genus are known from India of which one is reported from West Bengal.

135. *Calamochrous carnealis* Swinhoe

1894. *Calamochrous carnealis* Swinhoe, *Ann. Mag. Nat. Hist.*, (6) 16 : 302.

1899. *Calamochrous carnealis*, Hampson, *Proc. zool. Soc. Lond.*, p. 228.

Material examined : One (F), Calcutta, No. date, (N. Annandale Coll., Old Collection from NZC).

Diagnostic characters : Colour yellowish red. Fore wing pinkish; costal area white; a dark speck in cell and discellular spot; Hind wing whitish yellow; pale dark marks on margin at middle. Underside of fore wing suffused with brown. Wing exp. 26 mm.

Distribution : India : West Bengal (Calcutta), and Meghalaya (Khasis).

Remarks : This is the first specific report of the species from Calcutta, West Bengal.

Genus 80. *Pionea* Guenee.

1854. *Pionea* Guenee, *Delt. et Pyral.*, p. 367.

Twenty species under this genus are known from India of which one is reported from West Bengal.

136. *Pionea flavofimbriata* (Moore)

1887. *Mabra flavofimbriata* Moore, *Descr. Ind. Lep. Atk.*, p. 208.

1899. *Pionea flavofimbriata*, Hampson, *Proc. zool. Soc. Lond.*, p. 240.

Material examined : One (F), Kurseong, Darjiling dist., No. date, Purchased collection, (from old collection of NZC).

Diagnostic characters : Colour brownish. Abdomen brown. Fore wing with the costal and outer margins yellowish; traces of an antemedial line, a discocellular spot; postmedial line waved and bent

outwards. Hind wing brown; traces of postmedial line bent outwards; cilia of both wings yellowish. Wing exp. 24 mm.

Distribution : India : West Bengal (Calcutta and Kurseong, Darjiling dist.), Meghalaya (Khasis), Sikkim; and Sri Lanka.

Remarks : This is the first specific report of the species from Kurseong, Darjiling district, West Bengal.

Genus 81. *Pyrausta* Schrank

1802. *Pyrausta* Schrank, *Fauna Boica*, 2 (2) : 163.

Amongst fortyfour Indian species under this genus on;ly four are reported from West Bengal.

Key to the species of *Pyrausta* Schrank

1. Body and wings black-brown in colour *silhetalis* Guenee
 Body and wings not black-brown in colour 2
2. Fore wing with postmedial line bent outwards between M_2 and Cu_{1b}
 *eriopisalis* (Walker)
 Fore wing with postmedial line bent outwards not between M_2 and Cu_{1b} but between M_1 and Cu_{1b}
 3
3. Hind wing with postmedial line excurved between M_2 and Cu_{1b} *incoloralis* (Guenee)
 Hind wing with postmedial line excurved not between M_2 and Cu_{1b} but between M_2 and Cu_{1a}
 *machoeralis* (Walker)

137. *Pyrausta silhetalis* Guenee

1854. *Pyrausta silhetalis* Guenee, *Delt. et Pyral.*, p. 166.

1899. *Pyrausta silhetalis*, Hampson, *Proc. zool. Soc. Lond.*, p. 269.

Material examined : One (M), Darjiling, (Old Collection from NZC with no other data).

Diagnostic characters : Colour blackbrown. Head, legs and abdomen orange. Fore wing black brown with traces of dark ante-and postmedial bands. Hind wing dark brown with broad medial orange band. Underside of each wing with orange fascia on inner margin. Wing exp. 18 mm.

Distribution : India : West Bengal (Darjiling), Meghalaya (Khasis), East and North West Himalayas; also China (Yarkand).

Remarks : This is the first specific report of the species from Darjiling, West Bengal.

138. *Pyrausta machoeralis* (Walker)

1859. *Scopula machoeralis* Walker, *Cat. Lep. Het. Brit. Mus.*, 19:1014.

1899. *Pyrausta machoeralis*, Hampson, *Proc. zool. Soc. Lond.*, 263.

Material examined : One (F), Calcutta, 31.viii. 1965 (K.S. Pradhan and K.V. Lakshminarayan Coll.), 7 (MM), 11 (FF), Kurseong, Darjiling dist., Feb. 1901 and 2 (MM), 2 (FF), Calcutta, (all old collections from NZC with no other data).

Diagnostic characters : Colour bright yellow. Frons white at sides. Fore wing with a tawny-yellow subcostal fascia; antemedial line oblique; a speck in cell and discocellular lunule; a postmedial line excurved between M_1 and Cu_{1b} , a submarginal line; Hind wing postmedial line excurved between M_2 and Cu_{1a} . Marginal dark line and two lines through the cilia in both wings. Wing exp. 22-24 mm.

Distribution : India : West Bengal (Calcutta, Kurseong, Darjiling dist.), Meghalaya (Khasis), Tamil Nadu and Kerala (Nilgiris), Uttar Pradesh (Dehra Dun); also from Australia; Burma; Java; Sri Lanka and Taiwan.

Remarks : This is the first specific report of the species from Calcutta and Kurseong, Darjiling district of West Bengal. The larva is destructive to teak trees.

139. *Pyrausta eriopisalis* (Walker)

1859. *Botys eriopisalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 19 : 1006.

1899. *Pyrausta eriopisalis* (= *eriopsalis*), Hampson, *Proc. zool. Soc. Lond.*, p. 260.

Material examined : One (M), Kurseong, Darjiling dist., No date, (Purchased old collection from NZC).

Diagnostic characters : Brownish grey in colour; palpi white below. Fore wing brownish at the base of costa; antemedial line brownish; a black speck in cell. Postmedial line of both wings also brownish and with a black discocellular lunule. Wing exp. 34 mm.

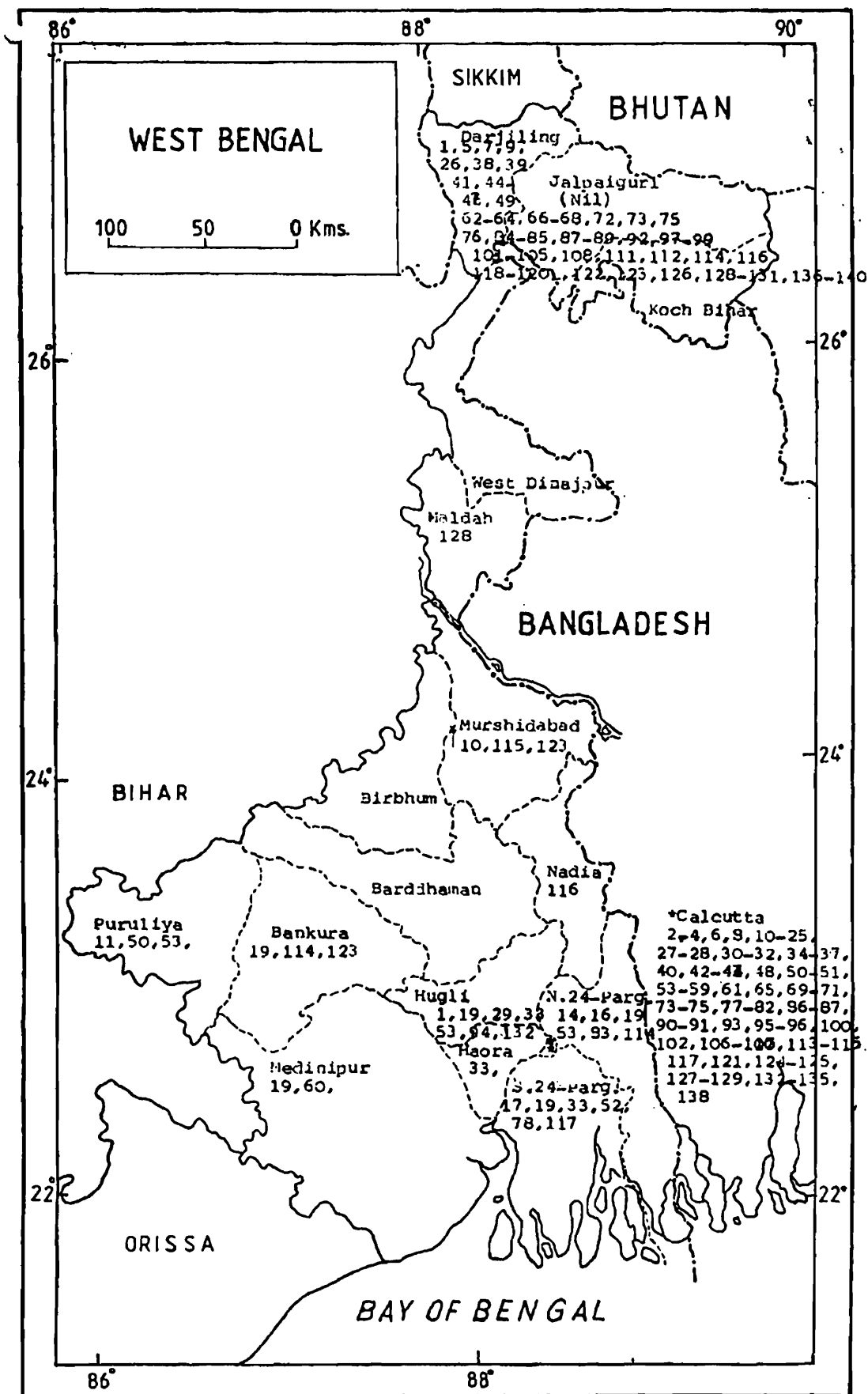
Distribution : India : West Bengal (Kurseong, Darjiling dist.); Meghalaya (Khasis); also from Borneo.

Remarks : This is the first specific report of the species from Kurseong, Darjiling district and also from West Bengal. Hampson (1899) described the species as *eriopsalis* while in the original description by Walker (1859) it is *eriopisalis*.

140. *Pyrausta incoloralis* (Guenee)

1854. *Botys incoloralis* Guenee, *Delt. et Pyral.*, p. 332, No. 369.

1899. *Pyrausta incoloralis*, Hampson, *Proc. zool. Soc. Lond.*, p. 257.



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Material examined : One (F), Kurseong, Darjiling dist., No date, (Purchased old collection in NZC).

Diagnostic characters : Colour yellowish white; palpi white below. Fore wing with base of costa bright yellow; antemedial line faint brownish; a speck in cell and disocellular lunule; a postmedial brownish line and a marginal band. Hind wing with a pale spot at lower angle of cell; a postmedial line and marginal band. Wing exp. 30 mm.

Distribution : India : West Bengal (Kurseong, Darjiling dist.), Madhya Pradesh (Mhow), Maharashtra (Bombay, Poona), throughout India; also from Africa (Congo, South Africa), Australia; Celebes Java; Malayan subregion; South Yemen (Aden) and Syria.

Remarks : This is the first specific report of the species from Kurseong Darjiling district and also from West Bengal.

SUMMARY

The present study includes the systematic account, keys, diagnostic characters, distribution etc. of 140 species of *Pyralidae* along with a list of another 44 species with distribution and original reference. Of these a good number of species are either recorded for the first time from different districts of West Bengal or from the State itself. A map showing the distribution of the species from different districts of West Bengal has also been incorporated in the paper.

ACKNOWLEDGEMENTS

The author is grateful to the Director, Zoological Survey of India, Calcutta for providing necessary facilities in connection with this work and for publication of the paper.

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APPENDIX

(List of species recorded from Calcutta)

Subfamily SCHOENOBIINAE

1. *Ramila mrginella* Moore1867. *Ramila marginella* Moore, *Proc. zool. soc. Lond.*, p. 667, pl. 33, fig. 16.*Distribution* : India : Sikkim.2. *Cirrhochrista brizoalis* (Walker)1859. *Margaronia brizoalis* Walker, *Cat. Lep. Het. Brit. Mus.*, **19** : 976.*Distribution* : India : Bombay, Nilgiris, N.W. Himalayas; also Australia; Borneo; Celebes; China; Japan and Taiwan.

Subfamily PHYCITINAE

3. *Thylactoptila paurosema* Meyrick[=*Nephoptyx paurosema* (Meyrick)]1885. *Thylactoptila paurosema* Meyrick, *Ent. Mon. Mag.*, **22** : 106.*Distribution* : India : Assam, Chandigarh, Dehra Dun; also Aden; Cape Verd Islands; Sri Lanka and West Africa.

4. *Phycita hemixanthella* Hampson

1896. *Phycita hemixanthella* Hampson, *Fauna Brit. India*, Moths, 4 : 95.

Distribution : India : Naga hills, Nagaland.

Subfamily PYRALINAE

Pyralis manihotalis Guenee

1854. *Pyralis manihotalis* Guenee, *Delt. et Pyral.*, p. 121.

Distribution : Australian, Oriental and Neotropical regions.

6. *Tamraca torridalis* (Lederer)

1863. *Asopia torridalis* Lederer, *Wien. ent. Mon.*, 7 : 342 and 457.

Distribution : India : Bombay, Nagaland, North West Himalayas; also Burma; Celebes; China; Java and Sri Lanka.

7. *Herculia igniflualis* (Walker)

1859. *Pyralis igniflualis* Walker, *Cat. Lep. Het. Brit. Mus.*, 17 : 268.

Distribution : India : Nilgiris; also Borneo and Sri Lanka.

8. *Herculia nigrivitta* (Walker)

1863. *Cisse nigrivita* Walker, *Cat. Lep. Het. Brit. Mus.*, 27 : 125.

Distribution : Borneo and Burma.

Subfamily HYDROCAMPINAE

9. *Nymphula crisonalis* (Walker)

1859. *Hydrocampa crisonalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 19 : 961.

Distribution : Australia; Celebes; China; Java and Sri Lanka.

10. *Talanga sexpunctalis* (Moore)

1877. *Oligostigma sexpunctalis* Moore, *Proc. zool. Soc. Lond.*, p. 616, pl. 60, fig. 12. (Now
Pyraustinae).

Distribution : India : Andamans, Bombay, Dharmasala, Nilgiris, Sikkim; also Borneo; Celebes; New Britain; New Hebrides; Sri Lanka and Taiwan.

11. *Tatobotys varanesalis* (Walker)

1859. *Botys varanesalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 18 : 719.

Distribution : Borneo and Rangoon, Burma.

Subfamily PYRAUSTINAE

12. *Pycnarmon virgatalis* Moore

1867. *Pycnarmon virgatalis* Moore, *Proc. zool. Soc. Lond.*, p. 92, pl. 7, fig. 9.

Distribution : India : Bengal, Dharmasala, Khasis, Sikkim; also Bhutan and Sri Lanka.

13. *Pycnarmon caberalis* (Guenee)

1854. *Spilomela caberalis* Guenee, *Delt. et Pyral.*, p. 284.

Distribution : Throughout India; also Borneo; Burma; Celebes; China; Fiji; Flores; Java; Pulo Laut; Sri Lanka and Sumatra.

14. *Agrotera basinotata* Hampson

1893. *Agrotera basinotata* Hampson, *Ill. Typ. Lep. Het. Brit. Mus.*, 8 : 137, pl. 155, fig. 13.

Distribution : India, Bombay Presidency; Nilgiris; Punjab; also Burma and Sri Lanka.

15. *Ercta elutalis* (Walker)

1859. *Cataclysta* (?) *elutalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 17 : 448.

Distribution : India ; Nilgiris; also Borneo; Celebes and Sri Lanka.

16. *Ercta ornatalis* (Duponchel)

1830. *Asopia ornatalis* Duponchel, *Lep. France*, 8(2) : 207, pl. 223, fig. 8.

Distribution : Australian; Ethiopian; Oriental; South Europe; South Nearctic and Neotropical regions.

17. *Marasmia venilialis* (Walker)

1859. *Asopia venilialis* Walker, *Cat. Lep. Het. Brit. Mus.*, 17 : 373.

Distribution : Throughout India; also Australia; Borneo; Burma; Fiji; Solomons; Sri Lanka; West and South Africa.

18. *Ceratarcha umbrosa* Swinhoe

1894. *Ceratarcha umbrosa* Swinhoe, *Ann. Mag. Nat. Hist.*, (6) 14 : 200.

Distribution : India : Meghalaya, Khasis; Nagaland and Sikkim.

19. *Botyodes asialis* Guenee

1854. *Botyodes asialis* Guenee, *Delt. et Pyral.*, p. 321.

Distribution : Throughout India; also Borneo; Burma; Pakistan, Baluchistan; and Sri Lanka.

20. *Sylepta balteata* (Fabr.)
(=*Sylepta auranticalis* Fisch.)

1798. *Phalaena balteata* Fabricius, *Ent. Syst. Suppl.*, p. 457, No. 300.

Distribution : Throughout India; Burma; China; Japan; Sri Lanka and South Europe.

21. *Sylepta lunalis* (Guenee)

1854. *Botys lunalis* Guenee, *Delt. et Pyral.*, p. 352.

Distribution : Throughout India including Andamans; also Borneo; Burma; Celebes; Sri Lanka; Sumbawa and Taiwan.

22. *Lygropia quaternalis* (Zeller)

1852. *Botys quaternalis* Zeller, *K. Vet. AK. Handl.*, p. 44.

Distribution : Throughout India; Australia; Borneo; Sri Lanka; West and South Africa.

23. *Diaphania marinata* (Fabr.)
(=*Glyphodes psittacalis* Hubner)

1775. *Phalaena marinata* Fabricius, *Syst. Ent.*, 3 : 209.

Distribution : Throughout India including Andamans; Australia; Borneo; Burma; Celebes; Fiji and Sri Lanka.

24. *Diaphania hilaralis* (Walker)
[= *Glyphodes hilaralis* (Walker)]

1859. *Margaronia hilaralis* Walker, *Cat. Lep. Het. Brit. Mus.*, 18 : 532.

Distribution : India : North West and East Himalayas; also Borneo; Burma (Rangoon); Sri Lanka and Sumatra.

25. *Diaphania stolalis* (Guenee)
(=*Glyphodes stolalis* Guenee)

1854. *Glyphodes stolalis* Guenee, *Delt. et Pyral.*, p. 293, No. 296, pl. 3, fig. 11.

Distribution : India : Assam, Sikkim; Also Australia; Borneo; Fiji; Nepal; Pulo Laut and Sri Lanka.

26. *Diaphania bivitalis* (Guenee)
(=*Glyphodes bivitalis* Guenee)

1854. *Glyphodes bivitalis* Guenee, *Delt et Pyral.*, p. 293, No. 298.

Distribution : India ; Andamans, Assam, Sikkim, West and South India; Borneo; Burma; Sri Lanka and Taiwan.

27. *Glyphodes pyloalis* Walker

1859. *Glyphodes pyloalis* Walker, *Cat. Lep. Het. Brit. Mus.*, **19** : 973.

Distribution : Throughout India; Burma; China and Japan.

28. *Euclasta defematalis* (Walker)

1859. *Ilurgia defematalis* Walker, *Cat. Lep. Het. Brit. Mus.*, **18** : 544.

Distribution : Throughout India ; Burma and Sri Lanka.

29. *Nausinohoe neptis* (Cramer)
(=*Lepyrodes neptis* (Cramer)]

1779. *Phalaena (Noctua) neptis* Cramer, *Pap. Exot.*, 3, pl. 264., Fig. F.

Distribution : Throughout India; Australia; Burma; Malayan Subregion and Sri Lanka.

30. *Nausinoe geometralis* (Guenee)
(=*Lepyrodes geometralis* Guenee)

1854. *Lepyrodes geometralis* Guenee, *Delt. et Pyral.*, p. 278, No. 271, pl. 8, fig. 6.

Distribution : Throughout India including South Andamans; Australia; Burma; China; Java; Taiwan and West Africa.

31. *Analyta sigulalis* (Guenee)

1854. *Leucinodes sigulalis* Guenee, *Delt. et Pyral.*, p. 223, No. 188.

Distribution : India ; Kuku (Himachal Pradesh), Mhow (Madhya Pradesh); also Amboina and Borneo.

32. *Analyta melanopolis* (Guenee)

1854. *Leucinodes melanopolis* Guenee, *Delt. et Pyral.*, p. 224, No. 189.

Distribution : India : Bombay.

33. *Leucinodes orbonalis* Guenee

1854. *Leucinodes orbonalis* Guenee, *Delt. et Pyral.*, p. 223, No. 187.

Distribution : India : Andamans; Burma; Duke of York Island; Java; Sri Lanka and S. Africa.

34. *Leucinodes apicalis* Hampson

1896. *Leucinodes apicalis* Hampson, *Fauna Brit. India, Moths*, 4:371.

Distribution : India : Dharmasala (H.P.) and Sri Lanka.

35. *Sameodes cancellalis* (Zeller)

1852. *Botys cancellalis* Zeller, *K. Vet. A.K. Handl.*, p. 34.

Distribution : Throughout India including Andamans; Africa; Australia; Burma; Fiji; Java and Sri Lanka.

36. *Archernis tropicalis* (Walker)

1859. *Botys tropicalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 18:670.

Distribution : India : Bombay, Dharmasala, Nilgiris, Sikkim; Burma, Tenasserim; Sri Lanka and Taiwan.

37. *Terastia meticulosalis* (Guenee)

Terastia meticulosalis Guenee *Delt. et Pyral.*, p. 212.

Distribution : India : Car Nicobar; also Honduras; Java; Philippines; Sri Lanka and St. Domingo.

38. *Hyalobathra filalis* (Guenee)

[=*Isocentris filalis* (Guenee)]

1854. *Asopia filalis* Guenee, *Delt. et Pyral.*, p. 204.

Distribution : India : Bombay, Coimbatore, Gt. Nicobar; Australia; Bangladesh, Sylhet; Burma; Celebes; Java; Mauritius; Sri Lanka and Taiwan.

39. *Maruca testulalis* (Geyer)

1832. *Crochiphora testulalis* Geyer, *Hubn. Samml. Exot. Schmett.*, 4(4) : 12.

Distribution : Throughout the Australian and Oriental regions; Neotropical and Ethiopian regions and Japan.

40. *Tetridia caletoralis* (Walker)

1859. *Botys caletoralis* Walker, *Cat. Lep. Het. Brit. Mus.*, 18:651.

Distribution : India : Assam (Sibsagar); Meghalaya (Khasis), Sikkim; also Borneo; Burma; Celebes and Sri Lanka.

41. *Antigastra catalaunalis* (Duponchel)

1830. *Botys catalaunalis* Duponchel, *Hist. Nat. Lep. France*, 8 : 330, pl. 232, fig. 8.

Distribution : Throughout India including Andamans; also Aden; Burma; Europe; East and West Africa; Sri Lanka and Syria.

42. *Noorda fessalis* (Swinhoe)

1886. *Glyphodes fessalis* Swinhoe, *Proc. zool. Soc. Lond.*, p. 459, pl. 41, fig. 13.

Distribution : India : Andamans, Assam, Kanara, Manipur, Meghalaya (Khasis); Mhow (M.P.), Nagaland; also Aden; Burma (Shan States); Pakistan (Karachi) and West Africa.

43. *Pionea albicostalis* Swinhoe

1890. *Pionea albicostalis* Swinhoe, *Trans. ent. Soc. Lond.*, p. 271.

Distribution : India : Great Nicobar, Nilgiris, Punjab; also Burma (Rangoon).

44. *Pionea leucanalis* Swinhoe

1890. *Pionea leucanalis* Swinhoe, *Trans. ent. Soc. Lond.*, p. 276, pl. 8, fig. 15.

Distribution : India : Meghalaya (Khasis); and Burma (Rangoon).

INSECTA : LEPIDOPTERA : SATURNIIDAE

I. J. GUPTA

Zoological Survey of India Calcutta

INTRODUCTION

About 1100 species belonging to seven subfamilies of the family Saturniidae are known from the World. Of these, 40 species distributed over 18 genera and two subfamilies, viz., Saturniinae and Salassinae occur in India. West Bengal harbours 20 species representing 14 genera of both the subfamilies.

The family Saturniidae includes moths popularly called as non-mulberry silkmoths, wild silkmoths, emperor moths etc. They are beautifully coloured and are usually of large size. *Attacus atlas* (Linnaeus) commonly called as 'The Atlas moth' is known to have the largest wing area of all the Lepidoptera. The larvae of many species are polyphagous, feeding upon species of plants of different families. The family is of great economic importance as some of the species of these moths produce silk. To mention, *Antheraea paphia* (Linnaeus) known as 'Tasar Silkmoth' yields tasar silk, *Antheraea assamensis* (Helfer) known as 'Muga Silkmoth' produces muga silk and *Samia cynthia* (Drury) known as 'Eri Silkmoth' provides eri silk. India ranks first and second in the World in producing eri silk and tasar silk, respectively whereas India has monopoly in the world for the yield of muga silk.

Earlier works on Indian saturniids are by Wardle (1881), Cotes and Swinhoe (1887)-1889), Cotes (1889, 1889), Hampson (1892) Packard (1914), Seitz (1924), Draudt (1930) and also by Sen Sarma (1956) and Arora and Gupta (1979).

All the 20 species known from West Bengal were reported from Darjiling district. The number of species occurring in other districts are : Calcutta (3), North 24-Parganas (2) South 24-Parganas (1); Hughly (1); Medinipur (1) and West Dinajpur (1). Besides recorded from Darjiling, *Antheraea paphia* (Linnaeus) is represented in other five districts (Calcutta, Hughly, Medinipur, North 24-Parganas and South 24-Parganas); *Actias selene* (Huebner) in two districts (Calcutta and North 24-Parganas); *Cricula trifenestrata* (Helfer) and *Samia cynthia* (Drury) in Calcutta and West Dinajpur districts, respectively. No species of Saturniidae is known from the remaining ten districts despite the recent faunistic surveys of the State.

On the basis of the material of species of Saturniidae available in the old collections of Zoological Survey of India and also the species reviewed from literature, it is observed that the status of these moths is very rare.

The present account deals with 20 species and subspecies belonging to 14 genera in two subfamilies, Saturniinae and Salassinae from West Bengal. Keys for the identification of taxa have been included. Common name, wing expanse/forewing length, geographical distribution and remarks, if any, have been given for each species. Four genera, viz., *Rinaca* Walker, *Caligula* Moore, *Neoris* Moore and

Solus Watson are provided with diagnostic characters and are not treated in the key to the genera of subfamily Saturniinae. The species not available in the old collections of Zoological Survey of India have been reviewed from literature and are marked with a symbol of asterisk (*). An appendix and a map showing district-wise distribution of species have been included. Illustrations on the morphology of this group of moths have also been provided.

MATERIAL AND METHODS

(Figure 1. A–I)

The saturniid moths are nocturnal and attracted at night towards light of petromax, neon or tube light. During flight the collection is made by using a 'butterfly net' or putting a wide mouth bottle over the moth when it is sitting. The smaller specimens are usually killed by exposing them to strong vapours of benzene or potassium cyanide, largely preferring the former. The larger specimens are killed like butterflies, by pinching the thorax laterally with the thumb and index finger.

For building up reference collection of moths, the methods involved are the same as for butterflies i.e. their storage, relaxation, setting and pinning, writing locality labels, study and identification, det. labels, species index cards and arrangement of specimens in drawers fitted in cabinets.

MORPHOLOGY AND TERMINOLOGY

(Figures 2–4)

The morphology and terminology as mentioned for butterflies are largely followed for these moths except for some of the characteristic features. In Saturniidae, antennae are quadripectinate i.e. each segment bearing a pair of basal and distal ramii which in case of male are longer than those in female. The labial palpi are comparatively short and highly variable being one, two or three segmented. The proboscis when present is represented by a pair of very short galea. The wings usually bear eye spots or ocelli on the discocellular area. Each ocellus has a hyaline spot also referred to as fenestra or window and is bounded by rings or lunules of different colours. The hyaline spots are rounded, elliptical or triangular. The ocelli are large or small or may be diminished.

SYSTEMATIC ACCOUNT

Family SATURNIIDAE

Key to subfamilies of family SATURNIIDAE

In forewing vein R_s arising from well before the apex of discal cell SATURNIINAE

In forewing vein R_s usually arising from anterior apical angle of discal cell SALASSINAE

Subfamily SATURNIINAE

Key to tribes of subfamily SATURNIINAE

Cell completely or partly closed in forewing and hindwing *Saturniini*

Cell completely open in forewing and hindwing *Attacini*

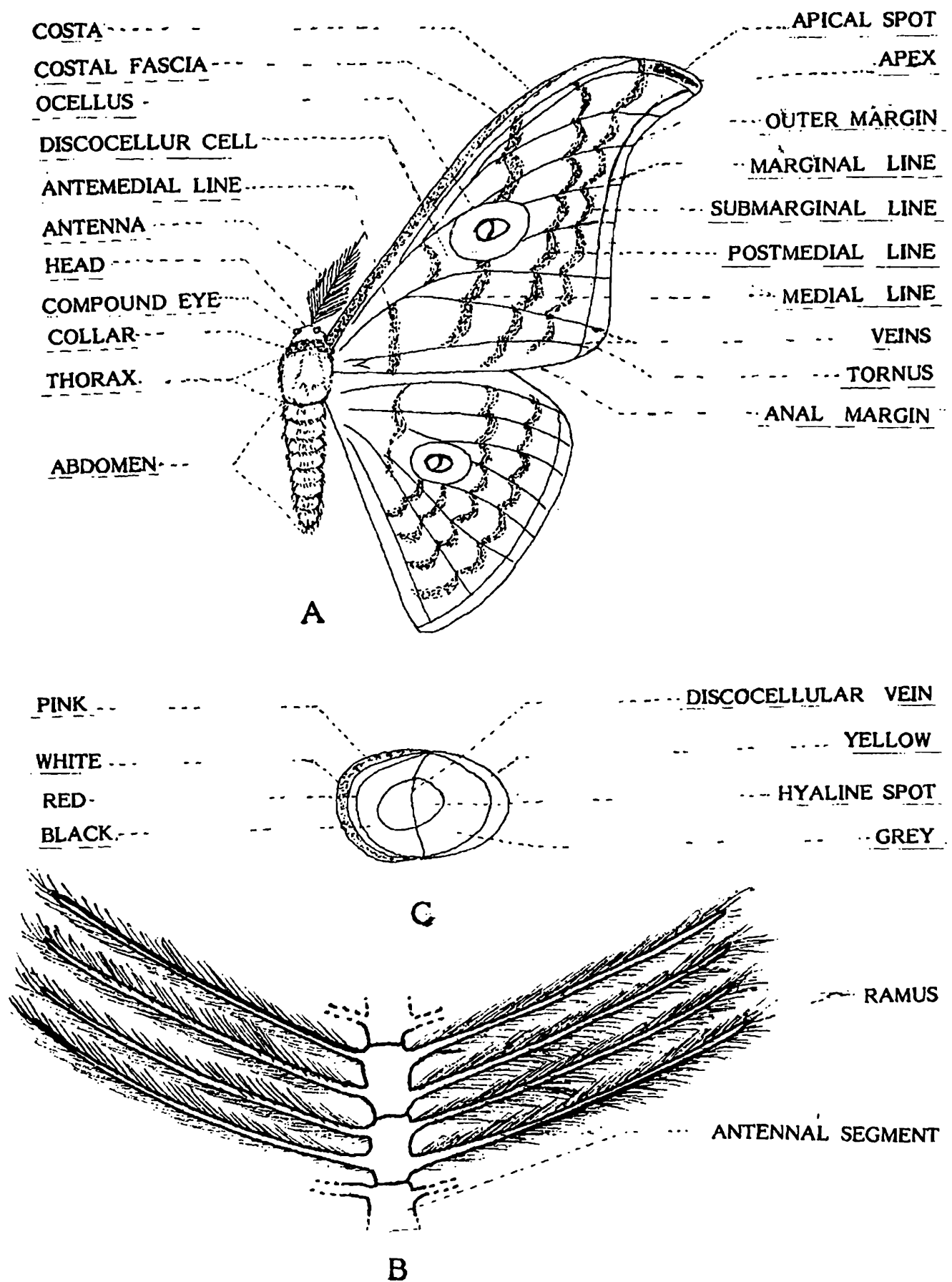


Fig 1. : A-Adult moth showing antenna and wings on one side; B- Part of Antenna; C-Ocellus

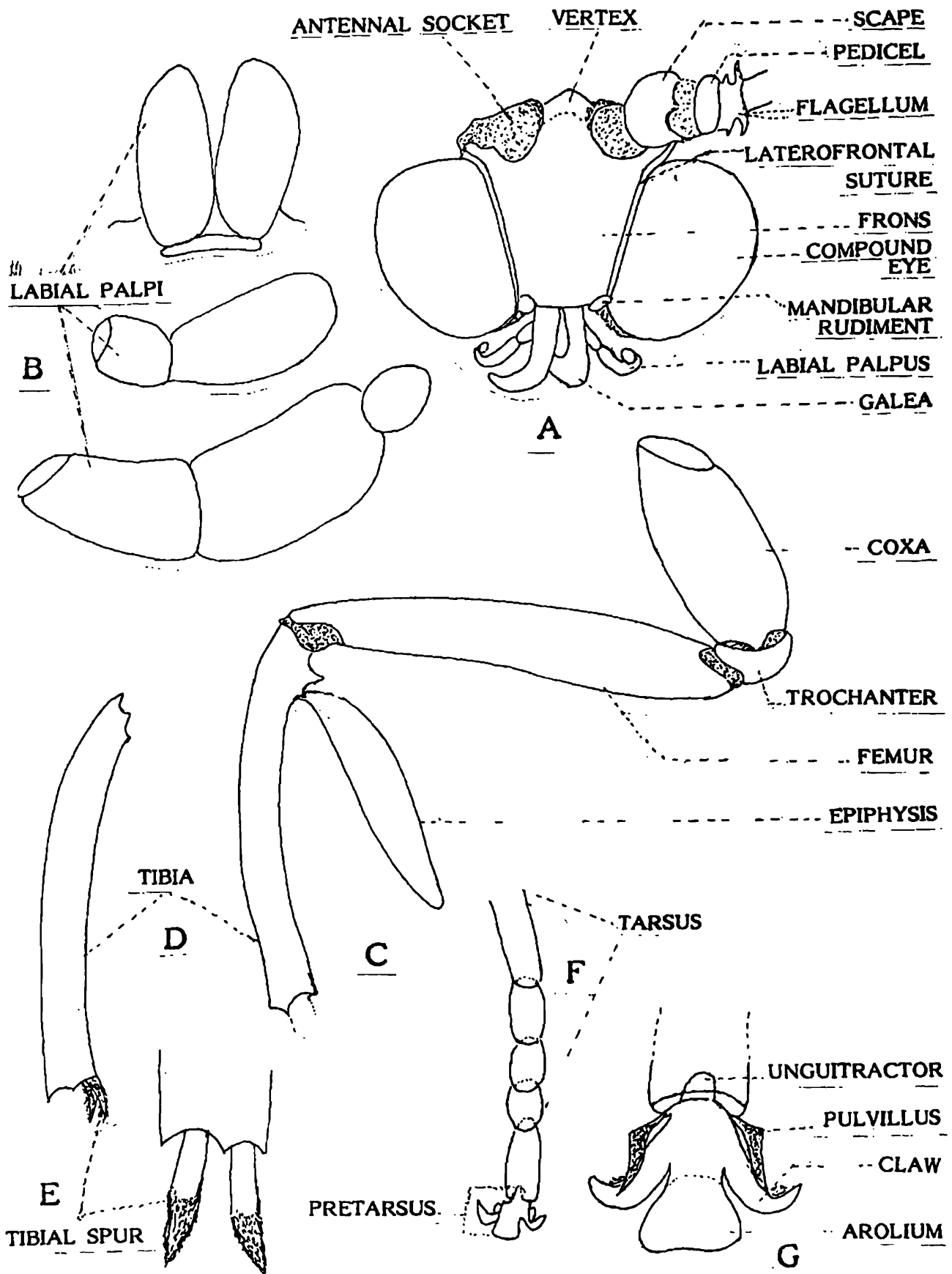


Fig 2. : A-Head; B-Labial palpi; C-Leg; D-Tibia; E-Tibial Spur; F-Tarsus; G-Arolium

Key to genera of Tribe SATURNIINI

1. Hindwing with a tail 2
 Hindwing without tail 3
2. Forewing with five radials; hindwing tail shorter than costa of forewing in male
 *Actias* Macleay
 Forewing with four radials; hindwing tail longer than costa of forewing in male
 *Sonthonnaxia* Watson
3. Cell partly closed in forewing and hindwing. In forewing R_s stalked with M_1 beyond upper angle
 of cell *Rhodinia* Staudinger
 Cell completely closed in forewing and hindwing. In forewing R_s arising before upper angle of cell
 4
4. Forewing with four radials *Antheraea* Huebner
 Forewing with five radials 5
5. Frons convex and raised above the level of eyes; antennae with distal ramii of one segment close
 to basal ramii of the succeeding segment *Loepa* Moore
 Frons flat and at level of eyes; antennae with distal ramii of one segment well separated from the
 basal ramii of the succeeding segment *Cricula* Walker

I Genus *Actias* Macleay 1815

1815. *Actias* Macleay, In Leach, *Zool. Miscell.*, 2 : 25.

This genus is represented in India by a single species, *Actias selene* (Huebner) which is presently dealt with from West Bengal.

1. *Actias selene* (Huebner)

1806. *Echidna caudata selene* Huebner, *Samml. Exot. Schmett.*, 1 : 3, pl. 172 (M), pl. 174 (F).

1892. *Actias selene*, Hampson, *Fauna of British India* (Moths), 1 : 13.

1936. *Actias selene*, Schuessler, *lepid. Cat.*, 70 : 60-68.

1979. *Actias selene*, Arora & Gupta, *Mem. zool. Surv. India*, 16(1) : 12.

Material examined : Calcutta, 1(M), (no date), (*Holland* coll.); Darjiling, 13 (M), 2 (F) (no date), (*F. Moller* coll) ; 3 (M), 1 (F), 17.ii.1917 (*Capt. Dracot* coll.) North 24-Parganas Dist., Khardha (on the compound wall of Vegetable garden), 1(F), 6.x.1953 (*Kanai Lal Adhikari* coll.).

Forewing Length : Males 60-82 mm., females 62-85 mm.

Distribution : India : West Bengal (Calcutta, Darjiling, North 24-Parganas); Andamans; Assam; Bihar; Himachal Pradesh; Karnataka; Madhya Pradesh; Maharashtra; Manipur; Meghalaya; Orissa; Sikkim; Tamil Nadu and Uttar Pradesh. Elsewhere : Bangladesh, Bhutan, Burma, China, Indonesia, Japan, Nepal, Pakistan, Sri Lanka and USSR.

Remarks : This moth is popularly known as The Indian Moon-Moth. Fresh specimens are beautifully coloured apple green. Hindwing is tailed. The species has a large number of food plants.

II Genus *Sonthonnaxia* Watson 1912

1912. *Sonthonnaxia* Watson, *The Wild Silkmoths of the World*.

A single species of *Sonthonnaxia maenas* (Doubleday) is dealt with from West Bengal.

2. *Sonthonnaxia maenas* (Doubleday)

1847. *Actias maenas* Doubleday, *Ann. Mag. nat. Hist.*, 19:95, pl. 7, fig. 1.

1892. *Actias maenas*, Hampson, *Fauna of British India (Moths)*, 1 : 14.

1936. *Sonthonnaxia maenas*, Schuessler, *Lepid. Cat.*, 70 : 49-50.

Material examined : Darjiling Dist., Darjiling, 28(M), 15 (F) (no date) (F. Moller coll.)

Forewing length : Males 55-85 mm, females 66-91 mm.

Distribution : India : West Bengal (Darjiling), Assam; Meghalaya; Sikkim and South Andamans. Elsewhere : Bangladesh, Bhutan, Burma, China, Indonesia, N. Vietnam and Thailand.

III. Genus *Rhodinia* Staudinger 1892

1892. *Rhodinia* Staudinger, *In Rom, Mem. Sur. les Lep.*, 6 : 327.

The genus is represented in India by a single species i.e. *Rhodinia newara* (Moore).

3. * *Rhodinia newara* (Moore)

1872. *Rhodia newara* Moore, *Proc. zool. Soc. Lond.*, : 578.

1892. *Loepa newara*, Hampson, *Fauna of British India (Moths)*, 1 : 26, No. 27.

1979. *Rhodinia newara*, Arora & Gupta, *Mem. zool. Surv. India*, 16 (1) : 18.

Material examined : Nil.

Wing expanse : Males 110-150 mm; females 125-150 mm.

Distribution : India : West Bengal (Darjiling); Meghalaya and Sikkim. *Elsewhere* : Nepal.

IV Genus *Antheraea* Huebner 1816

1820. *Antheraea* Huebner, *Verz. bek Schmett.*, : 152.

Ten species are known from India, of which four are dealt with from West Bengal.

Key to the species of genus *Antheraea*

1. Forewing with vein R_1 stalked with R_{2+3} and R_4 2
 Forewing with vein R_1 free and arising from the cell 3
2. Hindwing with submarginal line single, smoothly curved, pinkish red and outlined by white; ocellus large *paphia* (Linnaeus)
 Hindwing with submarginal line double, highly angulated; ocellus small *frithi* Moore
3. Forewing with costal fascia extending upto basal half. Hindwing with antemedial line not touching ocellus *roylei* Moore
 Forewing costal fascia extending upto basal two-thirds. Hindwing with antemedial line farther from base and touching or nearly touching ocellus *helpferi* Moore

4. *Antheraea paphia* (Linnaeus)

1758. *Phalaena Bombyx paphia* Linnaeus, *Syst. Nat.*, Ed. X, 1 : 496.
 1773. *Phalaena Attacus mylitta* Drury, *Illustr. nat. Hist. Ins.*, 2 : 8, Pl.5, 5, fig. 10.
 1775. *Bombyx paphia*, Fabricius, *Syst., Ent.*, : 557, No.4.
 1855. *Bombyx mylitta*, Guerin-Meneville, *Rev. Zool.*2(7) : 297-299.
 1892. *Antheraea paphia*, Hampson, *Fauna of British India (Moths)*, 1 : 18.
 1979. *Antheraea paphia*, Arora & Gupta, *Mem. zool. Surv. India*, 16 (1) : 25.

Material examined : Calcutta, 1 (M), - ii.1870, 1 (F), 2.vii.1910, 2 (M), 1(F) (no date) (*J. Cleghoru* coll.); 1(M), 3.viii.1964, (*S.S. Saha* Coll.). Darjiling Dist., Kurseong, alt. 1524 m, 1 (M), 1 (F) (no further data). North 24-Parganas Dist., Agarpara, 1 (F) 31.v.1965 (*S.P. Chakraborty* coll.). South 24-Parganas Dist., Akra, 2 (M), 2(F) - i-1866 (no further data); champahati, 1(F), 16 —. —1964 (no coll.). Medinipur Dist., Satyadihi Tasar Farm, Arjan plantation, 1 (M), 3 (F), 20.xii.1985 (*A.K. Hazra & Party* coll.). Hughly Dist., Chandannagar, 1 (M), (No further data).

Forewing length : Males 57-76 mm, females 60-78 mm.

Distribution : India : West Bengal (Calcutta, Darjiling, Hughly, Medinipur, North 24-Parganas and

South 24-Parganas); Andhra Pradesh; Assam; Bihar; Himachal Pradesh; Karnataka; Madhya Pradesh; Maharashtra; Meghalaya; Orissa; Pondichery; Punjab; Tamil Nadu and Uttar Pradesh. Elsewhere ; Bangladesh, Bhutan, Burma, Nepal, Pakistan, South-China and Sri Lanka.

Remarks : The moth is popularly known as 'The Tasar Silk - Moth' and its cocoons yield tasar silk. It has a large number of food plants but the species is traditionally reared on *Terminalia tomentosa* (Assam), *T. arjinua* (Arijun) and *Shorea robusta* (Sal) number of food plants. The species displays a great degree of variation in colouration which Lefroy (1909) assigned to hybridisation in the species and absence of mating in captivity.

5. *Antheraea frithi* Moore

1858-59 *Antheraea frithi* Moore, *Cat. Lep. Ins. Mus. E.I. House*, **2** : 396-397.

1979. *Antheraea frithi*, Arora & Gupta, *Mem. zool. Surv. India*, **16** (1) : 28.

Material examined : Darjiling, 6(M), 7(F) (no date),

Forewing length : Males 50-70 mm; females 63-76 mm.

Distribution : India : West Bengal (Darjiling); Andamans; Bihar; Himachal Pradesh; Meghalaya and Sikkim. *Elsewhere* : Bhutan, Indonesia and South Vietnam.

Remarks : This species is known to have preference for food plant of species *Shorea robusta* (Sal).

6. *Antheraea roylei* Moore

1858-59. *Antheraea roylei* Moore, *Cat. Lep. Ins. Mus. E.I. House*, **2** : 397-398.

1892. *Antheraea roylei*, Hampson, *Fauna of British India, (Moths)*, **1** : 18.

1895. *Antheraea pernyi roylei*, Rothschild, *Novit. Zool.*, **2** : 43-44.

1979. *Antheraea roylei*, Arora & Gupta, *Mem. zool. Surv. India*, **16** (1) : 31.

Material examined : Darjiling, Govt. Rest House, 1 (F), v. 1912 (Lord Carmichael coll.).

Forewing length : 70 mm.

Distribution : India : West Bengal (Darjiling); Assam; Himachal Pradesh; Meghalaya; Sikkim and Uttar Pradesh.

Remarks : The moth is commonly called 'The Oak Tasar Moth' Its larvae spin double layered cocoons. Hybrids obtained by crossing *A. roylei* with a Chinese species *A. pernyi*, yield oak Tasar Silk of commercial value. The sub-Himalayan belt comprising states of Jammu & Kashmir, Himachal Pradesh, Uttar Pradesh, Assam, Meghalaya and Manipur is actively engaged in propagating this hybrid on oak.

7. *Antheraea helferi* Moore

- 1858-59. *Antheraea helferi* Moore, *Cat. Lep. Ins. E.I. House*, 2 : 397.
 1892. *Caligula helferi*, Kirby, *Syn. Cat. Lep. Het.*, 1 : 760, No.2, 937.
 1979. *Antheraea helferi*, Arora & Gupta, *Mem. zool. Surv. India*, 16(1): 33.

Material examined : Darjiling, 1(M), (no further data).

Forewing length : Male 65 mm.

Distribution : India : West Bengal (Darjiling), Manipur and sikkim.

V Genus *Loepa* Moore 1858

- .1858. *Loepa* Moore, *Cat. Lep. Ins. E.I. House*, 2 : 399, No. 923.

This genus is represented in India by two species i.e. *Loepa anthera* Jordan and *L. katinka* (Moore), of which the latter is dealt with from West Bengal.

8. * *Loepa katinka* (Westwood)

1848. *Saturnia katinka* Westwood, *Cab. Orient. Ent.* : 25, pl. 12, fig. 2.
 1855. *Antheraea katinka*, Walker, *Cat. Lep. Ins. Mus. E.I. House*, 2 : 399, pl. 20, figs 1 1a.
 1892. *Loepa katinka*, Hampson, *Fauna of British India (Moths)*, 1 : 25.
 1979. *Loepo katinka*, Arora & Gupta, *Mem. zool. Surv. India*, 16 (1) : 36.

Material examined : Nil.

Wing expanse : 71-124 mm.

Distribution : India : West Bengal (Darjiling); Arunachal Pradesh; Assam; Himachal Pradesh; Meghalaya, Sikkim; Uttar Pradesh and Tamil Nadu. *Elsewhere* : Bangladesh, China and Indonesia.

VI Genus *Cricula* Walker 1855

1855. *Cricula* Walker, *Cat. Lep. Het. Brit. Mus.*, 2 : 1186-1187.

Two species viz., *Cricula andrei* Jordan and *C. trifenestrata* (Helfer) represent this genus in India, the former species is dealt with from West Bengal.

9. *Cricula trifenestrata* (Helfer)

1837. *Saturnia trifenestrata* Helfer, *J. Asiat. Soc. Beng.*, 6 : 45, No. 10, (M), (F)
 1892. *Cricula trifenestrata*, Hampson, *Fauna of British India (Moths)*, 1:28.

Material examined : Calcutta, 1(M), 21.ii.1892 (Editor The Asian' Coll.). Darjiling Dist.,

Darjiling, 1(M), 2 (F), (no further data); Kurseong, alt. 1524m., 1(M), 6.ix.1909 (*Indian Mus. coll.*).

Wing expanse : 62-112 mm.

Distribution : India : West Bengal (Calcutta, Darjiling), Andamans; Assam; Bihar; Kerala; Meghalaya; Sikkim and Tamil Nadu. *Elsewhere* : Bangladesh, Burma, Indonesia and Sri Lanka.

Tribe ATTACINI

1. Frons flat; labial palpi one segmented. Forewing with a slender reddish streak between veins R_4 and R_5 ; antemedial line not sending spurs along veins Cu_{1a} and Cu_{1b} . Mid and hind tibiae without terminal spurs *Attacus* Linnaeus

Frons convex; labial palpi three-segmented. Forewing without reddish streak between veins R_4 and R_5 ; antemedial line sending whitish spurs at bases of Cu_{1a} and Cu_{1b} . Mid and hind tibiae with terminal spurs 2

2. Forewing with a short blackish patch between veins R_4 and R_5 ; discocellular spot large and triangular *Archaeoattacus* Watson

Forewing with a short ocellate spot between veins R_4 and R_5 ; discocellular spot narrow and lunate *Samia* Huebner

VII Genus *Attacus* Linnaeus 1767

1767. *Phalaena Attacus* Linnaeus, *Syst. Nat. XII ed.*, 1(2) : 808.

Only a single species i.e. *Attacus atlas* (Linnaeus) occurs in India.

10. **Attacus atlas* (Linnaeus)

1758. *Phalaena Bombyx atlas* Linnaeus, *Syst. Nat. Ed. X*, 1:495.
 1767. *Phalaena Attacus atlas*, Linnaeus, *Syst. Nat. Ed. XII*, 1(2) : 808.
 1892. *Attacus atlas*, Hampson, *Fauna of British India (Moths)*, 1:15.
 1979. *Attacus atlas*, Arora & Gupta, *Mem. zool. Surv. India*, 16 (1) : 44.

Material examined : Nil.

Wing expanse : Male 224 mm, female 250 mm.

Distribution : India : West Bengal (Darjiling); Andamans; Assam; Bihar; Gujarat; Karnataka, Maharashtra; Sikkim; Tamil Nadu and Uttar Pradesh. *Elsewhere* : Bangladesh, Burma, Indonesia, Singapore, Sri Lanka, South Asia and Western Malayasia.

Remarks : It is popularly known as Indian Atlas Moth. The species has the largest wing-area of all

the known *Lepidoptera*. It feeds on several species of plants. The cocoons of these moths yield "Fagara" silk.

VIII Genus *Archaeoattacus* Watson 1910

1910. *Archaeoattacus* Watson, *Trans. Manchester entom. Soc.*

The genus is represented in India by a single species i.e. *Archaeoattacus edwardsii* (White).

11. **Archaeoattacus edwardsii* (White)

1859. *Attacus edwardsii* White, *Proc. zool. Soc. Lond.*, **27**:115, pl. 57.

1914. *Archaeoattacus edwardsii*, Watson, *In Packard: Mem. nat. Acad. Sci.*, **12**(1) : 265.

1979. *Archaeoattacus edwardsii*, Arora & Gupta, *Mem. zool. Surv. India*, **16**(1) : 47.

Material examined : Nil.

Wing Expanse:: Males 204-244 mm., Females 224 mm.

Distribution : India : West Bengal (Darjiling), Assam; Meghalaya; Nagaland and Sikkim.
Elsewhere : Bhutan and Nepal.

Remarks : The moth is commonly called 'The Edward' Silkmoth.

IX Genus *Samia* Huebner 1820

1820. *Samia* Huebner, *Verz. bek. Schmett.*, : 156.

The genus is represented by only a single species i.e. *Samia cynthia* (Drury).

12. *Samia cynthia* (Drury)

1773. *Phalaena Attacus cynthia* Drury, *Illust. Nat. Hist. Exot. Ins.*, **2** : 10, pl. 19, f. 2.

1880. *Samia cynthia*, Huebner, *Verz. bek. Schmett.*, : 156.

1892. *Attacus cynthia*, Hampson, *Fauna of British India (Moths)*, **1** : 16.

1956. *Philosamia cynthia*, Sen-Sarma, *Indian Forest Leaflet* No. 121 (30) : 289.

1979. *Samia cynthia*, Arora & Gupta, *Mem. zool. Surv. India*, **16** (1) : 50.

Material examined : Darjiling Dist, Darjiling, 1(M) 21.i.1984, 11(M) ii-1904 (*E. Moller* coll); Kurseong, 1(F), (No further data), West Dinajpur, 2(M), 1(F), (no further data).

Forewing length : Males 42-69 mm; females 42-82 mm.

Distribution : India : West Bengal (Darjiling, West Dinajpur); Arunachal Pradesh; Assam; Bihar; Himachal Pradesh; Meghalaya; Nilgiri Hills; Sikkim; South Andamans and Uttar Pradesh. *Elsewhere* :

Australia, Bangladesh, Burma, China, Indonesia, Sri Lanka and U.K.

Remarks : The moth is popularly known as Eri Silkmoth or Ailanthus silkmoth and feeds on a large number of species of plants. Its cocoons yield 'Eri Silk'

X Genus *Rinaca* Walker 1855

1855. *Rinaca* Walker, *Cat. Lep. Het. Brit. Mus.*, 6 : 1274.

Diagnostic characters : Antennae much longer than the thorax. Labial palpi very short. Wings long, moderately broad; ocellus truncate with a curved discal vitreous line. Forewings almost straight in front, rounded at tips; outer margin oblique. In male antennae very deeply pectinated, branches ciliated and in pairs, the latter equal in length; forewing slightly falcate, concave along outer margin. In female, antennae with fewer joints than those of male; branches in pairs, the latter unequal in length.

The genus is represented in India by a single species i.e. *Rinaca zuleika* (Hope).

13. *Rinaca zuleika* (Hope)

1843. *Saturnia zuleika* Hope, *Trans. Linn. Soc. London. Zool.*, 19:132, No. 18, t.11, fig.5.

1892. *Saturnia zuleika*, Hampson, *Fauna of British India (Moths)*, 1:21.

1936. *Rinaca zuleika*, Schuessler, *Lepid. Cat.* 56:236.

Material examined : Darjiling, Govt. College, 1ex., 19.x.1987 (R. Roy Coll.).

Wing expanse : 69 mm.

Distribution : India : West Bengal (Darjiling), Meghalaya, Nagaland and Sikkim. *Elsewhere* : Bangladesh and Tibet.

XI Genus *Caligula* Moore 1862

1862. *Caligula* Moore, *Trans. ent. Soc. Lond.*, (3) 1 : 321.

Diagnostic characters : Antennae of male densely quadripectinated and feathered to the apex. Wings ample; in male apex of forewing falcate but rounded in female.

Four species of this genus occur in India of which three are dealt with from West Bengal.

Key to the species of genus *Caligula*

1. Labial palpi very short ; in male branches of antennae short *lindia* (Moore)
- Labial palpi of moderate size; in male branches of antennae long 2

2. Head, thorax and abdomen brown, collar yellow. Forewing bearing a large and round ocellus, the latter red-brown ringed with black *anna* (Moore)

Head, thorax and abdomen uniformly ochreous slightly, with grey brown. Forewing bearing a rounded ocellus, the latter with a narrow fawn ring *thibeta* (Westwood)

14. * *Caligula thibeta extensa* (Butler)

1881. *Rinaca extensa* Butler, *Illustr. Lep. Het. Brit. Mus.*, 5 : 61, t.94, fig.2(M).
 1892. *Saturnia thibeta* Hampson, *Fauna of British India (Moths)*, 1:22.
 1936. *Caligula thibeta extensa*, Schuessler, *Lepid. Cat.*, 56:242.

Material examined : Nil.

Wing expanse : 124-146 mm.

Distribution : India : West Bengal (Darjiling); Assam; Sikkim and Uttar Pradesh. *Elsewhere* : Tibet.

15. * *Caligula anna* (Moore)

1865. *Saturnia anna* Moore, *Proc. zool. Soc. Lond* : 818.
 1892. *Saturnia anna*, Hampson, *Fauna of British India (Moths)*, 1:22.
 1936. *Caligula anna*, Schuesler, *Lepid. Cat.*, 56:238.

Material examined : Nil.

Wing expanse : 110-120 mm.

Distribution : India : West Bengal (Darjiling); North India and Sikkim. *Elsewhere* : South China.

16. * *Caligula lindia* Moore

1865. *Caligula lindia* Moore, *Trans. ent. Soc. Lond.*, (3) 2:424, No.3, t.22, fig.3 (M)
 1892. *Saturnia lindia*, Hampson, *Fauna of British India (Moths)*, 1:23.
 1936. *Caligula lindia*, Schuessler, *Lepid. Cat.*, 56:241.

Material examined : Nil.

Wing expanse : 86 mm.

Distribution : India : West Bengal (Darjiling); Himachal Pradesh; Jammu & Kashmir and Sikkim. *Elsewhere* : Tibet.

XII Genus *Neoris* Moore 1862

1862. *Neoris* Moore, *Trans. ent. soc. Lond.*, (3) 1 : 321.

Diagnostic characters : Allied to genus *Leopa* in form but differs in shape of ocelli being smaller

in forewing and larger in hindwing. In male antennae strongly quadripectinated and feathered to apex.

The genus is represented in India by a single species i.e. *Neoris huttoni* Moore which is presently dealt with from West Bengal.

17. **Neoris huttoni* Moore

1862. *Neoris huttoni* Moore, *Trans.ent. Soc. Lond.*, (3) 1:321, (M).
 1892. *Saturnia huttoni*, Hampson, *Fauna of British India (Moths)*, 1:24.
 1936. *Neoris huttoni*, Schuessler, *Lepid. Cat.*, 56:248.

Material examined : Nil.

Wing expanse : 110 mm.

Distribution : India : West Bengal (Darjiling); Assam; Himachal Pradesh and Uttar Pradesh.

XIII Genus *Solus* Watson 1913

1913. *Solus* Watson, *Notes Leyden Mus.*, 35 : 181, t.8., Fig.1.

Diagnostic characters : Cells of forewing and hindwing open and without any discal vein in the cell, inner margin of forewing straight making a right angle with the outer margin. Differs from genus *Cricula* by hindwing being longer (twice the length of body) and ocelli not so completely hyaline.

Only a single species i.e. *Solus drepanoides* (Moore) occurs in India.

18. **Solus drepanoides* (Moore)

1865. *Cricula drepanoides* Moore, *Proc. zool. Soc. Lond.*, :817.
 1892. *Cricula drepanoides*, Hampson, *Fauna of British India (Moths)*, 1:29.
 1936. *Solus drepanoides*, Schuessler, *Lepid, Cat.*, 56:158.

Material examined : Nil.

Wing expanse : 68 mm.

Distribution : India : West Bengal (Darjiling) and Sikkim. *Elsewhere* : Bhutan.

Subfamily SALASSINAE

This subfamily is represented by a single genus, *Salassa* Moore occurring in Southern Asia.

XIV Genus *Salassa* Moore 1859

1859. *Salassa* Moore, *Proc. zool. Soc. Lond.*, : 246.

The genus is represented in India by four species of which two are dealt with from West Bengal.

Key to the species of genus *Salassa*

Head, thorax abdomen and wings brick-red. Forewing with a series of hyaline striae on postmedial line, ocellus ringed black, white and deep red exteriorly *lola* (Westwood)

Head, thorax, abdomen and wings very dark purplish red brown. Forewing without hyaline striae on postmedial line, outer ring of ocellus narrow and black but not deep red *royi* (Elwes)

19. *Salassa lola* (Westwood)

1847. *Saturnia lola* Westwood, *Cab. Or. Entom.*, : 25, pl. 12, fig.3.

1892. *Salassa lola*, Hampson, *Fauna of British India (Moths)*, 1:27.

1936. *Salassa lola*, Schuessler, *Lepid. Cat.*, 56:94.

Material examined : Darjiling Dist., Ghoom Bhujang, 1ex., 29.v.1975 (J.K. Jonathan & Party).

Forewing length : 47 mm.

Distribution : India : West Bengal (Darjiling) and Sikkim, *Elsewhere* : Bangladesh.

20. * *Salassa royi* (Elwes)

1887. *Saturnia royi* Elwes, *Proc. zool. Soc. Lond.*, : 447, (M).

1892. *Salassa royi*, Hampson, *Fauna of British India (Moths)*, 1:27.

1936. *Salassa royi*, Schuessler, *Lepid. Cat.*, 56:95.

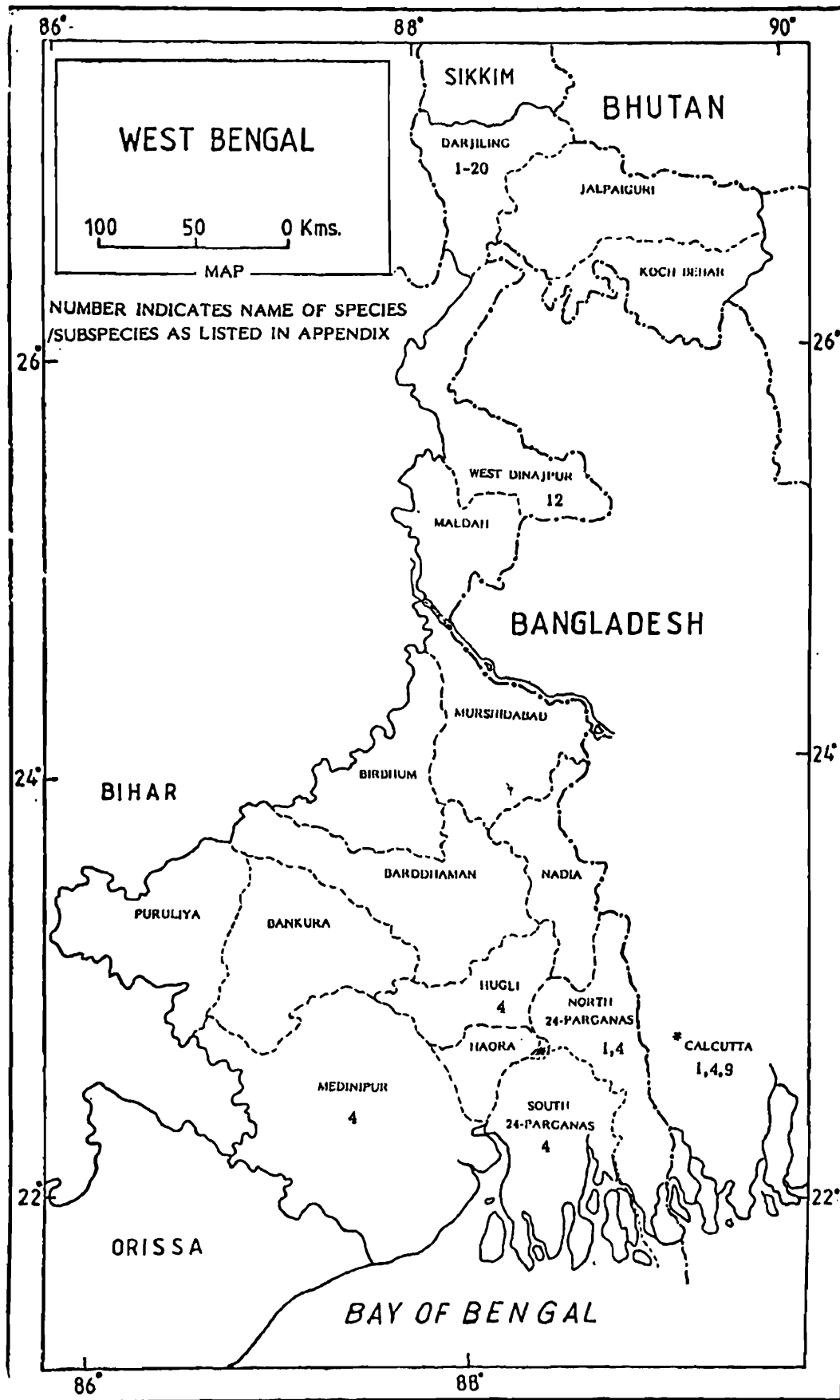
Material examined : Nil.

Wing expanse : Male 149 mm., female 154 mm.

Distribution : India : West Bengal (Darjiling), Himalay and Sikkim.

DISCUSSION

Of the twenty species of family Saturniidae known from West Bengal, the specimens of eleven species were represented in the old collection of Zoological Survey of India whereas other nine species have been reviewed from literature. Even the collections of insects made during recent faunistic surveys of the State include only a few specimens of these moths. The scanty material of Saturniidae appears to be due to destruction of forests which had plenty of food plants of these phylogenetically highly specialised and also economically important group of moths. Their rare occurrence draws attention of The Wild Life (Protection) Act, 1972 (amended from time to time). Though Schedule-I, Part-IV of Wild Life Act refers to 'Butterflies and Moths', only species of butterflies have been mentioned. Therefore, it is suggested that the species of these moths be included in the above mentioned Act.



Map 1

SUMMARY

Twenty species belonging to fourteen genera and two subfamilies, Saturniinae and Salassinae have been dealt with from West Bengal. Keys to identification of taxa have been provided. Common name, wing expanse/forewing length, distribution and remarks, if any, have been given for each species. An appendix has been given listing taxa from West Bengal. Map showing district-wise distribution of species has been included. Of the 17 districts of West Bengal these moths are recorded from only seven districts. All the 20 species are known from Darjiling district followed by Calcutta (3 spp.), North 24-Parganas (2 spp.), South 24-Parganas (1 spp), Hughly (1sp), Medinipur (1 sp) and West Dinajpur (1 sp.). Discussion has been made regarding the status of the species of these moths.

ACKNOWLEDGEMENTS

The author is very grateful to the Director, Zoological Survey of India, for providing necessary Laboratory facilities for the study of this group of moths. Thanks are also due to Dr. T. Sengupta, Scientist-SE, (Retd.) Entomology Division (A) for his encouragement and valuable suggestions and to Dr. S. K. Ghosh, Scientist-SD, (Retd.) Officer-in-Charge, Lepidoptera Section for going through the manuscript critically.

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APPENDIX :
List of species of family Saturniidae from West Bengal

Name of the species	Bankura	Bardhaman	Birbhum	Calcutta	Darjiling	Haora	Hugli	Jalpaiguri	Koch Behar	Maldah	Medinipur	Murshidabad	Nadia	24-Parganas (North)	24-Parganas(South)	Puruliya	West Dinajpur
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	

Family SATURNIIDAE

Subfamily SATURNIINAE

- | | | | | | | | | | | | | | | | | | |
|---|--|--|--|---|---|--|---|--|--|--|---|--|--|---|---|--|--|
| 1. <i>Actias selene</i> (Huebner) | | | | + | + | | | | | | | | | + | | | |
| 2. <i>Sonthonnaxia maenas</i> (Doubleday) | | | | | + | | | | | | | | | | | | |
| 3. <i>Rhodinia newara</i> (Moore) | | | | | + | | | | | | | | | | | | |
| 4. <i>Antheraea paphia</i> (Linnaeus) | | | | + | + | | + | | | | + | | | + | + | | |
| 5. <i>A. frithi</i> Moore | | | | | + | | | | | | | | | | | | |
| 6. <i>A. roylei</i> Moore | | | | | + | | | | | | | | | | | | |
| 7. <i>A. helferi</i> Moore | | | | | + | | | | | | | | | | | | |
| 8. <i>Loepa katinka</i> (Westwood) | | | | | + | | | | | | | | | | | | |
| 9. <i>Cricula trifenestrata</i> (Helfer) | | | | + | + | | | | | | | | | | | | |
| 10. <i>Attacus atlas</i> (Linnaeus) | | | | | + | | | | | | | | | | | | |
| 11. <i>Archaeoattacus edwardsii</i> (White) | | | | | + | | | | | | | | | | | | |

Name of the species	Bankura	Bardhaman	Birbhum	Calcutta	Darjiling	Haora	Hugli	Jalpaiguri	Koch Behar	Maldah	Medinipur	Murshidabad	Nadia	24-Parganas (North)	24-Parganas(South)	Puruliya	West Dinajpur	16	17
12. <i>Samia cynthia</i> (Drury)							+												+
13. <i>Rinaca zuleika</i> (Hope)							+												
14. <i>Caligula lindia</i> (Moore)							+												
15. <i>C. anna</i> (Moore)							+												
16. <i>C. thibeta extensa</i> (Butler)							+												
17. <i>Neoris huttoni</i> Moore							+												
18. <i>Solus drepanoides</i> (Moore)							+												
Subfamily SALASSINAE							+												
19. <i>Salassa lola</i> (Westwood)																			
20. <i>S. royi</i> (Elwes)							+												

INSECTA : LEPIODEPTERA : LYCAENIDAE

I. J. GUPTA

Zoological Survey of India, Calcutta

INTRODUCTION

There are 4,089 species of butterflies of family Lycaenidae known from the world. Of these, about 400 species are from India. The earlier record of about 60 species from West Bengal has now increased to 83 species of Lycaenidae distributed over 47 genera and four subfamilies, viz, Poritinae, Miletinae, Lycaeninae and Theclinae.

The family Lycaenidae includes butterflies commonly called 'Blues'. During larval stages, some of the species display unique association with ants. The caterpillar bears an oval opening with lips, like a mouth, dorsally on eleventh segment. These lips, on protrusion, exude a sweet liquid. This organ with sweet tasting liquid exudation is greatly effected by ants of different species, who in return for the food they obtain from the larvae act as their most efficient guardians or protectors. For instance, larva of *Euchrysops cnejus* (Fabricius) is attended by an ant - *Camponotus (Tanaemyrmex) compressus* Fabricius; larva of *E. pandava* (Horsfield) is attended by three species of ants - *Cremastogaster (Acrocoelia) brunnea* var. *nicevillei* Fores, *Monomorium specularis* Mayr. and *Paratrechina (Paratrechina) longicornis* (Latreille) and larva of *Lampidess boeticus* (Fabricius) is attended by two species of ants - *Camponotus (Tanaemyrmex) compressus* (Fabricius) and *Prenolepis obscura* Mayr.

The contributions on Lycaenidae from India have been made mainly by de Nicéville (1890), Bingham (1907), Evans (1932), Wynter Blyth (1957) and Cantlie (1962). Rothney (1882) reported several lycaenid species from North 24-Parganas District (Barrackpore) whereas de Nicéville (1885) and Sanders (1944) reported their occurrence in Calcutta.

The studies of these butterflies are based mainly on specimens available in the collection of Zoological Survey of India, and also the material collected during several faunistic surveys of West Bengal. Altogether, 83 species and subspecies distributed over 47 genera and four subfamilies are found in the State. Of these, 20 species and subspecies constitute first records from West Bengal.

Regarding status of lycaenid species and subspecies of West Bengal, Evans (1932), Wynter - Blyth (1957) and Cantlie (1962) have been followed. Thus, one species i.e. *Allotinus drumila* (Moore) is very rare, 12 are rare and 35 not rare. Schedule-I (Part-4) and Schedule-II (part-2) of the Wild Life (Protection) Act, include 3 and 20 species/sub-species, respectively.

The family Lycaenidae is reported from 11 out of 17 districts of the State ; Maldah (48 species), Calcutta (40 species), Darjeeling (27 species), Murshidabad (12 species), North 24-Parganas (12 species), Jalpaiguri (10 species), Birbhum (7 species) South 24-Parganas (12 species) Bardhaman (1 species), Hugli

(1 species) and Nadia (1 species). Therefore, lycaenids not represented or found in two or three districts may be considered rare.

Keys to subfamilies, genera and species of the family Lycaenidae have been given. Common name, forewing length, geographical distribution and status of taxa have been provided. The species/subspecies for which material was not available have been reviewed from literature and are marked with asterisk (*). Appendix-I and maps indicate district-wise distribution of taxa in the State.

SYSTEMATIC ACCOUNT

Family LYCAENIDAE

Key to subfamilies of family LYCAENIDAE

1. Hindwing with vein Sc abnormal, the latter equal to half the length of vein 1A+ 2A in forewing; traces of precostal vein present. PORITINAE
- Hindwing with vein Sc normal, the latter nearly or quite equal to vein 1A + 2A in forewing; traces of precostal vein absent. 2
2. Legs abnormal MILETINAE
- Legs normal 3
3. Antennal club flattened and spatulate or hollow beneath (except genera *Spalgis* and *Castalius*) LYCAENINAE
- Antennal club gradual and cylindrical (except genus *Chliaria*) THECLINAE

Subfamily PORITINAE

This subfamily is represented in India by two genera i.e. *Cyaniriodes* De Nicéville and *Poritia* Moore; the latter is dealt with from West Bengal.

I Genus *Poritia*

1865. *Poritia* Moore *Proc. zool. Soc. Lond.*, : 775.

This genus is represented in India by three species of which one i.e. *Poritia hewitsoni* Moore is found in West Bengal.

1. **Poritia hewitsoni hewitsoni* Moore (The Common Gem)

1865. *Poritia hewitsoni* Moore, *Proc. zool. Soc. Lond.* : 775, pl. 51, fig. 10.

1957. *Poritia hewitsoni*, Wynter-Blyth, *The Butterflies of the Indian Region* : 252

1962. *Poritia hewitsoni hewitsoni*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932:19.

Material examined : Nil.

Wing expanse : 31-38 mm.

Distribution : India : Bengal; Assam; Uttar Pradesh. *Elsewhere* : Bangladesh and Nepal.

Remarks : De Nicéville (1890) referred to its occurrence in 'Bengal' Its status is 'not rare' It has been included in Schedule-II (Part-2) of the Wild Life (Protection) Act.

Subfamily MILETINAE

There are three genera occurring in India, of which *Allotinus* Felder is treated from West Bengal.

II. Genus *Allotinus* Felder 1865

1865. *Allotinus* Felder, *Reise Novara, Lep.*, 2 : 285.

Three species of this genus occur in India of which one i.e. *Allotinus drumila* (Moore) is dealt with from West Bengal.

2. **Allotinus drumila drumila* (Moore) (The Crenulate Darkie)

1865. *Miletus drumila* Moore, *Proc. zool. Soc. Lond.*, : 777, Pl. 51, fig. 12. (F).

1890. *Allotinus drumila*, De Nicéville, *The Butterflies of India, Burmah and Ceylon*, 3 : 26.

1962. *Allotinus drumila drumila*, Cantlie, *The Lycaenidae Portion of Bridadier Evans' The Identification of Indian Butterflies*, 1932 : 26.

Material examined : Nil.

Wing expanse : 48-54 mm.

Distribution : India : West Bengal (Darjiling); Uttar Pradesh to Assam. *Elsewhere* : Burma.

Remarks : De Nicéville (1890) described *Allotinus multistrigatus* and distinguished it from *A. drumila* (Moore) by having inner angle of forewing evenly rounded and not produced (vs. inner angle of forewing greatly produced). Both the species were also treated as valid by Wynter-Blyth (1957). Cantlie (1962) opined that *A. drumila multistrigatus* de Nicéville is wet season form of *A. drumila drumila*. Wynter-blyth (1957) referred to its status as very rare. It has also been listed in Schedule-II (Part-2) of the Wild Life (Protection) Act.

Subfamily LYCAENINAE

This subfamily is represented in India by 47 genera of which 21 occur in West Bengal.

Key to the genera of subfamily LYCAENINAE

1. Underside of wings with blackish markings from extreme bases 2
 Underside of wings without blackish markings at extreme bases 6
2. Eyes smooth 3
 Eyes hairy 5
3. Antennal club abnormal. Hindwing tailless *Spalgis* Moore
 Antennal club normal Hindwing tailed *Castalius* Huebner
4. In forewing vein R_1 ending well before end cell *Castalius* Huebner
 In forewing vein R_1 ending opposite end cell *Tarucus* Moore
5. In forewing veins R_1 and Sc free. Hind wing tailed *Syntarucus* Butler
 In forewing veins R_1 and Sc anastomosed. Hindwing tailless *Azanus* Moore
6. Eyes smooth (except a few species of genus *Celastrina*) 7
 Eyes densely hairy 16
7. Hindwing with tornus evenly rounded *Neopithecops* Distant
8. In Hindwing with tornus angled forewing veins R_1 and Sc anastomosed *Everes* Huebner
 In forewing veins R_1 and Sc free 9
9. Underside of wings with markings not white edged 10.
 Underside of wings with markings white edged 11
10. Underwise of forewing with two black dots on costa above vein Sc *Megisba* Moore
 Underside of forewing without black dots on costa above vein Sc *Celastrina* Tutt
11. Hindwing tailed *Euchrysops* Butler
 Hindwing tailless 12

12. In forewing vein Cu_{1b} arising opposite to the origin of vein R_1 or vein R_1 nearer base *Chilades* Moore
 *Chilades* Moore
 In forewing vein Cu_{1b} arising nearer base than origin of vein R_1 13
13. Underside of hindwing with jewelled spots along margin or at tornus *Freyeria* Curvoisier
 Underside of hindwing without jewelled spots along margin or at tornus 14
14. In forewing veins R_1 and Sc anastomosed to costa *Zizula* Chapman
 In forewing veins R_1 and Sc anastomosed or touching and then free to costa 15
15. Underside of hindwing with postdiscal spots in interspaces 5,6,7 in line *Zizeeria* Chapman
 Underside of hindwing with post discal spot in interspace 6 moved in and not in line with spots in interspaces 5 and 7 *Zizina* chapman
16. In forewing veins R_1 and Sc free 17
 In forewing veins R_1 and Sc anastomosed or connected by a short spur 19
17. Hindwing with three short tails at veins 1A + 2A, Cu_{1b} and Cu_{1b} *Anthene* Doubleday
 Hindwing with a long tail at vein Cu_{1b} only 18
18. Underside of wings with catenulated bands and some spots *Catochrysops* Boisduval
 Underside of wings with white lines; only tornal spots on hindwing *Lampides* Huebner
19. In forewing veins R_1 and Sc free but connected by a short spur *Jamides* Moore
 In forewing veins R_1 and Sc anastomosed 20
20. Underside of forewing with a spot in interspace 2 in line with spots in interspaces 1b and 3.
 Underside of hindwing with a black tornal spot in interspace 2 and another small spot in interspace 1b may be present *Nacaduba* Moore
 Underside of forewing with a spot in interspace 2 moved inwards and out of line with spots in interspace 1b and 3. Underside of hindwing with two small and equal black tornal spots
 *Petrelaea* Toxopeus

III Genus *Spalgis* Moore 1879

This genus is represented in India by two species, viz. *Spalgis epeus* Westwood and *S. baigonus* Cantlie and Norman, of which the former is dealt with from West Bengal.

3. *Spalgis epeus epeus* (Westwood)
(The Apefly)

1852. *Lucia epius* Westwood, In Doubleday's, *Westw. & Hew. Gen. Diurn. Lep.*, 2 : 502, pl. 76 fig. 5 (F).
1890. *Spalgis epius*, De Nicéville, *The Butterflies of India, Burma and Ceylon*, 3 : 55.
1907. *Spalgis epius*, Bingham, *The Fauna of British India (Butterflies)*, 2 : 311.
1962. *Spalgis epeus epeus*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932 : 30.

Material examined : Calcutta, 1 ex., (no further data); Calcutta, 2 exs., ___viii. 1882 (no coll.).
Maldah dist., Bholahat, 1 ex, (no further data).

Forewing length : 12-14 mm.

Distribution : India : West Bengal (Calcutta, Maldah); Assam, Bihar, Karnataka, Maharashtra, Nilgiris, Orissa, Sikkim; Southern India and Uttar Pradesh. Elsewhere : Bhutan, Burma, Nepal and Sri Lanka.

Remarks : The nominate subspecies is distinguished from *S. epeus nubilus* Moore (found in Andamans and Nicobars) by upperside and underside of wings being paler and a white discal patch almost present on upperside of forewing (vs. upperside and underside of wings darker and white discal patch is obsolete on upperside of forewing. Its status is not rare. The nominate subspecies was also earlier reported from Calcutta and Maldah.

IV. Genus *Castalius* Hübner 1816

1816. *Castalius* Hübner, *Verz. bekannt. Schmett.*, : 70.

There are five species of this genus occurring in India of which two are dealt with from West Bengal.

Key to the species of genus *Castalius*

- Upperside of forewing and hindwing with ground colour white, bearing several black spots
..... *rosimon* Fabricius
- Upperside of forewing and hindwing with ground colour black, bearing a white band
..... *caleta* Hewitson

4. *Castalius rosimon rosimon* (Fabricius)
(The Common Pierrot)

1775. *Papilio rosomon* Fabricius, *Syst. Ent.*, : 523.
1907. *Castalius rosimon*, Bingham, *The Fauna of British India (Butterflies)*, 2 : 424.
1962. *Castalius rosimon rosimon*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932 : 31.

Material examined : Calcutta, 4 exs. (no further data); Calcutta, 1 ex., 4.iv.1880 (*de Nicéville coll.*). Maldah dist., Bholahat, 1 ex., (no date), de Nicéville Coll.); Bholahat, 5 exs. (no further data). Murshidabad Dist. Raghunathganj (Potapur colony), 1 ex., 7.11.1986, Sagardighi, 1 ex., 14.11.1986 (*I.J. Gupta & Party coll.*).

Forewing length : 12-14 mm.

Distribution : India : West Bengal (Calcutta, Maldah, Murshidabad); widely distributed in India. *Elsewhere* : Burma, Pakistan and Sri Lanka.

Remarks : The nominate subspecies is widely distributed in India except Andamans and Nicobars where *C. rosimon alarbus* Felder occurs. Its status is common.

5. *Castalius caleta decidia* (Hewitson)
(The Angled Pierro)

1876. *Lycaena decidia* Hewitson, *Exot. Butt.*, 5 : 1 pl., fig. 4.

1907. *Castalius decidia*, Bingham, *The Fauna of British India (Butterflies)*, 2 : 429.

1962. *Castalius caleta decidia*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies* : 31.

Material examined : Maldah dist., 14 exs (no date), (de Nicéville coll.).

Forewing length : 13-15 mm.

Distribution : India : West Bengal (Malda); Assam, Bihar, Maharashtra, Orissa, Sikkim. Elsewhere; Burma and Nepal.

Remarks : This subspecies bears a whitebroad band on upperside at wings and therefore, can be distinguished from *C. caleta hamatus* Moore (found in Sri Lanka) by a narrower white band on upperside of wings. It was also previously known from Maldah.

V. Genus *Tarucus* Moore

1881. *Tarucus* Moore, *Lep. Ceylon*, 1 (3) : 81.

Eight species of this genus occur in India of which three are found in West Bengal.

Key to the species of genus *Tarucus*

1. Underside of forewing and hindwing with a postdiscal band maculated and composed of more or less connected round spots *callinara* Butler

Underside of forewing and hindwing with a postdiscal band continuous, not maculated but composed of connected streaks between veins. 2

2. In male, upperside of forewing with a conspicuous black spot at end cell *nara* Kollar

In male, upperside of forewing with one or two black discal spots in addition to a spot at end cell
..... *balkanica* (Freyer)

6. *Tarucus callinara* Butler
(The Spotted Pierrot)

1886. *Tarucus callinara* Butler, *Ann. Mag. nat. Hist.*, (5) 18 : 185.

1962. *Tarucus callinara*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932 : 33.

Material examined : Maldah Dist., Bholahat, 12 exs., (no date), (de N. coll.); Bholahat, 6 exs., (no further data).

Forewing length : 11-14 mm.

Distribution : India : West Bengal (Maldah); North West India to West Bengal. *Elsewhere* : Burma, Pakistan and Sri Lanka.

Remarks : Wynter-Blyth (1957) mentioned it locally common and no specimen is available in collection made during recent faunistic survey of West Bengal. It is a first report from West Bengal. It has been listed in Schedule-II (Part-2) of the Wild Life (Protection) Act.

7. *Tarucus nara* (Kollar)
(The Striped Pierrot)

1848. *Lycaena nara* Kollar, *In Huegel's Kaschmir*, 4 : 241.

1907. *Tarucus theophrastus*, Bingham, *The Fauna of British India (Butterflies)*, 2 : 417.

1962. *Tarucus nara*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932:33.

Material examined : Maldah Dist., Bholahat, 9 exs, (no date), (de Niceville coll.). Murshidabad Dist., Raghunathganj (Char Island), 1 ex., 8.ii.1986, Jangipur (Chhotklaai), 1 ex., 10.ii.1986, Sagardighi, Chandan Mati. 1 ex., 15.ii.1986 (I.J. Gupta & Party coll).

Forewing length : 11-12 mm.

Distribution : India : West Bengal (Maldah, Murshidabad); Sikkim; Southern, Western and Northern India; Uttar Pradesh. *Elsewhere* : Sri Lanka.

Remarks : The species not represented in the material collected during several faunistic surveys of the State. It is a first report from West Bengal. Its status is not rare.

8. *Tarucus balkanica nigra* (Bethune-Baker)
(The Black Spotted Pierrot)

1913. *Hypolycaena nigra* Bethune-Baker, *Tr. ent. Soc. London*, : 502 *Megisba nigra* Moore, *Proc. Linn. Soc. N. S.-Wales* (2) 5 : 36.
1957. *Tarucus nigra*, Wynter-Blyth, *Butterflies of the Indian Region*, : 264.
1962. *Tarucus balkanica nigra*, Cantlie, *The Lycaenidae portion of Brigadier Evans, The Identification of Indian Butterflies*, 1932, : 32.

Material examined : Maldah Dist., 1 ex., no date, (*de Niceville coll.*).

Forewing length : 12 mm.

Distribution : India : West Bengal (Maldah); Delhi, Gujarat, Himachal Pradesh, Madhya Pradesh and Uttar Pradesh. Elsewhere ; Pakistan.

Remarks : From West Bengal, there is only a single specimen available in the collection of Zoological Survey of India. Therefore, it is a first report from the State. Its status is 'not rare'

VI. Genus *Syntarucus* Butler 1901

1901. *Syntarucus* Butler, *Proc. zool. Soc. Lond.*, (1900), (4) : 929.

The genus is represented in India by a single species, *Syntarucus plinius* (Fabricius) and is dealt with from West Bengal.

9. *Syntarucus plinius* (Fabricius)
(The Blue Zebra)

1793. *Hesperia plinius* Fabricius, *Ent. Syst.*, 3 : 284.
1907. *Tarucus plinius*, Bingham, *The Fauna of British India (Butterflies)*, 2 : 420-421.
1962. *Syntarucus plinius*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932 : 34.

Material examined : Maldah Dist., Bholahat, 3 exs. (no further data); Bholahat, 3 exs. (no date), (*de Niceville coll.*),

Forewing length : 12-15 mm.

Distribution : India : West Bengal (Maldah); Arunachal Pradesh; Madhya Pradesh and Uttar Pradesh. *Elsewhere* : Burma, Nepal, Pakistan and Sri Lanka.

Remarks : It is a first report from West Bengal. Cantlie (1962) referred to its status common.

VII. Genus *Azanus* Moore 1881

1881. *Azanus* Moore, *Lep. Ceylon*, 1 (2) : 79.

There are two species, viz., *Azanus uranus* Butler and *A. jesous* (Guerin) occurring in India, of which the former is dealt with from West Bengal.

10. *Azanus uranus* Butler
(The Dull Babul Blue)

1886. *Azanus uranus* Butler, *Proc. zool. Soc. Lond.*, : 366, pl. 35, fig.1.

1962. *Azanus uranus*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932:34.

Material examined : Maldah Dist., Bholahat, 12 exs., (no date), (*de Niceville Coll.*).

Forewing length : 11-12 mm.

Distribution : India : West Bengal (Maldah); Central and southern India; Sikkim and Uttar Pradesh.
Elsewhere : Pakistan.

Remarks : Cantlie (1932) referred to its status common. It is earlier known from West Bengal.

VIII Genus *Neopithecops* Distant 1884

1884. *Neopithecops* Distant, *Rhop. malayana* : 197, 209.

The genus is represented in India by a single species i.e. *Neopithecops zalmora* Butler and it is found in West Bengal.

11. *Neopithecops zalmora* (Butler)
(The Quaker)

1869. *Pithecops zalmora* Butler, *Cat. Fabr. Lep. B.M.* : 161.

1962. *Neopithecops zalmora*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932 : 37.

Material examined : Calcutta, 7 exs. (no further data); Calcutta, 1 ex., - viii. 1884 (*de Niceville coll.*)
Maldah Dist., Bholahat, 5 exs. (no further data); Bholahat, 3 exs. (no date) (*de Niceville coll.*).
Murshidabad Dist., Azimganj 1 ex., 5.ii.1986, Lal Bagh (Katra Colony), 4 exs., 13.ii.1986 (*I.J. Gupta & Party coll.*).

Forewing length : 11-13 mm.

Distribution : India : West Bengal (Calcutta, Maldah, Murshidabad) to South India, Andamans, Assam, Orissa, Sikkim, Uttar Pradesh to limits of India. *Elsewhere* : Burma and Sri Lanka.

Remarks : Cantlie (1962) referred to its status common. It is earlier known Bengal.

IX. Genus *Everes* Hübner 1819

1819. *Everes* Hübner, *Verz. bekannt. Schmett.* (5) : 69.

Six species of this genus occur in India of which only a single species i.e. *Everes lacturnus* is dealt with from West Bengal.

12. *Everes lacturnus assamica* Tytler
(The Indian Cupid)

1915. *Everes parhasius assamica* Tytler, *J. Bombay nat. hist. Soc.* 24(1) : 122

1962. *Everes lacturnus assamica*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932 :

Material examined : Maldah Distt., Bholahat, 12 exs., (de Niceville coll.)

Forewing length : 10-13 mm.

Distribution : India : West Bengal (Maldah), Assam, Himachal Pradesh, Sikkim and Uttar Pradesh.
Elsewhere : Burma and Nepal.

Remarks : The species is a first report from West Bengal. Its status is not rare.

X Genus *Megisba* Moore 1881

1881. *Megisba* Moore, *Lep. Ceylon*, 1 (2) : 71.

Megisba malaya (Horsfield) is the only species of this genus occurring in India and it has been listed in Schedule-II (Part-2) of the Wild Life (Protection) Act.

13. *Megisba malaya thwaitesi* Moore
(The Malayan)

1881. *Megisba thwaitesi* Moore, *Lep. Ceylon*, 1 : 71, pl. 34, figs 3, 3a, 3b, (F). larva & pupa.

1962. *Megisba malaya thwaitesi*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies* : 40.

Material examined : Calcutta. 1 ex. 14.ii.1880 (de Niceville coll.).

Forewing length : 10 mm.

Distribution : India : West Bengal (Calcutta) and South India. *Elsewhere* : Sri Lanka.

Remarks : It was earlier known from Calcutta and its status is not rare.

14. *Megisba malaya sikkima* Moore
(The Malayan)

1884. *Megisba sikkima* Moore, *J. Asiat. Soc. Beng.* 53 : 21.

1962. *Megisba malaya sikkima*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932, : 41.

Material examined : Maldah Dist., Bholahat, exs., (no further data); Bholahat, 3 exs; (no date) (*de Niceville coll.*)

Forewing length : 11-12 mm.

Distribution : India : West Bengal (Maldah), Andamans, Uttar Pradesh. *Elsewhere* : Burma.

Remarks : Hindwing is tailed in this subspecies and it, therefore, differs from *M. megisba thwatesi* Moore which is with tailless hindwing. Its status is rare. It was previously known from Calcutta.

XI. Genus *Celastrina* Tutt 1906

1906. *Celastrina* Tutt. *Ent. Rec.* 18:131.

This genus is represented in India by 14 species of which two are dealt with from West Bengal.

Key to the species of genus *Celastrina*

Underside of both wings grey, with reddish dusting and thick markings edged with white. In male, upperside of forewing with black border widening towards apex *limbata* (Moore)

Underside of both wings pale bluish white with markings rather faint and not white edged. In male, upperside of forewing with border thread like. *dilectus* (Moore)

15. **Celastrina limbata limbata* (Moore)
(The Plain Hedge Blue)

1879. *Polyommatus limbata* Moore, *Proc. zool. Soc. Lond.* : 139.

1907. *Cyaniris limbata*, Bingham, *The Fauna of British India(Butterflies)*, 2 : 329.

1962. *Celastrina limbata limbata*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932 : 47.

Material examined : Nil.

Wing expanse : 28-34 mm.

Distribution : India : West Bengal; Assam; Bihar; Meghalaya and South India.

Remarks : De Niceville (1890) referred to its occurrence in 'Bengal'. Cantlie (1962) mentioned its

distribution from South India to Bengal. Its status is 'not rare'

16. *Celastrina dilectus* (Moore)
(The Pale hedge Blue)

1879. *Polyommatus dilecta* Moore, *Proc. zool. Soc. Lond.* : 139.
1905. *Cyaniris dilecta*, Bingham, *The Fauna of British India (Butterflies)*, 2 : 331.
1962. *Celastrina dilectus*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies* 1932, : 47.

Material examined : Maldah Dist., 2 exs, no date, (de Niceville coll)

Forewing length : 14-15 mm.

Distribution : India : West Bengal (Maldah); Himachal Pradesh to Arunachal Pradesh. *Elsewhere*: Burma and Nepal.

Remarks : Its status is 'not rare' From Uttar Pradesh (Mussoorie) eastwards it is fairly common (Wynter-Blyth, 1957).

XII Genus *Euchrysops* Butler 1900

1900. *Euchrysops* Butler, *Entomologist*, 33 : 1.

The genus is represented in India by three species of which two are found in West Bengal.

Key to the species of genus *Euchrysops*

Upperside of hindwing with equal or nearly equal sbmarginal spots in interspaces 1c and 2.

Underside of hindwing with discal band tornally broken into separated spots, the last spot near the anal margin in interspace 1b far removed from the next spot in interspace 1c. *cnejus* (Fabricius)

Upperside of hindwing with markedly unequal submarginal spots in interspaces 1c and 2. Underside of hindwing with discal band at tornus more united, the spot in interspace 1b being conjoined or approximated to the spot in interspace 1c *pandava* (Horsfield)

17. *Euchrysops cnejus* (Fabricius)
(The Gram Blue)

1798. *Hesperia cnejus* Fabricius, *Ent. Syst. Supdt.* : 430.
1907. *Catochrysops cnejus*, *The Fauna of British India Butterflies* 2 : 415.
1962. *Euchrysops cnejus*, Cantlies, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932 : 65.

Material examined : Maldah Dist., Bholahat, 10 exs., no date, (de Niceville coll.); Bholahat, 4 exs

(no further data). Murshidabad Dist. Jiyaganj, 1 ex., 6.ii.1986, Raghunathganj (Char Island), 2 exs., 8.ii.1986 (*I.J. Gupta Party coll.*). North 24-Parganas Dist., Belgharia, 1 ex. 13.v.1967 (*H.C. Ghosh coll.*). South 24-Parganas Dist., Sonarpur, 1 ex., 28.xi.1961 (*R.K. Varshney coll.*); Canning, 1 ex., 18.xi.1965 (*G.S. Arora & party coll.*).

Forewing length : 12-13 mm.

Distribution : India : West Bengal (Maldah, Murshidabad, North 24-Parganas, South 24-Parganas) Andamans, Madhya Pradesh, Central and South Nicobars. *Elsewhere* : Burma, Nepal Pakistan and Sri Lanka.

Remarks : It is a first report from West Bengal. Cantlie (1962) referred to its status common but it has been listed in Schedule II (Part-2) of the Wild Life Protection Act.

18. *Euchrysops pandava pandava* (Horsfield)
(The Plains Cupid)

1829. *Lycaena pandava* Horsfield, *Cat. Lep. Ins. East India Coy.* : 84.
1907. *Catochrysops pandava*, Bingham, *The Fauna of British India (Butterflies)*, 2 : 413.
1962. *Euchrysops pandava*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932:66.

Material examined : Calcutta, 1 ex., 15.v.1880 (no coll), Calcutta, 2 exs., 14.vi.1880, 2 exs., viii 1882, 10 exs., - iv - 1884, 1 exs, - xii-1885, 5 exs., - xii -, 1 ex, no date, (de Niceville coll.); Calcutta, 1 ex, no further data). North 24-Parganas, Baranagar, 1 ex., 16.i.1967 (H.C. Ghosh coll.)

Forewing length : 11-13 mm.

Distribution : India ; West Bengal (Calcutta, North 24-Parganas), Andamans & Nocobars and Karnataka. *Elsewhere* : Burma, East Pakistan and Nepal.

Remarks : It is a first report from West Bengal. Cantlie (1962) referred to its status as common.

XII Genus *Chilades* Moore 1881

1881. *Chilades* Moore, *Lep. Ceylon*, 1 (2) : 76.

The genus is represented in India by a single species i.e. *Chilades laius* Cramer and is dealt with from West Bengal.

19. *Chilades laius laius* (Cramer)
(The Lime Blue)

1780. *Papilio laius* Cramer, *Pap. exot.*, 4 : 62, pl. 319, figs. D., E.
1907. *Chilades laius*, Bingham, *The Fauna of British India (Butterflies)*, 2 : 365.
1962. *Chilades laius laius*, Cantlie, *The Lycaenidae portion of Brigider Evans' The Identification of Indian Butterflies*, 1932 : 62.

Material examined : Bardhaman Dist., Bandel (Debanandapur), 1 ex., 26.x.1964 (A.N.T. Joseph & party coll.) Birbhum Dist, Gonatea, 6 exs, 29. xi. 1879 (*de Niceville coll.*) Gonatea, 1 ex, (no further data). Calcutta, 2 exs., (no further data); Calcutta, 2 exs., vii. (no coll.); Calcutta, 1 ex, 7.xii.1879, 1ex, 28.iii.1880, 1ex., iv.1884 (*de Niceville coll.*); Calcutta, Eden Garden, 1ex, II-xi. 1964 Shaukat Ali Coll. Maldah Dist., Bholahat 11 exs (no date), (*de Niceville coll.*), Bholahat, 4 exs. (no further data). Nadia Dist., Ranaghat, 2 exs., 18.viii.1965 (*D.K. Mandal & Party coll.*).

Forewing length : 10-14 mm.

Distribution : India : West Bengal (Bardhaman, Birbhum, Calcutta, Maldah, Nadia); Assam, Maharashtra and fairly distributed in India. *Elsewhere* : Burma, Nepal and Sri Lanka.

Remarks : Cantlie (1962) referred to its status common. The nominate subspecies is previously known from West Bengal.

XIV Genus *Freyeria* Curvoisier 1920

1920. *Freyeria* Curvoisier, *Dt. ent. Z. Iris*, Dresden. 34:234.

Only a subspecies, *Freyeria trochilus putli* (Kollar) occurs in India and is dealt with.

20. *Freyeria trochilus putli* (Kollar) (The Ceylon Grass Jewel)

1848. *Lycaena putli* Kollar, *In Huegrel's Kaschmir*, 4 (2) : 422, No. 8.

1907. *Chilades trochilus*, Bingham, *The Fauna of British India (Butterflies)*, 2 : 367.

1932. *Zizeeria trochilus putli*, Evans, *The Identification of Indian Butterflies* : 233.

1962. *Freyeria trochilus putli*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932, : 62.

Material examined : Calcutta, 2 exs., vii -, (*de Niceville coll.*). Maldah Dist., Bholahat, 5 exs., (no date), (*de Niceville coll.*); Bholahat, exs., (no further data).

Forewing length : 7-10 mm.

Distribution : India : West Bengal (Calcutta, Maldah); Arunachal Pradesh; South to Northeast India. *Elsewhere* : Burma.

Remarks : Cantlie (1962) mentioned its status common. This subspecies was previously known from Maldah.

XV. Genus *Zizula* Chapman 1910

1910. *Zizula* Chapman, *Trans. ent. Soc. Lond.*, : 483.

Only a single species i.e. *Zizula hylax* (Fabricius) occurs in India.

21. *Zizula hylax* (Fabricius)
(The Tiny Grass Blue)

1775. *Papilio hylax*, Fabricius, *Syst. Ent.* : 526.

1907. *Zizera gaika*, Bingham, *The Fauna of British India (Butterflies)*, 2 : 359.

1962. *Zizula hylax*, Cantlie, *The Lycaenidae portion of Brigadier Evns' The Identification of Indian Butterflies*, 1932:65.

Material examined : Maldah Dist., Bholahat, 2 exs, no date (*de Niceville coll.*). Murshidabad Dist., Raghunathganj (Char Island), 1 ex., 8.ii.1986, Lal Bagh (Katra Colony), 1 ex., 13.ii.1986, Sagardighi, Chandan Mati, 1 ex., 15.ii.1986 (*I.J. Gupta & Party coll.*).

Forewing length : 9-11 mm.

Distribution : India : West Bengal (Maldah, Murshidabad), Andamans and Nicobars, Madhya Pradesh. *Elsewhere* : Burma, Pakistan and Sri Lanka.

Remarks : This species is the smallest of all the diurnal Lepidoptera. It is a first report from West Bengal.

XVI. Genus *Zizeeria* Chapman 1910

1910. *Zizeeria* Chapman, *Trans. ent. Soc. Lond.*, : 480, 482.

There are two species viz. *Zizeeria maha* (Kollar) and *Z. knysna karsandra* (Moore) occur in India and are dealt with.

Key to the species of genus *Zizeeria*

In male, upperside of both wings light blue ad sometimes silvery blue. In female upperside of both wings brownish black, sometimes purplish at bases *maha* (Kollar)

In male, upperside of both wings violet blue. In female, upperside of both wings pale satiny brown *knysna* (Trimen)

22. *Zizeeria maha* (Kollar)
(The Pale Grass Blue)

1848. *Lycaena maha* Kollar, *In Huegel's Kaschmir*, 4 : 422.

1907. *Zizeeria maha*, Bingham, *The Fauna of British India (Butterflies)*, 2 : 355.

1962. *Zizeeria maa maha*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*. 1932, :64.

Material examined : Maldah Dist., Bholahat, 4 exs., no date (*de Niceville coll.*); Bholahat, 9 exs. (no further data). Murshidabad Dist., Jiyaganj, 1 ex., 6.ii.1986 Jangipur (Chhot Kalai), 1 ex., 10.ii.1986, Berhampur Sericulture Farm, 5 exs., 11.ii.1986 (*I.J. Gupta & party coll.*). North 24-Parganas Dist.,

3angaon, 1 ex., 15.ii.1986 (*H.C. Ghosh & party coll.*)

Forewing length : 11-13 mm.

Distribution : India : West Bengal (Maldah, Murshidabad, North 24-Parganas) Assam, Central to Northern India. *Elsewhere* : Baluchistan; Burma; Kurram; Nepal and Pakistan.

Remarks : This nominate subspecies is distinguished from *Z. maha* swinhoe by markings being always prominent on underside of wings (Vs. markings being prominent on underside of wings). Its status is very common.

23. *Zizeeria knysna karsandra* (Moore)
(The Dark Grass Blue)

1865. *Polyommatus karsandra* Moore, *Proc. zoo. Soc. Lond* : 505, no. 106, pl. 31, fig.7 (F).

1907. *Zizera lysimon*, Bingham, *The Fauna of British India (Butterflies)* 2 : 357.

1962. *Zizeeria knysna karsandra*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932, : 64.

Material examined : Calcutta, 1ex., - vii -, (*de Niceville coll.*); Calcutta, 1ex., 25.iv.1950 (*Shaukat Ali coll.*) Maldah Dist., Bholahat, 2 exs. (no further date); Bholahat, no date, (*de Niceville coll.*). Murshidabad Dist., Raghunathganj (Char Island), 1ex, 8.ii.1986, Mor Gram, Phulbari, 1 ex., 9.ii.1986, Lal Bagh (Katra colony), 1 ex., 13.ii.1986 (*I.J. Gupta & party coll.*)

Forewing length : 10-11 mm.

Distribution : India : West Bengal (Calcutta, Maldah, Murshidabad, Andamans, Arunachal Pradesh and Madhya Pradesh. *Elsewhere* : Burma; Pakistan and Sri Lanka.

Remarks : Its status is common. It is a first report from West Bengal.

XVII. Genus *Zizina* chapman 1910

1910. *Zizina* Chapman, *Trans. ent. Soc. Lond.* : 482.

Only a single species, *Zizina otis* (Fabricius) occurs in India and is reported from West Bengal.

24. *Zizina otis sangra* (Moore)
(The Lesser Grass blue)

1865. *Polyommatus sangra* Moore, *Proc. zool. Soc. Lond.* : 772, pl. 61, fig. 8,

1890. *Zizera sangra*, de Niceville, *The Butterflies of India, Burmah and Ceylon*, 3 : 1120-121.

1907. *Zizera otis*, Bingham, *The Fauna of British India (Butterflies)* 2 : 360.

1962. *Zizing otis sangra*, Cantlie, *The Lycaenidae portion of Brigadier Evans; The Identification of Indian Butterflies* 1932, : 63.

Material examined : Calcutta, 7 exs (no further data); Calcutta, 1 ex., 6.xii.1897, 3 exs., 9.xii.1879, 1 ex, - vii-, (*de Niceville coll.*); Maldah Dist., Bholahat, 1 ex., (*de Niceville coll.*); Bholahat, 3 exs. (no further data). Murshidabad Dist. Raghunathganj (Char Island), 2exs., 8.ii.1986, Amarpur, 1 ex, 8.ii.1986, Mor Gram (Phulbari), 3 exs., 9.ii.1986, Sagardighi, Chandan mati 1ex., 15.ii.1986 (*I.J. Gupta & Party coll.*).

Forewing length : 8-11 mm.

Distribution : India : West Bengal (Calcutta, Maldah, Murshidabad, Andamans & Nicobars, Assam and Sikkim. *Elsewhere* : Burma and South-east Asia.

Remarks : This subspecies differs from closely related *Zizina otis indica* Murray by its underside of wings with small spots which may be nearly obsolete (Vs. underside of wings with prominent spots). It was previously recorded from Calcutta.

XVIII Genus *Anthene* Doubleday 1847

1847. *Anthene* Doubleday, *List Spec. Lep. Ins. Brit. Mus.*, 2 : 27.

This genus is represented in India by two species, viz., *Anthene emolus* (Godart) and *A. lycaenoides* (Felder), the former is dealt with from West Bengal.

Key to the species of genus *Anthene*

Underside of forewing with a discal band continuous or broken at vein Cu1b. Underside of hindwing with a large of spot of ground colour near base of interspace 7; discal band more or less continuous. Upperside of male dark purple blue *emolus* (Godart)

Underside of forewing with a discal band broken at vein M₅. Underside of hindwing with a small and black spot near base of interspace 7; discal band broken at vein R₅. Upperside of male much paler and bluer *lycaenoides* (Felder)

25. *Anthene emolus emolus* (Godart) (The Ciliate Blue)

1823. *Polyommatus emolus* Godar, *Ency. meth.*, 9:656.

1907. *Anthene emolus*, Bingham, *The Fauna of British India (Butterflies)* 2:

1962. *Anthene emolus emolus*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932 : 66-67.

Material examined : Birbhum Dist., Gonatea, 1 ex., 20.xi.1897, (*de Niceville Coll.*); Gonatea, 2 exs (no further date). Calcutta, 2 exs., vii -, (no coll); Calcutta, 1 ex, viii -, (no coll); Calcutta, 6 exs viii 1883, (no coll). Maldah Dist., Bholahat, 7 exs., no date, (*de Niceville coll.*).

Forewing length : 12-15 mm.

Distribution : India : West Bengal (Birbhum, Calcutta, Maldah); Arunachal Pradesh, Bihar, Sikkim and South India. *Elsewhere* : Burma and Nepal.

Remarks : *Anthene emolus* (Godart) differs from its closely related species. *A. lycaenoides* Felder by having underside of hindwing with a large basal black spot in interspace 7 and discal band almost continuous (Vs. a small basal black spot in interspace 7 or at vein Rs and discal band broken at vein M1). The status of the nominate subspecies is common.

26. *Anthene lycaenoides lycambes* (Hewitson)
(The Pointed Ciliate blue)

1878. *Lycaenesthes lycambes* Hewitson, *Ill. Diurn. Lep.* : 220, no. 3, pl. 90, figs. 11,12, male.
1907. *Lycaenesthes lycaenina* Bingham, *The Fauna of British India (Butterflies)* 2:375.
1962. *Anthene lycambes lycambes*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification Butterflies*, 1932 : 67.

Material examined : Birbhum Dist., Gonatea, 1 ex., (No further data). Calcutta, 2 exs., 14.vii.1879 (*de Niceville coll.*). Darjiling Dist., Buxa, 5 exs (no further data). Maldah Dist, Bholahat, 4 exs., no date, (*de Niceville coll.*). Murshidabad Dist., no date, (*de Niceville*), Murshidabad Dist., Lal Bagh (Katra Colony), 1 ex, 13.ii.1986. (*I.J. Gupta coll.*). North 24-Parganas Dist., Barrackpore, 1ex., 17.vi.1883 (*de Niceville coll.*).

Forewing length : 12-14 mm.

Distribution : India : West Bengal (Birbhum, Calcutta, Darjiling, Maldah, Murshidabad, North-24 Parganas); Andamans, Assam, Sikkim. *Elsewhere* : Burma.

Remarks : This subspecies is earlier known from West Bengal. Cantlie(1963) referred to its status not rare.

XIX Genus *Catochrysops* Boisduval 1832

1832. *Catochrysops* Boisduval, In d'Urville, *Voy. 'Astrolabe', Ent. 1 (Lep)* : 87.

There are two species, viz. *Catochrysops strabo* (Fabricius) and *C. panormus* Elwes, of this genus known from India and former is found in West Bengal.

27. *Catochrysops strabo strabo* (Fabricius)
(The Forget Me Not)

1793. *Hesperia strabo* Fabricius, *Ent. Syst.* 3 : 287.
1907. *Catochrysops strabo*, Eingham, *The Fauna of British India (Butterflies)*; 2 : 411.
1962. *Catochrysops strabo strabo*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932, : 67.

Material examined : Calcutta, 1ex., 7.xii.1879, 1 ex., 25.i.1880 (*de Niceville coll.*); Calcutta, 2 exs.

(no further data), Calcutta, Basdhari, 1 ex., 24.xi.1955 (*Shaukat Ali coll.*); Calcutta, Bansdroni, 1 ex., 19.i.1961 (*A. P. Kapur coll.*) Maldah Dist. Bholahat, 4 exs., (*de Niceville coll.*), Bholahat, exs. (no further data). Murshidabad Dist., Azimganj, 2 exs., 5.ii.1986, Raghunathganj (Potapur colony), 3 exs., 7.ii.1986, Raghunathganj, 2exs., 8.ii.1986, Raghunathganj (Char Island) 8 exs., 8.ii.1986, Mor Gram (Phulbari), 1 ex., 9.ii.1986, Lal Bagh (katra colony), 1 ex., 13.ii.1986, Sagardighi, 1 ex., 14.xi.1986 (*I.J. Gupta & Party coll.*). North 24-Parganas Dist., Bagaon, 2 exs., 15.ii.1966 (*H.C. Ghosh & Party coll.*).

Forewing length : 14-16 mm.

Distribution : India : West Bengal , (Calcutta, Maldah, Murshidabad, North 24-Parganas); Bihar, Madhya Pradesh, Maharashtra and South India. *Elsewhere* : Burma.

Remarks : *Catochrysops strabo* (Fabricius) is distinguished from *C. panormus* (Felder) by a spot on costa being midway between spot end cell and the discal band on the underside of forewing (Vs. spot on costa adjoining the upper end of discal band). It is previously known from West Bengal. Its status is common.

XX. Genus *Lampides* Huebner

1889. *Lampides* Huebner, *Verz. bekannt. Schmett.* (5) : 70.

Only a single species *Lampides boeticus* (Linnaeus) of this genus occur in India.

28. *Lampides boeticus* (Linnaeus) (The Pea Blue)

1767. *Papilio boeticus* Linnaeus, *Syst. Nat.* (ed.12) : 78.

1907. *Polyommatus boeticus*, Bingham, *The Fauna of British India (Butterflies)*, 2 : 432.

1962. *Lampides boeticus*, Cantlie, *The Ly caenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932:69.

Material examined : Calcutta, 1 ex., 1.ii.1880 (*de Niceville coll.*), Maldah Dist., Bholahat, 3 exs., no date, (*de Niceville coll.*); Bholahat, 4 exs. (no further data). Murshidabad Dist., Azimganj, 3 exs., 5.ii.1986, Jiyaganj (Raichandpur), 2 exs., 6.ii.1986, Raghunathganj (Potapur colony), 2 exs., 7.ii.1986, Char Island, 6 exs., 8.ii.1986, Amarpur, 1 ex., 8.ii.1986, Jangipur (Mohamapur), 1 ex., 10.ii.1986, Dhanpatnagar, 1 ex., 12.ii.1986 (*I.J. Gupta & party coll.*) South 24-Parganas Dist., Budge Budge, 1 ex., 19.i.1966 (*D.K. Mandal H.Ch. Ghosh & H.L. Paul coll.*); Subhas Gram, 1 ex., 29.x.1965 (*S.C. Mitra & party coll.*).

Forewing length : 14-18 mm.

Distribution : India : West Bengal (Calcutta, Maldah, Murshidabad, South 24-Parganas) Andamans and Nicobars, Arunachal Pradesh, Madhya Pradesh, North-east India, Uttar Pradesh; widely distributed in India. *Elsewhere* : Nepal, Pakistan and Sri Lanka.

Remarks : The wide distribution of this species is attributed to its wide choice of food plants all leguminous. Wynter-blyth (1957) referred to its status as very common whereas Cantlie (1962) mentioned

its status common in India, Pakistan and Sri Lanka, 'rare' in Andamans and Nicobars. It has now been listed in Schedule-II (Part-2) of the Wild Life (Protection) Act.

XXI Genus *Jamides* Huebner 1819

1819. *Jamides* Huebner, *Verz. bekannt. Schmett.*, (5) : 71.

This genus is represented in India by eight species of which four occur in West Bengal.

Key to the species of genus *Jamides*

1. Underside of forewing with third white line from base not continuous from costa to dorsum *alecto* (Felder) 0
 Underside of forewing with third white line from base continuous from costa to dorsum 2
2. Underside of forewing with white line bent apically *bochus* (Cramer)
 Underside of forewing with white line straight 3
3. In male, upperside of forewing with a narrow thread like border and not widened at apex. Female sky-blue with black border and markings *pura* (Moore)
 In male, upperside of forewing with a narrow thread like border at tornus gradually widening at apex or the border may be wider. Female dull blue with dull brownish black border and markings *celeno* (Cramer)

29. *Jamides alecto alocina* Swinhoe (The Metallic Cerulean)

1915. *Jamides alecto alocina* Swinhoe,
 1957. *Jamides alecto*, Wynter-Blyth, *The Ann. Mar. Nat. Hist.*, 16 171-185 *Butterflies of The Indian Region*, : 293.
 1962. *Jamides alecto alocina*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932:72.

Material examined : Calcutta, 1 ex, 1.i.1880, 1 ex., 1.ii.1880 (*de Niceville coll.*); Calcutta, 4 exs. (no further data). Maldah Dist., Bholahat, 2 exs., no date, (*de Niceville coll.*); Bholahat, 1 ex, (no further data).

Forewing length : 16-18 mm.

Distribution : India : West Bengal (Calcutta, Maldah); Sikkim and South India; *Elsewhere* : Burma and Nepal.

Remarks : This subspecies differs from other two subspecies *J. Alecto fusca* Evans occurring in Andamans and *J. alecto kondulana* (Felder) found in Central and south Nicobars by the absence of

postdiscal markings on the upperside of hindwing (vs. presence of postdiscal markings on upperside of hindwing). Cantlie (1962) referred to its status common. It is a first report from West Bengal.

30. *Jamides bochus bochus* (Cramer)
(The Dark Cerulean)

1782. *Papilio bochus* Cramer, *Pap. exot.* 4 : 210, pl. 391, figs. C,D

1907. *Lampides bochus*, Bingham, *The Fauna of British India (Butterflies)*, 2 : 398.

1962. *Jamides bochus bochus*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932 : 70.

Material examined ; Birbhum Dist., Gonatea, 1 ex., 29.xi.1879(*de Niceville coll*); Calcutta, 1 ex., 31.i.1880, 1ex, 22.ii.1880, 1 ex., - iii - (*de Niceville coll*); Calcutta, 5 exs; (no further data). Maldah Dist., Bholahat, 1 ex., no date, (*de Niceville coll.*); Bholahat, 2 exs., (no further data).

Forewing length : 14-16 mm.

Distribution : India : West Bengal (Birbhum, Calcutta, Maldah); Andamans; Arunachal Pradesh; Assam. *Elsewhere* : Burma, Nepal, Pakistan and Sri Lanka.

Remarks : This nominate subspecies differs from *Jamides bochus nicobaricus* Wood-Mason & de Niceville (occurring in Nicobars) by the costa being black on upperside of forewing in male (vs. costa blue at least at base). The nominate subspecies is previously known from Calcutta. Its status is common.

31. **Jamides pura pura* (Moore)
(The White Cerulean)

1886. *Lampides pura* Moore, *Journ. Linn. Soc. Zool.* 21 : 41.

1956. *Jamides cleodus pura*, Roonwal & Avinash Chandra, *Indian Forest Leaflet*, 10 : 121 4) : 357.

1957. *Jamides cleodus*, Wynter-blyth, *The Butterflies of the Indian Region*, : 292.

1962. *Jamides pura pura*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies* : 70.

Material examined : Nil.

Wing expanse : 27-38 mm.

Distribution : India : West Bengal (Darjiling); Assam and Meghalaya. *Elsewhere* ; Burma.

Remarks : The status of this nominate subspecies is rare. It should be included in Schedule-I of the Wild Life (Protection) Act. Roonwal & Avinash Chandra (1956) referred to its occurrence in Darjiling.

32. *Jamides celeno aelianus* (Fabricius)
(The Common Cerulean)

1793. *Hesperia aelianus* Fabricius, *Ent. Syst.* 3 (1) : 280, No. 79.
 1869. *Lampides aelianus*, Butler, *Cat. Fabr. Lep* : 166, No. 16.
 1907. *Lampides celeno*, Bingham, *The Fauna of British India (Butterflies)*, 2:404.
 1962. *Jamides celeno aelianus*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian butterflies*, 1932:71.

Material examined : Birbhum Dist., Gonatea, 1 ex., 29.xi.1879, (*de Niceville coll.*). Calcutta, 1 ex., vi. 1 ex, - xii 1 ex., 21.xii. 1879, 2 exs., 25.xii.1879, 1 ex, vi 1 ex, vii -, 1 ex (bred), 19.viii. 1886 (*de Niceville coll.*); 2 exs, no. date , (*de Niceville coll.*); 1 ex (no further data). Maldah dist., Bholahat, 1 ex, (no further data).

Forewing length : 15-18 mm.

Distribution : India : West Bengal (Birbhum, Calcutta, Maldah); Assam, Madhya Pradesh.
Elsewhere : Burma and Pakistan.

Remarks : This subspecies differs from other subspecies occurring in India by upperside of wings being whiter and upperside of hindwing without submarginal spots. It is earlier known from Calcutta. Its status is common.

XXII Genus *Nacaduba* Moore 1881

1881. *Nacaduba* Moore, *Lep. Ceylon*, 1(3) : 88.

There are 14 species of this genus known from India of which four occur in West Bengal.

Key to the species of genus *Nacaduba*

1. Underside of forewing and hindwing with spaces between discal lines not darker than the ground colour 2

Underside of forewing and hindwing with spaces between discal lines darker than the ground colour 3

2. In male upperside of wings shining violet blue, markings from below clearly showing above, discal area not clothed with specialized hair like scales. In female, bases of wings normally shining pale blue and discal area white; underside of wings with markings regular and prominent
 *kurava* (Moore)

In male upperside of wings darker violet blue, opaque, discal area covered with white hairs. In female, bases of wings purple blue, discal area not white; underside of wings with markings duller and more irregular *beroe* Felder

3. Hindwing tailed *nora* Felder
 Hindwing not tailed *dubiosa* (Semper)

33. *Nacaduba kurava euploea* Fruhstorfer
 (The Transparent Six-Line Blue)

1916. *Nacaduba euploea* Fruhstorfer, *Zool. meed.* Leiden 2 : 132.
 1962. *Nacaduba kurava euploea*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932, : 78.

Material examined : Darjeeling Dist; 3 exs, (no further data). Maldah Dist., Bholahat, 2 exs, (no further data); Bholahat, 2 exs., not date (de Niceville coll.).

Forewing length : 13-15 mm.

Distribution : India : West Bengal (Darjiling, Maldah); Andamans; Assam; Car and Central Nicobars; Sikkim. *Elsewhere* : Burma and Nepal.

Remarks : This subspecies is a first record from West Bengal. Its status is not rare.

34. *Nacaduba bereo gythion* (Fruhstorfer)
 (The Opaque Six Line Blue)

1916. *Nacaduba atrata gythion* Fruhstorfer, *Zool. Meded. Leiden*, 2 : 131.
 1962. *Nacaduba bereo gythion*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932 : 79.

Material examined : Darjiling Dist., Buxa, 1ex., (no further data).

Forewing length : 15 mm.

Distribution : India : West Bengal (Darjiling), Arunachal Pradesh, Sikkim. *Elsewhere* : Burma.

Remarks : This subspecies is a first report from West Bengal. Its status is not rare.

35. *Nacaduba nora nora* (Felder)
 (The Common Line blue)

1860. *Lycaena nora* Felder, *Sitz. Ak. Wiss, Math. Nat. cl.*, 40:458, no. 37.
 1907. *Nacaduba ardates*, Bingham, *The Fauna of British India (Butterflies)*, 2 : 391.
 1962. *Nacaduba nora nora*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932 : 80.

Material examined : Maldah Dist., Bholahat, 1ex., no date, (de Niceville coll.); Bholahat, 1ex, (No further data).

Forewing length : 9-11 mm.

Distribution : India : West Bengal (Maldah); Arunachal Pradesh, Maharashtra, Meghalaya, Orissa, Sikkim, South India, Uttar Pradesh. *Elsewhere* : Burma, Pakistan and Sri Lanka.

Remarks : This nominate subspecies is earlier known from West Bengal. Cantlie (1962) referred to its status as common.

36. *Nacaduba dubiosa indica* Evans
(The Tailless Line blue)

1925. *Nacaduba dubiosa indica* Evans, *J. Bombay nat. Hist. Soc.*, **30** : 613.

1962. *Nacaduba dubiosa indica*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932, : 81.

Material examined : Calcutta, 1 ex., - iv - 1882 (*de Niceville coll.*), Calcutta, 1 ex, (No further data). Darjiling, 1 ex., (no further data). Maldah Dist., Bholahat, 3 exs, (no date), (*de Niceville coll.*), Bholahat, 1 ex, (no further data).

Forewing length : 9-11 mm.

Distribution : India : West Bengal (Calcutta, Darjiling, Maldah); Andamans. *Elsewhere* : Burma; Nepal, Pakistan and Sri Lanka.

Remarks : This subspecies is a first report from West Bengal. Its status is common.

XXIII Genus *Petrelaea* Toxopeus 1929

1929. *Petrelaea* Toxopeus, *Tijdschr. Ent.*, **72** : 242.

Only a single species i.e. *Petrelaea dana* (*de Niceville*) occurring India is dealt with from West Bengal.

37. *Petrelaea dana* (de Nicéville)
(The Dingy Line Blue)

1883. *Nacaduba dana* de Nicéville, *J. Asiat. Soc. Bengal*, **52**(2):73, pl.1, fig.15.

1907. *Nacaduba dana*, Bingham, *The Fauna of British India (Butterflies)*, **2** : 386.

1962. *Petrelaea dana*, Cantlie, *The Lycaenide portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932 : 82.

Material examined : Maldah Dist., Bholahat, 1 ex, no data, (*de Nicéville coll.*).

Forewing length : 11 mm.

Distribution : India : West Bengal (Maldah); Andamans, Arunachal Pradesh, Sikkim, Uttar

Pradesh. *Elsewhere* : Burma, Bhutan and Sri Lanka.

Remarks : The species exhibits variation in the shade of the ground colour. This species is previously known from Maldah. Its status is 'not common'

Subfamily THECLINAE

There are 57 genera of this subfamily occurring in India. Of these 57, 23 genera are represented in West Bengal.

Key to the genera of subfamily THECLINAE

1. In forewing vein R_5 ending at termen just below the apex *Curetis* Huebner
 In forewing vein R_5 ending at or before apex (except in tailed females of *Amblypodia* and *Jacoona*)
 2
2. Labial palpi hairy *Chrysozephyrus* Shiroz & Yamamoto
 Labial palpi smooth 3
3. Eyes Smooth 4
 Eyes densely hairy 20
4. In forewing veins M_2 and M_1 approximate or from a point 5
 In forewing veins M_2 and M_1 separate (except some species of genus (*Tajuria*) 9
5. Hindwing with a lobe and tail at vein $1A + 2A$ 6
 Hindwing without tail at vein $1A + 2A$ but with a lobe at tornus and tail at vein Cu_{1b} 7
6. In forewing veins M_2 and M_1 from a point *Iraota* Moore
 In forewing veins M_2 and M_1 approximate but not from a point *Amblypodia* Horsfield
7. Hindwing with costa concave; tail spatulate *Mahathala* Moore
 Hindwing with costa usually arched; tail, if present, not spatulate 8
8. Underside of forewing with annular spots in cell *Narathura* Moore
 Underside of forewing without annular spots in cell but a prominent pale quadrate spot usually present near the end of cell *Flos* Doherty

9. Hindwing without a tail at vein 1A + 2A 10
 Hindwing with a tail at vein 1A + 2A 11
10. Hindwing not produced at vein Cu_{1b} or tornus; tail comparatively short *Surendra* Moore
 Hindwing produced at vein Cu_{1b} , tail long *Loxura* Horsfield
11. In forewing veins M_1 and R_5 forked or from a point 12
 In forewing veins M_1 and R_5 separate at origin 14
12. In forewing veins R_4 and R_3 present in male but vein R4 absent in female *Zesius* Huebner
 In forewing, in both sexes, vein R_4 absent but vein R_3 present 13
13. Hindwing with ill developed lobe, tails at vein Cu_{1b} as long as at vein 1A + 2A . *Apharitis* Riley
 Hindwing with a prominent lobe; tail at vein 1A + 2A and Cu_{1b} nearly equal
 *Spindasis* Huebner
14. Hindwing with tails at veins 1A + 2A and Cu_{1b} approximately equal. Upperside of female more or
 less blue and no white subtornal area on hindwing 14
 Hindwing with tails at veins 1A + 2A and Cu_{1b} unequal
 Upperside of female never blue and usually with a white subtornal area on hindwing 16
15. In male upperside of hindwing with a brand at or near origin of vein R_5 *Pratapa* Moore
 In male upperside of hindwing without a brand *Tajuria* Moore
16. Hindwing with a tail at vein 1A + 2A longer than tail at vein Cu_{1b} 17
 Hindwing with a tail at vein 1A + 2A shorter than tail at vein Cu_{1b} 18
17. Male without secondary sexual characters *Charana* Moore
 Male with secondary sexual characters *Jacoona* Distant
18. In forewing vein R_3 present *Ticherra* De Niceville
 In forewing veins R_4 and R_3 absent 19

19. Hindwing sharply angled and produced at vein M_3 *Rathinda* Moore
 Hindwing faintly angled at vein M_3 *Horaga* Moore
20. In forewing veins R_4 and R_3 absent. Hindwing with tails at vein $1A + 2A$ and Cu_{1b} , former being longer and lobed 21
 In forewing vein R_4 absent but R_3 present. Hindwing without a tail at vein Cu_{1b} but prominent 22
21. Antennae with club flattened and somewhat spatulate *Chliaria* Moore
 Antennae cylindrical and as usual *Hypolycaena* Felder
22. Male without secondary sexual characters *Deudorix* Hewitson
 Male with usually a tuft at mid dorsum on underside of hindwing; on underside of hindwing a brand present about at base of interspace 7 23
23. In forewing veins M_1 and R_5 from a point, lower discocellular vein concave, veins R_1 and Sc separate *Virachola* Moore
 In forewing veins M_1 and R_5 separate at origin, lower discocellular vein straight, veins R_1 and Sc approximated *Rapala* Moore

XXIV Genus *Chrysozephyrus* Shirozu and Yamamoto 1956

1956. *Chrysozephyrus* Shirozu and Yamamoto, 1 (14) : 381.

This genus is represented in India by 19 species of which three are found in West Bengal.

Key to the species of genus *Chrysozephyrus*

1. In male upperside of both wings with very deep green colouration *zoa* (de Niceville)
 In male upperside of both wings with lighter green colouration and of a more brassy hue 2
2. In male discal band on hindwing including dark line defining the disco-cellular veins. In female, upperside dark brown, forewing with discal orange spots but no blue towards base
 *duma* (Hewitson)
- In male discal band on underside of hindwing quite distinct from dark line defining discocellular veins. In female, upperside, forewing shining blue on disc and base *assamicus* Tytler

38. * *Chrysozephyrus zoa* (de Niceville)
(The Powdered Green Hairstreak)

1889. *Zephyrus zoa* de Niceville *J. Bombay nat. Hist. Soc.*, 4 : no. 6, pl. A, fig. 3 male.
1932. *Thecla zoa*, Evans, *The Identification of Indian Butterflies*, : 250.
1962. *Chrysozephyrus zoa*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932, : 95.

Material examined : Nil.

Forewing length : 22 mm.

Distribution : India : West Bengal (Darjiling); Manipur and Sikkim.

Remarks : This species is earlier known from Darjiling. Its status is rare. It has also been listed in Schedule-II (part-2) of the Wild Life (Protection) Act.

39. **Chrysozephyrus duma* (Hewitson)
(The Metallic Green Hairstreak)

1869. *Dipsas duma* Hewitson, *III. diurn. Lep. Suppl.*, : 15, no. 14, pl. 6 suppl. fig. 15 male.
1890. *Zephyrus duma*, de Niceville, *The Butterflies of India, Burmah and Ceylon*, 3 : 304.
1932. *Thecla duma*, Evans, *The Identification of Indian Butterflies*, : 250.
1962. *Chrysozephyrus duma*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932:96.

Material examined : Nil.

Forewing length : 22.5 mm.

Distribution : India : West Bengal (Darjiling); Manipur, Nagaland, North India, Sikkim. *Elsewhere* : Bangladesh and Bhutan.

Remarks : Cantlie (1932) referred to its occurrence in Darjeeling. Its status is 'not rare'

40. * *Chrysozephyrus assamicus* (Tytler)
(The Assam Hairstreak)

1915. *Zephyrus assamica* Tytler, *J. Bombay nat. Hist. Soc.* 24 (1) : 130.
1932. *Thecla syla assamica*, Evans, *The Identification of Indian Butterflies*, : 251.
1962. *Chrysozephyrus assamicus*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932:99.

Material examined : Nil.

Forewing length : 18-19 mm.

Distribution : India : West Bengal (Darjiling), Manipur, Nagaland, Sikkim. *Elsewhere* : Bhutan and Nepal.

Remarks : This species is earlier known from Darjiling. The new common name 'The Assam Hairstreak' has been assigned to this species as its taxonomic status has been raised from subspecies. Its status is rare.

XXV Genus *Curetis* Huebner 1816

1816. *Curetis* Huebner, *Verz. bekkant. Schmett* (7) : 102.

There are four species of this genus occurring in India of which two viz., *Curetis thetis* (Drury) and *C. dentata* Moore are found in West Bengal.

Key to the species of genus *Curetis*

Underside of forewing with discal and subterminal markings or bands parallel and not anteriorly convergent *thetis* (Drury)

Underside of forewing with discal and subterminal markings or bands anteriorly convergent
..... *dentata* Moore

41. *Curetis thetis thetis* (Drury) (The Indian Sunbeam)

1773. *Papilio thetis* Drury, *III. Exot. Ent.*, 2 : 16, pl. 9, figs, 3,4, female.

1907. *Curetis thetis*, Bingham, *The Fauna of British India, Butterflies*, 2 : 437.

1962. *Curetis thetis thetis*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932, : 101.

Material examined : Calcutta, 1 ex, (bred), (no further date); Calcutta, 10 exs (no further data); Calcutta, 1 ex (bred), vii -, (no coll); Calcutta, 1 ex., - vii 1886, (no coll); Calcutta, 1 ex., - vi-(no coll). Maldah Dist., Bohlahat, 11 exs., (no further data). North 24-Parganas Dist., Barrackpore, 1 ex, 14.iv.1886, 2 exs, 11.vii.1886, 2 exs. 16.vii.1886 (no coll).

Forewing length : 18-21 mm.

Distribution : India : West Bengal (Calcutta, Maldah, North 24-Parganas); Maharashtra; Orissa to South India. *Elsewhere* : Sri Lanka.

Remarks : This nominate subspecies is earlier known from West Bengal. Its status is 'not rare'

42. *Curetis dentata dentata* Moore (The Toothed Sunbeam)

1879. *Curetis dentata* Moore, *Proc. zool. Soc. Lond.*, : 137-139.

1932. *Curetis acuta dentata*, Evans, *The Identification of Indian Butterflies*, : 254.

1962. *Curetis dentata dentata*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932, :104.

Material examined : Darjiling Dist, Buxa, 1 ex., (no further data); Rangpo, alt. 400 m., 1 ex., 25.xii.1975 (G.K. Srivastava, G.S. Arora & party coll.).

Forewing length : 20-22 mm.

Distribution : India : West Bengal (Darjiling); Arunachal Pradesh; Assam; Himachal Pradesh; Madhya Pradesh; Sikkim, South India; Uttar Pradesh. *Elsewhere* : Burma and Nepal.

Remarks : This nominate subspecies is a first report from West Bengal. Cantlie (1962) mentioned its status 'common'

XXVI Genus *Iraota* Moore 1881

1881. *Iraota* Moore, *Lep. Ceylon*, 1(3) : 101.

Two species namely *Iraota timoleon* (Stoll) ad *I. rochana* (Horsfield) occur in India; the former is dealt with from West Bengal.

43. *Iraota timoleon timoleon* (Stoll) (The Silverstreak Blue)

1790. *Papilio timoleon* Stoll, *Suppl. Cramer, Pap. exot.* 5 : pl. 32, figs. 4, 4D, female.

1890. *Iraota timoleon*, de Niceville, *The Butterflies of India, Burmah and Ceylon*, 3 : 215.

1962. *Iraota timoleon timoleaeo*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932, : 105.

Material examined : Calcutta, 3 exs, (no further data); Calcutta, 1 ex., 7.xii.1879 (de Niceville coll); Calcutta, 2 exs., no date, 1 1ex. 2.xi.1907, 1 ex., 17.xi.1909 (Ind Mus. Colln.).

Forewing length : 16-20 mm.

Distribution : India : West Bengal (Calcutta, Jalpaiguri), Andamans, Orissa, Sikkim. Uttar Pradesh. *Elsewhere* : Burma.

Remarks : This nominate subspecies is previously known from Jalpaiguri. Its status is 'not rare.'

XXVII Genus *Amblypodia* Horsfield 1829

1829. *Amblypodia* Horsfield, *Descr. Cat. Lepid. Ins. Mus. East India Coy* (2) : 98.

This genus is represented in India by a single species i.e. *Amblypodia anita* (Fruhstorfer).

44. *Amblypodia anita dina* (Fruhstorfer)
(The Purple Leaf Blue)

1907. *Horsefieldia dina* Fruhstorfer, *I. Ent. Zeitschr*, **21** : 150.
1932. *Horsefieldia anita dina*, Evans, *The Identification of Indian Butterflies*, : 255.
1962. *Amblypodia anita dina*, Cantlie, *The Lycaenidae portion of Brigadier Evans, The Identification of Indian Butterflies*, 1932:106.

Material examined : Birbhum Dist., Gonatea, ex., 29.i.1979, (*de Niceville coll*); Gonatea, 4 exs. (no further data). Calcutta, 1 ex., 27.v.1880 (no coll.) Maldah Dist., Bholahat, 1 ex., no date, (*de Niceville coll.*).

Forewing length : 18-27 mm.

Distribution : India : West Bengal (Birbhum, Calcutta, Maldah); Assam; Bihar; Maharashtra; Orissa; Sikkim; South India.

Remarks : This subspecies is earlier known from West Bengal, Cantlie (1962) referred to its status 'not rare'

XXVIII Genus *Mahathala* Moore 1878

1878. *Mahathala* Moore, *Proc. zool. Soc. Lond.*, : 702.

Only a single species i.e. *Mahathala ameria* (Hewitson) occurring in India is dealt with from West Bengal.

45. *Mahathala ameria ameria* (Hewitson)
(The Falcate Oakblue)

1832. *Amblypodia ameria hewitson*, *Cat. Lycaenidae Brit. Mus.* : 14, no. 64, pl.8, figs 85, 86, female.
1890. *Mahathala ameria*, de Niceville, *The butterflies of India, Burmah and Ceylon*, **3** : 283.
1962. *Mahathala ameria ameria*, Hewitson, *The Lycaenidae portion of Brigadier Evans' The Identification of India, Butterflies*, 1932, : 107.

Material examined : Birbhum Dist., Gonatea, 1 ex., (no further data), Calcutta, 3 exs. (no further data).

Forewing length : 19-21 mm.

Distribution : India : WestBengal (Birbhum, Calcutta, North 24-Parganas). *Elsewhere* : East Pakistan and Siam.

Remarks : This nominate subspecies is distinguished from *M. ameria kingana* Talbot by the upperside, in male, having dark border 3 mm wide at vein Cu_{1b} (Vs. dark border 1-1.5 mm or less at vein 3). It is earlier known from West Bengal. Its status is not rare. It has been included in Schedule II (part-2) of the Wild Life (Protection) Act.

XXIX Genus *Narathura* Moore 1878

1878. *Narathura* Moore, *Proc. zool. Soc. Lond.* : 835.

This genus includes 18 species from India of which five occur in West Bengal.

Key to the species of genus *Narathura*

1. In male, upperside of both wings light blue *camdeo* (Moore)
 In male, upperside of both wings dark blue or purple 2
2. In both sexes, wing expanse upto 50 mm or less *atrax* (Hewitson)
 In both sexes, wing expanse 50 mm or more 3
3. In both sexes, hindwing without any anal lobe *centaurus* (Fabricius)
 In both sexes, hindwing with an anal lobe 4
4. In both sexes, underside of forewing with a costal spot just beyond the middle
 *silhetensis* (Hewitson)
 In both sexes, underside of forewing without a costal spot just beyond the middle
 *amantes* (Hewitson)

46. *Narathura camdeo camdeo* (Moore)
 (The Lilac Oakblue)

1857. *Amblypodia camdeo* Moore, *Horsfield and Moore, Cat. Lep. Mus. East India Coy*, 1 : 41, No.58, pl. 1a, fig.6, female.

1890. *Arhopala camdeo*, de Niceville, *The Butterflies of India, Burmah and Ceylon*, 3 : 257.

1932. *Amblypodia camdeo camdeo*, Evans, *The Identification of Indian Butterflies* : 257.

1957. *Narathura camdeo camdeo*, Evans, *Bull. Brit. Mus. nat. Hist.* 5 (3) : 91.

Material examined : Jalpaiguri, 5 exs. (no date), (de Niceville Coll.)

Forewing length : 23-27 mm.

Distribution : India : West Bengal (Jalpaiguri); Sikkim to Assam. *Elsewhere* : Bangladesh and Bhutan.

Remarks : The nominate subspecies is previously known from Jalpaiguri. Evans (1932) mentioned its status 'rare' It has been listed in Schedule-II (Part-2) of the Wild Life (Protection) Act.

47. *Narathura atrax* (Hewitson)
(The Indian Oakblue)

1862. *Amblypodia atrax* Hewitson, *Cat. Lycaenidae Brit. Mus.* : 13, no. 58, pl.7, figs.80, 82 female.
1890. *Arhopala atrax*, de Niceville, *The Butterflies of India, Burma and Ceylon*, 3 : 246.
1932. *Amblypodia atrax*, Evans, *The Identification of Indian Butterflies* :
1957. *Narathura atrax*, Evans, *Bull. Bri. Mus. nat. Hist.* 5 (3) : 105.

Material examined : Darjiling Dist., Buxa, 1 ex., (no further data). Jalpaiguri, 1 ex. (no further data).

Forewing length : 18-19 mm.

Distribution : India : West Bengal (Calcutta, Darjiling, Jalpaiguri, Maldah, North 24-Parganas). Bihar, Madhya Pradesh, Orissa; South India; Uttar Pradesh. *Elsewhere* : Bhutan and Burma

Remarks : This species is previously known from West Bengal. Its status is 'not rare'.

48. *Narathura centaurus pirithous* (Moore)
(The Centaur Oakblue)

1883. *Nilasera pirithous* Moore, *Proc. zool. Soc. Lond.*, : 531.
1890. *Arhopala centaurus*, de Niceville, *The Butterflies of India, Burmah and Ceylon*, 3 : 234.
1932. *Amblypodia centaurus pirithous*, Evans, *The Identification of Indian Butterflies*, : 263.
1956. *Amblypodia centaurus centaurus*, Roonwal and Avinash Chandra, *Indian Forest Leaflet* 121 (4) : 368.
1957. *Narathura centaurus pirithous*, Evans, *Bull. Brit. Mus. nat. Hist.*, 5 (3).

Material examined : Darjiling Dist., Sukna, 1 ex., 15.ii.1974 (*H. K. Bhowmik & Party Coll.*); Darjiling, Teesta, Alt. 214 m., 1 ex., 24.v.1974 (*M. S. Shishodia & party Coll.*); Darjiling, Rangpo, Andherikhola Stream, 3 exs., 15.v.1987 (*Raja Ram & Party Coll.*).

Forewing length : 24-26 mm.

Distribution : India : West Bengal (Darjiling); Assam, Uttar Pradesh.

Remarks : Roonwal and Avinash Chandra (1956) also mentioned its occurrence in darjiling. Its status is not rare.

49. * *Narathura silhetensis silhetensis* (Hewitson)
(The Sylhet Oakblue)

1862. *Amblypodia silhetensis* Hewitson, *Cat. Lycaenidae Brit. Mus.*, : 7, no.31, pl.4, figs. 27, 28, male.
1890. *Arhopala silhetensis*, de Niceville, *The Butterflies of India, Burma and Ceylon*, 3 : 237.
1932. *Amblypodia silhetensis silhetensis*, Evans, *The Identification of Indian Butterflies*, : 260.
1957. *Narathura silhetensis*, Evans, *Bull. Brit. Mus. nat. Hist.*, 5 (3) : 102.

Material examined : Nil.

Wing expanse : 50 - 56 mm.

Distribution : India : West Bengal (Jalpaiguri); Assam; Sikkim. *Elsewhere* : Bangladesh and Burma.

Remarks : The nominate subspecies was earlier known from Jalpaiguri. Its status is 'rare'

50. *Narathura amantes amantes* (Hewitson)
(The Large Oakblue)

1862. *Amblypodia amantes* Hewitson, *Cat. Lycaenidae Brit. Mus.* : 4, no.17, pl.2, figs. 2, 3 male, 1 female.

1890. *Arhopala amantes*, de Niceville, *The Butterflies of India, Burma and Ceylon*, 3 : 239.

1932. *Amblypodia amantes amantes*, Evans, *The Identification of Indian Butterflies* : 264.

1957. *Narathura amantes amantes*, Evans, *Bull. Brit. Mus. nat. Hist.* 5 (3) : 110.

Material examined : Jalpaiguri, 2 exs., no date, (de Niceville Coll.).

Forewing length : 25-27 mm.

Distribution : India : West Bengal (Calcutta, Jalpaiguri), Andamans, Maharashtra, Sikkim, South India, Uttar Pradesh. *Elsewhere* : Sri Lanka.

Remarks : This nominate subspecies is earlier known from Calcutta. Its status is 'not rare'

XXX Genus *Flos* De Niceville 1889

1889. *Flos* Doherty, *J. Asiat. Soc. Bengal*, Part 2, 58(4) : 412.

This genus is represented in India by eight species of which one i.e. *Flos fulgida* (Hewitson) occurs in West Bengal.

51. **Flos fulgida* (Hewitson)
(The Shining Pushblue)

1853. *Amblypodia fulgida* Hewitson, *Ill. Diurn. Lep. Lycaenidae*, : 11, no. 49, pl. 5, fig. 31, female.

1932. *Amblypodia fulgida*, Evans, *The Identification of Indian Butterflies* : 271.

1956. *Amblypodia fulgida*, Roonwal and Avinash Chandra, *Indian Forest Leaflet*, 121 (4) : 369.

1957. *Flos fulgida*, Evans, *Bull. Brit. Mus. nat. Hist.*, 5(3) : 131.

Material examined : Nil.

Wing expanse : 36-46 mm.

Distribution : India : West Bengal (Darjiling); Meghalaya, North India, Sikkim. *Elsewhere* : Burma.

Remarks : Previously this species was reported from Darjiling by Roonwal and Avinash Chandra (1956). Evans (1932) mentioned its status 'not rare'

XXXI Genus *Surendra* Moore 1879

1878-1879 *Srendra* Moore, *Proc. zool. Soc. Lond.*, (4) : 835.

Of the two species viz., *Surendrz vivarna* Horsfield and *S. todara* Moore occurring in India, the former is treated from West Bengal.

52. *Surendra vivarna quercetorum* (Moore)
(The Common Acacia Blue)

1857. *Amblypodia quercetorum* Moore, In Horsfield and Moore, *Cat. Lep. Ins. Mus. East India Coy*, 1 : 42, no. 63, pl. 1a, fig. 7, male.
1890. *Surendra quercetorum*, de Niceville, *The Butterflies of India Burmah and Ceylon*, 3 : 320.
1962. *Surendra vivarna quercetorum*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932 : 109.

Material examined : Darjiling, 1 ex., (no further date).

Forewing length : 19 mm.

Distribution : India : West Bengal (Darjiling); Arunachal Pradesh, Himachal Pradesh. *Elsewhere* ; Bangladesh and Burma.

Remarks : Cantlie (1962) mentioned its status 'common' This subspecies is a first report from West Bengal.

XXXII Genus *Loxura* Horsfield 1829

1829. *Loxura* Horsfield, *Decr. Cat. Lep. Ins. Mus. East India Coy*, (2) : 119.

This genus is represented in India by a single species *Loxura atymnus* (Cramer) which is dealt with here.

53. *Loxura atymnus continentalis* Frushstorfer
(The Yamfly)

1911. *Loxura atymnus continentalls* Fruhstorfer, *Berl. Ent. Ztschr.*, 65: 221.

Material examined : Calcutta, 3 exs., vii -, (no coll); Calcutta, 2 exs. (no further data). Darjiling, 1 ex, 29.iv.1880 (*Ind. Mus. Colln.*); Darjiling, 1 ex. (no further data). Maldah Dist., Bholahat, 3 exs., (no further data).

Forewing length : 18-20 mm.

Distribution : India : West Bengal (Calcutta, Darjiling, Maldah); Assam, Madhya Pradesh, Orissa, Uttar Pradesh. *Elsewhere* : Burma and Nepal.

Remarks : Its status is common. Besides this subspecies, there are three other subspecies of which the nominate one is confined to South India; *L. atymnus prabha* Moore and *L. atymnus nicobarica* Evans are found in Andamans and Nicobars, respectively.

XXXIII Genus *Zesius* Huebner 1819.

1819. *Zesius* Huebner, *Verz. becannt. Schmett.* (5) : 77.

Only a single species *Zesius chrysomallus* Huebner occurring in India is dealt with.

54. *Zesius chrysomallus* Huebner (The Redspot)

1823. *Zesius chrysomallus* Huebner, *Zutr. Ex. Schmett, figs.* 301, 302, male.

1932. *Zesius chrysomallus*, Evans, *The Identification of Indian Butterflies*, : 279.

1962. *Zesius (Sic) chrysomallus*, Cantlie, *The Lycaenidae portion of Brigadier Evans, The Identification of Indian Butterflies*, 1932, : 118.

Material examined : Maldah Dist, Bholahat, 7 exs., (no further data).

Forewing length : 18-21 mm.

Distribution : India : West Bengal (Calcutta, Maldah); Bihar; Maharashtra; Orissa; South India. *Elsewhere* : Sri Lanka.

Remarks : This species is previously known from Calcutta. Its status is rare.

XXXIV Genus *Apharitis* Riley 1925

1925. *Apharitis* Riley, *Novit. Zool.*, **32** : 70, 78.

Only a single species i.e. *Apharitis lilacinus* (hewitson) occurs in India and is dealt with from West Bengal.

55. *Apharitis lilacinus* (Hewitson) (The Lilac Silverline)

1857. *Apharitis lilacinus* Hewitson, *J. Asiat. Soc. Beng.*, **53**(2) : 28.

1890. *Aphnaeus lilacinus*, de Niceville, *The Butterflies of India, Burmah and Ceylon*, **3** : 354.

1962. *Apharitis lilacinus*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932:113.

Material examined : MaldahDist., 19 exs, (no further data).

Forewing length : 12-14 mm.

Distribution : India : West Bengal (Maldah), Assam; Himachal Pradesh; Karnataka; Madhya Pradesh; Uttar Pradesh.

Remarks : Cantlie (1962) referred to its status 'rare'. It has been listed in Schedule - II (Part-2) of the Wild Life (Protection) Act.

XXXV Genus *Spindasis* Wallengren 1857

1857. *Spindasis* Wallengren, *K. svenska Vetensk Akad. Handl.*, Stock holm (n.f.), 1 (1) no. 4 : 45.

Of the eight species found in India, five are dealt with from West Bengal.

Key to the species of genus *Spindasis*

1. Underside of hindwing with sub-basal band continuous along vein 1b to or nearly to the lower end of central band..... *lohita* Hewitson
 Underside of hindwing with sub-basal band ending on vein 1b and never continued along it. 2
2. Underside of forewing without a costal streak from base to central cell bar; cell markings consisting of a club like streak from base *syama* (Horsfield)
 Underside of forewing with a basal streak along costa to central cell bar; cell markings consisting of a streak from base and a spot beyond, conjoined or separate 3
3. Underside of hindwing with outer basal band continuous *vulcanus* (Fabricius)
 Underside of hindwing with outer basal band broken into three spots 4
4. In both sexes, upperside of forewing with well-defined triangular orange patch; in male upperside of forewing with blue shot area above vein 2; in female upperside of wings with plumbeous scales *ictis* (Hewitson)
 In male, upperside of forewing with a small obscure orange patch; in female, the patch being circular, not triangular and, not extending to below vein 2. In female, upperside of wings without plumbeous scales *elima* (Moore)

56. * *Spindasis lohita himalayanus* (Moore)
(The Long-Banded Silverline)

1884. *Aphnaeus himalayaneus* Moore, *J. Asiat. Soc. Beng.*, 53(2) : 26.
1957. *Spindasis lohita*, Wynter-Blyth, *The Butterflies of the Indian Region*, : 333.
1962. *Spindasis lohita himalayanus* Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932, : 117.

Material examined : Nil.

Wing expanse : 30–42 mm.

Distribution : India : West Bengal (Calcutta); Arunachal Pradesh, Assam, Sikkim. *Elsewhere* : Burma, Nepal.

Remarks : The species, *Spindasis lohita* (Hewitson) has been listed in Schedule-II (part-2) of the Wild Life (Protection) Act. This is among the three subspecies occurring in India and it is earlier known from Calcutta. Evans (1932), Wynter-Blyth (1957), and Cantlie (1962) mentioned its status 'common'

57. *Spindasis syama peguanus* (Moore)
(The Club Silverline)

1884. *Aphaenus peguanus* Moore, *J. Asiat. Soc. Beng.* 53(2) : 26.
1957. *Spindasis syama*, Wynter-Blyth, *The Butterflies of the Indian Region*, : 333.
1962. *Spindasis syama peguanus*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932 : 117.

Material examined : Darjiling, 1 ex., (no further data).

Forewing length : 16 mm.

Distribution : India : West Bengal (Darjiling); Orissa; Sikkim. *Elsewhere* : Burma and Nepal.

Remarks : This subspecies is a first record from West Bengal. Cantlie (1962) mentioned its status 'common'

58. *Spindasis vulcanus vulcanus* (Fabricius)
(The Common silverline)

1775. *Papilio vulcanus* Fabricius, *Syst. Ent.* : 519, no. 23.
1890. *Aphaneus vulcanus*, de Niceville, *The Butterflies of India, Burmah and Ceylon*, 3 : 349.
1962. *Spindasis vulcanus vulcanus*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932, : 114.

Material examined : Calcutta, 4 exs, (no further data); Calcutta, 2 exs., iv -, 1 ex., vii 1, ex., - viii - 1882, 1 ex, viii 1883, 1ex, xii -, 1ex, 20-viii-1886 (no coll); Calcutta, 1ex, xii 1879

(*de Niceville* coll). Maldah Dist., Bholahat, 15 exs., (no further data). North 24-Parganas Dist., Barrackpore, 1 ex, 11.vi.1886, 1ex., 15.vi.1886, 2exs, 17.vi.1886, 1ex., 27.vi.1886 (no coll). Barrackpore), Chandmari 1ex., 8.v.1985 (*K.K. Ray* coll.), South 24-Parganas, Sonarpur, 1ex., 8.ix.1965 (*K.S.Pradhan & Party* coll.).

Forewing length : 11-14 mm.

Distribution : India : West Bengal (Calcutta, Maldah, North 24-Parganas, South 24-Parganas) widely distributed in India except Eastern Himalayas and Assam. *Elsewhere* : Pakistan.

Remarks : Only the nominate subspecies occurs in India whereas *S. vulcanus fusca* Moore and *S. vulcanus tavoyana* Evans are found in neighbouring countries, Sri Lanka and Burma respectively. It is a first report from West Bengal. Its status is common. It will be interesting to observe De Niceville's remarks, it is unnecessary to give particular localities for this species as it occurs almost every where'.

59. *Spindasis ictis ictis* (Hewitson)
(The Common Shot Silverline)

1865. *Aphaenus ictis* Hewitson, *Ill. Diurn. Lep* : 61, no. 5, pl. 25, figs. 8,9, female.
1957. *Spindasis ictis*, Wynter-Blyth, *The Butterflies of the Indian Region*, : 332.
1962. *Spindasis ictis ictis*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932 : 115.

Material examined : Calcutta, 1ex., vii -, 1ex, 28.vi.1885 (no coll). Maldah Dist., Bholahat, 1ex., -iv-, 7 exs., - v-, Bholahat (no coll). 18 exs (no further data). North 24-Parganas Dist., Barrackpore, 1 ex, 4.vi.1886 (no coll).

Forewing length : 13-17 mm.

Distribution : India : West Bengal (Calcutta, Maldah , North 24-Parganas); Jammu & Kashmir, Karnataka, Madhya Pradesh, Orissa, Uttar Pradesh. *Elsewhere* : Pakistan.

Remarks : The nominate sub-species is previously known from West Bengal. Its status is common.

60. *Spindasis elima elima* (Moore)
(The Scarce Shot Silverline)

1877. *Aphnaeus elima* Moore, *Ann. Mag. nat. Hist.* 4th series, 20:51.
1957. *Spindasis elima*, Wynter-Blyth, *The Butterflies of the Indian Region* : 333.
1962. *Spindasis elima elima*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932:115.

Material examined : Calcutta, 1ex., (no further data). Maldah Dist., Bholahat, 2 exs., - v - (no coll); Bholahat, 2 exs (no further data). North 24-Parganas, Barrackpore, 1 exs., 2.vi.1886, 1 ex., 4.vi.1886, 1 ex., 6.vi.1886, 1ex., 30.vi.1886 (no coll).

Forewing length : 13-14 mm.

Distribution : India : West Bengal (Calcutta, Darjiling, Maldah, North 24-Parganas); Haryana; Himachal Pradesh, Madhya Pradesh, Maharashtra, Manipur, Orissa, Sikkim, South India, Uttar Pradesh.
Elsewhere : West Pakistan.

Remarks : Cantlie (1962) has referred to its status 'rare' whereas the nominate sub-species is well represented in certain parts of India. It is earlier known from West Bengal. It is listed in Schedule - II (Part-2) of the Wild Life (Protection) Act.

Genus *Pratapa* Moore 1881

1881. *Pratapa* Moore, *Lep. Ceylon*, 1(3) : 108.

This genus includes eight species from India, of which five are found in West Bengal.

Key to the species of genus *Pratapa*

1. Underside of wings with a prominent white discal band *penicilligera* (de Niceville)
- Underside of wings without a white discal band 2
2. In male, underside of forewing without a tuft *bhotea* (Moore)
- In male, underside of forewing with tuft/tufts 3
3. In male, underside of forewing with two tufts, inner one long and black, outer short and white
..... *cleobis* (Godart)
- In male, underside of forewing with a single tuft of long hairs 4
4. Labial palpi aberrant, third joint long, straight, in line with second joint. In forewing veins M_2 and M_3 approximate at origin *ctesia* (hewitson)
- Labial palpi normal, third joint short, bent down at an angle to second joint. In forewing veins M_2 and M_3 separate at origin..... *deva* (Moore)

61. **Pratapa penicilligera* (De Niceville)
(The Double Tufted Royal)

1890. *Arrhenothrix penicilligera*, De Niceville, *The Butterflies of India, Burmah and Ceylon*, 3 : 337.
1932. *Pratapa vidura penicilligera*, Evans, *The Identification of Indian Butterflies*, : 279.
1956. *Dalcaba penicilligera*, Roonwal and Avinash Chandra, *Indian Forest Leaflet*, 121 (4) : 373.
1957. *Pratapa vidura*, Wynter-Blyth, *The Butterflies of the Indian Region* : 337.
1962. *Pratapa penicilligera*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932, : 118-119.

Material examined : Nil.

Wing expanse : 38-42.

Distribution : India : West Bengal (Darjiling), Meghalaya. *Elsewhere* : Burma.

Remarks : Roonwal and Avinash Chandra (1956) and Wynter-Blyth (1957) referred to its occurrence in Darjiling. Cantlie (1962) mentioned its status 'not rare'.

62. **Pratapa bhotea* (Moore)
(The Slate Royal)

1884. *Pratapa bhotea* Moore, *J. Asiat. Soc. Beng.*, **53**(2) : 37.

1890. *Maneca bhotea*, de Niceville, *The Butterflies of India, Burmah and Ceylon*, **3** : 344.

1956. *Maneca bhotea*, Roonwal and Avinash Chandra, *Indian Forest Leaflet*, **121** (4) : 376.

1962. *Pratapa bhotea*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian butterflies*, 1932 : 122.

Material examined : Nil.

Wing expanse : 26-27 mm.

Distribution : India : West Bengal (Darjiling); Assam, Sikkim. *Elsewhere* : Nepal.

Remarks : Cantlie (1962) mentioned its status 'rare'.

63. *Pratapa cleobis* (Godart)
(The Broadtail Royal)

1823. *Polymmaatus cleobis* Godart, *Ent. Meth.*, **9** : 634, no. 61.

1890. *Camena cleobis*, de Niceville, *The Butterflies of India Burmah and Ceylon*, **3** : 343.

1962. *Pratapa cleobis*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian butterflies*, 1932, : 121.

Material examined : Calcutta, 2 exs., vii -, (no coll); Calcutta, 5 exs., (no further data); Calcutta, 1 ex, 14.xii.1879, 1 ex, 21.xii.1879, 1 ex., 26.xii.1879 (*de Niceville* coll). Jalpaiguri, 1ex, (no further data), Maldah Dist, Bholahat, 2 exs, no further data.

Wing expanse : 27-38 mm.

Distribution : India : West Bengal (Calcutta, Jalpaiguri, Maldah), Himachal Pradesh, Meghalaya, South India, Uttar Pradesh. *Elsewhere* : Burma.

Remarks : This species is earlier known from West Bengal. Its status is 'not rare'.

64. *Pratapa ctesia* (Hewitson)
(The Bi-spot Royal)

1865. *Camena ctesia* Hewitson, *III. Diurn. Lep.*, : 48, pl. 20, figs. 1,2, male.
1957. *Pratapa ctesia*, Wynter-Blyth, *The Butterflies of the Indian Region*, : 338.
1962. *Pratapa ctesia*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932 : 120.

Material examined : Darjiling, 2 exs; (no further data).

Forewing length : 18-19 mm.

Distribution : India : West Bengal (Darjiling); Meghalaya, Nagaland, Sikkim, Uttar Pradesh.
Elsewhere : Burma, Nepal.

Remarks : This species is a first report from West Bengal. Its status is not rare.

65. *Pratapa deva deva* (Moore)
(The White Royal)

1857. *Amblypodia deva* Moore, Horsfield and Moore, *Cat. Lep. Mus. East India Coy*, 1 : 46, no. 74.
1890. *Camena deva*, de Niceville, *The Butterflies of India, Burmah and Ceylon*, 3 : 341.
1957. *Pratapa deva*, Wynter-blyth, *The Butterflies of the Indian Region* : 339.

Material examined : Maldah Dist., Bholahat, 8 exs., (no further data).

Forewing length : 15-16 mm.

Distribution : India : West Bengal (Calcutta, Maldah), Madhya Pradesh, Meghalaya, South India, Uttar Pradesh. *Elsewhere* : Burma, Sri Lanka.

Remarks : Previously, the nominate subspecies is known from Calcutta and Maldah. Its status is rare. However, eight specimens referred under 'material examined' had locality labels 'Bholahat' (Maldah district) under the subspecies *P. deva lila* (Moore) in the collection of Zoological Survey of India.

XXXVII Genus *Tajuria* Moore 1881

1881. *Tajuria* Moore, *Lep. Ceylon*, 1 (3) : 108.

Of the 13 species of this genus occurring in India only two namely *Taruria jehana* Moore and *T. cippus* (Fabricius) are found in West Bengal.

Key to the species of genus *Tajuria*

Above cilia conspicuously white. Upperside of male slately blue. In female, upperside of forewing with blue more extensive, which beyond cell becoming paler and sometimes whitish *jehana* Moore

Above cilia brown or the long hairs only white. Upperside of male dark shining blue. Female greyish blue becoming whitish outwardly on forewing *cippus* Fabricius

66. *Tajuria jehana* Moore
(The Plains Royal Blue)

1883. *Tajuria jehana* Moore, *Proc. zool. Soc. Lond.*, : 529.

1962. *Tajuria jehana*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932, : 126.

Material examined : Maldah Dist., Bholahat, 6 exs, (no further data); Bholahat, 4 exs, - v - 1 ex, 19.vi.1886 (no coll). North 24-Parganas Dist., Bangaon (Dhaka para), 1 ex., 9.vii.1965 (M.M. Ghosh & K.D.C. Coll.).

Forewing length : 14-16 mm.

Distribution : India : West Bengal, (Maldah, North 24-Parganas); Himachal Pradesh, Madhya Pradesh, Maharashtra, Orissa, South India, Uttar Pradesh. *Elsewhere* : Sri Lanka.

Remarks : This species is earlier known from West Bengal. Its status is not rare.

67. *Tajuria cippus cippus* (Fabricius)
(The Peacock Royal)

1798. *Hesperia cippus* Fabricius, *Ent. Syst.* 5 : suppl. 429, no. 43.4.

1890. *Camena cippus* de Niceville, *The Butterflies of India, Burmah and Ceylon*, 3 : 340.

1962. *Tajuria cippus cippus*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932, : 127.

Material examined : Calcutta, 4 exs., (no further data), Maldah Dist., Bholahat, 1 ex, - v -, (no coll); Bholahat, 10 exs, (no further data).

Forewing length : 15-18 mm.

Distribution : India : West Bengal (Calcutta, Maldah); Andamans, Assam. *Elsewhere* : Bhutan, Burma and Nepal.

Remarks : This is a first report from West Bengal. Cantlie (1962) referred to its status 'common'.

XXXVIII Genus *Charana* De Niceville 1890

1890. *Charana* de Niceville, *The Butterflies of India, Burmah and Ceylon*, 3 : 401.

Of the three species of this genus occurring in India, two are treated from West Bengal.

Key to the species of genus *Charana*

Underside of wings white. Hindwing with two equal tails (6 mm) at vein 1b and vein 2
 *jalindra*(Horsfield).

Underside of wings Yellow. Hindwing with unequal tails at vein 1b (12 mm) and at vein 2 (6 mm)
 *mandarinus* (Hewitson)

68. *Charana jalindra indra* (Moore)
 (The Banded Royal)

1883. *Sithon indra* Moore, *Proc. zool. Soc. Lond.*, : 527.

1890. *Tajuria indra*, de Niceville, *The Butterflies of India, Burmah and Ceylon*, 3 : 373.

1962. *Charana jalindra indra*. Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932 : 128.

Material examined : Calcutta, 3 exs., (no further data). Maldah Dist, Bholahat, 10 exs., (no further data).

Forewing length : 16-19 mm.

Distribution : India : West Bengal (Calcutta, Maldah); Assam, Meghalaya, Orissa, Sikkim.
Elsewhere : Bangladesh, Nepal.

Remarks : The subspecies is earlier known from West Bengal. Its status is 'not rare'

69. *Charana mandarinus* (Hewitson)
 (The Mandarin Blue)

1863. *Myrina mandarinus* Hewitson, *Ill. Diurn. Lep.* : 28, no. 4, pl. 11, figs. 6,7, female.

1890. *Charana mandarinus*, de Niceville, *The Butterflies of India, Burmah and Ceylon*, 3 : 401.

1962. *Charana mandarinus*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932, : 128.

Material examined : Darjiling Dist., Buxa, 1 ex, (no further data); Darjiling, 1ex., 18.ix.-(no coll).
 Jalpaiguri, 2 exs, (no further data).

Forewing length : 19-20 mm.

Distribution : India : West Bengal (Darjiling, Jalpaiguri); Andamans, Assam, Meghalaya, Sikkim.
Elsewhere : Bangladesh, Bhutan and Burma.

Remarks : This species is previously known from Buxa (West Bengal). Its status is 'not rare'

XXXIX Genus *Jacoona* Distant 1884

1884. *Jacoona* Distant, *Rhop. Malay.* : 241.

This genus is represented in India only by the nominate subspecies, *Jacoona fabronia fabronia* (Hewitson) which is dealt with from West Bengal.

70. *Jacoona fabronia fabronia* (Hewitson)
(The Pale Grand Imperial)

1878. *Myrina fabronia* Hewitson, *Ill. Diurn. Lep. Suppl.* : 28, pl. 3a, fig. 89-91.

1962. *Jacoona fabronia*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932 : 130.

Material examined : Darjiling, 1 ex (No further date).

Forewing length : 20 mm.

Distribution : India : West Bengal (Darjiling); Sikkim. *Elsewhere* : Burma.

Remarks : This nominate subspecies is a first report from West Bengal. Its status is 'rare'. It has been listed in Schedule II (Part-2) of the Wild Life (Protection) Act.

XL Genus *Ticherra* de Niceville 1887

1887. *Ticherra* de Niceville, *Proc. zool. Soc. Lond.* : 457.

Only a single species *Ticherra acte* (Moore) represents this genus in India and is treated from West Bengal.

71. *Ticherra acte* (Moore)
(The Blue Imperial)

1857 *Myrina acte* Moore, Horsfield and Moore, *Cat. Lep. Mus. East. India Coy.* 1 : 47, no. 77 female.

1890. *Ticherra acte*, de Niceville, *The Butterflies of India, Burmah and Ceylon*, 3 : 407.

1962. *Ticherra acte*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932:133.

Material examined : Darjiling Dist, Buxa, 1ex., (no further data); Darjiling, 1ex., (no further data).

Forewing length : 19-20mm.

Distribution : India : West Bengal (Darjiling); Meghalaya, Sikkim, Uttar Pradesh. *Elsewhere* : Bhutan and Burma.

Remarks : This species constitutes a first report from West Bengal. Cantlie (1932) referred to its status 'not rare'

XLI Genus *Rathinda* Moore 1881

1881. *Rathinda* Moore, *Lep. Ceylon*, 1 : 99.

This genus includes a single species i.e. *Rathinda amor* (Fabricius) from India and is also found in West Bengal.

72. *Rathinda amor* (Fabricius)
(The Monkey Puzzle)

1775. *Papilio amor* Fabricius, *Syst. Ent.* : 518, no. 321.

1890. *Rathinda amor*, de Niceville, *The Butterflies of India, Burnah and Ceylon*, 3 : 414.

1962. *Rathinda amor*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932 : 137.

Material examined : Calcutta, 2 exs., (no further data). Murshidabad Dist, Raghunathganj (Potapur Colony), 1ex., 7.ii.1986 (*I.J. Gupta & Party* coll.).

Forewing length : 12-13 mm.

Distribution : India : West Bengal (Calcutta, Murshidabad) Assam, Karnataka, Maharashtra, Orissa, South India. *Elsewhere* : Sri Lanka.

Remarks : This species was previously recorded from Calcutta by Moore (1881). Its status is 'not rare'

XLII Genus *Horaga* Moore 1881

1881. *Horaga* Moore, *Lep. Ceylon*, 1 : 98.

This genus includes four species from India of which one i.e. *Horaga syrinx* (Hewitson) occurs in West Bengal.

73. *Horaga syrinx moulmein* Moore (The Yellow Onyx)

1883. *Horaga moulmeina* Moore, *Prox. zool. Soc. Lond.*, : 525.

1883. *Horaga sikkima* Moore, *Proc. zool. Soc. Lond.*, : 525.

1962. *Horaga syrinx moulmeina*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932, : 138.

Material examined ; Darjiling Dist, Buxa, 1ex., (no further data).

Forewing length : 16 mm.

Distribution : India : West Bengal (darjiling); Meghalaya, Sikkim. Elsewhere ; Bhutan and Burma.

Remarks : This subspecies is a first report from West Bengal. Cantlie (1962) mentioned its status not rare.

XLIII Genus *Chliaria* Moore 1884

1884. *Chliaria* Moore, *J. Asiat. Soc. Beng.* (Part 2), 53(1) : 32.

Two species viz., *Chliaria kina* (Hewitson) and *C. othona* (Hewitson) occurring in India, are dealt with from West Bengal.

Key to the species of genus *Chliaria*

Underside of forewing with a small black costal spot above mid cell *othona* (Hewitson)

Underside of forewing without a black costal spot *kina* (Hewitson)

74. *Chliaria othona* (Hewitson) (The Orchard Tit)

1865. *Hypolycaena othona* Hewitson, *III. Diurn. Lep.*, : 50, no. 7, pl. 22, figs. 17, 18, male.

1962. *Chliaria othona*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*:

1962. *Chliaria kina*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932:140.

Material examined : Nil.

Wing expanse : 26-31 mm.

Distribution : India : West Bengal (Darjiling); Arunachal Pradesh, Assam, Nagaland, Sikkim, Uttar Pradesh. Elsewhere : Bangladesh and Nepal.

Remarks : Roonwal and Avinash Chandra (1956) reported it from Darjiling (West Bengal). Its status is not rare.

XLIV Genus *Hypolycaena* Felder 1892

1862. *Hypolycaena* Felder, *Wien. Ent. Monatsch.*, 6 : 293.

There are three species of this genus occurring in India, of which a single species i.e. *Hypolycaena erylus* (Godart) is represented in West Bengal.

76. *Hypolycaena erylus himavantus* Fruhstorfer
(The Common Tit)

1912. *Hypolycaena erylus himavantus* Fruhstorfer, *Berl. ent.* 2s, 56 : 237
Hypolycaena himavantus Fruhstorfer, *Berl. Ent.* 2., 56: 253.
1962. *Hypolycaena erylus himavantus*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Butterflies*, 1932, : 142.

Material examined : Jalpaiguri Dist., Mendabari forest (chilapata), 1ex., 16.x.1987, (S.K. Tandon & Party).

Forewing length : 17 mm.

Distribution : India : West Bengal (Jalpaiguri); Assam, Sikkim. Elsewhere : Burma and Nepal.

Remarks : This subspecies differs from *Hypolycaena erylus andamans* Moore by being smaller and on opperside of hindwing, in female, the tornal spot in interspace/c hardly (Vs. larger and on upperside of hindwing in female, the tornal spot in interspaces is defined by white edging). This is a first report from West Bengal. Cantlie (1962) mentioned its status 'common'

XLV Genus *Deudorix* Hewitson 1863

1863. *Deudorix* (Part) Hewitson, *III. Diurn. lep* : 16.

Two species namely *Deudorix epijarbas* Moore and *D. Hy[erguroa]* Elwes represent this genus in India; the former occurs in West Bengal.

77. **Deudorix epijarbas epijarbas* (Moore)
(The Cornelian)

1857. *Dipras epijarbas* Moore, Horsfield and Moore, *Cat. Lep. Mus. East India Coy* : 32, no. 40.
1890. *Deudorix epijarbas*, de Niceville, *The Butterflies of India, Burmah and Ceylon*, 3 : 449.
1962. *Deudorix epijarbas epijarbas*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932, : 143.

Material examined; Nil.

Wing expanse; 34-38.

Distribution : India : West Bengal (Calcutta); Orissa to South India.

Remarks : This nominate sub species was recorded from Calcutta by Sanders (1944). Its status is 'not rare'.

XLVI Genus *Virachola* Moore 1881

1881. *Virachola* Moore, *Lep. Ceylon*, 1 : 104.

This genus is represented in India by three species of which one *Virachola isocrates* (Moore) is dealt with from West Bengal.

78. *Virachola isocrates* (Fabricius)
(The Common Gauva Blue)

1793. *Hesperia isocrates* Fabricius, *Ent. Syst.*, BF 3(1) : 266, no. 29.

1962. *Virachola isocrates* Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of..... Indian Butterflies, 1932* : 144.

Material examined : Calcutta, 1 ex., 26.xii.1879 (de Niceville coll), Calcutta, 4 exs; (no farther data). Darjiling, 1 ex., (no further data), Hughli, 1 ex (from gauva), iv-1907 (no coll), Maldah Dist., Bholahat, 3 exs. (no further data).

Forewing length : 16-22 mm.

Distribution : India ; West Bengal (Calcutta, Darjiling, Hughli, Maldah); Assam, Maharashtra, Meghalaya, Nagaland, Orissa. Elsewhere : Pakistan and Sri Lanka.

Remarks : De Niceville (1890) mentioned 'it appears to occur almost everywhere in the plains of India except the desert tracts, but it is found in Assam or Burma'. Cantlie (1962) referred that it is rare in Assam whereas Tytler found it common in Manipur. Since, this species thrives well on plantation of pomegraate and gauva, therefore, areas having such plantation are likely to have this butterfly in abundance. De Niceville (loc.cit) reported it very common in Calcutta during the winter, much affecting the flowers of *Poinsettia* sp. Its status is common.

XLVII Genus *Rapala* Moore 1881

1881. *Rapala* Moore, *Lep. Ceylon*, 1 (3) : 105.

This genus is represented in India by 17 species, of which five are found in West Bengal.

Key to the species of genus *Rapala*

1. In male upperside of wings blue2
- In male upperside of wings with some shade of red3
2. Underside of forewing with discal band double, comparatively broad and white edged on both sides. Upperside of male dark shining and greenish indigo blue, shading on forewing to a shining black border, not shot blue. Upperside of female pale shining streely blue, more or less purple glossed *varuna* Horsfield

Underside of forewing with discal band single, only white edged outwardly. Upperside of male dark slately blue, shot more or less brilliantly deep blue. Female like *varuna*, rather darker and more purple *manea* Hewitson

3. Underside of wings scately grey and no ochreous tinge *iarbus* (Fabricius)
4. Upperside of male dark copper red, colour extensive, border not continuing along dorsum of forewing; on hindwing red to termen. *pheretima* Hewitson

Upperside of male bright scarlet, may be obscurely purple shot, border and continued along dorsum of forewing; on hindwing base and dorsum, black *dienece* (Hewitson)

79. *Rapala varuna orseis* (Hewitson)
(The Indigo Flash)

1863. *Deudorix orseis* Hewitson, *III. diurn. lep.*, 1 : 23.
1890. *Rapala orseis*, de Niceville, *The Butterflies of India, Burma and Ceylon*, 3 : 461.
1957. *Rapala varuna*, Wynter-blyth, *The Butterflies of Indian Region* : 361.
1962. *Rapala varuna orseis*, Cantlie, *The Lycaenidae portion of the Brigadier Evans' The Identification of Indian Butterflies*, 1932:149.

Material examined : Calcutta, 1 ex., (no further data). Maldah Dist, Bholahat, 1ex (No further data).

Forewing length : 12-3 mm.

Distribution : India : West Bengal (Calcutta, Maldah); Andamans, Arunachal Pradesh, Assam, Orissa, Sikkim. Elsewhere : Burma; Nepal.

Remarks : The specimens under 'material examined' agree well with the characters of *R. varuna orseis* (Hewitson) as given by Cantlie (1962). For *R. varuna lazulina* (Moore), Cantlie (*loc. cit*) mentioned its distribution as South India and Sri Lanka alongwith its record from Calcutta made by Sanders (1944). Its status is not rare.

80. *Rapala manea schistacea* (Moore)
(The Slate Flash)

1879. *Deudodrix schistacea* Moore, *Proc. Zool. Soc. Lond* : 140.
1890. *Rapala schistacea*, de Niceville, *The Butterflies of India, Burmah and Ceylon*, 3 : 459.
1962. *Rapala manea schistacea*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932, : 149.

Material examined : Calcutta, 1ex., 25.xii.1879, 1ex., 31.xii.1879 (de Niceville coll); ; Calcutta, 9 exs. (no further data). Maldah Dist., Bholahat, 12 exs. (no further data).

Forewing length : 14-18 mm.

Distribution : India : West Bengal (Calcutta, Maldah); Andamans, Assam, Orissa, South India, Uttar Pradesh. Elsewhere : Burma, Nepal, Pakistan and Sri Lanka.

Remarks : This subspecies is previously known from West Bengal. Its status is 'common'

81. *Rapala iarbus iarbus* (Fabricius)
(The Common Red Flash)

1787. *Papilio iarbus* Fabricius, *Mant. Ins.*, 2 : 68, no. 648.

1890. *Rapala jarbas*, de Niceville, *The butterflies of India, Burmah and Ceylon*, 3 : 468.

1957. *Rapala melampus*, Wynter-blyth, *The butterflies of the Indian Region*, : 362.

1962. *Rapala iarbus iarbus*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932:150.

Material examined : Maldah Dist., Bholahat, 1ex., (no further data).

Forewing length : 15-17 mm.

Distribution : India : West Bengal (Calcutta, Maldah); Sikkim. Elsewhere : Burma, Nepal.

Remarks : There is a single specimen of this nominate subspecies from Maldah District (West Bengal) in the old collection of Zoological Survey of India, and it agrees well with the characters given by Cantlie (1962). On the other hand, Cantlie (1962) referred to the distribution of another subspecies, *Rapala iarbus sorya* (Kollar) as Punjab (Amritsar), Pakistan (Murree) to Uttar Pradesh (Kumaon, Kanpur), South India to Orissa, Nepal and Sri Lanka including its record from Calcutta by Sanders (1944). Its status is 'common'.

82. *Rapala pheretima petosiris* (Hewitson)
(The Copper Flash)

1863. *Deudorix petosiris* Hewitson, *Ill. diurn. Lep.* : 22, no. 13, pl. 9, figs. 30, 31 male.

1890. *Rapala petosiris*, de Niceville, *The Butterflies of India, Burmah and Ceylon*, 3 : 465.

1957. *Rapala pheretima* (Sic), Wynter-Blyth, *The Butterflies of the Indian Region*, : 363.

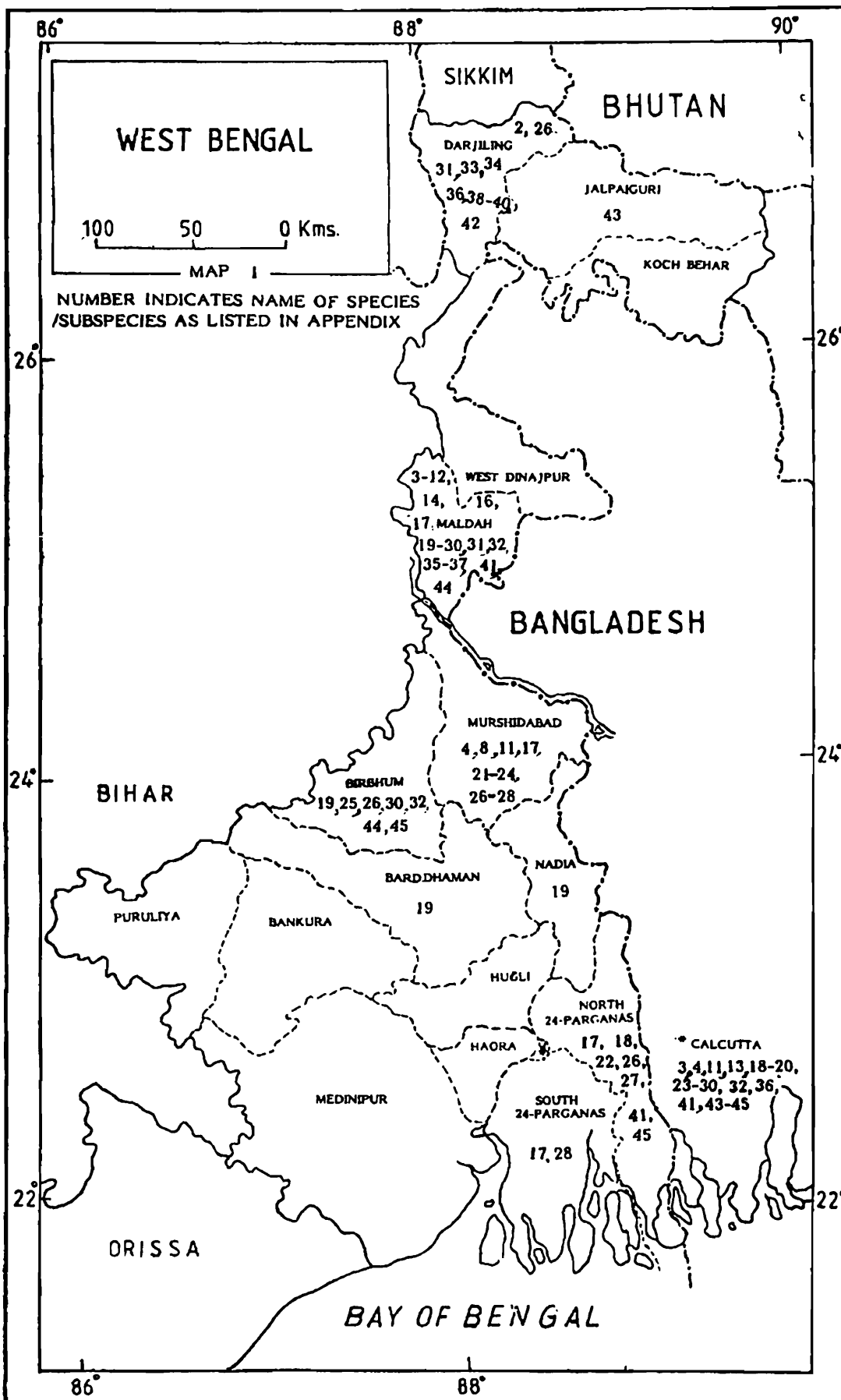
1962. *Rapala pheretima petosiris*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian butterflies*, 1932, : 149.

Material examined : Darjiling, 1ex. (no further data).

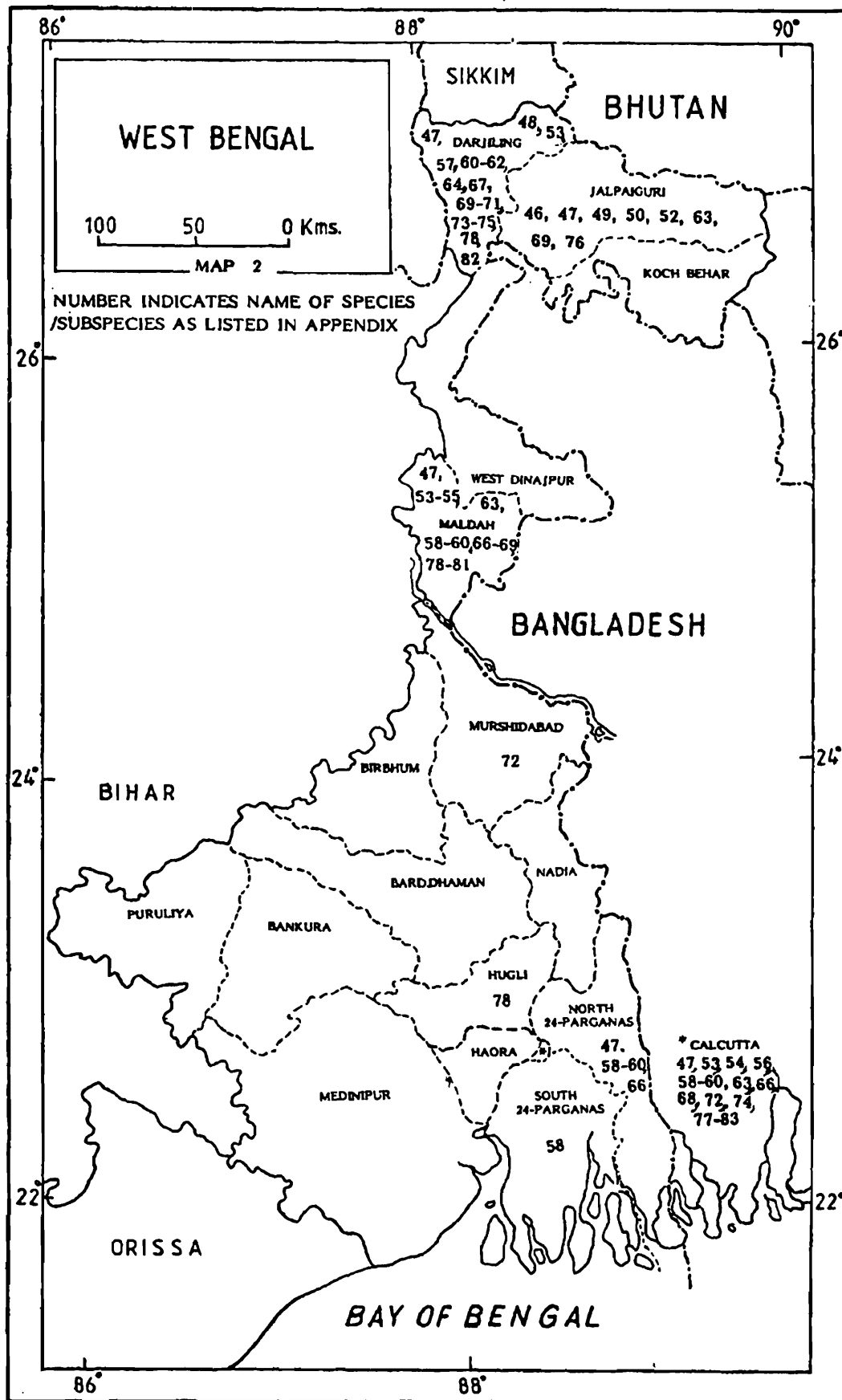
Forewing length : 19 mm.

Distribution : India : West Bengal (Calcutta, Darjiling); Assam, Orissa, Sikkim. Elsewhere : Bangladesh, Burma, Nepal.

Remarks : Sanders (1944) reported its occurrence in Calcutta. Its status is not rare.



Map 1



Map 2

83. *Rapala diences diences* (Hewitson)
(The Scarlet Flash)

1878. *Deudorix diences* Hewitson, *III. diurn. Lep. Suppl.* : 31, no. 35, pl. Suppl. 5a fig. 65, 67 male.
1890. *Rapala xenophon*, de Niceville, *The butterflies of India, Burmah and Ceylon*, 3 : 470.
1962. *Rapala diences diences*, Cantlie, *The Lycaenidae portion of Brigadier Evans' The Identification of Indian Butterflies*, 1932:150.

Material examined : Calcutta, 1ex., 14.xii.1879, 1ex., 26.xii.1879, 1ex., 18.i.1880 (de Niceville coll.); Calcutta, 2 exs. (no further data).

Forewing length : 11-15 mm.

Distribution : India : West Bengal (Calcutta); Assam. Elsewhere : Burma.

Remarks : This nominate subspecies is earlier known from Calcutta. Its status is 'rare'

SUMMARY

Eighty three species and subspecies belonging to 47 genera and four subfamilies, viz : Poritinae, Miletinae, Lycaeninae and Theclinae of family Lycaenidae have been dealt with from West Bengal. Some of the species are interesting because of their association, during larval stages, with ants. The present lycaenid fauna is represented in 11 out of 17 districts of the State. The status of species is that a single species i.e. *Allotinus drumila* (Moore) is very rare, 12 are rare and 35 are not rare. Schedule-I (Part-4) and Schedule - II (Part-2) of Wild Life (Protection) Act included 3 and 20 species respectively. Keys to subfamilies, genera and species have been given. Common name, forewing length, expanse and geographical distribution of each of the taxa have been provided. Twenty species and subspecies constitute first records from the State. Appendix-I and maps provide list of taxa and their district wise distribution/records. It has been indicated that taxa represented in two or three districts should be considered rare and their need for inclusion in the Wild Life (Protection) Act.

ACKNOWLEDGEMENTS

The author is grateful to the Director, Zoological Survey of India, for providing laboratory facilities for this work. He is thankful to Dr. T. Sengupta, Scientist SE, (Retd.) Entomology division (A) for his valuable suggestions. Thanks are due to Dr. S.K. Ghosh, Scientist-SD, (Retd.) Officer-In-charge of Lepidoptera Section for going through the manuscript.

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**APPENDIX - I SHOWING DISTRICT-WISE DISTRIBUTION OF SPECIES/SUBSPECIES
OF FAMILY LYCAENIDAE IN WEST BENGAL**

Name of the Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
I. Subfamily PORITINAE																	
*1. <i>Poritia hewitsoni hewitsoni</i> Moore																	
II. Subfamily MILETINAE																	
*2. <i>Allotinus drumila drumila</i> (Moore)					+												
III. Subfamily LYCAENINAE																	
3. <i>Spalgis epeus epeus</i> (Westwood)				+						+							
4. <i>Castalius rosimon rosimon</i> (Fabricius)				+						+		+					
5. <i>Castalius caleta decidia</i> (Hewitson)										+							
6. <i>Tarucus callinara</i> Butler										+							
7. <i>Tarucus nara</i> (Kollar)										+		+					
8. <i>Tarucus balkanica nigra</i> (Bethune-Baker)										+							
9. <i>Syntarucus plinius</i> (Fabricius)										+							
10. <i>Azanus uranus</i> Butler										+							

Name of the Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
11. <i>Neopithecops zalmora</i> (Butler)				+						+		+					
12. <i>Everes lacturnus assamica</i> Tytler										+							
13. <i>Megisba malaya thwaitesi</i> Moore				+													
14. <i>Megisba malaya sikkima</i> Moore										+							
15. * <i>Celastrina limbata limbata</i> (Moore)																	
16. <i>Celastrina dilectus</i> (Moore)										+							
17. <i>Euchrysops cnejus</i> (Fabricius)										+		+		+		+	
18. <i>Euchrysops pandava</i> (Horsfield)				+										+			
19. <i>Chilades laius laius</i> (Crammer)		+	+	+						+			+				
20. <i>Freyeria trochilus putli</i> (Kollar)				+						+							
21. <i>Zizula hylax</i> (Fabricius)										+		+					
22. <i>Zizeeria maha maha</i> (Kollar)										+		+		+			
23. <i>Zizeeria knysna karsandra</i> (Moore)				+						+		+					
24. <i>Zizina otis sangra</i> (Moore)				+						+		+					
25. <i>Anthene emolus emolus</i> (Godart)			+	+						+							
26. <i>Anthene lycaenoides lycambes</i> (Hewitson)			+	+	+					+		+		+			
27. <i>Catochrysops strabo strabo</i> (Fabricius)				+						+		+		+			
28. <i>Lampides boeticus</i> (Linnaeus)				+						+		+					+

* No specific locality given

Name of the Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
29. <i>Jamides alecto alocina</i> Swinhoe				+						+							
30. <i>Jamides bochus bochus</i> (Cramer)			+	+						+							
31. <i>Jamides pura pura</i> (Moore)					+												
32. <i>Jamides celeno aelianus</i> (Fabricius)			+	+						+							
33. <i>Nacaduba kurava euplea</i> (Fruhstorfer)					+					+							
34. <i>Nacaduba beroe gythion</i> (Fruhstorfer)					+												
35. <i>Nacaduba nora nora</i> (Felder)										+							
36. <i>Nacaduba dubiosa indica</i> Evans				+	+					+							
37. <i>Petrelaea dana</i> (de Niceville)										+							
*38. <i>Chrysozephyrus zoa</i> (de Niceville)					+												
*39. <i>Chrysozephyrus duma</i> (Newitson)					+												
*40. <i>Chrysozephyrus assamicus</i> (Tytler)					+												
41. <i>Curetis thetis thetis</i> (Drury)				+						+				+			
42. <i>Curetis dentata dentata</i> Moore					+												
43. <i>Iraota timoleon timoleon</i> (Stoll)				+				+									
44. <i>Amblypodia anita dina</i> (Fruhstorfer)			+	+						+							
45. <i>Mahathala ameria ameria</i> (Hewitson)			+	+										+			
46. <i>Narathura camdeo camdeo</i> (Moore)								+									
47. <i>Narathura atrax</i> (Hewitson)				+	+			+		+				+			

Name of the Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
48. <i>Narathura centaurus pirithous</i> (Moore)					+												
49. <i>Narathura silhetensis silhetensis</i> (Hewitson)								+									
50. <i>Narathura amantes amantes</i> (Hewitson)								+									
*51. <i>Flos fulgida</i> (Hewitson)								+									
52. <i>Surendra vivarna quercetorum</i> (Moore)								+									
53. <i>Loxura atymnus continentalis</i> (Fruhstorfer)				+	+					+							
54. <i>Zesius chrysomallus</i> Huebner				+						+							
55. <i>Apharitis lilacinus</i> (Hewitson)										+							
56. <i>Spindasis lohita himalayanus</i> (Moore)				+													
57. <i>Spindasis syama peguanus</i> (Moore)					+												
58. <i>Spindasis vulcanus vulcanus</i> (Fabricius)				+						+				+	+		
59. <i>Spindasis ictis ictis</i> (Hewitson)				+						+				+			
60. <i>Spindasis elima elima</i> (Moore)				+	+					+				+			
*61. <i>Pratapa penicilligera</i> (de Niceville)					+												
*62. <i>Pratapa bhotea</i> (Moore)					+												
63. <i>Protapa cleobis</i> (Godart)				+				+		+							
64. <i>Pratapa ctesia</i> (Hewitson)					+												
65. <i>Pratapa deva deva</i> (Moore)				+						+							
66. <i>Tajuria jehana</i> Moore										+				+			

Name of the Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
67. <i>Tajuria cippus cippus</i> (Fabricius)				+						+							
68. <i>Charana jalindra indra</i> (Moore)				+						+							
69. <i>Charana mandarinus</i> (Hewitson)					+			+									
70. <i>Jacoona fabronia fabronia</i> (Hewitson)					+												
71. <i>Ticherra acte</i> (Moore)					+												
72. <i>Rathinda amor</i> (Fabricius)				+								+					
73. <i>Horaga syrix moulmeina</i> Moore					+												
74. <i>Chilaria othona</i> (Hewitson)				+	+												
75. <i>Chliaria kina</i> (Hewitson)					+												
76. <i>Hypolycaena erylus himavantus</i> Fruhstorfer								+									
*77. <i>Deudorix epijarbas epijarbas</i> (Moore)				+													
78. <i>Virachola isocrates</i> (Fabricius)				+	+		+			+							
79. <i>Rapala varuna orseis</i> (Hewitson)				+						+							
80. <i>Rapala manea schistacea</i> (Moore)				+						+							
81. <i>Rapala iarbus iarbus</i> (Fabricius)				+						+							
82. <i>Rapala pheretima petosiris</i> (Hewitson)				+	+												
83. <i>Rapala diences diences</i> (Hewitson)				+													
Total :	0	1	7	46	21	0	1	10	0	48	0	12	1	12	3	0	0

INSECTA : LEPIDOPTERA : HETEROCERA GEOMETRIDAE

D.K. MANDAL AND S.K. GHOSH

Zoological Survey of India, Calcutta

INTRODUCTION

Familiarly known as 'Carpets' 'Pugs', 'Waves' etc., the geometers constitute a very large family of slender, weak-flying and diurno-nocturnal moths. Their food-habit, as far as known, is variable from mono- to polyphagy. They inhabit much more in the tropico-temperate wet forests amidst hills and mountains than in gardens, open grasslands, etc., of the coastal and dry plains. They are generally low-flying forms frequenting constricted spaces of thorny bushes.

The members of the Geometridae are readily recognised by the fore wing with second median nearer the first than the third at origin, hind wing with a precostal spur at the extreme base and abdomen with antero-ventral tympanal organs.

The work is based on the faunistic inventory of geometrid material of West Bengal collected by different survey parties from the Zoological Survey of India. The district-wise survey of West Bengal reveals that the bulk of the species has been brought from the Darjiling localities. Their status and habits, wherever known, are provided along with keys to the taxa examined and specific distribution. Certain species of distributional interest are also indicated in the state-maps. The classification of the family is adopted after Hampson (1895, 1896), being modified by Prout (1912, 1913, 1914, 1915, 1932, 1934, 1935).

Earlier, taxonomical studies of a number of species of the Geometridae from West Bengal were made by several workers as already cited in the preceding article on other moths by Mondal, et al. Apart from the works of Swinhoe (1900) and others (*vide supra*), Sevastopulo (1939, 1941, 1942, 1945, 1946, 1947, 1948, 1956, 1956a) dealt with as many as 168 species from the state, of which about 80% were represented from Tukdah of the Darjiling District and 20%, from Calcutta. Besides, only 18 species from Darjiling and one, i.e., *Scopula minorata* Boisduval from Puruliya, all lying in the collections of the Forest Research Institute (F.R.I.) at Dehra Dun, U.P., were catalogued by Singh (1962).

The geometers are represented by over 1100 species in more than 160 genera under five subfamilies from India. Of these, over 300 species in not less than 150 genera under all these subfamilies were earlier known from West Bengal. Over 20% of the species belonging to all the subfamilies but Oenochromiinae from the State enjoy endemic status at Darjiling. With the present discovery, twenty one species, in addition, constitute new locality records for West Bengal. An appendix to the species not dealt with in the Systematic Account is also incorporated.

MATERIAL AND METHOD

The authors could examine 158 exs. in 47 species of 32 genera under all the subfamilies but

Oenochrominae, as available in the collections for study of the family concerned. For other details, *vide* preceding articles on moths and butterflies by Mondal, et. al.

SYSTEMATIC ACCOUNT

(Taxa in parentheses used in the Hampsonian system ; *, new record for West Bengal).

Order : LEPIDOPTERA

Suborder : HETEROCERA

Family : GEOMETRIDAE

Key to the Subfamilies

1. Hind wing M_2 present 2
- Hind wing M_2 absent Geometrinae
2. Hind wing $Sc+R_1$ free from or connected by a bar with RS near base and M_2 given off from above middle discocellular ; colour always bright green Hemitheinae
- Hind wing $Sc+R_1$ anastomosed or rarely bar-connected with RS and M_2 given off from middle discocellular ; colour not bright green 3
3. Hind wing $Sc+R_1$ slightly anastomosed with RS near base and never connected with it by bar in either sex Sterrhinae
- Hind wing $Sc+R_1$ strongly anastomosed with RS, or nearly connected with it by a bar beyond middle of cell in male Larentiinae

Subfamily A. GEOMETRINAE (Boarminae)

Key to the genera

1. Scaling smooth or moderately hairy 2
- Scaling rough and much hairy 8
2. Palpi short and clothed with short hairs 3
- Palpi long and clothed with long hairs 4
3. Fore wing R_2-R_5 stalked ; R_1 anastomosed with R_2 and Sc. Male antennae simple *Bapta* Stephens
- Fore wing R_3-R_5 stalked ; R_1 free ; R_2 absent. Male antennae serrate *Pristostegania* Warren
4. Palpi clothed with hairs throughout the length 5

- Palpi with 2nd segment thickly clothed with hairs, 3rd naked. Fore wing R1-R2 stalked and connected with Sc and R3-R4 *Synegia* Guenée
- 5. Hind wing with outer margin not angled at M3 6
- Hind wing with outer margin angled at M3 ; both wings Cula from angle of cell; fore wing R2 absent and with fovea in male. Male antennae never bipectinate *Macaria* Curtis
- 6. Fore wing outer margin excised below apex ; R1 and R2 from cell *Pseudopanthera* Hübner
- Fore wing outer margin not excised below apex 7
- 7. Fore wing apex not produced ; outer margin suberect ; R1-R2 stalked with R3-R5
..... *Eurytaphria* Warren
- Fore wing apex produced ; outer margin very oblique ; R1 free from R3-R5, R2 being absent
..... *Luxiaria* Walker
- 8. Both wings broad ; fore wing apex quadrate, outer margin suberect and male fovea absent
..... *Gnophos* Treitschke
- Both wings narrow ; fore wing apex acute, outer margin oblique and male fovea often present
..... 9
- 9. Male without hair-tufts from hind coxae and edge of abdominal stigmata
..... *Boarmia* Treitschke
- Male with long hair-tufts from hind coxae and edge of abdominal stigmata
..... *Psilalcis* Warren

Genus I. *Bapta* Stephens (1829)1. *Bapta platyleucata* (Walker, 1866)1866. *Acidalia platyleucata* Walker, *Cat. Lep. Het. Brit. Mus.*, 35 : 1628.1914. *Bapta platyleucata* : Prout, *Macrolep. World*, 4 : 315, fig. 15e.

Material examined : One (F), Kurseong, Darjiling district, C. Duncan Coll. (Old Collection).
Wing expanse : 33 mm.

Diagnosis : Palpi and frons rufous ; both wings white, thickly irrorated with fuscous and with a dark speck at end cell, costa of the fore pair fulvous.

Distribution : India : West Bengal (Darjiling) ; Jammu and Kashmir ; Meghalaya. *Elsewhere*: Afghanistan and West China.

Genus II. *Pristostegania* Warren (1897)
(*Stegania*)

2. *Pristostegania trilineata* (Moore, 1867)

1867. *Hyria trilineata* Moore, *Proc. zool. Soc. Lond.*, 1867 : 642.

1900. *Pristostegania trilineata* : Swinhoe, *Cat. East. Austral. Lep. Het.*, 2 : 238.

Material examined : One (F), Kurseong, Darjiling district (*Old Collection*). *Wing expanse* : 26 mm.

Diagnosis : Body fuscous suffused with ochreous. Wings with curved orange lines.

Distribution : India : West Bengal (Darjiling).

Remarks : The species is placed here with *Pristostegania* after Swinhoe (1900), in which the specimen examined fits well.

Genus III. *Synegia* Guen  (1857)

* 3. *Synegia* sp.

Material examined : One (F), Kurseong, Darjiling district, C. Duncan Coll. (*Old Collection*). *Wing expanse* : 39 mm.

Remarks : On the basis of a single female, the species could not be identified. The specimen examined is apparently allied to *S. lunulosa* (Moore) from Sikkim, but differs by the absence of sinuous black mark below the apex of fore wing and basal half of hind wing not rufous.

Genus IV. *Pseudopanthera* Hubner (1818)
(*Venilia*).

4. *Pseudopanthera himalayica* (Kollar, 1848)

1848. *Ennomos himalayica* Kollar, in H gel, *Kasch. Reich Seik*, 2 : 485.

1915. *Pseudopanthera himalayica* : Prout, *Macrolep. World*, 4 : 343, fig. 18 d.

Material examined : One (M), loc. ?, c 2025 m, Darjiling district, 'at light'.. 10. vi. 1975, J.K. Jonathon and party coll. *Wing expanse* : 25 mm.

Diagnosis : Fore wing with large spot at middle of costa and dorsum, termen angled and hind wing anal margin also medially maculate.

Distribution : India : West Bengal (Darjiling) ; Himachal Pradesh ; Sikkim ; Uttar Pradesh.

Genus V. *Eurytaphria* Warren (1893)

* 5. *Eurytaphria undilineata* Warren (1893)

1893. *Eurytaphria undilineata* Warren, *Proc. zool. Soc. Lond.*, 1893 : 410.

Material examined : One (M), Kurseong, Darjiling district, C. Duncan Coll. (*Old Collection*).
Wing expanse : 22 mm.

Diagnosis : Fore wing grey, irrorated rufous, antemedian line angled and postmedian line curved; hind wing with a postmedian series of specks ; both wings with end-cell speck and dark marginal line.

Distribution : India : West Bengal (Darjiling) ; Kerala ; Sikkim. *Elsewhere* : Burma.

Genus VI. *Luxiaria* Walker (1860)

6. *Luxiaria contigaria* (Walker, 1861)

1861. *Acidalia contigaria* Walker, *Cat. Lep.Het. Brit. Mus.*, 22 : 754.

1915. *Luxiaria contigaria* : Prout, *Macrolep. World*, 4 : 350, fig. 181.

Material examined : One (M), Kurseong, Darjiling district, C. Duncan Coll. (*Old Collection*).
Wing expanse : 52 mm.

Diagnosis : Yellowish brown with wings having end-cell speck, sinuous medial and waved postmedial and sub-marginal lines, the last two being conjoined into a diffused band, and a marginal series of specks.

Distribution : India : West Bengal (Darjiling); Himachal Pradesh ; Maharashtra ; Meghalaya; Sikkim ; Tamil Nadu. *Elsewhere* : Borneo, Central and West China, Japan, Korea, Sri Lanka and Sumatra.

Remarks : As reconciled from the literature review, the species, of which the female is much paler, is common in status and enjoys wide range of distribution. It is variable in facies to such an extent that Swinhoe (1900) treated most of the forms in the synonymy list of *contigaria* (*vide* Hampson, 1895) as separate species. Subsequently, Prout (1915) agreed with the views of Hampson (*loc. cit.*) and considered two more Eastern Palaearctic forms, viz., *melanops* Bastelb. and *amasa* Btlr., under the species concerned. The specimen examined belongs to the nominal form.

Genus VII. *Macaria* Curtis (1823)

7. *Macaria pluviata* (Fabricius,? 1793)
(*sufflata*)

1793. *Phalaena pluviata*, Fabricius, *Syst. Ent.*, .. (o.s. unseen).

1915. *Macaria pluviata* : Prout, *Macrolep. World*, 4 : 348, pl. 18 g.

Material Examined : One (F), Calcutta, Mus. Coll. (*Old Collection*). *Wing expanse* : 26 mm.

Diagnosis : Fore wing without patch between median and postmedian lines and subapical spot, too; hind wing postmedian line well apart from cell-spot ; both wings with ground colour whitish ochreous, cilia not chequered and underside yellow.

Distribution : India : West Bengal (Calcutta; Darjiling); almost throughout the rest of mainland. *Elsewhere* : Burma, China, Japan, Pakistan, Sri Lanka and South-East Siberia.

Remarks : This widely distributed species has quite a few subspecies, of which the one, i. e., *hebesata* Walker from eastern and northern India up to Shanghai, suits for the specimen examined. It differs from the nominal counterpart, from the rest of India, by the absence of fore wing markings and other characters cited above and also by the smaller wing expanse. It may further be mentioned that *M. vasudeva* Walker from Darjiling earlier treated as conspecific with *sufflata* Guené'e by Hampson (1895), was considered as a good species by Swinhoe (1900).

Genus VIII. *Gnophos* Treitschke (1827)
(*Gnophus*)

8. *Gnophos muscosaria* Walker (1866)
(*muscosarius*)

1866. *Gnophos muscosaria* Walker, *Cat. Lep. Het. Brit. Mus.*, 35 : 1956.

Material examined : One (M), 2 (F), Mid-wood, Darjiling district, 'at light' 22, 25. v., 3. vi. 1973, D.N. Nandi coll. *Wing expanse* : (M), 40, (F), 48-52 mm.

Diagnosis : Male hind wing underside and abdomen without hairy tufts ; fore wing R1 and R2 from cell and free, olivegreen and distal area with strong cupreous admixture ; underside brownish white, especially distally and postmedian line of hind wing prominently crenulate.

Distribution : India : West Bengal (Darjiling) ; North West Himalaya ; Sikkim. *Elsewhere* : Omei-Shan and Ta-Chien-lu.

Remarks : The species is typically mountain-dweller and found sitting on rocks with wings outspread. Swinhoe (1900) treated it under the genus *Scotopteryx* Hubner, but Prout (1915) placed it with *Gnophos*; the latter has been reasonably followed here.

Genus IX. *Boarmia* Treitschke (1825)

Key to the species

1. Male with fovea at the base of fore wing2
- Male without fovea at the base of fore wing. [Fore wing striated fuscous, with submarginal line spotted white at middle; hind wing white; both wings with cell-spot] ...*combustaria* (Walk.)
2. Male antenna serrate-fasciculate3
- Male antenna bipectinate up to 3/4th of length4
3. Fore wing white ; both wings with ocellated cell-spot *selenaria* (Schiff.)

- Fore wing irrorated fuscous-grey, with a cell-speck ; hind wing without ocellated cell-spot
..... *diversicolor* (Warr.)
4. Wings red-brown, with a black end-cell speck ; 1st abdominal segment banded black and white
..... *atrostipata* (Walk.)
- Wings whitish, with cell-spot centrally pure white ; 2nd abdominal segment banded rufous.
..... *alienaria* Wlk.

*9. *Boarmia diversicolor* (Warren, 1888)

1888. *Abraxas diversicolor* Warren, *Proc. zool. Soc. Lond.*, 1888 : 325.

1895. *Boarmia diversicolor* : Hampson, *Fauna Brit. India*, Moths, 3 : 257.

Material examined : 4 (F), Kurseong, Darjiling district (Old Collection). *Wing expanse* : 38-45 mm.

Diagnosis : Vide key.

Distribution : India : West Bengal (Darjiling); Punjab.

10. *Boarmia selenaria* (Schiffermuller, 1776)

(*Selenaria*, ? Hubner)

1776. *Geometra selenaria* Schiffermuller, *Syst. Verz. Schmett. Wien. Geg.*, p. 101.

1915. *Boarmia selenaria* : Prout, *Macrolep. World*, 4* : 376, pl. 219.

Material examined : One (F), Kurseong, Darjiling district, C. Duncan coll. (Old Collection). *Wing expanse* : 62 mm.

Diagnosis : Vide key.

Distribution : India : West Bengal (Darjiling); Madhya Pradesh; Meghalaya; North-West Himalaya; Sikkim. *Elsewhere* : China, Ethiopian Region, Europe, Japan, Korea, Middle-East, Nepal, Sri Lanka and U.S.S.R.

Remarks : This widely distributed species is known to be common in the Palaearctic Region. It is a variable element at the subspecific level and, referable to the ssp. *dianaria* Hubner with much more grey-brown colour from the warmer latitudes including India. It is bivoltine and feeds on various low plants. Like the African and Japanese specimens, the one now examined is also larger than usual (cf. Hampson, 1895). The species, earlier treated in the genus *Ascotis* Hubner by Swinhoe (1900), fits well in *Boarmia*. According to the 'Law of Priority', the author of the species should be Schiffermuller and not Hubner.

11. *Boarmia alienaria* Walker (1860)

(*Acaciaria*, part.)

1860. *Boarmia alienaria* Walker, *Cat. Lep. Het. Brit. Mus.*, 21 : 370.

Material examined : One (F), Midwood, Darjiling district, 19.v. 1973, 'at light' D.N. Nandi

Coll. *Wing expanse* : 33 mm.

Diagnosis : *Vide key*.

Distribution : India : West Bengal (Darjiling) ; Andaman Islands : Assam; Maharashtra ; Meghalaya ; Sikkim. *Elsewhere* : Australia, Bangladesh and Sri Lanka.

Remarks : Hampson (1895) confused *B. acaciaria* Boisduval with quite a few allied species as treated in the synonymy list. In fact, this is a composite group of species from the Indo-Australian and African Regions, as observed by Prout (1915). *B. alienaria* is considered here as a good species after Swinhoe (1900), who reasonably separated this from other members of the *acaciaria*-group. It feeds on *Alseodaphne semicarpifolia*, *Cassia fistula*, *Cinnamomea* sp., *Dalbergia volubilis* and *Shorea robusta*.

12. *Boarmia atrostipata* (Walker, 1862)

1862. *Scotosia atrostipata* Walker, *Cat. Lep. Het. Brit. Mus.*, **25** : 1354.

1900. *Boarmia atrostipata* : Swinhoe, *Cat. East Austral. Lep. Het.*, **2** : 292.

Material examined : 2 (F), in and around Govt. House, Darjiling, vii. 1912, Lord Car Michael Coll. (*Old Collection*). *Wing expanse* : 41-43 mm.

Diagnosis : *Vide key*.

Distribution : India : West Bengal (Darjiling) ; Himachal Pradesh ; Sikkim.

13. *Boarmia combustaria* (Walker, 1866)

1866. *Gnophos combustaria* Walker, *Cat. Lep. Het. Brit. Mus.*, **35** : 1597.

1895. *Boarmia combustaria* : Hampson, *Fauna Brit. India, Moths*, **3** : 278.

Material examined : One (F), Midwood, Darjiling district, 26. v. 1973, 'at light' *D.N. Nandi* Coll. *Wing expanse* : 43 mm.

Diagnosis : *Vide key*.

Distribution : India : West Bengal (Darjiling).

Genus X. *Psilalcis* Warren (1893) (*Boarmia*)

*14. *Psilalcis inceptaria* (Walker, 1866)

1866. *Tephrosia inceptaria* Walker, *Cat. Lep. Het. Brit. Mus.*, **35** : 1590.

1900. *Psilalcis inceptaria* : Swinhoe, *Cat. East Austral. Lep. Het.*, **2** : 287.

Material examined : One (F), Kurseong, Darjiling district (*Old Collection*). *Wing expanse* : 32 mm.

Diagnosis : Reddish brown. Fore wing with a black mark on costa near base and end-cell spot, the lines being mostly ill-defined, both wings with crenulate black marginal line.

Distribution : India : West Bengal (Darjiling) ; Sikkim. *Elsewhere* : Burma, Flores and Sri Lanka.

Remarks : The species, which is distinct from *P. breta* (Swinhoe) from the Nilgiris (*Vide* synonymy list in Hampson, 1895), feeds on the flowers and leaves of *Lantana aculeata*.

Subfamily B. LARENTIINAE

Key to the genera

1. Hind wing Sc+R1 bar-connected with Rs near mid-cell [Palpi scaled. Fore wing R1-2 anastomosed with R3-5 ; hind wing M1 from cell]..... *Naxidia* Hampson
- Hind wing Sc+R1 anastomosed with Rs to mid- or near end-cell 2
2. Fore wing non-areolate [Fore wing radials all stalked. Palpi porrect, more than twice the head-length, 2nd segment thickly hairy] *Hypenorhynchus* Hampson
- Fore wing areolate 3
3. Fore wing double-areolate 4
- Fore wing single-areolate 7
4. Hind tibia without mesial pair of spurs [Palpi more than twice the head length. Hind wing Rs and M1 from cell. Abdomen very long] *Phthonoloba* Warren
- Hind tibia with mesial pair of spurs 5
5. Frons sharply tufted 6
- Frons smoothly rounded [Fore wing termen suberect ; hind wing ample] *Asthena* Hubner
6. Hind wing termen crenulate [Palpi long. Male antenna prominently flattened, mid tibia dilated and abdomen long, with a large anal tuft] *Collix* Guenee
- Hind wing termen noncrenulate [Palpi short. Antenna variable in form but not flattened. Both wings termen rounded] *Cidaria* Treitschke
7. Fore wing R2 anastomosing with R3-4, R5 and M1 from cell ; hind wing in male usually lobed at base. Palpi and abdomen very long. Antennae highly thickened and flattened. Male hind tibia without spur, female with one pair *Sauris* Guenee

- Fore wing R1-2 anastomosing with R3-4, R5 and M1 stalked ; hind wing in male never lobed at base. Palpi and abdomen moderately long. Antennae never highly thickened and flattened. Hind tibia in both sexes with two pair of spurs *Cataclysmes* Hubner

Genus XI. *Naxidia* Hampson (1895)

Key to the species

Fore wing slightly irrorated fuscous ; all the series of specks from antemedial to marginal prominent. Hind wing in both sexes not pale fuscous throughout ; underside postmedial line highly angled at M2 *punctata* (Butl.)

Fore wing thickly irrorated olivefuscous ; all the above-mentioned series of specks indistinct. Hind wing in female pale fuscous throughout ; underside postmedial line not distinctly angled at M2
..... *irrorata* (Mre.)

15. *Naxidia punctata* (Butler, 1880)

1880. *Argidava punctata* Butler, *Ann. Mag. nat. Hist.*, (5) 6 : 128.

1914. *Naxidia punctata* : Prout, *Macrolep. World*, 4 : 192, pl. 7f.

Material examined : 3 (M), 11(F), Kurseong, Darjiling district (*Old Collection*). *Wing expanse* : (M) 30-32, (F), 31-38 mm.

Diagnosis : *Vide* key.

Distribution : India : West Bengal (Darjiling) ; Nagaland. *Elsewhere* : West China.

Remarks : The species is nocturnal in habit and apparently very common in the East Himalaya. Prout (1914) stated it as 'scarcely penetrating into the essentially Palaearctic Region'

16. *Naxidia irrorata* (Moore, 1887)

1887. *Argidava irrorata* Moore, *Descr. new Indian Lep. Ins. Coll. Atkinson*, p. 251.

1914. *Naxidia irrorata* : Prout, *Macrolep. World*, 4 : 192, pl. 11e.

Material examined : One (M), Kurseong, Darjiling district (*Old Collection*). *Wing expanse* : 30 mm.

Diagnosis : *Vide* key.

Distribution : India ; West Bengal (Darjiling); Nagaland. *Elsewhere* : West China.

Genus XII. *Hypenorhynchus* Hampson (1895)* 17. *Hypenorhynchus erectilineatum* (Moore, 1887)1887. *Lygranoa rectilineata* Moore, *Descr. new Indian Lep. Ins. Coll. Atkinson*, p. 272.1895. *Hypenorhynchus erectilineatum* : Hampson, *Fauna Brit. India, Moths*, 3 : 341.

Material examined : One (M), Kurseong, Darjiling district, C. Duncan Coll. (Old Collection).
Wing expanse : 20 mm.

Diagnosis : Body grey; palpi at sides and foreleg bands brown; fore wing with erect ante — and postmedial diffused lines and cell-speck all brown, cilia grey-brown.

Distribution : India : West Bengal (Darjiling); Meghalaya.

Remarks : Hampson (1895) redescribed the only species of his genus by male from the khasi Hill.

Genus XIII. *Collix* Guenee (1857)*(Phibalapteryx)*

Key to the species

Body grey-brown. Wings with prominent waved lines, submarginal series of specks obsolete; underside whitish, postmedial band replaced by a series of streaks coalescing at middle with the submarginal spots except the one between M_3 and Cu_{1a} *ghosha* Wlk.

Body dark fuscous to brown. Wings with indistinct waved lines, submarginal series of brown specks developed; underside fuscous brown, postmedial band prominent, obscure in female and not coalescing with the submarginal series of spots, of which one between M_3 and Cu_{1a} being absent
 *hyospilata* Guen.

* 18. *Collix ghosha* Walker (1862)1862. *Collix ghosha* Walker, *Cat. Lep. Het. Brit. Mus.*, 24 : 1249.

Material examined : One (F), Kurseong, Darjiling district, C. Duncan Coll. (Old collection).
Wing expanse : 32 mm.

Diagnosis : Vide key.

Distribution : India : West Bengal (Darjiling); Maharashtra; Meghalaya. *Elsewhere* : South Burma and Sri Lanka.

* 19. *Collix hyospilata* Guenée (1857)

1857. *Collix hyospilata* guenée, *Hist. nat. Ins. Lep.*, 2 : 358.

Material examined : One (M), Kurseong, Darjiling district (*Old Collection*). *Wing expanse* : 33 mm.

Diagnosis : *Vide* key.

Distribution : India : West Bengal (Darjiling); Maharashtra; Meghalaya; Tamil Nadu. *Elsewhere*: Japan, South Africa and Sri Lanka.

Remarks : The specimen examined is smaller than usual (*Vide* Hampson, 1895).

Genus XIV. *Cataclysmes* Hubner (1816)* 20. *Cataclysmes conturbata* (Walker, 1862)

1862. *Larentia conturbata* Walker, *Cat. Lep. Het. Brit. Mus.*, 26 : 1703.

1914. *Cataclysmes conturbata* : Prout, *Macrolep. World*, 4 : 266.

Material examined : One (F), Mal, Darjiling 25.v.1973, 'at light' D. N. Nandi coll. *Wing expanse*: 40 mm.

Diagnosis : Fore wing with a dark end-cell spot, median band excised and both wings with clear white postmedian band. Body grey-fuscous.

Distribution : India : West Bengal (Darjiling); Meghalaya; North-West Himalaya; Tamil Nadu.

Remarks : *Paraplaneta* Warren, in which the species was treated by Swinhoe (1900), is the subgenus of *Cataclysmes* after Prout (1914).

Genus XV. *Cidaria* Trietschke (1828)

Key to the species

Male antenna simple. Body grey-brown. Fore wing antemedial line dark; medial band with wavy edges; outer area tinged pinkish; submarginal patches on costa and below apex. Hind wing fuscous; underside postmedial line wavy *scorteae* Swinh.

Male antenna bipectinate. Body dark grey-brown with vinous scales. Fore wing antemedial band green with 2 each of black lunules and dentate lines on it; medial band with wavy black lines on it, enclosing black patches and spots; outer area green; submarginal line pale and wavy. Hind wing mostly white. Both wings underside with cell-spot and postmedial line angled *curcumata* Mre.

* 21. *Cidaria scortea* Swinhoe (1891)

1891. *Cidaria scortea* Swinhoe, *Trans. ent. Soc. Lond.*, p. 493.

Material examined : One (M), Kurseong, Darjiling district, C. Duncan Coll. (*Old Collection*).
Wing expanse : 33 mm.

Diagnosis : *Vide* key.

Distribution : India : West Bengal (Darjiling); Meghalaya; Sikkim.

22. *Cidaria curcumata* Moore (1887)

1887. *Cidaria curcumata* Moore, *Descr. new Indian Lep. Ins. Coll. Atkinson*, p. 278.

Material examined : 2(F), Kurseong, Darjiling district (*Old Collection*). *Wing expanse* : 23-28 mm.

Diagnosis : *Vide* key.

Distribution : India : West Bengal (Darjiling); Himachal Pradesh; Meghalaya; Sikkim.

Remarks : The specimens examined are appreciably smaller than usual (*vide* Hampson, 1895).

23. *Cidaria* sp.

Material examined : One (M), Darjiling (*Old Collection*). *Wing expanse* : 37 mm.

Remarks : The specimen examined is rather too badly rubbed off to obscure its diagnostic features; but it seems to be nearer to *C. truncata* (Hubner), a highly variable species, after Prout (1914), being known from the East Himalaya and elsewhere.

Genus XVI. *Phthonoloba* Warren (1894)24. *Phthonoloba decussata* (Moore, 1867)

1867. *Sauris ecussata* Moore, *Proc. zool. Soc. Lond.*, 1867 : 655, pl.33, fig. 10.

1895. *Phthonoloba decussata* : Hampson, *Fauna Brit. India*, Moths, 3 : 407, fig. 190.

Material examined : One (M), Kurseong, Darjiling district, C. Duncan Coll. (*Old Collection*).
Wing expanse : 32 mm.

Diagnosis : Head, thorax and fore wing bright green and marked with black lines and patches; palpi at tips and antennal rings black; hind wing and abdomen fuscous, latter basally and terminally green.

Distribution : India : West Bengal (Darjiling); Kerala; Meghalaya; Sikkim; Tamil Nadu.

Genus XVII. *Sauris* Guenée (1857)

25. *Sauris hirudinata* Guenée (1857)

1857. *Sauris hirudinata* Guenée, *Hist. nat. Ins. Lep.*, 2 : 362.

Material examined : 5 (F), Kurseong, Darjiling district, C. Duncan Coll. (Old Collection). *Wing expanse* : 27-36 mm.

Diagnosis : Head, thorax and fore wing olive-green, the last with silvery scales, many lines, purplish suffusion and black marginal spots; hind wing and abdomen fuscous.

Distribution : India : West Bengal (Darjiling); Meghalaya; Sikkim; Tamil Nadu. *Elsewhere* : Australia, Burma, Ethiopian, Malayan, Micronesian and Sri Lanka.

Genus XVIII. *Asthenia* Hübner (1816)

26. *Asthenia plurilinearia* (Moore, 1867)

1867. *Somatina plurilinearia* Moore, *Proc. zool. Soc. Lond.*, 1867 : 645.

1914. *Asthenia plurilinearia* : Prout, *Macrolep. World*, 4 : 273, pl. 10 i.

Material examined : One (F), Kurseong, Darjiling district (Old Collection). *Wing expanse* : 30 mm.

Diagnosis : Body ochreous. Palpi, frons, vertex and collar black-banded; fore wing with many dark lines, costo-basal patch, black end-cell spot and both wings with submarginal series of white spots and dark marginal line.

Distribution : India : West Bengal (Darjiling); Meghalaya; North West Himalaya; Sikkim. *Elsewhere* : Japan and U.S.S.R.

Remarks : The specimen examined is quite smaller than usual particularly in female (*vide* Hampson, 1895). Swinhoe (1900) treated the species in the genus *Laciniodes* Warren which was aptly considered as the subgenus of *Asthenia* by Hampson (*loc. cit.*)

Subfamily C. STERRHINAE
(Acidaliinae)

Key to the genera

1. Palpi short, 3rd segment not prominent2
- Palpi long, 3rd segment quite prominent [Fore wing R_1 shortly anastomosed at origin with the stalk of R_{2+5} . Male antenna bipectinate to near apex] *Anisodes* Guenée.

- 2. Fore wing single-areolate 3
- Fore wing double-areolate [Male antenna bipectinate to near apex. Male hind tibia with 2 pair of spurs. Wing margins angled at M_3 ; fore wing Cu_{1a} from angle of cell; hind wing Rs and M_1 from cell] *Synegiodes* Swinhoe
- 3. Hind wing outer margin not produced to a point at M_3 5
- Hind wing outer margin produced to a point at M_3 4
- 4. Hind tibia in male not dilated. Fore wing R_1 not anastomosed with $R_{3,5}$; hind wing M_3 and Cu_{1a} from cell *Traminda* Warren
- Hind tibia in male fringed and dilated with a tufted fold. Fore wing R_1 anastomosed with $R_{3,5}$; hind wing M_3 and Cu_{1a} stalked *Calothysanis* Hübner
- 5. Both wings M_2 from mid-discocellular 6
- Both wings M_2 from above mid-discocellular [Hind wing outer margin evenly rounded] *Problepsis* Lederer
- 6. Hind tibia in both sexes without median spur. Hind wing Rs and M_1 stalked *Sterrha* Hübner
- Hind tibia in female with 2 pair of spurs, spurs being totally absent in male. Hind wing Rs and M_1 from cell *Scopula* Schrank

Genus XIX. *Scopula* Schrank (1802)

(*Craspedia*)

Key to the species

- 1. Hind wing margin angled at M_3 ; both wings with marginal series of dark specks 2
- Hind wing margin uniformly rounded 5
- 2. Both wings without streak or patch; hind wing cell-spot embraced by medial line *walkeri* (Butl.)
- Both wings with streaks or patches 3
- 3. Both wings with antemedial line and submarginal series of markings, but without medial line 4

- Both wings without antemedial line and submarginal series of markings, but with medial line; fore wing postmedial line prominently dentate with orange patches above middle and inner margin; hind wing with a black cell speck and postmedial line with fulvous patches above middle *moorei* (C. & Swinh.)
4. Fore wing antemedial line prominently curved and submarginal series of dark streaks on diffused spots; both wings with large diffused dark mark at end-cell and postmedial line minutely dentate with a maculate fuscous band beyond *fluidaria* (Swinh.)
- Fore wing antemedial line indistinctly waved, with a cell-speck, postmedial line much excurved below costa, with rufous patches, submarginal series of markings blue grey; hind wing postmedial line waved with fuscous marks above inner margin and a black cell-spot embraced by medial line *pulchellata* (Fabr.)
5. Wings fuscous grey to pale ochreous; cell-speck present 6
- Wings cream-coloured with a few black scales; cell-speck may be absent 7
6. Fore wing antemedial line dentate, reaching costa, postmedial line much dentate at M_1 , submarginal line crenulate and expanded into patches at middle and above inner margin *fibulata* (Guen.)
- Fore wing antemedial line waved, not reaching costa, postmedial line waved and running into hind wing antemedial line; both wings submarginal line distinctly dentate with 2 indistinct waved lines beyond *remotata* (Guen.)
7. Wings with all bands waved, end-cell speck absent and marginal series of minute black specks *aspilataria* (Wlk.)
- Wings with all bands reduced to lines, end-cell-speck present, medial line excurved beyond cell, postmedial line angled at M_1 and M_3 and marginal specks absent *actuaria* (Walk.)

27. *Scopula moorei* (Cotes and Swinhoe, 1888)

1888. *Anisodes moorei* Cotes and Swinhoe, *Cat Moths India*, 4:532.

1934. *Scopula moorei* : Prout, *Lep. Cat.*, 63(2) : 224.

Material examined : One (M), Kurseong, Darjiling district (*Old Collection*). *Wing expanse* : 37mm.

Diagnosis : Vide key.

Distribution : India : West Bengal (Darjiling); West and North-West Himalaya. *Elsewhere* : Central and West China and also Taiwan.

Remarks : The specimen examined may be referred to the nominal subspecies which is known

to fly in the wet season.

28. *Scopula walkeri* (Butler, 1883)

1883. *Idaea Walkeri* Butler, *Proc. zool. Soc. Lond.*, **1883**:170.

1934. *Scopula walkeri* : Prout, *Lep. Cat.*, **63**(2) : 224.

Material examined : One (F), Kurseong, Darjiling district, C. Duncan Coll. (*Old Collection*).
Wing expanse : 30mm.

Diagnosis : Vide key.

Distribution : India : West Bengal (Darjiling); Andaman Islands; Bihar; Madhya Pradesh; Maharashtra; Meghalaya; North-West Himalaya; Sikkim; Tamil Nadu. *Elsewhere* : Burma and Sri Lanka.

Remarks : Prout (1934) cited only 'Ceylon' (now Sri Lanka) as the distribution of the species, but review from literature reveals that it also occurs in other areas as stated above.

*29 *Scopula fluidaria* (Swinhoe, 1885)

1885. *Ephyra fluidaria* Swinhoe, *Proc. zool. Soc. Lond.*, **1885**:856, pl. 56, fig.10.

1934. *Scopula fluidaria* ; Prout, *Lep. Cat.*, **63**(2):221.

Material examined : One (F), Kurseong, Darjiling district, C. Duncan Coll. (*Old Collection*).
Wing expanse : 20mm.

Diagnosis : Vide key.

Distribution : India : West Bengal (Darjiling); Maharashtra. *Elsewhere* : Pakistan, Sri Lanka and Taiwan(?).

Remarks : The species shows its origin in the Indian subregion, though Prout (1934) doubtfully referred to its distributional range extending to Taiwan.

*30. *Scopula pulchellata* (Fabricius, 1794)
(*addictaria*)

1794. *Phalaena pulchellata* Fabricius, *Ent. Syst.*, **3**(2) : 171.

1934. *Scopula pulchellata* : Prout, *Lep. Cat.*, **63**(2) : 221.

Material examined : One (M), 1(F), Calcutta, *Mus. Coll.* (*Old Collection*), Salt Lake, Calcutta, 'at light' 25.x.1989, S.K. Ghosh Coll.

Diagnosis : Vide key.

Distribution : India : West Bengal (Calcutta); East and North-West Himalaya and throughout the rest of the Peninsula; Lakshadweep Is. *Elsewhere* : Burma, Sri Lanka, Sino-Malayan, South Yemen and Ethiopio-Malagassic.

*31. *Scopula fibulata* (Guenée, 1857)

1857. *Acidalia fibulata* Guenée, *Hist. nat. Ins. Lep.*, 1:490, pl.15, fig.5.

1934. *Scopula fibulata* : Prout, *Lep. Cat.*, 63(2) : 198.

Material examined : 19 (M), 25 (F), Kurseong, Darjiling district (*Old Collection*). *Wing expanse*: (M), 22-25, (F), 24-28 mm.

Diagnosis : *Vide key*.

Distribution : India : West Bengal (Darjiling); Himachal Pradesh; Madhya Pradesh; Maharashtra; Meghalaya; Punjab; Tamil Nadu. *Elsewhere* : Burma, Hainan, Pakistan, Sri Lanka and Tonkin.

Remarks : Most of the synonyms treated under *fibulata* by Hampson (1895) have been considered as distinctly heterospecific by Prout (1934). The species under study is apparently very common in the Darjiling district, though no fresh material could be brought to the Survey during the recent faunistic exploration in the state. Furthermore, this species is not on record from the state so far, as reviewed from the literature.

*32. *Scopula aspilataria* (Walker, 1861)

1861. *Acidalia aspilataria* Walker, *Cat. Lep. Het. Brit. Mus.*, 23:791.

1934. *Scopula aspilataria* : Prout, *Lep. Cat.*, 63(2) : 266.

Material examined : One (M), 1(F), Kurseong, Darjiling district (*Old Collection*). *Wing expanse*: 21mm.

Diagnosis : *Vide key*.

Distribution : India : West Bengal (Darjiling); Meghalaya; Southern Peninsula. *Elsewhere* : Bhutan and Sri Lanka.

*33. *Scopula actuaria* (Walker, 1861)

1861. *Acidalia actuaria* Walker, *Cat. Lep. Het. Brit. Mus.*, 22 : 752.

1934. *Scopula actuaria* : Prout, *Lep. Cat.*, 63(2) : 262.

Material examined : 4 (F), Kurseong, Darjiling district (*Old Collection*). *Wing expanse* : 18-20 mm.

Diagnosis : *Vide key*.

Distribution : India : West Bengal (Darjiling); Andaman Islands; Himachal Pradesh; Maharashtra; Tamil Nadu. *Elsewhere* : Burma, Iran, Malayan, Pakistan, Papuan, Sri Lanka and Taiwan.

Remarks : The species was rather regarded by Prout (1913) as one of the Eastern representatives and closely related to the Sino-Japanese species, *personata* Prout. It feeds on the flowers and young leaves of *Lantana aculeata*.

34. *Scopula remotata* (Guenée, 1857)

1857. *Acidalia remotata* Guenée, *Hist. nat. Ins. Lep.*, 1 : 458.

1934. *Scopula remotata* : Prout, *Lep. Cat.*, 63(2) : 265.

Material examined : 6 (M), 9 (F), Calcutta, Mus. Coll., Kurseong, Darjiling district (*Old Collections*). *Wing expanse* : 21-28mm.

Diagnosis : *Vide key*.

Distribution : India : West Bengal (Calcutta; Darjiling); also other areas of the East Himalaya and eastern Peninsula. *Elsewhere* :? West Palaearctic.

Remarks : Hampson (1895) treated this element as a composite species under *Craspedia* Hübner in the subfamily Acidaliinae, with citation of as many as ten synonyms from a wide area of the Oriental Region. Subsequently, Prout (1913) replaced it in the genus *Acidalia* Treitschke, but later (1934) considered the same in the genus *Scopula* Schrank under the subfamily Sterrhinae. According to Prout (1934), *S. remotata* is rather restricted in "Nord-Indien" This is perhaps a duplex species of widely distributed Indo-African *minorata* Boisduval and also of the Palaearctic *ochrolecata* Herrich-Schaffer. Further, Prout (1913) raised the bivoltine Palaearctic species, *beckeraria* Butler (nec Lederer), from the synonymy list of *remotata* (*vide* Hampson, *loc.cit.*) to the status of distinct species, but later he (1934) dubiously resynonymised it with *remotata*.

Genus XX. *Sterrha* Hubner (1826)
(*Acidalia*)

*35. *Sterrha actiosaria* (Walker, 1861)

1861. *Acidalia actiosaria* Walker, *Cat. Lep. Het. Brit. Mus.*, 22:750.

1934. *Sterrha actiosaria* : Prout, *Lep. Cat.*, 63(2) : 404.

Material examined : 7 (M), 15 (F), Kurseong, Darjiling district (*Old Collection*). *Wing expanse*: 17-22 mm.

Diagnosis : Body purplish pink. Wings with wavy lines, dark cell-speck and also marginal series of specks.

Distribution : India : West Bengal (Darjiling); Sikkim; Tamil Nadu. *Elsewhere* : China, Malayan and Sri Lanka.

Remarks : Amongst the specimens examined , certain females have the stalk of R_s and M_1 slightly shorter on hind wing, while in a few males, R_1 of fore wing arises near the tip of areole.

Genus XXI. *Synegiodes* Swinhoe (1892)
(*Erythrolophus*)

36. *Synegiodes hyriaria* (Walker, 1866)
(*hyriarius*)

1866. *Anisodes hyriaria* Walker, *Cat. Lep. Het. Brit. Mus.*, 35 : 1617.

1934. *Synegiodes hyriaria* : Prout, *Lep. Cat.*, 61(1) : 48.

Material examined ; 2 (F), Kurseong, Darjiling district, C. Duncan Coll. (*Old Collections*). *Wing expanse* : 35-36mm.

Diagnosis : Body yellow-red, vertex of head and antennal shaft white. Fore wing costa at basal half purplish; both wings with white cell-speck and prominent bands.

Distribution : India : West Bengal (Darjiling); Heghalaya; Sikkim. *Elsewhere* : Burma and West China.

Remarks : The species shows sexual dimorphism particularly in respect of the much redder tinge and more prominent wing-bands of female. It may also be noted that *S. histrionaria* Swinhoe from Meghalaya which was sunk into the synonymy list of '*hyriarius*' by Hampson (1895), was later given the status of valid species by Swinhoe (1900), being subsequently followed by Prout (1934).

Genus XXII. *Anisodes* Guenée (1857)

37. *Anisodes absconditaria* Walker (1962)

1862. *Anisodes absconditaria* Walker, *Cat. Lep. Het. Brit. Mus.*, 26:1580.

Material examined : One (M), Kurseong, Darjiling district (*Old Collection*). *Wing expanse* : 34 mm.

Diagnosis : Body dark irrorated with fuscous. Both wings without antemedial speck and with distinctly waved postmedian line; hind wing with a large end-cell annulus ringed narrowly black and fore wing underside basally suffused pink.

Distribution : India : West Bengal (Darjiling); Meghalaya : Southern Peninsula. *Elsewhere* : Malayan and Taiwan.

Remarks : This species has two local forms, of which the northern one under report differs from its southern counter-part by the hind wing annulus with the ring narrow and distinct and not wide and diffused. The specimen examined has the wing expanse fairly shorter than that (40mm) mentioned by Hampson (1895) for the species. As in the preceding species, i.e., *S. hyriaria*, here also *A. patruelis*

Moore from Sri Lanka, which was treated as synonym of *A. absconditaria* by Hampson (*loc. cit.*), is a good species after Prout (1934). Swinhoe (1900), however, dealt with *A. absconditaria* under the genus *Perixera* Meyrick, which is not followed here.

Genus XXIII. *Traminda* Warren (1895)
(*Timandra*)

*38. *Traminda* sp.

Material examined : One (M), 3 (F), Calcutta (*Old Collection*). *Wing expanse* : (M), 16mm, (F), 18-20 mm.

Diagnosis : Body pale green to pink; vertex of head white. Fore wing with a discocellular speck, antemedial series of markings indistinct and an oblique line from mid-costa up to a little before the middle of hind wing margin; hind wing with a small white-centred discocellular ocellus and without a crimson speck at the tip of the point of outer margin at M_3 ; both wings mildly striated.

Remarks : The species examined is allied to the Indo-Australo-Ethiopian sp., *T. mundissima* (Walker), a defoliating species of *Acacia arabica*, but differing by the indistinct antemedial markings and midcostal oblique line of fore wing terminating to pre-mid-anal margin of hind wing and also by the absence of hind wing marginal crimson speck. The male genitalia could not be studied, as its abdomen is missing.

Genus XXIV. *Problepsis* Lederer (1852)

*39. *Problepsis vulgaris* Butler (1889)
(*delphiaria*)

1889. *Problepsis vulgaris* Butler, *Ill. Typ. Lep. Het. Brit. Mus.*, 7:43, pl. 125, fig.2.

Material examined : One (F), Rangaroon Forest Rest House, alt. c. 2050 metres, Darjiling district, 'at light' 30.v.1979, M.S. Shishodia coll. *Wing expanse* : 32 mm.

Diagnosis : Body white. Fore wing inner marginal spot prominent and proximal edge of ocellus bordered by a thick black mark; both wings with median markings dark.

Distribution : India : West Bengal (Darjiling; North-West Himalaya; Southern Peninsula. *Elsewhere* : Sino-Malayan and Sri Lanka.

Remarks : Prout (1913, 1934) segregated this good species from the synonymy list of *P. delphiaria* (Guenée) as earlier treated by Hampson (1895) and Swinhoe (1900). In fact, *P. delphiaria*, s. str., is not an Indian species.

Genus XXV. *Calothysanis* Hübner (1825)
(*Timandra*)

*40. *Calothysanis convectaria* (Walker, 1861)
(*amataria*)

1861. *Timandra convectaria* Walker, *Cat. Lep. Het. Brit. Mus.*, 23:800.

1934. *Calothysanis convectaria* : Prout, *Lep. Cat.*, 61(1):56.

Material examined ; One (M), Kurseong, Darjiling district (*Old Collection*). *Wing expanse* : 32 mm.

Diagnosis : Antennal shaft and basal half of fore wing costa fuscous. Fore wing with prominent dark dots on M2 and M3 and subcostals close to apex; hind wing tail pointed; both wings tinged reddish with oblique line rufous and cilia dark.

Distribution : India : West Bengal (Darjiling); Maharashtra; North-West Himalaya; Sikkim; Tamil Nadu. *Elsewhere* : Bangladesh, China and Sri Lanka.

Remarks : Like the preceding species, this one also is quite valid after Prout (1934) who segregated it from the synonymy list of *T. amataria*, Hampson (1895). The species, *amataria* (now, *amata*, Linnaeus) is Palaearctic in distribution, but does not occur in India.

Subfamily D. HEMITHEINAE
(Geometrinae)

Key to the genera

1. Hind wing without basal expansion. Frenulum present in both sexes 2
- Hind wing with marked basal expansion. Frenulum in female obsolete 5
2. Hind tibia without median spurs. Prevailing colouration never leaf-green. Head without hood. Pectus not densely hairy. Hind wing Sc+R₁ approximated to cell at point only near base. Femora glabrous] *Epipristis* Meyrick
- Hind tibia with median spurs. Prevailing colouration leaf-green 3
3. Fore wing apex falcate, termen smooth [Third joint of palpus elongate] . *Tanaorhinus* Butler
- Fore wing apex not falcate, nor termen smooth. 4
4. Antennae in male simple [Metathorax not crested. Fore wing not angled at M₃]
..... *Agathia* Guenée
- Antennae in male bipectinate [Both wings termen strongly and irregularly dentate]
..... *Chlorodontopera* Warren

5. Hind tibia in male with two spurs [Hind wing Sc+R₁ anastomosing at a point, M₂ from middle of cell; tailed. Antennae in male ciliated. Abdomen with small crests]. *Hemithea* Duponchel
 — Hind tibia in male with four spurs 6
6. Hind wing with DC continuously and extremely oblique *Thalassodes* Guenée
 — Hind wing with DC not so [Palpus in female with third joint not very long. Abdomen without crests] *Gelasma* Warren

Genus XXVI. *Epipristis* Meyrick (1888)
 (*Pseudoterpna*)

*41. *Epipristis minimaria* (Guenée, 1857)

1857. *Hypochroma minimaria* Guenée, *Hist. nat. Ins. Lep.*, 1:279.

1913. *Epipristis minimaria* : Prout, *Lep. Cat.*, 14:6.

Material examined ; One (F), Kurseong, Darjiling district (*Old Collection*). *Wing expanse* : 25 mm.

Diagnosis : Body brown. Fore wing antemedial line wavy, distal area rather pink.

Distribution : India : West Bengal (Darjiling); Meghalaya; Sikkim. *Elsewhere* : Australia, Borneo, Burma and Sri Lanka.

Remarks ; The specimen examined is too rubbed possibly to get its true identity. On the basis of general facies closely examined, it seems to fit in *E. minimaria* (Guenée).

Genus XXVII. *Chlorodontopera* Warren (1893)

42. *Chlorodontopera discospilata* (Moore, 1867)
 (*discopilata*)

1867. *Odontoptera discospilata* Moore, *Proc. zool. Soc. Lond.*, 1867:621.

1913. *Chlorodontopera discospilata* : Prout, *Lep. Cat.*, 14:38.

Material examined : One (M), Midwood, Darjiling district, 'at light', 25.v.1973, D.N. Nandi Coll. *Wing expanse* : 53mm.

Diagnosis : Body olive-green; abdomen dorsally tufted dark. Fore wing costa pink; hind wing ventrally with a curved black postmedial line; both wings with a large pale-edged black discocellular spot being reniform on hind wing, wavy lines, cilia pinkish and ventrally black-irrorated orange and cilia blackish.

Distribution : India: West Bengal (Darjiling); Meghalaya; Sikkim. *Elsewhere* : Taiwan.

Genus XXVIII. *Agathia* Guenée (1857)43. *Agathia lycaenaria* (Kollar, 1844)

1844. *Geometra lycaenaria* Kollar, in Hügel, *Kasch. Reich Seik., Ins.* 4 : 486.

1913. *Agathia lycaenaria* : Prout, *Lep. Cat.*, 14:36.

Material examined : One (F), Dakshin Para, Thakurpukur, South 24-Parganas district, 26.iii.1987, 'at light' D.N. Nandi Coll.

Diagnosis : Body bright green. Fore wing costal margin red-brown, with a basal patch, antemedial band and marginal line thickened; hind wing submarginal band developed at costa.

Distribution : India : West Bengal (Calcutta; South 24-Parganas); Himachal Pradesh; Kashmir; Maharashtra; Sikkim. *Elsewhere* : Bangladesh, China, Malayan and? Sri Lanka.

Remarks : The species shows sexual variations particularly in respect of the wing markings which are much more extended in female than in male. It is known as a defoliator of *Holarrhena antidysenterica* and *Tavernaemontana heyneana*. Prout (1912) mentioned this element 'as a rather common and widely distributed Indian species' that reaches the outskirts of the Palaearctic Region in West China. The 'Ceylonese' distribution of the species after Hampson (1895) is, however, doubtful.

Genus XXIX. *Hemithea* Duponchel (1829)*44. *Hemithea distinctaria* (Walker, 1866)

1866. *Thalassodes distinctaria* Walker, *Cat. Lep. Het. Brit. Mus.*, 35:1607.

1913. *Hemithea distinctaria* : Prout, *Lep. Cat.*, 14:112.

Material examined : One (M), Midwood, Darjiling district, 'at light', 25.v.1973, D.N. Nandi Coll. *Wing expanse* : 30 mm.

Diagnosis : Body blue-green. Fore wing postmedian line fine and straight; hind wing with this line slightly bent opposite to the angle in the distal margin; both wings with traces of cell-specks. Abdomen with small fuscous tufts. Underside white.

Distribution : India : West Bengal (Darjiling); Sikkim. *Elsewhere* : Bhutan and Tibet.

Remarks : The specimen examined is a little smaller than usual (35 mm), as mentioned by Hampson (1895).

Genus XXX. *Tanaorhinus* Butler (1979)
(*Tanaorrhinus*)*45. *Tanaorhinus kina* Swinhoe (1893)

1893. *Tanaorhinus kina* Swinhoe, *Ann. Mag. nat. Hist.*, (6) 12:150.

Material examined : One (M), Rangaroon Forest Rest House, Darjiling district, alt. c. 2050m, 9.vi.1975, 'at light', J.K. Jonathan & Party Coll. *Wing expanse* : 58 mm.

Diagnosis : Yellow-green. Fore wing antemedial line absent; cilia pure white; underside with submarginal black spots and blotches large and conjoined on hind wing and a marginal black line.

Distribution : India : West Bengal (Darjiling); Meghalaya.

Remarks : The specimen examined has a larger wing expanse than that (48mm) mentioned by Hampson (1895). The species is restricted to the East Himalaya.

Genus XXXI. *Thalassodes* Guenée (1857)

46. *Thalassodes opalina* Butler (1880)
(*veraria*)

1880. *Thalassodes opalina* Butler, *Ann. Mag. nat. Hist.*, (5)6:214.

Material examined; One (M), Sulka para, Jalpaiguri district, 28.viii.1975, H.K. Bhowmik & party Coll. *Wing expanse* : 44mm.

Diagnosis : Semitransparent emerald green; antennae white at base. Fore wing with white median line straight and costal margin yellow; hind wing postmedian line white, angular and basal half of Rs yellow; both wings white-striated, with opaline tinge and cilia yellow-tipped; underside paler, immaculate and fore wing costa cream coloured.

Distribution : India : West Bengal (Darjiling; Jalpaiguri); Punjab.

Remarks : This is a valid species after Prout (1913) who split it from the synonymy list of *T. veraria* Guenée as dealt with by Hampson (1895). Singh (1962) catalogued *T. opalina* as subspecies of *T. immisaria* Walker which was earlier synonymised with the Malay-Papuan species, *T. depulsata* Walker with doubtful distribution in the Indian subregion (*vide* Prout, 1913). The species feeds on bud and foliage of *Mesua ferrea*.

Genus XXXII. *Gelasma* Warren (1893)
(*Thalassodes*)

47. *Gelasma goniaria* (Felder, 1874)
(*acutissima*)

1874. *Timandra goniaria* Felder, *Reis. Nov.*, pl.128, fig.3.

1913. *Gelasma goniaria* : Prout, *Lep. Cat.*, 14:93.

Material examined : 2 (F), Calcutta, Lord Car Michael Coll., 1912 (*Old Collections*). *Wing expanse* : 32-36 mm.

Diagnosis : Green. Fore wing costa ochreous, antemedial line pale; both wings semihyaline, with postmedial line waved on inner half of hind wing, a fine dark marginal line and cilia ochreous. Underside white.

Distribution : India : West Bengal (Calcutta); Maharashtra; Tamil Nadu.

Remarks : Prout (1913) considered most of the Hampsonian synonyms including *goniaria* under *acutissima* (Walker) as good species. Reportedly, the species is the defoliator of almond tree.

APPENDIX TO SPP. OF W. B.

Family GEOMETRIDAE

A. Subfamily GEOMETRINAE

1. Genus *Ourapteryx* Leach
 1. *primularis* Butler
 2. *sciticaudaria* Walker
 3. *ebuleata* Guenée
 4. *picticaudata* Walker
2. Genus *Sirinoptyx* Butler
 5. *rufivinctata* Walker
3. Genus *Thinopteryx* Butler
 6. *crocoptera* Kollar
4. Genus *Myrteta* Walker
 7. *planaria* Walker
 8. *simpliciata* Moore
5. Genus *Bapta* Stephens
 9. *alba* Moore
6. Genus *Lomographa* Hübner
 10. *deletaria* Moore
7. Genus *Metrocampa* Latreille
 11. *haliaria* Walker
 12. *biseriata* Moore
8. Genus *Caberodes* Guenée
 13. *dentisignata* Moore

9. Genus *Plutodes* Guenée
 14. *subcaudata* Butler
10. Genus *Scardamia* Guenée
 15. *metallaria* Guenée
11. Genus *Peratophyga* Warren
 16. *aerata* Moore
12. Genus *Synegia* Guenée
 17. *pleuristriaria* Walker
 18. *camptogrammaria* Guenée
13. Genus *Hypochrosis* Guenée
 19. *pachiaria* Walker
 20. *hyadaria* Guenée
14. Genus *Osicerda* Walker
 21. *squalidaria* Hübner
 22. *incitata* Walker
15. Genus *Anonymia* Warren
 23. *violacea* Moore
 24. *grisea* Butler
 25. *lativitta* Moore
16. Genus *Heterolocha* Lederer
 26. *falconaria* Walker
17. Genus *Opisthograptis* Hübner
 27. *tridentifera* Moore
 28. *sulphurea* Butler
18. Genus *Corymica* Walker
 29. *deducta* Walker
19. Genus *Elicrinia* Hübner
 30. *flava* Moore
20. Genus *Eurytaphria* Warren
 31. *bisinuata* Hampson

21. Genus *Peetula* Moore
 32. *exanthemata* Moore
22. Genus *Spilopera* Warren
 33. *ferrifera* Moore
23. Genus *Callerinnys* Warren
 34. *obliquilinea* Moore
24. Genus *Rhynchobapta* Hampson
 35. *cervinaria* Moore
25. Genus *Luxiaria* Walker
 36. *exclusa* Walker
 37. *obliquata* Moore
26. Genus *Krananda* Moore
 38. *semihyalina* Moore
27. Genus *Zeheba* Moore
 39. *lucidata* Walker
28. Genus *Macaria* Curtis
 40. *frugaliata* Guenée
 41. *fasciata* Fabricius
 42. *nora* Walker
 43. *elvirata* Guenée
 44. *odataria* Swinhoe
 45. *vasudeva* Walker
 46. *effusata* Guenée
 47. *emersaria* Walker
29. Genus *Evarzia* Walker
 48. *ozararia* Walker
30. Genus *Tephrina* Duponchel
 49. *purpurascence* Moore
31. Genus *Orsonoba* Walker
 50. *clelia* Cramer

32. Genus *Hyposidra* Guenée
51. *talaca* Walker
52. *aquilaria* Walker
33. Genus *Petelia* Herrich-Schäffer
53. *medardaria* herrich-Schäffer
34. Genus *Hyperythra* Guenée
54. *lutea* Cramer
55. *phoenix* Swinhoe
35. Genus *Psyra* Walker
56. *spurcataria* Walker
57. *angulifera* Walker
58. *cuneata* Walker
36. Genus *Phalaena* Linnaeus
59. *lugens* Butler
60. *albifrons* Moore
37. Genus *Fascellina* Walker
61. *chromataria* Walker
62. *plagiata* Walker
38. Genus *Leptomiza* Warren
63. *decorata* Moore
64. *basipuncta* Moore
65. *anticleata* Moore
66. *calcearia* Walker
67. *dentilineata* Moore
39. Genus *Crocallis* Treitschke
68. *cervinaria* Moore
40. Genus *Gonodontis* Hübner
69. *similaria* Moore
41. Genus *Garaeus* Moore
70. *specularis* Moore

- 71. *cruentatus* Butler
- 72. *argillaceous* Butler
- 42. Genus *Pseudomiza* Butler
 - 73. *castanearia* Moore
 - 74. *argentina* Moore
- 43. Genus *Dalima* Moore
 - 75. *schistacearia* Moore
 - 76. *vulpinaria* Moore
- 44. Genus *Metoxydia* Butler
 - 77. *calamina* Butler
- 45. Genus *Amblychia* Guenée
 - 78. *testacearia* Moore
- 46. Genus *Biston* Leach
 - 79. *regalis* Moore
- 47. Genus *Buzura* Walker
 - 80. *suppressaria* Guenée
- 48. Genus *Elphos* Guenée
 - 81. *hymenaria* Guenée
- 49. Genus *Cusiala* Moore
 - 82. *bengaliaria* Guenée
- 50. Genus *Xandrames* Moore
 - 83. *dholaria* Moore
 - 84. *albofasciata* Moore
- 51. Genus *Gnophos* Treitschke
 - 85. *aereus* Butler
 - 86. *licheneus* Oberthür
 - 87. *eolaria* Guenée
- 52. Genus *Ophthalmodes* Guenée
 - 88. *herbidarium* Guenée
- 53. Genus *Boarmia* Treitschke
 - 89. *boarmioies* Moore

- 90. *duplexa* Moore
- 91. *conifera* Moore
- 92. *idaeoides* Moore
- 93. *ochrifasciata* Moore
- 94. *irrorata* Moore
- 95. *boarmiaria* Guenée
- 96. *variegata* Moore
- 97. *conspicuata* Moore
- 98. *semialba* Moore
- 99. *imbecilis* Moore
- 100. *semiclarata* Walker
- 101. *vialis* Moore
- 102. *perspicuata* Moore
- 103. *sikkima* Moore
- 104. *cineracea* Moore
- 105. *sublavaria* Guenée
- 106. *infixaria* Walker
- 107. *albifera* Moore
- 108. *megaspilaria* Moore
- 109. *granitaria* Moore
- 110. *albibasis* Hampson
- 111. *semicirculata* Moore
- 112. *tephrosaria* Moore
- 54. Genus *Ectropis* Hübner
 - 113. *dentilineata* Moore
 - 114. *bhurmitra* Walker
- 55. Genus *Paralcis* Warren
 - 115. *pallidaria* Moore
- 56. Genus *Paradarisa* Warren
 - 116. *exclusaria* Walker

57. Genus *Cleora* Curtis
117. *venustularia* Walker
58. Genus *Calicha* Moore
118. *retrahens* Moore
59. Genus *Hemerophila* Stephens
119. *subplagiata* Walker
60. Genus *Hirasa* Moore
120. *scripturaria* Walker
61. Genus *Medasina* Moore
121. *plumalis* Butler
122. *objectaria* Walker
123. *mauraria* Guenée
124. *parisnattei* Walker
125. *creataria* Guenée
126. *strixaria* Guenée
127. *mucidaria* Walker
128. *similis* Moore
129. *interruptaria* Moore
130. *dissimilis* Moore
131. *fratercula* Moore
132. *basistrigaria* Moore
133. *vagans* Moore
134. *contaminata* Moore
135. *albidaria* Walker
62. Genus *Arichanna* Moore
136. *transfasciata* Warren
137. *albovittata* Moore
138. *furcifera* Moore
63. Genus *Erebomorpha* Walker
139. *fulguraria* Walker

140. *metachromata* Walker
64. Genus *Abraxas* Leach
141. *sylvata* Scopoli
142. *martaria* Guenée
143. *irrorata* Moore
65. Genus *Percnia* Guenée
144. *ductaria* Walker
145. *foraria* Guenée
146. *felinaria* Guenée
147. *belunaria* Guenée
148. *giraffata* Guenée
66. Genus *Culcula* Moore
149. *exanthemata* Moore
67. Genus *Obeidia* Walker
150. *tigrata* Guenée
68. Genus *Genusa* Walker
151. *bigutta* Walker
- B.Subfamily OENOCHROMINAE
- 69.Genus *Sarcinodes* Guenée
152. *restitutaria* Walker
153. *debitaria* Walker
154. *carnearia* Guenée
155. *aequilineararia* Walker
70. Genus *Paleomystis* Warren
156. *falcataria* Moore
71. Genus *Celerena* Walker
157. *divisa* Walker
72. Genus *Eumelea* Duncan
158. *ludovicata* Guenée
73. Genus *Derambila* Walker
159. *satelliata* Walker

74. Genus *Ozola* Walker
 160. *microniaria* Walker
 161. *impedita* Walker
 162. *minor* Moore
 163. *sinuicosta* Prout
- C.Subfamily LARENTIINAE
75. Genus *Dysethia* Warren
 164. *bicommata* Warren
76. Genus *Cryptoloba* Warren
 165. *cinera* Butler
77. Genus *Syzeuxis* Hampson
 166. *trinotaria* Moore
78. Genus *Carige* Walker
 167. *cruciplaga* Walker
79. Genus *Anaitis* Duponchel
 168. *pudicata* Guenée
 169. *fulgurata* Guenée
80. Genus *Scotosia* Stephens
 170. *sordidata* Moore
81. Genus *Triphosa* Stephens
 171. *expansa* Moore
82. Genus *Phibalapteryx* Stephens
 172. *flavofasciata* Moore
83. Genus *Calleulype* Warren
 173. *compositata* Guenée
84. Genus *Cidaria* Treitschke
 174. *muscolor* Moore
 175. *lativittaria* Moore
 176. *ochreata* Moore
 177. *catenaria* Moore

- 178. *mediovittaria* Moore
- 179. *oblongata* Guenée
- 180. *triangulifera* Moore
- 181. *delecta* Butler
- 182. *obfusca* Warren
- 183. *siderifera* Moore
- 184. *seriata* Moore
- 185. *albofasciata* Moore
- 186. *affinis* Moore
- 187. *aurigena* Butler
- 188. *albigirata* Kollar
- 85. Genus *Microlygris* Prout
 - 189. *prophyriata* Moore
- 86. Genus *Eustroma* Hübner
 - 190. *fissisignis* Butler
- 87. Genus *Apithecia* Prout
 - 191. *viridata* Moore
- 88. Genus *Larentia* Treitschke
 - 192. *argentilineata* Moore
 - 193. *viribilis* Warren
 - 194. *decorata* Moore
 - 195. *schistacea* Moore
 - 196. *plumbeata* Moore
 - 197. *lateritiata* Moore
 - 198. *cuprearia* Moore
- 89. Genus *Perizoma* Hübner
 - 199. *maculata* Moore
- 90. Genus *Dysstroma* Hübner
 - 200. *subapicaria* Moore
- 91. Genus *Photoscotosia* Warren
 - 201. *miniosata* Walker

202. *obliquisignata* Moore
203. *nubilata* Moore
204. *aurantiaria* Moore
92. Genus *Callabraxas* Butler
205. *amanda* Butler
93. Genus *Chloroclystis* Hübner
206. *chlorophilata* Walker
94. Genus *Eupithecia* Curtis
207. *lineosa* Moore
208. *ustata* Moore
209. *tricrossa* Prout
95. Genus *Trichopterigia* Hampson
210. *decorata* Moore
96. Genus *Brabira* Moore
211. *atkinsoni* Moore
212. *artemidora* Oberthür
97. Genus *Sauris* Guenée
213. *ignobilis* Butler
214. *lineosa* Moore
98. Genus *Hydrelia* Hübner
215. *bicolorata* Moore
216. *subobliquaria* Moore
217. *recurvilineata* Moore
99. Genus *Discoloxia* Warren
218. *obliquisigna* Moore
100. Genus *Asthena* Hübner
219. *albosignata* Moore
101. Genus *Cambogia* Guenée
220. *pulchella* Hampson
221. *pictaria* Moore

222. *plicata* Moore
102. Genus *Hastina* Moore
223. *gemmifera* Moore
- D.Subfamily STERRHINAE
101. Genus *Rhodometra* Meyrick
114. *sacraria* Linnaeus
104. Genus *Scopula* Schrank
225. *mecysma* Swinhoe
226. *nictata* Guenée
227. *albomaculata* Moore
228. *opicata* Fabricius
229. *ferrilineata* Moore
230. *emissaria* Walker
231. *minorata* Boisduval
232. *pulverosa* Warren
105. Genus *Sterrhia* Hübner
233. *acuminata* Moore
234. *macrospila* Prout
106. Genus *Synegiodes* Swinhoe
235. *sanguinaria* Moore
107. Genus *Anisodes* Guenée
236. *obrinaria* Guenée
108. Genus *Craspediopsis* Warren
237. *pallivittatus* Moore
109. Genus *Rhodostrophia* Hübner
238. *vinacearia* Moore
110. Genus *Calothysanis* Hübner
239. *correspondens* Hampson
111. Genus *Trygodes* Guenée
240. *cuneilinea* Walker

112. Genus *Antitrygodes* Warren
241. *divisaria* Walker
113. Genus *Somatina* Guenée
242. *anthophilata* Guenée
- E. Subfamily HEMITHEINAE
114. Genus *Dysphania* Hübner
243. *militaris* Linnaeus
244. *recessa* Walker
115. Genus *Pingasa* Moore
245. *ruginaria* Guenée
116. Genus *Terpna* Herrich-Schäffer
246. *costistrigaria* Moore
247. *varicoloraria* Moore
248. *ornataria* Moore
249. *apicalis* Moore
250. *leopardinata* Moore
251. *pictaria* Moore
117. Genus *Dindica* Moore
252. *polyphaenaria* Guenée
118. Genus *Actenochroma* Warren
253. *muscoloraria* Walker
119. Genus *Dooabia* Warren
254. *viridata* Moore
120. Genus *Rhomborista* Warren
255. *devexata* Walker
121. Genus *Agathia* Guenée
256. *beata* Butler
257. *visenda* Butler
258. *arcuata* Moore
259. *hilarata* Guenée

122. Genus *Opisthotia* Warren
260. *tumidilinea* Moore
123. Genus *Uliocnemis* Warren
261. *cassidara* Guenée
124. Genus *Hemithea* Duponchel
262. *costipunctata* Moore
125. Genus *Tanaorhinus* Butler
263. *rafflesii* Moore
264. *vittata* Moore
126. Genus *Comibaena* Hübner
265. *chalybeata* Moore
127. Genus *Euchloris* Hübner
266. *quantula* Swinhone
128. Genus *Comostola* Meyrick
267. *laesaria* Walker
129. Genus *Microloxia* Warren
268. *indecretata* Walker
130. Genus *Maxates* Moore
269. *coelataria* Walkar
270. *quadraria* Guenée
132. Genus *Pamphlebia* Warren
271. *rubrolimbraria* Guenée
133. Genus *lotaphora* Warren
272. *iridicolor* Butler
134. Genus *Ornithospila* Warren
273. *avicularia* Guenée
135. Genus *Anisozyga* Prout
274. *textilis* Butler
136. Genus *Osteosema* Warren
275. *pastor* Butler

276. *sanguilineata* Moore
137. Genus *Gelasma* Warren
277. *thetydaria* Guenée
138. Genus *Berta* Walker
278. *chrysolineata* Walker
139. Genus *Diplodesma* Warren
279. *obnupta* Swinhoe
140. Genus *Iodis* Hübner
280. *argutaria* Walker

SUMMARY

The paper deals with the systematic account of 47 species of Geometridae belonging to 32 genera from the state of West Bengal. Of these, 21 species constitute new locality records from the state. While most of the species are widespread, certain others like *Pristostegania trilineata* (Moore) and *Boarmia combustaria* (Walker), amongst the material examined, are restricted to the Darjiling Himalaya. Keys to the taxa and a couple of state maps showing the distribution of species of interest are also incorporated together with an appendix of 280 elements not dealt with in the systematic account.

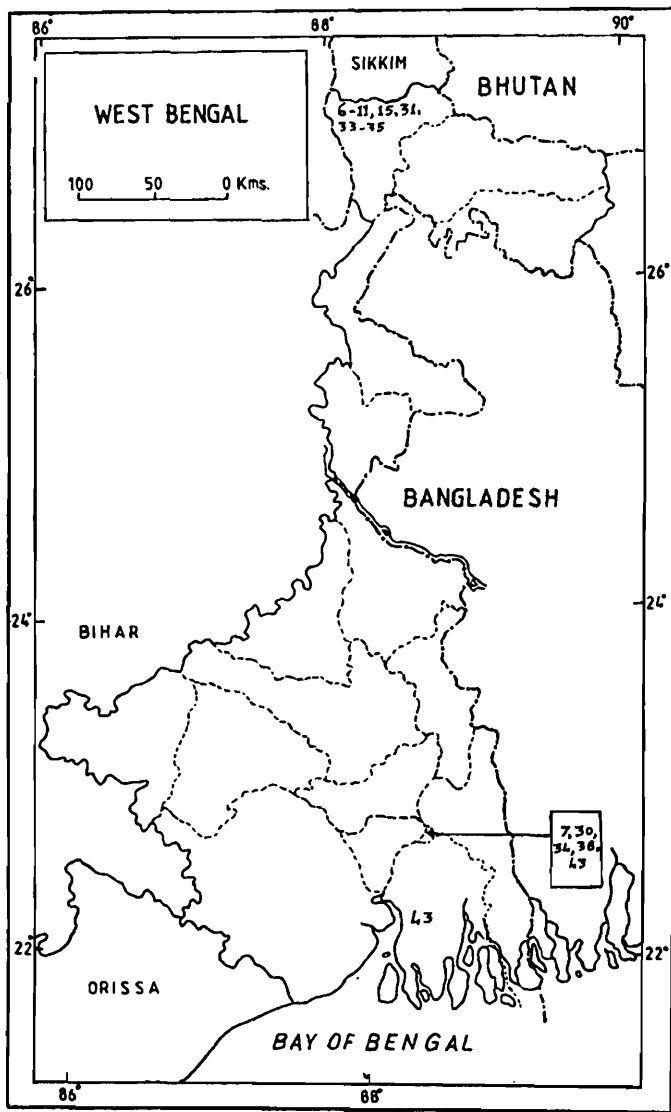
ACKNOWLEDGEMENT

The authors are grateful to the Director, Zoological Survey of India, for providing laboratory facilities to their work. They are also thankful to Dr. A.K. Ghosh, Ex-Director, for critically going through the paper.

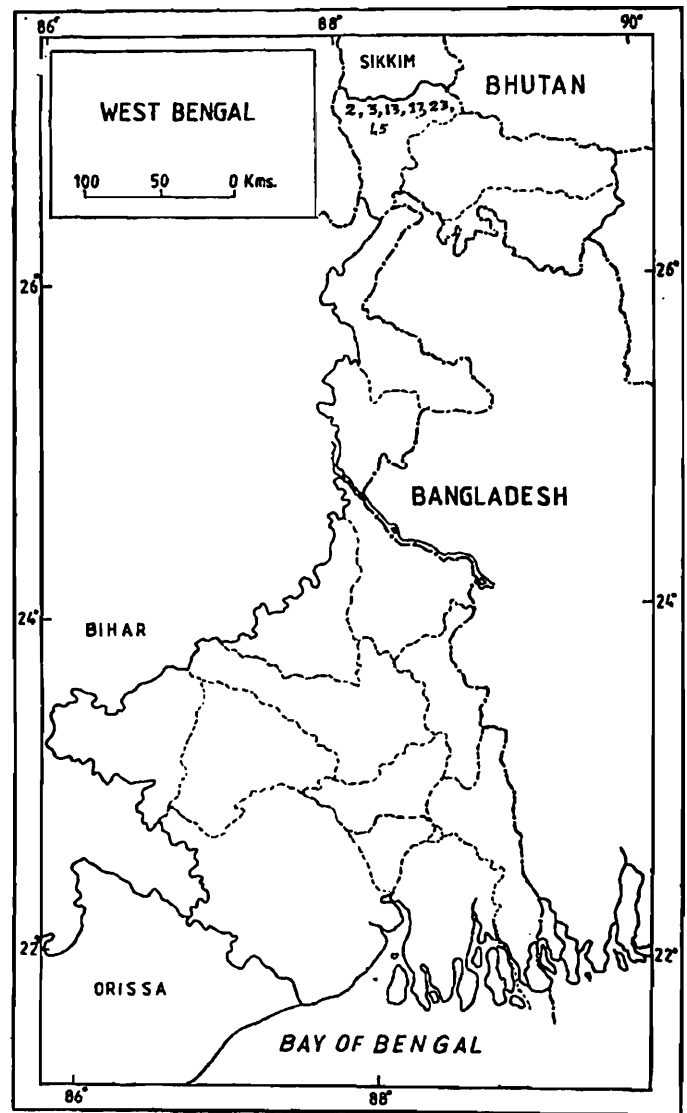
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I



II

[Map-plotted numerical figures indicate serial no. of spp. dealt with in the text]

Fig. I. Map showing the distribution of some common species of Geometridae from West Bengal.

Fig.II. Map showing the distribution of some rare species of Geometridae from West Bengal.

**INSECTA : LEPIDOPTERA : AMATHUSIIDAE : ACRAEIDAE
NYMPHALIDAE : RIODINIDAE**

I. J. GUPTA

Zoological Survey of India, Calcutta

INTRODUCTION

There are 17,280 species of butterflies known in the world of which about 1,200 occur in India. Over 800 species i.e. 66% of the known butterflies from India are from Northeast zone of India comprising eight States. West Bengal adjoining the North-east zone, has more than 150 species of butterflies of which 70 belonged to four families namely, Amathusiidae, Acraeidae, Nymphalidae and Riodinidae.

Earlier references to butterflies of India are by Marshall and de Nicéville (1882), de Nicéville (1886), Bingham (1905), Evans (1932), Talbot (1947) and Wynter-Blyth (1957). The earlier works dealing with the exploration of butterfly fauna of West Bengal may be referred to as follows : from Darjiling and Sikkim (Teesta and Chumbi Vallyes) by de Nicéville (1881-1883, 1885,) and Elwes (1882, 1888), Darjiling district by Maude (1949, Darjiling and Tukdah by Sevastopulo (1944,1956); Barrackpore (24-parganas, North) by Rothney (1882) and Calcutta by de Nicéville (1885 and Sanders (1944).

The present studies on butterflies belonging to four families are based on a collection of these insects, made during recent faunistic surveys of West Bengal and also the material collected over last hundred years and available in the National Zoological Collection of Zoological Survey of India. This account includes 97 species and subspecies belonging to 46 genera and four families, viz., Amathusiidae, Acraeiidae, Nymphalidae and Riodinidae.

West Bengal has 17 districts, of which, Darjiling has the maximum number (89 species and subspecies) which constitute 90% of the butterfly fauna belonging to four families from the State. The number of species and subspecies in other districts are : Calcutta (30) ; Maldah (18), Jalpaiguri (12); Bankura (11); Birbhum (9); Medinipur and Barddhaman each (6); North 24-Parganas and Murshidabad each (7); Haora and Puruliya each (4); Nadia and West Dinajpur each (3), Hugli (2) and South 24-Parganas (2). Koch Behar is not represented by the present fauna.

Of these butterflies, *Precis almana almana* (Linnaeus) is represented in 16 out of 17 districts i.e. except Koch Behar, followed by *P. atlites* Linnaeus in 11 districts, *P. lemonias lemonias* (Linnaeus) in 10 districts and *Ariadne ariadne indica* (Moore) in 9 districts and others in one to seven districts.

The status of the presently reported butterflies according to Evans (1932) and Wynter-Blyth (1957) is that a couple of species and subspecies are very rare, 19 rare, and others are of variable status. Of these 97 species and subspecies, 26 are new reports from West Bengal. On the basis of the present studies of butterflies, species and subspecies represented in one to four districts may be considered as of rare occurrence.

It is presumed that with the decrease in vegetation due to deforestation, there is a decline in the diversity and population of these delicate insects. Some of the species and subspecies of butterflies which were collected earlier are conspicuous by their absence in the collection made during recent faunistic surveys of West Bengal. Such species and their habitats require protection. Subordinate Legislation under The Wild Life (Protection) Act, 1972 (53 of 1972) as modified provides a list of fauna which require protection. Of the present butterfly fauna from West Bengal, 4, 18 and 1 species and subspecies have been included in Schedule-I, II and IV respectively, of the Wild Life Act.

For 97 species and subspecies belonging to four families of butterflies, keys to identification of the genera and species have been provided. Common name, forewing length, distribution and remarks for each of the taxa have been given. Species and subspecies not available in the collection have been reviewed from literature and marked with the symbol of asterisk(*). District-wise distribution of taxa has been shown in maps. Illustrations of characters like antennae, wing venation and photographs of some of the interesting species/subspecies and that constituting first reports from West Bengal have been included. Appendix-I provides a list of species and subspecies indicating their collection/occurrence in districts of the State.

MATERIAL AND METHODS

(Figure I. A-I)

The information about habits and habitats of butterflies makes one to look for these insects in the field. Amathusiids inhabit thick forests avoiding light and open spaces. They only fly at dusk and dawn and possibly during night (hiding in dark places during day time). Acraeids are slow fliers and they proceed in a straight forward way keeping generally close to the ground and settle frequently either on flowers in exposed places on leaves or on the ends of twigs or sticks. Some of the nymphalids are fast fliers but almost all have one characteristic i.e. fond of basking in the sunshine. Riodinids live in denser forests skulking among undergrowth until evening but all are found at water.

The butterflies are collected using a butterfly net which should be placed over a resting insect settled on the ground. When in flight the effective way of catching butterflies is with upward sweep of net against rather than across or with the line of flight. For a butterfly settled on leaf an upward stroke of net is quite effective. As the butterfly is caught, net is turned with sharp twist of the wrist so that the bag folds over and prevents the insect to escape. After catching, butterfly is killed readily and easily by gathering the net around it, folding the wings back so that they are closed and finally giving its thorax a light but sharp nip between the thumb and forefinger. While killing care should be taken that the butterfly does not flutter about inside before collapsing otherwise scales covering the wings will be rubbed off and destroy the characteristic pattern of colour markings. After killing, the butterflies are kept in transparent or semitransparent rectangular or triangular envelopes of the size depending on that of the specimens. A label bearing name of locality and collector and date of collection and other necessary information is placed along with the specimen. These envelopes are kept in a suitable card box containing some cotton and powdered naphthalene or paradichlorobenzene to avoid growth of fungus or damage to collection by ants, other insects etc. They are kept in sunlight to allow the specimens to dry.

In laboratory, butterflies are relaxed in a relaxing chamber, followed by pinning perpendicularly through the middle of thorax at point equidistant between the bases of forewings. The wings are spread

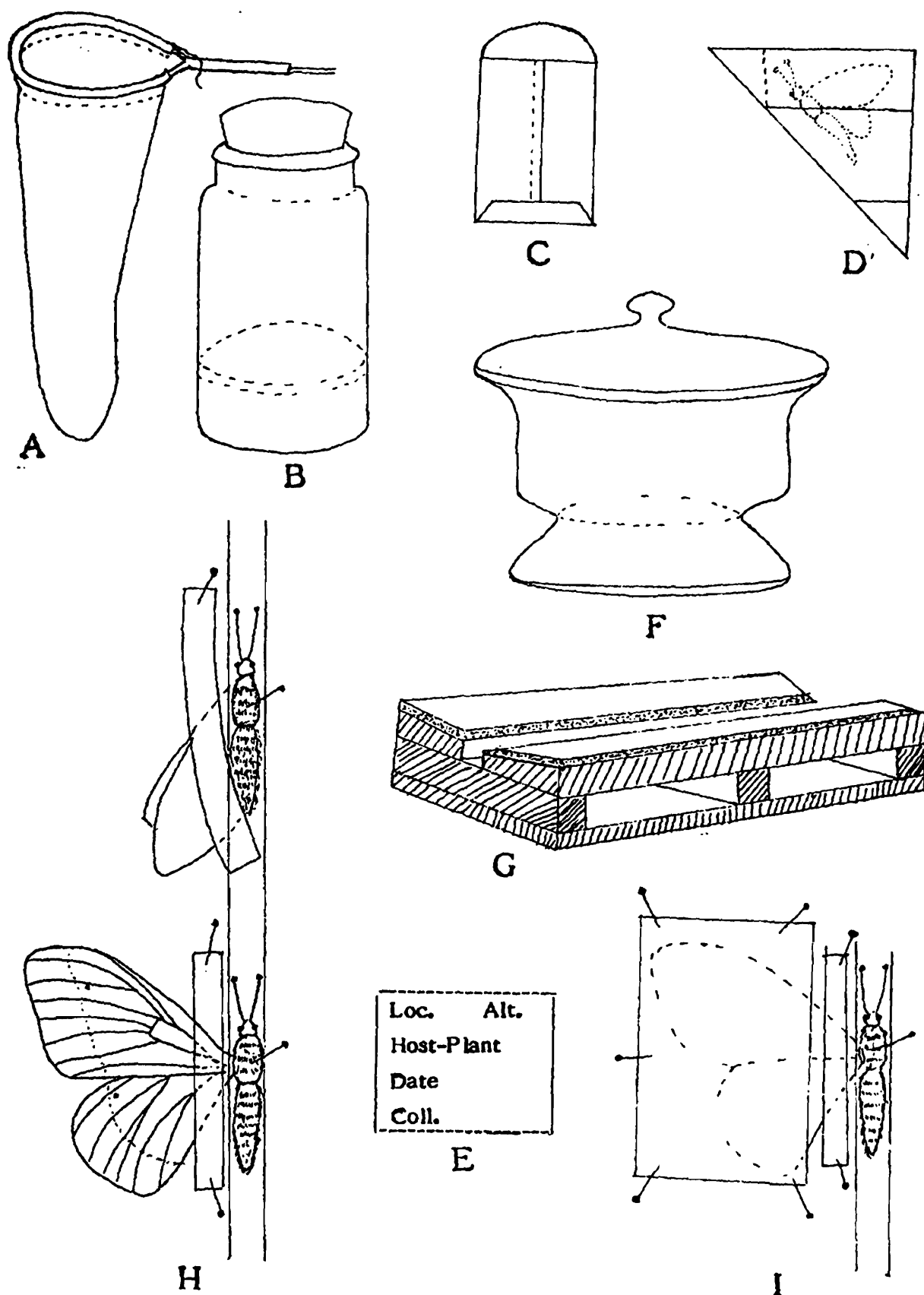


Fig 1. A – Butterfly net; B – Killing Bottle, C – Rectangular insect envelope; D – Triangular insect envelope; E – Locality label; F – Relaxing chamber; G – Insect setting board; H and I – Stages in setting and pinning.

using paper strips. Antennae and abdomen are kept in proper position. A label bearing data is pinned below the specimen. The set and pinned butterflies are allowed to dry in a dessicator for 2-3 weeks depending on the climatic conditions. The dried specimens are transferred to air tight insect boxes which are already treated with benzene and containing powdered naphthalene. A label written legibly in black India ink is affixed with each specimen.

The specimens of butterflies ready as mentioned above are studied under a binocular. Antennae, labial palpi, form of wing and markings on wings, legs etc. are easily made out. Wing expanse is measured in mm from middle of thorax to the apex of forewing and making it double, whereas forewing length is measured from base to apex of forewing. Wing venation, one of the important characters, is studied by applying benzene or toluene on underside of wings with a fine sable hair brush (No. 'O' or 'I') when scales lie flat and veins stand out. It is convenient to start from vein 2 i.e. Culb (the lowest vein arising from the cell) to count upwards towards the costa. Study of these characters in accordance with literature (Evans, 1932 ; Talbot, 1939, 1947; and Wynter-Blyth, 1957) and comparing the specimen with that in reference collection will accomplish identification. A label bearing zoological name of species and the other bearing name of a person who identifies are affixed with the specimen. A species index card is prepared with all information as given on different labels affixed with the specimen. A large number of identified specimens housed properly in drawers with glass covers, fitted in cabinets and species index cards build up a reference collection for guidance of future workers.

MORPHOLOGY AND TERMINOLOGY

(Figure 2. A-D)

The body of an adult butterfly consists of head, thorax and abdomen.

The head bears a pair of long segmented antennae situated in front of or between the compound eyes and a proboscis (long coiled sucking tube) arising between the paired labial palpi. The shaft of antenna thickens abruptly or gradually at the distal end forming a distinct club which may be grooved on its lower side. The club usually narrows towards tip which may be pointed or rounded. The compound eyes are large and immobile and may be smooth or hairy. During feeding, the butterfly extends its proboscis which otherwise remains coiled up. The labial palpi are three segmented which may be porrect or erect. The basal (first) segment being short while second and third segments vary in length, shape and scaling which are of taxonomic value.

The thorax is made up of three segments namely prothorax, mesothorax and metathorax, each carrying a pair of legs. The mesothorax and metathorax also bear a pair of forewings and hindwings, respectively. Each leg consists of five segments, the coxa articulating with the thorax; trochanter is a very small segment interposed between the coxa and femur ; tibia of medium length or long and armed with one or two pairs of movable tibial spurs, may be spiny or densely fringed with hair ; and lastly tarsus which is five segmented. The terminal or fifth segment ends in a pair of claws beneath which is usually a small pad called the pulvillus. Adjacent to each claw is a brush-like attachment known as the paronychium. The legs are of major importance in the classification of butterflies. The forelegs are short, slender and not fully developed as in family Nymphalidae.

The shape of the wing is very variable. The upper or anterior margin is known as the costa and lower or posterior edge is the inner margin or dorsum, the proximal part of wing next to thorax is the base and margin remote from the thorax is distal margin, outer margin or termen. The anterior tip of the wing is

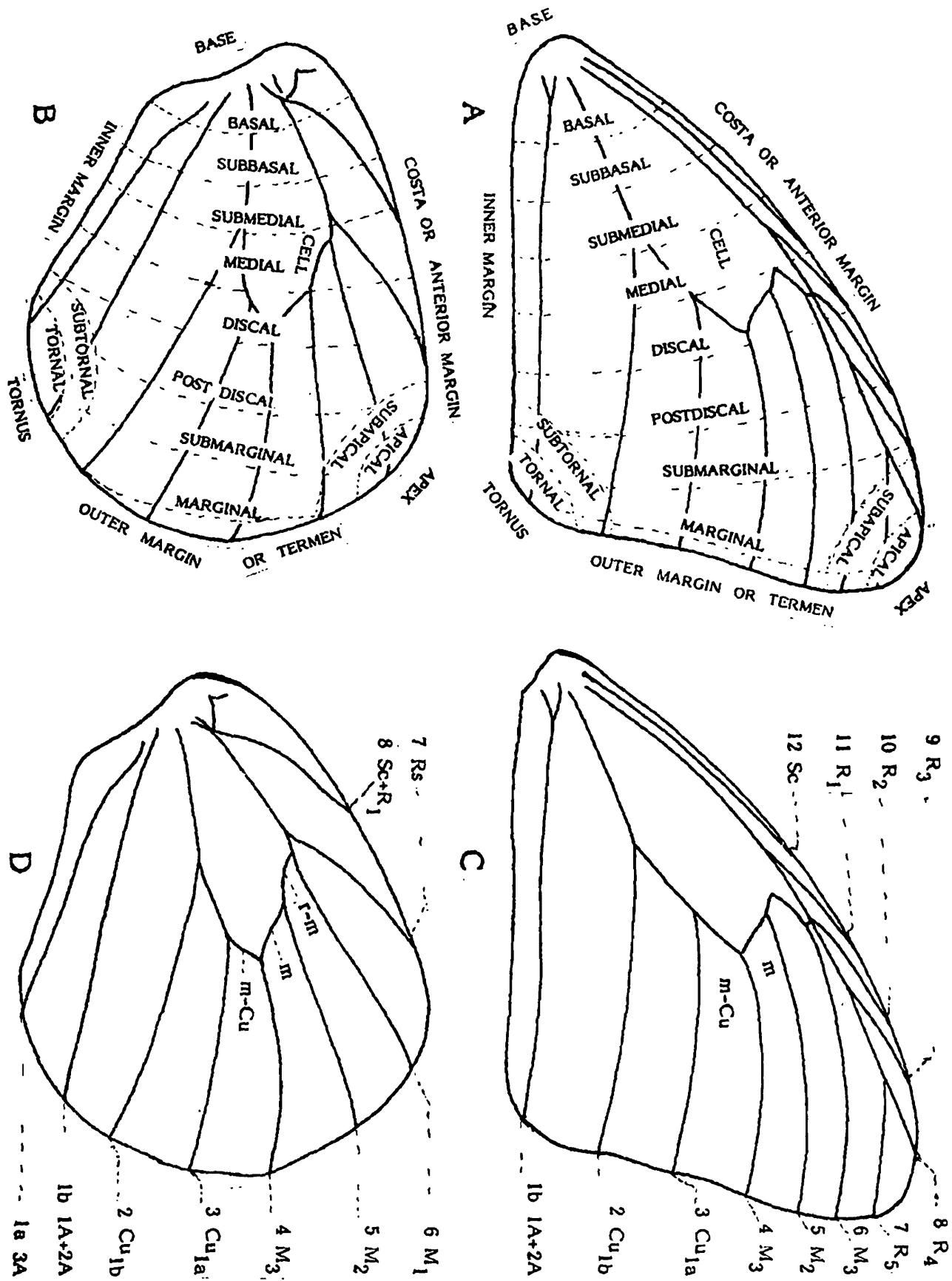


Fig 2. Subdivisinal regions of the wings : A - Forewing; B - Hindwing
Wing venation : A - Forewing; B - Hindwing

called the apex and that of inner margin is known as the tornus. The prefix sub-implies "near to", and the lines or markings on wings may be described as basal, sub-basal, medial or discal, postmedian or post-discal, submarginal or subterminal, marginal or terminal, apical, subapical, tornal, subtornal etc. Along the outer margin is a regular fringe or the cilia composed of closely-packed scales in a double row. The markings on wings consist of bands, lines, spots, patches and rings of varied form.

The wings are membranous with veins running longitudinally from base to the wing margin or termen. There is a comparatively wide and approximately triangular space called discal or discoidal cell or simply the cell which is usually closed at the outer end by short transverse veinlets known as discoidal or discocellular veins. The portion of the wing surface surrounded by the discoidals is usually termed the discal area. Usually ten veins arise from the cell in forewing and six in hindwing. Sometimes one or more veins are absent especially on the forewing. There are different systems of notation to describe the venation namely numerical notation, Comstock-Needham notation, Rothschild & Jordan notation etc. In Numerical notation the veins are numbered from the dorsum or inner margin to the costa so that veins run from 1a or 1b to vein 12 i.e. Veins 3A (third anal) or 1A + 2A (first anal + second anal) to vein Sc in forewing and from vein 1a to 8 i.e. veins 3A (third anal) to R1 + Sc (radius 1 + subcostal) in hindwing. Veins 2-11 (Cu 1b-R1) in forewing and 2-7 (cu 1b-Rs) in hindwing arise from the margin of the cell (or veins arising from the cell) while remaining veins originate from the wing bases. The space between two veins is interspace and is known by the lower vein e.g. in forewing space between anal margin — 1A + 2A, 1A + 2A — Cu 1b, Cu 1b — Cu 1a, Cu 1a — M₃, M₃ — M₂, M₂ — M₁, M₁ — R₅, R₅ — R₄, R₄ — R₃, R₃ — R₂, R₂ — R₁, R₁ — Sc is called as interspace 1a, 1b, 2, 3, 4, 5, 6, 7, 8, 9, 10 and 11 respectively. Similarly, in hindwing space between anal margin — 3A, 3A — 1A + 2A, 1A + 2A — Cu 1b, Cu 1b — Cu 1a, Cu 1a — M₃, M₃ — M₂, M₂ — M₁, M₁ — Rs, Rs — Sc + R₁ is called interspace 1a, 1b, 1c, 2, 3, 4, 5, 6 and 7, respectively.

The upper margin and lower margin of the cell are called radius and cubitus, respectively. In this case radius runs from base to origin of vein R₅ (i.e. vein 7) (or vein M₁ when M₁ and R₅ stalked i.e. vein 6 when 6 and 7 stalked) whereas cubitus extends from base to origin of vein M₃ i.e. vein 4. Lower discocellular vein is the cross vein joining veins M₃ and M₂ (veins 4 and 5), middle discocellular vein is cross vein joining veins M₂ and M₁ (veins 5 and 6) while upper discocellular vein is cross vein joining veins M₁ and R₅ (veins 6 and 7) and is often obsolete. In some cases, in hindwing, a small vein or a trace of such a vein arises from near base of vein Sc + R₁ (vein 8) and it is called precostal or humeral vein or spur.

The abdomen consists of ten segments and 8th to 10th segments contain male genital apparatus in male and female genital organs in female.

SYSTEMATIC ACCOUNT

Family AMATHUSIIDAE

Key to the genera of family Amathusiidae

1. Forewing with discocellular veins tubular throughout. In hindwing vein 1a always longer than the abdomen, if vein 1b as long as vein Cu 1b 2
- Forewing with median discocellular vein absent. In hindwing vein 3A not longer than the abdomen, vein 2A + 1A as long as vein Cu 1b 3

2. In forewing vein R_2 absent, veins R_1 and Sc anastomosed..... *Stichophthalma* Felder
 - In forewing vein R_2 and R_1 anastomosed to vein Sc.... *Thaumantis* Huebner
3. In forewing vein R_2 present and veins R_1 and Sc anastomosed *Discophora* Boisduval
 - In forewing vein R_2 absent, vein R_1 anastomosed with vein Sc *Enispe* Doubleday

I Genus *Stichophthalma* Felder (C) & Felder (R) 1862

1862. *Stichophthalma* Felder & Felder, *Wien ent. Monats.*, 6 : 271.

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

Key to the species of genus *Stichophthalma*

Upperside of hindwing with submarginal markings small and slender *nourmahal* (Westwood)

Upperside of hindwing submarginal markings large and prominent *camadeva* (Westwood)

I. *Stichophthalma nourmahal nourmahal* (Westwood)

(The Chocolate jungle Queen)

(Plate 1, nos. 1, 2)

1851. *Thaumantis nourmahal* Westwood, In Doubleday, *Hewitson Gen. Diurn. Lep.*, : 337

1932. *Sticophthalma (sic) nourmahal nourmahal*, Evans, *The Identification of Indian Butterflies*, : 132.

1947. *Stichophthalma nourmahal nourmahal*, Talbot, *The Fauna of British India (Butterflies)*, 2 : 417.

Material examined : Darjiling Dist, Darjiling, 1 ex., (no date), Ex. T. (Otter & E.T. Camp).

Forewing length : 47 mm.

Distribution : India : West Bengal (Darjiling) ; Assam, Naga Hills and Sikkim. Elsewhere : Burma.

Remarks : This nominate subspecies is represented by a single specimen from West Bengal (Darjiling) in the old collection of Zoological Survey of India. No specimen of this nominate subspecies was collected during the recent faunistic surveys of the State. It is a first report for West Bengal. Its status is rare. It is included in the Schedule -II (Part I) of the Wild Life (Protection) Act.

2. * *Stichophthalma camadeva* (Westwood)

(The Northern Jungle Queen)

1848. *Morpho camadeva* Westwood, *Cab. Oriental Entomology*, : 9, pl. 4, fig. 1, 2.

1932. *Sticophthalma (sic) camadeva*, Evans, *The Identification of Indian Butterflies*, : 132.

1947. *Stichophthalma camadeva*, Talbot, *The Fauna of British India (Butterflies)*, 2 : 418.

Material examined : Nil.

Wing expanse : 125-150 mm.

Distribution : India : West Bengal (Darjiling); Assam; Naga Hills and Sikkim. Elsewhere : Burma.

Remarks : According to de Nicéville (1882) "Mr. Otto Moller has taken numerous specimens in the neighbourhood of Darjiling, in June." This species is not represented in the collection made during recent surveys of West Bengal. Wynter-Blyth (1957) also referred that species was "caught at 2000-3000 feet in June and July in the Sikkim-Darjiling area" Its status is rare.

II Genus *Thaumantis* Huebner 1826

†826. *Thaumantis* Huebner, *Samml. Exot. Schmett.*, 2 : Pl. 61.

Only a nominate subspecies, *Thaumantis diores diores* (Doubleday) represents this genus in India. Presently, it is dealt with from West Bengal.

3. *Thaumantis diores diores* (Doubleday) (The Jungle Glory) (Plate I, nos. 3, 4)

1845. *Thaumantis diores* Doubleday, *Ann. Mag. nat. Hist.*, 16:234.

1947. *Thaumantis diores diores*, Talbot, *The Fauna of British India (Butterflies)* 2 : 427.

Material examined : Darjiling Dist., Darjiling, 2 exs, (no further data); Singla, 1 ex (no date), (de Nicéville coll.).

Forewing length : 48-49 mm.

Distribution : India : West Bengal (Darjiling); Sikkim. Elsewhere : Burma.

Remarks : Only the specimens of the nominate subspecies mentioned under "material examined" are available in the old collection of Zoological survey of India. The subspecies is conspicuous by its absence in the collection made during recent faunistic surveys of the State. Evans (1932) and Talbot (1947) referred to its distribution from India (Sikkim) to Burma. Therefore, its occurrence in West Bengal is a first report.

III Genus *Discophora* Boisduval 1836

1836. *Discophora* Boisduval, (Roret's Suite a Buffon), *Hist. nat. Ins. Consid. gen. Lepid.*, 1 : pl.4 (=4a), fig. 12 (larva et pupa) as (*Discophorus*) pl. 12 (= 8B), fig. 3 (as *Discophora*).

Five species represent this genus in India, of which *Discophora sondaica* Boisduval is dealt with from West Bengal.

4. *Discophora sondaica zal* Westwood
(The Common Duffer)

1851. *Discophora zal* Westwood, In Doubleday & Westwood, *Gen. diurn. Lep.*, 2 : 331.
 1905. *Discophora tullia*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 202.
 1932. *Discophora tullia zal*, Evans, *The Identification of Indian Butterflies*, : 135.
 1947. *Discophora sondaica zal*, Talbot, *The Fauna of British India (Butterflies)*, 2 : 448.

Material examined : Calcutta Dist, Calcutta, 4 exs., (no further data).

Forewing length : 39-40 mm.

Distribution : India : West Bengal (Darjiling) and Sikkim. Elsewhere : Burma.

Remarks : This subspecies is represented by four specimens from Calcutta (West Bengal) in the old collection of Zoological Survey of India. Evans (1932) and Talbot (1947) mentioned its distribution from India (Sikkim) to Burma. De Nicéville (1882) and Wynter-Blyth (1957) referred to its occurrence in Bengal also. Though its status referred to is common, it is not represented in the collection made during recent faunistic surveys of West Bengal.

IV Genus *Enispe* Doubleday 1848

1848. *Enispe* Doubleday, *Gen. diurn. Lep.* (2) : pl. 40, fig. 2.

This genus is represented in India by two species viz. *Enispe cycnus* Westwood and *E. euthymius* Doubleday and are presently dealt with from West Bengal.

Key to the species of genus *Enispe*

- Upperside of wings blackish brown..... *cycnus* Westwood
 Upperside of wings bright ochreous with blackish brown markings... ..
 *euthymius* (Doubleday)

5. *Enispe cycnus cycnus* Westwood
(The Blue Caliph)

1851. *Enispe cycnus* Westwood, In Doubleday & Westwood, *Gen. diurn. Lep.*, 2 : 330.
 1905. *Enispe cycnus*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 199.
 1932. *Enispe cycnus cycnus*, Evans, *The Identification of India Butterflies*, : 135.
 1947. *Enispe cycnus cycnus*, Talbot, *The Fauna of British India (Butterflies)*, 2 : 258.

Material examined : Darjiling Dist., Darjiling, 1 ex., (no further data); Buxa, 1 ex., (no further data).

Forewing length : 40-41 mm.

Distribution : India : West Bengal (Darjiling) and Assam. Elsewhere : North Burma.

Remarks : Two specimens of this nominate subspecies from Darjiling (West Bengal) are available in the old collection of Zoological Survey of India. Bingham (1905), Evans (1932), Talbot (1947) and Wynter-Blyth (1957) referred to its distribution in India (Assam) and Burma. Its occurrence in West Bengal is a first report. It is listed in the Schedule-II (Part-2) of the Wild Life (Protection) Act.

6. *Enispe euthymius euthymius* (Doubleday)
(The Red Caliph)
(Plate I, nos. 5, 6)

1845. *Adolias euthymius* Doubleday, *Ann. Mag. nat. Hist.*, **16** : 179.
1905. *Enispe euthymius*, Bingham, *The Fauna of British India (Butterflies)*, **1** : 198.
1932. *Enispe euthymius euthymius*, Evans, *The Identification of Indian Butterflies*, : 135.
1947. *Enispe euthymius euthymius* Talbot, *The Fauna of British India (Butterflies)*, **2** : 560.

Material examined : Darjiling Dist., Darjiling, I ex., (no further data).

Forewing length : 42 mm.

Distribution : India : West Bengal (Darjiling); Assam and Sikkim. Elsewhere : Burma.

Remarks : Only a single specimen from West Bengal (Darjiling) is available in the old collection of Zoological Survey of India. Bingham (1905), Evans (1932), Talbot (1947) and Wynter-Blyth (1957) mentioned its distribution as Sikkim, Assam and Burma. Presently, its occurrence in West Bengal is a first report. Though literature refers to its status as not rare but no specimen of this subspecies is represented in the material collected during recent faunistic surveys of the State.

Family ACRAEIDAE

V Genus *Acraea* Fabricius 1807

1807. *Acraea* Fabricius, *Mag. f. Insektenk (Illiger)*, **6** : 284.

There are two species viz., *Acraea violae* (Fabricius) and *A. issoria* (Huebner) known from India which also occur in West Bengal.

Key to the species of genus *Acraea*

Antennae with a short abrupt club. Hindwing with M_1 and R_5 not stalked, R_5 arising before upper apex of cell *violae* (Fabricius)

Antennae with a gradually formed club. Hindwing with M_1 and R_5 stalked well beyond upper apex of cell. *issoria* (Huebner)

7. *Acraea violae* (Fabricius)
(The Tawny Coster)
(Plate I, nos. 7, 8)

1775. *Papilio violae* Fabricius, *Syst. ent.*, : 460.
1905. *Telchinia violae*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 471.
1932. *Telchinia violae*, Evans, *The Identification of Indian Butterflies* : 192.
1947. *Acraea violae*, Talbot, *The Fauna of British India (Butterflies)*, 2 : 466-469.
1957. *Telchinia violae*, Wynter-Blyth, *The Butterflies of the Indian Region*, : 235.
1988. *Acraea violae*, Gupta & Shukla, *Rec. zool. Surv. India, Occ. Paper No. 109*, : 2.

Material examined : Bankura Dist., Kangshabati Project Area, 1 ex., 22.ix.1981 (H.K. Bhowmik & Party coll.); Bishnupur, 1 ex., 25.x.1985 (M. Dutta & Party coll); Joypur Forest, 1 ex., 5.iii.1986, 1 ex., 6.iii.1986 (K.P. Mukherjee & Party coll.); Jhilimili, 2 exs, 23.ix.1985 (M. Prasad & Party coll.); Bishnupur range, Central Nursery, 3 exs, 17.xii.1985, Birai Jheel, 1 km. East of Bishnupur Guest House, 1 ex, 25.xii.1985, Jungle Mahal, 5 Km South of Joypur F.R.H., 4 exs, 20.xii.1985, Jungle Mahal, 5 Km. West of Joypur F.R.H., 1 ex., 22.xii.1985; Ashna, about 17 Km. N.E. of Simlapal F.R.H., 3 exs., 25.xii.1985, 4 Km along the southern bank of Birai Jheel, 1 Km east of Bishnupur Guest House, 2 exs., 25. xii. 1995, around a radius of about 4 km of Simlapal, 1 ex, 24.xii.1985 (D.K. Mondal & Party coll.); Piardoba, 3 exs, 1. i.x. 1986 (P. Mukhopadhyaya coll); North Bankura Sushuma Hills, 1 ex., 9.x.1985 (K.K. Roy & Party coll.); Mukutmanipur, 2 exs., 28.x.1985 (M. Datta & Party coll.). Barddhaman Dist., Panagarh, Soai Forest, 5 exs, 9.ii.1983 (S.K. Ghosh & Party coll.). Birbhum Dist., Palitpur, 2 exs., 3.x.1987 (M. Prasad & Party coll); Ballavpur Reserve forest, 1 ex., 29.i.1986, Illambazar Forest Range (2 Km away from F.R.H., 1 ex, 27.i.1986; Tumbani, 4 exs, 22.i.1986; Eglegram Forest Gopalpur, 1ex. 24.i.1986 (S.B. Roy & Party coll.); Sainthia, 1ex, 29.iii.1986; Bhachapur, 1 ex., 30.iii.1986, Mallarpur, 1 ex, 4.iv.1986 (M.S. Shishodia & Party coll.); Gonpur Forest, Suri, 1ex, 10.xi.1974 (A.K. Hazra & Party coll). Darjiling Dist., Panitanki, 6 Km from Naxalbari, 1 ex, 11.v.1987 (Raja Ram & Party coll.). Medinipur Dist, Jhargram, near Deer Park, 4 Km from PWD Bunglow, 3 exs, 7.iii.1984, Radhanagar, 4 exs, 8.iii.1984, Bachchurdoba, 2 km from PWD Bungalow, 2 exs, 9.iii.1984 (K.K. Ray & Party coll); around Belpahari F.R.H., 2 exs, 8.ix.1985, Belpahari, 1 ex, 9.ix.1985, 1ex, 13.vii.1985 (S. Biswas & Party coll.); Jhargram, 2 exs, 6.viii.1985, Eastern Jhargram, 1ex, 10.viii.1985, Salbari, 3 exs, 9.viii.1985 (B.C. Das & Party coll.); Arabari Forest, 2 exs, 3.iv.1985 (B.Nandi & A.R. Lahiri coll). Murshidabad Dist., Mor Gram, Phulwari, 2 exs, 9.ii.1986 (I.J. Gupta & Party coll.). Puruliya Dist, Malha Protected Hills, alt. 205 m, 2 exs, 16.xi.1974, Digha Forest, 1ex, 17.xi.1974 Arabari Forest, 1 ex, 26.xi.1974, (A.K. Hazra & Party coll.).

Forewing length : 21-29 mm.

Distribution : India : West Bengal (Bankura, Barddhaman, Birbhum, Calcutta, Darjiling, Medinipur, Murshidabad and Puruliya); widely distributed in India. Elsewhere : Sri Lanka.

Remarks ; Upperside of hindwing exhibits prominent to faint black spots. The status of the species is common. Previously, this species was reported from Calcutta by de Nicéville (1885) and Sanders (1944).

8. *Acraea issoria issoria* (Huebner)
(The Yellow Coster)
(Plate II, nos. 9,10)

1818. *Telchinia issoria* Huebner, *Zutr. Z. Samml. exot. Schmett.*, 1 : 27.
1905. *Pareba vesta*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 469-470.
1932. *Pareba vesta vesta*, Evans, *The Identification of Indian Butterflies* : 192.
1947. *Acraea issoria issoria*, Talbot, *The Fauna of British India (Butterflies)*, 2 : 463.

Material examined : Bankura Dist., Mukutmanipur, 1 ex, 18.x. 1985 (M. Datta & Party coll.)
Darjiling Dist., Kurseong, Dow Hill, 3 exs, 13.v.1979, Kurseong, alt. 1475m, 36 exs, 15.v.1979, Lebong,
alt. 1759 m, 9 exs., 18.v.1979 (M.S. Shishodia & Party coll.); Mirik, alt. 1760 m, 2 exs., 26.v. 1980 (R.N.
Tiwari & Party coll.).

Forewing length : 23-34 mm.

Distribution : India : West Bengal (Bankura and Darjiling); Sikkim to Assam.

Remarks ; The species, particularly the female, shows variation in the size of the black spots on the
upperside of wings. Evans (1932) referred to its status as not rare.

Family NYMPHALIDAE

Key to the genera of family Nymphalidae

1. Costa of forewing serrated.. 2
Costa of forewing not serrated..... 3
2. Cell of forewing and hindwing closed..... *Charaxes* Ochseneimer
Cell of forewing and hindwing open *Polyura* Billberg
3. Cell of both forewing and hindwing closed 4
Cell of forewing closed, of hindwing open, or open in both forewing and hindwing 21
4. Eyes hairy. 5
Eyes not hairy 10
5. Forewing with Cu_{1a} from lower apex of cell 6
Forewing with Cu_{1a} from well before lower apex of cell, vein M_3 from apex..... 7

6. Antennae shorter than half the length of costa. In hindwing procostal vein curved forward.....
 *Stibochiona* Butler
- Antennae longer than half the length of costa. In hindwing precostal vein straight
 *Dichorragia* Butler
7. Mid -and hind tarsi with paronychia simple..... *Cynthia* Fabricius
- Mid-and hind tarsi with paronychia bifid..... 8
8. Dorsum of forewing strongly sinuous, tornus lobed *Kaniska* Moore
- Dorsum of forewing straight or slightly convex but not sinuous, tornus not lobed..... 9
9. Outer margin of hindwing produced into a prominent tooth or tail at apex of vein M_3
 *Aglais* Dalman
- Outer margin of hindwing not produced into a prominent tooth or tail at apex of vein M_3
 *Vanessa* Fabricius
10. Forewing with vein Sc swollen at base *Ariadne* Horsfield
- Forewing with Sc not swollen at base 11
11. Forewing with Cu_{1a} and M_3 stalked. 12
- Forewing with Cu_{1a} and M_3 free 13
12. Forewing with R_2 arising out of R_5 *Chersonesia* Distant
- Forewing with R_5 free..... *Pseudergolis* Felder & Felder
13. Forewing with Cu_{1a} from before lower apex of cell, M_3 from apex 14
- Forewing with Cu_{1a} and M_3 from lower apex of cell 17
14. Hindwing with Cu_{1a} and M_3 from lower apex of cell 15
- Hindwing with Cu_{1a} and M_3 stalked and branching beyond lower apex of cell 16
15. Antennal club short, broad and abrupt..... *Argyreus* Scopoli
- Antennal club long, narrow and gradual..... *Penthema* Westwood
16. Forewing with cell short, not half the length of the wing, middle discocellular deeply con-
 cave..... *Hypolimnas* Huebner

- Forewing with cell long, at least half the length of wing, middle discocellular straight.....
 **Lebadea** C. Felder
17. Hindwing with Cu_{1a} and M_3 from apex of cell..... 18
 Hindwing with Cu_{1a} and M_3 stalked, branching beyond lower apex of cell..... 19
18. Antennal club short, broad, abrupt, flat or concave below..... **Phalanta** Horsfield
 Antennal club long, narrow, gradual, not flat or concave below **Cethosia** Fabricius
19. Forewing with M_2 and M_1 closely approximate at base **Auzakia** Moore
 Forewing with M_2 and M_1 well separated at base 20
20. Hindwing with M_1 and R_5 well separated at base **Kallima** Doubleday
 Hindwing with M_1 and R_5 closely approximated at base **Cyrestis** Boisduval
21. Cell closed in forewing and open in hindwing 22
 Cell open in forewing and closed in hindwing 30
22. Forewing with Cu_{1a} and M_3 stalked, branching well beyond lower apex of cell 23
 Forewing with Cu_{1a} and M_3 not stalked 24
23. Antennae equal to half the length of costa, slender and clubless **Cirrochroa** Doubleday
 Antennae longer than half the length of costa, club gradual **Vindula** Hemming
24. Forewing with Cu_{1a} and M_3 from lower apex of cell..... 25
 Forewing with Cu_{1a} from before lower apex of cell and vein M_3 from apex..... 28
25. Forewing with R_2 arising from upper apex of cell..... **Pantoporia** Heubner
 Forewing with R_2 arising from well before upper apex of cell 26
26. Eyes not hairy..... **Abrota** Moore
 Eyes hairy..... 27

27. Upperside of forewing and hindwing crossed by a pale green band..... *Sumalia* Moore
 Upperside of forewing and hindwing crossed by a broad white band..... *Parasarpa* Moore
28. Forewing with R_2 arising from upper apex of cell.....*Aconthea* Boisduval
 Forewing with R_2 arising from well before apex of cell..... 29
29. Eyes hairy.....*Symbrenthia* Huebner
 Eyes not hairy 30
30. Forewing with R_2 arising out of vein Sc, free..... 31
 Forewing with R_2 arising out of vein R_5 , not free..... 37
31. Hindwing with R_5 at base closer to vein M_1 than to vein Sc 32
 Hindwing with R_5 at base as close to vein Sc as to vein M_1 or closer..... 33
32. Antennal club short, broad, flat and concave beneath..... *Precis* Huebner
 Antennal club long, narrow and cylindrical... *Apatura* Fabricius
33. Forewing with R_3 from well before middle of vein R_5 , or if from middle of vein R_5 then vein R_1 anastomosed with vein Sc..... 34
 Forewing with R_3 from beyond middle of vein R_5 35
34. Thorax robust. In forewing of male veins R_1 and Sc free, in female veins R_1 and Sc free or anastomosed, vein R_3 arising closed to the cell apex and remote from vein R_4 . In hindwing precostal vein curved and simple. *Euthalia* Huebner
 Thorax relatively slender. In forewing veins R_1 and Sc anastomosed in both sexes, in female vein R_3 arising approximately mid-way between apex of cell and origin of vein R_4 . In hindwing precostal vein more or less angled and sometimes with a spur at the angle..... *Tanaecia* Butler
35. Labial palpi broad, with a dense clothing of scales.....*Athyma* Westwood
 Labial palpi narrower, with a clothing loose lax scales with numerous fine hairs..... 36
36. In hindwing of male, vein Sc ends on termen, in female precostal vein with a spur directed basad....
 *Phaedyma* C. Felder
 In hindwing of male, vein Sc ends on costa, in female precostal vein with long spur directed distad....
 *Neptis* Fabricius

37. Labial palpi very long and black at base..... *Sephisia* Moore
 Labial palpi short and white at base..... 38
38. Eyes smooth..... *Euripus* Doubleday
 Eyes hairy..... *Diagora* Snellen

VI Genus *Charaxes* Ochseneheimer 1816

1816. *Charaxes* Ochseneheimer, *Schmett. Europe*, 4 : 18.

This genus is represented in India by five species of which, two viz, *C. fabius* (Fabricius) and *C. polyxena* (Cramer) occur in West Bengal.

Key to species of the genus *Charaxes*

- Upperside of wings with basal area black *fabius* (Fabricius)
 Upperside of wings with basal area fulvous or ochraceous.. *polyxena* Cramer)

9. *Charaxes fabius fabius* (Fabricius) (The Black Rajah)

1781. *Papilio fabius* Fabricius, *Spec. Ins.*, 2 : 12.
 1882. *Charaxes fabius fabius*, Rothney, *Entomologists' mon Mag.*, 19 : 33-36.
 1932. *Charaxes fabius fabius*, Evans, *The Identification of Indian Butterflies* : 142.

Material examined : Calcutta, 4 exs, de Nicéville, (purchased).

Forewing length : 30-34 mm.

Distribution : India : West Bengal (Calcutta, North 24-Parganas); Bihar; Himachal Pradesh; Karnataka; Maharashtra; Sikkim; South India and Uttar Pradesh.

Remarks : This nominate subspecies is not represented in the collection made during faunistic surveys of West Bengal. Its choice of foodstuff is usually the common tamarind tree. Its status is not common. Rothney (1882) recorded it from Barrackpore (North 24-Parganas) whereas de Nicéville (1885) and Sanders (1944) reported its occurrence in Calcutta.

10. *Charaxes polyxena hierax* Felder (The Tawny Rajah)

1867. *Charaxes hierax* Felder, *Novara Reise, Lep Rhop.*, 3 : 422.
 1932. *Charaxes polyxena hierax*, Evans, *The Identification of Indian Butterflies*, : 141.

Material examined ; Darjiling Dist., 3 Kms South of Rambi, Alt. 300 m, 1ex., 2.iii. 1973 (H.S.

Sharma & Party Coll.), Jalpaiguri Dist., Mendabari Forest, Chilapata, 1 ex., 16. x. 1987 (S.K. Tandon & Party coll).

Forewing length : 36-42 mm.

Distribution : India : West Bengal (Darjiling, Jalpaiguri) and Sikkim. Elsewhere : North Burma,

Remarks : This subspecies predominantly inhabits forests and is the finest and most active of the species of the genus. It is fast flyig round the tops of trees. A specimen from Jalpaiguri District bears two white spots in interspcaes 5 and 6, separated from the main white discal band on upper side of forewing. Its status is common.

11: *Charaxes polyxena imna* Butler

1870. *Charaxes imna* Butler, *Tran. ent. Soc. Lond.*, : 122, pl. 4, fig. 2.

1932. *Charaxes polyxena imna* Evans, *The Identification of Indian Butterflies*, : 141.

Material examined : Calcutta, 1ex, (purchased, de Nicéville).

Forewing length : 92 mm.

Distribution : India : West Bengal (Calcutta); South India to Orissa.

Remarks : This subspecies is distinguished from *C. polyxena hierax* Felder by having broad marginal border on upperside of forewing. A single specimen is available in the old collection of Zoological Survey of India. Evans (1932) referred to its status not rare and its occurrence from South India to Orissa. Sanders (1944) recorded it from Calcutta.

VII Genus *Polyura* Billberg 1820

1820. *Polyura* Billberg, *Enum. Ins. Mus. Billb.* : 79.

There are nine species found in India of which three occurring in West Bengal are dealt with here.

Key to species of the genus *Polyura*

1. Upperside of wings with the ground colour black or deep indigo-blue..... *athamas* (Drury)
 Upperside of wings with the ground colour yellowish white 2
2. Upperside of forewing with one transverse post discal series of white spots.. *dolon* (Westwood)

 Upperside of forewing with two transverse post discal series of white spots
 *eudamippus* (Doubleday)

12. *Polyura athamas athamas* (Drury)
(The Common Nawab)

1770. *Papilio athamas* Drury, III. *exot. Ent.*, 1 : 5 pl. 2, fig. 4.
1905. *Eulepis athamas*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 220-222.
1932. *Eriobea athamas athamas*, Evans, *The Identification of Indian Butterflies*, : 143.
1978. *Polyura athamas athamas*, Corbet & Pendlebury, *The Butterflies of the Malay Peninsula*, : 212.

Material examined : Maldah dist. : Bholahat, 1 ex, (de Nicéville coll.),

Forewing length : 35 mm.

Distribution : India : West Bengal (Calcutta, Maldah); Arunachal Pradesh; Himachal Pradesh; Karnataka; Meghalaya and Uttar Pradesh. Elsewhere : North Burma.

Remarks : Evans (1932) referred to its occurrence from India (Himachal Pradesh: Kulu) to North Burma. Its status is common but it is not represented in the collection made during recent faunistic surveys of West Bengal. Sanders (1944) reported it from Calcutta.

13. *Polyura dolon centralis* (Rothschild)
(The Stately Nawab)
(Plate II, nos. 11,12)

1899. *Eriboea centralis* rothschild, *Novit. Zool.*, 6 : 274.
1932. *Eriboea dolon centralis*, Evans, *The Identification of Indian Butterflies* : 143.
1956. *Polyura dolon centralis*, Corbet & Pendlebury, *The Butterflies of the Malay Peninsula* : 244.

Material examined : Darjiling, 1 ex, (no further data); 1 ex. (Ex. J. Oten E.T. Camp coll.).

Forewing length : 85 86 mm.

Distribution : India : West Bengal (Darjiling) and Sikkim. Elsewhere : Bhutan and Nepal.

Remarks : The subspecies is a new record from West Bengal. Its status is rare. Only two specimens from West Bngal are available in the old collection of Zoological Survey of India. It is not represented in the material collected during faunistic surveys of the State. It is listed in the Schedule - II (Part-2) of the Wild Life (Protection) Act.

14.* *Polyura eudamippus eudamippus* (Doubleday)
(The Great Nawab)

1843. *Charaxes eudamippus* Doubleday, *Ann. Soc. ent. Fr.*, : 218 pl. 8.
1932. *Eriboea eudamippus eudamippus*, Evans, *The Identification of Indian Butterflies* : 144.
1978. *Polyura eudamippus*, Corbet & Pendlebury, *The Butterflies of Malay Peninsula*, : 212.

Material examined : Nil.

Wing expanse : 100-110 mm.

Distribution : India : West Bengal (Darjiling); Kumaon (Uttar Pradesh) to Assam.

Remarks : Evans (1932) referred to its distribution from Kumaon to Assam. Roonwal et. al. (1956) mentioned its record from Darjiling, West Bengal. Its status is not rare.

VIII Genus *Stibochiona* Butler 1816

1816. *Stibochiona* Butler, *Proc. zool. Soc. Lond.*, (3) : 614.

Only a single species i.e. *Stibochiona nicea* (Gray) occurs in India. It is represented in the collection made during faunistic survey of West Bengal and is dealt with here.

15. *Stibochiona nicea nicea* (Gray) (The Popinjay)

1833-1846. *Adolias nicea* Gray, *Lep. Ins. Nepal.* : 13, pl. 12, fig. 1.

1932. *Stibochiona nicea nicea*, Evans, *The Identification of Indian Butterflies.* : 150.

1988. *Stibochiona nicea nicea*, Gupta & Shukla, *Rec. zool. Surv. India, Occ. Paper No.* 109 : 29.

Material examined : Darjiling Dist., Darjiling, 1ex (no further data); Dange, 1ex., 1.iv.1978 (A.R. Bhowmik & Party coll.).

Forewing length : 29-30 mm.

Distribution : India : West Bengal (Darjiling); Himachal Pradesh (Kulu) to Arunachal Pradesh. Elsewhere : North Burma.

Remarks : There are about six species known under this genus which is only found in the Oriental Region. Evans (1932) referred to its status not rare but only a single specimen is represented in the collection made during faunistic surveys of West Bengal and another specimen was available in the old reference collection of Zoological Survey of India.

IX Genus *Dichorragia* Butler 1869

1869. *Dichorragia* Butler, *Proc. zool. Soc. London*, (3) : 614.

The species, *Dichorragia nesimachus* (Boisduval) represents this genus in India. Presently, the species is dealt with from West Bengal.

16.* *Dichorragia nesimachus* (Boisduval) (The Constable)

1836. *Adolias nesimachus* Boisduval, *Cuv. Reg. Anim, Ins.*, 2 : Pl. 139, bis, fig. 1.

1905. *Dichorragia nesimachus*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 248.

1932. *Dichorragia nesimachus*, Evans, *The Identification of Indian Butterflies.* : 149.

Material examined: Nil.

Forewing expanse : 65-85 mm.

Distribution : India : West Bengal (Darjiling); Jammu & Kashmir to Arunachal Pradesh. Elsewhere : Burma.

Remarks : Roonwal and Avinash Chandra (1956) mentioned its occurrence in Darjiling, West Bengal. The species is not represented in the collection made during recent faunistic surveys of the State. Its status is not rare.

X Genus *Cynthia* Fabricius 1807

1807. *Cynthia* Fabricius, *Mag. f. Insektenk* (Illiger), 6:281.

This genus is represented in India by a single species, *Cynthia cardui* (Linnaeus) and is dealt with from West Bengal.

17. *Cynthia cardui* (Linnaeus) (The Painted Lady)

1758. *Papilio cardui* Linnaeus, *Syst. Nat.* (ed.10), 1 : 475.

1932. *Vanessa cardui*, Evans, *The Identification of Indian Butterflies* : 177.

1971. *Cynthia cardui*, Field, *Smithson Contr. Zool.*, 84 : 37.

1977. *Cynthia cardui*, Varshney, *Newsl. zool. Surv. India*, 3(1) : 13-14.

1988. *Cynthia cardui*, Gupta & Shukla, *Rec. zool. Surv. India, Occ. Paper No. 109*, : 59.

Material examined ; Maldah Dist., Bholahat, 1ex. (W.H. Irvine Exch.). Murshidabad Dist., Mor Gram, 1ex., 9.ii. 1986 (I.J. Gupta & Party coll.).

Forewing length ; 25-26 mm.

Distribution : India : West Bengal (Calcutta, Murshidabad); Arunachal Pradesh; Madhya Pradesh; Meghalaya and Uttar Pradesh Elsewhere : Worldwide except South America.

Remarks : The species has developed migratory habits. Previously it was under the genus *Vanessa* Fabricius but Field (1971) resurrected the genus *Cynthia* and treated the species as *Cynthia cardui* (Linnaeus). Though Evans (1932) and Wynter-Blyth (1957) referred to its status being common but only a single specimen has been collected during the recent faunistic surveys of West Bengal in addition to a specimen available in the National Zoological collection of Zoological Survey of India. De Nicéville (1885) and Sanders (1944) recorded it from Calcutta.

XI Genus *Kaniska* Moore 1899

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

This genus is represented in India by a single species i.e. *Kaniska canace* (Linnaeus).

18. *Kaniska canace canace* (Linnaeus)
(The Blue Admirable)

1763. *Papilio canace* Linnaeus, *Centur. In.*, : 23.
1932. *Vanessa canace canace*, *The Identification of Indian Butterflies*, : 178.
1983. *Kaniska canace*, Varshney, *Rec. zool. surv.. India, Occ. Paper No. 47* : 8.

Material examined ; Darjiling Dist., Darjiling, 2 exs, (no further data). Maldah Dist., Bholahat, 1 ex. (no further data).

Forewing length : 32-33 mm.

Distribution : India : West Bengal (Darjiling and Maldah); Meghalaya; Naga Hills and Sikkim, Elsewhere : Burma.

Remarks ; This species was treated for a long time under the genus *Vanessa* Fabricius but Corbet and Pendlebury (1978) opined that species *canace* Linnaeus should be treated under the genus *Kaniska* Moore. Evans (1932) mentioned its distribution from India (Sikkim) to North Burma whereas de Nicéville (1886) referred to its record also from Maldah, West Bengal.

XII Genus *Aglais* Dalman 1816

1816. *Aglais* Dalman, *K. svenska vetensk - Akad. Handl., Stockholm*, 1 : 56.

Of the three species of this genus occurring in India only *Aglais cashmirensis* Kollar is found in West Bengal and is dealt with here.

19. *Aglais cashmirensis aesis* (Fruhstorfer)
(The Indian Tortoiseshell)
(Plate II, nos 13,14)

1909. *Vanessa aesis* Fruhstorfer, *In Seitz : Macrolepidoptera of the World*, 9 : 527.
1932. *Vanessa cashmirensis aesis*, Evans, *The Identification of Indian Butterflies*, : 179.
1983. *Aglais cashmirensis aesis*, Mandal, *Rec. zool, Surv. India, Occ. Paper No. 47* : 41.

Material examined ; Darjiling Dist., Darjiling, 2 exs. (no data); Goomti, alt. 825m., 1 ex., - vii-1911 (F.H. Gravely coll); Kalimpong, DFO's Office Compound, 1 ex., 3.iv.1973, in and around 'Pandam Tea Estate' 3 Kms South-east of Meadow Bank, alt. 1525 m, 1 ex., 23.iv.1973 (H.S. Sharma Party coll.); South of Ghoombhujang, 1 ex., 17.iii.1973, Hill Forest, alt. 2150 m (above Mima Falls), 1 ex., 17.iii. 1973 (P.K. Maity & Party coll.); Kalimpong Park area, 1 ex., 26.ii. 1973, Kurseong, alt. 1535 m (Dow Hill), 1 ex., 5.ii.1973, Risum, 3 exs., 22.ii.1973 (H.K. Bhowmik & Party coll.); Darjiling, Lava FRH, alt. 2150 m, 1 ex., 4.vi.1975; Rangirum around FRG), alt. 2000 m., 1 ex., 23.v.1975; Ghoombhujang, alt. 1435 m., 2 exs., 28.v.1975 (J.K. Jonathan & Party coll.); Darjiling, Chaikhiola, 2 exs., 12.iv.1976, Kurseong, 1 ex., 19.iii. 1978, Tindharia, alt. 856 m., 1 ex., 4.v. 1976 (A.R. Bhowmik & Party coll.); Kalimpong, alt. 1300 m, 1 ex., 2.iv.1981; Kurseong, alt. 1450 m, 1 ex., 23.iv.1978 (R.K. Varshney & Party coll.); Maldah Dist., Gar, 1 ex., 19.ix.1975 (H.K. Bhowmik & Party coll.).

Forewing length : 25-30 mm.

Distribution : India : West Bengal (Darjiling and Maldah); Himachal Pradesh (Simla) and Uttar Pradesh to Sikkim.

Remarks : This subspecies previously considered under *Vanessa* Fabricius is now treated under the genus *Aglais* Dalman. The species was earlier collected by Frushstorfer from Darjiling during May and June. Evans (1932) mentioned its status as common but collection made during faunistic surveys of West Bengal includes material only from Darjiling and Maldah Districts.

XIII Genus *Vanessa* Fabricius 1807

1807. *Vanessa* Fabricius, *Mag. f. Insektenk* (Illiger), 6 : 281.

There are eight species known from India of which, two occurring in West Bengal are dealt with here.

Key to the species of genus *Vanessa*

Inner margin of forewing strongly sinuous, tornus lobed..... *egea*(Cramer)

Inner margin of forewing not sinuous, tornus not lobed..... *indica* (Herbst)

20. *Vanessa egea agnicula* (Moore) (The Comma Eastern)

1872. *Hrapta agnicula* Moore, *Proc. zool. Soc. Lond.*, : 559 (Male) only.

1905. *Vanessa C-album* race *agnicula*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 372-373.

1932. *Vanessa egea agnicula*, Evans, *The Identification of Indian Butterflies* : 178.

Material examined ; Darjiling Dist., Buxa, lex., (no date), (de Nicéville coll.).

Forewing length : 25 mm.

Distribution : India : West Bengal (Darjiling). Elsewhere : Nepal to Bhutan.

Remarks : For this subspecies Evans (1932) mentioned distribution from Nepal to Bhutan. In the National Zoological Collection there is a specimen of this subspecies collected by de Nicéville from Buxa at the adjoining borders of Darjiling (West Bengal) and Bhutan. Its status is rare. It is included in Schedule -II(Part-2) of the Wild Life (Protection) Act.

21. *Vanessa indica indica* (Herbst) (The Indian Red Admirable) (Plate II, nos. 15,16)

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

1932. *Vanessa indica indica*, Evans, *The Identification of Indian Butterflies* : 177.

1988. *Vanessa indica indica*, Gupta & Shukla, *Rec. zool. Surv. India, Occ. Paper No. 109* : 60.

Material examined ; Darjiling Dist., Darjiling, 2 exs. (no further data); Debrepani, 6 exs., 22.x.1961 (R.N. Katiyar coll.); Darjiling, Mahanadi, above Goomti, alt. 1255m, 1 ex., 28.iv.1971 (A.R. Bhowmik & Party); Kalimpong, DFO's Office Compound, 1 ex., 3.iv.1973 (H.S. Sharma & Party Coll.); Suba Basti, alt. 880 m, 1 ex., 2.i.1974, Rangli, alt. 830 m., 4 exs., 20.xii.1975, Rangpo, alt. 400 m., 2 exs., 25.vii.1975 (G.K. Srivastava, G.S. Arora & Party coll.); Kalimpong, alt. 1200 m., 2 exs., 2.iv.1981 (R.K. Varshney & Party coll.).

Forewing length : 24-29 mm.

Distribution : India : West Bengal (Darjiling), Jammu & Kashmir to Arunachal Pradesh. Elsewhere : North Burma.

Remarks ; Evans (1932) referred to its status as common whereas the collection made during faunistic surveys of West Bengal includes specimens only from Darjiling District.

XIV Genus *Ariadne* Horsfield 1829

1829. *Ariadne* Horsfield, *Descr. Cat. Lep. Ins. Mus. East India Coy*, (2) : 33 (ref.pl.vi).

Two species of this genus occurring in India are also found in West Bengal and are dealt with here.

Key to the species of the genus *Ariadne*

Upperside of wings with a single discal line just beyond cell being regular. In forewing, outer margin deeply concave between veins Cu_{1a} and M_2 *ariadne* (Linnaeus)

Upperside of wings with a double discal line just beyond cell being highly irregular. In forewing outer margin faintly concave between veins Cu_{1a} and M_3 *merione* (Cramer)

22. *Ariadne ariadne indica* (Moore)

(The Angled Castor)

(Plate III, nos. 17,18)

1884. *Ergolis indica* Moore, *J. Asiat. Soc. Beng.* 53 : 20.

1905. *Ergolis ariadne*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 461.

1932. *Ergolis ariadne indica*, Evans, *The Identification of Indian Butterflies* : 191.

1978. *Eriadne ariadne*, Corbet & Pendlebury, *The Butterflies of Malay Peninsula*, : 161.

Material examined : Bankura Dist., Basi, Right side of Darkeshar river, 1 ex., 1.vi.1971 (S. Khera & Party coll.), Sonamukhi Block Colony, Bishnupur, 1 ex., 7.xi.1985 (S. Sen & Party coll.). Bardhaman Dist., Adra Mati, 1 ex., 6.ix.1986 (K.K. Ray & Party coll.). Calcutta, Dunlop Bridge, 1 ex., 4.v.1967 (no coll.). Darjiling Dist., Tumthang Khola, 5 kms south of Rangpo, alt. 300 m., 1 ex., 28.xii.1975 (G.K. Srivastava, G.S. Arora & Party coll.). Hugli Dist., Bandel, 1 ex., 21.x.1964 (A.N.T. Joseph & Party coll.). Maldah Dist., Gangarampur, 1 ex., 15.vi.1987 (K.P. Mukherjee & Party Coll.); Sahapur, 1 ex., 17.ix.1975 (H.K. Bhowmik & Party coll.). Nadia Dist., Kalyani, 1 ex., 20.vii.1965 (H.C. Ghosh & Party Coll.);

Ranaghat, 1 ex., 18.viii. 1965 (D.K. Mandal & Party coll.). 24-Parganas (North) Dist., Sodepur, 4 exs., 20.x.1984 (S.K. Ghosh & Party coll.). Puruliya Dist., Hathiahari, 1 ex., 10.xi.1985 (T.R. Mitra & Party coll.).

Forewing length : 23-26 mm.

Distribution : India : West Bengal (Bankura, Bardhaman, Calcutta, Darjiling, Hugli, Maldah, Nadia, 24-Parganas (North), Puruliya and South India.

Remarks ;The upperside of hindwing in male bears shining white veins M_2 and M_1 and discal black lines do not run through them to costa. Its status is common. De Nicéville (1885) and Sanders (1944) reported it from Calcutta.

23. *Ariadne merione assama* (Evans)

(The Common Castor)

(Plate III, nos. 19,20)

1924. *Ergolis merione assama* Evans, *J. Bombay nat. Hist. Soc.*, **30** : 95.

1978. *Ariadne merione*, Corbet & Pendlebury, *The Butterflies of Malay Peninsula*, : 161.

1988. *Ariadne merione indica*, Gupta & Shukla, *Rec. zool. Surv. India, Occ. Paper No. 109*, : 70 pl. 19, Nos. 145, 146.

Material examined ; Haora Dist., Chanditala, 1 ex., 21.xi. 1961 (R.P. Ghosh & H.C. Ghosh coll.); Botanical Gardens, 1 ex, 29.x.1965 (S.C. Mitra & Party coll.). Maldah Dist., Manichak, 2 exs., 24.vii. 1986 (M.S. Shishodia & Party coll.).

Forewing Length : 26-29 mm.

Distribution : India : West Bengal (Calcutta, Haora and Maldah); Sikkim to Arunachal Pradesh. Elsewhere : North Burma.

Remarks : Fuhstorfer (1912) referred to distribution of *A. merione tapestrina* (Moore) from Uttar Pradesh (Dehra dun) along southern slopes of Himalaya (Himachal Pradesh : Simla) to Sikkim and Assam. Evans (1924, 1932) mentioned that *A. merione tapestrina* (Moore) is replaced by *A. merione assama* (Evans) from India (Sikkim) to North Burma and distinguished this subspecies from *A. merione tapestrina* being larger and dry season form never much variegated. De Nicéville (1885) and Sanders (1944) reported from Calcutta.

XV Genus *Chersonesia* Distant 1983

1883. *Chersonesia* Distant, *Rhop. Malayana*, **1** : 86-142.

There are two species viz., *Chersonesia risa* (Doubleday) and *C. rahria* Moore known from India of which; the former occurs in West Bengal.

24. *Chersonesia risa* (Doubleday)
(The Common Maplet)

1850. *Cyrestis risa* Doubleday, *In Doubleday, Gen. diurn. Lep.*, 2 : 262, pl. 32, fig. 4.

1932. *Chersonesia risa*, Evans, *The Identification of Indian Butterflies*, : 173.

Material examined ; Darjiling, 1ex, (no further data).

Forewing length : 20 mm.

Distribution : India : West Bengal (Darjiling); Uttar Pradesh (Kumaon) to Arunachal Pradesh. Elsewhere : Burma.

Remarks ; Evans (1932) mentioned the status of the species as not rare. Presently, one specimen from Darjiling is available in the National Zoological Collection of Zoological Survey of India. The species is not represented in the collection made during recent faunistic surveys of the State.

XVI Genus *Pseudergolis* Felder & Felder 1868

1868. *Pseudergolis* Felder & Felder, *Reise Novara Lep. Rhop.*, (3) : 404.

The genus is represented in India by a single species i.e. *Pseudergolis wedah* (Kollar) and presently dealt with from West Bengal.

25. *Pseudergolis wedah* (Kollar)
(The Tabby)
(Plate III, nos. 21,22)

1848. *Ariadne wedah* Kollar, *In Huegel's Kaschimer*, 4 (2) : 437.

1932. *Pseudergolis wedah*, Evans, *The Identification of Indian Butterflies*, : 173.

1988. *Pseudergolis wedah*, Gupta & Shukla, *Rec.zoo. Surv. India, Occ. Paper No. 109*, : 51.

Material examined : Calcutta. 1ex. (no further data); Darjiling, 1ex. (no further data).

Forewing length ; 29-30 mm.

Distribution : India : West Bengal (Calcutta and Darjiling); Himachal Pradesh (Kulu) to Arunachal Pradesh. Elsewhere : Burma.

Remarks : Evans (1932) referred to its status as not rare. There are two specimens from West Bengal available in the collection of Zoological Survey of India but no specimen is represented in the collection made during recent faunistic surveys of the State.

XVII Genus *Agryreus* Scopli 1777

1777. *Agryreus* Scopoli, *Introd. Hist. nat.* : 431.

There are 14 species known from India, of which three occur in West Bengal.

Key to the species of genus *Agryreus*

1. Hindwing with the precostal vein straight and rather obscure.....*lathonia* (Linnaeus)
- Hindwing with the precostal vein well curved forward..... 2
2. Underside of hind wing ochreous and olive brown..... *hyperbius* (Linnaeus)
- Underside of hind wing dark green..... *childreni* (Gray)

26. *Agryreus lathonia issoea* (Doubleday)
(The Queen of Spain Fritillary)

1848. *Agrynnis issoea* Doubleday, *In Gray, Lep. Ins. Nepal*, : 11.

1932. *Agrynnis lathonia issoea*, Evans, *The Identification of India Butterflies* : 183.

Material examined : Darjiling, 1ex, (no further data), Darjiling, 1428 m, 1 ex (no date) (De Nicéville coll.).

Forewing length : 22-23 mm.

Distribution : India : West Bengal (Darjiling); Jammu & Kashmir to Arunachal Pradesh. Elsewhere: Pakistan and Burma.

Remarks ; Though Evans (1932) mentioned the status of this subspecies common but no specimen is represented in the material collected during faunistic survey of West Bengal. Two examples referred to under material examined are available in the old National Zoological Collection of Zoological survey of India.

27. *Argyreus hyperbius hyperbius* (Linnaeus)
(The Indian Fritillary)

1764. *Papilio hyperbius* Linnaeus, *Amoen acad.*, 6 : 408, (female).

1932. *Agrynnis hyperbius hyperbius*, Evans, *The Identification of Indian Butterflies*, : 182.

1978. *Argyreus hyperbius* Corbet & Pendlebury, *The butterflies of Malay Peninsula*, : 164.

Material examined ; Darjiling Dist., Kurseong, Eastern Himalaya, alt., 1020 m, 3 exs. (no date) (C. Lynch coll.); Mahanadi 1.5 Km West towards Kurseong, alt. 1240 m, 1ex., 25.iv.1971 (A.R. Bhowmik & party coll.); Mirik Raid hap, alt. 1428 m, 1ex, 21.ix.1974 (H.K. Bhowmik & Party coll.); Pedong, alt. 816 m, 1ex., 10.ix.1978, Labong, alt. 1600 m. 1ex, 25.ix.1978 (A.N.T. Joseph & party coll.); Samsing (North Bengal, alt. 500 m, 1ex, 29.iii.1981 (R.K. Varshney & party coll). Jalpaiguri Dist., 1ex (de Nicéville coll).

Forewing length : 32-39 mm.

Distribution : India : West Bengal (Darjiling and Jalpaiguri); Madhya Pradesh to Arunachal Pradesh and Rajasthan. Elsewhere : Pakistan and North Burma.

Remarks : Wynter-Blyth (1957) mentioned its status common but this subspecies is represented by specimens only from Darjiling in the collection made during the recent faunistic surveys of West Bengal.

28. *Argyreus childreni childreni* (Gray)
(The Large Silverstripe)

1831. *Argynnis childreni* Gray, *Zool. Misc.*, **1** : 33.

1932. *Argynnis childreni childreni*, Evans, *The Identification of Indian Butterflies*, : 182.

Material examined : Darjiling Dist., Darjiling, 1 ex (no further data); Sukiapukri, near Balaranbasti, 1428 m, 3 exs., 3.x.1974 (H. K. Bhowmik, A. R. Bhowmik & Party coll.).

Forewing length : 41-45 mm.

Distribution : India : West Bengal (Darjiling); Uttar Pradesh (Kumaon) to Arunachal Pradesh. Elsewhere : North Burma.

Remarks : The subspecies is represented by specimens only from Darjiling, West Bengal, Evans (1932) mentioned its status as not rare.

XVIII Genus *Penthema* Doubleday 1848

1848. *Penthema* Doubleday, *Gen. diurn. Lep.*, (2) : pl.39, fig.3.

Only a single species, *Penthema lisarda* (Doubleday) found in India, also occurs in West Bengal.

29. *Penthema lisarda lisarda* (Doubleday)
(The Yellow Kaiser)
(Plate III, nos. 23,24)

1845. *Diadema lisarda* Doubleday, *Ann. Mag. nat. Hist.*, **16** (1) : 233.

1905. *Penthema lisarda*, Bingham, *The Fauna of British India Butterflies*, **1** : 390.

1932. *Penthema lisarda lisarda*, Evans, *The Identification of Indian Butterflies*, : 149.

Material examined : Darjiling, 1 ex. (no further data).

Forewing length : 59 mm.

Distribution : India : West Bengal (Darjiling); Sikkim to Manipur.

Remarks : This nominate subspecies is a first report from West Bengal. Evans (1932) referred to its status as rare. It is included in the Schedule-II (Part-2) of the Wild Life (Protection) Act.

XIX Genus *Hypolimnas* Huebner 1819

1819. *Hypolimnas* Huebner, *Verz. bekannt. Schmett* (3) : 45.

The genus is represented in India by two species viz., *Hypolimnas bolina* (Linnaeus) and *H. misippus* (Linnaeus). Both these species occur in West Bengal.

Key to the species of genus *Hypolimnas*

Underside of hindwing with a prominent middle black costal spot in interspace 7 *misippus* (Linnaeus)

Underside of hindwing without any prominent middle black costal spot in interspace 7..... *bolina* (Linnaeus)

30. *Hypolimnas misippus* (Linnaeus) (The Danaid Eggfly) (Plate IV, nos. 25,26)

1764. *Papilio misippus* Linnaeus, *Mus. Utr.*, 264, F

1932. *Hypolimnas misippus*, Evans, *The Identification of Indian Butterflies*, : 173.

1987. *Hypolimnas misippus*, Gupta & Shukla, *Rec. zool. Surv. India, Occ. Paper No. 106* : 28.

Material examined : Bankura Dist., Kumardanga (Bishnupur), 1 ex., 6.xi.1985 (S. Sen & Party coll.). Calcutta (bred), 3 exs (no date), 1 ex., purchased (no date) (de Nicéville coll.), Darjiling Dist., Goomti (Near Kurseong), alt. 1300 m, 1 ex., 22.iv.1984 (R. K. Varshney & Party coll.). Maldh Dist., Bholahat, 5 exs., (no date), (de Niceville coll.). 24-Parganas (North), between Databad and Nalbani, North Salt Lake, 1 ex. 5.vii.1969 (B. Biswas & Party coll.).

Forewing length : 33-35 mm.

Distribution : India : West Bengal (Bankura, Birbhum, Calcutta, Darjiling, Maldah and 24-Parganas (North); Andaman and Nicobar Islands; Arunachal Pradesh; Sikkim and Uttar Pradesh. Elsewhere : Burma, Pakistan and Sri Lanka.

Remarks : Evans (1932) and Wynter-Blyth (1957) referred to its status as common but the species is now considered as endangered and as such is included in Schedule-I (Part-4) of the Wildlife (Protection) Act. It was previously reported from Calcutta and Santiniketan (Birbhum Dist.).

31. *Hypolimnas bolina* (Linnaeus) (The Great Eggfly) (Plate IV, nos. 27-30)

1758. *Papilio bolina* Linnaeus, *Syst. Nat.* (ed. 10), 1 : 479.

1932. *Hypolimnas bolina*, Evans, *The Identification of Indian Butterflies*, : 174.

1988. *Hypolimnas bolina*, Gupta & Shukla, *Rec. zool. Surv. India, Occ. Paper No. 109*, : 52.

Material examined : Bankura Dist., Mukutmanipur, 1 ex, 21.ix.1981 (H. K. Bhowmik & party coll.). Calcutta, 1 ex, (reared in Museum) (no further data); Calcutta, 3 exs (no date), 1 ex, -. viii.1883 (de Nicéville coll.); Calcutta, 1 ex., 7.xii.1879 (no coll.). Darjiling Dist., Kurseong (eastern Himalayas), Alt. 1020 m, 1 ex. (no date) (C. Lynch coll.). Jalpaiguri Dist., Jaldapara, 1 ex, 3.ix.1975, Nilpara, Hasimara, 1 ex, 31.viii.1975 (H. K. Bhowmik & Party coll.). Medinipur Dist., Bholahat, 4 exs. (de Nicéville coll.)

Forewing length : 37-51mm.

Distribution : India : West Bengal (Bankura, Calcutta, Darjiling, Jalpaiguri and Maldah); Andaman and Nicobar Islands; Arunachal Pradesh; Madhya Pradesh; Meghalaya and Uttar Pradesh. Elsewhere : Burma, Pakistan and Sri Lanka.

Remarks : The upperside of hind wing displays variation in the size of submarginal white spots. Evans (1932) and Wynter-Blyth (1957) mentioned its status as common but in 1981, this species was listed in the Rare and Endangered Animals of India. De Nicéville (1885) and Sanders (1944) reported this species from Calcutta.

XX. Genus *Lebadea* Felder 1861

1861. *Lebadea* Felder, *Nova Acta Leop. Carol.* 28(3) : 28.

This genus is represented in India by a single species i.e. *Lebadea martha* (Fabricius) which is dealt with from West Bengal.

32. *Lebadea martha ismene* (Doubleday) (The Knight)

1850. *Liminitis ismene* Doubleday, In Doubleday, Westw. & Hewt *Gen. Diurn. Lep.*, 2 : 276, pl.34, fig.2.

1905. *Lebadea martha*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 299.

1932. *Lebadea martha ismene*, Evans, *The Identification of India Butterflies*, : 159.

Material examined : Darjiling Dist., 1 Km south of Reyang F.R.H., on the bank of Reyang river, alt. 300 m., 1 ex., 28.iii.1973 (H. S. Sharma & Party coll.)

Forewing length : 31 mm.

Distribution : India : West Bengal (Darjiling); Assam to Manipur.

Remarks : This subspecies is first report for West Bengal and is represented by a single specimen from Darjiling in the material collected during recent faunistic surveys of West Bengal. Evans (1932) referred to its status as not rare.

XXI. Genus *Phalanta* Horsfield 1829

1829. *Phalanta* Horsfield, *Descr. Cat. Lep. Ins. Mus. East India Coy* (2) : Pl.7.

Two species viz. *Phalanta phalantha* (Drury) and *P. alcippe* (Cramer) represent the genus in India and the former occurs in West Bengal.

33. *Phalanta phalantha phalantha* (Drury)
(The common Leopard)
(Plate IV, nos. 31,32)

1770. *Papilio phalantha* Drury, *Exot. Inst.*, 1 : 41, pl. 21, figs. 1,2.
1905. *Atella phalantha*, Bingham, *The Fauna of British India (butterflies)*, 1:412-413, fig.75.
1932. *Atella phalanta*, Evans, *The Identification of Indian Butterflies* : 187.
1957. *Atella phalantha*, Wynter-Blyth, *The Butterflies of the Indian Region*, : 224.
1980. *Phalanta phalantha phalantha*, Varshney et al., *Rec. zool. Surv. India, Occ. Paper No. 31*:18-19.
1988. *Phalanta phalantha phalantha*, Gupta & Shukla, *Rec. zool. Surv. India, Occ. Paper No. 109* : 64-65.

Material examined : Birbhum Dist., Santiniketan, 2 exs., 5.x.1974, 1 ex, 10.vii.1974 (B.N. Das coll.). Calcutta, 1ex. (no date), Calcutta (bred), 1ex (no date) (de Nicéville coll.). Darjiling Dist., 1 Km south of Reyang, on way to Rambh, alt. 390m., 1 ex., 31.iii.1973 (H.S. Sharma & Party coll.); Bamanpokari, 1ex, 23.vii.1975 (H.K. Bhowmik & Party coll). Maldah Dist., Bholahat 1ex (no further data). West Dinajpur Dist., Rampur, 1 ex., 25.xi.1987 (T.R. Mitra coll).

Forewing length : 24-30 mm.

Distribution : India : West Bengal (Birbhum, Calcutta, Darjiling, Maldah and West Dinajpur); Arunachal Pradesh; Madhya Pradesh; Maharashtra; Nicobar Island; Tamil Nadu and Uttar Pradesh: Eslewhere ; Burma, Pakistan and Sri Lanka.

Remarks : The upperside and underside of wings bear black markings, which are faint in some specimens. Evans (1932) mentioned its status as common. De Nicéville (1885) and Sanders (1944) reported it from Calcutta.

XXII Genus *Cethosia* Fabricius 1806

1806. *Cethosia* Fabricius, *Mag. f. Insektenk (Illiger)*, 6 :280.

The genus is represented in India by three species, of which two occur in West Bengal.

Key to the species of genus *Cethosia*.

Upperside of forewing, in both sexes, marked with a broad oblique discal white or yellowish band.....
..... *cyane* (Drury)

Upperside of forewing, in either sex, without a broad oblique discal white or yellowish band.....
..... *biblis* (Drury)

34. *Cethosia cyane* (Drury)
(The Leopard Lacewing)

1770. *Papilio cyane* Drury, Ill. exot. Ent., 1 : pl.4, fig. 1.
1932. *Cethosia cyane*, Evans, *The Identification of Indian Butterflies*, : 190.
1988. *Cethosia cyane*, Gupta & Shukla, *Rec. zool. Surv. India, Occ. Paper No. 109*, : 69.

Material examined ; Calcutta, 1ex (no further data). Darjiling, 1ex. (no further data).

Forewing length : 33-34 mm.

Distribution : India : West Bengal (Calcutta and Darjiling); Uttar Pradesh (Mussoorie) to Arunachal Pradesh. Elsewhere ; Burma.

Remarks ; Two specimens mentioned under 'Material examined' were available from West Bengal in the old National Zoological Collection of the Zoological Survey of India. No specimen is represented in the material collected during recent faunistic surveys of the State. De Nicéville (1885) recorded it from Calcutta. Evans (1932) referred to its status as not rare.

35. *Cethosia biblis tisamena* Frushstorfer
(The Red Lacewing)

1909. *Cethosia tisamena* Fruhstorfer, In Seitz, *Macrolepidoptera of the World*, 9 : 725.
1932. *Cethosia biblis tisamena*, Evans, *The Identification of Indian Butterflies*, : 190.
1988. *Cethosia biblis tisamena*, Gupta & Shukla, *Rec. zool. Surv. India, Occ. Paper No. 109*, : 69.

Material examined ; Darjiling Dist., Kurseong, Eastern Himalayas, alt. 1020 m., 4 exs (no date) (C. Lynch coll.); Darjiling, Eastern Himalayas, 1ex (no further data).

Forewing length : 40-41mm.

Distribution : India : West Bengal (Darjiling); Sikkim to Arunachal Pradesh. Elsewhere : Burma.

Remarks : The subspecies is represented by five specimens from West Bengal in the old National Zoological Collection of the Zoological Survey of India. It is a first report for West Bengal and no specimen of this subspecies is represented in the collection made during recent of faunistic surveys of the State. Its status is common.

XXIII Genus *Auzakia* Moore 1898

1898. *Auzakia* Moore, *Lep. ind.*, 3 (32) : 146, 148.

Two species viz., *Auzakia danava* (Moore) and *A. austenia* (Moore) represent this genus in India

and the former species is presently dealt with from West Bengal.

36. *Auzakia danava* (Moore)
(The Commodore)
(Plsdt IV, nos. 33, 34)

1857. *Liminitis danava* Moore, *Cat. Lep. Ins. Mus. East India Coy*, 1 : 180, pl. 6a., fig. 2,
1905. *Auzakia danava*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 300.
1932. *Liminitis danava*, Evans, *The Identification of Indian Butterflies*, : 160.
1978. *Auzakia danava*, Corbet & Pendlebury, *The Butterflies of the Malay Peninsula* : 192.

Material examined : Darjiling, 1ex. (no further data).

Forewing length : 39 mm.

Distribution : India : West Bengal (Darjiling); Himachal Pradesh (Shimla) to Arunachal Pradesh.
Elsewhere : Burma.

Remarks : A single specimen from Darjiling was available in the old National Zoological Collection of Zoological Survey of India. No specimen is represented in the material collected during recent faunistic surveys of West Bengal. Its status is rare. It is included in the Schedule-II (Part -2) of the Wild Life (Protection) Act.

XXIV Genus *Kallima* Doubleday 1849

1849. *Kallima* Doubleday, *Gen. diurn. (paralekta) Lep.*, (2) : 52, pl. 52, figs. 2,3.

Of the four species occurring in India, two are found in West Bengal.

Key to the species of genus *Kallima*

Upperside of forewing marked with an orange discal band..... *inachus* (Boisduval)

Upperside of forewing marked with a bluish white discal band..... *alompora* Moore

37. *Kallima inachus inachus* (Boisduval)
(The Orange Oak Leaf)

1836. *Paphia inachus* Boisduval, *In Crochard's ed., Curv. Reg. Anim. Ins.*, 2 : pl. 139, fig. 3 (female)
1905. *Kallima inachus*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 395.
1932. *Kallima inachus inachus*, Evans, *The Identification of Indian Butterflies*, : 175.

Material examined ; Darjiling Dist., Darjiling, 1ex., 29.iv.1880 (East India Company Mus. coll);

1 Km West of Reyang, in and around Reyang Nallah, alt. 375 m 1 ex., 30.iii.1973 (H.S. Sharma & Party coll.); Bamapokri (North Bengal), 1ex, 21.viii.1975 (H.K. Bhowmik & Party coll.); Darjiling, Teesta, alt. 600m, 1ex., 30.vi.1979 (M. Prasad & Party coll.).

Forewing length : 39-41 mm.

Distribution : India : West Bengal (Darjiling); Sikkim to Arunachal Pradesh.

Remarks ; This nominate subspecies having dry season form not much paler than the darker wet season form is distinguished from *K. inachus huegeli* (Kollar) where dry season form is very pale. It is a first report from West Bengal and it is represented by specimens collected from Darjiling during recent faunistic surveys of West Bengal. Its status is not rare.

38. *Kallima alompora* Moore
(The Scarce Blue Oak Leaf)

1879. *Kallima alompora* Moore, *Trans. ent. Soc. Lond.*, : 14,
1905. *Kallima Horsfieldi*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 397.
1932. *Kallima alompora*, Evans, *The Identification of Indian Butterflies*, : 176.

Material examined : Darjiling Dist, Buxa, 1ex. (no date) (de Nicéville coll.).

Forewing length : 46 mm.

Distribution : India : West Bengal (Darjiling); Sikkim. Burma.

Remarks : No specimen of this species is represented in the collection made during recent faunistic surveys of West Bengal. The single specimen from Buxa (Darjiling) available in the National Zoological Collection of Zoological Survey of India constitutes a first report from West Bengal. Evans (1932) referred to its status as rare. It is listed in the Schedule-II (Part-2) of the Wild Life(Protection) Act.

XXV Genus *Cyrestis* Boisduval 1932

1832. *Cyrestis* Boisduval, *In de'urville, Voy. 'Astrolabe' Ent.*, 1 : 117.

Three species represent this genus in India, of which *Cyrestis thyodamas* Boisduval is found in West Bengal.

39. *Cyrestis thyodamas thyodamas* Boisduval
(The Common Map)

1836. *Cyrestis thyodamas* Boisduval, *Cuv. Reg. Anim. Ins.*, 2 : pl. 138, fig.,4.
1932. *Cyrestis thyodamas thyodamas*, Evans, *The Identification of Indian Butterflies* : 173.
1988. *Cyrestis thyodamas thyodamas*, Gupta & Shukla, *Rec. zool. Surv. India, Occ. Paper No. 109*, : 49.

Material examined ; Darjiling, Teesta, 3 exs, iii.1953. (M. B. Kripalini coll.).

Forewing length : 30-31 mm.

Distribution : India : West Bengal (Darjiling); Sikkim to Arunachal Pradesh. Elsewhere : Burma.

Remarks ; Three specimens (partly damaged) from Darjiling (Teesta) collected in 1953 are available for study. This is a first report from West Bengal. Its status is rare.

XXVI Genus *Cirrochroa* Doubleday 1847

1847. *Cirrochroa* Doubleday, *Gen. diurn. Lep.*, (1) : pl. 21, fig. 2.

Of the four species of this genus known from India, two viz. *Cirrochroa aoris* Doubleday and *C. tyche* Felder occur in West Bengal.

Key to the species of genus *Cirrochroa*

- Forewing truncate at apex..... *aoris* Doubleday
 Forewing rounded, not truncate at apex..... *tyche* Felder

40. *Cirrochroa aoris aoris* Doubleday (The Large Yeomen)

1847. *Cirrochroa aoris* Doubleday, *In doubleday, Gen. diurn. Lep.*, (1) : 157, pl. 21, fig.2, (female)

1932. *Cirrochroa aoris aoris*, Evans, *The Identification of Indian Butterflies*, : 188.

1988. *Cirrochroa aoris aoris* Gupta & Shukla, *Rec. zool. Surv. India, Occ. Paper No. 109*, : 67.

Material examined : Darjiling Dist., Great Raijit, 1ex., 21.ix.1959, Darjiling, 1ex (no date) (B.K. Tikader coll.).

Forewing length : 36-38 mm.

Distribution : India : West Bengal (Darjiling); Sikkim to Arunachal Pradesh.

Remarks : Only the nominate subspecies occurs in India. This subspecies is a first report from West Bengal on the basis of two specimens from Darjiling available in the old collection. No specimen of this subspecies is represented in the material collected during recent faunistic surveys of the State. Evans (1932) referred to its status as not rare.

41. *Cirrochroa tyche mithila* Moore (The Common Yeomen)

1872. *Cirrochroa mithila* Moore, *Proc. zool. Soc. Lond.*, : 558.

1932. *Cirrochroa tyche mithila*, Evans, *The Identification of Indian Butterflies*, : 188.

Material examined : Darjiling Dist., around Rambh, alt. 360 m, 1 ex, 6.i.1974 (G.K. Srivastava, G.S. Arora & Party coll.). Maldah Dist., Bholahat, 1 ex (no further data), 24-Parganas Dist (North), Barrackpore, 2 exs., vi. (de Nicéville coll.).

Distribution : India : West Bengal (Calcutta, Darjiling, Maldah and 24-Parganas, North) Arunachal Pradesh; Meghalaya; Nagaland and Sikkim. Elsewhere : Burma.

Remarks : The subspecies is a first report from West Bengal. Though Evans (1932) mentioned its status common but the subspecies is represented by a few specimens collected from three out of 17 districts. De Nicéville (1885) and Sanders (1944) recorded it from Calcutta.

XXVII Genus *Vindula* Hemming 1934

1934. *Vindula* Hemming, *Entomologist*, **67** : 77.

Only a single species i.e. *Vindula erota* (Fabricius) occurring in India is dealt with from West Bengal.

42. *Vindula erota erota* (Fabricius) (The Cruiser)

1793. *Papilio erota* Fabricius, *Ent. Syst.*, **3** (1) : 76.

1905. *Cynthia erota*, Bingham, *The Fauna of British India, Butterflies*, **1** : 406.

1932. *Cynthia erota erota*, Evans, *The Identification of Indian Butterflies*, : 188.

1956. *Vindula erota erota*, Corbet & Pendlebury, *The Butterflies of the Malay Peninsula* : 196.

Material examined ; Darjiling Dist., Darjiling, 1 ex, (no further data); Kurseong (Eastern Himalayas), alt. 1520 m, 1 ex, (no date), (C. Lynch coll).

Forewing length : 41 mm.

Distribution : India : West Bengal (Darjiling); Sikkim to Arunachal Pradesh. Elsewhere : Burma.

Remarks : Two specimens of this nominate subspecies from West Bengal (Darjiling), are available in the old Collection of Zoological Survey of India. Evans (1932) referred to its status not rare but it is not represented in the collection made during recent faunistic surveys of the State. It is a first report from West Bengal.

XXVIII Genus *Pantoporia* Huebner 1819

1819. *Pantoporia* Huebner, *Verz. Bekannt. Schmett.*, (3) : 44.

The genus is represented in India by a single species ie. *Pantoporia hordonia* (Stoll) which is presently dealt with from West Bengal.

43. *Pantoporia hordonia hordonia* (Stoll)
(The Common Lascar)

1791. *Papilio hordonia* Stoll, Cramer's *Pap. exot. Suppl.*, pl. 33, figs. 4, 4D.
1905. *Rohinda hordonia*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 344.
1932. *Neptis hordonia hordonia*, Evans, *The Identification of Indian Butterflies*, : 172.
1978. *Pantoporia hordonia*, Corbet & Pendlebury, *The Butterflies of Malay Peninsula*, : 188.

Material examined ; Calcutta, 1 ex., 14.ii.1880, 1 ex, 15.ii.1880, 1 ex., 20.ii.1880, 1 ex., 29.ii.1880 (de Nicéville Coll). Darjiling Dist., Darjiling, 1 ex (no date), (East India Co. Museum Colln.); 3 Km West of Rangpo F.R.H., alt. 360 m, 3 exs., 7.iv.1973, 3 Km South-east of Rangpo F.R.H., alt. 750 m, 1 ex, 10.iv.1973, 1 Km east of Goke F.R.H. Singla, alt. 400 m, 1 ex, 17.iv.1973 (H.S. Sharma & Party coll.); Bamanpokri, 1 ex, 24.viii.1975 (H.K. Bhowmik & Party coll.); Tung, 1 ex, 25.iii.1978 (A.R. Bhowmik & Party coll.). Maldah Dist, Bholahat, 1 ex (no date), (de Nicéville coll); Bholahat, 1 ex (no date) (W.H. Irvine, by exchange).

Forewing length : 21-24 mm.

Distribution : India : West Bengal (Calcutta, Darjiling and Maldah); Southern India; Uttar Pradesh to Arunachal Pradesh. Elsewhere : Burma.

Remarks : The nominate subspecies is represented in old collection of Zoological Survey of India from three districts viz., Calcutta, Darjiling and Maldah. Evans (1932) referred to its status as common but it is represented by specimens only from Darjiling District, collected during recent faunistic surveys of West Bengal. Sanders (1944) reported it from Calcutta.

XXIX Genus *Abrota* Moore 1857

1857. *Abrota* Moore, In Horsfield and Moore, *Cat. Lep. Ins. Mus. East India Coy* (1) : 176.

The genus is represented by a single species i.e. *Abrota ganga* Moore which is found in West Bengal.

44. *Abrota ganga* Moore
(The Sergeant-Major)
(Plate V, nos. 37,38)

1857. *Abrota ganga* Moore, *Cat. Lep. Ins. Mus. East India Coy*, 1 : 178, pl. 6a, fig.1.
1932. *Abrota ganga*, Evans, *The Identification of Indian Butterflies*, : 159.

Material examined : Darjiling, 2 exs (no further data).

Forewing length : 41-42 mm.

Distribution : India : West Bengal (Darjiling); Sikkim to Arunachal Pradesh. Elsewhere : Bhutan.

Remarks : The species is a first report from West Bengal and is represented by two specimens from Darjiling, in the old collection of Zoological Survey of India. Its status is rare.

XXX Genus *Sumalia* Moore 1898

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

Key to the species of genus *Sumalia*

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

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

45. *Sumalia daraxa* (Doubleday)
(The Green Commodore)

1850. *Liminitis daraxa* Doubleday, In Doubleday : *Westw. & Hew. Gen. Diurn. Lep.*, 2 : 276, pl. 34, fig.4.

1932. *Limenitis daraxa* Evans, *The Identification of Indian Butterflies* : 160.

1978. *Sumalia daraxa*, Corbet & Pendlebury, *The Butterflies of Malay Peninsula*, : 192

Material examined : Darjiling Dist., Kurseong (eastern Himalayas), 1ex, (C. Lynch coll); Kurseong, 1ex, 4.vi.1952 (no coll.).

Forewing length : 28-29 mm.

Distribution : India : West Bengal (Darjiling); Uttar Pradesh; Sikkim to Nagaland. Elsewhere ; Bangladesh, Bhutan; Burma to the Malay Peninsula.

Remarks : The species is represented by two specimens from Darjiling, in the old collection of Zoological Survey of India and there is no specimen in the collection made during recent faunistic surveys of the State. It is a first report from West Bengal. Its status is not rare.

46. *Sumalia zulema* (Doubleday)
(The Scarce White Commodore)

1850. *Liminitis zulema* Doubleday, In Doubleday, *Westw., Hew. Gen. Diurn. Lep.*, 2 : 276, Pl. 34, fig. 1.

1932. *Limenitis zulema*, Evans, *The Identification of Indian Butterflies*, : 160.

Material examined : Darjiling Dist, Kurseong (Eastern Himalayas), 1ex, (no date) (C. Lynch coll.).

Forewing length : 36 mm.

Distribution : India : West Bengal (Darjiling); Sikkim to Meghalaya. Elsewhere : Bhutan and Burma.

Remarks ; The species is represented by a single specimen, from Darjiling (West Bengal), in the

old collection of Zoological Survey of India. It is a first report from West Bengal. Its status is very rare. It is included in Schedule -(IV) of the Wild Life(Protection) Act.

XXXI Genus *Parasarpa* Moore 1898

1898. *Parasarpa* Moore, *Lep, ind.*, 3 (32) : 146-147.

The genus is represented in India by a single species i.e. *Parasarpa zaiyla* (Doubleday), which is dealt with from West Bengal.

47.* *Parasarpa zayla* (Doubleday) (The Bicolour Commodore)

1850. *Liminitis zayla* Doubleday, *In Doubleday, Westw. & Hew. Gen. diurn. Lep.*, 2 : 276, pl. 35, fig. 4.

1932. *Limenitis zayla*, Evans, *The Identification of Indian Butterflies*, : 160.

Material examined : Nil.

Forewing expanse : 3.5 3.8 inches' (vide de Nicéville, 1886).

Distribution : India : West Bengal (Darjiling); Sikkim to Assam.

Remarks : Evans (1932) mentioned its status not rare and its distribution from Sikkim to Assam. De Niceville (1886) referred to it as the most beautiful species of the genus and reported its plentiful occurrence on Birch Hill, Darjiling. The species is not represented in the collection made during recent faunistic surveys of West Bengal.

XXXII Genus *Aconthea* Horsfield 1829

1829. *Aconthea* Horsfield, *Descr. Cat. Lep. Ins. Mus. East India Coy.* (2) : explic, pls: 5,8.

This genus is represented in India by three species and *Aconthea khasiana* (Swinhoe) is dealt with from West Bengal.

48. *Aconthea khasiana khasiana* (Swinhoe) (The Dark Archduke)

1893. *Symphaedra khasiana* Swinhoe, *Trans. ent. Soc. Lond.*, : 284.

1932. *Adolias khasiana khasiana*, Evans, *The Identification of Indian Butterflies* : 158.

1988. *Aconthea khasiana khasiana*, Gupta & Shukla, *Rec. zool. Surv. India, Occ. Paper No.* 109:32.

Material examined : Darjiling Dist., Buxa, 1 ex. (no date) (Museum colln.).

Forewing length : 36 mm.

Distribution : India : West Bengal (Darjiling); Arunachal Pradesh; Assam and Meghalaya.

Remarks : The nominate subspecies differs from *Aconthea khasiana intermedia* (Tytler) occurring in Manipur by the male having upperside of forewing practically unspotted and the blue border vestigial; upperside of hindwing with blue border narrow and mostly purple; and female possessing bluish white spots on upperside of wings, spots larger at bases of interspaces 2 and 3, underside of wings ochreous brown and hindwing hardly or not at all green washed (vs. male having upperside of forewing with markings more developed of hindwing with blue border and mostly blue, turning to green at the tornus; female with pale yellow spots on upperside of forewing and dark yellow on upperside of hindwing). A single specimen from Buxa (West Bengal) is available in the old collection of Zoological Survey of India. Evans (1932) referred to its status as not rare. It is not represented in the material collected during recent faunistic survey of West Bengal. It is a first report from the State

XXXIII Genus *Symbrenthia* Huebner 1819

1819. *Symbrenthia* Huebner, *Verz. bekannt. Schmett.*, (3) : 43.

Of the four species of this genus occurring in India, two viz. *Symbrenthia hippoclus* (Cramer) and *S. hypselis* (Godart) are found in West Bengal.

Key to the species of genus *Symbrenthia*

Underside of wings marked with black tessellations..... *hypselis* (Godart)

Underside of wings not marked with black tessellations..... *hippoclus* (Cramer)

49. *Symbrenthia hypselis cotanda* Moore (The Spotted Jester)

1874. *Symbrenthia cotanda* Moore, *Proc. zool. Soc. Lond.*; 569, pl. 46. fig. 9,

1905. *Symbrenthia hypselis*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 378.

1932. *Symbrenthia hypselis cotanda*, Evans, *The Identification of Indian Butterflies*, : 181.

Material examined : Darjiling Dist., 2 exs. (no further data), Buxa , 6 exs (no further data), Buxa, 2 exs. (no date), (Museum colln.); Lingsaka, 1ex., 7.ix.1959 (B.K. Tikader coll).

Forewing length : 21-24 mm.

Distribution : India : West Bengal (Darjiling); Uttar Pradesh to Arunachal Pradesh. Elsewhere : Burma.

Remarks ; This subspecies is represented by specimens from, Darjiling district, in the old collection of Zoological Survey of India. There is no specimen in the collection made during recent faunistic surveys of West Bengal. Its status is not rare.

50. *Symbrenthia hippoclus khasiana* Moore
(The Common Jester)

1874. *Symbrenthia Khasiana* Moore, *Proc. zool. Soc. Lond.*, : 569.
1905. *Symbrenthia lucina* Bingham, *The Fauna of British India (Butterflies)*, 1 : 376.
1932. *Symbrenthia hippoclus khasiana*, Evans, *The Identification of Indian Butterflies*, : 180.

Material examined : Darjiling dist., Goomti, Tea Estate, Kurseong, alt. 1428m, 1ex., 18.ii.1973 (H.K. Bhowmik & Party coll.); Rambh, Alt. 360 m, 1 ex, 6.i.1974, Sukna, 200 m, 1ex, 7.i.1976 (G.K. Srivastava, G.S. Arora & Party coll).

Forewing length : 22-23 mm.

Distribution : India : West Bengal (Darjiling), Eastern Ghats, Jammu & Kashmir to Arunachal Pradesh. Elsewhere : Burma.

Remarks : Only a single subspecies occurs in India. Evans (1932) referred to its status as common but specimens collected during recent faunistic surveys of West Bengal belong only to Darjiling district.

XXXIV Genus *Moduza* Moore 1881

1881. *Moduza* Moore, *Lep. Ceylon*, 1 (2) : 47.

Only a single species i.e. *Moduza procris* (Cramer) occurring in India is dealt with from West Bengal.

51. *Moduza procris procris* (Cramer)
(The Commander)

1777. *Papilio procris* Cramer, *Pap. exot.*, 2 : pl. 106, figs. E,F, (female).
1905. *Moduza procris*, Bingham, *The Fauna of British India Butterflies*, 1 : 291.
1932. *Limenitis procris procris*, Evans, *The Identification of Indian Butterflies*, : 161.
1988. *Moduza procris procris*, Gupta & Shukla, *Rec. zool. Surv. India, Occ. Paper No.* 109 : 36.

Material examined : Calcutta, 1ex (no date) (Wood-Mason coll); Calcutta, 1ex (no date) de Nicéville coll); Calcutta, 5 exs. (no date) (de Niceville, purchased). Darjiling Dist. Darjiling, 1ex (no further data), Rangpo, alt. 400m, 1 ex, 26.xii.1975 (G.K. Srivastava, G.S. Arora & Party coll.). Jalpaiguri Dist., Hasimara, 1ex, 22.viii. 1986 (T.K. Pal & Party coll.), Noorpore, 1ex, 18.xii.1986 (R.S. Barman & Party coll.), Mendabari Forest, Chilapata, 2 exs, 16.x. 1987 (S.K. Tandon & Party coll.).

Forewing length : 32-34 mm.

Distribution : India : West Bengal (Calcutta, Darjiling and Jalpaiguri); Uttar Pradesh to Arunachal Pradesh. Elsewhere : Burma.

Remarks : The nominate subspecies is represented in three districts of West Bengal, viz. Calcutta,

Darjiling and Jalpaiguri. The specimens collected during recent faunistic surveys of the State belong to Darjiling and Jalpaiguri districts. Its status is not rare. De Nicéville (1885) and Sanders (1944) reported it from Calcutta.

XXXV Genus *Precis* Huebner 1819

1819. *Precis* Huebner, *Verz. bekannt. Schmett.*, (3) : 33.

Six species of this genus are found in India and all are dealt with from West Bengal.

Key to the species of the genus *Precis*

1. Upperside of forewing without an ocellus in interspace 2..... *iphita* (Cramer)
 Upperside of forewing with a black spot of variegated ocellus in interspace 2..... 2
2. Upperside of hindwing with a black spot in interspace 2.... *hierta* (Fabricius)
 Upperside of hindwing with a variegated ocellus in interspace 2..... 3
3. Upperside of forewing and hindwing with submarginal ocelli in all interspaces.. *atlites* (Linnaeus)
 Upperside of forewing and hindwing without submarginal ocelli in interspaces 3 and 4..... 4
4. Upperside of forewing with a whitish subapical band..... *orithya* (Linnaeus)
 Upperside of forewing without a whitish subapical band..... 5
5. Upperside of forewing brown with pale yellow spots..... *lemonias* (Linnaeus)
 Upperside of forewing fulvous orange and without pale yellow spots. *almana* (Linnaeus)

52. *Precis iphita iphita* (Cramer)
 (The Chocolate Pansy)

1779. *Papilio iphita* Cramer, *Pap. exot.*, 3 : pl. 209, fig. C,D.
 1905. *Junonia iphita*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 356.
 1932. *Precis iphita iphita*, Evans, *The Identification of Indian Butterflies*, : 177.

Material examined ; Birbhum Dist., Illambazar, 1 ex., 14.iii.1986. (K.P. Mukherjee & Party coll), Darjiling Dist., Buxa, 1 ex, (Museum Colln.), Darjiling, 1 ex, 24.iv.1880. (East India Co. & Museum colln.); Kurseong (eastern Himalayas), alt. 1500 m. (no date), (Lynch C. coll.); Teesta Valley. 1 ex., 30.i.1953 (M.B. Kripalani coll.), Teesta, alt. 214 m 1 ex, 24.v.1974 (M.S. Shishodia & Party coll); Teesta, Melti, 300 m., 1 ex, 27.xii.1975 (G. K. Srivastava, G. S. Arora & Party Coll); 1 Km south of Reyang

F.R.H., on the bank of Reyang river, 300m, 1 ex, 28.iii.1973, 1 Km west of Reyang F.R.H., in and around Reyang Nallah, 1 ex, 30.iii.1973 (H. S. Sharma & Party coll), Rangpo, alt. 400 m., 1 ex, 4.vii.1974 (M. Prasad & Party coll). Jalpaiguri Dist, Jainti Forest, 2 exs., 8.v.1987 (Raja Ram & Party coll.). Maldah Dist., Gar, 1 ex., 19.iv.1975 (H. K. Bhowmik & Party Coll.)

Forewing length : 29-33 mm.

Distribution : India : West Bengal (Birbhum, Calcutta, Darjiling, Maldah and Jalpaiguri); Sikkim to Arunachal Pradesh. Elsewhere : Burma.

Remarks : Evans (1932) referred to its status as very common. Presently the nominate subspecies is represented in four districts of West Bengal by specimens collected during recent faunistic surveys of the State. It was earlier reported from Calcutta.

53. *Precis hierta magna* Evans
(The Yellow Pansy)

1926. *Precis hierta magna* Evans, *J. Bombay nat. Hist. Soc.* 31: 715.

1932. *Precis hierta magna*, Evans, *The Identification of Indian Butterflies*, : 176.

Material examined : Calcutta, 2 exs (no further data). Darjiling, 1 ex (no date) (East India Company Museum coll.). Jalpaiguri Dist., Rudak forest, 1 ex, 8.ix.1975 (H. K. Bhowmik & Party Coll.); Santalabari, 1 ex, 19.xiii.1986 (T. K. Pal & Party coll.). Maldah Dist., Bholahat, 1 ex (no date), (de Nicéville coll.); Haldia, 1 ex 4.viii.1985 (B. C. Das & Party coll.)

Forewing length : 23-30 mm.

Distribution : India : West Bengal (Calcutta, Darjiling, Jalpaiguri and Maldah); Andaman Islands, Sikkim to Arunachal Pradesh. Elsewhere : Burma.

Remarks : It is represented in four districts of West Bengal by specimens collected during faunistic surveys of the State. The status of this subspecies is common. De Nicéville (1885) and Sanders (1944) reported it from Calcutta.

54. *Precis atlites* (Linnaeus)
(The Grey Pansy)

1763. *Papilio atlites* Linnaeus, *Centur. Ins.*; 24.

1905. *Junonia atlites*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 359.

1932. *Precis atlites*, Evans, *The Identification of Indian Butterflies*, : 176.

Material examined : Bankura Dist., Bishnupur (Onda village), 1ex, 6.xi.1985, Bishnupur, (Kumardanga Village), 1ex, 6.xi.1985 (S. Sen & Party coll); Birai Jheel, Bishnupur, 2 exs, 18.xii.1985, 1ex, 25.xii.1985, Ahalaya Bai Road 5 Km south of Mohan Temple, 1ex, 26.xii.1985 (D.K. Mandal & Party coll.); Birbhum Dist., Santiniketan, 1ex, 5x.1974 (B.N. Das & Party coll); Ballavpur, 2 exs, 15.iii.1987

(K.P. Mukherjee & Party coll). Calcutta, 4 exs, (no further data), 2 exs, (no date (de Niceville coll)); 1 ex, - ii.1988 (Shureef coll); Museum Campus, 2 exs, 24.iii.1955 (no coll). Darjiling Dist, Darjiling, 1 ex, (no further data), Jhalung, alt. 300-400 m, 1 ex, 23.xii.1973 (G.K. Srivastava & P.K. Maiti coll); Sevok, 1 ex, 12.iv.1984 (M. Prasad & Party coll). Haora Dist, Abhirampur, 1 ex, 23.i.1986, Uluberia, 1 ex, 26.i.1986, (B. Datta coll); Uluberia, 1 ex, 19.iii.1986 (M. S. Shishodia & B.K. Coll). Jalpaiguri Dist, Hanskhali, 1 ex, 10.x.1987 (S.K. Tandon & Party coll); Maldah, Agricultural Farm, 2 exs, 19.xi.1986 (B.C. Das coll). Ratua, 1 ex, 26.vi.1986 (M.S. Shishodia & Party coll). Medinipur Dist, Belda, 16 Km from Zila Parishad Bungalow, Danton, 1 ex, 10.iii.1984 (K.K. Ray & Party coll); Medinipur, Kesaniola, 1 ex 31.iii.1985 (B. Nandy & Party coll). Puruliya Dist, Digha Forest, 1 ex, 17.xi.1974 (A.K. Hazra & Party coll); Ajodhya village, Ajodhya Hills, 1 ex, 1.xi.1986 (T.R. Mitra & Party coll). North 24-Parganas Dist., Nalbani, North Salt Lake, 3 exs, 21.vi.1964, 1 ex, 11.vii.1964, 2 exs, 22.iv.1965, 1 ex, 4.vii.1965 (B. Biswas & coll); Sodepur, Natagarh, Krishnapur bye Lane, 1 ex, 20.x.1984 (S.K. Ghosh & Party coll.). West Dinajpur Dist., Rampur, 2 exs, 25.xi.1987 (T.R. Mitra & Party coll).

Forewing length : 25-32 mm.

Distribution : India : West Bengal (Bankura, Birbhum, Calcutta, Darjiling, Haora, Jalpaiguri, Maldah, Medinipur, Puruliya, 24-Parganas North and West Dinajpur); widely distributed in India. Elsewhere : Burma and Sri Lanka.

Remarks : The upperside of wings exhibit dark brown thick to light brown thin markings. Evans (1932) mentioned its status not rare whereas the specimens were collected from 11 districts of West Bengal during recent surveys of the State. Rothney (1882) reported it from Barrackpore whereas de Nicéville (1885) and Sanders (1944) recorded it from Calcutta.

55. *Precis orithya ocyale* Huebner (The Blure Pansy)

1819. *Precis ocyale* Huebner, *Verz. bekannt. Schmett.* : 34.
1905. *Junonia orithya*, Bingham, *The Fauna of British India Butterflies*, 1 : 358.
1932. *Precis orithya ocyale*, Evans, *The Identification of Indian Butterflies*, : 176.

Material examined ; Bankura Dist, Bishnupur, Central Nursery, 1 ex, 17.x.1985 Ahalya Bai Road, 1 ex, 26.xii.1985 (D.K. Mandal & Party coll); Gangajal Ghati, 1 ex, 11.ix.1986 (R.S. Barman & Party coll). Bardhaman Dist, Soai Forest, Panagarh, 1 ex, 9.ii.1983 (S.K. Ghosh & Party coll). Birbhum Dist., Chandrapur Forest, 1 ex, 9.xi.1974 (A.K. Hazra & Party coll); Bhachapur, 1 ex, 30.iii.1986, Mallarpur, 1 ex, 4.iv.1986 (M.S. Shishodia & Party coll). Darjiling Dist, Darjiling, 1 ex, (East India Company Museum colln); near Barbatia Basti, 3 Km north-west of Bhanjeng Y Hostel, alt. 1900 m, 1 ex, 18.iii.1973 (H.S. Sharma & Party coll.); Bhanjeng Y Hostel, alt. 1900 m, 18.iii.1973 (H.S. Sharma & Party coll). Murshidabad Dist, Amarpur, 1 ex, 8.ii.1986 (I.J. Gupta & Party coll).

Forewing length : 20-23 mm.

Distribution : India : West Bengal (Bankura, Bardhaman, Birbhum, Calcutta, Darjiling and Murshidabad); Sikkim to Arunachal Pradesh. Elsewhere : Burma.

Remarks : The subspecies is represented in five dists. of West Bengal by specimens collected during recent faunistic surveys of the State. Its status is very common. De Nicéville (1885) and Sanders (1944) reported it from Calcutta.

56. *Precis lemonias lemonias* (Linnaeus)
(The Lemon Pansy)

1758. *Papilio lemonias* Linnaeus, *Syst. Nat.* (ed.10) : 473.
1905. *Junonia lemonias*, Bingham, *The Fauna of British India Butterflies*, : 357.
1932. *Precis lemonias lemonias*, Evans, *The Identification of Indian Butterflies*, : 176.

Material examined ; Bankura Dist, Sonamukhi Block Colony, Bishnupur, 1 ex, 7.xi.1985 (S. Sen & Party coll). Birbhum Dist. Santiniketan, 1 ex, - vii. 1974, (B.N. Das & Party coll), 1 ex, 5.x.1974 (B.N. Das & G.C. Dey coll). Calcutta, 1 ex, (no further data), Eden Garden, 1 ex, 5.viii. 1959 (A.P. Kapur coll) Eden Garden, 2 exs., 20.vii.1966 (R.K. Singh & Party coll); Eden Garden, 1 ex, 19.viii.1966 (G.S. Arora coll), Eden Garden 1 ex, 20.vii.1966 (R.S. Pillai & G.P. coll). Darjiling Dist, Debrepani, 2 exs, 11.x.1961 (R.N. Katiyar coll); 1 Km south of Reyang F.R.H. on the bank of Reyang on way to Rambi, alt. 390 m, 1 ex, 31.iii.1973 (H.S. Sharma & Party coll); Daling coat, 3 Kms north of Gorubothan, alt. 400 m, 1 ex, 20.xii. 1973, Jhalung, alt. 350-450 m, 5 exs, 5.i.1974, Mahanadi alt. 1280 m, 1 ex, 9.i.1976, Sukna, alt. 200m, 1 ex, 7.i.1976 (G.K. Srivastaba, G.S. Arora & Party coll); Naxalbari, 1 ex, 11.ix.1974, Bamanpokri, 1 ex, 24.vii.1975 (H.K. Bhowmik & Party coll.). Haora Dist., Uluberia, 1 ex, 19.iii.1966 (M.S. Shishodia & B.K. Biswas coll). Jalpaiguri Dist, Chapromari Forest, 1 ex, 30.iv.1975 (B.N. Nandi & Party coll). Jaianti Forest, 3 exs, 8.v.1987 (Raja Ram & party coll). Medinipur Dist, Jhargram (near Roybari), 1 ex, 3.ix. 1983 (A.K. Hazra & Party coll); Arabari Reserve Forest, 1 ex, 3.iv.1985 (B. Nandy & Party coll); Danton (Baghra), 1 ex, 14.viii.1985, Danton (Tokinagar), 1 ex, 15.vii.1985 (B.C. Das & Party coll), Belpahari (palpira), 1 ex, 9.ix.1985 (S. Biswas & Party coll). Murshidabad Dist., Sagardighi (Chandan Mati), 1 ex, 15.ii.1986 (I.J. Gupta & Party coll). Nadia Dist, Ranaghat, 1 ex, 18.viii. 1965 (D.K. Mandal & Party coll.). 24-Parganas (North) Dist., Barrackpore, 1 ex., 28.x.1965 (O.B. Chhotani coll.).

Forewing length : 22-30 mm.

Distribution : India : West Bengal (Bankura, Birbhum, Calcutta, Darjiling, Haora, Jalpaiguri, Medinipur, Murshidabad, Nadia and 24-Parganas North) ; Sikkim to Arunachal Pradesh. Elsewhere : Burma.

Remarks : The nominate subspecies is well represented in West Bengal as specimens were collected from 10 districts during recent faunistic surveys of the State. Its status is common. De Niceville (1885) and Sanders (1944) reported it from Calcutta.

57. *Precis almana almana* (Linnaeus)
(The Peacock Pansy)
(Plate VI, nos. 41-42)

1758. *Papilia almana* Linnaeus, *Syst. Nat.* (ed. 10) : 472
1905. *Junonia almana*, Bingham, *The Fauna of British India (Butterflies)* : 176.
1932. *Precis almana almana*, Evans, *The Identification of India (Butterflies)*. 176,

Material examined : Bankura Dist, Bishnupur, central Nursery, 2 exs, 17 xii. 985. Birai Jheel 4 km south-west of Jamuna Bandh, 4 exs., 18. xii. 1985 (D.K. Mandal & Party coll) Joypur Forest, 1 ex, 6.iii. 1986, Kanchanpur Forest, 3 exs, 10.iii.1986 (K.P. Mukherjee & Party coll). Barddhaman Dist, Adra Mati, 1 ex, 8.iv. 1986 (K.K. Ray & Party coll). Birbhum Dist, Santinketan, 1 ex, 10. ix. 1974, 1 ex, 5.x.1974 (S. Khera & Party coll); Santiniketan, 2 exs, 10.ix.1974, 1 ex, 11.ix.1974 (B.N. Das & G.C. Dey coll.); Illambazar, 1 ex, 2.x.1987 (M. Prasad & Party oll.). Calcutta, 1 ex, -i.1871 (no coll); Calcutta, 5 exs, (no further data); Calcutta Museum Compound, 5 exs, 25. viii.1955, 1 ex, 26. viii. 1955 (zoological coll.); Basdhani near Calcutta, e exs, 13.xi.1955, Eden Garden, 1 ex, 24. xii. 1964 (S. Ali coll); Alipore, 2 exs, 30.viii.1957, Calcutta 2 exs, 7.ii.1960, Calcutta, Eden Garden, 2 exs, 30.vii.1960, 1 ex, 12.i.1961 (A.P. Kapur coll). Botanical Garden, 1 ex, 4. ix. 1957 (M.R. Majeed coll); Baghmari, 1 ex, 24.viii.1962 (B. Das & H.C. Paul coll); Edn Garden, 1 ex, 27.vii.1964, 1 ex, 29.vii.1964 (G. Prasad coll); Wden Garden, 1 ex, 7. vi. 1965 (A.N.T. Jaseph coll); Alipore (horticulture Garden), 1 ex, 11.viii.1965 (B.K. Mudi coll); Eden Garden, 1 ex, 20.vii.1966 (R.K.Singh & Party coll); Eden Garden, 1 ex, 19.viii.1966 (G.S. Arora & Party Eden Garden, 1 ex, 20.viii.1966 (R.S. Pillai & G. Prasad coll) Darjiling Disdt, Kurseong (Mahanadi), alt. 2100 m, 1 ex, 7.ii.1973, Sukna, 1 ex, 13.ii.1974 (H.K. Bhowmik & Party coll); Sevok, 21 ex, 12.iv.1984 (M. Prasad & Party coll), Mirik Bazar, 1 ex, 19.iv.1986 (B.C. Das & Party coll). Haora Dist, Bally, Nischinda, 1 ex, 4.ix.1966 (S.S. Saha coll); Mahespur, 2 exs, 25.i.1986 (B. Datta & G. Sen coll). Hugli Dist, ChandanNagar, 1 ex, 9.xi.1967 (K.K. Ray coll). Jalpaiguri Dist, Santalbari, 2 exs, 19. viii. 1986 (T.K. Pal & Party coll); Joyanti, 1 ex, 17.xii.1986 (R.S. Barman & Party coll). Maldah Dist, Alal, 1ex, 19.vi.1986, Tushi hata, 1ex, 25.vi.1987 (K.P. Mukherjee & Party coll); Haldi bari, 1ex, 16.viii.1986, Chanchali, 20.vii. 1986, Ratua, 1ex, 20.vii. 1986 (M.S. Shishodia & Party coll); Agriculture Farm, 1ex, 19.xii 1986 (B.C. Das coll.) Medinipur Dist, Reghumathpur Seed Farm, 1ex, 29.v.1971, Brahman Mundi, 1ex, 3.vi. 1971, Circuit House Compound, 1ex, 4.vi.1971 (S. Khera coll); Haldia, 1ex, 3.viii.1985, Salbani 2 exs, 9.viii. 1985 (B.C. Das & Party coll). Murshidabad Dist, Mor Gram, 2 exs, 9.ii.1986 (I.J. Gupta & Party coll). Nadia Dist, Kalyani, 1ex, 20.vii. 1965 (H.C. Ghosh & Party coll); Ranaghat, 1ex, 18.viii.1965 (D.K. Mandal & Party coll). Puruliya Dist, Mathwari, Government Seed Farm, 5 exs, 30.v.1971 (S. Khera & Party coll). 24-Parganas (North) Dist., Dhapa, 1ex, 30.vi.1962, 1ex, 11.xi.1964 (Shaukat Ali Coll); Dattabad, North Salt Lake, 3 exs, 21.vi.1964, Hediari Hat, 5 Kms north of Salt Lake, 1ex, 19.vii. 1964, (B. Biswas coll); Prafullanagar, 1ex, 17.vi.1965 (H.C. Ghosh & Party coll); Natagarh, Krishnapur bye lane, 1ex, 20.x.1984 (S.K. Ghosh & Party coll). 24-Parganas (South) Dist, Kawkdweep (Hardwood Point), 1ex, 18.ii.1984 (S.K. Ghosh & Party coll); Govindapur, 1ex, 27.iv.1986 (B.N. Das & Party coll). West Dinajpur Dist, Raiganj, 1ex Kod Gram, 2 exs, 14.ii.1986 (B.C. Das coll); Rampur (Fathepur), 1ex, 27.xi.1987 (T.R. Mitra coll).

Forewing length : 23-30 mm.

Distribution : India : West Bengal (Bankura, Barddhaman, Birbhum, Calcutta, Darjiling, Haora, Hugli, Jalpaiguri, Maldah, Medinipur, Murshidabad, Nadia, Puruliya, 24Parganas North, 24-Parganas South and West Dinajpur; widely distributed in India. Elsewhere : Burma and Sri Lanka,

Remarks : The upperside of wings shows variation in black markings from prominent and thick to faint and thin, ground yellow colour is also deep to light. Evans (1932) mentioned its status as common. Presently it is observed that the nominate subspecies is very common and widely distributed. A large number of specimens were collected from 16 out of 17 districts of West Bengal during recent faunistic surveys of the State. Though, Evans (loc.cit) referred to the wing expanse of this subspecies 60-65 mm

but present specimens have forewing length (from base to apex) 23-30 mm and wing expanse approximately 46-66 mm. De Niceville (1885) and Sanders (1944) reported it from Calcutta.

XXXVI Genus *Apatura* Fabricius 1807

1807. *Apatura* Fabricius, *Mag. f. Insektenk (Illiger)*, 6 : 280.

This genus is represented in India by six species of which three are dealt with from West Bengal.

Key to the species of genus *Apatura*

1. Underside of forewing with prominent small subapical white dots in interspaces 5,6 and 8.
..... *parisatis* Westwood.
- Underside of forewing without subapical white dots in interspaces 5,6 and 8..... 2
2. Underside of forewing with black spots in the cell..... *ambica* Kollar
- Underside of forewing without black spots in the cell..... *sordida* Moore.

58. *Apatura parisatis parisatis* Westwood
(The Black Prince)

1850. *Apatura parisatis* Westwood, *Gen. diurn, Lep.* 2 : 305.

1932. *Apatura parisatis parisatis*, Evans, *The Identification of Indian Butterflies* : 147.

1988. *Apatura parisatis parisatis*, Gupta & Shukla, *Rec. zool. Surv. India, Occ. Paper No. 109* : 24.

Material examined : Darjiling, Ghoom, alt. 2100 m, 1ex, 27.ix.1978 (A.N.T. Joseph & Party coll).

Forewing length : 26 mm.

Distribution : India : West Bengal (Darjiling); Uttar Pradesh to Arunachal Pradesh. Elsewhere ; Burma.

Remarks : Evans (1932) referred to its status as not rare. The nominate subspecies is represented by a single specimen from Darjiling District in the collection made during recent faunistic surveys of West Bengal.

59. *Apatura ambica ambica* Kollar
(The Indian Purple Emperor)
(Plate VI, nos. 43, 44)

1844. *Apatura ambica* Kollar, *In Huegel's Kaschmir*, 4 (2) : 431.

1932. *Apatura ambica ambica*, Evans, *The Identification of Indian Butterflies* : 146.

1988. *Apatura ambica ambica*, Gupta & Shukla, *Rec. zool. Surv. India, Occ. Paper No. 109* : 24.

Material examined ; Darjiling Dist, Kurseong (eastern Himalayas), alt. 1520m, 1ex (C. Lynch

coll); Buxa, 1ex, (no date) (de Nicéville coll); Buxa, 6 exs (no date), (Museum coll).

Forewing length : 33-35 mm.

Distribution : India : West Bengal (Darjiling); Jammu & Kashmir to Arunachal Pradesh. Elsewhere : Burma.

Remarks : There is no representative of the nominate subspecies in the collection made during recent faunistic surveys of West Bengal. The specimens referred to under 'Material examined' belong to the old collection of Zoological Survey of India. Its status is not rare.

60. **Apatura sordida sordida* Moore
(The Sordid Emperor)

1865. *Apatura sordida* Moore, *Proc. zool. Soc. Lond.* : 765. PL. 41, fig. 2, (M).

1932. *Apatura sordida sordida*, Evans, *The Identification of Indian Butterflies*, : 145.

Material examined : Nil.

Forewing expanse : 60-70 mm.

Distribution : India : West Bengal (Darjiling); Sikkim to Arunachal Pradesh. Elsewhere : Burma.

Remarks : Evans (1932) referred to its status as rare. This nominate subspecies is not represented in the material collected during recent faunistic surveys of West Bengal. Roonwal et al (1956) mentioned its occurrence in Darjiling.

XXXVII Genus *Euthalia* Huebner 1819

1819. *Euthalia* Huebner, *Verz. bekannt. Schmett.*, (3) : 41.

There are 19 species under this genus occurring in India of which eight are dealt with from West Bengal.

Key to the species of genus *Euthalia*

1. Underside of hindwing with two spots in cell, these spots may be reddish; no markings in interspaces 5,6,7..... *nais* (Forster)
- Underside of hindwing with two spectacle marks in cell, outer one extending at base of interspace 5, a ring present at bases of interspaces 6 and 7..... 2
2. Underside of forewing with cell entirely open..... 3
- Underside of forewing with cell closed or at least with a small spur from base of vein M₂ 7

3. Upperside or underside of forewing with two detached apical white spots on either side of vein R_5 , just before origin of vein R_4 unless forming part of the pale band in female. Upperside of forewing with basal markings in interspace 1b consisting of a well defined ring under the origin of vein Cu_{1b} 4
- Upperside or underside of forewing always with two detached white apical spots on either side of vein R_5 , just before origin of vein R_4 . Upperside of forewing with basal markings in interspace 1b, consisting of a spot (not a ring) under origin of vein Cu_{1b} and a dash at extreme base; both (spot or dash) may be absent..... 5
4. Underside of forewing always bearing, at base of interspace 1b, a ring or rounded spot under origin of vein Cu_{1b} usually with a second one below it.....*anosia* (Moore)
- Underside of forewing with no markings or only a single spot or dash under origin of vein Cu_{1b} and only very rarely at extreme base.....*telchinia* (Ménétries)
5. Upperside of wings with red spots on hindwing and in cell of forewing.....*lubentina* (Cramer)
- Upperside of wings with none of the spots red..... 6
6. Upperside of hindwing with outer discal band of small usually well defined and well separated spots.....*garuda* (Moore)
- Upperside of hindwing with outer discal line continuous or absent, but never of well separated small spots*phemius* (Doubleday)
7. Upperside of forewing with a submarginal row of white spots. Cell in forewing not fully closed*franciae* (Gray)
- Upperside of forewing without a row of submarginal white spots,. Cell in forewing closed.....*sahadeva* (Moore)

61. *Euthalia nais* (Forster)
(The Baronet)

1771. *Papilio nais* Forster, *Nov. Spec. Ins. Cent*, 1: 73.
1905. *Euthalia nais*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 287.
1932. *Euthalia nais*, Evans, *The Identification of Indian Butterflies* : 157.

Material examined ; Barddhaman Dist, Panagarh, 1ex, 9.ii.1983 (S.K. Ghosh & Party coll). Bankura Dist, north Bankura, Sushuni Hills, 9.x.1985 (K.K. Ray & Party coll); Mukutmanipur, 1ex, 28.x.1985 (M. Datta & Party coll); Jangle Mahal, 5 Km south of Joypur FRH, 1ex, 20.xii.1985 (D.K. Mandal & Party coll). Maldah Dist, Bholahat, 1ex, (no date) (de Nicéville coll); Bholahat, 1ex, (no date) (H.W. Irvine coll). Medinipur Dist. Jhargram, 1ex, 15.ix.1985 (S. Biswas & Party coll). Murshidabad Dist, Berhampore (C.S. R.S. Campus), 1ex, 3.xi.1974 (A.K. Hazra & Party coll).

Forewing length : 23-30 mm.

Distribution : India : West Bengal (Bankura, Bardhaman, Calcutta, Maldah, Medinipur and Murshidabad); Gujarat, Madhya Pradesh Pradesh, South India and Uttar Pradesh to Sikkim. Elsewhere: Sri Lanka.

Remarks : The upperside of wings is tawny orange bearing black markings. The species represented in four districts of West Bengal by specimens collected during recent faunistic surveys of the State. Its status is not rare. De Nicéville (1885) and Sanders (1944) reported it from Calcutta.

62.* *Euthalia anosia saitaphernes* Fruhstorfer
(The Grey Baron)

1912. *Euthalia anosia saitaphernes* Fruhstorfer, *In Seitz : Macrolepidoptera of the World* 9:647.

1932. *Euthalia anosia saitaphernes*, Evans, *The Identification of Indian Butterflies*, : 152.

Material examined ; Nil.

Forewing expanse : 70-85 mm.

Distribution : India : West Bengal (Darjiling); Sikkim and Meghalaya.

Remarks : Evans (1932) referred to its occurrence in Sikkim. Roonwal and Avinash chandra (1956) listed this subspecies from Darjiling (West Bengal) and Khasi Hills (Meghalaya). Evans (loc.cit.) mentioned its status rare. No specimen is represented in the collection made during recent faunistic surveys of the State. It is listed in Schedule-II (Part-2) of the Wild Life (Protection) Act.

63. *Euthalia telchinia* Ménétries
(The Blue Baron)

1857. *Adolias telchinia* Ménétries, *Enum, Carp. Anim. Mus. Petrop, Lep.*, 2 : 120, Pl.9, fig. 3.

1905. *Euthalia telchinia*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 281.

1932. *Euthalia telchinia*, Evans, *The Identification of Indian Butterflies*, : 153.

Material examined : Darjiling Dist, Darjiling, 1ex. (no further data).

Forewing length : 34 mm.

Distribution : India ; West Bengal (Darjiling); Karnataka; Sikkim to Arunachal Pradesh. Elsewhere : Nepal and North Burma.

Remarks ; A single specimen of this species is available from Darjiling in the old collection of Zoological Survey of India and no specimen is represented in the collection made during recent faunistic surveys of the State. Its status is very rare. It is included in Schedule-I (Part -4) of the Wild Life (Protection) Act.

64. *Euthalia lubentina indica* Fruhstorfer
(The Gaudy Baron)

1904. *Euthalia lubentina indica* Fruhstorfer, *Sett. Zg.*, 65 : 350.

1932. *Euthalia lubentina indica*, Evans, *The Identification of Indian Butterflies*, : 155.

Material examined : Calcutta, 6 exs, (no date) (de Nicéville, purchased). Darjiling Dist, 1ex, (no date), (Museum coll).

Forewing length : 32-33 mm.

Distribution : India : West Bengal (Calcutta and Darjiling); Maharashtra and Himachal Pradesh (Kangra) to Arunachal Pradesh. Elsewhere : Burma.

Remarks : This subspecies is represented in Calcutta and Darjiling districts by specimens available in the old collection of Zoological Survey of India. Presently, no specimen is represented in the material collected during faunistic surveys of West Bengal. It is included in Schedule -IV of the Wild Life (Protection) Act. De Nicéville (1885) and Sanders (1944) reported it from Calcutta.

65. *Euthalia garuda garuda* (Moore)
(The Baron)

1857. *Adolias garuda* Moore, *Cat. Lep. Ins. Mus. East India Coy*, 1 : 186, pl. 6, figs. 2, 2a larva and pupa.

1905. *Euthalia garuda*, Bingham, *The Fauna of British India Butterflies*, 1 : 282.

1932. *Euthalia garuda garuda*, Evans, *The Identification of Indian Butterflies*, : 154.

Material examined : Bankura Dist, Jungle Mahal, 5 Km West of Joypur F.R.H., 1ex, 22.xii.1985 (D.K. Mandal & Party coll.). Birbhum Dist, Illambazar, 1ex, 14.iii.1986 (K.P. Mukherjee & Party coll.). Calcutta, 1ex, 7.xii.1879, 1ex, 8.ii.1880, 2 exs (no date) (de Nicéville, purchased colln.); Calcutta, 1ex, -vii.- 1ex, 14.ii.1879, 1ex, 21.xii.1895, 1ex (bred in April), 1ex (bred in July), de Nicéville coll.). Darjiling, 1ex (no further data). Maldah Dist., Bholahat, 1ex, (W.H. Irvine, by exchange).

Forewing length : 28-35 mm.

Distribution : India : West Bengal (Bankura, Birbhum, Calcutta, Darjiling and Maldah); Assam. Elsewhere : Burma.

Remarks : The specimens referred under 'material examined' agree with the distinguished features of the nominate subspecies. There are also specimens in the old collection determined as *Euthalia garuda garuda* Evans (1923) mentioned *Euthalia garuda garuda* (Moore), distributed from Assam to Burma and *Euthalia garuda sudhodana* Fruhstorfer occurring in Bengal and Sikkim. The specimens collected during recent faunistic surveys of West Bengal belong to Bankura and Birbhum districts whereas specimens representing Calcutta and Darjiling districts are available in the old collection of Zoological Survey of India. Its status is not rare. De Nicéville (1885) and Sanders (1944) reported it from Calcutta.

66. *Euthalia phemius* (Doubleday)
(The White-edged Blue Baron)

1848. *Itanus phemius* Doubleday, *In Doubleday, Gen. diurn. Lep.*,: pl.41, fig. 4 (male).

1905. *Euthalia phemius*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 280.

1932. *Euthalia phemius*, Evans, *The Identification of Indian Butterflies*, : 154.

Material examined ; Darjiling Dist, Darjiing, 2 exs, (no further date); Darjiling, 1ex, (no date), Ex.T. (Olein E.T. Camp Museum); Buxa, 1ex, no date, (Museum coll.); 1 Km. east of Reyang, FRH, on Western bank of river Teesta, alt. 275 m, 1ex, 29.iii.1973, 1 Km West of Reyang FRH, Peran Nallah, alt. 375 m, 2 exs, 30.iii.1973, 3 Km West of Rangpo F.R.H., alt. 300 m, 1 ex, 7.iv.1973, 1 Km South West of Goke FRH, Singla, alt. 450m, 16.iv.1973 (H.S. Sharma & Party coll.); Teesta, 200 m, 1ex, 23.ix.1980 (B.C. Das & Party coll.).

Forewing length : 29-38 mm.

Distribution : India : West Bengal (Darjiling); Sikkim - Elsewhere : Burma.

Remarks ; The specimens available in the old collection of Zoological Survey as well as collected during recent faunistic surveys of West Bengal belong only to Darjiling District. The occurrence of this species in West Bengal is a first report as Evans (932) referred to its distribution from India (Sikkim) to Burma. Its status is not rare.

67. *Euthalia franciae franciae* (Gray)
(The French Duke)
(Plate VI, nos. 45,46)

1846. *Adolias franciae* Gray, *Lep. Ins. Nep.*, : 12, pl. 14.

1905. *Euthalia franciae*, Bingham, *The Fauna of British India Butterflies*, 1 : 279.

1932. *Euthalia franciae franciae*, Evans, *The Identification of Indian Butterflies*, : 155.

Material examined ; Darjiling Dist, Darjiling, 1ex, - v. - (no coll).

Forewing length : 36 mm.

Distribution : India : West Bengal (Darjiling) and Sikkim. Elsewhere : Bhutan and Nepal.

Remarks : The species is not represented in the material collected during recent faunistic surveys of West Bengal. A single specimen from West Bengal (Darjiling) is available in the National Zoological collection of Zoological Survey of India. It is a first report from West Bengal. Its status is rare. It is listed in Schedule-II (Part-2) of the Wild Life (Protection) Act.

68. *Euthalia sahadeva sahadeva* (Moore)
(The Green Duke)
(Plate VI, nos. 47,48)

1859. *Adolias sahadeva* Moore, *Trans. ent. Soc. Lond.*, (new series), 5 : 80, pl. 8, fig.3.

1905. *Dophla sahadeva* Bingham, *The Fauna of British India (Butterflies)*, 1 : 262.

1932. *Euthalia sahadeva sahadeva*, Evans, *The Identification of Indian Butterflies*, : 156.

Material examined ; Darjiling Dist, Darjiling, 1ex (no further date).

Forewing length : 39 mm.

Distribution : India : West Bengal (Darjiling) and Sikkim. Elsewhere ; Bhutan.

Remarks ; Only a single specimen from Darjiling is available in the old collection of Zoological Survey of India. No specimen is represented in the collection made during recent faunistic surveys of West Bengal. It is a first report from the State. Evans (1932) referred to its status as not rare.

XXXVIII Genus *Tanaecia* Butler 1869

1869. *Tanaecia* Butler, *Proc. zool. Soc. Lond.*, (3) : 610.

The genus is represented in India by five species of which three occur in West Bengal.

Key to the species of genus *Tanaecia*

1. Forewing with apex produced and outer margin falcate below apex, outer margin of hindwing slightly angled at vein Cu_{1a} thereafter straight upwards..... .. *lepidea* (Butler)
Forewing not falcate, outer margin of hindwing evenly rounded... .. 2
2. Upperside of wings with two dark discal lines composed of diffused spots..... ..
..... .. *julii* (Bougainville)
Upperside of wings with discal bands consisting of conspicuous connected crescents..... ..
..... .. *jahnu* (Moore)

69. *Tanaecia lepidea lepidea* (Butler) (The Grey Count)

1868. *Adolis lepidea* Butler, *Ann. Mag. nat. Hist. Lond.*, (4) : 71.

1905. *Euthalia lepidea*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 272.

1932. *Euthalia lepidea lepidea*, Evans, *The Identification of Indian Butterflies*, : 150.

Material examined ; Darjiling Dist, 1 Km West of Reyang F.R.H., in and around Peran Nallah, alt. 375 m, 1ex, 30.iii. 1973 (H.S. Sharma & Party coll); Tindhara, 1ex, 27.iii.1978 (A.R. Bhowmik & Party coll.); Medinipur Dist, Chandrakona Road, 1ex, 27.xi.1974 (A.K. Hazra & Party coll).

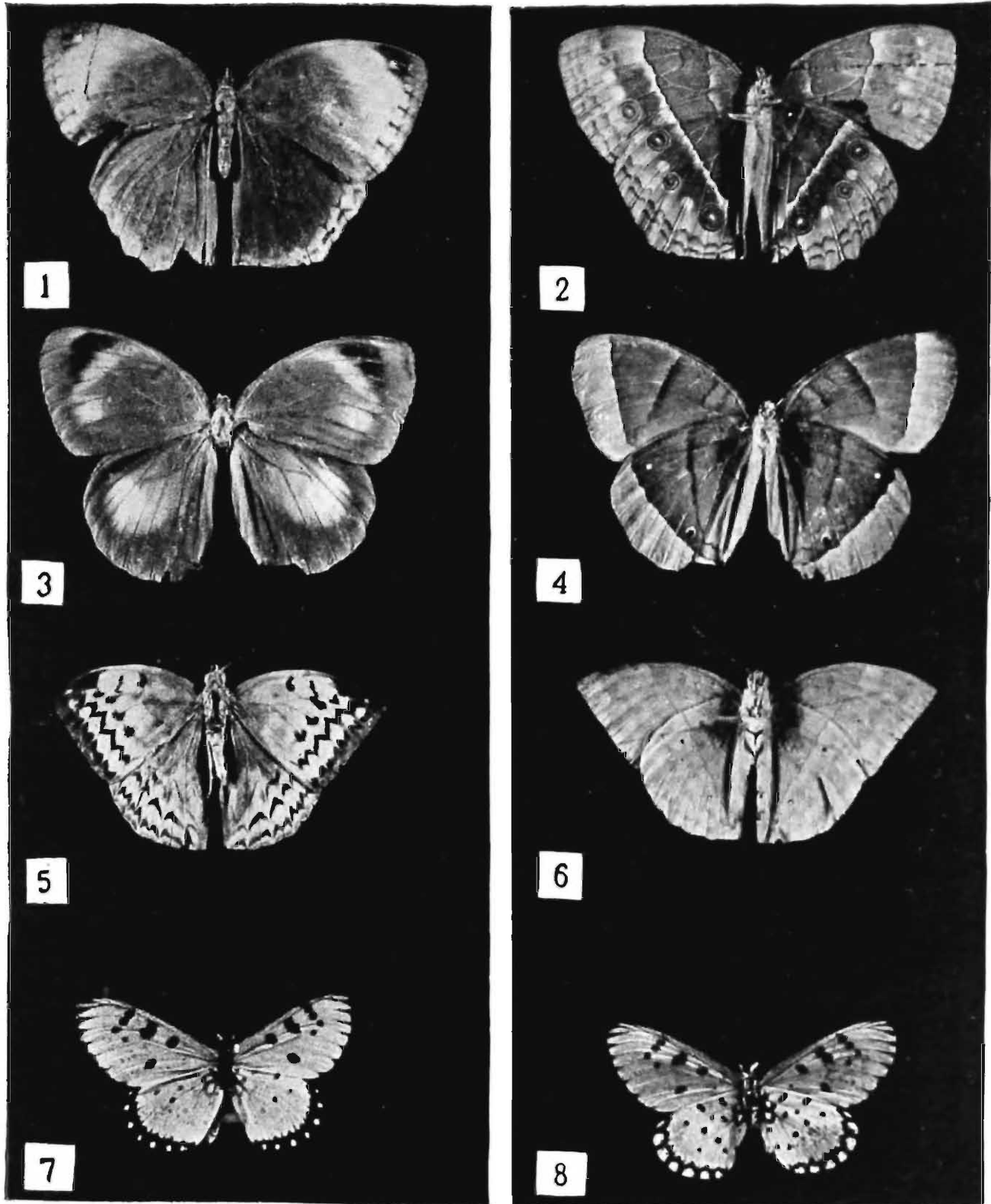
Forewing length : 29-36 mm.

Distribution : India : West Bengal (Darjiling and Medinipur), Uttar Pradesh to Arunachal Pradesh.

Remarks ; This nominate subspecies is represented in Darjiling and Medinipur districts by specimens collected during recent faunistic surveys of West Bengal. Evans (1932) referred to its status as not rare. It is listed in Schedule-II (Part-2) of the Wild Life (Protection) Act.

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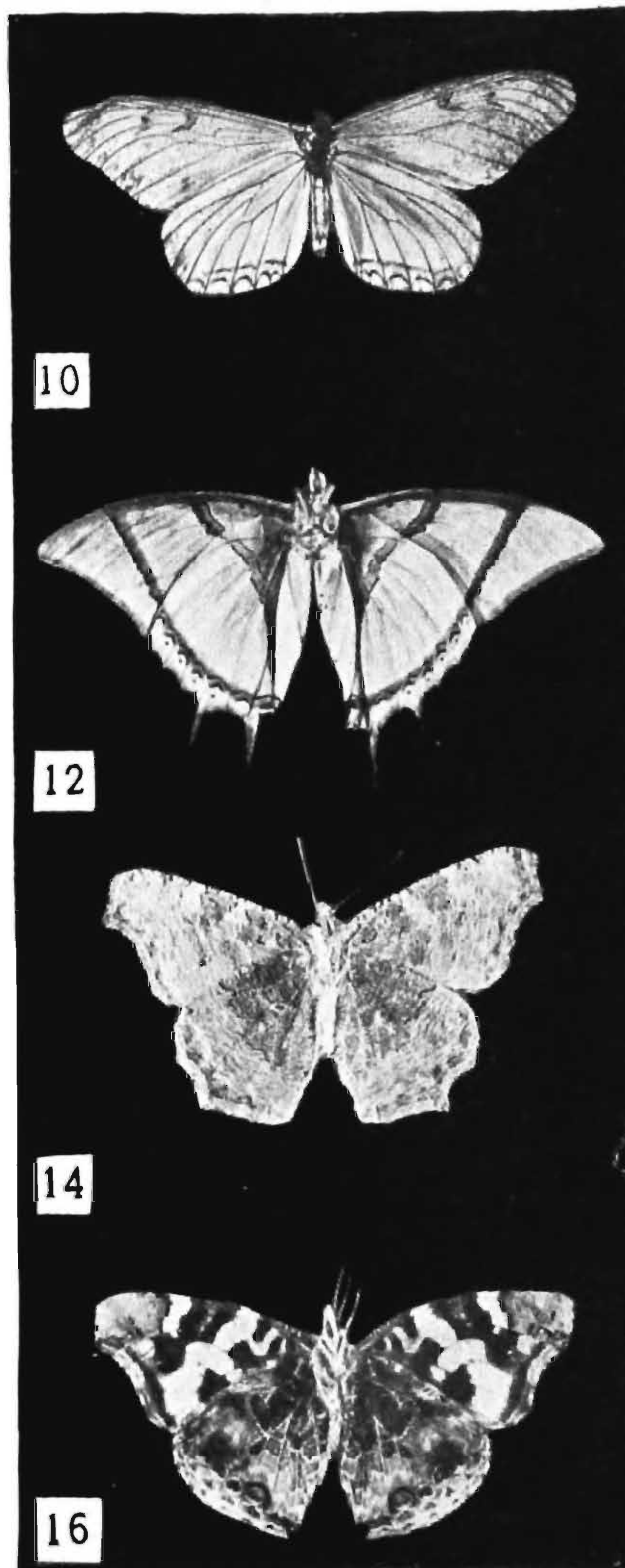
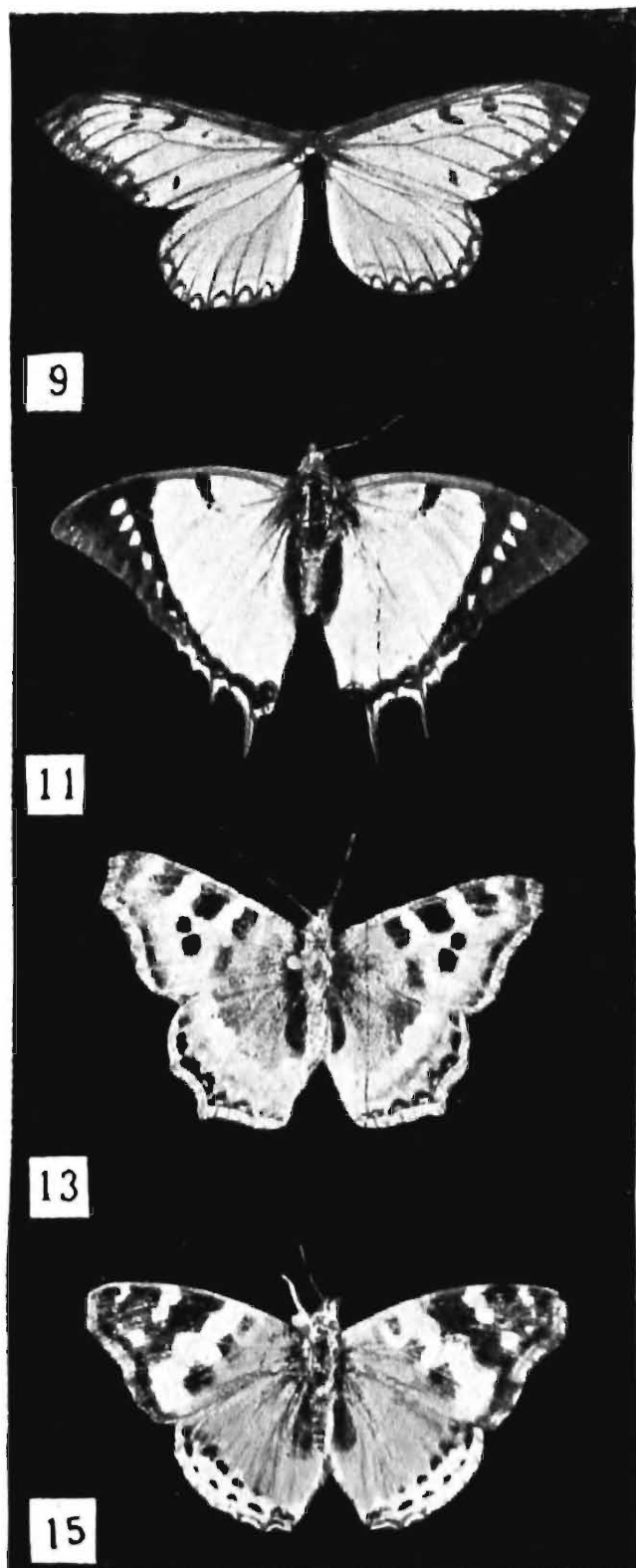
PLATE I



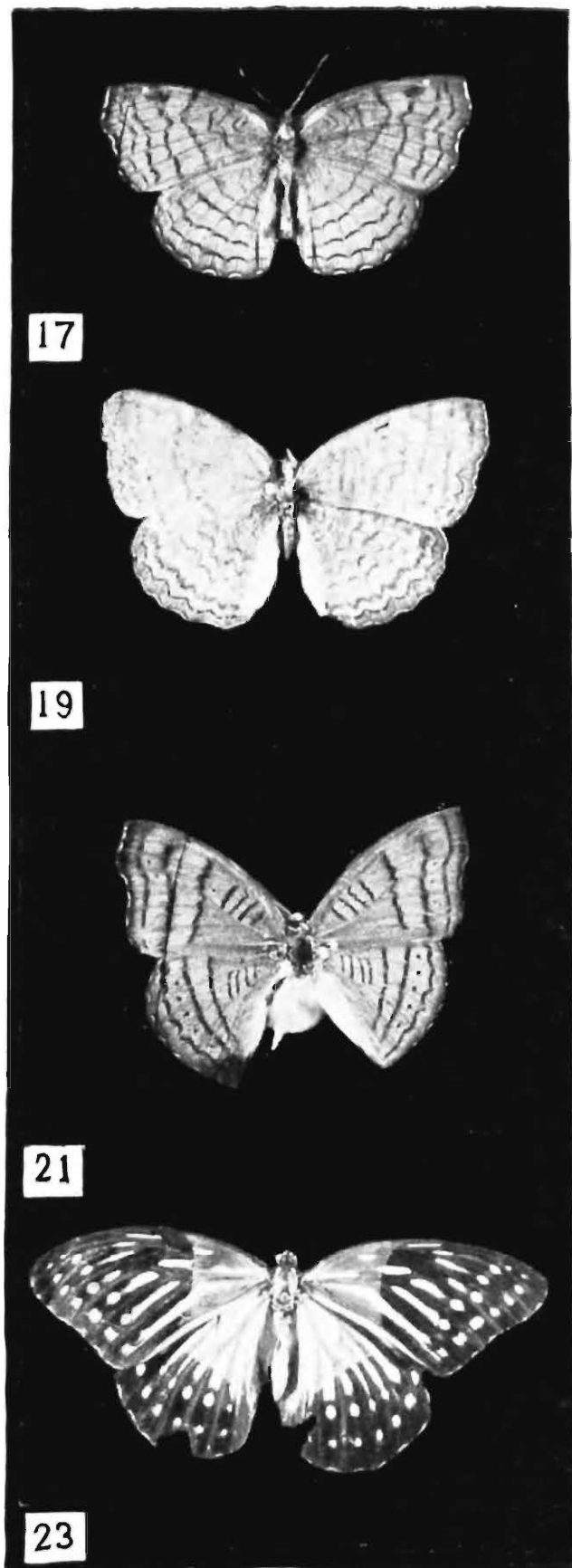
- | | |
|--------------|--|
| 1. Upperside | 2. Underside of <i>Stichophthalma nourmahal nourmahal</i> (Westwood) |
| 3. Upperside | 4. Underside of <i>Thaumantis diores diores</i> (Doubleday) |
| 5. Upperside | 6. Underside of <i>Enispe euthymius euthymius</i> (Doubleday) |
| 7. Upperside | 8. Underside of <i>Acraea violae</i> (Fabricius) |

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PLATE II



- | | |
|---------------|---|
| 9. Upperside | 10. Underside of <i>Acraea issoria issoria</i> (Huebner) |
| 11. Upperside | 12. Underside of <i>Polyura dolon centralis</i> (Rothschild) |
| 13. Upperside | 14. Underside of <i>Aglais cashmirensis aesis</i> (Fruhstarfer) |
| 15. Upperside | 16. Underside of <i>Vanessa indica indica</i> (Herbst) |

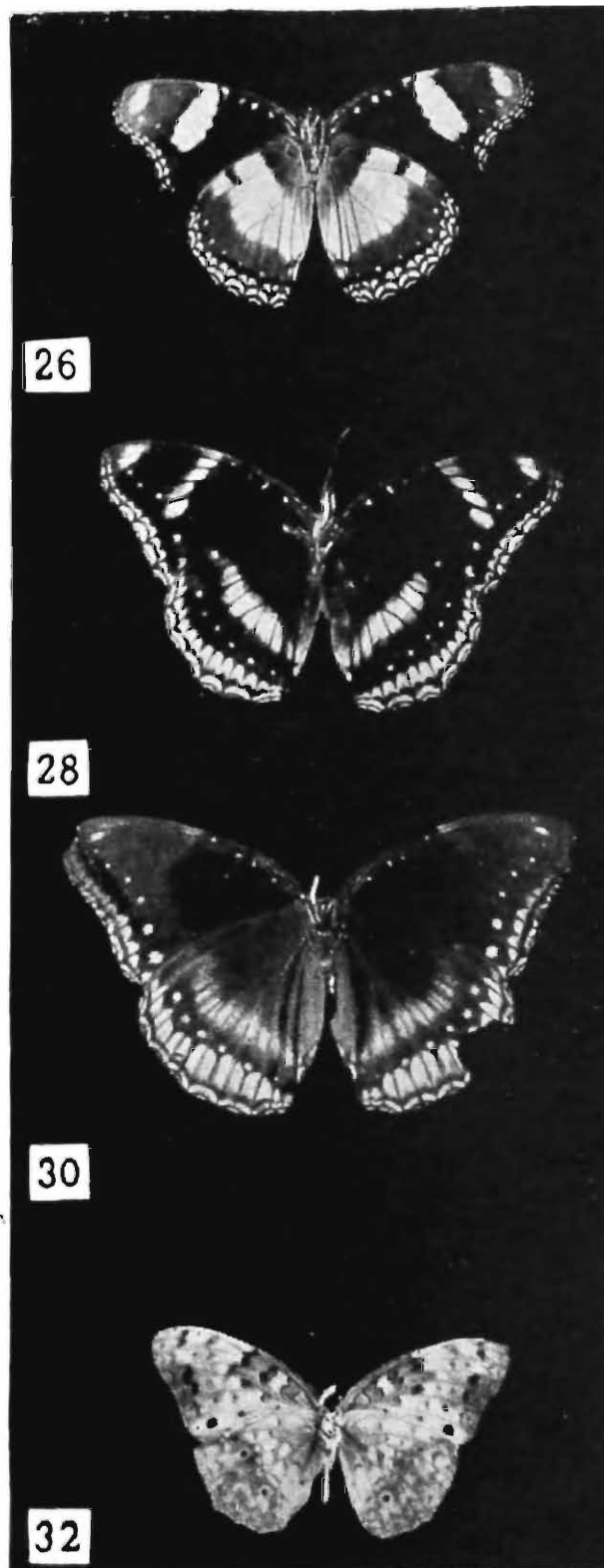


17. Upperside
19. Upperside
21. Upperside
23. Upperside

18. Underside of *Ariadne ariadne indica* (Moore)
20. Underside of *Ariadne merione assama* (Evans)
22. Underside of *Pseudergolis wedah* (Kollar)
24. Underside of *PantHEMA lisarda lisarda* (Doubleday)

GUPTA

PLATE IV



25. Upperside
27. Upperside
29. Upperside
31. Upperside

26. Underside of *Hypolimnas misippus* (Linnaeus)
28. Underside of male of *Hypolimnas bolina* (Linnaeus)
30. Underside of female of *Hypolimnas bolina* (Linnaeus)
32. Underside of *Phalanta phalantha phalantha* (Drury)

70. *Tanaecia julii appiades* (Ménétries)
(The Common Earl)

1857. *Adolias appiades* Ménétries, *Enum. Crop. an. Mus. Peter, Lep.*, 2 : 120, pl. 9, fig. 4.
1905. *Euthalia appiades*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 274.
1932. *Euthalia julii appiades*, Evans, *The Identification of Indian Butterflies*, : 151.
1978. *Tanaecia julii*, Corbet & Pendlebury, *The Butterflies of the Malay Peninsula*, : 196.

Material examined : Darjiling Dist, 1 ex (no further data); Buxa, 1 ex, (no further data). Murshidabad Dist, Murshidabad, 1 ex, (no date), (E.T. Atkinson coll).

Forewing length : 32-35 mm.

Distribution : India : West Bengal (Darjiling and Murshidabad); Uttar Pradesh (Kumaon) to Sikkim.

Remarks : The species, *Tanaecia julii* (Bougainville) is highly variable for which Evans (1932) referred to the occurrence of three subspecies (Uttar Pradesh to Manipur) viz. *T. julii appiades* (Ménétries) Uttar Pradesh to Sikkim) *T. julii adima* (Moore) (Medhalaya, Khasi Hills) and *T. julii sedeva* (Moore) (Manipur). The specimen given under 'material examined' belongs to the old collection of Zoological Survey of India and the specimen from Murshidabad bears det label of *T. julii sedeva*. Roonwal and Avinash Chandra (1956) listed *T. julii adima* ('odina') from Darjiling, Sikkim and Meghalaya (Khasi Hills). No specimen is represented in the collection made during recent faunistic surveys of West Bengal. Evans (loc.cit) referred to its status not rare.

71. *Tanaecia jahnu* (Moore)
(The Plain Earl)

1857. *Adolias jahnu* Moore, *Cat. Lep. Mus. East India Coy*, 1 : 192
1905. *Euthalia jahnu*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 276.
1932. *Euthalia jahnu jahnu*, Evans, *The Identification of Indian Butterflies*, : 152,

Material examined ; Darjiling Dist, Darjiling, 3 exs., (no further data); 1 Km South of Reyang FRH, on the bank of Reyang river, alt. 300 m, 1 ex, 23.iii.1973 (H.S. Sharma & Party coll).

Forewing length : 31-36 mm.

Distribution : India : West Bengal (Darjiling); India (Sikkim) to North Burma.

Remarks : Only the nominate subspecies is known to occur in India. Presently the subspecies is represented in Darjiling District by four specimens. Of these four, three belong to old collection of Zoological Survey of India and remaining only a single specimen is available in material collected during recent faunistic surveys of West Bengal.

XXXIX Genus *Athyma* Westwood 1850

1850. *Athyma* Westwood, *Gen. diurn. Lep.*, 2 : 272.

The genus is represented in India by 10 species of which six occur in West Bengal.

Key to the species of genus *Athyma*

1. Cell open in forewing..... *perius* (Linnaeus)
- Cell closed in forewing..... 2
2. Sexes dissimilar. In male upperside of forewing with discal spots from dorsum to interspace 2 or 3 conjoined and directed to apex or costa, not mid termen as usual..... 3
- Sexes similar. On upperside of forewing discal spot in interspace 2 well separated from spot in interspace 1, no discal spot in interspace 3, lower part of discal band directed to mid termen... 6
3. Upperside of forewing with prominent discal spot in interspace 3. In female, upperside of wings with white or sullied brownish bands..... 4
- Upperside of forewing without a prominent discal spot in interspace 3. In female, upperside of wings with broad orange markings normally arranged..... 5
4. Underside of forewing with the discal streak twice divided by a brown line across cell; a triangular spot, at base of interspace 5, beyond cell well separated..... *selenophora* Kollar
- Underside of forewing with the discal streak entire and hardly separated from the spot at end cell in interspace 4..... *zeroa* (Moore)
5. In male, underside of forewing with discal streak much broken. In female, discal spots in interspaces 4,5 and 6 forming a continuous, even edged apical band..... *nefte* (Cramer)
- In male, underside of forewing with the discal streak continuous but upper edge irregular. In female, a small discal spot in interspace 4 and against outer edge spot in interspace 3..... *cama* (Moore)
6. Upperside of forewing with a large triangular white spot just beyond apex of cell..... *opalina* (Kollar)
- Upperside of forewing without a large triangular white spot just beyond apex of cell..... *ranga* (Moore)

72. *Athyma perius* (Linnaeus)
(The Common Sergeant)

1758. *Papilio perius* Linnaeus, *Syst. nat.*, **10** : 471.
1905. *Athyma perius*, Bingham, *The Fauna of British India (Butterflies)*, **1** : 315.
1932. *Pantoporia perius*, Evans, *The Identification of Indian Butterflies*, : 164.
1978. *Athyma perius*, Corbet & Pendlebury, *The Butterflies of the Malay Peninsula*, : 189.

Material examined ; Barddhaman Dist., Panagarh, Soai Forest, 1 ex, 9.ii.1983 (S.K. Ghosh & Party coll.). Calcutta Dist., Calcutta, 2 exs. (no date) (de Nicéville purchased). Darjiling Dist., Tumthang Khola, 5 Km. South of Rangpo, alt. 300 m., 1 ex, 28.xii.1975 (G.K. Srivastava, G.S. Arora & Party coll.). Jalpaiguri Dist., Teesta River Forest Belt, 1 ex., 8.xii.1986 (R.S. Burman & Party coll.); Apalchand Kathambari, 1 ex., 11.x.1987 (S.K. Tandon & Party coll). Maldah Dist., Bholahat, 1 ex., (no further data).

Forewing length : 27-33 mm.

Distribution : India : West Bengal (Barddhaman, Calcutta, Darjiling, Jalpaiguri, Maldah); South India to Himachal Pradesh and from there to Arunachal Pradesh. Elsewhere : Burma.

Remarks : The species is widely distributed in India. It is earlier known from Calcutta. Its status is common.

73. *Athyma selenophora selenophora* (Kollar)
(The Staff Sergeant)

1844. *Liminitis selenophora* Kollar, *In Huegel's Kaschmir*, **4(2)** : 426, pl.7, figs. 1,2.
1905. *Pantoporia selenophora*, Bingham, *The Fauna of British India (Butterflies)*, **1** : 310.
1932. *Pantoporia selenophora selenophora*, Evans, *The Identification of Indian Butterflies*, : 162.
1978. *Athyma selenophora*, Corbet & Pendlebury, *The Butterflies of the Malay Peninsula*: 189.

Material examined : Darjiling, 1 ex, (no further data); Darjiling, Teesta, 1 ex, -. ii.1957 (M.B. Kripalini coll).

Forewing Length : 31-32 mm.

Distribution : India : West Bengal (Darjiling) : Uttar Pradesh to Arunachal Pradesh. Elsewhere : Burma.

Remarks ; Two specimens are available in the old National Zoological collection but no specimen is represented in the collection made during recent faunistics surveys of West Bengal. Its status is not rare.

74. *Athyma zeroa* (Moore)
(The Small Staff Sergeant)
(Plate VII, nos. 49,50)

1872. *Athyma zeroa* Moore, *Proc. zool. Soc. Lond.*, : 564.
1905. *Pantoporia zeroa*, Bingham, *The Fauna of British India (Butterflies)*, **1** :
1932. *Pantoporia zeroa*, Evans, *The Identification of Indian Butterflies*, : 162.

Material examined ; Darjiling Dist., Tindharia, 1ex, 26.iii.1978 (A.R. Bhowmik & Party coll.), Buxa, 2 exs (no data) (Museum)

Forewing length : 27-28 mm.

Distribution : India : West Bengal (Darjiling); Uttar Pradesh (Kumaon) to Arunachal Pradesh. Elsewhere : Burma.

Remarks : The species is represented by one specimen during recent faunistic survey and two specimens available in the old collection of Zoological Survey of India. Its status is not rare.

75. *Athyma nefte inara* (Doubleday)
(The Colour Sergeant)
(Plate VII, nos. 51,52)

1850. *Limenitis inara* Doubleday, *In Doubleday; Gen. diurn. Lep.*, 2 : pl. 34, fig. 30.

1905. *Pantoporia nefte*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 304.

1932. *Pantoporia nefte inara*, Evans, *The Identification of Indian Butterflies*, : 162.

1978. *Athyma nefte*, Corbet & Pendlebury, *The Butterflies of the Malay Peninsula*, : 189.

Material examined ; Darjiling Dist, DFO's Office Compound, Kalimpong, alt. 122 m, 1ex, 3.iv.1973 (H.S. Sharma & Party coll); Darjiling, 1ex, (no further data), Dhurumkhola, 1ex, (no further data). Jalpaiguri Dist., Mendabari Forest, Chilapati, 1ex, 16.x.1987 (S.K. Tandon & Party coll) Noorepore, 1ex, 18.xii.1986 (R.S. Barman & Party coll).

Forewing length : 24-30 mm.

Distribution : India : West Bengal (Darjiling and Jalpaiguri); Orissa, Sikkim to Arunachal Pradesh, Southern India. Elsewhere : North Burma.

Remarks ; The subspecies is reresented by specimens collected from Darjiling and Jalpaiguri districts during recent faunistic surveys of the State. Its status is not rare.

76. *Athyma cama* Moore
(The Orange Staff Sergeant)

1857. *Athyma cama* Moore, *Cat. Lep. Ins. Mus. East India Coy*, 1 : 174, pl. 5, fig. 5, male, female.

1905. *Pantoporia cama*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 309.

1932. *Pantoporia cama*, Evans, *The Identification of Indian Butterflies*, : 162.

1978. *Athyma cama*, Corbet & Pendlebury, *The Butterflies of the Malay Peninsula*, : 189.

Material examined ; Darjiling, Buxa, 1 ex. (Museum colln.).

Forewing length : 30 mm.

Distribution : India : West Bengal (Darjiling); Uttar Pradesh to Arunachal Pradesh. Elsewhere : North Burma.

Remarks : The species is represented by a single specimen (from Buxa) in the National Zoological collection of the Zoological Survey of India. Its status is not rare.

77. *Athyma opalina orientalis* (Elwes)
(The Himalayan Sergeant)
(Plate VII, nos. 53,54)

1888. *Athyma orientalis* Elwes, *Trans. ent. Soc. Lond.*, : 354, pl.9, fig.4.
1905. *Pantoporia opalina*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 312.
1932. *Pantoporia opalina orientalis*, Evans, *The Identification of Indian Butterflies*, : 163.

Material examined ; Darjiling Dist, Buxa, 1ex, (no date), (Museum colln.).

Forewing length : 31 mm.

Distribution : India : West Bengal (Darjiling); Sikkim to Arunachal Pradesh. Elsewhere : Burma.

Remarks ; This subspecies constitutes a first report from West Bengal and is represented by a single specimen from Buxa in the old collection of Zoological Survey of India. Its status is not rare.

78. *Athyma ranga ranga* Moore
(The Black Vein Sergeant)
(Plate VII, nos. 55,56)

1857. *Athyma ranga* Moore, *Cat. Lep. Ins. Mus. East India Coy*, 1 : 175, pl. 5a, fig. 6 (male).
1905. *Pantoporia ranga*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 312.
1932. *Pantoporia ranga ranga*, Evans, *The Identification of Indian Butterflies*, : 163.
1978. *Athyma ranga*, Corbet & Pendlebury, *The Butterflies of the Malay Peninsula*, : 189.

Material examined ; Darjiling, 3 exs, (no further data); Buxa, 1ex (Museum colln.).

Forewing length : 28-30 mm.

Distribution : India : West Bengal (Darjiling); Sikkim to Arunachal Pradesh. Elsewhere : Burma.

Remarks ; The nominate subspecies is a first report from West Bengal. Evans (1932) referred to its status as rare. The subspecies is not represented in the material collected during recent faunistic surveys of West Bengal. It is included in Schedule-II (Part-2) of the Wild Life (Protection) Act.

XL Genus *Phaedyra* Felder (C) 1861

1861. *Phaedyra* Felder (C.), *Nova acta Leop. Carol.*, 28 (3) : 31.

The genus is represented in India by a single species *Phaedyma columella* (Cramer), which is presently dealt with from West Bengal.

79. *Phaedyma columella ophiana* Moore
(The Short Banded Sailer)

1872. *Neptis ophiana* Moore, *Proc. zool. Soc. Lond.*, : 561, (male).
 1905. *Neptis columella*, Bingham, *The Fauna of British India, (Butterflies)*, 1 : 326.
 1932. *Neptis columella ophiana*, Evans, *The Identification of Indian Butterflies* : 164.
 1978. *Phaedyma columella*, Corbet & Pendlebury, *The Butterflies of the Malay Peninsula* : 187.

Material examined ; Darjiling Dist, 1ex, iv. (no coll); 2 Km south of Rangpo, alt. 300 m, 1ex, 9.iv.1973 (H.S. Sharma & Party coll).

Forewing length : 34-35 mm.

Distribution : India : West Bengal (Calcutta, Darjiling); Maharashtra and Uttar Pradesh to Arunachal Pradesh. Elsewhere : Burma.

Remarks : The subspecies is represented in West Bengal by specimens collected from Darjiling district. Its status is not rare. De Nicéville (1885) and Sanders (1944) reported it from Calcutta.

XLI Genus *Neptis* Fabricius

1807. *Neptis* Fabricius, *Mag.f. Insektenk* (Illiger), 6 : 282.

28 species represent this genus in India, of which 11 occur in West Bengal.

Key to the species of genus *Neptis*

1. Upperside of forewing with cell streak always divided into a basal streak and a spot beyond.....2
 Upperside of forewing with cell streak and spot beyond it conjoined..... 5
2. Upperside of forewing with discal spots in interspaces 2 and 3 in line with discal spot in interspace 5, the line being directed towards costa well before apex..... *jumbah* Moore
 Upperside of forewing with discal spots in interspaces 2 and 3 not in line with spot in interspace 5; the line joining centres of spots in interspaces 2 and 3 directed to termen below apex or to apex 3
3. Markings on underside black-edged, particularly inner discal band on hindwing. Underside of forewing with spot at end cell well separated from basal streak (in the cell)..... *hylas* (Linnaeus)
 Markings on underside not black edged. Underside of forewing with the cell streak and spot beyond cell often joined..... 4

4. Upperside of wings with markings narrow, broken into spots and usually dirty white. These markings being darker on underside. Upperside of hindwing with discal band narrow and not entering base of interspace 3 or it enters interspace 3 leaving an equivalent dark space at base of interspace 3..... *soma* Moore
- Upperside of wings with markings normally clear. These markings being brighter brown on underside. Upperside of hindwing with discal band broader and always filling base of interspace 3 and extending upto base of interspace 2 or beyond..... *nandina* Moore
5. Upperside of forewing with cell streak not extending into interspace 3..... 6
- Upperside of forewing with cell streak extending into base of interspace 3... .. 10
6. Upperside of wings with orange yellow markings..... *ananta* Moore
- Upperside of wings without orange yellow markings..... 7
7. Underside of hindwing with basal costal streak broad and without pale streak at base of cell... .. *cartica* Moore
- Underside of hindwing with basal costal streak narrow and not prominent than the streak at base of cell, or, both may be obscure or absent..... 8
8. Upperside of wings with clear broad markings..... *sankara* (Kollar)
- Upperside of wings with narrow diffused markings... .. 9
9. Upperside of wings with dirty white but whiter and more clearly defined on underside. Upperside of forewing with discal spot in interspace 2 more or less quadrate..... *vikasi* Horsfield
- Upperside of wings with pale markings but these markings pale brown and obscure on underside. Upperside of forewing with a crescentric spot in interspace 2..... *harita* Moore
10. Underside of forewing without costal spots above the end cell streak..... *viraja* Moore
- Underside of forewing with pale costal spot/spots above the end cell streak..... 11
11. Upperside of wings with white or yellow markings. Pale costal spots confined to costa..... *narayana* Moore
- Upperside of wings with orange yellow markings. Pale costal spots / streaks continued to cell streak *radha* Moore

80. *Neptis jumbah jumbah* Moore
(The Chestnut Streaked Sailer)

1857. *Neptis jumbah* Moore, *Cat. Lep. Mus. East India Coy*, 1 : 167, pl. 4a, fig. 5 (F).
1905. *Neptis jumbah*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 327.
1932. *Neptis jumbah jumbah*, Evans, *The Identification of Indian Butterflies*, : 165.

Material examined ; Calcutta District, Calcutta, 11 exs, 22.ii.1880, 1ex, 24.ii.1880 (de Nicéville, purchased); Calcutta, 2 exs, 24.ii.1880 (de Nicéville coll.). 24-Parganas South dist., Sundarbans, 1ex, (no date), (de Nicéville coll).

Forewing length : 30-32 mm.

Distribution : India : West Bengal (Calcutta and 24-Parganas South). South India to West Bengal and Meghalaya. Elsewhere : Burma and Sri Lanka.

Remarks : The specimens from Calcutta and 24-Parganas (South) are available in the old collection of Zoological survey of India. The nominate subspecies is not represented in the collection made during recent faunistic surveys of West Bengal. Its status is not rare. De Nicéville (1885) and Sanders (1944) reported from Calcutta.

81. *Neptis hylas astola* Moore
(The Common Sailer)

1872. *Neptis astola* Moore, *Proc. zool. Soc. Lond.*, : 560.
1905. *Neptis eurynome*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 323.
1932. *Neptis hylas astola*, Evans, *The Identification of Indian Butterflies* : 166.

Material examined ; Darjiling Dist., 1 Km west of Reyang F.R.H., in and around Reyang Nallah, alt., 375m, 1ex, 30.iii.1973, Kalimpong (D.F.O's Officer's Compound), alt. 122 m, 1ex, 3.iv.1973, Darjiling, Goke (singhla), 1ex, 16.iv.1973 (H.S. Sharma & Party coll); Darjiling, Goomti Forest, Reyang, 1ex, 5.i.1974 (G.K. Srivastava and P.K. Maity coll); Tumthang Khola, 1ex, 28.xii.1975 (G.K. Srivastava, G.S. Arora & Party coll).

Forewing length : 22-26 mm.

Distribution : India : West Bengal (Calcutta, Darjiling) and Jammu and Kashmir to Arunachal Pradesh. Elsewhere : Burma.

Remarks ; Evans (1932) mentioned its status very common whereas the specimens are represented only from Darjiling district in the material collected during recent faunistic surveys of West Bengal. De Nicéville (1885) and Sanders (1944) reported it from Calcutta.

82. *Neptis soma* Moore
(The Sullied Sailer)
(Plate VII, nos. 57,58)

1859. *Neptis soma* Moore, *Proc. zool. Soc. Lond* : 9, pl. 49 fig. 6, (female).
1932. *Neptis soma soma*, Evans, *The Identification of Indian Butterflies* : 166.

Material examined ; Darjiling Dist, Buxa, 8 exs (no date), (Museum coll); Tumthang Khola, 5 Km south of Rangpo, alt. 300 m, 1 ex, 28.xii.1975 (G.K. Srivastava, G.S. Arora & Party coll).

Forewing length : 22-23 mm.

Distribution : India : West Bengal (Darjiling); Uttar Pradesh to Arunachal Pradesh. Elsewhere : Burma.

Remarks ; The nominate subspecies is represented by specimens from Darjiling district, available mainly in the old collection of Zoological Survey of India. Its status is rare. It is included in Schedule-II (Part-2) of the Wild Life(Protection) Act.

83. *Neptis nandina susruta* Moore
(The Clear Sailer)

1872. *Neptis susruta* Moore, *Proc. zool. Soc. Lond.*, : 563, pl. 32, fig. 4 (male).

1932. *Neptis nandina susruta*, Evans, *The Identification of Indian Butterflies*, : 167.

Material examined : Darjiling Dist, 3 Km north east of Reyang F.R.H. on the eastern bank of Teesta valley, alt., 900 m, 1ex, 1.iii.1973, Reyang, 1ex, 28.iii.1973, 1 Km east of Reyang F.R.H., on the Western bank of Teesta Valley River, alt. 276 m, 1 ex, 29.iii.1973, 1 Km West of Reyang F.R.H., in and around Reyang Nallah, 1 ex, 30.iii.1973, Rangpo, 1x, 7.iv.1973 (H.S. Sharma & Party coll.); East Gommara, 1ex, 3.v.1975 (B.C. Nandi coll.); Rangli, alt. 830 m, 1ex, 20.xii.1975 (G.K. Srivastava, G.S. Arora & Party Coll).

Forewing length : 22-25 mm.

Distribution : India : West Bengal (Darjiling); Sikkim to Arunachal Pradesh. Elsewhere : Burma.

Remarks ; Evans (1932) mentioned its status common and distribution from India (Sikkim) to Burma but the specimens are represented from Darjiling District in the collection made during resent faunistic Surveys of West Bengal. De Nicéville (1885) and Sanders (1944) reported from Calcutta.

84. *Neptis ananta ochracea* Evans
(The Yellow Sailer)

1924. *Neptis ananta ochracea* Evans, *J. Bombay nat. Hist. Soc.*, 30 : 79.

1932. *Neptis ananta ochracea*, Evans, *The Identification of Indian Butterflies*, : 168.

Matrial Examined : Darjiling Disdt, Kurseong (eastern Himalayas), 1 ex, (no date). (de Nicéville coll.).

Forewing length : 31 mm.

Distriibution : India : West Bengal (Darjiling); Sikkim to Arunachal Pradesh. Elsewhere : Burma.

Remarks : A single specimen of this subspecies from Darjiling disdtrict is available in the old collection of Zoological Survey of India. It is a first report from West Bengal. This subspecies is not represented in the material collected during recent faunistic surveys of West Bengal. It is included in Schedule-II (Part-2) of the Wild Life (Protection) Act.

85. *Neptis cartica cartica* Moore
(The Plain Sailer)

1872. *Neptis cartica* Moore, Proc. zool. Soc. Lond., : 562.

1905. *Neptis cartica*, Bingham, *The Fauna of British India Butterflies* : 333.

1932. *Neptis cartica cartica*, Evans, *The Identification of Indian Butterflies* : 168.

Material examined ; Darjiling Dist, Darjiling, 1ex, xi. (de Nicéville coll.).

Forewing length : 27 mm.

Distribution : India : West Bengal (Darjiling); Sikkim to Assam.

Remarks : The nominate subspecies is represented in West Bengal (Darjiling) by a single specimen available in the old collection of Zoological Survey of India. The subspecies is conspicuous by its absence in the material collected during recent faunistic surveys of the State. It is a first report from West Bengal as Evans (1923) mentioned its occurrence from Sikkim to Assam. Its status is not rare.

86. *Neptis sankara quilta* Swinhoe
(The Broad Banded Sailer)

1897. *Neptis quilta* Swinhoe, *Ann. Mag. nat. Hist, London*, 6 (19) : 408.

1905. *Neptis sankara*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 332.

1932. *Neptis sankara quilta*, *The Identification of Indian Butterflies*, : 167.

Material examined : Darjiling dist., 1 Km South of Reyang F.R.H. on the bank of the River Reyang, alt, 400m, 1ex, 28.iii.1973 (H.S. Sharma & Party coll.).

Forewing length : 33 mm.

Distribution : India : West Bengal (Darjiling); Sikkim to Arunachal Pradesh. Elsewhere : Burma.

Remarks : The subspecies is represented in the material collected from Darjiling dist. during faunistic survey in 1973. Evans (1932) referred to its occurrence from Sikkim to Burma. It is a first report from West Bengal. Its status is not rare.

87. *Neptis vikasi pseudovikasi* (Moore)
(The Dingy Sailer)

1899-1900. *Bimbisara pseudovikasi* Moore, *Lep. ind.*, 4 : 7, pl. 292, figs. 1, 1a-1c,

1905. *Neptis vikasi*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 338.

1932. *Neptis vikasi pseudovikasi*, Evans, *The Identification of Indian Butterflies*, : 168.

Material examined : Darjiling Dist, Darjiling, 1 ex, no date, (de Nicéville coll.); Kalimpong, 1 ex, 5.ix.1959 (B.K. Tikader coll.).

Forewing length : 27-28 mm.

Distribution : India : West Bengal (Darjiling); Uttar Pradesh to Arunachal Pradesh.

Remarks : This is a single subspecies of *Neptis vikasi* Horsfield occurring in India. It is not represented in the material collected during recent faunistic surveys of West Bengal. Its status is ot rare.

88. * *Neptis harita* Moore
(The Dingiest Sailer)

1874. *Neptis harita* Moore, *Proc. zool. Soc. Lond.* : 571. pl. 56, fig. 8.

1905. *Niptis harita*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 337.

1932. *Neptis harita*, Evans, *The Identification of Indian Butterflies* : 168.

Material examined : Nil.

Forewing length : 28 mm.

Distribution : India : West Bengal (Calcutta, Darjiling). Elsewhere : Burma.

Remarks ; The species is not represented in the collection made during recent faunistic surveys of West Bengal. Sanders (1944) reported it from Calcutta.

89. *Neptis viraja viraja* Moore
(The Yellow Jack Sailer)

1872. *Neptis viraja* Moore, *Proc. zool. Soc. Lond.* : 563, pl. 32, fig. 6.

1905. *Neptis viraja*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 342.

1932. *Neptis viraja viraja*, Evans, *The Identification of Indian Butterflies*, : 86.

Material examined : Darjiling Dist, Buxa, 5 exs, (no further data); Reyang, 1 ex, 28.iii.1973 (H.S. Sharma & Party coll.).

Forewing length : 28-30 mm.

Distribution : India : West Bengal (Darjiling) and Uttar Pradesh. Elsewhere : Burma.

Remarks ; The nominate subspecies is distinguished from *N. viraja kanara* Evans (South India to Orissa) in having narrower bands on upperside and darker markings with sharply defined edges on underside of wings (vs. wide bands on upperside and markings with their edges diffused on underside of wings). The nominate subspecies is represented in West Bengal by specimens collected from Darjiling district. Its status is not rare.

90. *Neptis narayana narayana* Moore
(The Broad Stick Sailer)
(Plate VIII, nos. 61, 62)

1858. *Neptis narayana* Moore, *Proc. zool. Soc. Lond.* : 6, Nos. 8, pl. 49, figs. 3.
1905. *Neptis narayana*, Bingham, *The Fauna of British India (Butterflies)*, : 334.
1932. *Neptis narayana* Evans, *The Identification of Indian Butterflies*, : 170.

Material examined : Darjiling Dist, Buxa, 1ex, (no date) (de Nicéville coll.).

Forewing length : 31 mm.

Distribution : India : West Bengal (Darjiling); Jammu & Kashmir to Uttar Pradesh.

Remarks ; This nominate subspecies differs from *Neptis narayana nana* de Nicéville, (Sikkim to Manipur) by yellow markings on upperside of wings (vs. white markings on upperside of wings). A single specimen of *N. narayana narayana* Moore from West Bengal (Darjiling), is available in the old collection of Zoological Survey of India. The nominate subspecies is not represented in the material collected during recent faunistic surveys of the State. Its status is rare. It is a first report from West Bengal. It is listed in Schedule-II (Part-2) of the Wild Life (Protection) Act.

91. *Neptis radha radha* Moore
(The Great Yellow Sailer)

1857. *Neptis radha* Moore, In Horsfield & Moore, *Cat. Lep. Mus. East India Coy*, 1 : 166, No. 343, pl. 4a, fig. 4.
1905. *Neptis radha*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 39.
1932. *Neptis radha radha*, Evans, *The Identification of Indian Butterflies*, : 170.

Material examined : Darjiling Dist. 1ex, (no further data).

Forewing length : 37 mm.

Distribution : India : West Bengal (Darjiling); Uttar Pradesh to Assam and Nagaland. Elsewhere ; Bhutan.

Remarks : Only a nominate subspecies occurs in India and its single specimen collected from West Bengal (Darjiling) is available in the old collection of Zoological Survey of India. It is not represented in the material collected during recent faunistic surveys of the State. Its status is rare. It is included in Schedule-II (Part-2) of the Wild Life (Protection) Act.

XLII Genus *Sephisa* Moore 1882

1882. *Sephisa* Moore, *Proc. zool. Soc. Lond.*, : 240.

The genus is represented in India by two species viz, *Sephisa dichroa* (Kollar) and *S. chandra* (Moore) and the latter is dealt with from West Bengal.

92. *Sephis chandra* Moore
(The Eastern Courtier)

1858. *Castalia chandra* Moore, *Cat. Lep. Ins. Mus. East India Coy*, 1 : 200, pl. 6A.
1905. *Sephia chandra*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 246.
1932. *Sephia chandra*, Evans, *The Identification of Indian Butterflies* : 147.

Material examined ; Darjiling Dist, Darjiling, 1ex, (no further data).

Forewing eLength : 37 mm.

Distribution: India : West Bengal (Darjiling); Sikkim to Arunachal Pradesh. Elsewhere : Burma.

Remarks : A specimen from West Bengal (Darjiling) is available in the old collection of Zoological Survey of India. This species is not represented in the collection made during recent faunistic surveys of West Bengal. Its status is not rare. Roonwal & Avinash Chandra (1956) referred to the occurrence of *Sephis chandra* (viz. *f. albina* Evans) in West Bengal (Darjiling). It has been included in Schedule -I (Part-4) of the Wild Life (Protection) Act.

XLIII Genus *Euripus* Doubleday 1848

- 1848 *Euripus* Doubleday, *Gen. diurn. Lep.* (2) : 41, fig. 2.

This genus includes two species viz. *Euripus consimilis* (Westwood) and *E. halithersis* Doubleday known from India, the former is dealt with from West Bengal.

93. *Euripus consimilis consimilis* (Westwood)
(The Painted Courtesan)

1850. *Diadma consimilis* Westwood, *Gen. diurn. Lep*, 2 : 281, No. 20, note (female).
1905. *Euripus consimilis*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 244.
1932. *Euripus consimilis consimilis*, Evans, *The Identification of Indian Butterflies* : 147.

Material Examined : Darjiling dist, Buxa, 1 ex (no further data).

Forewing length : 32 mm.

Distribution : India : West Bengal (Darjiling) and Uttar Pradesh. Elsewhere : Burma.

Remarks : This nominate subspecies is distinguished from *E. consimilis meridionalis* Wood-Mason (South India) by black discal band on upperside of hindwing, continued to costa in male and also traceable in female (vs. black discal band only traceable in male). It is represented in West Bengal (Darjiling) by a single specimen available in the old collection of Zoological Survey of India. The nominate subspecies is conspicuous by its absence in the material collected during recent faunistic surveys of the State. It is included in Schedule-II (Part-2) of the Wild Life(Protection)Act.

XLIV Genus *Diagora* Snellen 1894

1894. *Diagora* Snellen, *Tijdschr. Ent.*, **37** : 67,

Two species viz, *Diagora nicevellei* Moore and *D. persimilis* (Westwood) occur in India and the former is dealt with from West Bengal.

94. *Diagora persimilis persimilis* (Westwood)
(The Siren)

1850. *Hestina persimilis* Westwood, *In Doubleday, Gen. diurn. Lep.*, **2** : 281.

1905. *Parhestina persimilis*, Bingham, *The Fauna of British India (Butterflies)*, **1** : 240.

1932. *Diagora persimilis persimilis*, Evans, *The Identification of Indian Butterflies* : 148.

Material examined ; Darjiling Dist., Darjiling, 1 ex, 23.iv.1880 (no coll).

Forewing length : 29 mm.

Distribution : India : West Bengal (Darjiling): Orissa, Sikkim to Arunachal Pradesh. Elsewhere : Burma.

Remarks : This nominate subspecies differs from *D. persimilis zella* Butler (Himachal Pradesh, Simla to Uttar Pradesh, Kumaon) being darker and having narrower white markings on upperside of wings (vs. paler and having wider white markings). A specimen of this nominate subspecies from West Bengal (Darjiling) is represented in the old collection of Zoological Survey of India. This subspecies is conspicuous by its absence in the material collected during recent faunistic surveys of the State. Its status is rare. It is listed in Schedule-II (Part-2) of the Wild Life (Protection) Act.

Family RIODINIDAE

Key to the genera of family Riodinidae

Eyes hairy. In hindwing, precostal vein arising from after origin of vein Sc.....
..... *Abisara* Felder & Felder

Eyes naked. In hindwing, precostal vein arising from the origin of vein Sc..... *Zemeros* Boisduval

XLV Genus *Abisara* Felder & Felder 1860

1860. *Abisara* Felder & Felder, *Wien. ent. Monats.*, **4** : 397.

Six species of this genus occur in India, of which two are dealt with from West Bengal.

Key to the species of genus *Abisara*

Upperside of forewing with a prominent broad pale band from mid costa across end cell, or just beyond, to tornus..... *chela* de Nicéville

Upperside of forewing with a pale band, if present, well beyond end cell..... *echerius* (Stoll)

95. * *Abisara chela* de Nicéville
(The Spot Judy)

1886. *Abisara chela* de Nicéville, *J. Asiat. Soc. Beng.*, 4 (2) : 252, No. 4, pl. 11, fig. 7 (male).
1905. *Abisara chela*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 492.
1932. *Abisara chela chela*, Evans, *The Identification of Indian Butterflies*, : 197.

Material examined : Nil.

Wing expanse : 45-50 mm.

Distribution : India : West Bengal (Darjiling) and Sikkim to Assam.

Remarks ; This nominate subspecies is not represented in the collection made during recent faunistic surveys of West Bengal. Roonwal and Avinash Chandra (1956) listed it from Darjiling (Teesta Valley). Evans (1932) referred to its status rare.

96. *Abisara echerius suffusa* (Moore)
(The Plum Judy)
(Plate VIII, nos. 63,64)

1882. *Abisara suffusa* Moore, *Proc. zool. Soc. Lond.*, : 244.
1905. *Abisara echerius*, Bingham, *The Fauna of British India (Butterflies)*, 1 : 492.
1932. *Abisara echerius suffusa*, Evans, *The Identification of Indian Butterflies*, : 197.

Material examined : Nil.

Forewing expanse : 40-50 mm.

Distribution : India : West Bengal (Calcutta, Darjiling).

Remarks ; The subspecies is represented by a few specimens from West Bengal (Darjiling) in the old collection of Zoological Survey of India. De Nicéville (1885) and Sanders (1944) reported it from Calcutta. Though Evans (1932) referred to its status common but no specimen of this subspecies was collected during recent faunistic surveys of the State.

XLVI Genus *Zemerus* Boisduval 1836

1836. *Zemerus* Boisduval, (Roret's Suite a Buffon), *Hist. nat. Ins. Spec. gen. Lepid.*, 1 : pl. 21 (=pl. 5C), fig. 5.

The only subspecies, *Zemerus flegyas indicus* Fruhstorfer occurring in India is presently dealt with from West Bengal.

97. *Zemerus flegyas indicus* Fruhstorfer
(The Punchinello)
(Plate VIII, nos. 65,66)

1897. *Zemerus flegyas indicus* Fruhstorfer, *Berl. ent. Zeits.*, **42** : 333.
1905. *Zemerus flegyas*, Bingham, *The Fauna of British India Butterflies*, **1** : 499.
1932. *Zemerus flegyas indicus*, Evans, *The Identification of Indian Butterflies*, : 194.

Material examined ; Darjiling Dist, Mahanadi (above Goomti), alt. 1255 m, 1 ex, 28.iv.1971 (A.R. Bhowmik & Party coll); Kalijhora, 1 ex, 4.iv.1984 (M. Prasad & Party coll). Jalpaiguri Dist, Jainti Forest, 1 ex, 8.v.1987 (Raja Ram & Party coll).

Forewing length : 18-20 mm.

Distribution : India : West Bengal (Darjiling and Jalpaiguri); Uttar Pradesh to Arunachal Pradesh. Elsewhere : Burma.

Remarks : The subspecies is represented in Darjiling and Jalpaiguri districts by the specimens collected during recent faunistic survey of West Bengal. Evans (1932) referred to its status very common.

SUMMARY

The present studies on butterflies from West Bengal deal with 97 species and subspecies belonging to 46 genera and four families namely Amathusiidae, Acraeidae, Nymphalidae and Riodinidae. Keys to identification of the genera and species have been given. Common name, forewing length, distribution and remarks for each species and subspecies have been provided. Maps showing distribution of butterflies and a list of species and subspecies (Appendix - I) occurring in districts of West Bengal have been included. Butterflies studied, are represented in all districts except Koch Behar. The maximum of 90 species and subspecies are found in Darjiling district and minimum of two in 24-Parganas (South). *Precis almana almana* (Linnaeus) has been recorded from 16 districts while 65 species and subspecies from only Darjiling didistrict.

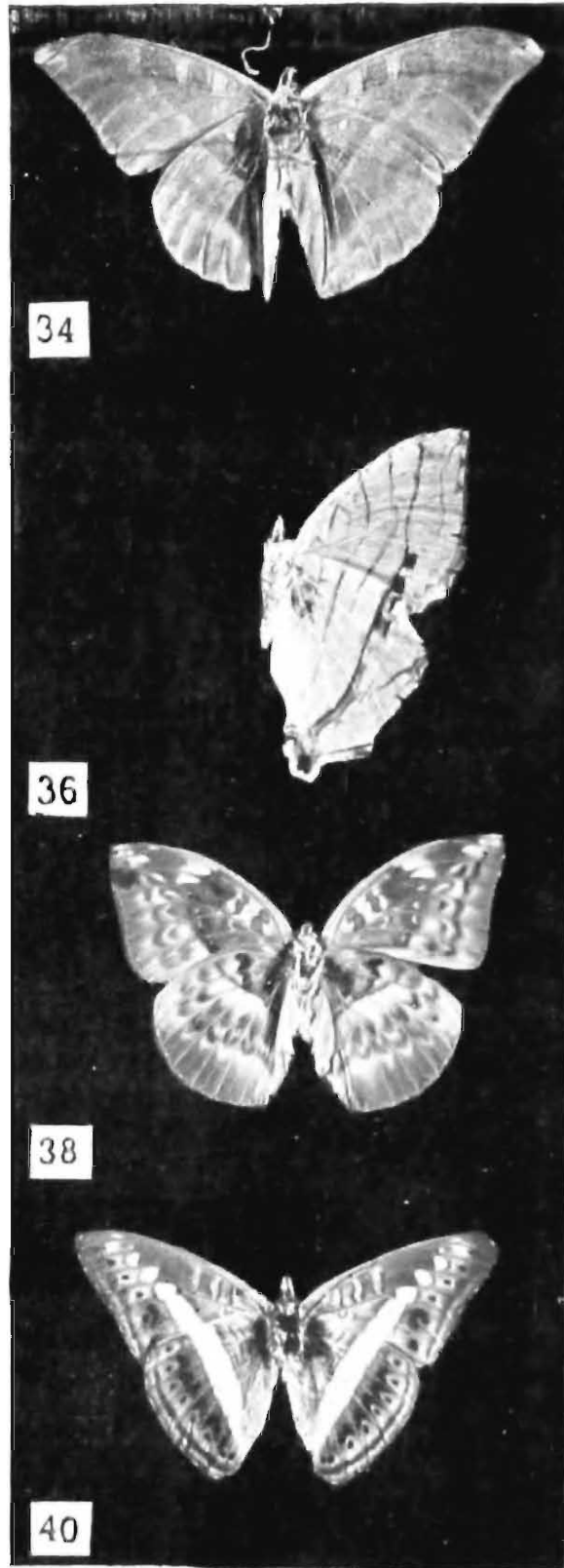
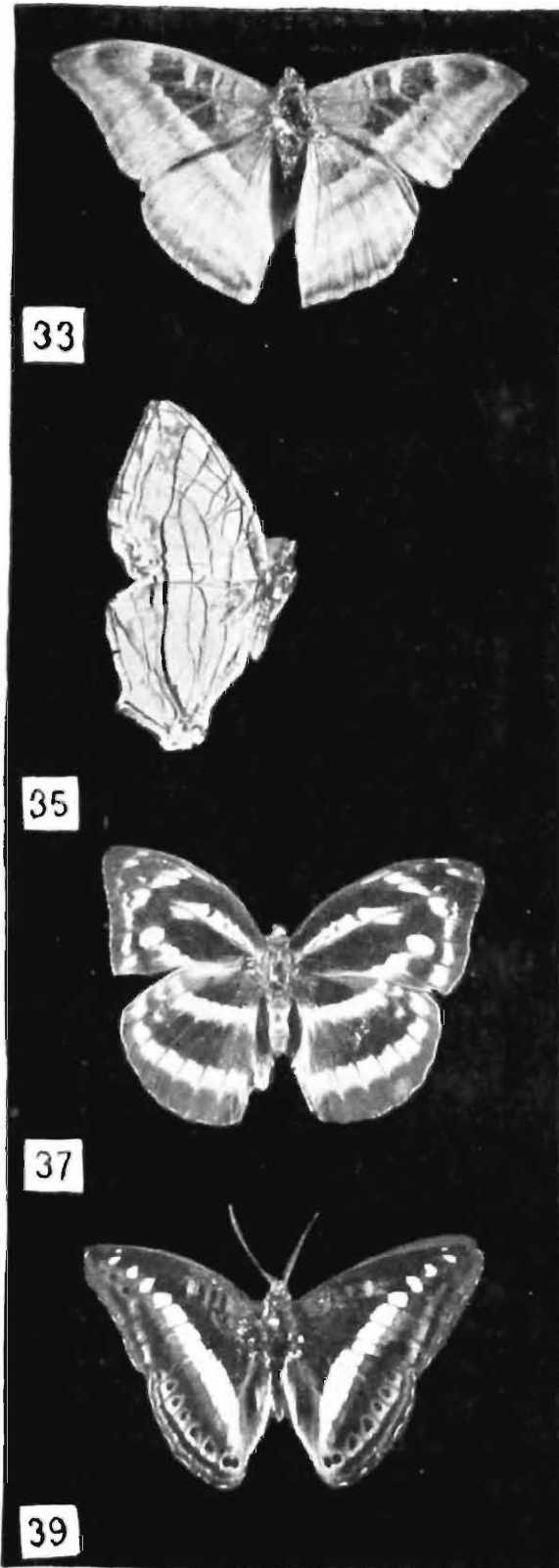
Of the 97 species and subspecies, 16 constitute first reports from West Bengal. Regarding their status, a couple of these are very rare, 19 rare, and others are of variable status. Schedules-I, II and IV of Wild Life (Protection) Act also include 23 species and subspecies. On the basis of present studies, species and subspecies represented in one to four districts may be considered as of rare occurrence.

ACKNOWLEDGEMENTS

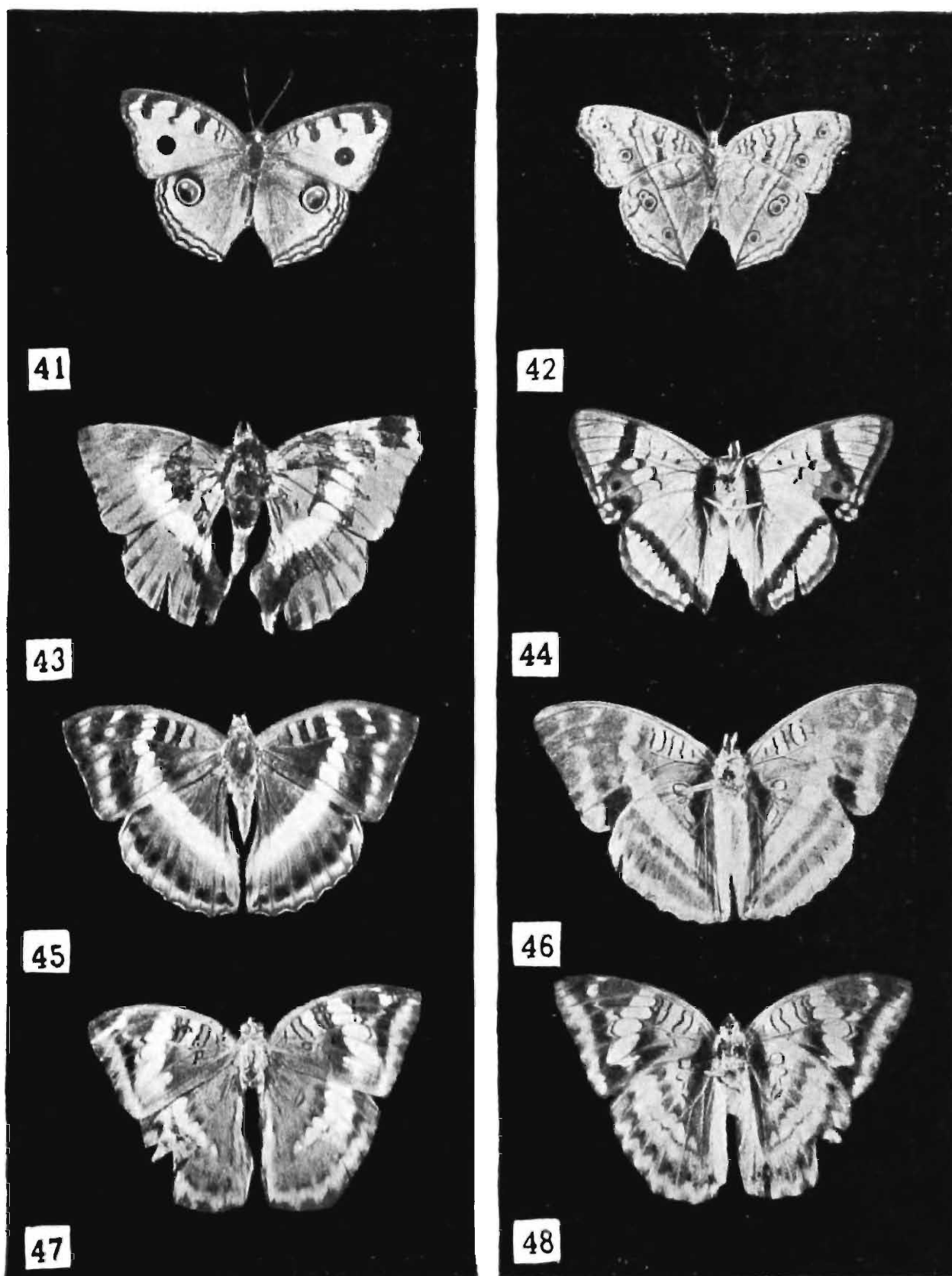
The author is grateful to the Director, Zoological Survey of India, for providing Laboratory facilities to carry out this work. Thanks are also due to Dr. T. Sengupta, Scientist-SE, (Retd.) Entomology Division (A) and Dr. J. K. Jonathan, Scientist-SF for their valuable suggestions; Dr. S.K. Ghosh, Scientist-SD, (Retd.) Officer-In-Charge of Lepidoptera Section for going through the manuscript critically and staff of Photography Section especially Mr. Sekhar Sen for the Photography of specimens of butterflies.

GUPTA

PLATE V

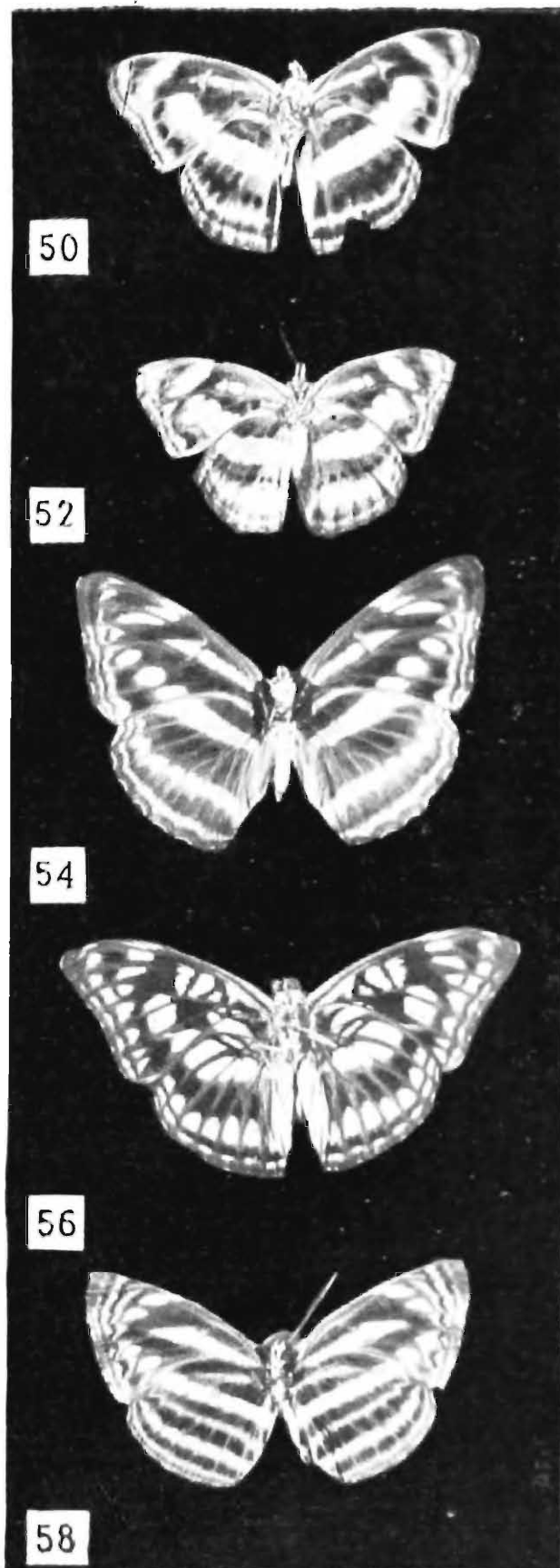
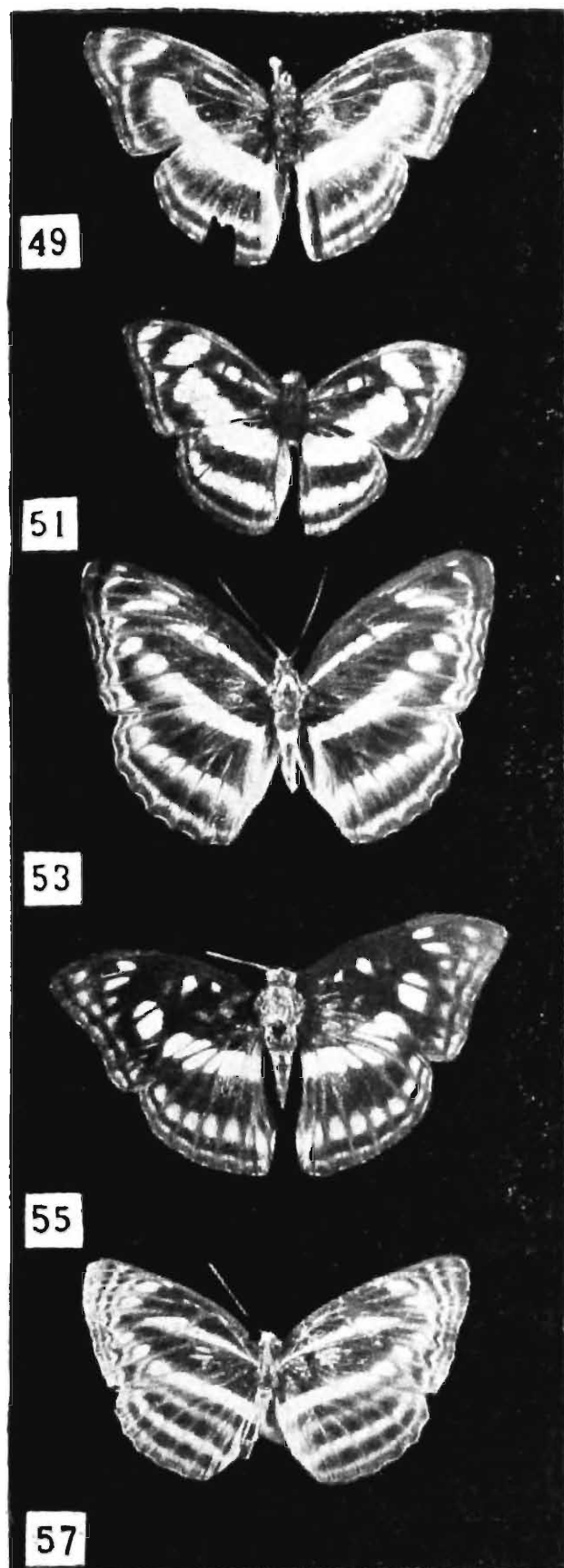


- | | |
|---------------|--|
| 33. Upperside | 34. Underside of <i>Auzakia danava</i> (Moore) |
| 35. Upperside | 36. Underside of <i>Cyrestis thyodamas thyodamas</i> (Boisduval) |
| 37. Upperside | 38. Underside of <i>Abrota ganga</i> (Moore) |
| 39. Upperside | 40. Underside of <i>Sumalia daraxa</i> (Doubleday) |



- 41. Upperside
- 43. Upperside
- 45. Upperside
- 47. Upperside

- 42. Underside of *Precis almana almana* (Linnaeus)
- 44. Underside of *Apatura ambica ambica* Kollar
- 46. Underside of *Euthalia franciae franciae* (Gray)
- 48. Underside of *Euthalia sahadeva sahadeva* (Moore)

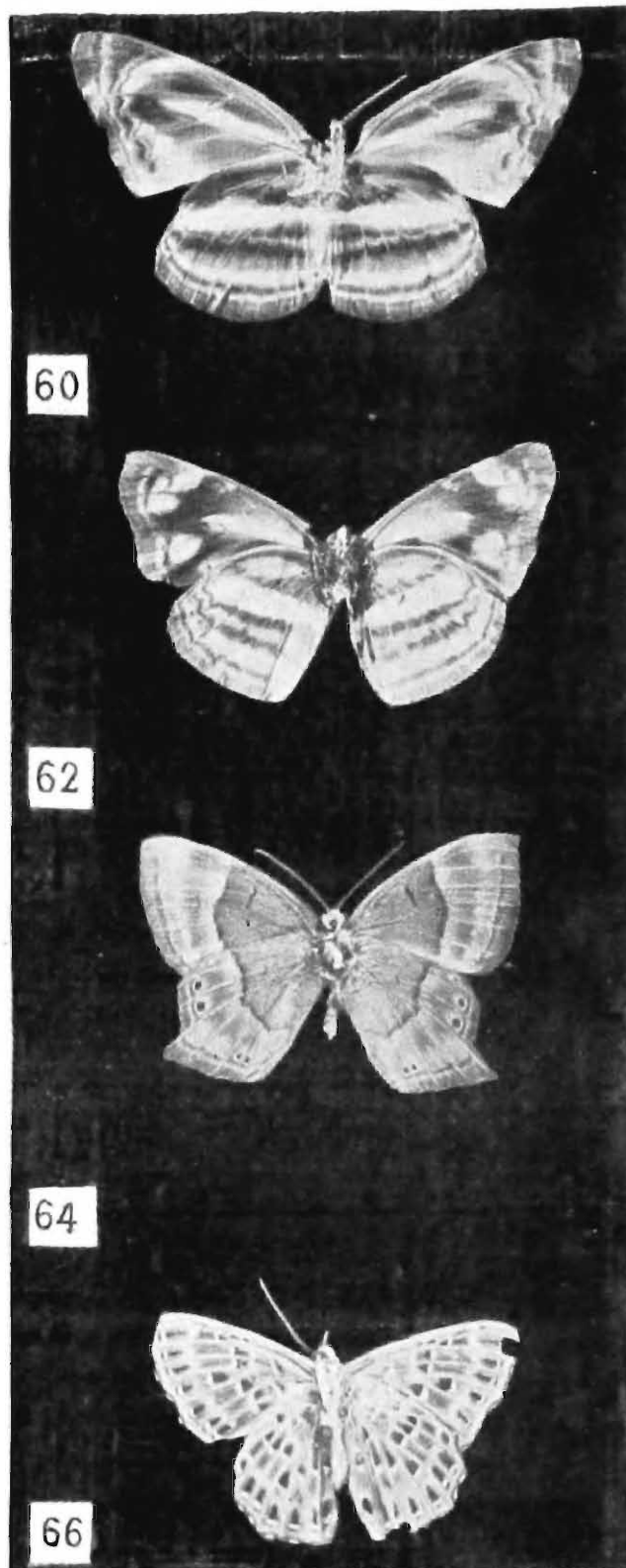


- 49. Upperside
- 51. Upperside
- 53. Upperside
- 55. Upperside
- 57. Upperside

- 50. Underside of *Athyma zeroa* (Moore)
- 52. Underside of *Athyma nefte inara* (Doubleday)
- 54. Underside of *Athyma opalina orientalis* (Elwes)
- 56. Underside of *Athyma ranga ranga* (Moore)
- 58. Underside of *Nentis soma soma* (Moore)

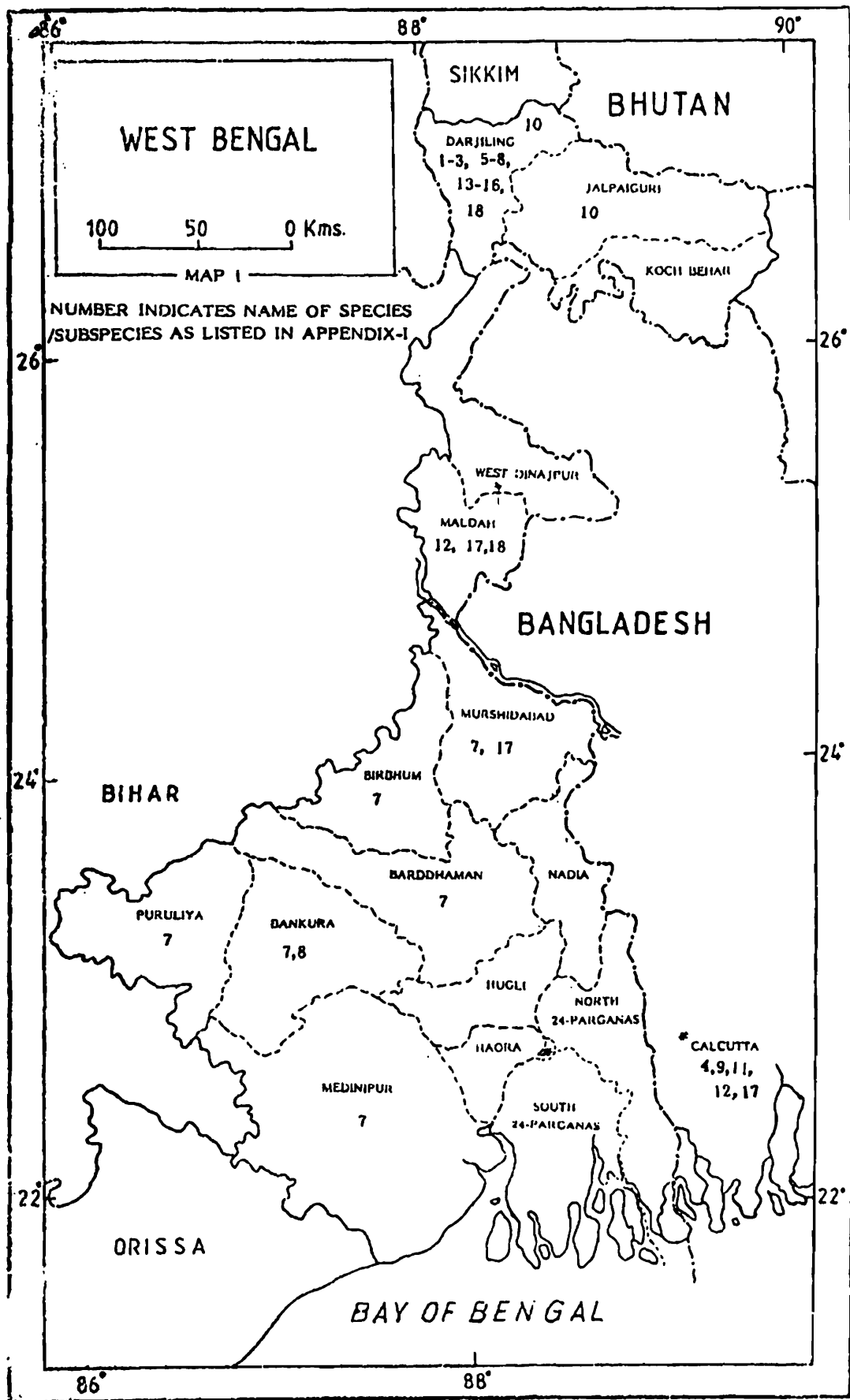
GUPTA

PLATE VIII

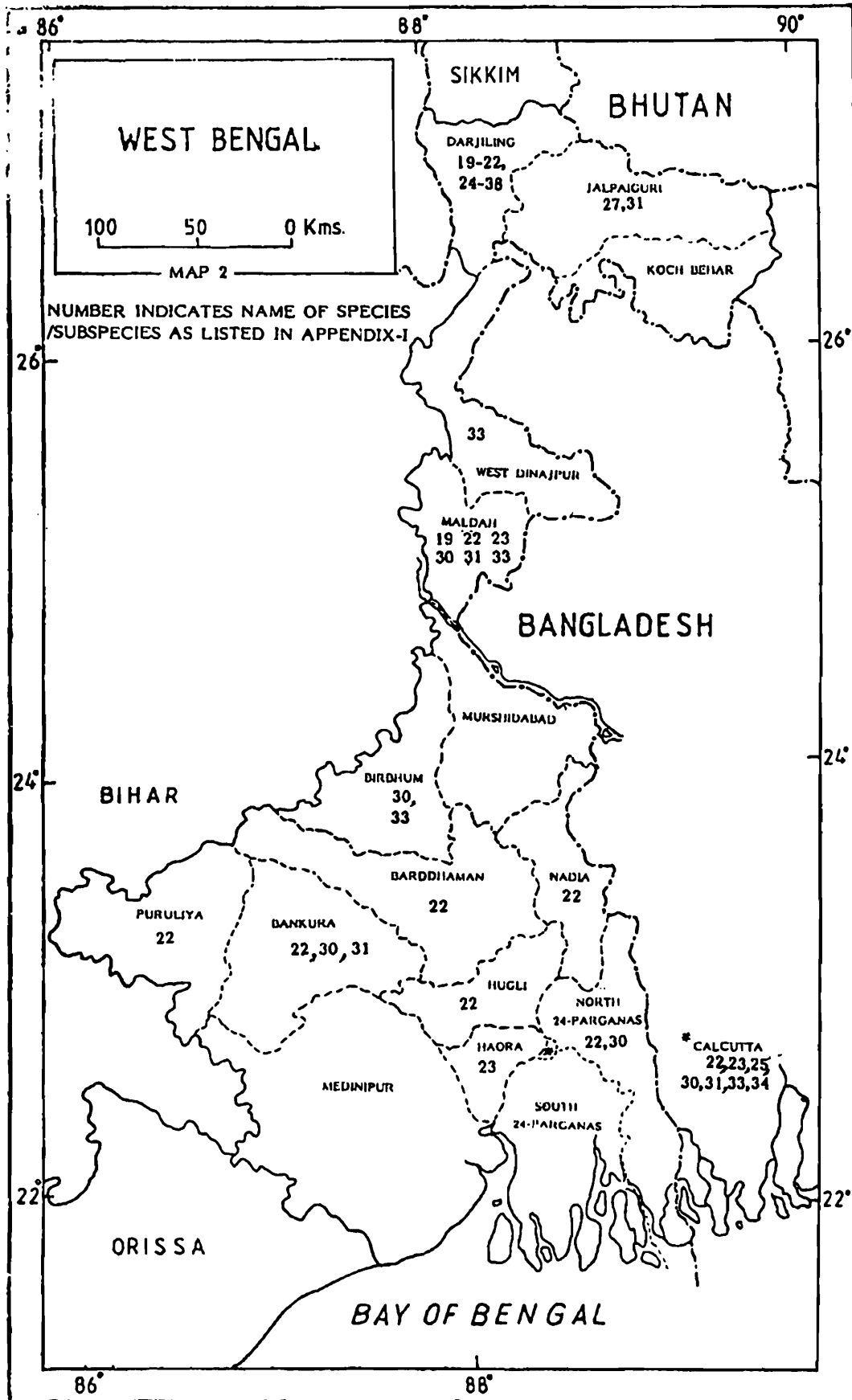


- 59. Upperside
- 61. Upperside
- 63. Upperside
- 65. Upperside

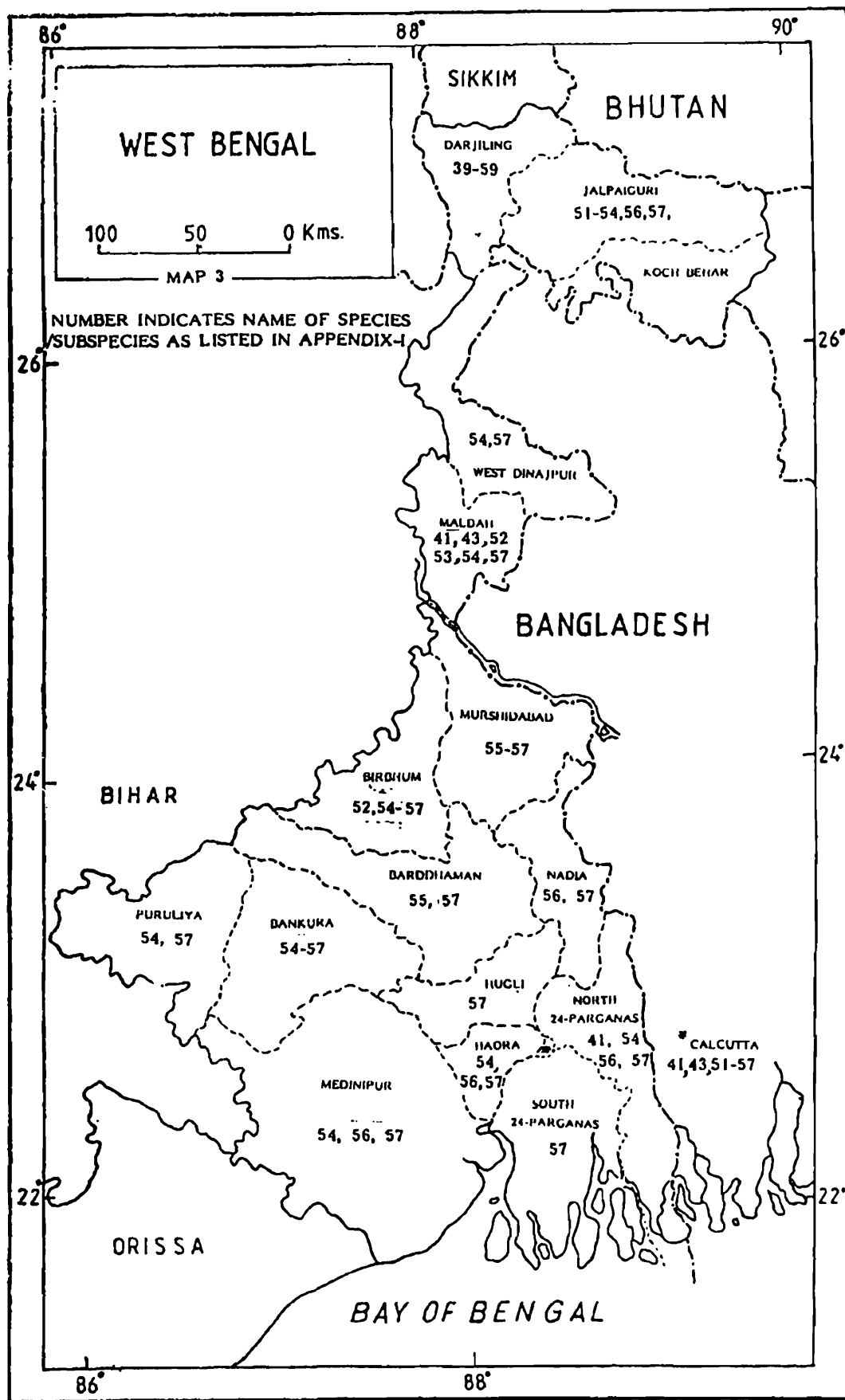
- 60. Underside of *Neptis vikasi pseudovikasi* (Moore)
- 62. Underside of *Neptis narayana narayana* (Moore)
- 64. Underside of *Abisara echerius suffnsa* (Moore)
- 66. Underside of *Zemeros flegyas indicus* (Fruhstorfer)



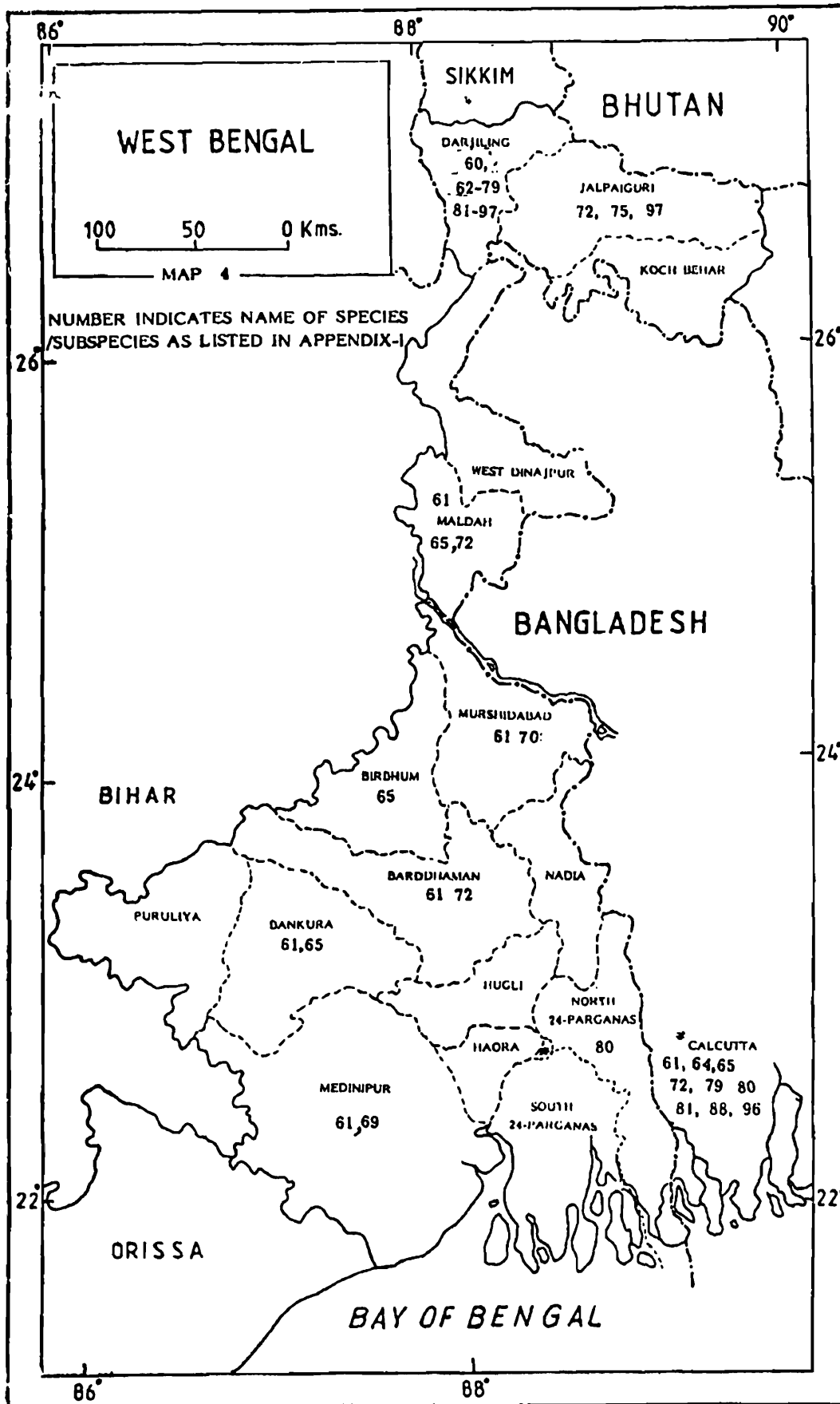
Map I



Map 2



Map 3



Map 4

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APPENDIX - I
List of species and subspecies reported from West Bengal

Name of the Species	Bankura	Bardhaman	Calcutta	Birbhum	Darjiling	Haora	Hugli	Jalpaiguri	Koch Behar	Maldah	Medinipur	Murshidabad	Nadia	24-Parganas (North)	24-Parganas(South)	Puruliys	West Dinajpur
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Family AMATHUSIIDAE																	
1. <i>Stichophthalma nourmahal nourmahal</i> (Westwood)					+												
2. <i>Stichophthalma camadeva</i> (Westwood)					+												
3. <i>Thaumantis diores diores</i> (Doubleday)					+												
4. <i>Discophora sondaica zal</i> (Westwood)				+													
5. <i>Enispe cycnus cycnus</i> Westwood					+												
6. <i>Enispe euthymius euthymius</i> (Doubleday)					+												
Family ACRAEIDAE																	
7. <i>Acraea violae</i> (Fabricius)	+	+	+		+						+	+					+
8. <i>Acraea issoria issoria</i> (Huebner)	+				+												
Family NYMPHALIDAE																	
9. <i>Charaxes fabius fabius</i> (Fabricius)				+													
10. <i>Charaxes polyxena hierax</i> Felder					+			+									

Name of the Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
11. <i>Charaxes polyxenaimna</i> Butler				+													
12. <i>Polyura athamas athamas</i> (Drury)				+						+							
13. <i>Polyura dolon centralis</i> (Rothschild)					+												
14. <i>Polyura eudamippus eudamippus</i> (Doubleday)				+													
15. <i>Stibochiona nicea nicea</i> (Gray)					+												
16. <i>Dichorragia nesimachus</i> (Boisduval)					+												
17. <i>Cynthia cardui</i> (Linnaeus)				+						+	+						
18. <i>Kaniska canace canace</i> (Linnaeus)					+					+							
19. <i>Aglais cashmirensis aesis</i> (Fruhstorfer)					+					+							
20. <i>Vanessa egea agnicula</i> (Moore)					+												
21. <i>Vanessa indica indica</i> (Herbst)					+												
22. <i>Ariadne ariadne indica</i> Moore	+	+		+	+		+			+			+	+			+
23. <i>Ariadne merione assama</i> (Evans)				+		+				+							
24. <i>Chersonesia risa</i> (Doubleday)					+												
25. <i>Pseudergolis wedah</i> (Kollar)				+	+												
26. <i>Argyreus lathonia issoea</i> (Doubleday)					+												
27. <i>Argyreus hyperbius hyperbius</i> (Linnaeus)					+			+									
28. <i>Argyreus childreni childreni</i> (Gray)					+												
29. <i>PentHEMA lisarda lisarda</i> (Doubleday)					+												

Name of the Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
30. <i>Hypolimnas misippus</i> (Linnaeus)	+		+	+	+						+			+			
31. <i>Hypolimnas bolina</i> (Linnaeus)	+			+	+			+			+						
32. <i>Lebadea martha ismene</i> Doubleday					+												
33. <i>Phalanta phalantha phalantha</i> (Drury)			+	+	+						+						+
34. <i>Cethosia cyane</i> (Drury)				+	+												
35. <i>Cethosia biblis tisamena</i> Frushstorfer					+												
36. <i>Auzakia danava</i> (Moore)					+												
37. <i>Kallima inachus inachus</i> (Boisduval)					+												
38. <i>Kallima alompora</i> Moore					+												
39. <i>Cyrestis thyodamas thyodamas</i> Boisduval					+												
40. <i>Cirrochroa aoris aoris</i> Doubleday					+												
41. <i>Cirrochra tyche mithila</i> Moore				+	+						+			+			
42. <i>Vindula erota erota</i> (Fabricius)					+												
43. <i>Pantoporia hordonia hordonia</i> (Stoll)				+	+						+						
44. <i>Abrota ganga</i> Moore					+												
45. <i>Sumalia daraxa</i> (Doubleday)					+												
46. <i>Sumalia zulema</i> (Doubleday)					+												
47. <i>Parasarpa zayla</i> (Doubleday)					+												
48. <i>Aconthea khasiana khasiana</i> (Swinhoe)					+												

Name of the Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
49. <i>Symbrenthia hypselis cotanda</i> Moore					+												
50. <i>Symbrenthia hippoculus khasiana</i> Moore					+												
51. <i>Moduza procris procris</i> (Cramer)				+	+			+									
52. <i>Precis iphita iphita</i> (Cramer)				+	+	+		+		+							
53. <i>Precis hiera magna</i> Evans				+	+			+		+							
54. <i>Precis atlites</i> (Linnaeus)	+		+	+	+	+		+		+	+			+		+	+
55. <i>Precis orithya ocyale</i> Huebner	+	+	+	+	+							+					
56. <i>Precis lemonias lemonias</i> (Linnaeus)	+		+	+	+	+		+			+	+	+	+			
57. <i>Precis almana almana</i> (Linnaeus)	+	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+
58. <i>Apatura parisatis parisatis</i> Westwood					+												
59. <i>Apatura ambica ambica</i> Kollar					+												
60. <i>Apatura sordida sordida</i> Moore					+												
61. <i>Euthalia nais</i> (Forster)	+	+		+						+	+	+					
62. <i>Euthalia anosia saitaphrenes</i> Fruhstorfer					+												
63. <i>Euthalia telchinia</i> Ménétériés					+												
64. <i>Euthalia lubentina indica</i> Fruhstorfer				+	+												
65. <i>Euthalia garuda garuda</i> (Moore)	+		+	+	+					+							
66. <i>Euthalia phemius</i> (Doubleday)					+												
67. <i>Euthalia francae francae</i> (Gray)					+												

Name of the Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
68. <i>Euthalia sahadeva sahadeva</i> (Moore)					+						+						
69. <i>Tanaecia lepidea lepidea</i> (Butler)					+							+					
70. <i>Tanaecia julii appiades</i> (Menetries)					+												
71. <i>Tanaecia jahnu jahnu</i> (Moore)					+												
72. <i>Athyma perius</i> (Linnaeus)		+		+	+			+		+							
73. <i>Athyma selenophora selenophora</i> (Kollar)					+												
74. <i>Athyma zeroca</i> (Moore)					+												
75. <i>Athyma nefte inara</i> (Doubleday)					+			+									
76. <i>Athyma cama</i> (Moore)					+												
77. <i>Athyma opalina orientalis</i> (Elwes)					+												
78. <i>Athyma ranga ranga</i> (Moore)					+												
79. <i>Phaedyma columella ophiana</i> Moore				+	+												
80. <i>Neptis jumbah jumbah</i> Moore				+										+			
81. <i>Neptis hylas astola</i> Moore				+	+												
82. <i>Neptis soma soma</i> Moore					+												
83. <i>Neptis nandina susruta</i> Moore					+												
84. <i>Neptis ananta ochracea</i> Evans					+												
85. <i>Neptis cartica cartica</i> Moore					+												
86. <i>Neptis sankara quilta</i> Swinhoe					+												

Name of the Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
87. <i>Neptis vikasi pseudovikasi</i> (Moore)					+												
88. <i>Neptis harita</i> Moore				+	+												
89. <i>Neptis viraja viraja</i> Moore					+												
90. <i>Neptis narayana narayana</i> Moore					+												
91. <i>Neptis radha radha</i> Moore					+												
92. <i>Sephisa chandra</i> (Moore)					+												
93. <i>Euripus consimilis consimilis</i> (Westwood)					+												
94. <i>Diagora persimilis</i> (Westwood)					+												
Family RIODINIDAE																	
95. <i>Abisara chela</i> de Nicéville					+												
96. <i>Abisara eucherius suffusa</i> (Moore)				+	+												
97. <i>Zemeros flegyas indicus</i> Fruhstorfer					+		+										

**INSECTA : LEPIDOPTERA : HETEROCERA :
SPHINGIDAE, LASIOCAMPIDAE, LYMANTRIIDAE AND RATARDIDAE**

D. K. MANDAL & D. R. MAULIK
Zoological Survey of India, Calcutta.

INTRODUCTION

In continuation with the authors' preceding part of studies on the butterfly fauna, this work presents a recent consolidated systematic account of four families of moths from West Bengal. The account is based on the material of Sphingidae, Lasiocampidae, Lymantriidae and Ratardidae available in both the old and fresh collections made by different parties of the Zoological Survey of India. Also, quite a number of species marked asterisk(*), not represented in these collections from the state, are incorporated in the text on the basis of literature review. The system of these families has mainly been followed in order after Bell & Scott (1937), Collier (1936), Bryk (1934) and Hering (1937).

Earlier, several workers contributed to the faunistic studies of moths from West Bengal either consolidatively or in amalgamation with the fauna of other areas in India or elsewhere. They were Moore (1865), Cotes and Swinhoe (1887-'89), de Niceville (1889-'94), Hampson (1892), Swinhoe (1892), Jordan (1912), Sevastopulo (1941, 1945 a,b, 1956) and others.

The family-wise break-up of the number of total fauna in relation to their subfamilies, genera and species from India *vis-a-vis* West Bengal shows the ratio as Sphingidae: 5,59, 120:: 5,35,67, Lasiocampidae : 20,49 :: 14, 25, Lymantriidae: 2, 28,171:: 1,23, 89 and Ratardidae : 1,3 :: 1,1. Of these, 30 species including 16 of Sphingidae, one of Lasiocampidae and 13 of Lymantriidae constitute new locality records for West Bengal, one, i. é. *Lymantia asoetria* Hübner of the last family, remaining hitherto unknown from India. As to the endemism, which is sometimes an artifact of collecting, the knowledge of the state fauna is rather poor and the report in this area only suggests what the real situation is. Presently, about 25% endemicity for 182 species of the foregone families taken together is estimated from the state and adjoining belts. While observing the status of the state fauna, it may be noted that the rare to very rare species rather highly outnumber the very common counterparts. Furthermore, no material from as many as eight districts of the state was available for study, while 41 species as rare to very rare and less than a dozen as very common are so far known from West Bengal (*vide* maps.). It is also interesting to note that most of the members of the Sphingidae are highly polyphagous and exhibit nocturnal habit, though only 4 species are typically monophagous and 3 are diurnal. At least two species of this family including *Acherontia lachesis* (Fabr.) and *Cephonodes hylas* (Linn.) are of economic importance.

MATERIAL AND METHOD

Amongst the material examined, the Sphingidae comprises 96 exs. in 41 species and 25 genera, Lasiocampidae, 15 exs. in 6 species and 5 genera and Lymantriidae, 52 exs. in 29 species and 12 genera. Keys to all the taxa from higher to the lower level, being related to the examined material, are befittingly provided.

In the authors' earlier part of studies, the field collecting methodology, laboratory processing, etc., have been dealt with in brief details, which are mostly applicable in case of these moths, too. But it must be noted here that small school-boys' nets are used for collecting the low-flying forms like certain lasiocampids flying over bushes. Also, nets with long poles are used for capturing certain lymantriids, as they fly high in the air when pursued. Besides, light-traps are also used for collecting the nocturnal moths.

SYSTEMATIC ACCOUNT

Order LEPIDOPTERA

Suborder HETEROCERA

Key to the families

1. Fore wing M2 nearer M1 than M3 [Body Stout-built. Antennae fusiform. Eyes large. Fore wing long, narrow and pointed; hind wing always with frenulum and 2A. Abdomen pointed at extremity]Sphingidae
- Fore wing M2 near M3 than M1 2
2. Hind wing without frenulum 3
- Hind wing with frenulum [Fore wing Cu2 absent; hind wing Sc + R1 connected with Rs by a bar, or touching it near mid-cell. Palpi of moderate size; proboscis aborted]...Lymantriidae
- [Fore wing areole, when present, never extending nearer to apex, R3 and R4 stalked; hind wing Sc + R1 and Rs not diverging from base]... Subfamily Lymantriinae
3. Fore wing CU2 absent; hind wing with two internal veins and no bar between Sc + R1 and Rs; both wings without cell-veinlet... Lasiocampidae
- Fore wing CU2 present; hind wing with three internal veins and a bar between Sc + R1 and Rs; both wings with a cell-veinlet... *Ratardidae*

Family I. SPHINGIDAE

Key to the divisions

- First segment of palpus without sensory patch of hairs on the inner surface near base Sphingidae Asemanophorae
- First segment of palpus with a short sensory patch of hairs on the inner surface near base ... Sphingidae Semanophorae

Division SPHINGIDAE-ASEMANOPHORAE

Key to the subfamilies

Terminal segment of antennae long and thin, with long hairs and bristles. Fore wing non- sinuate
 Acherontiinae

Terminal segment of antennae short and stout, with short hairs and bristles. Fore wing sinuate
 Ambuliciridae

Subfamily ACHERONTIINAE

Key to the tribes

Second segment of palpus impressed, with cavity being covered by a roof of long scales...
 Acherontiini

Second segment of palpus not impressed and normally scaled
 Sphingini

[Pulvillus present; paronychium bilobed. Hind tibia terminal spur as long as the tarsal segment]
 Genus *Meganoton* Boisduval

Tribe ACHERONTIINI

Key to the genera

1. Proboscis shorter than thorax, the latter with a dorsal skull-mark *Acherontia* Laspeyres

Proboscis longer than thorax, the latter without skull-mark... 2

2. First segment of palpus normally scaled. Abdomen with pink side-patches.....*Herse* Oken

First segment of palpus externally with a large apical cavity formed by scaling. Abdomen without pink side-patches*Megacorma* Roths-child & Jordan

Genus *Acherontia* Laspeyres (1809)

Key to the species

Hind wing upperside with the basal third marked black..... *lachesis* (Fabricius)

Hind wing upperside with the basal third immaculate... *styx* (Westwood)

1. *Acherontia lachesis* (Fabricius)

1798. *Sphinx lachesis* Fabricius, *Ent. Syst.*, Suppl., p. 434.

1937. *Acherontia lachesis* : Bell & Scott, *Fauna Brit. India*, Moths 5:55, fig. 9 A-B, pls.

Material examined : 10 exs., Calcutta, 6.viii.1912, Car Michael Colln., 21.x.1924, Old Collns; Chakrabortypara, Nabapath, Barasat, North 24-Parganas district, 23. iv.1987, adult reared in the Z.S.I. laboratory by D.R. Maulik.

Diagnosis : Vide key.

Distribution : India : West Bengal (Calcutta and North 24-Parganas); almost throughout the rest of mainland except the North-West Himalaya and also found in the Andaman Island. *Elsewhere* : Pakistan, Bhutan, Bangladesh, Burma, Sri Lanka, China, Western Malaysia, Java up to Southern Moluccas in the farther east.

Remarks : The species, which was earlier mentioned from Calcutta by Cotes & Swinhoe (1887-'89), is common especially in hills and forest areas. It is extremely polyphagous, feeding on the plants belonging to Bignoniaceae, Labiatae, Leguminosae, Oleaceae, Solanaceae, Verbenaceae, etc. On account of these garden plants, the moth also occurs in towns and villages, often coming to light in the evening. On being captured, the imagos emit a sharp chirping note. The moth rests with the wings folded pent-house-wise, covering the abdomen completely. It is also known to be a bee-hive fowler.

2. *Acherontia styx* (Westwood, 1848)*A. s.styx* (Westwood)

1848. *Sphinx (Acherontia) styx* Westwood, *Cab.Orient. Ent.*, p.88, pl.42, fig.3.

1937. *Acherontia styx styx* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 58, fig. 9 C-E, pl.

Material examined : 5 exs., Ganga Jachati, Bankura district, 8.ix. 1986, P. Mukherjee and party coll; Kalna, Barddhaman district, 9.xii. 1986, K.K. Ray and party coll.; Calcutta,, Old Collns.

Diagnosis : Skull-mark on thorax less conspicuous. Abdominal yellow side-patches well extensive. Fore wing with tawny-russet streaks and a postdiscal patch. Fore tibiae with a few spines, being prolonged apico-laterally.

Distribution : India : West Bengal (Bankura, Barddhaman and Calcutta); throughout the rest of mainland. *Elsewhere* : Pakistan, Bhutan, Bangladesh, Burma, Sri Lanka, Malacca and Ceram.

Remarks : The subspecies, which is very common in open country, was earlier recorded from Bengal by Moore (1865). The habits and food-plants of this moth are very much similar to those of the preceding element excepting that the former feeds also on *Sesamum indicum* (Pedaliaceae). It may also be noted that certain variations like the presence or absence of fore wing discal spot, hind wing interior black band, are confined neither to districts nor to seasons.

Genus *Herse* Oken (1815)

3. *Herse convolvuli* (Linnaeus, 1758)

H.c. convolvuli (Linnaeus)

1758. *Sphinx convolvuli* Linnaeus, *Syst. Nat.*, ed. 10:490.

1937. *Herse convolvuli convolvuli* : Bell & Scott, *Fauna Brit. India*, Moths, 5:61, figs. 10 A-D, pl.

Material examined : 5 exs., Calcutta, ..., Old Collns; Darjiling district, vii.1912, Car Michael Coll.; Haldia Bhavan Complex, Haldia, Medinipur district, 3.iii. 1984, K.K. Ray and party coll.

Diagnosis : Male fore wing much more strongly marked and darker than in female in which it is uniformly grey; hind wing in both sexes grey with black transverse bands. Abdomen with red lateral transverse spots.

Distribution : India : West Bengal (Calcutta, Darjiling and Medinipur); throughout the rest of mainland. *Elsewhere* : Eastern hemisphere except the higher latitudes, rare in Siberia and Europe.

Remarks : The subspecies, earlier mentioned from Calcutta and North Bengal by Cotes & Swinhoe (1887-1889), is usually treated in old manuals under *Protoparce* Burmeister. It is common in both dry and wet areas up to an approximate altitude of 2,200 metres. The moth is a fast flier, appearing at dusk to suck honey of tubular flowers by means of its extremely long proboscies. It is readily attracted by light and exhibits a characteristic diaposematic habit with the antennae being folded back over the wings. The food-plants belong to Compositae (*Helianthus* spp.), Convolvulaceae (*Ipomaea* spp., *Convolvulus* spp.), Leguminosae (*Arachis hypogaea*, *Dolichus lablab*, *Phaseolus* spp.), while flowers of *Hibiscus* (Malvaceae) and *Nicotiana tabacum* (Solanaceae) are known as adult attractants.

Genus *Megacorma* Rothschild & Jordan(1903)

4. *Megacorma obliqua* (Walker, 1856)

M.o. obliqua (Walker)

1856. *Macrosila obliqua* Walker, *Cat.Lep.Het. Brit. Mus.*, 8:208.

1937. *Megacorma obliqua obliqua* : Bell & Scott, *Fauna Brit. India*, Moths, 5:66, fig.11 A-C.

Material examined : One ex., Government House Compound, Darjiling district, Darjiling.....Old Colln.

Diagnosis : Thorax abnormally long, extending far beyond the base of fore wing. Fore wing with a heavy black streak under and along R1, reaching the outer margin.

Distribution : India : West Bengal (Darjiling); Assam and Sikkim. *Elsewhere* : Burma, Sri Lanka

and Malaya.

Remarks : The species, which was earlier treated as *Pseudosphinx discistriga* (non Walker) by Hampson (1892), is a new record for West Bengal. The moth is rare in status and its food-plant is unknown.

Tribe SPHINGINI

Genus *Meganoton* Boisduval (1875)

5. *Meganoton analis* (Felder, 1874)

1874. *Sphinx analis* Felder, *Reise Nov. Lep.*, 2 : pl.78, fig. 4.

1937. *Meganoton analis* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 71, fig. 12 A-D.

Material examined : One ex., Darjiling, district Darjiling, ..., Old Colln.

Diagnosis : Hind wing without pale spots on disc. Abdomen without yellow side-patches.

Distribution : India : West Bengal (Darjiling); Meghalaya. *Elsewhere* : China and Nepal.

Remarks : Similarly treated by Hampson (1892) as the preceding species, this moth was earlier recorded from Darjiling as *Diludia tranquillaris* by Butler (1877). This is a rare element amidst the mountainous country. It has a weak flight, rests with wings in a broadly slanting position and hardly comes to light. Food-plant is not known from the Indian subregion, though it is known as *Sassafras tzumu* (Lauraceae) in China.

Genus *Psilogramma* Rothschild & Jordan (1903)

* 6. *Psilogramma menephron* (Cramer, 1780)

Psilogramma m. menephron (Cramer)

1780. *Sphinx menephron* Cramer, *Pap. Exot.*, 3 : 164, pl. 285, fig. A.

1937. *Psilogramma menephron menephron* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 77, fig. 13 A-F, pls.

Distribution : India : West Bengal (districts not cited); almost throughout the rest of mainland.

Elsewhere : Nearly whole of the Indian subregion, China and eastwards to the Solomon Islands.

Remarks : The species, which was in part referred to *Pseudosphinx discistriga* (Walker) by Hampson (1892), was earlier recorded from Bengal by Moore (1865) and Swinhoe (1892). It is widely distributed and locally common in both forests and open country up to C 2000 metres. It is known to frequently come to light and suck tubular flowers after dusk. Food-plants belong to Bignoniaceae, Oleaceae and Verbenaceae.

Genus *Apocalypsis* Butler (1877)* 7. *Apocalypsis velox* Butler (1877)1877. *Apocalypsis velox* Butler, *Trans. zool. Soc. Lond.*, 9 : 641.1937. *Apocalypsis velox* : Bell & Scott, *Fauna Brit. India, Moths*, 5 : 82, fig. 14 A-B, pl.*Distribution* : India : West Bengal (Darjiling); Meghalaya.

Remarks : The species, which was earlier recorded from Darjiling by Butler (1877), is rare and restricted in the mountains of East Himalaya. It is univoltine, hibernating at the pupal stage and monophagous on *Callicarpa arborea* (Verbenaceae).

Subfamily AMBULICINAE

Key to the genera

1. Mid tibiae spinose... .. 2
Mid tibiae spineless... .. 3
2. Hind tibiae with 2 pair of spurs [Palpal joint not open]... .. *Clanis* Hubner
Hind tibiae with 1 pair of spurs [Wings green and red]... ..
..... *Rhodoprasina* Rothschild & Jordan
3. Hind tibiae with 1 pair of spurs [Fore tibiae ending in a strong, curved and horny spine]....
..... *Agnosia* Rothschild & Jordan
Hind tibiae with 2 pair of spurs... .. 4
4. End-segment of antennae long. Tibial spurs very long 5
End-segment of antennae less than 4 times as long as basally high. Tibial spurs short [Hind wing costal margin normal; fore wing apex acute and distal margin even].....
..... *Callambulyx* Rothschild & Jordan
5. Apex of fore wing acute... .. *Oxyambulyx* Rothschild & Jordan

Genus *Compsogene* Rothschild & Jordan (1903)8. *Compsogene panopus* (Cramer, 1779)*C. p. panopus* (Cramer)1779. *Sphinx panopus* Cramer, *Pap. Exot.*, 3 : 50, pl. 224, figs. A-B.1937. *Compsogene panopus panopus* : Bell & Scott, *Fauna Brit. India, Moths*, 5 : 104, fig. 19, pls.

Material examined : 2 exs. : District Darjiling,, Old Colln.

Diagnosis : Fore wing ashy-pink parted by 2 straight dark chocolate stripes into 3 areas and the inner area between Culb and 3A with fine white lines; hind wing pink, outwardly brown with 5 transverse stripes.

Distribution : India : West Bengal (Darjiling); Assam; Sikkim; Karnataka; Tamil Nadu; Andaman Islands. *Elsewhere* : Bangladesh, Bhutan, Burma, China, Hong Kong, Java, Malaya, Philippines and Sri Lanka.

Remarks : The subspecies, which is rather locally common in wooded hills, is a new record for West Bengal and possibly for whole of the eastern peninsular belt of India. The moth, which is not known so far to be attracted to blossoms nor to light at least in India, is one of the most beautiful sphingids. It is sluggish at day-time, but extremely active at night. Also, it is an wonderful example of protective resemblance in that the wings at rest are spread widely in a plane below the horizontal, the fore pair not quite covering the hind pair, the latter just covering the sides of abdomen, thus giving the impression of two different objects, viz., triangle and trapeze. The commonest food-plants are *Mangifera indica* (Anacardiaceae) and *Callophyllum inophyllum* (Guttiferae).

* 9. *Compsogene masoni* Clark (1924)

1924. *Compsogene masoni* Clark, *Proc. New. Engl. Zool. Club*, 9 : 17.

1937. *Compsogene masoni* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 108, fig.20.

Distribution : India : West Bengal (Kurseong, Darjiling district) Sikkim.

Remarks : This is a very rare species, being hitherto restricted to the East Himalaya. Seitz (1928) mentioned this species as a form of the preceding species under the misspelt name as "*mousoni*" The female and food-plants of the moth are unknown. Only one male from Kurseong (R.P. Andrews Coll.) is lying in the British Museum, London.

Genus *Oxyambulyx* Rothschild & Jordan (1903)

Key to the species

Fore wing without subbasal costal spot. Abdominal dorsal line distinct [Fore wing submarginal line posteriorly quite proximal; hind wing base never black] *liturata* (Butler)

Fore wing with a round subbasal costal spot. Abdominal dorsal line much indistinct [Fore wing underside with grey marginal area extending beyond M2 and submarginal line never ending on dorsum. Upperside pinkish grey] *matti* Jordan

10. *Oxyambulyx maculifera* (Walker 1866)

1866. *Ambulyx maculifera* Walker, *Cat. Lep. Het. Brit. Mus.*, 35 : 185.

1937. *Oxyambulyx maculifera* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 118, fig. 22 E-I.

Distribution : India : West Bengal (Darjiling); Sikkim. *Elsewhere* : Burma.

Remarks : The species, treated by Hampson (1892) as *Ambulyx substrigilis* (non Westwood), was described and subsequently recorded from Darjiling by Walker (1866) and Butler (1881) respectively. Apparently the moth is rare and shows sexual dimorphism. Bionomics and food-plants are unknown.

11. *Oxyambulyx liturata* (Butler, 1975)

O. l. liturata (Butler)

1875. *Ambulyx liturata* Butler, *Proc. zool. Soc. Lond.*, 1875 : 250.

1937. *Oxyambulyx liturata liturata* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 125, fig. 21 J-M.

Material examined : 3 exs., Darjiling, Old Colln.

Diagnosis : Vide key.

Distribution : India : West Bengal (Darjiling); Sikkim, Assam. *Elsewhere* : Burma and China.

Remarks : This is a rare moth described from Darjiling by Butler (1875) as *Ambulyx rhodoptera*, being subsequently treated as *A. substrigilis* (non Westwood) by Hampson (1892). It is seldom seen on the wing, but quite excitable when touched. The food-plants comprise *Quercus* spp. (Fagaceae) in India.

* 12. *Oxyambulyx substrigilis* (Westwood, 1848)

O. s. substrigilis (Westwood)

1848. *Sphinx (Ambulyx) substrigilis* Westwood, *Cab. Orient. Ent.*, p.61, pl.30, fig.2.

1937. *Oxyambulyx substrigilis substrigilis* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 131, figs. 23A D, 26.

Distribution : India : West Bengal (District not cited); Andaman Islands; Assam; Sikkim. *Elsewhere* : Bangladesh and Hainan.

Remarks : Seitz (1928) stated this form to belong to a highly variable and widely distributed species. Bionomics, food-plants and also the present-day status and abundance of this nominate subspecies are unknown. The moth was earlier recorded from Bengal by Moore (1865).

13. *Oxyambulyx matti* Jordan (1923)

1923. *Oxyambulyx matti* Jordan, *Nov. Zool.*, 30 : 188.

1937. *Oxyambulyx matti* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 132, fig.27.

Material examined : One ex., Mohanadi Goomti Tea Garden Factory Premises, district Darjiling. 28.iv.1971, A.R. Bhowmik and party coll.

Diagnosis : Vide key.

Distribution : India : West Bengal (Darjiling); Karnataka.

Remarks : This is a very rare species hitherto restricted to North Kanara district of Karnataka. The present discovery reveals that it constitutes new locality record for West Bengal. It is found in rainy forest up to an altitude of c 650 metres and feeds completely on leaves except their midribs of *Terminalia tomentosa* (Combretaceae). Seitz (1928) treated this insect as a subspecies of *O. substrigilis*, but as it occurs in the same area (North Kanara) as *O. substrigilis aglaia* Jordan, it appears to be more than a geographical race or subspecies.

Genus **Clanis** Hübner (1822)

Key to the species

Fore wing underside with a black strea behind the cell [Mid and hind tibiae white above].....
..... *bilineata* (Walker)

Fore wing underside without black streak behind the cell [Mid tibiae without white streak above. For wing with pale costal patch and pale lin before R3] *phalaris* (Cramer)

14. **Clanis phalaris** (Cramer, 1777)

1777. *Sphinx phalaris* Cramer, *Pap. Exot.* 2 : 83, pl.149, fig. A.

1937. *Clanis phalaris* : Bell & Scott, *Fauna Brit. India*, Moths 5 : 142, figs. 28 A-B, 29, pl.

Material examined : 2 exs., Darjiling,Old Colln.

Diagnosis : Vide key.

Distribution : India : West Bengal (Darjiling); Andaman Islands; Andhra Pradesh; Madhya Pradesh; Sikkim; Southern Peninsula. *Elsewhere* : Sri Lanka.

Remarks : The species, which is common in both open and forest-clad countries, was earlier recorded from West Bengal by Moore (1865). It occurs in jungles in pair and does not come to light. Food -plants are *Cassia stula*, *Millettia atropurpurea*, *Pongamia glabra*, *Xylia xylocara*, etc., all belonging to Leguminosae. The species was treated as *Ambulyx pagana* Fabr. by Hampson (1892).

15. **Clanis bilineata** (Walker, 1866)

C. b. bilineata (Walker)

1866. *Basiana bilineata* Walker, *Cat. Lep. Het. Brit. Mus.* 35 : 1857.

1937. *Clanis bilineata bilineata* : Bell & Scott., *Fauna Brit. India*, Moths, 5 : 150, fig.31 A-E, pl.

Material examined : One ex., Darjiling,, Old Colln.

Diagnosis : Vide key.

Distribution : India, West Bengal (Darjiling); southern Peninsula. *Elsewhere* : Japan, Korea and South China.

Remarks : The moth was described and subsequently recorded from Darjiling by Walker (1866) and Butler (1881) respectively. The status and bionomics are rather similar to those of the preceding species, but it feeds on certain other leguminous plants like *Mucuna* sp. and *Pterocarpus marsupium* than *Millettia atropurpurea* and *Pongamia glabra*.

Genus *Leucophlebia* Westwood (1848)

* 16. *Leucophlebia lineata* Westwood (1848)

1848. *Leucophlebia lineata* Westwood, *Cab. Orient Ent.*, p. 46, pl. 22, fig. 2.

1937. *Leucophlebia lineata* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 157, fig. 32 A-B, pl.

Distribution : India : West Bengal (district not cited); Assam; northern and southern Peninsula; East and West Himalaya. *Elsewhere*: China, Java, Malaya, Nepal, Philippines, Sri Lanka and Sulawesi.

Remarks : The species, which is seasonally common, was earlier recorded from Bengal by Moore (1865). The moth comes to light freely and rests with the wings held steeply pen-house-wise. It can not suck honey from flowers, as the tongue is functionless. The food-plants are characteristically known to belong to *Saccharum* sp. and other coarse grasses (Graminae).

Genus *Marumba* Moore (1882)

*17. *Marumba cristata* (Butler, 1875)

M.c. cristata (Butler)

1875. *Triptogon cristata* Butler, *Proc. zool. Soc. Lond.*, 1875: 253.

1937. *Marumba cristata cristata* : Bell & Scott, *Fauna Brit. India*, Moths, 5:176, fig. 35 A-C.

Distribution : India : West Bengal (Darjeeling); Sikkim. *Elsewhere* : China.

Remarks : Apparently not rare, the moth is known to be bivoltine, producing broods in spring and summer. It occurs in jungle of mixed bamboo and deciduous trees at an approximate altitude up to 2000 metres. Food-plants belong to certain members of Lauraceae. The form, which was treated as *Polyptychus dyras* (non Walker) by Hampson (1892), was described from Darjiling by Butler (1875).

* 18. *Marumba spectabilis* (Butler, 1875)

M.s. spectabilis (Butler)

1875. *Triptogon spectabilis* Butler, *Proc. zool. Soc. Lond.*, 1875 : 256.

1937. *Marumba spectabilis spectabilis* : Bell & Scott, *Fauna Brit. India*, Moths, 5:178, fig. 35 D-E.

Distribution : India : West Bengal (Darjiling); Meghalaya; Sikkim.

Remarks : This rare moth was described from Darjiling by Butler (1875). It is restricted to the East Himalaya, being found in forests with heavy rainfall. Food-plant is unknown.

* 19 *Marumba dyras* (Walker, 1856)
M. d. dyras (Walker)

1856. *Smerinthus dyras* Walker, *Cat. Lep. Het. Brit. Mus.*, 8 : 250.

1937. *Marumba dyras dyras* : Bell & Scott, *Fauna Brit. India*, Moths, 5:179, figs. 35 F-1, 37, pl.

Distribution : India : West Bengal (Darjiling); Andaman Islands; Assam; Sikkim; Southern Peninsula; West Himalaya. *Elsewhere* : Bangladesh and Sri Lanka.

Remarks : This is a common moth, being earlier recorded from Darjiling by Butler (1875) as *Triptogon fuscescens*. It prefers thickly wooded areas with heavy rainfall. It is hardly attracted by light and like *L. lineata*, due to the similar reason, does not suck at flowers. The food-plants belong to certain species of Euphorbiaceae, Malvaceae, Sapindaceae, Sterculiaceae and Tiliaceae.

Genus *Rhodoprasina* Rothschild & Jordan (1903)

20. *Rhodoprasina floralis* (Butler, 1877)

1877. *Ambulyx floralis* Butler, *Trans. zool. Soc. Lond.*, 9 : 639.

1937. *Rhodoprasina floralis* : Bell & Scott, *Fauna Brit. India* Moths, 5 : 199, fig. 45 A-C.

Material examined : One ex., Darjiling ..., Old Colln.

Diagnosis : Body and wings bright dark green; hind wing basal two-thirds dull purple red. Fore tibiae with a terminal long thorn.

Distribution : India : West Bengal (Darjiling); Sikkim.

Remarks : This is a very rare moth, being described from Darjiling by Butler (1877 A). It is restricted in the East Himalaya and monophagous on *Acer campbelli* (Sapindaceae).

Genus *Agnosia* Rothschild & Jordan (1903)

21. *Agnosia orneus* (Westwood, 1848)

1848. *Sphinx orneus* Westwod, *Cab.Orient. Ent.*, p.13., pl. 16, fig. 2.

1937. *Agnosia orneus* : Bell & Scott, *Fauna Brit. India*, Moths, 5:210, fig. 49 A-C, pl.

Material examined ; One ex., Darjiling,Old Colln.

Diagnosis : Head, thorax, abdomen and fore wing reddish ochreous; hind wing pink, with a grey

patch at anal angle. Fore tibiae with a strong, curved and horny terminal spine.

Distribution : India : West Bengal (Darjiling); northern and southern Peninsula; West Himalaya.
Elsewhere : Sri Lanka.

Remarks : This is a rare species which constitutes new locality record for West Bengal. It occurs in forest with heavy rainfall. Food-plant is *Grewia asiatica* (Tiliaceae).

Genus *Parum* Rothschild & Jordan (1903)

* 22. *Parum porphyria* (Butler, 1877)

1877. *Daphnusa porphyria* Butler, *Trans. zool. Soc. Lond.*, 9:640.

1937. *Parum porphyria* : Bell & Scott., *Fauna Brit. India, Moths*, 5 : 214, fig. 51 A-E.

Distribution : India : West Bengal (Darjiling); Sikkim.

Remarks : This is a very rare moth, being described from Darjiling by Butler (1877 A). Bionomics and food-plants are unknown.

Genus *Cypa* Walker(1864)

* 23. *Cypa decolor* (Walker, 1856)
C.d. declor (Walker)

1856. *Smerinthus decolor* Walker, *Cat. Lep. Het. Brit. Mus.*, 8 : 255.

1937. *Cypa decolor decolor* : Bell & Scott., *Fauna Brit. India, Moths*, 5 : 218, fig. 53 A-F.

Distribution : India : West Bengal (Darjiling); Sikkim.

Remarks : The moth, which was described from "Hindustan" by Walker (1856), was subsequently recorded as *Mimas decolor* from Darjiling by Butler (1877 A). It is not rare in status in the East Himalaya. Bionomics and food-plants are unknown.

Genus *Callambulyx* Rothschild & Jordan (1903)

24. *Callambulyx rubricosa* (Walker, 1856)
C.r. rubricosa (Walker)

1856. *Ambulyx rubricosa* Walker, *Cat. Lep. Het. Brit. Mus.*, 8 : 122.

1937. *Callambulyx rubricosa rubricosa* : Bell & Scott., *Fauna Brit. India, Moths*, 5 : 229, fig. 59 A-C.

Material examined : One ex., Darjiling, ..., Old Colln.

Diagnosis : Fore wing bright glaucous green, underside basal area not washed with red; hind wing brilliant crimson, with black postdiscal patch near margin.

Distribution : India : West Bengal (Calcutta and Darjiling); Meghalaya; Sikkim.

Remarks : This is a rare form recorded earlier from Calcutta and Darjeeling by Butler (1877 A) as '*superba*' Bionomics and food-plants are unknown.

Genus *Anambulyx* Rothschild & Jordan (1903)

* 25. *Anambulyx elwesi* (Druce, 1882)

1882. *Ambulyx elwesi* Druce, *Ent. Mo. Mag.*, **19**:17.

1937. *Anambulyx elwesi* : Bell & Scott, *Fauna Brit. India*, Moths, **5** : 232, fig. 60 A-B.

Distribution : India : West Bengal (Darjiling); Meghalaya; Sikkim.

Remarks : This is a rare moth described from Darjiling by Druce (1882). Bionomics and food-plants are unknown.

Division SPHINGIDAE-SEMANOPHORAE

Key to the subfamilies

1. Pilifer normal2
 Pilifer proximally long-bristled and distally shortbristled Choerocampinae
2. Abdomen with segment X mesially divided Sesiinae
 [Thorax not double-crested if abdominal spines be uniseriate; mid-coxal merum angulate if end-segment of antennae be long] Tribe Sesiini
 Abdomen with segment X mesially undivided Philampelinae
 [Abdominal spines in more than one row] Tribe Nephelini

Subfamily SESIINAE

Tribe SESIINI

Key to the genera

- Wings tinged metallic. Closely resembling carpenter-bees in appearance
 *Sataspes* Moore
- Wings hyaline. Closely resembling humble-bees... *Cephonodes* Hübner

Genus *Cephonodes* Hubner (1822)

26. *Cephonodes hylas* (Linnaeus, 1771)

C.h. hylas (Linnaeus)

1771. *Sphinx hylas* Linnaeus, *Mant. Plant*, p.539.

1937. *Cephonodes hylas hylas* : Bell & Scott, *Fauna Brit. India*, Moths, **5** : 247, fig. 64 A-C, pl.

Material examined : 5 exs., Calcutta 23 ix.1924, iv. 1930, 30.viii. 1975. Old Collns.; Rongpo Forest Rest House, West bank of Tista, Darjiling district, 6.xii. 1978, H.S. Sharma and party coll.

Diagnosis : Body green. Fore tibiae without apical spur. Abdomen with a red belt.

Distribution : India : West Bengal (Calcutta and Darjiling); almost throughout the rest of the mainland. *Elsewhere* : Bhutan, Burma, China, Japan and Sri Lanka.

Remarks : This is a diurnal and rapid-flying moth that constitutes new locality record for West Bengal. It is common in both hills and plains, but not attracted by light. It is polyphagous on different species of plants, all belonging to Rubiaceae. It is also known as a sporadic defoliator of these plants.

Genus *Sataspes* Moore (1857)

27. *Sataspes infernalis* (Westwood, 1848)

S.i., f. infernalis (Westwood)

1848. *Sesia infernalis* Westwood, *Cab. Orient. Ent.*, p.61, pl. 30. fig.3.

1937. *Sataspes infernalis, f. infernalis* : Bell & Scott, *Fauna Brit. India*, Moths, 5 :253, fig. 65 A-C, pl.

Material examined : One ex., Darjiling... Old Colln.

Diagnosis : Wings bluish-black. Abdomen black, postero-ventro-laterally yellow. Thorax in female yellow.

Distribution : India : West Bengal (Darjiling); Assam; Sikkim; western and southern Peninsula. *Elsewhere*; Bangladesh, Bhutan Burma, China and Nepal.

Remarks : The moth, which is not rare in the foot-hill areas with heavy rainfall, constitutes new locality record for West Bengal. It is day-flying, resting with the wings held horizontally and closely mimicking the *Xylocopa*-bees. In flight, it emits a humming sound. Food-plant is *Dalbergia volubilis* (Leguminosae).

Subfamily PHILAMPELINAЕ

Tribe NEPHELINI

Key to the genera

1. Abdominal tergites with the first row of spines not longer than broad [Antennae with end-segment elongate; in male with fasciculate cilia]..... *Macroglossum* Scopoli
 Abdominal tergites with the first row of spines longer than broad 2
2. Antennae with end-segment elongate and filiform 3
 Antennae with end-segment short 6

3. Mid and hind tibial spurs with a comb of bristles *Nephele* Hübner
 Mid and hind tibial spurs without comb of bristles 4
4. Fore wing distal margin not even 5
 Fore wing distal margin even. Antennae with end-segment scaled *Deilephila* Laspeyres
5. Antennae with end-segment not scaled but with numerous long bristles *Panacra* Walker
 Antennae with end-segment scaled and without bristle *Acosmeryx* Boisduval
6. Eye and palpus large. First hind tarsal segment longer than tibia *Elibia* Walker
 Eye and palpus small. First hind tarsal segment not longer than tibia
 *Ampelophaga* Bremer & Grey

Genus *Deilephila* Laspeyres (1809)

28. *Deilephila nerii* (Linnaeus, 1758)

1758. *Sphinx nerii* Linnaeus, *Syst. nat.*, ed. 10 : 490.

1937. *Deilephila nerii* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 268, figs. 68 A-E, 69, pl.

Material examined : 2 exs., Calcutta , i. viii. 1960, 2.xii. 1972, Old Collns.

Diagnosis : Fore wing apical line pale and simple and subbasal band bright olive-green. Tegulae bright olive-green. Abdomen without subbasal belt above.

Distribution : India : West Bengal (Calcutta); throughout the rest of mainland. *Elsewhere* : Burma, Sri Lanka, Pakistan, the Ethiopian Region, West Asia and Europe.

Remarks : This is a common species, being African in origin and extending northwards into the Palaearctic Region. This is a beautiful moth, very often coming to light and settling with the abdomen bent upwards. It feeds at flowers shortly after dusk. The food-plants are *Ervatamia heyneana*, *Holarrhena antedysenterica*, *Nerium odorum*, *Tabernaemontana coronaria*, *Vinca rosea*, etc., all belonging to Apocynaceae. Moore (1865) recorded the species from Bengal as *Daphnis nerii*.

* 29. *Deilephila hypothous* (Cramer, 1780)

D.h. hypothous (Cramer)

1780. *Sphinx hypothous* Cramer, *Pap. Exot.*, 3:165, pl. 285, fig. D.

1937. *Deilephila hypothous hypothous* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 271, fig. 68 F-G, pl.

Distribution : India : West Bengal (Calcutta); Andaman Islands; Assam; Meghalaya; Sikkim; southern Peninsula. *Elsewhere* : Bhutan, Burma, Sri Lanka, Malaya and China.

Remarks : This is a rather rare moth occurring in dense jungle during the rainy season in the East Himalaya. It is attracted by light. The food-plants are the species of *Uncaria*, *Cinchona*, etc. The element was recorded from Calcutta by Moore (1867) and Cotes & Swinhoe (1887-'89).

Genus *Ampelophaga* Bremer & Grey (1852)

30. *Ampelophaga khasiana* Rothschild (1895)
A.k. *khasiana* Rothschild

1895. *Ampelophaga khasiana* Rothschild, *Nov. Zool.*, 2:482.

1937. *Ampelophaga khasiana khasiana* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 283, pls.

Material examined : One ex., Manibhanjan, one km. north of the Youth Hospital, c 2000 metres alt., "at light", Darjiling district, 19.v.1975, J.K. Jonathon and party coll.

Diagnosis : Antennae black at tip. Body deep reddish. Fore wing interspaces between bands glossy whitish-grey, discal band narrow and well defined, postdiscal line broad and not dentate.

Distribution : India : West Bengal (Darjiling); Sikkim; Meghalaya. *Elsewhere* : China.

Remarks : This is a rare species recorded new for West Bengal. It occurs in dense forests during the rainy season, usually near water. Food plants are *Vitis* sp. (Ampelidae) and *Saurauja nepalensis* (Ternstroemiaceae). Bell & Scott (1937) stated, "The moth has not been observed ... coming to light" but the specimen examined has been caught in light-trap.

Genus *Elibia* Walker (1856)

31. *Elibia dolichus* (Westwood, 1848)

1848. *Sphinx (Chaerocampa) dolichus* Westwood, *Cab. Orient. Ent.*, p. 61, pl. 30. fig.1.

1937. *Elibia dolichus* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 287, fig. 72 A-C.

Material examined : 3exs. Darjiling district, ..., Old Colln.; Rydak Forest, Jalpaiguri district, 8.ix.1975, D.K. Bhowmik and party coll.

Diagnosis : Fore wing with the thick light, dark-shaded double stripes extending from the apical portion to the inner margin and a black white-centred stigma at end-cell; hind wing black with a bright blue basal portion and light shades before the margin.

Distribution : India : West Bengal (Darjiling and Jalpaiguri); Assam; Meghalaya ; Sikkim. *Elsewhere* : Bangladesh, Bhutan and Sundaland to Palawan.

Remarks : This species, which is not rare in status, constitutes new locality record for West Bengal. Food-plants are unknown.

Genus *Acosmeryx* Boisduval (1875)32. *Acosmeryx naga* (Moore, 1857)

1857. *Philampelus naga* Moore, in Horsfield & Moore, *Cat. Lep. Ins. Mus. E.I.C.*, 1:271.

1937. *Acosmeryx naga* : Bell & Scott, *Fauna Brit. India*, Moths, 5:291, figs. 74 A-B, 75, pls.

Material examined : 2 exs., Darjiling district, ... vii.1912, *Car Michael* coll.

Diagnosis : Fore wing upperside with grey submarginal line straight, extending to 3A.

Distribution : India ; West Bengal (Darjiling); Sikkim; West Himalaya. *Elsewhere* : China and Japan.

Remarks : This is a common species which was described from Darjiling by Moore (1857) and subsequently recorded from Bengal (districts not cited) by him (1865). It occurs in hilly forests during the monsoon. Food-plants are *Vitis* (Ampelidae) and *Saurauja* (Ternstroemiaceae). The moth is not attracted by light.

33. *Acosmeryx anceus* (Moore, 1865), non Stoll*A.a. subdentata* Rothschild & Jordan

1903. *Acosmeryx anceus subdentata* Rothschild & Jordan, *Revision of Sphingidae*, p. 528.

1937. *Acosmeryx anceus subdentata* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 294, figs. 74 C-E, 75 A, pl.

Distribution : India : West Bengal (district not cited); Sikkim; southern Peninsula. *Elsewhere* : Bangladesh, Bhutan and Malay.

Remarks : This is a rare moth recorded earlier from Bengal by Moore (1865). It occurs in dense forests with heavy rainfall. It hardly visits blossoms, nor becomes attracted by light. The food-plants are *Vitis indica* and *Leea* sp. (Ampelidae).

Genus *Lepchina* Oberthür (1904)* 34. *Lepchina tridens* Oberthür (1904)

1904. *Lepchina tridens* Oberthür, *Bull. Soc. Ent. Fr.*, p. 76.

1937. *Lepchina tridens* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 299.

Distribution : India : West Bengal (Darjiling); Sikkim.

Remarks : Restricted to the East Himalaya, the species is hitherto known by male only, of which food-plant is also unknown. The moth reportedly looks like a stunted *Acosmeryx* and was described from Darjiling by Oberthür (1904). It is apparently rare in nature.

Genus *Panacra* (Walker 1856)* 35. *Panacra busiris* Walker (1856)
P. b. busiris Walker1856. *Panacra busiris* Walker, *Cat. Lep. Het. Brit. Mus.*, 8 : 158.1937. *Panacra busiris busiris* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 304.

Distribution : India West Bengal (district not cited); Andaman and Nicobar Islands; Meghalaya; Sikkim. *Elsewhere* : Bangladesh, Burma, China, Malaya and Vietnam.

Remarks : Moore (1865) recorded this moth from Bengal. Not much is known about its status, bionomics and food-plants. As to the diaposematic habit, Seitz (1929) stated, "When it rests, it keeps its snout and abdominal end pressed upon its resting-place, whilst the centre of the body remains raised in a high bend, the wings being steeply raised"

* 36. *Panacra moseri* Gehlen (1930)1930 *Panacra moseri* Gehlen, *Ent. Zeit. Fr.*, 44 : No. 9, 17, p. 130, figs. 1-2.1937. *Panacra moseri* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 306, fig. 77.

Distribution : India : West Bengal (Rungrong Valley. Darjiling); Assam.

Remarks : Bell & Scott (1937) recorded the species from Darjiling. The moth is hitherto known by male only. Status, bionomics and food-plant are unknown.

37. *Panacra perfecta* Butler (1875)1875. *Panacra perfecta* Butler, *Proc. zool. Soc. Lond.*, 1875 : 391.1937. *Panacra perfecta* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 312.

Material examined : One ex., Darjiling, Old Colln.

Diagnosis : Fore wing non-sinuate, submarginal double line underside extending to hind margin and not joined to discal line by brown-black streak; hind wing postdiscal area underside extending from costal to abdominal margin, being interrupted before middle.

Distribution : India : West Bengal (Darjiling); Sikkim. *Elsewhere* : Bhutan and Vietnam.

Remarks : The species, earlier treated as *Chaerocampa metallica* (non Butler) by Hampson (1892) and also Dudgeon (1898), was described from Darjiling by Butler (1875). The moth is very rare and known by only male. Bionomics and foodplant are unknown.

* 38. *Panacra mydon* Walker (1856)*P.m. mydon* Walker1856. *Panacra mydon* Walker, *Cat. Lep. Het. Brit. Mus.*, 8 : 155.1937. *Panacra mydon mydon* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 313, fig. 79, pls.

Distribution : India : West Bengal (Calcutta; Barrackpore, North 24-Parganas district); Assam; Meghalaya; Sikkim. *Elsewhere* : Bangladesh, Bhutan, Burma, Malaya, Philippines and Vietnam.

Remarks : The moth was earlier recorded from Calcutta and North 24-Parganas by Hampson (1892) and Butler (1877) respectively. Seitz (1929) stated the element as "the most common species of the genus", while Bell & Scott (1937) observed that the "eggs and larvae are common during the monsoon" in the Khasi Hills. Food-plants are *Amorphophallus* sp., *Arisaema curvatum*, *Caladium* sp., *Colocasia antiquorum*, etc., all belonging to Aroideae.

Genus *Nephele* Hübner (1822)

39. *Nephele didyma* (Fabricius, 1775)

N.d., f. didyma (Fabricius)

1775. *Sphinx didyma* Fabricius, *Syst. Ent.*, p. 543.

1937. *Nephele didyma, f. didyma* : Bell & Scott. *Fauna Brit. India, Moths*, 5 : 325, pl.

Material examined : One ex., Calcutta ..., Old Colln.

Diagnosis : Deep earth-brown with alternately light and dark transverse bands and paired discal silvery spots on fore wing.

Distribution : India : West Bengal (Calcutta); almost throughout the rest of mainland. *Elsewhere* : Burma, Malaya, Nepal, Pakistan and Sri Lanka.

Remarks : Reportedly very common specially in the plains, the moth constitutes new locality record for West Bengal. It rests with the wings held horizontally and the tip of abdomen upturned. The flight is rapid and the moth comes to blossoms before dark, being also attracted by light. Food-plants are *Carissa carandas* and allied members of Apocynaceae.

Genus *Gurelca* Kirby (1880)

40. *Gurelca hyas* (Walker, 1856)

G.h. hyas (Walker)

1856. *Lophura hyas* Walker, *Cat. Lep. Het. Brit. Mus.*, 8 : 107.

1937. *Gurelca hyas hyas* : Bell & Scott, *Fauna Brit. India, Moths*, 5:331, fig: 85 A-C, pls.

Distribution : India : West Bengal (Darjiling); almost throughout the rest of mainland. *Elsewhere* : Bangladesh, Bhutan, Burma, China, Malaya and Philippines.

Remarks : The moth, which is common in the East Himalaya during monsoon, was earlier recorded from Darjiling by Walker (1866) as *Perigonia macroglossoides* and also from uncited district of Bengal by Moore (1865). Food-plant is *Paederia foetida* (Rubiaceae).

Genus *Eurypteryx* Felder (1874)

- * 41. *Eurypteryx bhaga* (Moore, 1865)
E.b. bhaga (Moore)

1865. *Darapsa bhaga* Moore, *Proc. zool. Soc. Lond.*, 1865 : 794.

1937. *Eurypteryx bhaga bhaga* ; Bell & Scott, *Fauna Brit. India, Moths*, 5 : 342, fig. 88 A-D.

Distribution : India : West Bengal (district not cited); Meghalaya; Sikkim. *Elsewhere* : Bhutan and Malaya.

Remarks : This rare moth was described from North Bengal by Moore (1865) and subsequently recorded there form by Hampson (1892). Bionomics and food-plant are unknown.

Genus *Macroglossum* Scopoli (1777)

key to the species

1. Hind wing distal border ill-defined 2
 Hind wing distal border well-defined with brownish-black and black marginal band reaching anal angle; fore wing discal lines distinct and median interspace broad and greyish
*pyrrhosticta* (Butler)
2. Hind wing without yellow band. Fifth abdominal segment without side-patch. Fore wing antemedial band not filled in with black *gyrans* (Walker)
 Hind wing with yellow band. Fifth abdominal segment with dark side-patch. Fore wing with brown postdiscal band R1-R4 prominent*assimilis* Swainson

42. *Macroglossum gyrans* (Walker, 1856)

1856. *Macroglossa gyrans* Walker, *Cat. Lep. Het. Brit. Mus.*, 8 : 91.

1937. *Mcrogolossium gyrans* : Bell & Scott, *Fauna Britt. India, Moths*, 5 : 356, fig. 90 E-F.

Material examined : One ex., Ajodhya, Bankura district, 25.iv. 1985, T.R. Mitra and party coll.

Diagnosis : Vide key.

Distribution : India : West Bengal (Bankura) : Orissa; Assam; West Himalaya; northern, western and southern Peninsula. *Elsewhere* : Burma, Sri Lanka, Pakistan, Malaya and Papuasias.

Remarks : This species, which is common in open upland country with scanty rainfall but rare in low forest country, constitutes new locality record for West Bengal. The moth is attracted by light. The food-plants are *Morinda tinctoria* and *M. citrifolia* (Rubiaceae).

* 43. *Macroglossum belis* (Linnaeus, 1758)

1758. *Sphinx belis* Linnaeus, *Syst. Nat.*, ed. 10:493.

1937. *Macroglossum belis* : Bell & Scott, *Fauna Brit. India*, Moths, 5:365, fig. 94, pl.

Distribution : India : West Bengal (Darjiling); Assam; Gujarat; Madhya Pradesh; Maharashtra; Sikkim; southern Peninsula; Uttar Pradesh. *Elsewhere* : Bangladesh, Bhutan, China, Pakistan, Sri Lanka and also Japan.

Remarks : The species, which is common in both forest and open countries, independent of rainfall, was recorded as *Macroglossa opis* from Darjiling by Boisduval (1875). The food-plants, are *Strychnos nux-vomica* (Loganiaceae) and other plants of Rubiaceae.

44. *Macroglossum assimilis* Swainson(1821)

1821. *Macroglossum assimilis* Swainson, *Zool. Illustr.*, pl. 64.

1937. *Macroglossum assimilis* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 368, fig.90, K-L, pl.

Material examined : One ex., Calcutta, Old Colln.

Diagnosis : Vide key.

Distribution : India : West Bengal (Calcutta); southern Peninsula. *Elsewhere* : Sri Lanka and Java.

Remarks : Reportedly common in forests and open countries, the species constitutes new locality record for West Bengal. The food-plant is *Memecylon edule* (Melastomaceae).

45.. *Macroglossum pyrrhosticta* (Butler, 1875)

M.p. pyrrhosticta (Butler)

1875. *Macroglossa pyrrhosticta* Butler, *Proc. zool. Soc. Lond.*, 1875 : 242, Pl. 36, fig. 8.

1937. *Macroglossum pyrrhosticta pyrrhosticta* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 370, figs, 90 M-N, 95, pls.

Material examined : One ex., Darjiling, ..., Old Colln.

Diagnosis : Vide key.

Distribution : India : West Bengal (Darjiling); Assam; Meghalaya; Sikkim; southern Peninsula. *Elsewhere* : Bangladesh, Bhutan, China, Japan, Nepal and Malaya.

Remarks : Reportedly common in forest areas with heavy rainfall, the moth was earlier recorded from Darjiling by Cotes & Swinhoe (1887-'89) as *Macroglossa gilia*. Only *Paederia foetida* (Rubiaceae) is known as the Indian food-plant for the moth.

* 46. *Macroglossum troglodytus* (Boisduval, 1875)

1875. *Macroglossa troglodytus* Boisduval, *Spec. Gén. Léop. Het.*, 1 : 344.

1937. *Macroglossum troglodytus* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 372, figs. 90 O-P. 96, pl.

Distribution : India : West Bengal (Darjiling); Assam; Meghalaya; Southern Peninsula.
Elsewhere : China, Java and Sri Lanka.

Remarks : The species is very common from May to September in forest areas at an altitude of c 1800 metres. It is frequently on the wing in the morning and evening. It was described from Darjiling by Boisduval (1875). The food-plants are *Hedyotis uncinella* and *H. scandens* (Rubiaceae).

* 47. *Macroglossum glaucoptera* (Butler, 1875)

1875. *Macroglossa glaucoptera* Butler, *Proc. zool. Soc. Lond.*, 1875 : 241, pl. 36, fig. 9.

1937. *Macroglossum glaucoptera* : Bell & Scott, *Fauna Brit. India*, Moths, 5:385, fig. 91 C-E.

Distribution : India : West Bengal (Calcutta). *Elsewhere* : Sri Lanka, Sundaland and Western Malaysia.

Remarks : This very rare moth, showing minor sexual dimorphism, was earlier recorded from Calcutta by Butler (1877 A) as *Macroglossa lepsa*. Bionomics and food-plant are unknown.

* 48. *Macroglossum aquila* (Boisduval, 1875)

1875. *Macroglossa aquila* Boisduval, *Spec. Gén. Léop. Het.*, 1:340.

1937. *Macroglossum aquila* : Bell & Scott., *Fauna Brit. India*, Moths, 5 : 386, fig. 91 H-I.

Distribution : India : West Bengal (Darjiling); Sikkim. *Elsewhere* : Borneo, Indo-China, Malacca and Philippines.

Remarks : This is a rare moth, being earlier recorded from Darjiling by Butler (1875) as *Macroglossa interrupta*. Bionomics and food-plants are unknown.

Subfamily CHOEROCAMPINAE

Key to the genera

1. Proboscis basally exposed; 2nd segment of palpus not contiguous 2
- Proboscis basally not exposed; 2nd segment of palpus contiguous 3
2. Second segment of palpus narrower than 1st and ventrally naked
..... *Cechenena* Roths. & Jordan
- Second segment of palpus not narrower than 1st *Rhagastis* Roths. & Jordan

3. First segment of palpus apically and ventrally scaled densely and regularly4
 First segment of palpus apically and ventrally scaled thinly and irregularly [Palpus rough, with long dispersed hairs] *Pergesa* Walker
4. Second segment of palpus apico-ventrally tufted with scales5
 Second segment of palpus without such scales *Hippotion* Hübner
5. First segment of palpus with scales longest distally *Rhyncholoba* Roths. & Jordan
 First segment of palpus with scales longest proximally *Theretra* Hübner

Genus *Pergesa* Walker (1856)

49. *Pergesa elpenor* (Linnaeus, 1746)
P. e. rivularis (Boisduval)

1875. *Choerocampa éivularis* Boisduval, *Spec. Gén. Lép. Het.*, 1 : 280.

1937. *Pergesa elpenor rivularis* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 41.

Material examined : 2 exs., Kalna, Barddhaman district, 9.ix.1986, K. K. Ray & party coll.

Diagnosis : Fore wing marginal band broad, with 20 oblique red bands and cilia red; hind wing marginal area red shaded with cinnamon and cilia white.

Distribution : India : West Bengal (Barddhaman and Darjiling); Himachal Pradesh; Jammu and Kashmir; Meghalaya; Sikkim; Uttar Pradesh. *Elsewhere* : Pakistan.

Remarks : The moth, which is common from April to October in the hilly country, was described from Darjiling by Boisduval (1875) and is now recorded from Barddhaman. It is known to feed at flowers after dusk and enter lighted bungalows at night. It is very beautiful in colour and shape, being very much allied to the Elephant Hawk Moth, *P.e. elpenor* (Linn.) from England. The food-plant is *Arisaema curvatum* (Aroideae).

Genus *Hippotion* Hübner (1822)

Key to the species

Hind wing base and anal angle bright pink, disc and veins black, outer area ochreous brown with a black submarginal line... *celerio* (Linnaeus)

Hind wing red, with a clay subanal patch. First segment of palpus without white lateral line close to eye... *boerhaviae* (Fabricius)

* 50. *Hippotion velox* (Fabricius, 1793)

1793. *Sphinx velox* Fabricius, *Ent. Syst.*, 3(i) : 378.

1937. *Hippotion velox* : Bell & Scott, *Fauna Brit. India*, Moths, 5, 415, figs. 105 A-D, 106.

Distribution : India : West Bengal (district not cited); Andaman Island; East Himalaya; southern and western Peninsula. *Elsewhere* : Australo-Oriental Region from Burma, Sri Lanka to Fiji through Sundaland, Moluccus, Philippines and Papua.

Remarks : This widely distributed but locally common species was earlier recorded from Bengal by Moore (1865). It visits flowers after dark, but is not attracted by light. The food-plants are *Pisonia morindifolia* and *P. aculeata* (Nyctaginaceae). Seitz (1929) stated that in North India the moth does not reach the Palaearctic frontier and that its variability, however, has not led to geographically founded forms or subspecies.

51. *Hippotion celerio* (Linnaeus, 1758)

1758. *Sphinx celerio* Linnaeus, *Syst. Nat.*, ed. 10:491.

1937. *Hippotion celerio* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 417, fig. 107, pls.

Material examined : One ex., Murshidabad district, ... Old Colln.

Diagnosis : *Vide* key.

Distribution : India : West Bengal (Murshidabad); Sikkim; West Himalaya; northern, southern and western Peninsula. *Elsewhere* : Whole Eastern Hemisphere except in the far North and Papua; also in Europe.

Remarks : This very common and widely spread species, which was earlier recorded from Bengal (district not cited) by Moore (1865) and now from Murshidabad, occurs in forest country with heavy rainfall. It flies very swiftly, visits flowers and is also attracted by light. It is polyphagous on plants belonging to Ampelidae, Aroideae, Nyctaginaceae, Polygonaceae, Rubiaceae, etc. Jordan (1912) stated that the moth is on the wing in the tropics almost throughout the year. It may also be noted that like the preceding species, this element, too, forms nowhere subspecies inspite of its wide range of facial variations, mostly unstable, and also of distribution.

52. *Hippotion boerhaviae* (Fabricius, 1775)

1775. *Sphinx boerhaviae* Fabricius, *Syst. Ent.*, p. 542.

1937. *Hippotion boerhaviae* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 424, figs. 105 J-K, 109, pl.

Material examined : 4 exs., Chandrapur Forest, Birbhum district, 9.xi.1974, A.K. Hazra and party coll.; Calcutta, ... Old Colln.; Mohanadi Goomti Tea Factory Premises, Darjiling district, 28.iv.1971, A.R. Bhowmick and party coll.

Diagnosis : *Vide* key.

Distribution : India : West Bengal (Birbhum, Calcutta and Darjiling); Andhra Pradesh; Gujarat; Madhya Pradesh; Maharashtra; Orissa; Sikkim; southern Peninsula; West Himalaya. *Elsewhere* : Pakistan, Bhutan, Malaya, Philippines, South China and Sri Lanka.

Remarks : The species, which is common in open country, constitutes new locality record for West Bengal. It is readily attracted by light and often visits flowers before dark. The food-plants belong to Geraniaceae, Nyctaginaceae, Rubiaceae, Scrophulariaceae, etc.

Genus *Theretra* Hübner (1822)

Key to the species

1. Hind wing red [First segment of abdomen with black side-patch. Hind wing unicolourous except for the marginal band].. *alecto* (Linnaeus)
Hind wing dusky... 2
2. Very large. Thorax and abdomen green, latter with sides golden. Fore wing costa green
..... *nessus* (Drury)
Never so large. Thorax and abdomen not green. Fore wing costa not green... 3
3. First segment of abdomen with black side-patch [Fore wing with apical line joining a discal line with which it forms a single line running from tip to inner margin]... *clotho* (Drury)
Abdomen without black side patch... 4
4. Abdomen without dorsal line. Fore wing with 6 discal lines... *latreillei lucasi*
(Walker)
Abdomen with dorsal line or lines... 5
5. Abdomen with a single white dorsal line... *pinastrina* (Martyn)
Abdomen with double white dorsal lines [Fore wing discal band black-brown and made of 3 lines, the last heavier than the 2nd. Abdomen with ochraceous lateral stripe].....
..... *oldenlandiae* (Fabricius)

53. *Theretra nessus* (Drury, 1773)

1773. *Sphinx nessus* Drury, *Illustr. Exot. Ins.*, 2:46, pl. 76, fig. 1.

1937. *Theretra nessus* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 430, figs. 110 A-B, 111, pl.

Material examined : 2 exs, Calcutta,, 1922, Old Colln.

Diagnosis : Vide key.

Distribution : India : West Bengal (Calcutta); East and West Himalaya; southern and western Peninsula; Andaman Island. *Elsewhere* : Aden, Australia, Bangladesh, Bhutan, Burma, Hong Kong, Japan, Malay, Pakistan, Papuasias and Sri Lanka.

Remarks : This is a locally common species, preferring hills and forest areas with heavy rainfall to open dry countries. It is widely distributed but not split up into subspecies. The moth is very shy and the food-plants belong to Aroidae, Convolvulaceae, Dioscoreaceae, Leguminosae and Myrtaceae.

54. *Theretra clotho* (Drury, 1773)

T.c. clotho (Drury)

1773. *Sphinx clotho* Drury, *Illustr. Exot. Ins.*, 2 : 48, pl. 28, fig. 1.

1937. *Theretra clotho clotho* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 434, figs. 110 C, 112, pls.

Material examined : 3 exs., Calcutta,.....1936; Darjiling district, ..., Old Collns.; Haldia Bhavan. Medinipur district, 3.iii. 1984, K K Ray & party coll.

Diagnosis : Fore wing with the discal spot distinct and the last oblique stripe faint; hind wing anal spots light yellow.

Distribution : India : West Bengal (Calcutta, Darjiling and Medinipur); almost throughout the mainland except the North-West Himalaya; Andaman Islands. *Elsewhere* : Bhutan, Burma, China, Malaya, the Philippines and Sri Lanka.

Remarks : This is a common moth in areas of medium to heavy rainfall, being earlier recorded from Bengal by Moore (1865). It is a rapid and powerful flier, being occasionally attracted by light and often visiting flowers at dusk. The food plants belong to Ampelidae, Aroidae, Dilleniaceae, Malvaceae and Onagraceae. Hampson (1892) treated this moth as *Chaerocampa butus* (non Cramer).

55. *Theretra latreillei* Mc Leay (1827)

T.l. lucasi (Walker)

1856. *Chaerocampa lucasi* Walker, *Cat. Lep. Het. Brit. Mus.*, 8 : 141.

1937. *Theretra latreillei lucasi* : Bell & Scott, *Fauna Brit. India* Moths, 5 : 438, fig. 110 D-G. pl.

Material examined : 2 exs., Darjiling, v. 1912 ; Murshidabad district,Old Collns.

Diagnosis : Vide key.

Distribution : India : West Bengal (Darjiling and Murshidabad); East Himalaya; almost throughout the Peninsula; Andaman Islands. *Elsewhere* : Bangladesh, Burma, Malaya, Philippines and Sri Lanka.

Remarks : This locally common moth was earlier recorded from Bengal by Moore (1865). The moth feeds before dark and frequently comes to light. The food-plants belong to Ampelidae, Begoniaceae, Geraniaceae, Lythraceae and Ternstroemiaceae.

56. *Theretra alecto* (Linnaeus, 1758)

T. a. alecto (Linnaeus)

1758. *Sphinx alecto* Linnaeus, *Syst. Nat.*, ed. 10 : 492.

1937. *Theretra alecto alecto* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 440, figs. 110 H, 113, pls.

Material examined : 2 exs., Calcutta ; Murshidabad, Old Collns.

Diagnosis : Fore wing deep brown, with distinct red tone; hind wing bright red.

Distribution : India : West Bengal (Calcutta, Darjiling and Murshidabad); East and West Himalaya; almost throughout the Peninsula. *Elsewhere* : Afghanistan, Bhutan, Burma, Java, Key Islands, Malaya, Pakistan, Sulawesi and Taiwan.

Remarks : Seitz (1929) stated, "The imagines swarm in the evening between 6 and 7 p.m. on blossoms and also come to the light; they are common nearly everywhere in their patria" The food plants belong to Ampelidae, Dilleniaceae, Rubiaceae and Ternstroemiaceae. The moth was earlier recorded from Darjiling and elsewhere of Bengal by Moore (1857, 1865).

* 57. *Theretra lycetus* (Cramer, 1775)

1775. *Sphinx lycetus* Cramer, *Pap. Exot.*, 1 : 96, pl. 61, fig. D.

1937. *Theretra lycetus* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 445, fig. 110 I-J, pl.

Distribution : India : West Bengal (district not cited); East and West Himalaya; eastern, northern and southern Peninsula. *Elsewhere* : Burma and Sri Lanka, eastwards to Java.

Remarks : The species, which is fairly common in areas of heavy rainfall during monsoon, was described from Bengal by Cramer (1775). Food-plants are *Dillenia pentagyna* (Dilleniaceae), *Vitis* and *Leea* spp. (Ampelidae).

58. *Theretra oldenlandiae* (Fabricius, 1775)

T. o. oldenlandiae (Fabricius)

1775. *Sphinx oldenlandiae* Fabricius, *Syst. Ent.*, 542.

1937. *Theretra oldenlandiae oldenlandiae* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 448, fig. 115, pl.

Material examined : 3 exs., Susunia, Bankura district, "at light", 25.ix.1981, H.K. Bhowmik & party coll; Calcutta., 28.viii.1927, Old Collns.

Diagnosis : Vide key.

Distribution : India : West Bengal (Bankura and Calcutta); East and West Himalaya; almost throughout the Peninsula. *Elsewhere* : Bhutan, Burma to Japan and Papua; also Pakistan and Sri Lanka.

Remarks : The moth is common in the plains and often caught while feeding at flowers and is also attracted by light. The food-plants belong to Ampelidae, Aroidae, Convolvulaceae, Geraniaceae, Myrtaceae, Onagraceae, Rubiaceae and Tiliaceae. The element was recorded from Calcutta by Cotes & Swinhoe (1887-'89).

59. *Theretra pinastrina* (Martyn, 1797)

T. P. pinastrina (Martyn)

1797. *Sphinx pinastrina* Martyn, *Psyche*, pl. 29, fig. 81, pl. 30, fig. 85.

1937. *Theretra pinastrina pinastrina* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 451, pl.

Material examined : 10 exs., Patrasayar, Bishnupur, 28.vii.1986, R.P. Mukherjee and party coll., Susunia, district Bankura, 25.ix.1981, H. K. Bhowmik and party coll.; Kalna, 9.ix.1986, University Campus, district Bardhaman, 5.ix.1986, K.K. Ray and party coll; Calcutta, 9.iv.1915, ... Old Collns.

Diagnosis : Fore wing with space between 4th and 5th lines broad and line 5 thicker than 6.

Distribution : India : West Bengal (Bankura, Bardhaman and Calcutta); East Himalaya; southern Peninsula. *Elsewhere* : Burma to Japan and Malaya; Also Sri Lanka.

Remarks : The moth is very common in open country with moderate rainfall. Earlier recorded from Bengal by Moore (1865), it is known to feed at flowers after dark, but not known whether it comes to light. Food-plants are aurums of various species (Aroide), *Boerhavia* sp. (Nyctaginaceae) and *Jussiae repens* (Onagraceae).

Genus *Rhyncholaba* Rothschild & Jordan (1903)

60. *Rhyncholaba acteus* (Cramer, 1779)

1779. *Sphinx acteus* Cramer, *Pap. Exot.*, 3 : 93, pl. 248A.

1937. *Rhyncholaba acteus* : Bell & Scott, *Fauna Brit. India.*, Moths, 5 : 462, fig. 119, pls.

Material examined : 6 exs., Kalna, Bardhaman district, 9.ix.1986, K. K. Ray and party coll; Calcutta, 8.vii. 1923, Old Collns.

Diagnosis : Head, thorax and abdomen purplish grey, vertex of head and dorso-lateral stripes on thorax and abdomen green. Fore wing with a green oblique discal area from below apex to inner margin; hind wing fuscous with anal patch and submarginal band ochreous.

Distribution : India : West Bengal (Bardhaman and Calcutta); East and West Himalaya; almost throughout the Peninsula. *Elsewhere* : Bhutan, Burma to Moluccas; also South China and Sri Lanka.

Remarks : This is a very common species being found both in forests and open countries. It feeds at flowers at dusk and is attracted by light. Food-plants belong to Ampelideae, Aroidae, Begoniaceae and Commelinaceae. The moth was earlier recorded from Bengal by Moore (1865).

Genus *Rhagastis* Rothschild & Jordan (1903)

Key to the species

1. Fore wing with a single series of sharply defined white submarginal lunules [Metanotum with a reddish-tawny lateral spot]..... *lunata* (Rothschild)
Fore wing markings otherwise..... 2
2. Fore wing with a series of white submarginal spots, preceded by a straight white line from apex to M_2 and by a lunate line between M_3 and (3A)... *olivacea* (Moore)
Fore wing without white submarginal scaling, but with brown marginal band joined to basal area between M_2 and M_3 , costal half of cell reddish and costal edge creamy
..... *confusa* Rothschild & Jordan

* 61. *Rhagastis velata* (Walker, 1866)

1866. *Pergesa velata* Walker, *Cat. Lep. Het. Brit. Mus.*, 35 : 1853.

1937. *Rhagastis velata* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 467, figs. 120 A, 121, pl.

Distribution : India : West Bengal (Darjiling); Meghalaya; Sikkim. *Elsewhere* : Bhutan.

Remarks : The species, which is hitherto confined to the East Himalaya up to c 1500 metres, was described from Darjiling by Walker (1866). Multivoltine and common in status, the moth prefers well-wooded areas during May-September. It visits flowers after dark but is unknown about the attraction to light. Food-plants are *Amorphophallus* and *Arisaema* spp. (Aroidae).

62. *Rhagastis confusa* Rothschild & Jordan (1903)

1903. *Rhagastis confusa* Rothschild & Jordan, *Revision of Sphingidae*, p.795, pl. 14, fig. 12.

1937. *Rhagastis confusa* : Bell & Scott, *Fauna Brit. India*, Moths, 5:473, fig. 120 D, pls.

Material examined : 3 exs., Hima Falls, Ghoom Bhanjan, c 2200 metres, 26.v.1971, A.R. Bhowmik and party coll.,, Darjiling district, Old Collns.

Diagnosis : Vide key.

Distribution : India : West Bengal (Darjiling); Meghalaya; Sikkim; Uttar Pradesh.

Remarks : This is a rare species being found in densely wooded areas with heavy rainfall. The

food-plant is *Vitis* sp. (Ampelideae). The moth constitutes new locality record for West Bengal.

63. *Rhagastis lunata* (Rothschild, 1900)
R.l.lunata (Rothschild)

1900. *Chaerocampa lunata* Rothschild, *Nov. Zool.*, 7:274.

1937. *Rhagastis lunata lunata* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 475, fig. 120E.

Material examined : One ex., Darjiling district, ... Old Colln.

Diagnosis : *Vide Key*.

Distribution : India : West Bengal (Darjiling); Meghalaya.

Remarks : Hitherto restricted in the Khasi Hills of Meghalaya, this rare moth is known only by male and constitutes new locality record for West Bengal. Bionomics and food-plant are unknown.

64. *Rhagastis olivacea* (Moore, 1872)

1872. *Pergesa olivacea* Moore, *Proc. zool. Soc. Lond.*, 1872 : 566.

1937. *Rhagastis olivacea* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 475, figs. 120 F, 122, pls.

Material examined : One ex., Darjiling district, Old Colln.

Diagnosis : *Vide key*.

Distribution : India : West Bengal (Darjiling); Himachal Pradesh; Meghalaya; Sikkim. *Elsewhere* : Bangladesh, Bhutan, Burma and South China.

Remarks : The species, which is reportedly multivoltine and common at an altitude of c 1500-2000 metres in forests with heavy rainfall, is a new record for West Bengal. The food-plants belong to *Impatiens* sp. (Geraniaceae) and also other species of Aroideae.

* 65. *Rhagastis gloriosa* (Butler, 1875)

1875. *Pergesa gloriosa* Butler, *Proc. zool. Soc. Lond.*, 1875 : 246.

1937. *Rhagastis gloriosa* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 478.

Distribution : India : West Bengal (Darjiling); Meghalaya; Sikkim. *Elsewhere* : Bhutan.

Remarks : This rare species was described from Darjiling by Butler (1875). Bionomics and food-plant are unknown. It is hitherto restricted to the East Himalaya.

Genus *Cechenena* Rothschild & Jordan (1903)

Key to the species

Mesonotum without mesial band. Fore wing oblique brown, with seven lines, of which the submarginal one is very faint... *minor* (Butler)

Mesonotum with a pale mesial band. Fore wing green, with nine lines... *lineosa* (Walker)

66. *Cechenena minor* (Butler, 1875)*C. m. minor* (Butler)

1875. *Chaerocampa minor* Butler, *Proc. zool. Soc. Lond.*, 1875 : 249.

1937. *Cechenena minor minor* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 487, fig. 123 I-K.

Material examined : One ex., Darjiling district ... vii. 1912, Old Colln.

Diagnosis : Vide Key.

Distribution : India : West Bengal (Darjiling); Himachal Pradesh; Meghalaya; Sikkim; Uttar Pradesh. *Elsewhere* : Bhutan to China, Japan and Western Malaysia.

Remarks : This is a rare species constituting new locality record for West Bengal. The moth is a rapid flier, visiting flowers after dusk and is attracted by light. Food-plants belong to Ampelideae, Aroideae and Ternstroemiaceae.

67. *Cechenena lineosa* (Walker, 1856)*C.l. lineosa* (Walker)

1856. *Chaerocampa lineosa* Walker, *Cat. Lep. Het. Brit. Mus.*, 8:144.

1937. *Cechenena lineosa lineosa* : Bell & Scott, *Fauna Brit. India*, Moths, 5:490, figs. 123 L-O, 124, pl.

Material examined : 2 exs., Darjiling district. ..., Old Colln.

Diagnosis : Vide Key.

Distribution : India : West Bengal (Darjiling); Meghalaya; Sikkim. *Elsewhere* : Bangladesh, Bhutan to Malaya and South China.

Remarks : This is a fairly common moth showing habits of the preceding subspecies. Food-plants belong to Ampelideae, Geraniaceae, Polygonaceae and Ternstroemiaceae. The element was earlier recorded from Darjiling and elsewhere of Bengal by Moore (1857, 1865) and Butler (1875).

Family II. LASIOCAMPIDAE

Key to the genera

1. Antennae in male with pectinations long, decreasing gradually towards apex. Fore wing M1 on a short stalk with R₅ 2
 Antennae in male with pectinations long in basal half, decreasing abruptly towards apex. Fore wing M1 on a long stalk with R_{4,5} 4
2. Antennae in both sexes with pectinations strongly developed. Palpi short, with end-segment minute. Hind wing cell open *Trabala* Walker
 Antennae in male with pectinations long, in female considerably short. Palpi long, with end-segment prominent. Both wings cell closed 3
3. Fore wing broad, with apex rectangular, R4 shortly stalked with R2-R3, M2 and M3 arising separately from lower angle of cell; hind wing M1 not stalked with M2, precostal cell broad and without accessory veinlet *Metanastria* Hübner
 Fore wing elongate, with apex rounded, R4 not stalked with R2-R3, M2 and M3 arising together from lower angle of cell; hind wing M1 shortly stalked with M2, precostal cell narrow and with two short accessory veinlets *Dendrolimus* Germar
4. Antennae in female not dentate. Mid- and hind tibiae with end-spurs present *Taragama* Moore
 Antennae in female dentate. Mid- and hind tibiae with end-spurs absent *Suana* Walker

Genus *Gastropacha* Ochseneimer (1810)

* 68. *Gastropacha divaricata* Moore (1884)

1884. *Gastropacha divaricata* Moore, *Trans. ent. Soc. Lond.*, 3 : 374.

1936. *Gastropacha divaricata* : Collier, *Lep. Cat.*, 73:10.

Distribution : India : West Bengal (Darjiling).

Remarks : Endemic in the Darjiling district, the moth of this rather typically Palaearctic genus is actually a stranger in the area. It was described by female from the district by Moore (1884). Bionomics and food-plants are unknown.

Genus *Stenophylloides* Hampson (1892)

* 69. *Stenophylloides sikkima* (Moore, 1879)

1879. *Gastropacha sikkima* Moore, *Descr. New Indian Lep. Ins. Coll. Atkinson*, 1:75.

1936. *Stenophylloides sikkima* : Collier, *Lep., Cat.* 73:36.

Distribution : India : West Bengal (Darjiling).

* 70. *Stenophylloides sinuata* (Moore, 1879)

1879. *Gastropacha sinuata* Moore, *Descr. New Indian Lep. Ins. Coll. Atkinson*, 1 : 76.

1936. *Stenophylloides sinuata* : Collier, *Lep. Cat.*, 73 : 36.

Distribution : India : West Bengal (Darjiling).

Remarks : This and the preceding species, for both of which status, bionomics and food-plants are unknown, were described from Darjiling by Moore (1879). Both the species are apparently endemic in this district of West Bengal.

Genus *Crinocraspeda* Hampson (1892)

* 71. *Crinocraspeda torrida* (Moore, 1879)

1879. *Gastropacha torrida* Moore, *Descr. new Indian Lep. Ins. Coll. Atkinson*, 1:76, pl. 3, fig. 19.

1936. *Crinocraspeda torrida* : Collier, *Lep. Cat.*, 73:155.

Distribution : India : West Bengal (Darjiling) ; Manipur; Meghalaya; Sikkim.

Remarks : Described by male from Darjiling by Moore(1879), the species is hitherto restricted to the East Himalaya. Status, bionomics and food plant are unknown.

Genus *Kosala* Moore (1879)

* 72. *Kosala flavosignata* (Moore, 1879)

1879. *Eutricha flavosignata* Moore, *Descr. new Indian lep. Ins. Coll. Atkinson*, 1:77, pl. 3, fig. 17.

1936. *Kosala flavosignata* : Collier, *Lep. Cat.*, 73:195.

Distribution : India : West Bengal (Darjiling).

Remarks : Moore (1879) described this species by male only from Darjiling where it is endemic. Habits, etc., are unknown.

Genus *Trabala* Walker (1856)

73. *Trabala vishnou* (Lefebvre, 1827)

1827. *Gastropacha vishnou* Lefebvre, *Zool. J.*, 3 : 207.

1936. *Trabala vishnou* : Collier, *Lep. Cat.*, 73:197.

Material examined : 5 exs., Jangal Mahal, 5 kms. west of Joypur Forest Rest House, Bankura district, 22, xii. 1985, D.K. Mandal and party coll.; Eden Gardens, Calcutta, 23.x.1959, 6.xii. 1960,

6.v.1987, H.N. Singh & R.K. Kulin coll., reared in Z.S.I. Laboratory, 16.ix.1961, R.K. Varshney.

Diagnosis : Sexually dimorphic : male light apple-green, fore wing costa and transverse oblique band light brown and cilia dark brown; female much larger than the male, yellowish green fading to ochreous, fore wing with a large sharp discal spot and an extended inner marginal reddish brown spot with darker edges.

Distribution : India : West Bengal (Bankura, Calcutta and Jalpaiguri); throughout the mainland and also Andaman Islands. *Elsewhere :* Bangladesh, Bhutan, Burma, China, Sri Lanka and Sundaland.

Remarks : The species, which is very common and highly variable in facies, was earlier recorded by Moore (1865) from Mahananda of the Jalpaiguri district and also by de Niceville (1889-94) from Calcutta. The female does not fly much, but the male is more active showing unsteady and clumsy flight over bushes and meadows at day time. The moth is multivoltine and polyphagous in habit.

Genus *Metanastria* Hübner (1816-'27)

* 74. *Metanastria lidderdalii* (Butler, 1881)

1881. *Lebeda lidderdalii* Butler, III. *Typ. Spec. Lep. Het. Brit. Mus.*, 5:73, pl. 100, figs. 1,2.

1936. *Metanastria lidderdalii* : Collier *Lep. Cat.*, 73 : 298.

Distribution : India : West Bengal (Darjiling); Sikkim. *Elsewhere :* Bhutan.

Remarks : This species, which was earlier mentioned from Darjiling by Grünberg (1923) and Collier (1936), is represented by the form *Stigmata* Butler (1881) from Darjiling and Sikkim. The moth is common, polyphagous and possibly the largest amongst the Indian lasiocampids.

* 75. *Metanastria lineata* (Moore, 1879)

1879. *Lebeda lineata* Moore, *Descr. new Indian Lep. Ins. Coll. Atkinson*, 1 : 81.

1936. *Metanastria lineata* : Collier, *Lep. Cat.*, 73 : 298.

Distribution : India : West Bengal (Darjiling).

Remarks : Hitherto remaining endemic in Darjiling, the species was mentioned from this district by Grünberg (1923) and Collier (1936). Status and habits are rather not known specifically.

* 76. *Metanastria obliquifascia* Swinhoe (1892)

1892. *Metanastria obliquifascia* Swinhoe, *Cat. E. & Austral. Lep. Het.*, 1 : 263.

1936. *Metanastria obliquifascia* : Collier, *Lep. Cat.*, 73: 298.

Distribution : India : West Bengal (Darjiling).

Remarks : As for the preceding species.

Genus *Taragama* Moore (1859)

Key to the species

Fore wing deep red-brown, with a white basal spot and oblique postmedial band; hind wing red-brown, in male with a white postmedian spot, in female with a white band. Abdomen red-brown, with narrow grey rings *dorsalis* (Walker)

Fore wing grey, with a red-brown basal spot ringed white and irregular postmedian line; hind wing white, in male with a slight fuscous suffusion on outer area and a dark patch near anal angle, in female with a reddish tinge on outer area. Abdomen white. *siva* (Lefebvre)

77. *Taragama dorsalis* (Walker, 1866)

1866. *Megasoma dorsalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 35:1947.

1936. *Taragama dorsalis* : Collier, *Lep. Cat.*, 73 : 307.

Material examined : One ex., Murshidabad district, Old Colln.

Diagnosis : Vide key.

Distribution : India : West Bengal (Calcutta and Murshidabad); North-West Himalaya; almost throughout the Peninsula. *Elsewhere* : Philippines, Sri Lanka and Sundaland.

Remarks : The species, which was earlier mentioned from Calcutta by Hampson (1892), occurs in the tropical Oriental belts, but also extends into the Palaearctic counterparts of the N.W. Himalaya. On the basis of the material data, the moth seems to have a poor status in West Bengal.

78. *Taragama siva* (Lefebvre, 1827)

1827. *Bombyx siva* Lefebvre, *Zool. J.*, 3:210.

1936. *Taragama siva* : Collier, *Lep. Cat.*, 73 : 311.

Material examined : 5 exs., Eden Gardens, Calcutta, 25. iv.1967, 26. vii. 1968, 24.x.1975, *Mus. Colls.*

Diagnosis : Vide key.

Distribution : India : West Bengal (Calcutta); almost throughout the North-West Himalaya and also the Peninsula. *Elsewhere* : Burma, Iraq and Pakistan.

Remarks : The species, which is very common in the plains of West Bengal, constitutes new locality record for the state.

Genus *Lebeda* Walker (1853)

* 79. *Lebeda nobilis* Walker (1855)

1855. *Lebeda nobilis* Walker, *Cat. Lep. Het. Brit. Mus.*, 6 : 1456.

1936. *Lebeda nobilis* : Collier, *Lep. Cat.*, 73 : 322.

Distribution : India : West Bengal (Darjiling); East to North-West Himalaya. *Elsewhere* : Bangladesh and Nepal.

Remarks : This common species was earlier mentioned from Darjiling by Collier (1936). The female with its strong and squat body and also large wing expanse (138-148 mm) is allied to that sex of *Suana concolor* (*vide infra*). Habits are unknown.

Genus *Suana* Walker (1855)

80. *Suana concolor* (Walker, 1855)

1855. *Lebeda concolor* Walker, *Cat. Lep. Het. Brit. Mus.*, 6:1463.

1936. *Suana concolor* : Collier, *Lep. Cat.*, 73:324.

Material examined : One ex., Darjiling district ... Old Coll.

Diagnosis : Male fore wing dark red-brown, costa greyish, subbasal spot yellowish, end-cell spot silvery white, lines dark wavy; hind wing darker red-brown. Female considerably larger and much paler.

Distribution : India : West Bengal (Darjiling); almost throughout the mainland. *Elsewhere* : Sri Lanka; Sundaland to Philippines.

Remarks : This is a locally common species, of which the male frequently comes to light.

Genus *Dendrolimus* Germar (1811)

Key to the species

Both sexes with a discal white spot and a series of submarginal spots on fore wing
 *latipennis* (Walker)

Male with an extended velvety black spot between two discal bands in addition to a white discal spot and both sexes with a wavy submarginal dark line on fore wing *hyrtaca* (Cramer)

* 81. *Dendrolimus fulgens* (Moore, 1879)

1879. *Lebeda fulgens* Moore, *Descr. new Indian Lep. Ins. Coll. Atkinson*, 1 : 81.

1892. *Dendrolimus fulgens* : Kirby, *Cat. Lep. Het.*, 1:814.

Distribution : India : West Bengal (Darjiling) and Sikkim.

Remarks : This and the following couple of species, erstwhile treated under the genus *Metanastris Hübner* by Collier (1936), are presently put under *Dendrolimus* Germar after the archaic classification as noted in above reference. The species was earlier recorded from Darjiling by Cotes and Swinhoe (1887-89). Status, food-plant and bionomics are unknown. It is confined to the East Himalaya.

82. *Dendrolimus latipennis* (Walker, 1855)

1855. *Lebeda latipennis* Walker, *Cat. Lep. Het. Brit. Mus.*, 6:1457.

1892. *Dendrolimus latipennis* : Kirby, *Cat. Lep. Het.*, 1 : 814.

Material examined : 2 exs., Calcutta,, Old Colln.; Tindharia, c 850 m. Darjiling district, 14.v.1979, M.S. Shishodia and party coll.

Diagnosis : Vide key.

Distribution : India : West Bengal (Calcutta and Darjiling); Himachal Pradesh; Meghalaya; Sikkim. *Elsewhere* : Burma, Sri Lanka and Sundaland.

Remarks : This species was earlier recorded from Darjiling by Cotes & Swinhoe (1887-'89) and from Calcutta by Hampson (1892).

83. *Dendrolimus hyrtaca* (Cramer, 1782)

1782. *Bombyx hyrtaca* Cramer, *Pap. Exot.*, 3 : 97, t. 249, f.F.

1892. *Dendrolimus hyrtaca*: Kirby, *Cat. Lep. Het.*, 1 : 815.

Material examined : One ex., Ghumbhanjan, Darjiling district, "at light", 28.v.1975, J.K. Jonathon and party coll.

Diagnosis : Vide key.

Distribution : India : West Bengal (Calcutta and Darjiling); Assam; Bihar; Madhya Pradesh; Maharashtra; Meghalaya; Orissa; Sikkim; Tamil Nadu. *Elsewhere* : China, Sri Lanka and Sundaland.

Remarks : The species, earlier known from Calcutta (*vide* Nandi and Mondal, 1977), is not rare in status.

* 84. *Dendrolimus plagifera* (Walker, 1855)

1855. *Lebeda plagifera* Walker, *Cat. Lep. Het. Brit. Mus.*, 6:1459.

1892. *Dendrolimus plagifera* : Kirby, *Cat. Lep. Het.*, 1:816.

Distribution : India : West Bengal (Darjiling); Himachal Pradesh; Sikkim. *Elsewhere* : Java and Nepal.

Remarks : This element, which was earlier recorded from Darjiling by Cotes & Swinhoe (1887-'89), has again been placed under the genus *Paralebeda* Aurivillius by Collier (1936), though the archaic system, as referred to above, is presently followed after proper literature review. The moth is reportedly gregarious particularly at the larval stage and feeds on various deciduous trees like *Corylus hetrophylla*, *Pinus* species, *Populus tremula*, *Quercus* species, etc. It may be noted here that the nominal subspecies does not occur in Amurland of U.S.S.R., its northern range being the East, Central and West Himalaya and extending to Java in the south.

Genus *Arguda* Moore (1879)

* 85. *Arguda bheroba* (Moore, 1858-'59)

1858-'59. *Odonestis bheroba* Moore, *Cat. Lep. Ins. Mus., Nat. Hist. East India House*, 2 : 424, t. 12A, fig. 5.
1936. *Arguda bheroba* : Collier, *Lep. Cat.*, 73 : 368.

Distribution : India : West Bengal (Darjiling); Sikkim. *Elsewhere* : Philippines, Sri Lanka and Sundaland.

Remarks : The species was earlier recorded from Darjiling by Cotes & Swinhoe (1887-'89).

* 86. *Arguda decurtata* Moore (1879)

1879. *Arguda decurtata* Moore, *Descr. new Indian Lep. Ins. Coll. Atkinson*, 1 : 79.
1936. *Arguda decurtata* : Collier, *Lep. Cat.*, 73:369.

Distribution : India : West Bengal (Darjiling).

Remarks : This rare endemic species was earlier reported from Darjiling by Collier (1936).

* 87. *Arguda vinata* (Moore, 1865)

1865. *Lebeda vinata* Moore, *Proc. zool. Soc. Lond.*, 1865 : 820.
1936. *Arguda vinata* : Collier, *Lep. Cat.*, 73:370.

Distribution : India : West Bengal (Darjiling).

Remarks : As for the preceding species.

Genus *Bharetta* Moore (1865)

* 88. *Bharetta cinnamomea* Moore (1865)

1865. *Bharetta cinnamomea* Moore, *Proc. zool. Soc. Lond.*, 1865: 820, t. 43, f.6.
1936. *Bharetta cinnamomea* : Collier, *Lep. Cat.*, 73 : 394.

Distribution : India : West Bengal (Darjiling).

Remarks : As for the preceding species.

Genus *Syrastrena* Moore (1884)

* 89. *Syrastrena minor* (Moore, 1879)

1879. *Metanastria minor* Moore, *Descr. new Indian Lep. Ins. Coll. Atkinson*, 1 : 78.

1936. *Syrastrena minor* : Collier, *Lep. Cat.*, 73 : 395.

Distribution : India : West Bengal (Darjiling); Sikkim.

Remarks : Restricted to the East Himalaya, this species is apparently rare.

Genus *Cosmotriche* Hübner (1816-27)

*90. *Cosmotriche lidderdalii* (Druce, 1899)

1899. *Odonestis lidderdalii* Druce, *Ann. Mag. nat. Hist.*, (7) 3: 471.

1936. *Cosmotriche lidderdalii* : Collier, *Lep. Cat.*, 73 : 431.

Distribution : India : West Bengal (Darjiling).

Remarks : This rare species was reported from Darjiling by Collier (1936).

* 91. *Cosmotriche pyriformis* (Moore, 1879)

1879. *Odonestis pyriformis* Moore, *Proc. zool. Soc. Lond.*, 1879 : 408, pl. 34, fig. 7.

1936. *Cosmotriche pyriformis* : Collier, *Lep. Cat.*, 73 : 447.

Distribution : India : West Bengal (Darjiling); Sikkim; North-West Himalaya.

Remarks : Collier (1936) reported this species from Darjiling.

* 92. *Cosmotriche signata* (Moore, 1879)

1879. *Odonestis signata* Moore, *Descr. new Indian Ins. Coll. Atkinson*, 1 : 76.

1936. *Cosmotriche signata* : Collier, *Lep. Cat.*, 73 : 447.

Distribution : India : West Bengal (Darjiling) ; Sikkim. *Elsewhere* : Bhutan.

Remarks : As for the preceding species, but endemic in the East Himalaya.

Family III. LYMANTRIIDAE

Subfamily LYMANTRIINAE

Key to the Groups

Fore wing R_2 originating from cell; areole very often present *Areolatae*

Fore wing R_2 not originating from cell; areole very often absent *Inareolatae*

Group AREOLATAE

Key to the genera

1. Fore wing R_3 given off from R_2 and anastomosing with R_4 to form an areole2

Fore wing R_{3+4} anastomosing with R_2 to form an areole. Palpi upturned. Antennae with pinnae longer in male than in female *Leucoma* Stephens

2. Palpi porrect. Antennae with pinnae usually longer in male than in female3

Palpi upturned. Antennae with pinnae of uniform length in both sexes *Numenes* Walker

3. Fore tarsi with lateral tufts of hair to the joints

[Hind tibiae with 2 pair of spurs. Fore wing produced; outer margin oblique] *Dasychira* Stephens

Fore tarsi without lateral tufts of hair to the joints

[Fore wing produced; hind wing R_s and M_1 stalked] *Laelia* Stephens

Genus *Dasychira* Stephens (1828)

Key to the species

1. Head and thorax white to whitish grey. Fore wing greyish white to silky white2

Head, thorax and fore wing never so coloured4

2. Fore wing reniform spot prominent3

Fore wing reniform spot absent

[Palpi laterally black. Fore wing silky white with tuft of raised scales at end-cell, submarginal band curved forming an anal patch; hind wing white. Abdomen white. In female, palpi white; fore wing thickly irrorated fuscous, ante- postmedial and submarginal lines well defined]
..... *albescens* Moore

3. Fore wing greyish white with dark irrorations, submarginal line irregularly denate, postmedial line in male single, obsolete in female; hind wing white with inner area orange. Abdomen orange, white in female *horsfieldi* (Saunders)

Fore wing pure white, submarginal line absent, postmedial line in male double, being represented by paired costal streaks in female; hind wing pale brown throughout, white in female. Abdomen pale brown *thwaitesi* Moore

4. Female with head, thorax and fore wing pale brown, the last without reniform spot; hind wing and abdomen concolourous. Male similar but darker in facies *tenebrosa* Walker

Female with head, thorax and fore wing pale green, the last with reniform spot; hind wing and abdomen orange. Male unknown *virescens* (Moore)

93. *Dasychira horsfieldi* (Saunders, 1851)

1851. *Arctia horsfieldii* Saunders, *Trans. ent. Soc. Lond.*, (2) 1 : 162, pl. 12., figs. 1-3.

1934. *Dasychira horsfieldi* : Bryk, *Lep. Cat.*, 20 (62) : 20.

Material examined : one ex., Darjiling district,Old Colln.

Diagnosis : Vide key.

Distribution : India : West Bengal (Darjiling) ; Tamil Nadu. *Elsewhere* : Australia, Sri Lanka, Sundaland and Western Malaysia.

Remarks : Apparently rare and new record for West Bengal, the species feeds on tea plants.

* 94. *Dasychira flavimacula* Moore (1865)

1865. *Dasychira flavimacula* Moore, *Proc. zool. Soc. Lond.*, 1865 : 804.

1934. *Dasychira flavimacula* : Bryk, *Lep. Cat.*, 20 (62) : 22.

Distribution : India : West Bengal (Darjiling); Sikkim. *Elsewhere* : Tibet.

Remarks : This species was earlier reported from Darjiling by Bryk (1934).

95. *Dasychira tenebrosa* Walker (1865)1865. *Dasychira tenebrosa* Walker, *Cat. Lep. Het. Brit. Mus.*, 32:361.1934. *Dasychira tenebrosa* : Bryk, *Lep. Cat.*, 20(62):23.*Material examined* : One ex., Darjiling district, 20.ix.1948, Old Coll.*Diagnosis* : *Vide key.**Distribution* : India : West Bengal (Darjiling); North-West Himalaya. *Elsewhere* : Taiwan, Tibet and West China.*Remarks* ; This is mainly a temperate species; being earlier mentioned from Darjiling by Bryk (1934).96. *Dasychira virescens* (Moore, 1879)1879. *Cadusia virescens* Moore, *Descr. new Indian Lep. Coll. Atkinson.*, p. 54, pl. 3, fig. 16.1934. *Dasychira virescens* : Bryk, *Lep. Cat.*, 20 (62) : 23.*Material examined* : One ex., Darjiling district ..., Old Colln.*Diagnosis* : *Vide key.**Distribution* : India : West Bengal (Darjiling); Sikkim.*Remarks* : Confined to the East Himalaya, this species is hitherto known by only female and was earlier reported from Darjiling by Bryk (1934). The element is rare in status.* 97. *Dasychira varia* Walker (1855)1855. *Dasychira varia* Walker, *Cat. Lep. Het. Brit. Mus.*, 4 : 868.1934. *Dasychira varia* : Bryk, *Lep. Cat.*, 20(62) : 24.*Distribution* : India : West Bengal (Darjiling); Himachal Pradesh ; Sikkim.*Remarks* : This mountain-dwelling species, feeding on *Leucosceptrum canum*, is hitherto known by female. It is rare, being earlier reported from Darjiling by Cotes & Swinhoe (1887-'89).98. *Dasychira thwaitesi* Moore (1883)1883. *Dasychira thwaitesi* Moore, *Lep. Ceyl.*, 2 : 98, pl. 116, figs. 1, 1a-b.1934. *Dasychira thwaitesi* : Bryk, *Lep. Cat.*, 20(62) : 25.*Material examined* : One ex., Darjiling district ... Old Colln.

Diagnosis : Vide key.

Distribution : India : West Bengal (Darjiling); Kerala; Tamil Nadu. *Elsewhere* : Sri Lanka.

Remarks : A new record for West Bengal, the species seems to be rare.

* 99. *Dasychira cymata* Swinhoe (1907)

1907. *Dasychira cymata* Swinhoe, *Ann. Mag. nat. Hist. Soc.*, (7) 19:204.

1934. *Dasychira cymata* : Bryk, *Lep. Cat.*, 20(62) : 26.

Distribution : India : West Bengal (Darjiling).

Remarks : Bryk(1934) reported this species from Darjiling, where it is hitherto known as endemic.

* 100. *Dasychira cinctata* Moore (1879)

1879. *Dasychira cinctata* Moore, *Descr. new Indian Lep. Coll. Atkinson*, p.59.

1934. *Dasychira cinctata* : Bryk, *Lep. Cat.*, 20(62):26.

Distribution : India : West Bengal (Darjiling); Sikkim.

Remarks : Bryk (1934) reported this species from Darjiling.

* 101. *Dasychira complicata* Walker (1865)

1865. *Dasychira complicata* Walker, *Cat. Lep. Het. Brit. Mus.*, 32 : 365.

1934. *Dasychira complicata* : Bryk, *Lep. Cat.*, 20(62):26.

Distribution : India : West Bengal (Darjiling; North 24-Parganas : Barrackpore); Sikkim.

Remarks : Cotes & Swinhoe (1887-89) recorded the species from the Darjiling and North 24-Parganas districts of West Bengal. It seems to be not rare.

102. *Dasychira albescens* Moore (1879)

1879. *Dasychira albescens* Moore, *Descr. new Indian Lep. Coll. Atkinson*, p. 59, pl. 3, fig.2.

1934. *Dasychira albescens* : Bryk, *Lep. Cat.*, 20(62) : 26.

Material examined : One ex., Darjiling district, ... Old Colln.

Diagnosis : Vide key.

Distribution : India : West Bengal (Darjiling); Sikkim.

Remarks : Bryk (1934) reported the species from Darjiling.

* 103. *Dasychira strigata* Moore (1879)1879. *Dasychira strigata* Moore, *Descr. new Indian Lep. Coll. Atkinson*, p.58.1934. *Dasychira strigata* : Bryk, *Lep. Cat.*, 20(62):26.

Distribution : India : West Bengal (Darjiling); Himachal Pradesh ; Meghalaya; Sikkim; Uttar Pradesh. *Elsewhere* : Japan and Malaya.

Remarks : This species was earlier reported from Darjiling by Bryk (1934).

* 104. *Dasychira brunnescens* Moore (1879)1879. *Dasychira brunnescens* Moore, *Descr. new Indian Lep. Coll. Atkinson*, p. 57.1934. *Dasychira brunnescens* : Bryk *Lep. Cat.*, 20(62) : 27.

Distribution : India : West Bengal (Darjiling); Sikkim.

Remarks : Bryk (1934) reported this species from Darjiling.

* 105. *Dasychira perdix* Moore (1879)1879. *Dasychira perdix* Moore, *Descr. New Indian Lep. Coll. Atkinson*, p.58, pl. 3, fig. 3.1934. *Dasychira perdix* : Bryk, *Lep. Cat.*, 20(62) : 27.

Distribution : India : West Bengal (Darjiling).

Remarks : This endemic species was reported from Darjiling by Bryk (1934).

* 106. *Dasychira bhana* Moore (1865)1865. *Dasychira bhana* Moore, *Proc. zool. Soc. Lond.*, 1865 : 804.1934. *Dasychira bhana* : Bryk, *Lep. Cat.*, 20(62):28.

Distribution : India : West Bengal (Darjiling).

Remarks : Reported earlier from Darjiling by male (*vide* Bryk, 1934), the species is apparently rare and known to be endemic in the district.

Genus *Orgyia* Ochseneimer (1810)* 107. *Orgyia australis* Walker (1855)*O. a. ocularis* Moore1879. *Orgyia ocularis* Moore, *Descr. New Indian Lep. Coll. Atkinson*, p. 44.1934. *Orgyia australis ocularis* : Bryk, *Lep. Cat.*, 20(62) : 76.

Distribution : India : West Bengal (Calcutta).

Remarks : This subspecies was treated under *O. postica* (Walker) by Strand (1914). Subsequently, Bryk (1934) considered both *ocularis* and *postica* as distinct subspecies of *O. australis* Walker, of which he (*loc.cit.*) reported the former from Calcutta. The other subspecies has much wider range of distribution, as cited by Hampson (1892) and Strand (*loc.cit.*). The moth is known to feed on *Caesalpinia* sp., almond and apple trees. It is possibly rare in Calcutta. It exhibits restless and tumbling flight just like *Pantana* spp. to follow.

Genus *Aroa* Walker (1855)

* 108. *Aroa socrus* (Geyer, 1837)

1837. *Gynaephora Socrus* Geyer, *Zutr...*, 5 : 12, figs. 837.

1934. *Aroa socrus* : Bryk, *Lep. Cat.*, 20 (62) : 88.

Distribution : India : West Bengal (Calcutta); East and North-West Himalaya. *Elsewhere* : Bangladesh, Bhutan, Burma, China, Java and Vietnam.

Remarks : Bryk (1934) considered *A. substrigosa* Walker from East Himalaya and *A. pyrrhochroma* Walker from both E. and North-West Himalaya as distinct subspecies of *A. socrus* and synonymised the latter in part with *clara* Swinhoe which is a good species from Maharashtra and not a synonym of *pyrrhochroma* as cited by Hampson (1892). The species, *A. socrus*, was earlier known from Calcutta as *Bazisa* (nec *Bazisa*) *detecta* Walker. This and the next species of the genus *Aroa* reportedly exhibit diurnal flight.

* 109. *Aroa ochracea* (Moore, 1879)

1879. *Chamidas ochracea* Moore, *Descr. New Indian Lep. Ins. Coll. Atkinson*, p. 44.

1934. *Aroa ochracea* : Bryk, *Lep. Cat.*, 20(62) : 89.

Distribution : India : West Bengal (Calcutta).

Remarks : The species, which was earlier sunk into the synonymy list of *A. plana* (Walker) by Hampson (1892), was described from Calcutta by Moore (1879) Apparently rare, the moth lives on bamboo. Pupation and emergence of adult are known to take place in late October.

Genus *Cifuna* Walker (1855)

* 110. *Cifuna locuples* Walker (1855)

1855. *Cifuna locuples* Walker, *Cat. Lep. Het. Brit. Mus.*, 5 : 1173.

1934. *Cifuna locuples* : Bryk, *Lep. Cat.*, 20 (62) : 93.

Distribution : India : West Bengal (District not specifically known); Meghalaya; Nagaland. *Elsewhere* : Bangladesh, Japan, Korea, Taiwan, U.S.S.R., Vietnam and West China.

Remarks : The typical form of this species was known from "N.O-Bengal" after Bryk (1934). The moth reportedly lives on low-growing plants, especially the vetches.

* 111. *Cifuna cervina* (Moore, 1879)

1879. *Baryaza cervina* Moore, *Descr. New Indian Lep. Ins. Coll. Atkinson*, p. 45, pl. 3, fig. 4.

1934. *Cifuna cervina* : Bryk, *Lep. Cat.* 20 (62) : 94.

Distribution : India : West Bengal (Darjiling); Sikkim.

Remarks : The species, which is apparently rare, is restricted to the East Himalaya.

Genus *Laelia* Stephens (1827)

112. *Laelia testacea* (Walker, 1855)

1855. *Cycnia testacea* Walker, *Cat. Lep. Het. Brit. Mus.*, 3 : 683.

1934. *Laelia testacea* : Bryk, *Lep. Cat.*, 20 (62) : 99.

Material examined : 2 exs., Barddhaman, 20. vii. 1916, Old Colln.

Diagnosis : Male fore wing with a black subapical streak; female more ochreous rather than red and hardly with dark irroration.

Distribution : India : West Bengal (Barddhaman); Kerala; Madhya Pradesh; Maharashtra; Meghalaya; Tamil Nadu. *Elsewhere* : Pakistan and Sri Lanka.

Remarks : The species constitutes new locality record for West Bengal. *Charnidas colon* Hampson from the Nilgris, one of the senior synonyms of *L. testacea*, has been raised to the status of a good species under the genus in question by Bryk (1934).

* 113. *Laelia atestacea* Hampson (1892)

1892. *Laelia atestacea* (*testacea* Moore nec Walker, 1855) Hampson, *Fauna Brit. India, Moths*, 1 : 443 (*nomen novum*).

1934. *Laelia atestacea* : Bryk, *Lep. Cat.*, 20 (62) : 100.

Distribution : India : West Bengal (Darjiling); Meghalaya; Sikkim. *Elsewhere* : Vietnam.

Remarks : It was Moore (1879) who described the species as *Harapa testacea* from Darjiling. Subsequently, new name as above has been adopted by Hampson (1892) for the species, since *testacea* is the preoccupied name for the preceding species.

* 114. *Laelia devestita* (Walker, 1865)

1865. *Odagra devestita* Walker, *Cat. Lep. Het. Brit. Mus.*, 32 : 402.

1934. *Laelia devestita* : Bryk, *Lep. Cat.*, 20 (62) : 101.

Distribution : India : West Bengal (Darjiling); Maharashtra; Punjab. *Elsewhere* : Burma, Pakistan and Taiwan.

Remarks : The species was described from Darjiling by Walker (1865).

* 115. *Laelia fasciata* (Moore, 1883)

1883. *Laeliodes fasciata* Moore, *Lep. Ceylon*, 2 : 84, pl. 110, fig. 6.

1934. *Laelia fasciata* : Bryk, *Lep. Cat.*, 20 (62) : 101.

Distribution : India : West Bengal (District unknown); Orissa. *Elsewhere* : Burma, Philippines, Sri Lanka and Vietnam.

Remarks : The female of this species was described from Bengal by Moore (1872) as *Procodeca testacea* (*nomen praeoccupatum* 1855). Hampson (1892) treated the species (part) as synonym of *L. rubripennis* (Moore) which was, in turn, considered as Burmese subspecies of *L. fasciata* by Bryk (1934). The moth reportedly flies during April in certain areas of the Oriental Region.

* 116. *Laelia venosa* Moore (1877)

1877. *Laelia venosa* Moore, *Proc. zool. Soc. Lond.*, 1877 : 601, pl. 59, fig. 1.

1934. *Laelia venosa* : Bryk, *Lep. Cat.*, 20 (62) : 102.

Distribution : India : West Bengal (Darjiling) ; Meghalaya; Sikkim; South Andaman. *Elsewhere* : Singapore.

Remarks : Strand (1914) described a small male form, *venosula* with an expanse of 32.5 mm., of this species from Darjiling. It is apparently rare.

Genus *Stilpnotia* Westwood & Humphreys (1841)

* 117. *Stilpnotia cygna* (Moore, 1879)

1879. *Redoa cygna* Moore, *Proc. zool. Soc. Lond.*, 1879 : 401.

1934. *Stilpnotia cygna* : Bryk, *Lep. Cat.*, 20(62) : 117.

Distribution : India : West Bengal (Darjiling); Andamans. *Elsewhere* : China, Japan and Sri Lanka.

Remarks : This species, earlier much confused with *Leucoma comma* (Hutton), *L. perfecta* (Walker), *L. lactea* Moore, *L. silhetica* (Walker), etc., chiefly by Hampson (1892), was described from Darjiling by Moore (1879) and reported subsequently therefrom by Butler (1881) as *Redoa cymbicornis*.

Genus *Euzora* Turner (1915)

* 118. *Euzora costalis* (Moore, 1879)

1879. *Caragola costalis* Moore, *Descr. New Indian Lep. Ins. Coll. Atkinson*, p. 46, pl.2, fig. 21.

1934. *Euzora costalis* : Bryk, *Lep. Cat.*, 20(62) : 122.

Distribution : India : West Bengal (Darjiling); Sikkim.

Remarks : Restricted to the East Himalaya, this species was described from Darjiling by Moore (1879). This and the following couple of species were earlier placed in the genus *Caviria* Walker by Hampson (1892).

Genus *Leucoma* Hübner (1806)

Key to the species

Antennae brownish yellow. Fore wing silvery white, but neither with apex yellow- ish nor cell-spot. Legs black-dotted only partly. Abdominal tip yellow*divisa* (Walker)

Antennae brownish. Fore wing silvery white with apex yellowish and a black cell-spot. Legs black-spotted throughout. Abdominal tip not yellow *submarginata* (Walker)

119. *Leucoma divisa* (Walker, 1855)

1855. *Euproctis divisa* Walker, *Cat. Lep. Het. Brit. Mus.*, 4 : 836.

1934. *Leucoma divisa* : Bryk (partim Hampson, 1892), *Lep. Cat.*, 20(62):126.

Material examined : One ex., Darjiling district ...Old Colln.

Diagnosis : *Vide* key.

Distribution : India : West Bengal (Darjiling). *Elsewhere* : Bangladesh, Bhutan, Burma, Philip-pines, Sundaland and Western Malaysia:

Remarks : The species is a new record for West Bengal. It is worth mentioning here that Hubner (1806) made a printed list of names including *Leucoma* for cabinet use and without descriptions, while Stephens (1829) subsequently described the genus in details.

* 120. *Leucoma diaphana* Moore (1879)

1879. *Leucoma diaphana* Moore, *Descr. Indian Lep. Ins. Coll. Atkinson*, p. 46.

1934. *Leucoma diaphana* : Bryk, *Lep. Cat.*, 20(62) : 126.

Distribution : India : West Bengal (Darjiling); Sikkim.. *Elsewhere* : Burma, China and possibly also Sumatra as reported by Strand (1914)

Remarks : Moore (1879) described this species by male from Darjiling and treated the female as *Redoa lactea* from the same district. Hampson (1892) sank *R. lactea* Moore in the synonymy list of the preceding species. Later, Strand (1914) and Bryk (1934) considered *lactea* as a distinct form of *L. diaphana* Moore.

121. *Leucoma submarginata* (Walker, 1855)

1855. *Redoa submarginata* Walker, *Cat. Lep. Het. Brit. Mus.*, 4 : 826.

1934. *Leucoma submarginata* : Bryk, *Lep. Cat.*, 20(62):128.

Material examined : One ex., Calcutta, Old Colln.

Diagnosis : Vide key.

Distribution : India : West Bengal (Calcutta ; Darjiling); Andamans; Assam; Meghalaya; Sikkim.
Elsewhere : Australia, Bangladesh, Bhutan, Burma, Papua, Philippines, Sri Lanka, Sundaland, West China and Western Malaysia.

Remarks : This widely distributed species was reported as the female form *sikkima* Strand (1915) from Darjiling. Also, it is known for the first time from Calcutta, too. The moth is known to fly during May and July and then from November till February. Apparently , it is not rare.

Genus *Kanchia* Moore (1883)

* 122. *Kanchia subvitrea* (Walker, 1865)

1865. *Leucoma subvitrea* Walker, *Cat. Lep. Het. Brit. Mus.*, 32:344.

1934. *Kanchia subvitrea* : Bryk, *Lep. Cat.*, 20(62) : 132.

Distribution : India : West Bengal (District unknown); Tamil Nadu. *Elsewhere* : China, Hong Kong, Sri Lanka, Taiwan and Vietnam.

Remarks : The female type of this species is known from Bengal. This is an iridescent moth living on *Terminalia catappa* in particular and presumably not rare. This is the only species that has been transferred to the genus *Kanchia* from *Leucoma* by Bryk (1934).

Genus *Pantana* Walker (1855)

123. *Pantana visum* (Hübner, 1825)

1825. *Liparis visum* Hübner, *Zutr. exot. Schemett.*, 3 : 33, figs. 543, 544.

1934. *Pantana visum* : Bryk *Lep. Cat.*, 20(62) : 133.

Distribution : India : West Bengal (Calcutta). *Elsewhere* : Burma, China, Hainan, Hong Kong, Taiwan, Sundaland, Western Malaysia and Vietnam.

Remarks : This species, with which the following counterpart (i.e. *bicolor*, part) has been synonymised by Bryk (1934), was earlier reported from Calcutta as *P. dispar* Walker by Cotes & Swinhoe (1887-'89), who, however, misspelt the generic name as "*Patana*" It is interesting to note after Strand (1915) that nets with long poles must be used for capturing this moth and the following couple of species of the genus, as these fly high up in the air when pursued. In each case the male is a very active flier particularly in the afternoon sunshine, describing circles and loops in the air and generally moves amidst the bamboo fences around gardens and courtyards. Their flight is as restless and tumbling as that of *Orgyia australis* Walker.

* 124. *Pantana bicolor* (Walker, 1855)1855. *Orgyia bicolor* Walker, *Cat. Lep. Het. Brit. Mus.*, 4 : 787.1934. *Pantana bicolor* : Bryk, *Lep. Cat.*, 20(62) : 134.

Distribution : India : West Bengal (Darjiling); throughout the East Himalaya and also Himachal Pradesh. *Elsewhere* : Bangladesh, Bhutan, Burma, Campunchea, Sundaland, Western Malaysia and Vietnam.

Remarks : The species was earlier reported from Darjiling by Cotes and Swinhoe (1887-'89).

* 125. *Pantana albifascia* Walker (1865)1865. *Orgyia albifascia* Walker, *Cat. Lep. Het. Brit. Mus.*, 32 : 325.1934. *Pantana albifascia* : Bryk, *Lep. Cat.*, 20(62) : 136.

Distribution : India : West Bengal (Darjiling); Meghalaya; Sikkim.

Remarks : The species was described from Darjiling by Walker (1865).

Genus *Pida* Walker (1865)* 126. *Pida apicalis* Walker (1865)1865. *Pida apicalis* Walker, *Cat. Lep. Het. Brit. Mus.*, 32:400.1934. *Pida apicalis* : Bryk, *Lep. Cat.*, 20(62) : 138.

Distribution : India : West Bengal (Darjiling); Meghalaya; Sikkim. *Elsewhere* : Bangladesh and Nepal.

Remarks : The species was reported from Darjiling by Bryk (1934).

* 127. *Pida decolorata* (Walker, 1869)1869. *Cyclidia decolorata* Walker, *Char. undescr. Lep. Het.*, p. 96.1934. *Pida decolorata* : Bryk, *Lep. Cat.*, 20 (62) : 138.

Distribution : India : West Bengal (Darjiling); Meghalaya; Uttar Pradesh. *Elsewhere* : Taiwan.

Remarks : The species was earlier reported from Darjiling by Bryk (1934).

Genus *Numenes* Walker (1855)128. *Numenes patrana* Moore (1859)1859. *Numenes patrana* Moore, *Cat. Lep. E. Ind. Comp.* 2:367.1934. *Numenes patrana* : Bryk, *Lep. Cat.*, 20 (62) : 140.

Material examined : One ex., Calcutta,....Old. Colln.

Diagnosis : Male differs from female by fore wing white with a basal dark red-brown diffused spot and costal marginal one beyond, broad Y-shaped discal band and an oblique streak from costa to the middle of margin.

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

Remarks : Earlier reported from Darjiling by Bryk (1934), the species has been recorded for the first time from Calcutta by the authors. The specimen examined is male and is known to be quite different from the female that exhibits a variegated colouring reminding one of the arctiids. Strand's (1911, 1915) view on the genus *Numenes* as "entirely Indian" and also his estimate of Indian species as 'six' are not justified, since out of 11 species under the genus, only 3 are Indian, while one or others of the rest are Palaearctic or Malayan or Ethiopian or Malagassic in distribution (cf. Bryk, 1934).

Genus *Daplasa* Moore (1879)

* 129. *Daplasa irrorata* Moore (1879)

1879. *Daplasa irrorata* Moore, *Descr. Indian Lep. Ins. Coll. Atkinson*, p. 52.

1934. *Daplasa irrorata* : Bryk, *Lep. Cat.*, 20 (62) : 143.

Distribution : India : West Bengal (Darjiling); Meghalaya and Sikkim. *Elsewhere* : Omeishan and Japan.

Remarks : Represented by small moths, the species of this monotypic genus was described by male from Darjiling by Moore (1879). *D. variegata* (Moore, as treated by Hampson (1892), has been transferred to the genus *Euproctis* Hübner by Bryk (1934).

Genus *Himala* Moore (1879)

* 130. *Himala argentea* (Walker, 1855)

1855. *Redoa argentea* Walker, *Cat. Lep. Het. Brit. Mus.*, 4 : 827.

1934. *Himala argentea* : Bryk, *Lep. Cat.*, 20(62):144.

Distribution : India : West Bengal (Darjiling); Assam; Himachal Pradesh; Uttar Pradesh.

Remarks : This typical Indian species of the monotypic genus was reported by female from Darjiling as *Dasychira ilita* by Moore (1859) and described by male from Kangra, Himachal Pradesh, by Walker (1855). The moth closely resembles the members of the Notodontid genus *Gazalina* Walker. Exceptionally enough, this is the only genus amongst the Areolatae series in question where there is no areole in the fore wing.

Group Inareolatae

Key to the genera

1. Fore wing R2 anastomosed with R3-5 to form an areole shortly after which the former is given off
[Antennal pinnae shorter in female than in male] *Mardara* Walker
Fore wing R2 stalked with R3-5, areole being absent 2
2. Palpi upturned
[Fore wing apex rounded; R2 given off nearer the cell than from the origin of R5. Antennae in female serrate, in male bipectinate] *Lymantria* Hübner
Palpi porrect 3
3. Hind wing M1 present in male. Hind tibiae with 2 pair of spurs 4
Hind wing M1 absent in male. Hind tibiae with one pair of spurs [Antennal pinnae shorter in female than in male. Hind wing R5 and M1 stalked, M2 and M3 from cell in female, the latter couple of veins being stalked in male] *Perina* Walker
4. Palpi short and stout 5
Palpi long and slender. Antennal pinnae in female as long as in male 7
5. Hind wing M2 absent. Antennal pinnae shorter in female than in male *Porthesia* Stephens
Hind wing M2 present 6
6. Fore wing R2 given off near apex. Antennal pinnae shorter in female than in male, former with a large anal tuft *Euproctis* Hübner
Fore wing R2 given off near cell. Antennal pinnae in female as long as in male *Cispia* Walker
7. Fore wing R1 not anastomosed with Sc; hind wing margin not angled *Imaus* Moore
Fore wing R1 anastomosed with Sc; hind wing margin angled at Cula *Dura* Moore

Genus *Lymantria* Hübner (1818)

Key to the species

1. Fore and hind wings in female much aborted. Hind tibiae with a minute terminal pair of spurs [Both wings and abdomen yellowish brown in male, former being white and black-spotted and the latter blackish in female] *ampla* (Walker)
- Fore and hind wings in female fully developed. Hind tibiae with two pair of spurs 2
2. Female fore wing deep black with yellow spots; hind wing and abdomen crimson, former with a marginal black band decreasing to anal angle and latter with a dorsal series of black spots. Male unseen..... *semicincta* (Walker)
- Female fore wing not black; white in male 3
3. Male fore wing with black spots, pattern not banded; hind wing coloured other than crimson ...4
- Male fore wing with white banded pattern totally broken up into spots; hind wing pink, with a greyish brown discal spot and subterminal band not reaching anal angle. Female fore wing white, with red and black basal spots, dark transverse bands partly broken up into spots; hind wing crimson, with a dark discal spot *grandis* Walker
4. Male fore wing with transverse lines zig-zag; hind wing and abdomen ochreous yellow, former with a broad black terminal band and latter unspotted. Female fore wing suffused brown, with black patches on costa and another Y-shaped one on dorsum; hind wing fuscous white, with terminal band obsolete *todara* Moore
- Male fore wing with transverse lines normal; hind wing white, with a series of terminal spots preceded by a fuscous subterminal band; abdomen crimson, with black dorso-lateral spots. Female fore wing suffused brown, but with markings obsolete; hind wing suffused fuscous *asoetria* Hübner

* 131. *Lymantria mathura* Moore (1865)

1865. *Lymantria mathura* Moore, *Proc. zool. Soc. Lond.*, 1865:805.

1934. *Lymantria mathura* : Bryk, *Lep. Cat.*, 20(62):151.

Distribution : India : West Bengal (Darjiling); Sikkim; North-West Himalaya. *Elsewhere* : Bangladesh, China, Japan, Korea and U.S.S.R.

Remarks : Recorded from Darjiling by Cotes and Swinhoe (1887-'89), this widely distributed species is possibly Palearctic in origin. The female has wing expanse as double as that of the male.

* 132. *Lymantria serva* (Fabricius, 1793)1793. *Bombyx serva* Fabricius, *Syst. Ent.*, (3) 1:474.1934. *Lymantria serva* : Bryk, *Lep. Cat.*, 20(62) : 158.

Distribution : India : West Bengal (Darjiling); Assam; Himachal Pradesh; Jammu and Kashmir (Kashmir); Karnataka; Madhya Pradesh; Maharashtra; Meghalaya; Tamil Nadu; Sikkim. *Elsewhere* : China, Hong Kong, Malaya, Philippines, Sri Lanka and Taiwan.

Remarks : The species has as many as five subspecies, of which *L. serva bhascara* Moore, formerly treated under *L. obsoleta* Walker by Hampson (1892) and Strand (1910, 1923), has been reported from Darjiling by Bryk (1934). The moth is reportedly common in August on tree-trunks especially on those of older Cassias and feeds on *Ficus indicus* and also on *Eugenia* sp. particularly at night, while in day time it rests between dry leaves. Pupation takes place at tree-roots.

* 133. *Lymantria similis* Moore (1879)1879. *Lymantria similis* Moore, *Proc. zool. Soc. Lond.*, 1879 : 402.1934. *Lymantria similis* : Bryk, *Lep. Cat.*, 20 (62) : 160.

Distribution : India : West Bengal (Calcutta) ; Assam; Sikkim. *Elsewhere* : Bhutan, Philippines and Sundaland.

Remarks : The species was described from Calcutta by Moore (1879).

* 134. *Lymantria marginata* Walker (1855)1855. *Lymantria marginata* Walker, *Cat. Lep. Het. Brit. Mus.*, 4 : 877.1934. *Lymantria marginata* : Bryk, *Lep. Cat.*, 20 (62) : 161.

Distribution : India : West Bengal (Darjiling); Himachal Pradesh; Sikkim. *Elsewhere* : Bangladesh, Burma and Java.

Remarks : The species was treated as *L. beatrix* Stoll by Hampson (1892). Out of several synonyms after Hampson (*loc. cit*), only *L. fuliginosa* Moore has been revalidated as good species and *Porthetria umbrina* Moore from Darjiling (*vide* Cotes & Swinhoe, 1887-89) has not been mentioned by Bryk (1934).

135. *Lymantria semicincta* (Walker, 1855)1855. *Alope semicincta* Walker, *Cat. Lep. Het. Brit. Mus.*, 3 : 620.1934. *Lymantria semicincta* : Bryk, *Lep. Cat.*, 20 (62) : 161.

Material examined : One ex., Choricha Forest, District Birbhum, 11. xi. 1974, A. K. Hazru & party coll.

Diagnosis : *Vide* key.

Distribution : India : West Bengal (Birbhum and Darjiling); Himachal Pradesh; Sikkim.

Remarks : The female of the species was reported from Darjiling by Strand (1923). Presently, it has been found at Birbhum too. The female of this typical Indian moth was earlier common, while the apparently rare male, lying amidst the British Museum collections of *L. rhodina* Walker from the East Himalaya, was finally segregated and figured by Collenette (1933) who, however, did not furnish the description of the male.

136. *Lymantria todara* Moore (1879)

1879. *Lymantria todara* Moore, *Proc. zool. Soc. Lond.*, 1879 : 402, pl. 33, fig. 6.

1934. *Lymantria todara* : Bryk, *Lep. Cat.*, 20 (62) : 162.

Material examined : One ex., Tindharia, Darjiling district, c 850 m, 14. v. 1979, M. S. Shishodia & party coll.

Diagnosis : Vide key.

Distribution : India : West Bengal (Darjiling) ; southern Peninsula. *Elsewhere* : Sri Lanka.

Remarks : The species constitutes new locality record for West Bengal.

137. *Lymantria grandis* Walker (1855)

1855. *Lymantria grandis* Walker, *Cat. Lep. Het. Brit. Mus.*, 4 : 874.

1934. *Lymantria grandis* : Bryk, *Lep. Cat.*, 20 (62) : 163.

Material examined : One ex., Darjiling district, ...Old Colln.

Diagnosis : Vide key

Distribution : India : West Bengal (Darjiling); Himachal Pradesh. *Elsewhere* : Australia, Bhutan and Sri Lanka.

Remarks : The species was earlier reported from Darjiling by Cotes & Swinhoe (1887-'89). Most of the earlier authors except Cotes & Swinhoe (*loc. cit.*) mentioned only 'Ceylon', now Sri Lanka, as the distribution of the species. Bryk (1934) over and above mentioned "N. S. Wales ex errore" for the species.

* 138. *Lymantria lepcha* (Moore, 1879)

1879. *Porthetria lepcha* Moore, *Cat. Lep. Indian Ins. Coll. Atkinson*, 1 : 54.

1934. *Lymantria lepcha* : Bryk, *Lep. Cat.*, 20 (62) : 164.

Distribution : India : West Bengal (Darjiling) ; Sikkim. *Elsewhere* : Philippines, Sundaland and Western Malaysia.

Remarks : The species was described from Darjiling by Moore (1879).

* 139. *Lymantria grisea* Moore (1879)

1879. *Lymantria grisea* Moore, *Cat. Lep. Indian Ins. Coll. Atkinson*, 1 : 55, pl. 3, fig. 5.

1934. *Lymantria grisea* : Bryk, *Lep. Cat.*, 20 (62) : 164.

Distribution : India : West Bengal (Darjiling); Sikkim. *Eleswhere* : Burma.

Remarks : The species was described by male from Darjiling by Moore (1879)

140. *Lymantria ampla* (Walker, 1855)

1855. *Enome ampla* Walker, *Cat. Lep. Het. Brit. Mus.*, 4 : 883.

1934. *Lymantria ampla* : Bryk, *Lep. Cat.*, 20 (62) : 164.

Material examined : 2 exs., Calcutta, ... Old Colln., Joth Khamar, Lalgola, Murshidabad district, 4. iii. 1985, S. K. Mitra & party coll.

Diagnosis : *Vide key*.

Distribution : India : West Bengal (Calcutta and Murshidabad); Maharashtra; Sikkim. *Elsewhere* : Burma, Sri Lanka and Yunan.

Remarks : The species constitutes new locality record for West Bengal

* 141. *Lymantria bivittata* (Moore, 1879)

1879. *Pegella bivittata* Moore, *Descr. Lep. Ins. Coll. Atkinson*, p. 58.

1934. *Lymantria bivittata* : Bryk, *Lep. Cat.*, 20 (62) : 165.

Distribution : India : West Bengal (Darjiling); Sikkim. *Elsewhere* : Bangladesh.

Remarks : The species was described by female from Darjiling by Moore (1879). Subsequently, the male was reported by Collenette (1933).

142. *Lymantria asoetria* Hübner (1818)

1818. *Lymantria asoetria* Hübner, *Samml. exot. Schmett.*, 2 : figs. 1-4.

1934. *Lymantria asoetria* : Bryk, *Lep. Cat.*, 20 (62) : 167.

Material examined : One ex., Calcutta, ... Old Colln.

Diagnosis : *Vide key*.

Distribution : India : West Bengal (Calcutta). *Elsewhere* : Burma and Java.

Remarks : The species was hitherto unknown from India.

Genus *Perina* Walker (1854)

Key to the species

Male with head orange, thorax and abdomen brown; scaled areas of wings dark brown. Female light ochreous *nuda* (Fabricius)

Male with head, thorax and abdomen whitish; scaled areas of wings white suffused with fuscous. Female white *pura* Walker

143. *Perina nuda* (Fabricius, 1787)

1787. *Bombyx nuda* Fabricius, *Mant. Ins.*, 2 : 117.

1934. *Perina nuda* : Bryk, *Lep. Cat.*, 20 (62) : 182.

Material examined : 10 exs., Calcutta ... 2.ii. 1954, Old Collns.

Diagnosis : *Vide key.*

Distribution : India : West Bengal (Calcutta); Assam; Madhya Pradesh; Maharashtra. *Elsewhere* : China, Hong Kong, Japan, Nepal, Sri Lanka and Taiwan.

Remarks : The species, earlier known from Calcutta, is very commonly found on fig trees shading the streets of tropical towns particularly during its flying-time in September-October. It feeds on *Ficus indicus* and *F. religiosa* Strand (1923) and Bryk (1934) mentioned the occurrence of this moth in the Palaearctic belts of China and Japan.

144. *Perina pura* Walker (1869)

1869. *Perina pura* Walker, *Char. undescr. Het.*, P. 17.

1934. *Perina pura* : Bryk, *Lep. Cat.*, 20 (62) : 183.

Material examined : One ex., Calcutta, 25. ix. 1975, ? Coll.

Diagnosis : *Vide key.*

Distribution : India : West Bengal (Calcutta); Assam ; northern Peninsula.

Remarks : Closely allied to the preceding species in *facies* and *habits*, the moth was earlier known from Calcutta.

Genus *Porthesia* Stephens (1829)

Key to the species

Male white, with some dark suffusion; hind wing black; antennal pectinations brownish. Female without dark suffusion *anthorrhoea* (Kollar)

Sexes not white, but with mauve suffusion; hind wing yellow; antennal pectinations yellowish *scintillans* (Walker)

145. *Porthesia xanthorrhoea* (Kollar, 1842)

1842. *Liparis xanthorrhoea* Kollar, in Hügel, *Kash. Reich. Seik*, 4(2) : 470.

1934. *Porthesia xanthorrhoea* : Bryk, *Lep. Cat.*, 20 (62) : 205.

Material examined : One ex., Mallarpur, Birbhum district, 4. iv. 1986, M. S. Shishodia & party coll.

Diagnosis : Vide key.

Distribution : India : West Bengal (Birbhum); Assam; Himachal Pradesh; Jammu and Kashmir (Kashmir); Madhya Pradesh; Maharashtra; Meghalaya; Punjab; Uttar Pradesh; Sikkim. *Elsewhere* : Burma, Java, Nepal and Sri Lanka.

Remarks : A new record for West Bengal, the species has in its synonymy list (after Hampson, 1892) *Euproctis virguncula* Walker and *E. marginalis* Walker, both of which have been revalidated as good species under *Porthesia* by Bryk (1934). It is also interesting to note that the larval hairs of *P. xanthorrhoea* and the following couple of species, on being touched, often cause skin-inflammation.

146. *Porthesia scintillans* (Walker, 1856)

1856. *Somena scintillans* Walker, *Cat. Lep. Het. Brit. Mus.*, 7 : 1734.

1934. *Porthesia scintillans* : Bryk, *Lep. Cat.*, 20 (62) : 206.

Material examined : One ex., Medinipur district, Old Colln.

Diagnosis : Vide key.

Distribution : India : West Bengal (Calcutta, Darjiling and Medinipur) ; Andaman and Nicobar Islands (Andaman Is.); Himachal Pradesh; Jammu and Kashmir (Kashmir); Maharashtra; Sikkim. *Elsewhere* : Burma, Java, Pakistan, Philippines, Sri Lanka, Sulawesi and Western Malaysia.

Remarks : Earlier known from Calcutta as *Artaxa justiciae* Moore and also f. *limbata* Butler from Darjiling, the species is presently recorded from the Medinipur district of the state. It is said to vary greatly in facies and feed on *Sesbania* sp. and also on a species of willows.

* 147. *Porthesia euproctiformis* Strand (1923)1923. *Porthesia euproctiformis* Strand, in Seitz., *Macrolep. World*, **10** : 333, pl. 45 c.1934. *Porthesia euproctiformis* : Bryk, *Lep. Cat.*, **20** (62) : 208.*Distribution* : India : West Bengal (Darjiling).

Remarks : Apparently restricted to the Darjiling district of West Bengal, the species was described from the said district by Strand (1923). Strand's (*loc. cit.*) doubt on the distribution of this moth has been clarified by Bryk (1934).

Genus *Euproctis* Hübner (1816)

Key to the species

1. Both sexes with head, thorax and wings pure white, the last with shiny lustre; abdomen deep black, with anal tuft orange *divisa* (Walker)

Both sexes with head, thorax and wings variable in colour, the last not lustrous; abdomen not deep black 2
2. Female with head and thorax greyish fuscous; wings purplish grey, fore pair irrorated with dark scales, with a subapical black spot and termen and cilia both yellow; hind wing with a whitish marginal band; abdomen brown. Male paler, with hind wing pure white; abdominal anal tuft golden brown *magna* (Swinhoe)

One or both sexes with facies otherwise 3
3. Both sexes with head, thorax and wings dull white; abdomen fuscous black, with anal tuft brownish orange *latifascia* (Walker)

Both sexes with head, thorax and wings not white; abdominal anal tuft not brownish orange... 4
4. Female with head, thorax and abdomen fulvous; fore wing with basal purple brown area joined to the postmedian band at costal and inner areas, leaving only a yellow patch at lower angle of cell and termen; black discocellular spot absent. Male unknown *plagiata* (Walker)

Both sexes with head yellow, thorax and abdomen being variable in colour; fore wing black discocellular spot present 5
5. Thorax dorsally of dark chocolate colour, ventrally yellow; fore wing yellow, with a chocolate band covering the surface except costa, distal half of cell and termen; hind wing blackish brown with costa and terminal band yellow; abdomen black, with yellow anal brush *oreosaura* (Swinhoe)

Thorax yellow; fore wing with a series of 4 spots from lower angle of cell to dorsum, being conjoined into a yellow band in male, the latter slight and ferruginous in female
 *semisignata* (Walker)

148. *Euproctis latifascia* (Walker, 1855)

1855. *Leucoma latifascia* Walker, *Cat. Lep. Het. Brit. Mus.*, 4 : 831.

1934. *Euproctis latifascia* : Bryk, *Lep. Cat.*, 20 (62) : 221.

Material examined : 2 exs., Rambh Forest Rest House compound, Darjiling district, 12. iv. 1973, H.S. Sharma & party coll.

Diagnosis : Vide key.

Distribution : India : West Bengal (Darjiling); Jammu & Kashmir; Himachal Pradesh; Maharashtra; Manipur. *Elsewhere* : Nepal, Hong Kong, Taiwan and Vietnam.

Remarks : Swinhoe in Cotes & Swinhoe (1887-89) collected the species from Darjiling whence its distribution is presently confirmed. This and most of the following species of the genus in question rest on the trunks of trees and are captured by shaking saplings or branches by heavy blows; the members are known to fly at night.

* 149. *Euproctis lunata* Walker (1855)

1855. *Euproctis lunata* Walker, *Cat. Lep. Het. Brit. Mus.*, 4 : 837.

1934. *Euproctis lunata* : Bryk, *Lep. Cat.*, 20 (62) : 224.

Distribution : India : West Bengal (Calcutta) ; northern, southern and western Peninsula; also North-West Himalaya. *Elsewhere* : Borneo and Sri Lanka.

Remarks : The species was earlier recorded from Calcutta by Cotes & Swinhoe (1887-'89).

* 150. *Euproctis plana* Walker (1856)

1856. *Euproctis plana* Walker, *Cat. Lep. Het. Brit. Mus.*, 7 : 171.

1934. *Euproctis plana* : Bryk, *Lep. Cat.*, 20 (62) : 225.

Distribution : India : West Bengal (Darjiling); Andaman and Nicobar Islands (South Andamans); Himachal Pradesh; Meghalaya; Sikkim. *Elsewhere* : Burma, China, Java and Sulawesi.

Remarks : The species was described from Darjiling.

* 151. *Euproctis varians* (Walker, 1855)

1855. *Artaxa varians* Walker, *Cat. Lep. Het. Brit. Mus.*, 4 : 796.

1934. *Euproctis varians* : Bryk, *Lep. Cat.*, 20 (62) : 226

Distribution : India : West Bengal (Calcutta); almost throughout the mainland and also Andamans. *Elsewhere* : Bhutan, Burma, China, Malaya, Pakistan, Philippines, Sri Lanka and South Africa.

Remarks : The species was earlier recorded from Calcutta by Cotes & Swinhoe (1887-'89).

* 152. *Euproctis digamma* (Gue'rin, 1829-1838)

1829-1838. *Bombyx digamma* Gue'rin, in Cuvier, *Icon. R. Anim. Ins.*, 7 : 508, pl. 86, fig. 4.

1934. *Euproctis digamma* : Bryk, *Lep. Cat.*, 20 (62) : 229.

Distribution : India : West Bengal (Calcutta); Karnataka; Meghalaya. *Elsewhere* : Bangladesh, Borneo, Burma, China, Java, Nepal and Sri Lanka.

Remarks : The species, earlier recorded from Calcutta by Cotes & Swinhoe (1887-'89), was mentioned as common in India by Strand (1910).

* 153. *Euproctis dispersa* (Moore, 1879)

1879. *Artaxa dispersa* Moore, *Descr. Indian Lep. Coll. Atkinson*, 1 : 50, pl. 2, fig. 6.

1934. *Euproctis dispersa* : Bryk, *Lep. Cat.*, 20 (62) : 230.

Distribution : India : West Bengal (Darjiling); Sikkim.

Remarks : Restricted to the East Himalaya, the species was confusingly described as *Artaxa inconcisa* Walker (1865) from Sikkim and subsequently recorded from Darjiling by Cotes & Swinhoe (1887-89).

* 154. *Euproctis subfasciata* (Walker, 1865)

1865. *Artaxa subfasciata* Walker, *Cat. Lep. Het. Brit. Mus.*, 32 : 332.

1934. *Euproctis subfasciata* : Bryk, *Lep. Cat.*, 20 (62) : 230.

Distribution : India : West Bengal (Calcutta); Assam; Meghalaya; Sikkim; Tamil Nadu. *Elsewhere* : Philippines and Vietnam.

Remarks : The species was reported from Calcutta by Hampson (1892).

* 155. *Euproctis venosa* (Moore, 1879)

1879. *Artaxa venosa* Moore, *Descr. Indian Lep. Coll. Atkinson*, 1 : 50, pl. 2, fig. 5.

1934. *Euproctis venosa* : Bryk, *Lep. Cat.*, 20 (62) : 231.

Distribution : India : West Bengal (Darjiling); Sikkim. *Elsewhere* : South Burma.

Remarks : The species was originally described from Darjiling.

* 156. *Euproctis variegata* Moore (1879)1879. *Euproctis variegata* Moore, *Descr. New Indian Lep. Coll. Atkinson*, 1 : 48, pl. 2, fig. 24.1934. *Euproctis variegata* : Bryk, *Lep. Cat.*, 20 (62) : 232.*Distribution* : India : West Bengal (Darjiling); Sikkim.*Remarks* : The species, which was originally described from Darjiling, was treated as *Daplasa variegata* by Hampson (1892).157. *Euproctis plagiata* (Walker, 1855)1855. *Cispia plagiata* Walker, *Cat. Lep. Het. Brit. Mus.*, 4 : 858.1934. *Euproctis plagiata* : Bryk, *Lep. Cat.*, 20 (62) : 232.*Material examined* : One ex., Darjiling, 19 x. 1887,? Coll.*Diagnosis* : Vide key.*Distribution* : India : West Bengal (Darjiling). *Elsewhere* : Nepal.*Remarks* : The species, apparently rare, constitutes new locality record for West Bengal.* 158. *Euproctis marginata* (Moore, 1879)1879. *Chaerotracha marginata* Moore, *Descr. New Indian Lep. Coll. Atkinson*, 1 : 49.1934. *Euproctis marginata* : Bryk, *Lep. Cat.*, 20 (62) : 232.*Distribution* : India : West Bengal (Kurseong : Darjiling); Manipur; Sikkim.*Remarks* : The species was reported from the Darjiling district by Bryk (1934).* 159. *Euproctis uniformis* (Moore, 1879)1879. *Chaerotracha uniformis* Moore, *Descr. New Indian Lep. Coll. Atkinson*, 1 : 49.1934. *Euproctis uniformis* : Bryk, *Lep. Cat.*, 20 (62) : 232.*Distribution* : India : West Bengal (Darjiling); Sikkim. *Elsewhere* : Burma.*Remarks* : The species was originally described by female from Darjiling.* 160. *Euproctis bipartita* (Moore, 1879)1879. *Chaerotracha bipartita* Moore, *Descr. New Indian Lep. Coll. Atkinson*, 1 : 49, pl. 2, fig. 4.1934. *Euproctis bipartita* : Bryk, *Lep. Cat.*, 20 (62) : 233.*Distribution* : India : West Bengal (Darjiling); Sikkim.

Remarks : Same as for the preceding species.

161. *Euproctis oreosaura* (Swinhoe, 1894)

1894. *Adlullia oreosaura* Swinhoe, *Ann. Mag. nat. Hist.*, (6) 14 : 435.

1934. *Euproctis oreosaura* : Bryk, *Lep. Cat.*, 20 (62) : 234.

Material examined : One ex., Darjiling, vi. 1912, *Car Michael* coll. (Old Colln.).

Diagnosis : *Vide key*.

Distribution : India : West Bengal (Darjiling); Meghalaya. *Elsewhere* : Java and Sumatra

Remarks : The species constitutes new locality record for West Bengal.

* 162. *Euproctis howra* (Moore, 1879)

1879. *Artaxa howra* Moore, *Descr. Indian Lep. Coll. Atkinson*, 1 : 51.

1934. *Euproctis howra* : Bryk, *Lep. Cat.*, 20 (62) : 234.

Distribution : India : West Bengal (Calcutta); Andaman Is.; Karnataka; Tamil Nadu. *Elsewhere* : Burma

Remarks : The species, originally described from Calcutta, has two subspecies, viz., *ssp. rhoda* (Swinhoe) from north Kanara and *obsoleta* (Hampson) from the Nilgiri Hills, of which the former was earlier treated as valid species with the latter as its synonym by Hampson (1892).

163. *Euproctis semisignata* (Walker, 1865)

1865. *Cispia semisignata* Walker, *Cat. Lep. Het Brit. Mus.*, 32 : 356.

1934. *Euproctis semisignata* : Bryk, *Lep. Cat.*, 20 (62) : 235.

Material examined : 2 exs., Lepchajagat Forest Rest House, Darjiling district, 3. vii. 1975, *J. K. Jonathon & party* coll.

Diagnosis : *Vide key*.

Distribution : India : West Bengal (Darjiling); Maharashtra; Karnataka. *Elsewhere* : Sri Lanka.

Remarks : Presently known from Darjiling, the species was earlier reported from Bengal by Bryk (1934), who, however, did not specifically mention district of the state concerned. Strand (1923) mentioned the wide distribution of the species in India and Sri Lanka.

* 164. *Euproctis lativitta* (Moore, 1879)

1879. *Pida lativitta* Moore, *Descr. New Indian Lep. Coll. Atkinson*, 1 : 49, pl. 2, fig. 18.

1934. *Euproctis lativitta* : Bryk, *Lep. Cat.*, 20 (62) : 236.

Distribution : India : West Bengal (Darjiling) ; Nagaland; Sikkim.

Remarks : The species, with which *E. nigripennis* Hampson has been synonymised by Bryk (1934), is restricted to the East Himalaya. *E. lativitta* was described from Darjiling.

* 165. *Euproctis postincisa* Moore (1879)

1879. *Euproctis postincisa* Moore, *Proc. zool. Soc. Lond.*, 1879 : 400 pl. 32, fig. 5.

1934. *Euproctis postincisa* : Bryk, *Lep. Cat.*, 20 (62) : 236.

Distribution : India : West Bengal (? Northern district) ; Sikkim.

Remarks : The specific district of West Bengal, where the species is distributed, is not cited in literature.

166. *Euproctis magna* (Swinhoe, 1891)

1891. *Somena magna* Swinhoe, *Trans. ent. Soc. London*, p. 479.

1934. *Euproctis magna* : Bryk, *Lep. Cat.*, 20 (62) : 237.

Material examined : 2 exs., Govt. House compound, Darjiling, 5 v. 1912, *Car Michael* coll. (Old Colln.).

Diagnosis : Vide key.

Distribution : India : West Bengal (Darjiling); Meghalaya. *Elsewhere* : Burma.

Remarks : A new record for West Bengal, the species was hitherto known from other localities in the East Himalaya. While Hampson (1892) mentioned the wing expanse as "64 mm" Strand (1923) recorded it as "44 mm" for this moth. The specimens examined have the expanse of 54-60 mm.

* 167. *Euproctis inconcisa* (Walker, 1865)

1865. *Artaxa inconcisa* Walker, *Cat. Lep. Het. Brit. Mus.*, 32 : 332.

1934. *Euproctis inconcisa* : Bryk, *Lep. Cat.*, 20 (62) : 238.

Distribution : India : West Bengal (Darjiling) ; Meghalaya; Punjab; Sikkim.

Remarks : This species, described from Darjiling, included "*dispersa* Moore" as synonym after Hampson (1892), but later Bryk (1934) considered both these as valid species.

168. *Euproctis divisa* (Walker, 1855)

1855. *Lerna ? divisa* Walker, *Cat. Lep. Het. Brit. Mus.*, 4 : 836.

1934. *Euproctis divisa* : Bryk, *Lep. Cat.*, 20 (62) : 239.

Material examined : 6 exs., Ghumbhanjan, 28. iii. 1975, Lepchajagat Forest Rest House compound.

3. vi. 1985, Manibhanjan, c. 2000 m, 18. v. 1985, J. K. Jonathon & party coll., Mahanadi Goomti Tea Factory Premises, 28. iv. 1971, Sukia Pokri, 17. v. 1971, A. R. Bhowmik & party coll., Tindharia, 14. v. 1979, c 850 m, dist. Darjiling, M. S. Shishodia & party coll.

Diagnosis : Vide key.

Distribution : India : West Bengal (Darjiling); Meghalaya; Nagaland; Punjab; Sikkim. *Elsewhere* : Bangladesh, Nepal, West China and Vietnam.

Remarks : New record for Darjiling, this species has a couple of synonyms, viz, *E. melanophila* Walker and *E. metamelana* Walker (vide Hampson, 1892), none of which has, however, been cited by Bryk (1934). It is very common in West Bengal.

* 169. *Euproctis basalis* (Moore, 1879)

1879. *Artaxa basalis* Moore, *Descr. New Indian Lep. Coll. Atkinson*, 1 : 51, pl. 2. fig. 16.

1934. *Euproctis basalis* : Bryk, *Lep. Cat.*, 20 (62) : 240.

Distribution: India : West Bengal (Darjiling); Meghalaya; Sikkim.

Remarks : The species was originally described from Darjiling and is reportedly restricted to the East Himalaya.

* 170. *Euproctis immaculata* (Butler, 1881)

1881. *Chaerotracha immaculata* Butler, III. *Typ. Lep. Het. Brit. Mus.*, 5 : 52, pl. 89, fig. 14.

1934. *Euproctis immaculata*: Bryk, *Lep. Cat.*, 20 (62) : 240.

Distribution : India : West Bengal (Darjiling).

Remarks : Described from and hitherto restricted to Darjiling, the species was confusingly treated by Hampson (1892) in the synonymy list of *E. plana*.

* 171. *Euproctis madana* Moore (1859)

1859. *Euproctis madana* Moore, *Cat. Lep. E. India, Comp.*, 2 : 348.

1934. *Euproctis madana* : Bryk, *Lep. Cat.*, 20 (62) : 240.

Distribution : India : West Bengal (Darjiling); Meghalaya; Sikkim.

Remarks : The species was originally described by female from Darjiling.

Genus *Mardara* Walker (1865)

* 172. *Mardara plagidotata* (Walker, 1862)

1862. *Cyclidia plagidotata* Walker, *Cat. Lep. Het. Brit. Mus.*, 25 : 1483.

1934. *Mardara plagidotata* : Bryk, *Lep. Cat.*, 20 (62) : 280.

Distribution : India : West Bengal (Darjiling); Nagaland.

Remarks : The species was originally described from Darjiling.

173. *Mardara calligramma* Walker (1865)

1865. *Mardara calligramma* Walker, *Cat. Lep. Het. Brit. Mus.*, 32 : 402.

1934. *Mardara calligramma* : Bryk, *Lep. Cat.*, 20 (62) : 280.

Material examined : One ex., 9. ix. 1948, Darjiling, Old Colln.

Diagnosis : Head, thorax and fore wing brown, first two with yellow hairs and the last with yellow veins, lines and a discocellular spot; hind wing smoky black. Abdomen with yellow-fringed segments and an orange anal brush.

Distribution : India : West Bengal (Darjiling); Himachal Pradesh; Nagaland; Sikkim.

Remarks : Originally described from Darjiling by male, this species is typically Himalayan in distribution. The specimen examined is a male. The spelling, "*caligramma*" after Hampson (1892) and Strand (1915) is *lapsus calami*.

* 174. *Mardara irrorata* (Moore, 1879)

1879. *Mahoba irrorata* Moore, *Descr. New Indian Lep. Coll. Atkinson*, 1 : 52.

1934. *Mardara irrorata* : Bryk, *Lep. Cat.*, 20 (62) : 280

Distribution : India : West Bengal (Darjiling); Sikkim.

Remarks : Originally described from Darjiling, this species was earlier treated as *Euproctis flavimaculata* Hampson (1892), but subsequently corrected as *M. irrorata* by the same author (*vide* Hampson, 1896).

Genus *Heracula* Moore (1865)

* 175. *Heracula discivitta* Moore (1865)

1865. *Heracula discivitta* Moore, *Proc. zool. Soc. Lond.* 1865 : 804, pl. 43, fig. 2.

1934. *Heracula discivitta* : Bryk, *Lep. Cat.* 20 (62) : 286.

Distribution : India : West Bengal (Darjiling); Sikkim.

Remarks : This is a monotypic species described from Darjiling. The Australian species, *leonina* Turner, was earlier treated under this genus by Strand (1915), but Bryk (1934) transferred it to the genus *Euproctis* Hübner.

Genus *Cispia* Walker (1855)

Key to the species

Fore wing brownish-orange, with medial band edged by red-brown internervular strigae; hind wing orange, underside with a maculate postmedial band, fore wing apex not fuscous
 *punctifascia* Walker

Fore wing bright orange, with medial band edged by almost concolourous inter-nervular strigae; hind wing also bright orange; underside of both wings with a maculate band, fore wing apex being fuscous
 *venosa* Walker

176. *Cispia punctifascia* Walker (1855)

1855. *Cispia punctifascia* Walker, *Cat. Lep. Het. Brit. Mus.*, **4** : 857.

1934. *Cispia punctifascia* : Bryk, *Lep. Cat.*, **20** (62) : 288.

Material examined : One ex., 1 km. south of Rayang Forest Rest House on the bank of the River Rayang, Darjiling, c 1300 m, 18. iii. 1985, H. S. Sharma & party coll.

Diagnosis : Vide key.

Distribution : India : West Bengal (Darjiling); Assam; Sikkim. *Elsewhere* : Bangladesh, Bhutan, Sri Lanka, Sumatra and Java.

Remarks : The species, earlier known from Darjiling, is represented by one male specimen which may be referred to the nominate subspecies from North India, having the medial band of the fore wing reaching both the costal and terminal margins. Strand (1923) mentioned, "The imagines of the genus do not seem to be very common"

177. *Cispia venosa* Walker (1862)

1862. *Cispia venosa* Walker, *Trans. ent. Soc. Lond.*, (3) **1** : 264.

1934. *Cispia venosa* : Bryk, *Lep. Cat.*, **20** (62) : 288.

Material examined : One ex., ... Darjiling, Old Colln.

Diagnosis : Vide key

Distribution : India : West Bengal (Darjiling); Sikkim.

Remarks : The species constitutes new locality record for West Bengal.

Genus *Imaus* Moore (1879)178. *Imaus munda* (Walker, 1855)

1855. *Lymantria munda* Walker, *Cat. Lep. Het. Brit. Mus.*, 4 : 875.

1934. *Imaus munda* : Bryk, *Lep. Cat.*, 20 (62) : 290.

Material examined : 5 exs., Govt. House ground, 5 v. 1912, Old Colln., Rongpo, c 550 m, 15. iv. 1976, Darjiling district, A. R. Bhowmik & party coll.

Diagnosis : Wings light brown ; fore wing with prominent spots and dentate postmedial line, hind wing with indistinct markings; legs spotted black.

Distribution : India : West Bengal (Darjiling); Meghalaya; Sikkim. *Elsewhere* : Bangladesh, Bhutan, Borneo and Java.

Remarks : Earlier known from Darjiling and spelt as "*mundus*" and "*mondus*" by certain authors, the species is locally common in the East Himalaya. Its occurrence in "North-West India" after Strand (1923), is, however, doubtful.

Genus *Dura* Moore (1879)179. *Dura alba* Moore (1879)

1879. *Dura alba* Moore, *Descr. New Indian Lep. Coll. Atkinson*, 1 : 56.

1934. *Dura alba* : Bryk, *Lep. Cat.*, 20 (62) : 292.

Material examined : One ex., Manibhanjan, 1 km. north of the Youth Hostel, Darjiling district, 19. v. 1975, J. K. Jonathon & party coll.

Diagnosis : Wings brownish white; fore wing with seven indistinct brownish wavy lines, orbicular and reniform outlined brownish; both wings with marginal series of black dots; palpi laterally black; antennal branches red-brown.

Distribution : India : West Bengal (Darjiling); Sikkim. *Elsewhere* : Philippines, Sumatra and Taiwan.

Remarks : Originally described from Darjiling, the species was earlier treated as *albus* under the genus *Imaus* Moore by Hampson (1892); subsequently it has been transferred to *Dura* Moore by Bryk (1934) on the basis of the characters already cited under the generic key of the Group Inareolatae.

Genus *Caviria* Walker (1855)* 180. *Caviria sericea* (Moore, 1879)

1879. *Stilpnotia sericea* Moore, *Descr. New Indian Lep. Ins. Coll. Atkinson*, p. 45.

1934. *Caviria sericea* : Bryk, *Lep. Cat.*, 20 (62) : 389.

Distribution : India : West Bengal (Darjiling); Kashmir; Sikkim; Uttar Pradesh. *Elsewhere* : Tibet and West China.

Remarks : The species was described from Darjiling by Moore (1879). It is not rare in Darjiling.

* 181. *Caviria ochripes* (Moore, 1879)

1879. *Stilpnotia ochripes* Moore, *Descr. New Indian Lep. Ins.. Coll. Atkinson*, p. 45.

1934. *Caviria ochripes* : Bryk, *Lep. Cat.*, 20 (62) : 389.

Distribution : India : West Bengal (Darjiling); Meghalaya; Nagaland; Sikkim. *Elsewhere* : Burma and West China.

Remarks : The species was described from Darjiling by Moore (1879).

Family IV. RATARDIDAE

Genus *Ratarda* Moore (1879)

* 182. *Ratarda marmorata* Moore (1879)

1879. *Ratarda marmorata* Moore, *Proc. zool. Soc. Lond.*, 1879 : 393, pl. 32, fig. 1.

1937. *Ratarda marmorata* : Hering, *Lep. Cat.*, 20 (81) : 2.

Distribution : India : West Bengal (Darjiling); Sikkim.

Remarks : Originally described from Darjiling, this species, along with two others, viz., *R. furvivescita* Hampson and *R. guttifera* Moore, all from the East Himalaya, have been segregated by Hering (1937) from Lymantriidae on the basis of the characters already cited under the key to the families.

SUMMARY

Systematic account of 182 species in 73 genera under 6 subfamilies of 4 families, viz., Sphingidae, Lasiocampidae, Lymantriidae and Ratardidae, from West Bengal is dealt with. A fairly good number of species, not available in the collections under report, are reviewed from literature. Keys to the taxa only for the material examined along with two maps showing distribution of very common and rare moths in the state are also incorporated. Thirty species constitute new locality records from West Bengal, of which one, i.e., *Lymantria asoetria* Hübner, was hitherto unknown from India.

ACKNOWLEDGEMENT

The authors are grateful to the Director, Zoological Survey of India, for kindly providing the laboratory facilities for the work.

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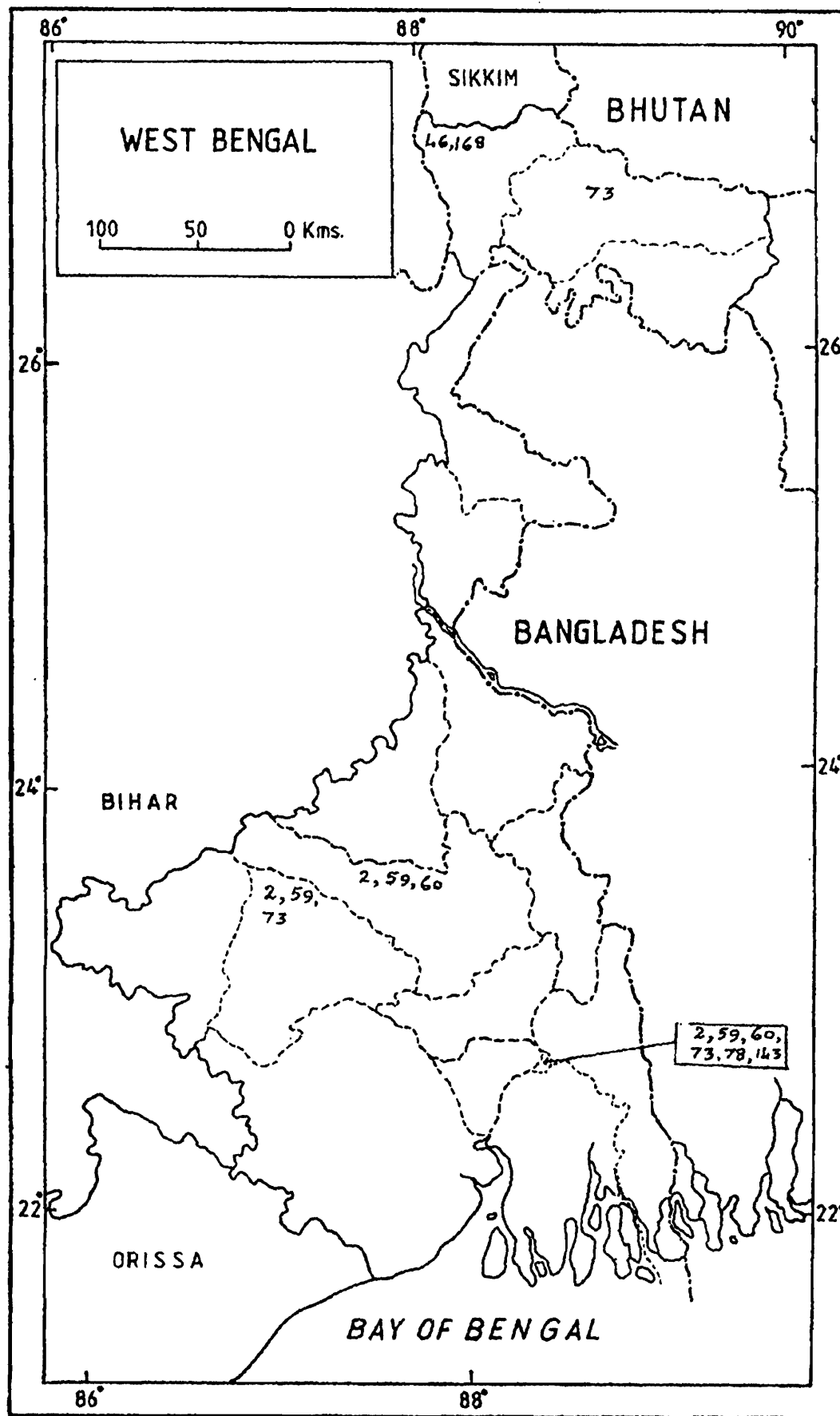


Fig. 1. Map of West Bengal showing the distribution of very common species.

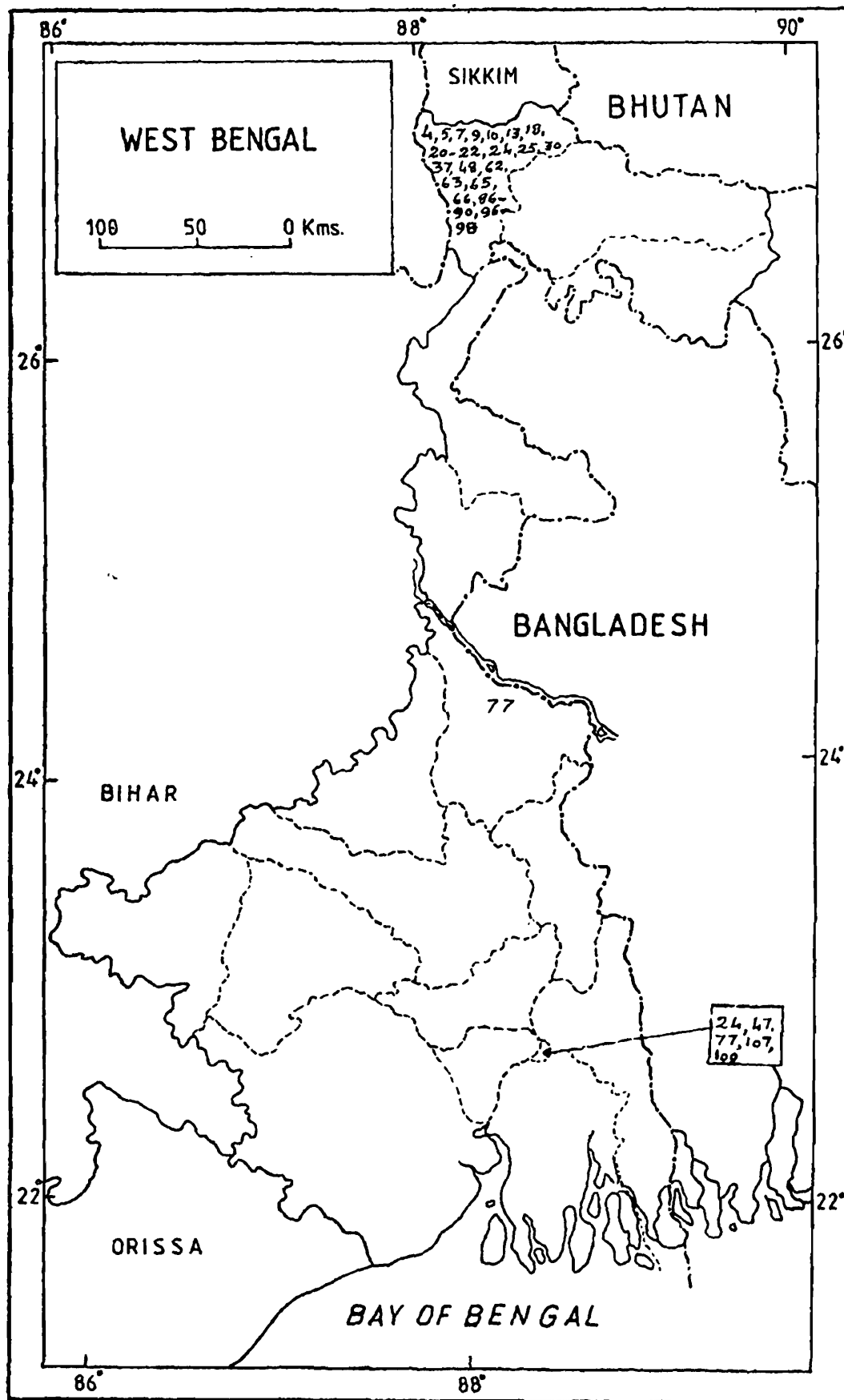


Fig. 2. Map of West Bengal showing the distribution of very rare/rare species.

INSECTA : LEPIDOPTERA : CTENUCHIDAE AND HYP SIDAE

S. K. GHOSH AND MRIDULA CHAUDHURY

Zoological Survey of India, Calcutta

INTRODUCTION

The present study is based on the collections of lepidoptera belonging to the families Ctenuchidae and Hypsididae lying in the National Zoological Collections and also on the collections made by different survey parties of Zoological Survey of India.

The account deals with a brief note on earlier investigation, key to taxa of the examined material, new locality records (marked*) and literature references. The species which are not available for study, have been reviewed from literature (marked**). Maps showing the distribution of 15 species of the family Ctenuchidae and 4 species of the family Hypsididae examined from different districts of West Bengal have also been included in this paper.

The classification of both the families has been mainly adopted after Hampson (1892, 1898).

EARLIER INVESTIGATION

The Indian Ctenuchidae is known through the works of Cotes and Swinhoe (1887-89), Hampson (1892, 1898), Seitz (1913, 1933) and Arora (1976, 1980). For Indian Hypsididae Cotes and Swinhoe (1887-1889), Hampson (1892) and Seitz (1933) may be referred to for references.

Key to families

1. Hind wing vein Sc+R₁ abroked, palpi small CTENUCHIDAE
- Hind wing vein Sc+R₁ present, palpi long HYP SIDAE

Family CTENUCHIDAE

Key to genera

1. R₅ and M₁ coincident in hindwing 2
- R₅ and M₁ not coincident in hindwing *Euchromia* Hübner
2. Cu_{1a} in hindwing absent *Creyx* Wallengren
- Cu_{1a} in hindwing present 3

3. M_2 either arising from lower angle of cell or shortly stalked with Cu_{1a} in hindwing
 *Syntomis* Ochsenheimer
- M_2 arising well above angle of cell and not stalked with Cu_{1a} in hindwing *Eressa* Walker

Genus *Euchromia* Hübner

1827. *Euchromia* Hübner, *Verz. bek. Schmett.*, p. 121.

1 *Euchromia polymena* (Linnaeus)

1858. *Sphinx polymena* Linnaeus, *Syst. Nat.*, 1:494.

1898. *Euchromia polymena*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, 1:297-298.

Material examined : West Bengal, Howrah district, Mahespur, 1(M), 2(F), 25.1.1986 (Coll. B. Dutta & G.C. Sen).

Wing expanse : (M), (F) : 42-45 mm.

Distribution : West Bengal (Howrah), Andamans, Maharashtra, (Bombay), Tamil Nadu (Nilgiris); Sri Lanka. Burma (Tenasserim, Moulemin), Thailand, China (Formosa), Sulwesi and the Philippines (Manila).

Genus *Ceryx* Wallengren

1863. *Ceryx* Wallengren, *Wien. Ent. Mon.*, 7:140.

Key to species of the Genus *Ceryx* Wallengren

- 1 Antennae of male minutely serrate or simple and not dilated 2
- Antennae of male bipectinate with short branches, dilated at extremity *diptera* (Fabricius)
- 2 Hindwing with narrow terminal black band *godartii* (Boisduval)
- Hindwing with broad terminal black band extending nearly to cell *imaon* (Cramer)

*2. *Ceryx diptera* (Fabricius)

1775. *Zygaena diptera* Fabricius, *Syst. Ent.*, p. 555.

1898. *Ceryx diptera*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, 1:36-37.

Material examined : West Bengal, Bankura district, Mukutmanipur, 1(M), 2 (F), 28.x.1985 (Coll. M. Dutta & party); Midnapur district, Belpahari, 2(M), 9.ix.1985 (Coll. S. Biswas & party).

Wing expanse : (M) : 17 mm., (F) : 20-22 mm.

Distribution : India : West Bengal (Bankura and Midnapur), South India including Tamil Nadu (Coimbatore); Sri Lanka.

Remarks : The species is for the first time recorded from West Bengal and readily recognised by the yellow band on first and penultimate segments of the abdomen in males.

3. *Ceryx godartii* (Boisduval)

1829. *Syntomis godartii* Boisduval, *Mon. Zyg.*, p. 115, pl. 7, fig. 3.

1898. *Ceryx godartii*, Hampson, *Lep. Phal. Brit. Mus.*, 1:43-44.

Material examined: West Bengal, Darjiling district, Garubathan F.R.H., 1200 ft., 1(F), 19.xii.1973 (Coll. G.K. Srivastava & P.K. Maity), Chunabati, 1(M), 9.iii.1974 (Coll. H.K. Bhowmik & party), Rongpo F.R.H., 500m., 1(F), 24.xii.1975, Singla F.R.H., 1(M), 5.1.1976 (Coll. G.K. Srivastava & G.S. Arora); South 24 Parganas, Hatberia, 1(M), 26.ii.1978 (Coll. N. K. Pramanik).

Wing expanse : (M), (F) : 30 mm.

Distribution : India : West Bengal (Calcutta, Darjiling and 24-Parganas), Assam, Sikkim, and South India; Burma, Malay and Sumatra.

4. *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: West Bengal, Darjiling district, Reyang F.R.H., 275m., 4(F), 28.iii.1973 (Coll. H.S. Sharma & party), 3 kms. N. of Garubathan, 2 (M), 2 (F), 20.xii. 1973, (Coll. G.K. Srivastava & P.K. Maity), Bijanbari, Hariyanabhawan, 1(M), 25.v.1974 (Coll. J.K. Jonathan & party), Melli, 5 Km. N. of Teesta, 300 m., 1(F), 27.xii.1975 (Coll. J.K. Jonathan & party), Melli 5 Kms. N. of Teesta, 300 m., 1(F), 27.xii.1975, Singla F.R.H., 1 (F), 3.1.1976, Rongpo F.R.H., 500 m., 1(F), date nil (Coll. G.K. Srivastava & G.S. Arora), Teesta, 650 ft., 1(M), 23.ix.1980 (Coll. B.C. Das); Jalpaiguri district, Champramuni Forest, 2 (M), 2(F), 30.v.1975 (Coll. B.C. Das).

Wing expanse : (M) (F) : 32 mm.

Distribution : India : West Bengal (Calcutta, Darjiling and Jalpaiguri), Assam, (Cachar), Andamans, Himachal Pradesh, Jammu & Kashmir, Maharashtra, (Bombay), Meghalaya (Shillong) and Tamil Nadu (Nilgiris); Sri Lanka, Burma and Indonesia.

Genus *Syntomis* Ochsenheimer

1808. *Syntomis* Ochsenheimer, *Eur. Schmett.*, 2 : 103.

Key to species of the genus *Syntomis* Ochseneheimer

1. Antennae simple in both sexes2
 Antennae of male serrate, female simple *diaphana* Kollar
2. Abdomen with more than two bands3
 - Abdomen with two bands4
3. Frons black; basal area of hind wing not hyaline *passalis* (Fabricius)
 Frons white; basal area of hindwing mostly hyaline *maltaena* Walker
4. Collar without orange ring5
 Collar with orange ring *cyssea* (Stoll)
5. Metathorax with orange patch6
 Metathorax without orange patch7
6. Inner area of hindwing bright orange *sperbius* (Fabricius)
 Inner area of hindwing without orange colour *hydatina* Butler
7. Frons yellow, hindwing with two yellowish spots *bicincta* (Kollar)
 Frons black, hindwing with a single yellowish spots *cingulata* (Weber)

***5. *Syntomis diaphana* Kollar**

1844. *Syntomis diaphana* Kollar, In : *Hugels Kaschmir und das Reich der Seik*, 4 : 46, pl. 19, fig. 7.

Material examined : West Bengal, Darjiling district, Kurseong, Subedarbasti , Dhobi Khola, 1459m., 1(M), 5.v.1971 (coll A.R. Bhowmik & party); North 24 Parganas district, Salt Lake, Nalbari, 2(F), 31.v.1964 (Coll. B. Biswas).

Wing expanse : (M) : 42mm., (F) : 45-50 mm.

Distribution : India : West Bengal (Darjiling and 24-Parganas), Assam, (Sibsagar), Jammu & Kashmir, Meghalaya (Khasis) and N.W. Himalayas (Almorah, Dalhousie, Mussorie, Kasauli) and Burma.

Remarks : The species is for the first time recorded from West Bengal. It can be recognised by the orange streaks below costa and on inner margin of forewing and also by the black anal segment.

6. *Syntomis passalis* (Fabricius)

1781. *Zygaena passalis* Fabricius, *Sp. Ins.*, 2 : 159.

1898. *Syntomis passalis*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, 1:86.

Material examined : West Bengal, Burdwan district, 1 (M), 1(F), 28.i.1983 (Coll. N. Haque), Guscara, 1 (M), 10.ix.1988 (Coll. K.K. Roy & party); Malda district, Nalagola, 1 (M), 2 (F), 18.vi.1989 (Coll. K.P. Mukherjee & party); Midnapur district, Chandrakona, 1 (M), 2 (F) 27.xi.1974 (Coll. A.K. Hazra & party), East Jhargram, 1(M), 1(F), 10.viii.1985, Dantan Chaulia, 1(M), 13.viii.1985 (Coll. B.C. Das & party); Murshabad district, Berhampur, C.S.R.S. Campus, 1(M), 3.xi.1974 (Coll. A.K. Hazra & party) Berhampur, 1(M), 15.ii.1986 (Coll. I.J. Gupta & party); Howrah district, Botanical Garden, 1(M), 1(F), 22.iv.1960 & 21.vi.1961 (Coll. H.N. Singh & S. Ali), Mahespur, 1(F), 25.1.1986, Uluberia, 26.1.1986 (Coll. B. Dutta & G.C. Sen); North 24-Parganas district, Salt Lake, Nalbari, 3(M), 2(F), 31.v.1964, 20.vi.1905, 1.v.1969 (Coll. B. Biswas); South 24 Parganas district, Diamond Harbour, 3 (F), 9.ii.1966 (Coll. A.N.T. Joseph), Laxmikantapur, 1(M), 15.x.1965 (Coll. S.P. Chakraborty & K.D. Chatterjee); Calcutta, Eden Garden, 2(F), 3.viii.1958 (Coll. A.P. Kapur), Dumdum, 3 (M), 19.ii.1959 (Coll. A.R. Bhowmik), Majerhat, 1(M), 22.viii.1927 (Coll. H.S. Pruthi).

Wing expanse : (M), (F) : 35-45 mm.

Distribution : India : West Bengal (Burdwan, Calcutta, Howrah, 24-Parganas, Malda, Midnapur and Murshidabad), Assam, Karnataka (Bangalore) and Tamil Nadu (Coimbatore); Sri Lanka.

*7. *Syntomis melaena* (Walker)

1854. *Syntomis melas* Walker, *List Lep. Insects. Brit. Mus.*, 1 : 133.

1898. *Syntomis malaena*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, 1 : 96.

Material examined : West Bengal, Darjeeling district, Kurseong, Dhobikhola, Subedarbasti, 1459 m., 2(F), 30.iv.1971 (Coll. A.R. Bhowmik & party).

Wing expanse : (F) : 54 mm.

Distribution : India : West Bengal (Darjiling), Assam, Meghalaya (Shillong and Khasis) and Sikkim; Burma and Nepal.

Remarks : The species constitutes a new locality record for West Bengal. It may be easily recognised by the white frons and basal hyaline area of hindwing.

8. *Syntomis cyssea* (Stoll)

1872. *Sphinx cyssea* Stoll, *Pap. Exot.*, 4:124, p. 355 B.

1898. *Syntomis cyssea*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, 1 : 105.

Material examined : West Bengal, Darjiling district, Bijanbari, in and around Phulbazar, 1(M),

29.v.1924 (Coll. *J.K. Jonathan & party*); Murshidabad district, C.S.R.S. Campus, 2 (M), 1(F), 3.xi.1974 (Coll. *A.K. Hazra & party*), Azimganj, 2(M), 1(F), 5.ii.1986 (Coll. *I.J. Gupta & party*); Bankura district Susunia Forest, 700 ft., 1(M), 21.xi.1974 (Coll. *A.K. Hazra & party*); South 24-Parganas district, Sukchar, 16 Kms. N. of Calcutta, 2(M), 2.viii.1964 (Coll. *B. Biswas*), Hatberia, 1(M), 26.i.1978 (Coll. *N.K. Pramanik*); Calcutta, Bansdrani, 1 (M), 14.i.1960 (Coll. *A.R. Bhowmik & S. Ali.*)

Wing expanse : (M) : 25 30 mm., (F) : 30 mm.

Distribution : India : West Bengal (Bankura, Calcutta, Darjiling and Murshidabad, 24-Parganas), Maharashtra (Bombay), N.W. Himalayas (Kangra), Tamil Nadu (Nilgiris); Nepal, Sri Lanka, Burma (Mhow) and Pakistan (Karachi).

*9. *Syntomis sperbius* (Fabricius)

1787. *Zygaena sperbius* Fabricius, *Mant. Ins.*, 2 : 103.

1898. *Syntomis sperbius*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, 1 : 106.

Material examined : West Bengal, Darjiling district, Garubathan, Pant Hill, 3 (F), 2.iii.1974 (Coll. *H.K. Bhowmik & party*), Bijanbari High School, 3 Kms. along Rongil River East Bank, 900 m., 2(F), 19.v.1974 (Coll. *J.K. Jonathan & party*).

Wing expanse : (F) : 30 mm.

Distribution : India : West Bengal (Darjiling), Assam (Cachar) and Sikkim ; Burma (Moulmein, Tenasserim and Tonkin).

Remarks : The species constitutes a new locality record for West Bengal. It can be easily recognised by the orange patch on metathorax and also bright orange inner area of hindwing.

10. *Syntomis hydatina* Butler

1876. *Syntomis hydatina* Butler, *Linn. Soc. Zool.*, 12:346.

Material examined : West Bengal, Murshidabad district, Raghunathganj Char, 5 (M), 8.ii.1986 (Coll. *I.J. Gupta & party*), Berhampur, Sericulture Inst., 1(F), 26.ii.1986 (Coll. *S.K. Mitra & party*); Nadia district, Plassey, Ramnagar, 1(M), 25.1.1986, Kalyani, Bhaonipur., 1(M), 22.1.1986 (Coll. *A.R. Lahiri & party*).

Wing expanse : (M) : 24 mm., (F) : 26 mm.

Distribution : India : West Bengal (Calcutta, Murshidabad and Nadia), Central India and Sikkim.

1. *Syntomis bicincta* Kollar

1844. *Syntomis bicincta* Kollar, *In : Hugel's Kaschmir und das Reich der. Siek.*, 4 : 460, pl. 19. fig.8.

Material examined : West Bengal, Darjiling district, 1 km., S.W. of Goke F.R.H., 1(M), 16.IV.1973 (Coll. H.S. Sharma & party).

Wing expanse : (M) : 40 mm.

Distribution : India : West Bengal (Calcutta and Darjiling), Meghalaya (Khasis), N.W. Himalayas, Uttar Pradesh (Dehra Dun) and Sikkim; China (Foochow).

12. *Syntomis cingulata* (Weber)

1801. *Zygaena cingulata* Weber, *Obs. Ent.*, p. 109.

1898. *Syntomis cingulata*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, 1:107.

Material examined : West Bengal, Murshidabad district Raghunathganj Char, 1(M), 18.II.1986 (Coll. I.J. Gupta & party).

Wing expanse : (M) : 23 mm.

Distribution : India : West Bengal (Murshidabad) and Andamans; China (Hongkong).

Remarks : Arora (1980) following Obrazstov (1966) placed the species *cingulata* under the genus *Amata* Fabricius on the basis of the genitalic characters in males. As the males of all the species examined by the authors are not available for study and some of the species reviewed from literature, so the authors, at the present moment, consider to keep all the species under the genus *Syntomis* as referred to by Hampson (1898).

**13. *Syntomis lucina* Butler

1876. *Syntomis lucina* Butler, *Linn. soc. Zool.*, 12:345.

Distribution : India : West Bengal (Calcutta).

Remarks : Due to the non-availability of the material for study it is not possible by the authors to re-examine the species. However, the yellow bands in basal and 5th segment of the abdomen and lateral series of spots in the intermediate segments and also the black tegulae and patagia as referred to in the literature confirm the identity of the species.

**14. *Syntomis insueta* Swinhoe

1892. *Syntomis insueta* Swinhoe, *Cat. Het. Mus. Oxon.*, p. 41 pl.2, fig. 16.

Distribution : India : West Bengal (Calcutta).

Remarks : Swinhoe (1892) and Hampson (1898) based the description of the species on females. The material including the males are not available for study. So, the authors reserve their comments on the

validity of the species.

Genus *Eressa* Walker

1854. *Eressa* Walker, *List Lep. Insects Brit. Mus.*, 1 : 149.

Key to species of the genus *Eressa* Walker

1. Antennae of male bipectinate; abdomen with dorsal and lateral series of orange yellow spots..2
 Antennae of male serrate; abdomen crimson with dorsal series of blue black bands and lateral series of blue black spots *multigutta* (Walker)
2. Hindwing with large hyaline patch below base of cell *confinis* (Walker)
 Hindwing with hyaline spots between veins M_2 and cu_{1b} and in end of cell..... *affinis* (Moore)

*15. *Eressa multigutta* (Walker)

1854. *Syntomis multigutta* Walker, *List Lep. Insects Brit.*, 1 : 134.

1898. *Eressa multigutta*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, 1 : 120-121.

Material examined : West Bengal, Darjiling district, Kurseong, 9(M), 18(F), 21-29.v.1906 (Coll. N. Annandale), Ghoombhanjan, 7000 ft., 1(F), 25.v.1975, on way to tea Garden, 6275 ft., 3(M), 2(F), 9.vi.1975 (Coll. J.K. Jonathan & party), Rongroom, 1700 m., 1(F), 2.x.1978 (Coll. A.N.T. Joseph & party).

Wing expanse : (M), (F) : 22-30 mm.

Distribution : India : West Bengal (Darjiling) and Sikkim; Burma, China, Nepal and Tibet.

Remarks : It is for the first time recorded from West Bengal.

16. *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 : West Bengal, Darjiling district, Bijanbari, Hariyana bhawan, 1(F), 21.v.1974 (Coll. J.K. Jonathan & party).

Wing expanse : (F) : 30 mm.

Distribution : India : West Bengal (Calcutta and Darjiling), Maharashtra (Bombay), N.W. Himalayas (Almorah and Kangra) and Tamil Nadu (Nilgiris); Bhutan, Sri Lanka and Burma.

***17. *Eressa affinis* Moore**

1877. *Eressa affinis* Moore, *Proc. zool. Soc. Lond.*, p. 596, pl. 59, Fig. 3.

Material examined : West Bengal, Jalpaiguri district, Nilpara, Hasimara, 2(F), 1.x.1975 (Coll. H.K. Bhowmik).

Wing expanse : (F) : 15 mm.

Distribution : India : West Bengal (Jalpaiguri) and Andamans.

Remarks : The species constitutes a new locality record for West Bengal.

****18. *Psichote duvanceli* Boisduval**

1829. *Psichote duvanceli* Boisduva, *Mon. Zyg.*, p. 129, pl. 8, fig.5.

Distribution : India : West Bengal (Calcutta) and Assam; Burma and Pakistan (Karachi and Sind).

Remarks : The species is not available for study. However, it may readily be recognised by its black colour, semihyaline wings and two goldenyellow bands at base and beyond middle of the abdomen.

Family HYPSIDAE**Genus. *Hypsa* Hübner**

1818. *Hypsa* Hübner, *Verz. bek. Schmett.*, p. 172.

Key to species of the genus *Hypsa* Hübner

1. Antennae of male with short fasciculated cilia 2
- Antennae of male with long fasciculated cilia *ficus* (Fabricius)
2. Hindwing orange 3
- Hindwing white *tortuosa* (Moore)
3. Forewing with three black spots on costa and basal orange patch extending along the costa
..... *producta* Butler
- Forewing with two black spots on costa and basal orange patch not extending to costa
..... *alciphron* Cramer

1. *Hypsa ficus* (Fabricius)

1794. *Noctua ficus* Fabricius, *Ent. Syst.*, 3(2) : 27, 62.
 1892. *Hypsa ficus*, Hampson, *Fauna Brit. India. Moths*, 1:504.

Material examined : West Bengal, Calcutta, Jabakusum House, 1(F), 21.viii.1966 (Coll. P. Roy).

Wing expanse : (F) : 65 mm.

Distribution : Throughout India including West Bengal (Calcutta) and Sri Lanka.

*2. *Hypsa tortuosa* (Moore)

1872. *Neochera tortuosa* Moore, *Proc. zool. Soc. Lond.*, p. 570, pl.33, fig.2.
 1892. *Hypsa tortuosa*, Hampson, *Fauna Brit. India, Moths*, 1 : 501.

Material examined : West Bengal, Darjiling district, Rongpo, on way to F.R.H., 500 m., 1(F), 31.v.1974, Ghoombhanjan, Dy. Forest office, 7000 ft., 1(F), 28.v.1975 (Coll. J.K. Jonathan & party).

Wing expanse : (F) : 66-72 mm.

Distribution : India : West Bengal (Darjiling) and Sikkim.

Remarks : The species constitutes a new locality record for West Bengal. Seitz (1933) placed some of the species of the genus *Hypsa* Hübner under *Asota* Hübner in the family Arctiidae. Hampson (1892) considered the genus *Hypsa* under the family Hypsidae which has been followed by the authors.

*3. *Hypsa producta* Butler

1875. *Hypsa producta* Butler, *Trans. ent. soc. Lond.*, p.3.

Material examined : West Bengal Darjiling district, Teesta, 1(F), _ii.1953. (Coll. M.B. Kripalini).

Wing expanse : (F) : 77 mm.

Distribution : India : West Bengal (Darjiling), Assam, Sikkim and South India; Burma, Malaya (Penang), Sri Lanka and Sumatra.

Remarks : Vide supra.

4. *Hypsa alciphron* (Cramer)

1777. *Phalaena alciphron* Cramer, *Pap. Exot.*; 2, pl. 133., fig.E.
 1892. *Hypsa alciphron*, Hampson, *Fauna Brit. India, Moths.*, 1 : 502-503.

Material examined : West Bengal, Bankura, district, Churamanipur Rest House, Sonamukhi, 1(M), 2.ix.1986 (Coll. *P. Mukherjee*); Burdwan district, Guscara, 1(M), 1(F), 10.ix.1986 (Coll. *K.K. Roy & party*); Calcutta, 1(F), 19.x.1956 (Coll. *A.P. Kapur*); Hooghly district, Tarakeswar, 1(M), 21.1.1984 (Coll. *S.K. Ghosh*); Midnapur, district, Jhargram, 1(M), 1(F), 7.viii. 1985 (Coll. *B.C. Das*).

Wing expanse : (M) : 47-65 mm., (F) : 52-65 mm.

Distribution : Throughout India including West Bengal (Bankura, Burdwan, Calcutta Hooghly and Midnapur); Amboina, Burma, Malaya (Penang), Ceram, Java, New Guinea, New Herbrides, New Ireland, and Solomons.

Remarks : Some of the specimens of both the sexes are smaller than those recorded earlier (Male): 62-67mm., (Female) : 72-76mm), However, this difference in wing expanse may be a local variation.

SUMMARY

The paper incorporates the account of eighteen species in five genera of the family Ctenuchidae from eleven districts of West Bengal and four species in a single genus of the family Hypsidae from six districts of the state (*vide* Map). Seven species of the family Ctenuchidae and two species of the family Hypsidae constitute new locality records for West Bengal. Besides, key to taxa of the examined species, geographical distribution, reference to the original literature and the remarks, wherever necessary, have also been provided. Over and above, the species, which are not available for study at present, have been reviewed from the literature.

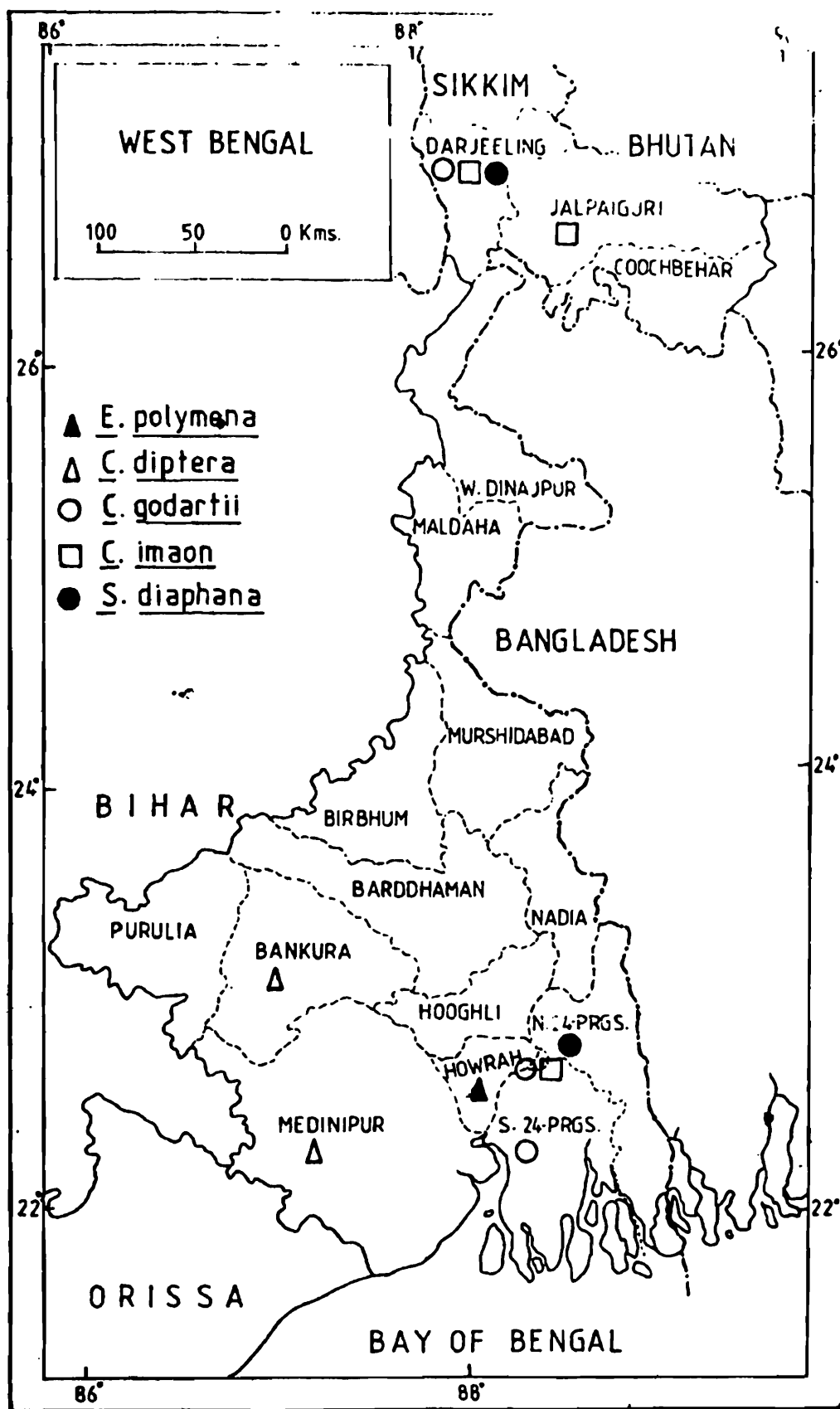
ACKNOWLEDGEMENT

The authors are grateful to the Director, Zoological Survey of India for providing laboratory facilities.

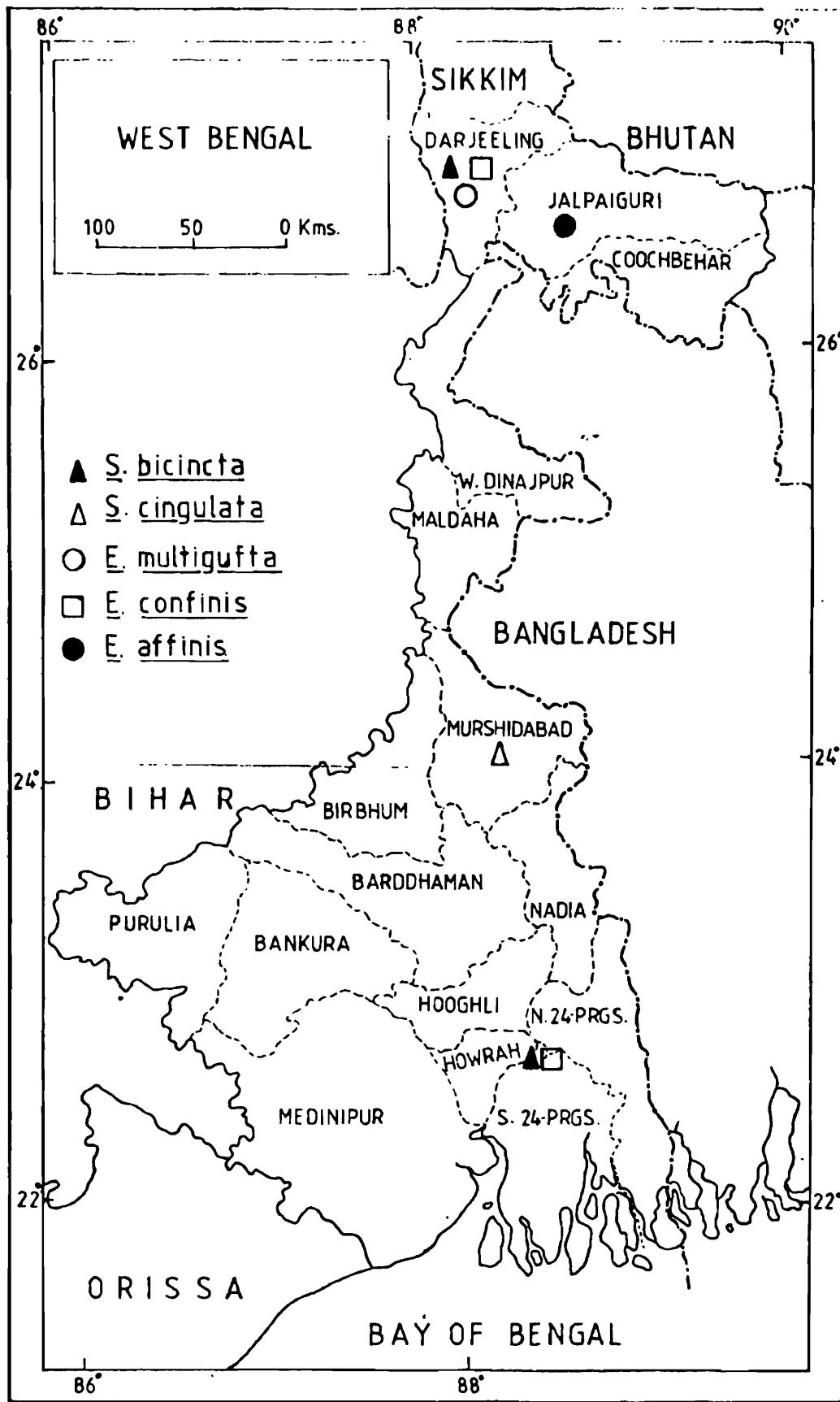
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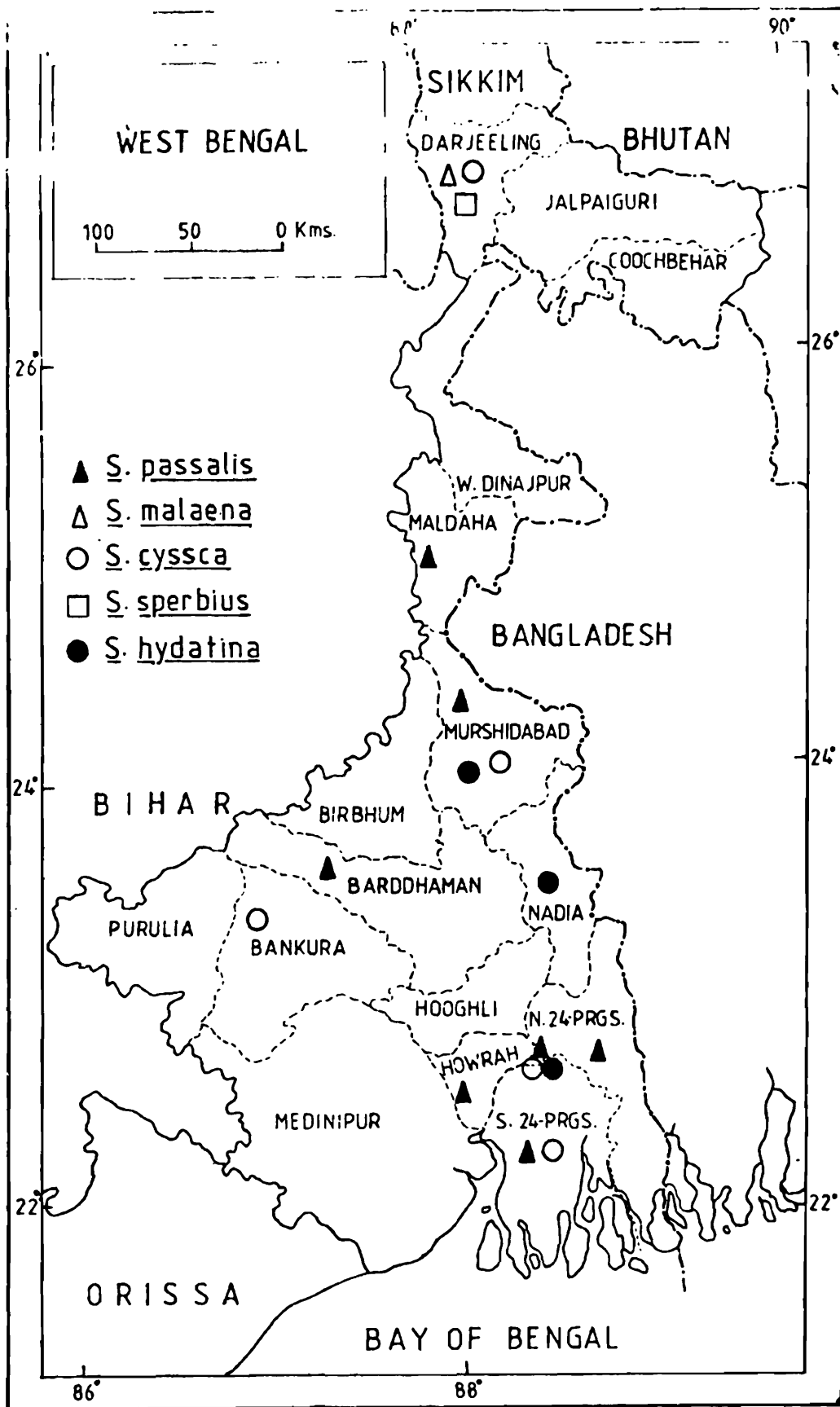
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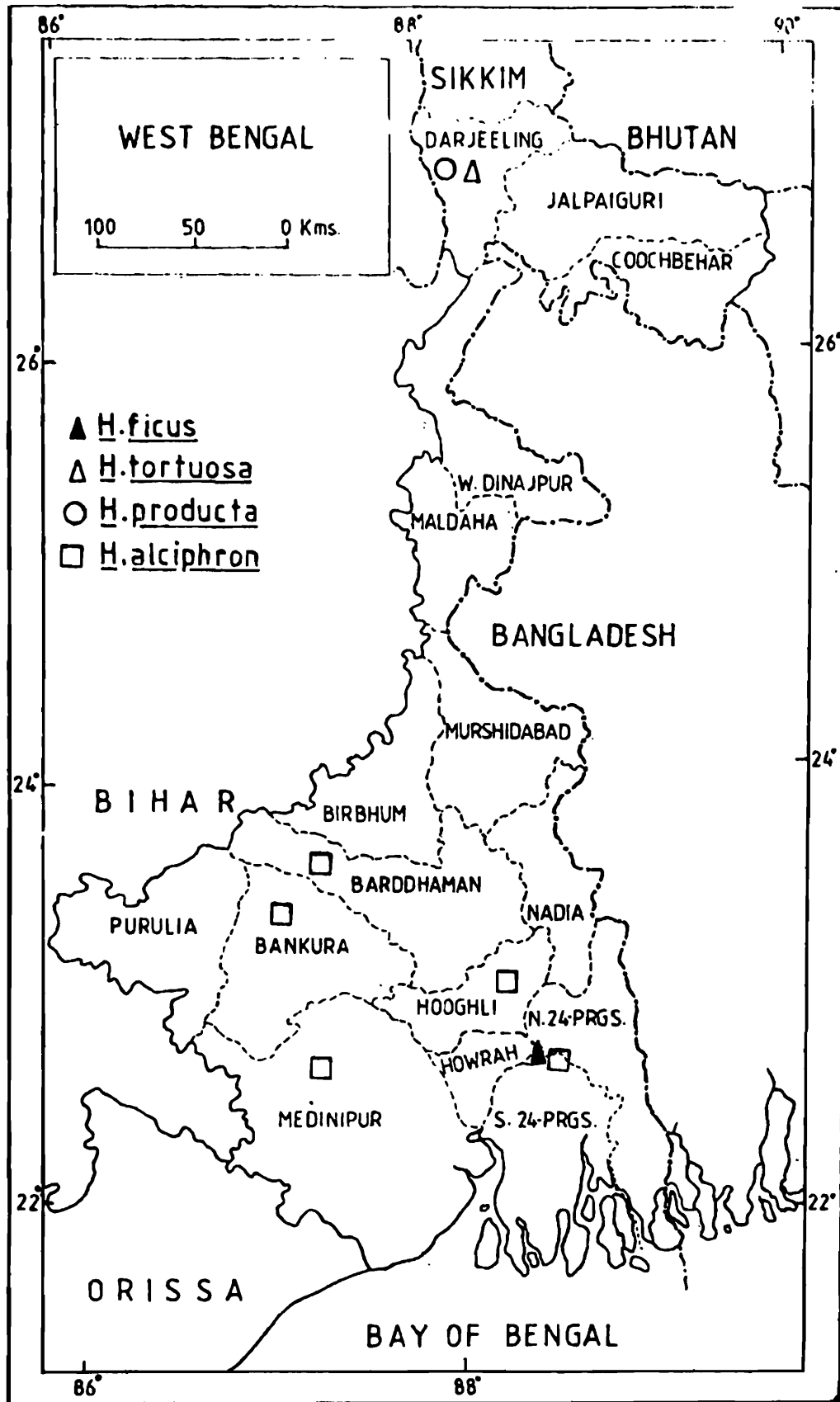
Map 1



Map 2



Map 3



Map 4

INSECTA : LEPIDOPTERA : PIERIDAE

S. K. GHOSH & M. CHAUDHURY
Zoological Survey of India, Calcutta

INTRODUCTION

The pierid butterflies are popularly called as "The whites and yellow" due to their nearly white or yellow coloured wings. The whites belong to subfamily Pierinae and yellows to Coliadinae. They are found abundantly both in plains and hills. It is interesting to note that the females generally prefer shade and the males choose sunlight.

The paper deals with the taxonomic studies of this interesting butterflies from West Bengal. A number of survey parties from Zoological Survey of India have undertaken several faunistic surveys of all the districts of West Bengal (*vide* Map) of different seasons of the year. A large number of specimens of the family were collected and available to the authors for studying the pierid fauna of the state. Besides, in this collection a comprehensive account of the fauna of West Bengal alongwith a brief review on earlier investigation, geographical distribution, new locality records (marked*) key to taxa and literature references is presented in this paper. An appendix to the list of species which are recorded from the literature but not available for study has been included in the paper.

In this connection it may be stated that classification has been followed after Talbot (1939) and all the species referred to in the paper are common in status.

EARLIER INVESTIGATION

Moore (1865), de Niceville (1885), Sevastopulo (1944-45, 1951-52), Mande (1949) and Maude (1949) made valuable contributions on the pierid fauna of West Bengal. Other workers who recorded the pierid species from the state are Butler (1874, 1880), Rothney (1882), Riley (1927), Evans (1932), Peile (1937), Talbot (1939) and Wynter-Blyth (1957).

Key to Superfamilies

1. Palpi always with hair, hindwing with well developed precostal vein curved distad . PIERINAE
Palpi without hair; hindwing without precostal vein or very short and directed based
..... COLIADINAE

Key to genera of subfamily PIERINAE

1. Forewing with vein R_4 and R_5 coincident 2

- Forewing with vein R_4 and R_5 separate *Valeria* Horsfield
2. Forewing with vein R_2 from the cell 3
- Forewing vein R_2 absent..... *Delias* Hübner
3. Forewing with vein R_3 4
- Forewing without vein R_3 *Leptosia* Hübner
4. Forewing with costa serrate *Prioneris* Wallace
- Forewing with costa not serrate 5
5. Forewing vein R_1 anastomosing with Sc *Anapheis* Hübner
- Forewing vein R_1 free 6
6. Forewing vein R_3 emitted from $R_4 + R_5$ very close to apex, stalk long *Pieris* Schrank
- Forewing vein R_3 emitted from $R_4 + R_5$ further from apex, stalk shorter 7
7. Male with a tuft of hair arising between the 7th and 8th abdominal segment *Appias* Hübner
- Male without any tuft of hair 8
8. Forewing vein R_3 , $R_4 + R_5$, and M_1 stalked 9
- Forewing vein M_1 from cell *Hebomoia* Hübner
9. Tornus of hind wing rounded; forewing apex rounded; antenna about half the length of forewing *Ixias* Hübner
- Tornus of hind wing obtuse; forewing apex blunt; antenna less than half the length of forewing *Cepora* Billberg

Genus *Valeria* Horsfield

1. *Valeria valeria hippia* (Fabricius)

1787. *Papilio hippia* Fabricius, *Mant. Ins.*, 2 : 55

1939. *Valeria valeria hippia*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 486-488.

Material examined : West Bengal, Bankura District, Jungle Mahal, 5 Km. S. of Joypur F.R.H. , 3 (M), 20-22.xii.1985, 2 Km. N. of Joypur F.R.H., 1 (F), 21.xii.1985, Camp site, Ahalya Bai Road, 1 (M),

26.xii.1985 (Coll. *D. K. Mandal* & party). Howrah District, Uluberia, 1 (F), 26.1.1986 (Coll. *B. Dutta* & *G. C. Sen*). Murshidabad District, Jiyaganj, Raichandpur, 3 (M), 6.ii.1986 (Coll. *I. J. Gupta* & party). Midnapur District, Digha Forest, Puruli, 1 (M), 17.xi.1974 (Coll. *A. K. Hazra* & party).

Wing expanse : (M) = 62 mm; (F) = 62-72 mm.

Distribution : West Bengal (24 Parganas, Howrah, Bankura, and Murshidabad); India to Burma and Thailand.

Genus *Delias* Hübner

Key to species of the genus *Delias* Hübner

1. Hindwing underside with a submarginal band of red spots; veins black 4
 - Hindwing underside with a red subbasal band from costa or vein 8 to inner margin 2
2. Hindwing underside with broad red subcostal stripe restricted in area 7 *descombesi* (Boisduval)
 - Hindwing underside with red subcostal stripe not restricted in area 7 3
3. Hindwing upperside without red patch *aglaia* (Linnaeus)
 - Hindwing upperside with red basal patch reaching well below the cell *thysbe* (Cramer)
4. Forewing upperside with a submarginal black line *eucharis* (Drury)
 - Forewing upperside without a submarginal black line *hyparete* (Linnaeus)

* 2. *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.

Material examined : West Bengal; Darjeeling District, Chunabati Forest, 400 ft., 1 (F), 28.xii.1973; Rambi, 1200 ft. 1 (M), 1 (F), 6.i.1974 (Coll. *G. K. Srivastava* & *P. K. Maity*); Singla 400 m., 2 (M), 1 ex. (abdomen broken), 2.i.1976, (Coll. *G. K. Srivastava* & *G. S. Arora*); Tindharia, 3 (M), 23.26.iii.1978, (Coll. *A. R. Bhowmik* & party).

Wing expanse : (M), (F) = 82 mm.

Distribution : India; West Bengal (Darjeeling). Nepal to Burma; also in Thailand, Assam, Saigon and Cochin China.

Remarks : It is recorded for the first time from West Bengal.

* 3. *Delias aglaia aglaia* (Linnaeus)

1758. *Papilio aglaia* Linnaeus, *Syst. Nat.*, 10th ed., p. 465.

1939. *Delias aglaia aglaia*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 343-344.

Material examined : West Bengal, Darjeeling District, Singla, 400 m. 2 (M), 2.i.1976 (Coll. G. K. Srivastava & G. S. Arora); Kalimpong, 1250 m., 1 (M), 1 (F), 19.ix.1980 (Coll. B. C. Das & party)

Wing expanse : (M) = 80 mm. (F) = 92 mm.

Distribution : India; West Bengal (Darjeeling), Meghalaya (Khasi Hills). Nepal to Lower Burma; also in Thailand, Tongking.

Remarks : It is recorded for the first time from West Bengal.

* 4. *Delias thysbe pyramus* (Wallace)

1867. *Thyca pyramus* Wallace, *Trans. ent. Soc. London*, 4 (ser. 3), pt. iii. 301-415, pl. vi-ix.

1939. *Delias thysbe pyramus*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 345-347.

Material examined : West Bengal, Darjeeling District, Singla, 400 m., 1 (M), 1.i.1976 (Coll. G. K. Srivastava & G. S. Arora); Rongpo 250 m., 1 (M), 14.ix.1978 (Coll. A.N.T. Joseph & party).

Wing expanse : (M) = 90 mm.

Distribution : India : West Bengal (Darjeeling); Assam. Nepal to Bhutan; Burma; Western Yunnan; Western Thailand.

Remarks : It is recorded for the first time from West Bengal.

5. *Delias eucharis* (Drury)

1773. *Papilio eucharis* Drury, *Illustr. Nat. Hist.*, 2 : pl.x, figs. 5,6.

1939. *Delias eucharis*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 352-356.

Material examined : West Bengal, Calcutta, Dum Dum Airport, 1 (M), 24.xi.1965, (Coll. P. Parui & J. R. Singh). 24-Parganas District, Palta, Jaffarpur, 1(M), 8.xii.1965, (Coll. R. P. Ghosh); Barrackpur, 1(M), 28.x.1965 (Coll. O. B. Chhotani); Barasat, 1 (M), 1(F), 17.xii.1965 (Coll. S. C. Mitra & R. Kulin); Subhas Gram, Kodalia, 1 (M), 29.x.1965 (Coll. S. C. Mitra & party). Howrah District, Andul Town, 1 (F), 28.ix.1968 (Coll. G. S. Arora & party). Hooghly District, Bandel, Debanandapur, 3 (M), 1 (F), 28.x.1965 (Coll. P. Parui); Chandannagar, 4 (M), 1 (F), 16, 18.x.1965 (Coll. H. L. Pal, P. K. maity, R. Kulin, and K. K. Roy), Singur, 2 (M), 29.iii.1975 (Coll. K. N. Singh). Birbhum District, Sriniketan Farm, 1 (F) 6.x.1974 (Coll. B. N. Das & party). Bankura District, Jungle Mahal, 5 km. west of Joypur F.R.H., 1 (F), 22.xii.1985

(Coll. *D. K. Mandal & party*). West Dinajpur District, Islampur Chopra Jhar, 1 (M), 4.xii.1986 (Coll. *B. C. Das & Party*). Malda District, Ratna, 1 (F), 16.viii.1986 (Coll. *M. S. Shishodia & party*); Sahapur, 1 (M), 2(F), 18.xii.1986; Malda Agric. Farm, 1 (M), 3 (F), 19.21.xii.1986 (Coll. *B. C. Das & party*). Murshidabad District, Raghunathganj Char, 1 (M), 1 (F), 8.ii.1986 (Coll. *I. J. Gupta & party*)

Wing expanse : (M) = 70 - 80 mm., (F) = 60 - 70 mm.

Distribution : West Bengal (Calcutta, 24 Parganas, Howrah, Hooghly, Birbhum, Bankura, West Dinajpur, Malda, Murshidabad); Peninsular India as far as the lower slopes of the Himalayas. Sri Lanka.

6. *Delias hyparete ethire* Doherty

1886. *Delias ethire* Doherty, *Journ. As. Soc. Beng.*, 55 (2) no. 3 : 256-265.

1939. *Delias hyparete ethire*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 357.

Material examined : West Bengal, Jalpaiguri District, Apalchand 1, Kathambari, 2 (F), 1.x.1987 (Coll. *S. K. Tandon & party*). Darjeeling District, Singla, 400 ., 1 (M), 2.i.1976. (Coll. *G. K. Srivastava & G. S. Arora*). Malda District, Malda Agric. Farm, 1 (M), 21.xii.1986 (Coll. *B. C. Das & Party*).

Wing expanse : (M) = 72 - 84 mm., (F) = 84 mm.

Distribution : West Bengal (Malda, Jalpaiguri, Darjeeling); Peninsular India; Tamil Nadu to West Bengal.

Genus *Leptosia* Hübner

7. *Leptosia nina nina* (Fabricius)

1793. *Papilio nina* fabricius, *Ent. Syst.*, 3 (1) : 194.

1939. *Leptosia nina nina*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 305-307.

Material examined : West Bengal, Darjeeling District, Nongpong, 200 ft., 10 Kms. W. of Bagrakote, 1 (F), 29.xii.1973; Ghoomti Forest, 5 Kms. N. of Reang, 1400 ft., 2 (M), 5.i.1974 (Coll. *G. K. Srivastava & P. K. Maiti*); Bamanpokri, 1 (F), 23.viii.1975 (Coll. *H. K. Bhowmik & party*). Murshidabad District, Raghunath Gunj Char, 1 (F), 8.ii.1986; Lalbagh, Katra Colony, 1(F), 13.II.1986, (Coll. *I. J. Gupta & Party*). Bankura District, 2 Km. north of Joypur F.R.H., 1 (M), 21, xii.1985, Jungle Mahal, 5 Kms. S. of Joypur F.R.H., 1 (M), 1 (F), 20.xii.1985 (Coll. *D. K. Mandal & party*); Bishnupur Sericulture Nursery, 1 (M), 1 (F), 25, 26.x.1985, Simlipal, 1 (M), 31.x.1985 (Coll. *M. Dutta & party*). Howrah District, Kamina, 1 (M), 22.i.1986, Uluberia, 1 (M), 1 (F) 26.i.1986, nantra, 1 (F), 30.i.1986 (Coll. *B. Dutta & G. C. Sen*). Midnapur District, Durgachak, Kumarpalli, 18 Kms. from Haldia Bowrea, 1 (M), 4.iii.1984 (Coll. *K. K. Roy & party*). 24 Parganas District, Sodpur, Krishnapur Bye Lane, Natagar, 1 (F), 20.x.1984 (Coll. *S. K. Ghosh & party*).

Wing expanse : (M) = 34 - 46 mm., (F) = 38 - 42 mm.

Distribution : West Bengal (24 Parganas, Howrah, Burdwan, Bankura, Midnapur, Murshidabad.

Darjeeling); Peninsular India to Mussooree Hills, U.P., Andaman Islands; Burma, Indo-China, Thailand, Hainan, South China.

Genus *Prioneris* Wallace

8. *Prioneris thestylis thestylis* (Doubleday)

1842. *Pieris thestylis* Doubleday, In Gray's zool. Miscell., p. 76.

1939. *Prioneris thestylis thestylis*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 373-375.

Material examined : West Bengal, Darjeeling District, Bamanpokri, 1 (M), 24.viii.1975 (Coll. H.K. Bhowmik & party).

Wing expanse : (M) = 90 mm.

Distribution : India : West Bengal (Darjeeling, Mussooree Hills, U.P. to Burma; Hainan, South China.

Remarks : It is recorded for the first time from West Bengal.

Genus *Anapheis* Hübner

9. *Anapheis aurota aurota* (Fabricius)

1793. *Papilio aurota* Fabricius, *Ent. Syst.*, 3(1) : 197.

1939. *Anapheis aurota aurota*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 380-382.

Material examined : West Bengal, Malda District, Tulshihata, 1 (F), 25.vi.1987 (Coll. K.P. Mukherjee & Party). Midnapur District, Sarsanka, 8 Kms. from Zilla Parisad Bungalow, 1 (F), 12.iii.1984 (Coll. K.K. Roy & party). Howrah District, Botanical Garden, 1 (F), 22.iv.1960 (Coll. H.N. Singh).

Wing expanse : (F) = 52-70 mm.

Distribution : West Bengal (Howrah, Midnapur, Malda); throughout India except Assam.

Genus *Pieris* Schrank

Key to species of the genus *Pieris* Schrank

1. Forewing dorsally with inner edge of black area dentate *canidia* (Sparrman)
- Forewing dorsally with inner edge of black area not dentate *brassicae* (Linnaeus)

*10. *Pieris canidia canis* Evans

1912. *Pieris canidia canis* Evans, *Journ. Bombay nat. Hist. Soc.*, 21 : 559, 976.

Material examined : West Bengal, Darjiling District, Mahanadi, 1/1/2 Km. West towards Kurseong, 1240 m., 2 (FF), 25.iv.1971; Mahanadi, above Goomti T.E. Factory, 1255 m., 1 (M), 25.iv.1971; Kurseong, in and around Singell T.E., 1429 m., 2 (MM) 1.v.1971; Kurseong, subedar Busti, Dhobi Khola 1459 m., 2 (MM), 1 (F), 5.v.1971; Darjeeling, 1 (F), 23.iii.1978; Tung, 1 (M), 2 (FF), 25.iii.1978; Lava, 7200 ft., 1 (M), 9.iv.1976; Chaikhola, 2 (FF), 12.iv.1976; Sukna, 1 (M), 5.v.1976. (Coll. A.R. Bhowmik & Party); D.F.O.'s Office compound, Kalimpong, 1225 m., 2 (MM), 8 (FF) 1,3,iv.1973; 3 Kms. w.of Rongpo F.R.H., 360m., 1 (M), 7.iv.1973, 33 Kms. S.E. of Rongpo F.R.H., 750 m. 1 (M), 10.iv. 1973, 3 Kms. S of Rambh F.R.H., 2150(M), 1(F), 12.iv.1973; 1 Km. S.W. pf Goke F.R.H., Singla, 480 m., 1 (M), 16.iv.1973; 4 Kms. S.E. of Goke F.R.H., Singla, 4000 m., on the Southern Bank of little Rangli River, 2 (MM), 18.iv.1973, In and around Karmata village, 5 Kms. West of Goke F.R.H., Singla, 450m., 1 (M), 19.iv.1973, in and around Pandom Tea Estate, 3 Kms. S.E. of Medow Bank, 1525 m.,5 (MM), 3 (FF), 23.iv.1973. (Coll. H.S. Sharma & Party); Kurseong Road area north, 2 (FF), 12.ii.1973, Agriculture seed Farm, 1 (F), 21.ii.1973, Gorubathan Plantation, 1 (M), 3.iii.1974; Darjeeling, Botanical, Garden, 10(F), 7.x.1974; (Coll. H.K. Bhowmik, A.R. Bhowmik, & Party); Suba Basti, Kalimpong 4300 ft., 3 (MM), 3 (FF), 2.i.1973, Bong Basti, Kalimpong, 3900 ft. 7 (MM), 3.i.1973, Baliason Busti, 3 Kms. E. of Sukhia Pokri, 1800 m., 1 (F), 19.iii.1973, Hill Forest, above Hima Falls, 4 Kms. W. of Bhanjang, 2150m., 2 (MM), 21.iii.1973; Rongli Tea Estate, 2 Kms. E. of Tukdah F.R.H., 1450 m., 1 (F), 25.iii. 1973; Govt. Seed Farm, Kalimpong, 1 (M), 1 (F), 31.iii.1973; (Coll. G.K. Srivastava & P.K. Maiti); Darjeeling Botanical Garden, 7000 ft., 2 (MM), 11.v.1974; 5 Kms. S.W. of Darjeeling chawk o way to Burning Ghat, 3 Kms. E. of High Scool, Bank of Ranjit River, 900 m., 2 (FF), 19.v.1974, Bijanbari, in and around Phulbazar, 900 m., 3 (MM), 10. 20.v.1974; Rangirum, around F.R.H., 2000 m., 4 (FF), 23,26,v.1974, Rangirum Tea Estate, 2000m., 4 (MM), 1 (F), 25.v.1974., (Coll. J.K. Jonathan & Party); Melli, 5 Kms. N. of Teesta, 300 m., 1(M) N. of Teesta , 300 m., 1(M), 2 (FF), 27.xii. 1975, Karmakar, 3 Kms. S.W. of Singla, 450 m., 3 (M), 1(F) ,3.i.1976, Singla Bazar, 400 m., 1 (M), 1(F), 5.i.1976, Mahanadi, 1280 m., 3 (M), 2 (F), 9.i.1976 (Coll. G. K. Srivastava & G. S. Arora); Tindharia, 856 m., 2(M), 14.v.1979, Darjeeling, 2123 m., 3 (MM), 17.v.1979, Lebong, 1759 m., 1 (M), 18.v.1979, Botanical Garden, 2125 m., 2 (MM), 20.v.1979, Darjeeling, 2123 m., 2 (MM), 21.v.1979, (Coll. M.S. Shishodia & party); Melli Bazar, 1 (M), 2.v.1980 (Coll. R.N. Tewari & party); Ghum, 2253 m., 1 (M), 21.vii.1979, (Coll. M. Prasad & party); Darjeeling, 1250 m., 1 (F), 17.iv.1986, Mirik Krish Manafar, 1 (M), 18.iv.1986, Mirik, 1 (M), 19.iv.1986, Simana, Sukhiapokri, 2345 m., 1 (M), 24.iv.1986 (Coll. B.C. Das & Party).

Wing expanse : (M) (F) = 52 65 mm.

Distribution : West Bengal (Darjeeling); South India (Nilgiri Hills).

Remarks : It is recorded for the first time from West Bengal.

11. *Pieris brassicae nepalensis* Doubleday

1846. *Pieris brassicae nepalensis* Doubleday, In Gray's *Lep. Ins. Nepal*, p.9, pl. vi. figs. 1-3.

Material examined : West Bengal, Darjeeling District, Khasmal Basti, 4 Kms. S. of Ghoombhanjan, 1 (F), 17.iii.1973. (Coll. P.K. Maiti & party); D.F.O.'s office compound, Kalimpong, 1225 m., 1 (M), 3.iv.1973, 2 Kms. E. of Rambh F.R.H., 1990 m., 4 (MM), 1 (F), 13.iv.1973 (Coll H.S. Sharma & party); Manbhanjan, 1 Km. N. from Youth Hostel 6400 ft., 1(M), 19.v.1975, Manbhanjan, 1 Km. West from the

camp., 6400 ft., 1 (M), 22.v.1975 (Coll. J.K. Jonathan & Party); Lova, 7200 ft., 1 (F), 9.iv.1976, Baedekhasmahal, 1 (M), 13.iv.1976. (Coll. A.R. Bhowmik & party); Lebong, 1759 m., 1(M), 18.v.1979 (Coll. M.S. Shishodia & Party); Manbhanjan, 2010 m., 2 (MM), 4 (FF), 24.1980 (Coll. R.N. Tiwari & party); Mirik Krishanapur, 1 (F), 18.iv.1986. 2 Kms. E. of Mirik, 1 (F) 30.iii.1986 (Coll. A.K. Hazra).

Wing expanse : (M) (F)= 60-72 mm.

Distribution : India : West Bengal (Darjeeling); plains adjoining the Himalayas including N.W. Himalayas Sikkim, to Assam. Also to Tibet and Yunnan.

Genus *Appias* Hübner

Key to species of the genus *Appias* Hübner

1. Forewing ventrally with an yellow subapical spot; hindwing ventrally yellow, with a broad chocolate brown marginal border *lyncida* (Cramer)

Forewing without any subapical spot, hindwing ventrally pearly bluish white, but without any markings or marginal border *wardi* (Moore)

12. *Appias lyncida eleonora* (Boisduval)

1836. *Pieris eleonora* Boisduval, *Spec. Gen. Dep.*, 1 : 481.

1939. *Appias lyncida eleonora*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 398-400, fig. 146.

Material examined : West Bengal, Darjeeling District, 3 Kms.S.E. of Rambhi, 5000 m., 2 (MM), 2.iv.1973, 1 Km. S.W. of Goke F.R.H., Singla, 450 m., 4 (MM), 16.17.iv.1973, in and around Karmata village, 5 Kms. W. of Goke F.R.H., 450 m., 3 (MM), 19,20.iv.1973 (Coll. H.S. Sharma & party); Ghoomti Forest, 5 Kms. N. of Reyang, 1400ft., 3 (MM), 3, 5.i.1974; (Coll. G.K. Srivastava & P.K. Maity); Rangpo, on way to F.R.H., 500 m., 2 (MM), 29, 31.v.1974 (Coll. J.K. Jonathan & party); Melli, 5 Kms. N. of Teesta, 300 m., 1 (M), 1 (F), 27.xii.1975 (Coll. G.K. Srivastava & G.S. Arora); Darjeeling, 1 (F), 23.iii.1978 (Coll. A.R. Bhowmik & party); Darjeeling, Kharibari, 1 (M), 9.xii. 1986 (Coll. R.S. Barmán & party). Jalpaiguri District, Bijanbari, Kawa, 1 (F), 19.iii.1986, (Coll. A.K. Hazra).

Wing expanse : (M) = 26-30 mm; (F)= 25 mm.

Distribution : India : West Bengal (Darjeeling and Jalpaiguri);Sikkim, Burma; extending to Hainan, Tong King, Thailand and Annam,

13. *Appias Wardi* (Moore)

1884. *Catophaga wardi* Moore, *Journ. As. Soc. Beng.*, 53 : 11, no. 1, p. 43.

1939. *Appias wardi*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 406-408.

Material examined : West Bengal, Darjeeling District, Rongpo, on way to F.R.H., 500 m., 3 (FF),

29,31.v.1974 (Coll. J.K. Jonathan & party).

Wing expanse : (F) = 30 mm.

Distribution : West Bengal (Darjeeling); Peninsular India (Karnataka; Canara and Coorg; Kerala; Travancore; Tamil Nadu (Nilgiri Hills).

Remarks : It is recorded for the first time from West Bengal.

Genus *Hebomoia* Hübner

14. *Hebomoia glaucippe glaucippe* (Linnaeus)

1758. *Papilie glaucippe* Linnaeus, *Syst. Nat. 10th ed.* p. 469.

1939. *Hebomoia glaucippe glaucippe*, Talbot, *Fauna Brit. India Butterflies*, 1 : 476-477.

Material examined : West Bengal, Jalpaiguri District, Rydak Forest, 1 (M), 8.iv.1975 (Coll. H.K. Bhowmik & party). Darjeeling District, Rongpo, 1 (M), 10.ix.1986 (Coll. B.C. Das & party); Rongpo, On way to F.R.H. 1 (M), 31.v.1974 (Coll. J.K. Jonathan & party).

Wing expanse : (M) = 53 mm.

Distribution : India : West Bengal (Darjeeling, Jalpaiguri). Nepal to Burma.

Genus *Ixias* Hübner

Key to species of the genus *Ixias* Hübner

1. Ground colour of both wings dorsally pure white *marianne* (Cramer)
- Ground colour of both wings dorsally chrome yellow *pyrene* (Linnaeus)

15. *Ixias marianne* (Cramer)

1779. *Papilio marianne* Cramer, *Pap. Exot.*, 3 : 41, pl. 217, figs. C, D, E

1939. *Ixias marianne*, Talbot, *Fauna Brit. India, Butterflies*, 1 : 440-443.

Material examined : West Bengal, Bankura District, Bishnupur, Amtalamore, 1 (F), 27.viii.1986 (Coll. P. Mukherjee & party); Palace compound 1 (M), 28.x.1980 (Coll. S. Ahmed & party). Hooghly District, Chandannagar, 1 (F), 15.xi.1965 (Coll. P. K. Maiti & R. Kulin). 24 Parganas District, N. Salt Lake, 1 (F), 22.iv.1965 (Coll. B. Biswas).

Wing expanse : (M), (F) = 24 mm.

Distribution : India : West Bengal (24 Parganas, Hooghly and Bankura); Punjab, N. W. Himalayas

(Kumaon), Maharashtra (Poona, Bombay, Western Ghats), Tamil nadu (Coromondel and Palni Hills); also extending from Sri Lanka to Peninsular India.

16. *Ixias pyrene sesia* (Fabricius)

1777. *Papilio sesia* Fabricius, *Gen. Ins.*, p. 257.

1939. *Ixias pyrene sesia*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 445-446.

Material examined : West Bengal, Darjeeling District 1 Km. West of Reyang F.R.H., in and around Reyang Nallah, 375 m., 3 (M), 30.iii.1973, 1 Km. S.W. of Reyang F.R.H., on the way to Rambhi, 390 m., 1 (M), 31.iii.1973, 3 Kms. S.E. of Rambhi, 1 (M), 1 (F), 2.iv.1973; Andhari Khola, 2 Kms. south of Rongpo F.R.H., 400 m., 1 (M), 6.iv.1973, in and around Karmata village, 5 kms. west of Goke F.R.H., Singla, 450 m., 1 (M), 19.iv.1973, (Coll. *H. S. Sharma & party*); Ghoomti Forest, 5 Kms. north of Reyang, 1400 ft., 5.i.1974 (Coll. *G. K. Srivastava & P. K. Maiti*); Melli, 5 Kms. N. of Teesta, 300 m., 1 (M), 27.xii.1975 (Coll. *G. K. Srivastava & G. S. Arora*); Teesta, 650 m., 1 (F), 23.ix.1980 (Coll. *B. C. Das & party*). Bankura District, Bishnupur, Birai Jheel, 4 Kms. S. W. of Jamunabandh, 1 (M), 18.xii.1985 (Coll. *D. K. Mandal & party*); Bishnupur, Amtala More, 1 (F), 27.iii.1985 (Coll. *P. Mukherjee & party*). Jalpaiguri District, Jayanti, 1 (M), 1 (F), 17.xii.1986 (Coll. *R. S. Barman & party*); Jayanti, 1 (F), 29.xii.1986 (Coll. *M. Dutta & party*).

Wing expanse : (M) = 22–30 mm., (F) = 25–35 mm.

Distribution : West Bengal (Bankura, Jalpaiguri and Darjeeling) and also Peninsular India.

Genus *Cepora* Billberg

17. *Cepora nerissa phryner* (Fabricius)

1775. *Papilio phryne* Fabricius, *Syst. Ent.*, p. 473.

1939. *Cepora nerissa phryne*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 362–364, pl. II, fig. 7.

Material examined : West Bengal, Darjeeling District, 1 Km. S. of Reyang F.R.H., on the bank of Reyang River, 300 m., 1 (M), 28.xii.1973, 3 Kms. south east of Rambhi, 350 m., 1 (M), 2.iv.1973; 3 Kms. west of Rongpo F.R.H., 360 m., 1 (F), 7.iv.1973, Goke, F.R.H., Singla, 450 m., 4(M); 16.iv.1973, in and around Karmata village, 5 kms. west of Goke F.R.H., Singla, 450 m., 1 (M), 1 (F), 19.iv.1973 (Coll. *H. S. Sharma & party*); Ghoomti Forest, Reyang, 1400 ft., 1 (F), 5.i.1974 (Coll. *G. K. Srivastava & P. K. Maiti*). 3 Kms. of Bijanbari High School, along Ranjit River Bank, 900 m., 1 (M), 9.iv.1974 (Coll. *J. K. Jonathan & party*); Rangtong, 1 (M), 2 (F), 13.iv.1978 (Coll. *A. R. Bhowmik & party*). Malda District, Gour & Environ., 1 (M), 18.vii.1986; Manikchak, 2 (F), 19.vii.1986 (Coll. *M. S. Shishodia & party*); Sahapur, 3 (M), 1 (F), 18.xii.1986 (Coll. *B. C. Das & party*). Bankura District, 2 Kms. north of Joypur F.R.H., 1 (F), 24.xii.1985; 4 Kms. along the southern bank of Birai Jheel, 1 Km. East of Bishnupur Guest House, 1 (M), 1 (F), 25.xii.1985 (Coll. *D. K. Mandal & party*). Midnapur District, Railway Station, 1 (F), 6.iv.1985 (Coll. *B. Nandy & A. R. Lahiri*); Haldia, 1 (F), 3.viii.1985 (Coll. *B. C. Das & party*); around Belpahar F.R.H., 1 (M), 8.ix.1985 (Coll. *S. Biswas & party*). Murshidabad District, Jiyaganj, Raichandpur, 1 (M), 6.ii.1986, Jangipur, Dhanpat Nagar, 1 (M), 12.ii.1986, Lalbag, Katra colony, 1 (M), 1 (F), 13.ii.1986, Sagardighi,

1 (F), 14.ii.1986 (Coll. *I. J. Gupta & party*). Nadia District, Plassey, Ashapora, 1 (M), 28.1.1986 (Coll. *A. R. Lahiri & party*). Howrah District, Laotala, Bagnan, 1 (M) 28.1.1986 (Coll. *B. Dutta & G. C. Sen*). South 24-Parganas District, Gobindapur, 1 (M), 2 (F), 27.iv.1986 (Coll. *B. N. Das*). Hooghly District, Sreerampur, Barabally, 1 (M), 2.xi.1965 (Coll. *P. Parui*).

Wing expanse : (M) = 20–30 mm. (F) = 18–25 mm.

Distribution : West Bengal (24-Parganas, Howrah, Hooghly, Bankura, Midnapur, Nadia, Murshidabad, Malda and Darjiling); Peninsular India to N. W. States. Nepal and Sri Lanka.

Key to genera of subfamily COLIADINAE

1. Hind wing with precostal vein short; male with oval sex patch on upperside of hind wing *Catopsilia* Hübner
- Hind wing with precostal vein absent or obsolete, male without sex patch 2
2. Fore wing with vein R_2 arising from stalk of R_4+R_5 and R_3 *Colias* Fabricius
- Fore wing with vein R_2 arising from cell *Eurema* Hübner

Genus *Catopsilia* Hübner

Key to species of the genus *Catopsilia* Hübner

1. Ventrally marked with transverse reddish brown strigae 2
- Ventrally without reddish brown strigae *crocale* (Cramer)
2. Forewing with continuous marginal dark border below apex dorsally *pyranthe* (Linnaeus)
- Forewing with macular marginal dark or brown narrow border below apex dorsally *florella* (Fabricius)

18. *Catopsilia crocale crocale* (Cramer)

1775. *Papilio crocale* Cramer, *Pap. Exot.*, 1 : 87, pl. iv, figs. C, D.

1919. *Catopsilia crocale crocale*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 492-493.

Material examined : West Bengal, Hooghly District, Singur 2 (MM), 5 (FF), 28-30.viii.1975 (Coll. *K.N. Singh*). Burdwan District, Kaksha village, near a pond side, 1 (F), 13.x.1985; (Coll. *S.K. Ghosh & party*). Coochbehar District, Muttabhanga, 2 (FF), 17.viii.1986 (Coll. *T.K. Pal & party*). Jalpaiguri District, Joyanti 1 (F), 21.viii.1986; Hasimara, 1 (F), 22.viii.1986 (Coll. *T.K. Pal & party*). Malda District, Sahapur, 2 (FF), 18.ix.1975 (Coll. *H.K. Bhowmik & party*); Pakuahat, 1 (F), 16.vi.1987, Bhalik Station 3 (FF), 26.vi.1987 (Coll. *K.P. Mukherjee & party*). Midnapur District, Belpharari 1 (F), 9.ix.1985 (Coll. *S.*

Biswas & party); Arabarii Forest, 1 (F), 30.ix.1974 (Coll. *A.K. Hazra*). Birbhum District, Santiniketan, 4 (MM), 26(FF), 10.ix.1974, 5.x.1974; Makranpur, 5 (FF), 7.x.1974, Bolpur, 1 (F), 9.x.1974 (Coll. *B.N. Das & G.C. Dey*). Howrah District, Andul Town, 1 (F), 28.ix.1964. (Coll. *G.S. Arora & Party*).

Wing expanse : (M) (F) = .56 78 mm.

Distribution : India : West Bengal (Howrah, Hooghly, Burdwan, Birbhum, Midnapur, Malda, Coochbihar and Jalpaiguri); Sri Lanka to Andaman Islands to South China, Burma, Phillipines, Borneo, Sumatra, Java.

*19. *Catopsilia pyranthe pyranthe* (Linnaeus)

1758. *Papilio pyranthe* Linnaeus, *Syst. Nat. 10th ed*, p. 469.

1939. *Catopsilia pyranthe pyranthe*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 496-499.

Material examined : West Bengal, Darjeeling District, Tukrajhar, Nercalbari, 1 (F), 18.vi.1979 (Coll. *P. Halder & Party*), Jalpaiguri District Kharibari, Sulkapara, 1 (F), 27.viii.1975, (Coll. *H.K. Bhowmik & party*). Coochbihar District, Tufanganj, 1 (F), 13.viii.1986; Dinahata, 1(F), 16.viii.1986 (Coll. *T.K. Pal & party*). Hooghly District, Singur 1(F), 26.viii.1975 (Coll. *K.N. Singh & party*). S. 24 Parganas District, Ramdaria, 1 (F), 18.iv.1986; Amtala, 2 (FF), 19.iv.1986; Gobindapur, 3 (FF), 27.iv.1986; Cossipur, 5 Kms. from Kakdwip, 1 (F), 2.v.1986 (Coll. *B.N. Das & party*). Malda District, Sahapur, 4 (FF), 17, 18.ix.1975 (Coll. *H.K. Bhowmik & party*); Pakuahat, 1(F), 16.vi.1987, Dhutian, 4 (FF), 17.vi.1987, Nalagola, 3 (FF), 18.vi.1987; Bamongola, 1 (M), 1(F), 23.vi.1987 (Coll. *K.P. Mukherjee & party*); Haldibari & environment, 2 (FF), 22.vii.1986 (Coll. *M.S. Shishodia & party*). Midnapur District, West of Digha Sea beach, 1(F), 27.ix.1983; east Coast of Digha Sea Beach, 2 (FF), 28.ix.1983; Jhargram Raj College, 1 (F), 4.x.1983, Jhargram Railway Station 1(F), 4.x.1983 (Coll. *A.K. Hazra & party*); Keranitola, 1 (F), 30.iii.1983, Arabari Res. Forest, 13.iv.1983, (Coll. *B.Nandy & A.R.Lahiri*); Belpahari, 1 (F), 8.viii.1985; Dantan Chaulia, 13.viii.1985, (Coll. *B.C. Das & party*); around Jhargram (East), 1 (F), 17.ix.1985, Garbeta, 3 (FF), 22.ix.1985 (Coll. *S. Biswas & party*); Circuit house compound and near Railway signals towards the south west, 1 (F), 4.vi.1971 (Coll. *S. Khera & party*). Bankura District, Agric. Farm, Nutanchati, 5 (FF), 1.vi.1971. (Coll. *S. Khera & party*); Panbazar, 1(F), 5.ix.1986 (Coll. *R.S. Barman & party*); Khatra, 1 (F), 6.x.1985 (Coll. *K.K. Ray & party*); Bishnupur, 1 (F), 25.x.1985, Bishnupur Sericulture Nursery, 2 (F), 26.x.1985, Sonamukhi, 2 (F), 30.x.1985 (Coll. *M. Dutta & party*); Amtala More, 1 (M), 2 (F), 27.viii.1986, Patrasayar, 5 (FF), 28.viii.1986, (Coll. *P. Mukherjee & party*). Purulia District, Dak Bunglow compound, 12 (FF), 30.v.1971, (Coll. *S. Khera & party*); Jhalda, 1 (M), 3 (FF), 7.ix.1986, Purulia Forest Rest House, at light; 3 (FF), 7.ix.1986, Kamalpur, 2 (MM), 1 (F), 10.ix.1986, Gamgajan ghati, 1 (F), 11.ix.1986 (Coll. *R.S. Barman & party*). Birbhum District, Santiniketan, 4 (MM), 8 (FF), 10, 14.ix.1974 (Coll. *B.N. Das & G.C. Dey*); Kacheyjur Suri, 1 (F), 8.xi.1974 (Coll. *A.K. Hazra*).

Wing Expanse : (M), (F) = 52 66 mm.

Distribution : India : West Bengal (24-Parganas, Hooghly, Bankura, Purulia, Midnapur, Birbhum, Coochbihar, Jalpaiguri and Darjiling); Andaman Islands Sri Lanka extending to Hainan, Taiwan, South China, Burma, South and East to Borneo, Java, Sulawesi, Phillipines.

Remarks : It is for the first time recorded from West Bengal.

20. *Catopsilia florella gnoma* (Fabricius)

1776. *Papilio gnoma* Fabricius, *Syst. Ent.*, p. 828.

1939. *Catopsilia florella gnoma*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 500-501.

Materials examined : West Bengal, Darjiling District, Sevak, 1 (F), 22.ii.1974 (Coll. A. Daniel, H.K. Bhowmik & party). Jalpaiguri District, Rydak Forest, 1 (F), 12.ix.1975 (Coll. H.K. Bhowmik & party). Bankura District, Bishnupur Camp. 1 (F), 7.xi.1985 (Coll. S. Sen & party); Central Nursery, Bishnupur Range, 3 (MM), 3 (FF), 17.xii.1985, Jamuna Bandh 4 Kms. north of I.B., Bishnupur, 1 (F), 7.xi.1985, Jungle Mahal, 5 Kms. West of Joypur F.R.H. 1 (M), 20.xii.1985, Aashna, 17 Kms. N.E. of Simlipal F.R.H., 10(M), 24.xii.1985, 4 Kms. along the southern bank of Birai Jheel, 1 Km. east of Bishnupur Guest House, 3 (MM), 25.xii.1985 (Coll. D.K. Mandal & party). Purulia District, Sub. Div. Adap., Res. Farm Balarampur, 2 (MM), 2.xi.1985 (Coll. S. Sen & party). Murshidabad, District, Jiyaganj, Nandan Mission, 1 (F), 6.ii.1986, Raghunathganj Char, 1 (F), 8.ii.1986, Moregram, Phulbari, 2 (FF), 9.ii.1986 (Coll. I.J. Gupta & party). Midnapur District, Keranitola, 1 (F), 5.iv.1985 (Coll. B. Nandy & A.R. Lahiri); around Belpahari F.R.H., 1 (F), 8.ix.1985, Belpahari, 13.ix.1985 (Coll. S. Biswas & party); Digha Sea side, 1 (F), 30.xi.1974 (Coll. A.K. Hazra). Birbhum District, Santiniketan, 2 (MM), 3 (FF), 10, 14.ix.1974 (Coll. B.N. Das & G.C. Dey); Bhaonapur, 1 (M), 30.iii.1986, Narayanpur, 1 (F), 2.iv.1986 (Coll. M.S. Shishodia & party); Gonpur Forest, 1(M), 10.xi.1974 (Coll. A.K. Hazra). S. 24 Parganas District, Joka. 1 (F), 30.iv.1986. (Coll. B.N. Das & party). Hooghly District, 1 (F), 28.viii.1975 (Coll. K.N. Singh).

Wing expanse : (M) (F) = 60-70 mm.

Distribution : India : West Bengal (24 Parganas, Hooghly, Midnapur, Birbhum, Bankura, Purulia, Jalpaiguri and Darjeeling); N.W. Himalayas, Maharashtra, Tamil Nadu, Andaman Islands; Sri Lanka and Burma.

*21. *Colias electo fieldi* Menetries

1885. *Colias fieldi* Menetries, *Enum. Corp. anim. Mus. Potr.*, 1 : 79 pl. 1, fig. 5.

1939. *Colias electo fieldi*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 562-563.

Material examined : West Bengal, Darjeeling District, Ghoom & environs 1(M), 20.iii.1973, Durbin Forest, 2 Kms. W. of Ghoom Bhanjan, 1 (F), 22.iii.1973 (Coll. P.K. Maiti & party); 3 Kms. N. of Rambhi F.R.H., 2100 m., 1 (M), 14.iv.1973 (Coll. H.S. Sharma & party). Jalpaiguri District, Rajabhatkhawa, 2 (FF), 27.iv.1986 (Coll. B.C. Das). Murshidabad District, Jiyaganj, Raichandpur, 2 (FF), 6.ii.1986 (Coll. I.J. Gupta & party). Howrah District, Kamina, 1 (M), 22.i.1986 (Coll. B. Dutta & party).

Wing expanse : (M) (F) = 45-50 mm.

Distribution : India : West Bengal (Howrah, Murshidabad, Jalpaiguri and Darjeeling); N.W. Himalayas, U.P., Maharashtra; Burma, Nepal and Tibet.

Remarks : It is for the first time recorded from West Bengal.

Genus *Eurema* HübnerKey to species of the genus *Eurema* Hübner

1. Forewing dorsally with black border not continued along vein 1A; without discocellular ring spots on both wings ventrally 2
 Forewing dorsally with black border often continued along vein 1A; with discocellular ring spots on both wings ventrally 3
2. Forewing ventrally with two small black discocellular spots *brigitta* (Cramer)
 Forewing ventrally with a small black discocellular spot *laeta* (Boisduval)
3. Forewing ventrally with three spots in the cell *blanda* (Boisduval)
 Forewing ventrally with two spots in the cell *hecabe* (Linnaeus)

22. *Eurema brigitta rubella* (Wallace)

1867. *Terias rubella* Wallace, *Trans. ent. Soc. Lond.*, 4 (3), pt. 3, p. 323.

1939. *Eurema brigitta rubella*, Talbot, *Fauna Brit. India, Butterflies*, 1 : 515 517.

Material examined : West Bengal, Birbhum District, Santiniketan, 1 (M), 2 (FF), 14.ix.1974 (Coll. B.N. Das & G.C. Dey). Midnapur District, Godapisadi, 1 (F), 29.iii.1985, Arabari Res. Forest, 1 (F), 3.iv.1985 (Coll. B. Nandi & A.R. Lahiri). Bankura District, Central Nursery, Bishnupur Range, 1 (F), 17.xii.1985. (Coll. D.K. Mandal & party).

Wing expanse : (M) = 20 mm.; (F) = 16 20 mm.

Distribution : India : West Bengal (Calcutta, Bankura, Birbhum, Midnapur); Punjab; N.W. Himalayas, U.P., Maharashtra and Karnataka.

23. *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.

Material examined : West Bengal, Birbhum District, Santiniketan, 1 (M), 1 (F), 10.ix.1974 (Coll. B.N. Das & G.C. Dey). Burdwan District, Panagarh Soai Forest, 1 (M), 9.ii.1983 (Coll. S. K. Ghosh).

Wing expanse : (M), (F) = 36 mm.

Distribution : West Bengal (Burdwan and Birbhum) Peninsular India to Western Himalayas.

*24. *Eurema blanda silhetana* (Wallace)

1867. *Terias silhetana* Wallace, *Trans. ent. Soc. Lond.*, 4 (Ser. 3); pt. III, p. 324.

1939. *Eurema blanda silhetana*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 523 525.

Material examined : West Bengal, Darjeeling District, Mal Forest, 1150 ft., 2 Kms. S.W. of Gorubathan, 2 (FF), 18.xii.1973. (Coll. G.K. Srivastava & P.K. Maity); Melli, 5 Kms. north of Teesta, 300 m., 2 (FF), 27.xii.1975, Tumthang Khola, 5 Kms. S. of Rongpo, 3(MM) 1 (F), 28.xii. 1975, Singhla, 400 m., 1 (F), 2.i.1976, Karmaktar, 3 Kms. S.W. of Singhla, 450 m., 1 (M), 3.i.1976 (Coll. G.K. Srivastava, G.S. Arora & party).

Wing expanse : (M) (F) = 50 mm. 55 mm.

Distribution : West Bengal (Darjeeling), Peninsular India to Sikkim, Assam, and Andamans Islands. Burma.

Remarks : It is for the first time recorded from the West Bengal.

25. *Eurema hecabe contubernalis* (Moore)

1886. *Terias contubernalis* Moore, *Journ. Linn. Soc. Lond. Zool.*, 21:46.

1939. *Eurena hecabe contubernalis*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 527-530.

Material examined : West Bengal, Darjeeling District, Kalimpong, D.F.O.'s office compound, 1225 m., 1 ex. damaged, 3.iv.1973, 1 Km. S.W. of Goke F.R.H., Singhla, 450 m., 1 (M), 16.iv.1973 (Coll. H.S. Sharma & party); Rambhi, 1200 ft., 1 (F), 6.i.1974 (Coll. G.K. Srivastava & P.K. Maity); North Sevak, 1 (M), 1(F), 24.ii.1974 (Coll. H.K. Bhowmik & party); Rongpo, on way to F.R.H., 500m., 2 (FF), 31.v.1974 (Coll. J.K. Jonathan & party); Karmaktar, 3 Kms. S.W. of singla, 450m., 4 (MM), 1 (F), 3.i.1970, Sukna, 200m., 1 (M), 1 ex. damaged, 7.i.1976, Mahanadi, 1280 m., 2(MM), 2 (FF), 9.i.1976 (Coll. G.K. Srivastava & G.S. Arora); Narcalbari, 1 (M), 17.vi.1979 (Coll. P. Halder & party); Singtan, 1 (M), 500 m., 17.vii.1979, Panighata, 1 (F), 10.iv.1982 (Coll. M. Prasad & party); Kalimpong, 1250m., 1 (F), 18.ix.1980 (Coll. B.C. Das & party); Kharibari, 1 (F), 9.xii.1986, (Coll. R.S. Barman & party). Jalpaiguri District, Bamanpokri, 1 (M), 2 (FF), 23.vii.1975, 2 Kms. S. of Rajabhat Khawa, Pattam Forest, 1 (F), 2.iii.1986 (Coll. A.K. Hazra); Kharibari, Sulkapara, 5 (MM), 6 (FF), 27, 28.viii.1975, Nilpara, Hasimara, 2 (MM), 3 (FF), 30,31.viii.1975; Jaldapara, 1 (F), 3.ix.1975; Rydak Forest, 3 (MM), 4 (FF), 9.12.ix.1975; (Coll. H.K. Bhowmik & party); Falakata, 2 (MM), 24.viii.1986; (Coll. T.K. Pal & party); Noorpore, 1 (M), 18.xii.1986, (Coll. R.S. Barman & party); Kalchini, 1(F), 5.i.1987 (Coll. M. Dutta & party); Mechbasti, Kathambari, 1 (M), 1 (F), 10.xx.1987; Palchanel I, 1 (M), 11.x. 1987, Hasimara (Torsu), 1 (F), 15.x.1987, Mandabari Forest, Chilapata, 1 (M), 2 (FF), 16.x.1987 (Coll. S.K. Tandon & party). Coochbehar District, 1 (M), 1 (F), 14,15.ix.1975 (Coll. H.K. Bhowmik & party); Dinhata, 1 (M), 16.viii.1986 (Coll. T. K. Pal & party). West Dinajpur District, Islampur, chopra, 2 (FF), 11.xii.1986, Subaspalli, 2 (MM), 3 (FF), 12.xii.1986; Raiganj, Kodgram, 2 (FF), 14.xii.1986; College para, 1 (F), 15.xii.1986 (Coll. B.C. Das & party). Malda District, Sahapur, 5 (MM), 6 (FF), 17, 18.ix.1975, (Coll. H.K. Bhowmik & party); Patua, 2 (F), 22.vii.1986, Khajurio, 7 (F), 23.vii.1986, Manikchak, 1 (M), 1 (F), 24.vii.1986; Haldibari, 2 (M), 2 (F), 25.vii.1986; (Coll. M.S. Shishodia & party); Birnagar, Rajganj, 1 (M), 16.xii.1986; Sahapur, 2 (F),

18.xii.1986; Malda Agric. Farm., 1 (M), 21.xii.1986 (Coll. *B.C. Das* & party); Nimbari, 1 (F), 24.vi.1987 (Coll. *K.P. Mukherjee* & party). Murshidabad District, Azimganj, 5 (F), 5.ii.1986; Jiyaganj, Raichandpur, 1 (M), 7 (F), 6.ii.1986, Potapur, Raghunathganj Char, 4 (M), 6 (F), 7.ii.1986; Chotkalai, 1 (M), 1 (F), 10.ii.1986, Jangipur, Dhanpatnagar, 2 (M), 4 (F), 12.ii.1986, Lalbagh, Katra Colony, 3 (F), 13.ii.1986; Sagardighi, 6 (F), 14.ii.1986 (Coll. *I.J. Gupta* & party). Birbhum District, Sriniketan Farm, 1 (M), 6.x.1974, Makranepur, 1 (M), 3 (F), 7.x.1974, Shambati, Bolpur, 5(F), 9.x.1974, Santiniketan, 2 (F), 10.ix.1974, Rajnagar, 1 (F), 11.ix.1974 (Coll. *B.N. Das* & *G.C. Dey*); Bhadrapur, 2 (F), 30.iii.1986, Muhammad bazar, 1 (M), 1 (F), 3.iv.1986, Mallarpur, 1 (F), 4.iv.1986 (Coll. *M.S. Shishodia* & party). Burdwan District Durgapur, 2 (F), 15.x.1985, Andal, 1 (M), 2 (F), 17.x.1985, Ukhra, 1 (M), 3 (F), 17.x.1985, Asansol, 1 (F) 18.x.1985 (Coll. *S.K. Ghosh* & party); Bolgona, 2 (F), 9.xii.1985, Dhatrigram, 1 (F), 12.xii.1985 (Coll. *B.N. Das* & party). Nadia District, Bahadurpur Forest, 1 (M), 2 (F), 15.xii.1985, Baliura, 2 (M), 2 (F), 21.xii.1985, Mayapur, 1 (F), 22.xii.1985, Phulia, 1 (F), 24.xii.1985 (Coll. *B.N. Das* & party) Plassey, Asha pane, 1 (F), 28.i.1986, Swarup Ganj, 1 (M), 31.i.1986, 1.vi.1971 (Coll. *A.R. Lahiri* & party). Bankura District, Nutanchati, 3 (M), 1 (F), 1.vi.1971 (Coll. *S. Khera* and party); Bishnupur, 5 (M), 10(F), 25.x.1985, Bishnupur Sericulture Nursery, 1 (F), 26.x.1985 (Coll. *M. Dutta* & party); Chatra, N.W. Bankura 4 (F), 10.x.1985; Kusumdagra, S. of Bankura, 1(M), 3 (F), 12.x.1985 (Coll. *K.K. Roy* & party); Pirdoba, 1 (F), 1.ix.1986 (Coll. *P. Mukherjee* & party); Tantipukur, 2 (M), 3 (F), 24.xi.1986; Gopal Nagar, Bishnupur, 1 (M), 2 (F), 25.xi.1986, Balarampur, Paatrasayer, 1 (M), 3 (F), 26.xi.1986 (Coll. *T.R. Mitra* & party); Central Nursery, Bishnupur Range, 5 (F), 17.xii.1985, Jumuna Bandh, North of I.B., Bishnupur, 1 (M), 1 (F), 18.xii.1985, Junglemahal, south of Joypur F.R.H., 3 (M), 20.xii.1985, 2 Kms. north of Jaypur F.R.H., 2 (F), 21.xii.1985, Jungle Mahal, 5 Kms. West of Joypur F.R.H. 1 (M), 2 (F), 22.xii.1985, Aashra, 17 Kms. N.E. of Simlipal F.R.H., 2 (M), 1 (F), 24.xii.1985. 4 Kms. along the southern bank of Birai Jheel, 1 Km. east of Bishnupur Guest House, 2 (F), 25.xii.1985, Camp Site, Ahalya Bai Road, 5 Kms. south of Madan Mohan Guest House, Bishnupur, 3 (F), 26.xii.1985 (Coll. *D.K. Mandal* & party). Purulia District, Dak Bunglow Compound, 7 (F), 29.v.1971 (Coll. *S. Khera* & party); Forest Office Compound, 1 (F), 1.xi.1985 (Coll. *S.Sen* & party); Biramdih, 1 (M), 28.xi.1986, Hathidohori, Near Ayodha Hills, 1 (M), 2(F), 1.xi.1986, Khejurdanga & environs, 1 (F), 2.xii.1986 (Coll. *T.R. Mitra* & party). Midnapur District, Motherpore, 2 Kms. from Dist. Seed Farm, right side of the road towards Bankura, 1 (M), 4 (F), 3.vi.1971 (Coll. *S. Khera* & party); Arabari Forest. 1 (M) 26.xi.1974 (Coll. *A.K. Hazra*); Durgachak, Uharpalli, 17 Kms. of Haldi Bhawan, 2 (F), 14.iii.1984, Sarbani Village, 6 Kms. N. of Kamabati Bunglow, Garbeta, 2 (F), 16.iii.1984 (Coll. *K.K. Roy* & party); Jhargrm, 2 (M), 3 (F), 6.viii.1985 (Coll. *B.C. Das* & party); Jhargram, 1 (F), 7.ix.1985; Belpahari, Patpira, 1 (F), 9.ix.1985, Midnapur, 1 (M), 16.ix.1985. (Coll. *S. Biswas* & party). Howrah District, Sibpur, Botanical Garden, 1 (F), 1983 (Coll. *D.N. Nandi*). 24 Parganas District, Salt Lake, Duttabad, 1 (F), 21.vi.1964 (Coll. *B. Biswas*); Kakdwip, 1 (F), 18.ii.1984 (Coll. *S.K. Ghosh* & party). Calcutta, 1 (F), 31.x.1957 (Coll. *A.P. Kapur*).

Wing expanse : (M) = 40 52 mm., (F) = 40 60 mm.

Distribution : India : West Bengal (24 Parganas, Howrah, Calcutta, Burdwan, Nadia, Birbhum, Bankura, Purulia, Midnapur, Murshidabad, Malda, Coochbihar, Jalpaiguri and Darjeeling, Assam, Sikkim and Gujarat. Burma, Malaya Peninsula and Singapore.

A P P E N D I X

List of species reviewed from literature.

The species which were earlier recorded from West Bengal but are not available for study may be listed along references and distribution in order to prepare a consolidated account of the pierid fauna of West Bengal.

1. *Delias berinda boyleae* Butler

1885. *Delias boyleae* Butler, *Ann. Mag. Nat., Hist.*, (5) 15:57-58.

1939. *Delias berinda boyleae*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 336.

Distribution : West Bengal (Darjeeling); Sikkim to Burma.

2. *Appias indra indra* (Moore)

1857. *Pieris indra* Moore, *Cat. Lep. Mus. E. I.C.*, 1 : 74.

1939. *Appias indra indra*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 391-392.

Distribution : West Bengal (Darjeeling); Nepal to Burma; Hainan; South China; Malay Peninsula and Cochin China.

3. *Appias libthea olferna* Swinhoe

1890. *Appias olferna* Swinhoe, *Ann. Mag. Nat Hist.*, (6) 5:353-365.

1939. *Appias libythea olferna*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 396.

Distribution : Bengal to Assam and Burma; Car Nicobar; extending to Hainan and Malay Peninsula.

4. *Ixias pyrene familiaris* Butler

1864. *Ixias familiaris* Butler, *Trans. ent. Soc. Lond.* Part 4, pp. 423-436.

1939. *Ixias pyrene familiaris*, Talbot, *Fauna Brit. India*, Butterflies 1 : 447.

Distribution : West Bengal (Darjeeling); Sikkim to Assam.

5. *Cepora nerissa nerissa* (Fabricius)

1775. *Papilio nerissa* Fabricius, *Syst. Ent.*, p. 471.

1939. *Cepora nerissa nerissa*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 364-365.

Distribution : West Bengal, Sikkim to Assam.

6. *Colotis calais modestus* (Butler)

1876. *Teracalus modestus* Butler, *Proc. zool. Soc. Lond.*, 126-165, Pls. vi., vii..

1939. *Colotis calais modestus*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 452-454.

Distribution : Peninsular India to West Bengal; Sri Lanka.

7. *Dercas verhuelli doubledayi* (Moore)

1905. *Dercas doubledayi* Moore, *Lep. Indica*, 7 : 1-32.

1939. *Dercas verhuelli doubledayi*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 502-503.

Distribution : Bengal, Sikkim to Northern burma.

DISCUSSION

The Pierid butterflies are moderate or fairly small sized insects. Colouration is largely white or with some shade of yellow or orange and also with black markings. Except few, these butterflies show seasonal variations in the intensity and extent of the markings. They are sexually dimorphic. The females are generally darker than the males and have additional markings. In general, the males like the association of other individuals belonging to the same species while the females are more solitary. The species belonging to the subfamilies Pierinae and Coliadinae mainly subsist on the food plants belonging to the natural orders Capparidaceae and Leguminosae respectively although other food plants are known where some of these butterflies thrive. They are found abundantly both in the plains and hill regions of India. The distribution of species in West Bengal districts shows that *D. descombesi descombesi* (Boisduval), *D. aglaia aglaia* (Linnaeus), *D. thysbe pyramus* (Wallace), *P. thestylis thestylis* (Double day), *P. brassicae nepalensis* Doubleday, *A. lyncida eleonora* (Boisduval), *H. glaucippe glaucippe* (Linnaeus) and *E. blanda silhetana* (Wallace) are restricted in the Himalayan belt of West Bengal. All other species are found both in the plains and hills of the state. *D. eucharis* (Drury), *C. crocale crocale* (Cramer), *C. pyranthe pyranthe* (Linnaeus), *C. nerissa phyrne* (Fabricius), *C. florella gnoma* (Fabricius) and *E. hecabe contubernalis* (Moore) are common and represented in 8 or more districts out of a total of 16 districts of West Bengal. It may specially be mentioned here that *E. hecabe contubernalis* (Moore) is very common in the State as it is found in 14 districts.

SUMMARY

The paper incorporates the taxonomic account of the fauna belonging to the family Pieridae from all the 16 districts of West Bengal collected by different survey parties from Zoological Survey of India. Altogether 25 species and 23 subspecies have been examined from West Bengal, of which one species and 8 subspecies have been established as new locality records. Running keys to subfamilies, families, genera and species have been provided. Besides, the distribution of all the species/subspecies, original and current references of each species along with literature references have been given. Besides, an appendix to the list of species which are recorded from literature but not studied at present has been included.

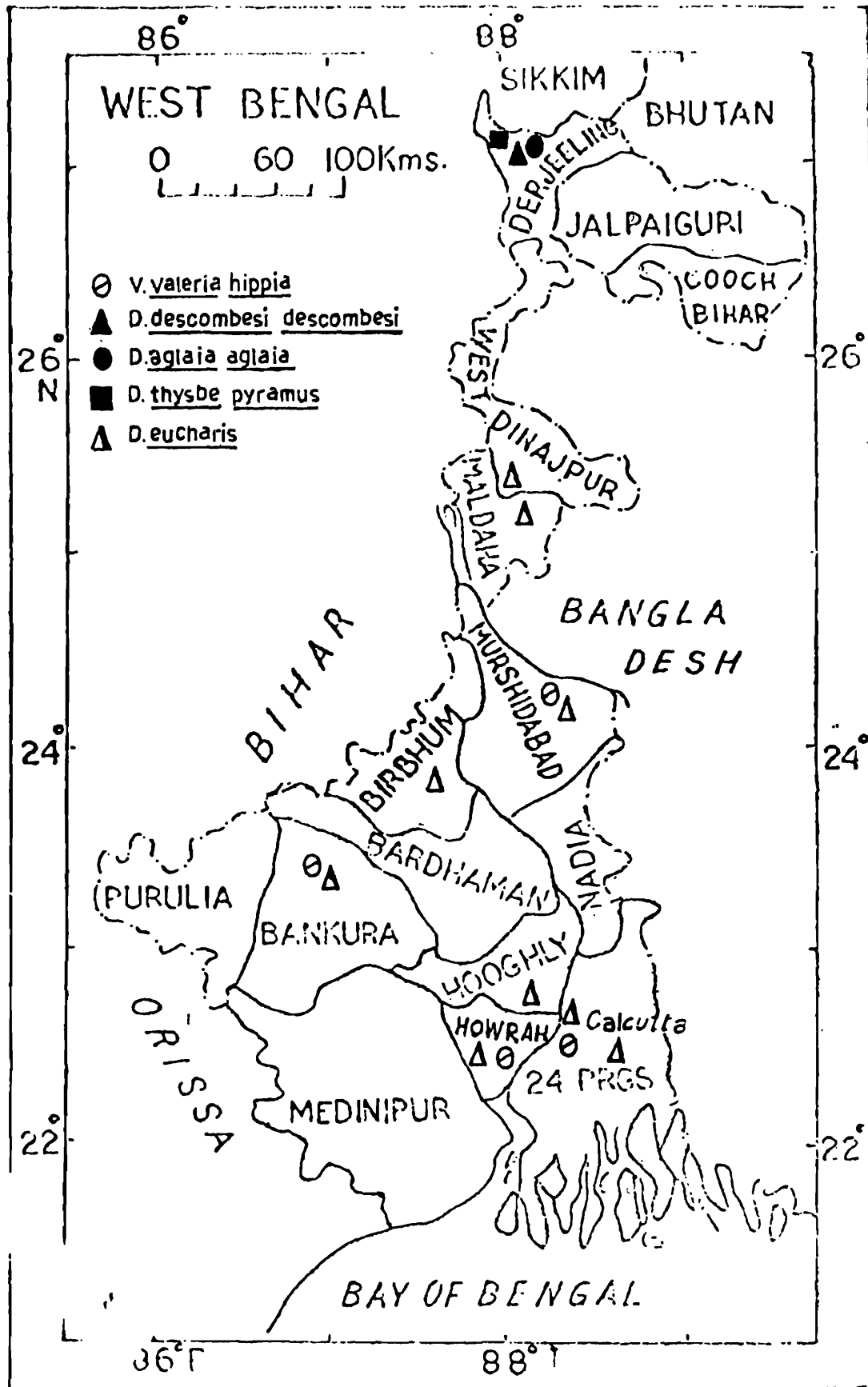
ACKNOWLEDGEMENT

The authors are grateful to the Director, Zoological Survey of India, Calcutta for providing the laboratory facilities.

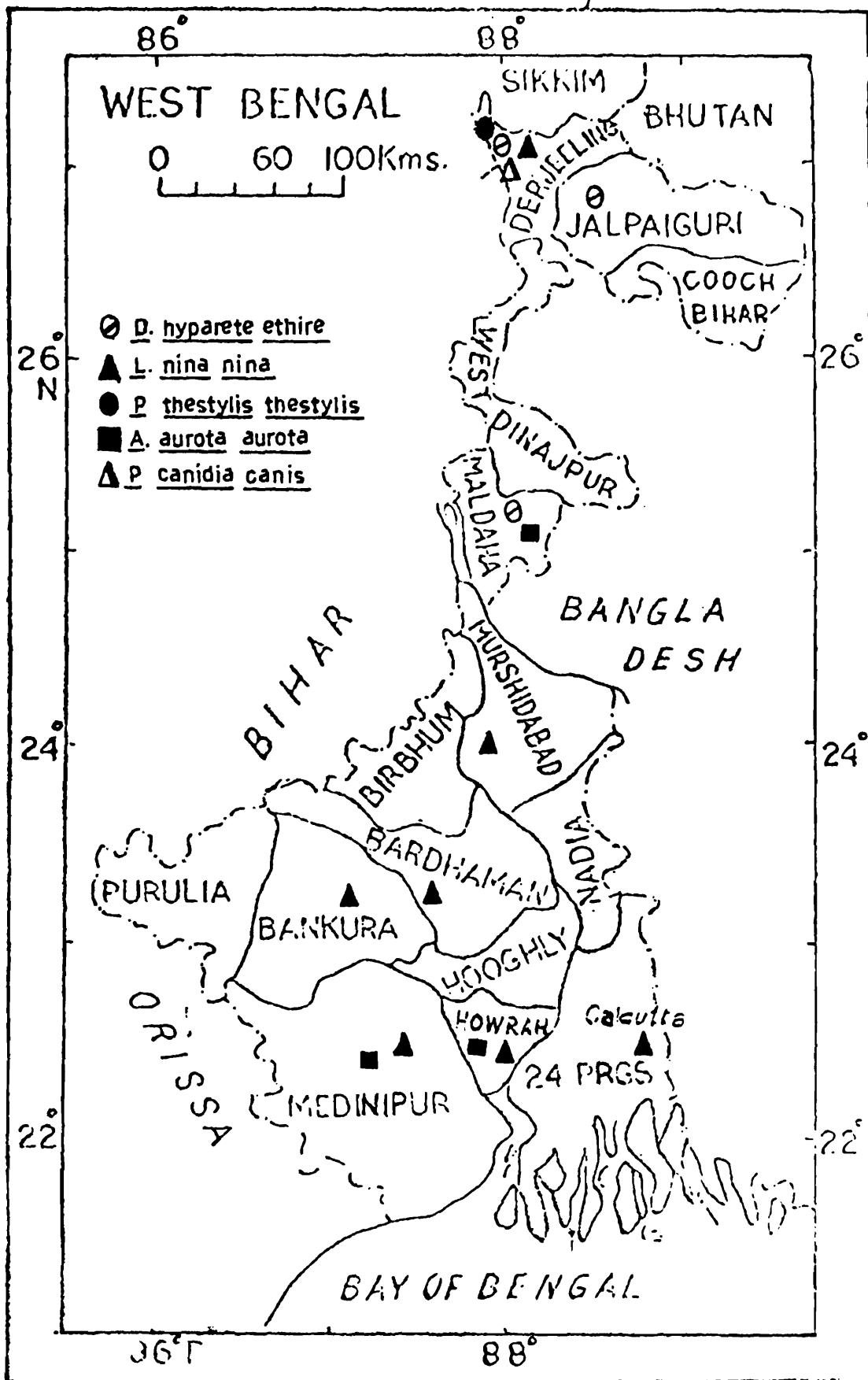
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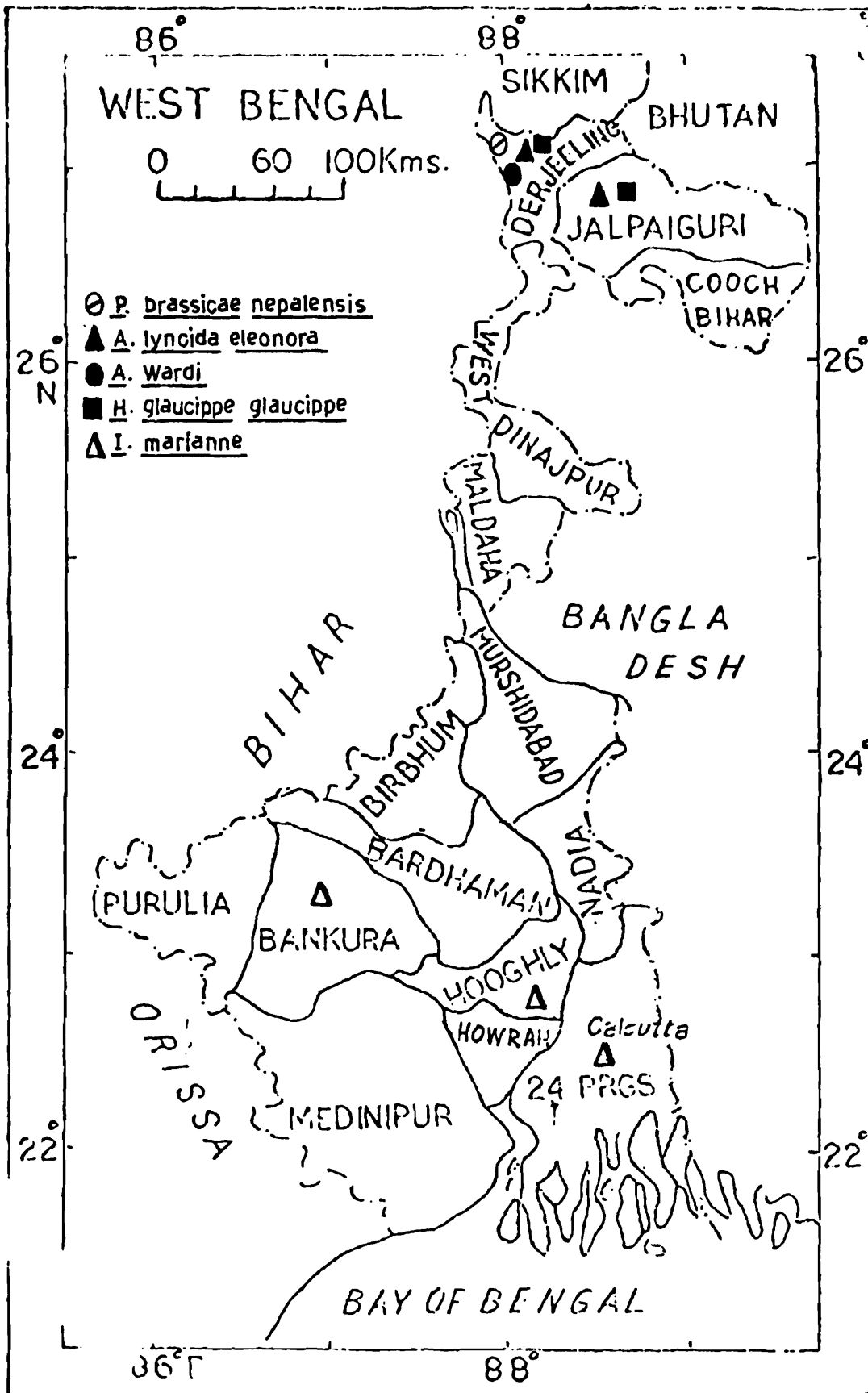
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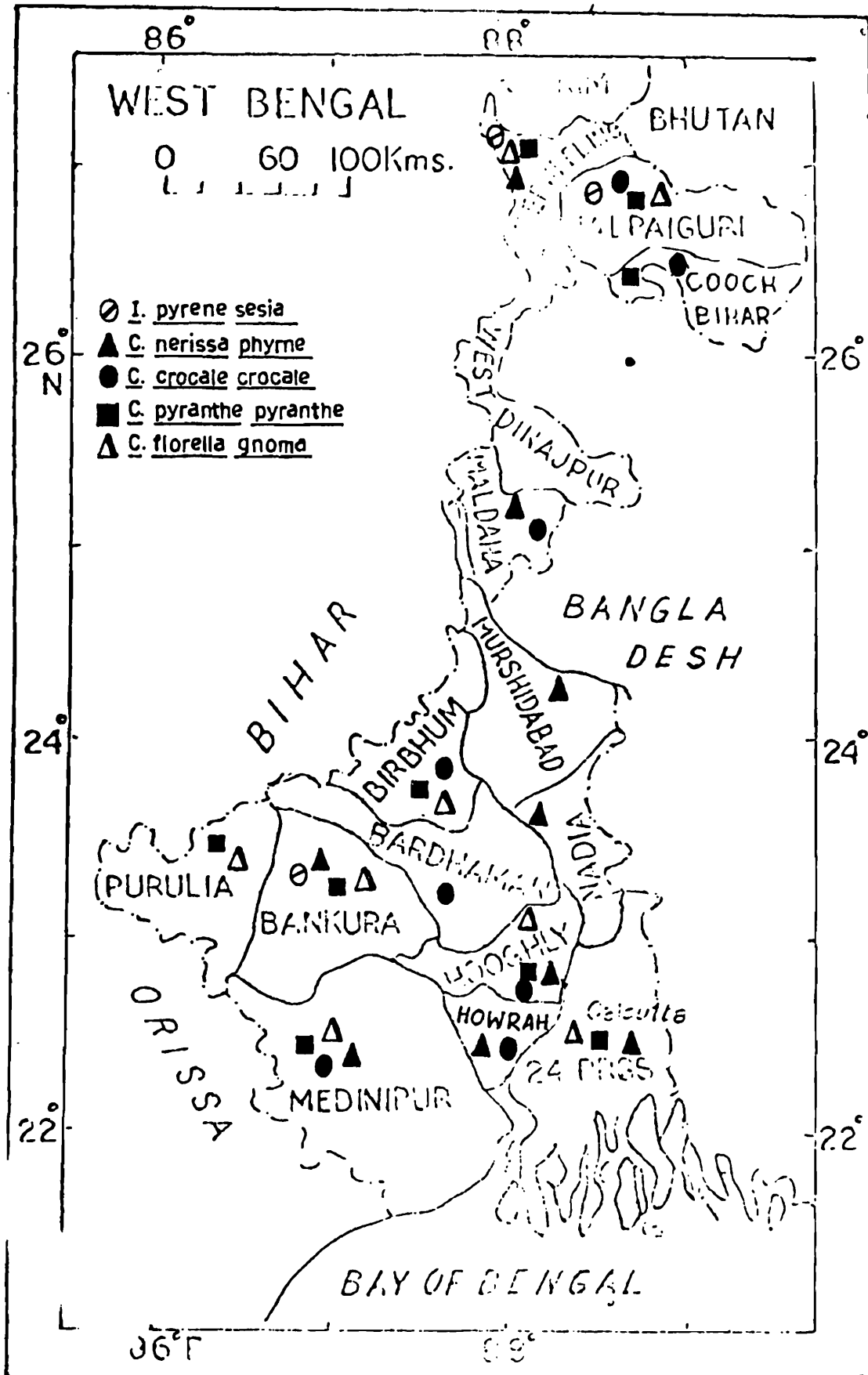
Map 1



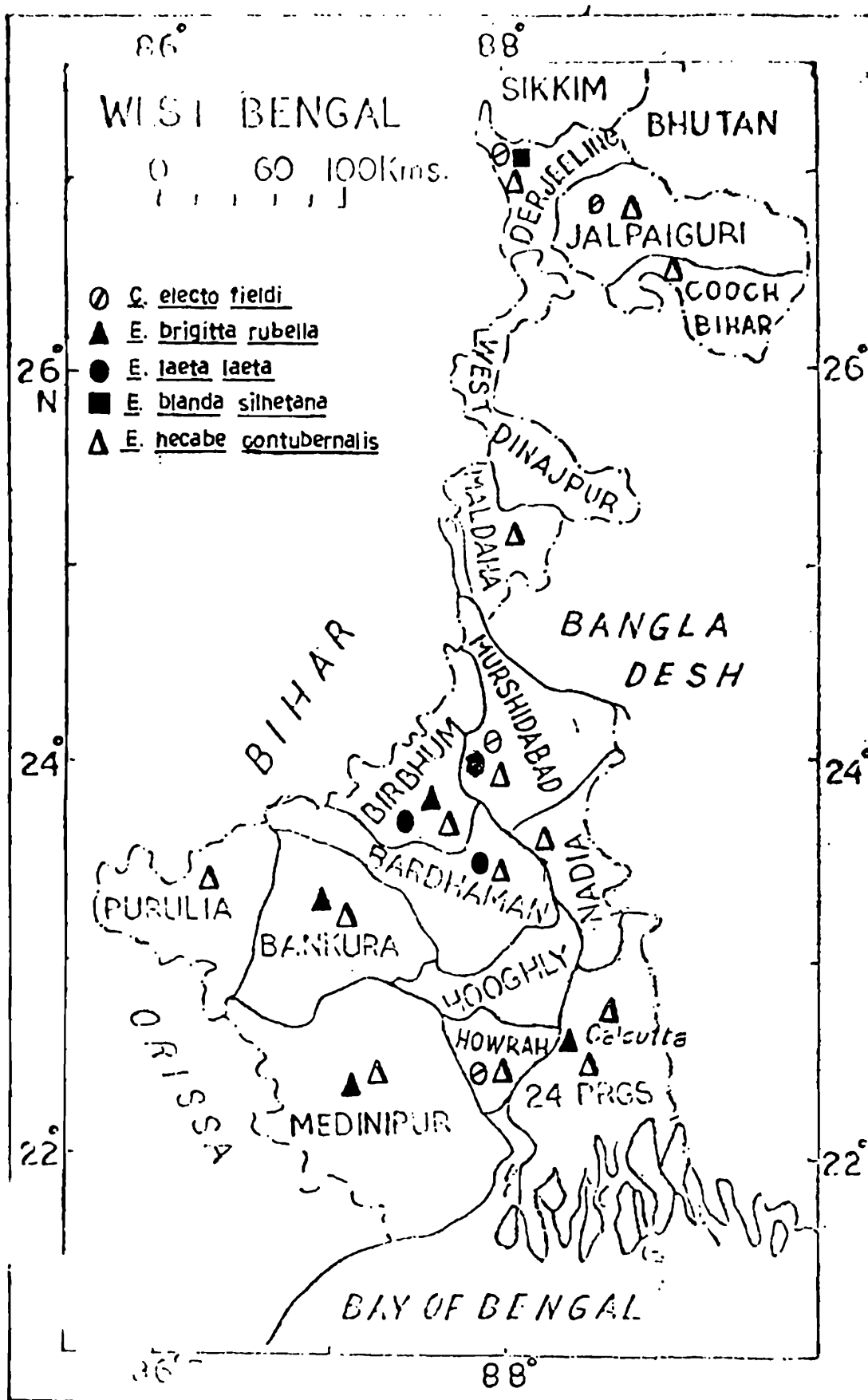
Map 2



Map 3



Map 4



Map 5

INSECTA : SATYRIDAE

D. P. BHATTACHARYA
Zoological Survey of India, Calcutta

INTRODUCTION

The paper deals with the systematic account of the family Satyridae, based on the collections made by different survey parties of Zoological Survey of India and collections received from outside correspondents and also the old collections present in the National Zoological collection. Followig is a brief account of the surveys undertaken for this report.

Darjiling district : (M.B. Kripalani, 1953; H.S. Sharma, 1973; J.K. Jonathan, 1975; G.K. Srivastava, 1975, 76; A.R. Bhaumick, 1976; A.N.T. Joseph, 1978; M.S. Shishodia, 1979; W.H. Evans, 1903 and old collections of National Zoological Collection by C. Lynch; J. Coline, E.T; and Lang, all without date and also purchased collections); *Maldah*: (T.R. Mitra, 1987; old collections of NZC, Irvine, 1885; de Niceville, 1886); *Bankura* : (D.K. Mandal and D.P. Bhattacharya, 1985; S. Sen, 1985, and K.P. Mukherjee, 1986); *Calcutta* : (A.P. Kapur, 1948, 1954; P.C. Dhar, 1969; B.C. Bakshi, 1973 and de Niceville, 1880, 81,86 and 88); *North 24 Parganas* : (K.V. Lakhshminarayan, 1961 and de Niceville 1880, 81, 86, 88); *Birbhum* : (A.K. Hazra, 1974; B.N. Das, 1974; M.S. Shishodia, 1986 and M. Prasad, 1987 and de Niceville, 1879); *Jalpaiguri* : (H.K. Bhowmik, 1975 and A.K. Hazra, 1986); *Medinipur* : (S. Biswas, 1985); *Koch Bihar* : (A. K. Mandal, 1983); *Murshidabad* : (I.J. Gupta, 1986); *Haora* : (S. Ghosh, 1886); *Puruliya* : (S. Sen, 1985); *Nadia* : (D.K. Ghosal, 1964 and A.R. Lahiri, 1986); *Barddhaman* : (S.K. Ghosh, 1983, 85; B.N. Das, 1985 and K.K. Roy, 1986); and *Hugli* : (S.K. Ghosh, 1984).

Moore (1865) first published a paper on the lepidopterous insects of the then undivided Bengal. de Niceville (1885 and 1886) reported the butterflies of Calcutta and the life history of some species of Satyridae. Bingham (1905) reported more than 150 species from India, Burma and Sri Lanka in *Fauna of British India*. Bell (1909 and 1910) described the common butterflies of the plains of India. Fruhstorfer (1911) recorded nearly 1000 species and subspecies from Indo-Australian region. Antram (1924) reported about 130 species of Satyridae from India of which more than 10 species were recorded from undivided Bengal. Evans (1932) reported about 540 species and subspecies from the Indian subregion. Talbot (1947) described about 200 species and subspecies from India of which more than 25 species and sub species were recorded from West Bengal. Wynter-Blyth (1957) reported about 140 species from Indian region and recorded five species specifically from Bengal.

In the present paper, a total of 39 species and subspecies are recorded from the state either based on actual collection or received through out side correspondents.

Key to the genera of SATYRIDAE from West Bengal

1. Eyes hairy..... 2
 Eyes not hairy..... 5
2. Fore wing with vein 1A + 2A swollen at base. *Mycalesis* Hubner
 Fore wing with vein 1A +2A not swollen at base.....3
3. Hind wing outer margin not evenly rounded and never symmetrical about a central axis.....
 *Lethe* Hubner
 Hind wing outer margin evenly rounded and symmetrical about a central axis..... 4
4. Fore wing with veins M_1 and M_2 not arising closely at their origin..... *Pararge* Hubner
 Fore wing with veins M_1 and M_2 arising closely at their origin..... *Rhaphicera* Moore
5. Hind wing with a precostal cell..... *Elymnias* Hubner.
 Hind wing without a precostal cell 6
6. Fore wing with vein R_2 always arising from vein R_5 *Ypthima* Hubner
 Forewing with vein R_2 arising from cell..... 7
7. Hind wing veins M_3 and cu_{1A} approximated at their origin..... *Orsotriaena* Wallengren
 Hind wing veins M_3 and Cu_{1A} not approximated at their origin..... 8
8. Fore wing vein 1A +2A terminating on outer margin in both male and female
 *Melanitis* Fabricius
 Fore wing 1A +2A terminating shortly before middle of inner margin in male only.....
 *Cyllogenes* Butler

Genus *Mycalesis* Hubner

1818. *Mycalesis* Hubner, *Zutr. Samml. exot. Schmett.*, 1:17.

Key to the groups of *Mycalesis*

1. Fore wing upper side with a cavity along vein 1A +2A, covered by hair pencil in male.....
 *Francisca* group

- Fore wing upper side without a cavity and hair pencil in male..... 2
2. Fore wing with R_2 from or near end of cell..... 3
- Fore wing with R_2 well beyond end of cell..... *Oroatis* group
3. Hind wing with Cu_{1A} arising before end of cell..... *Nicotia* group
- Hind wing with Cu_{1A} arising from or beyond end of cell..... 4
4. Hind wing with vein Cu_{1A} shortly stalked with M_3*Patnia* group
- Hind wing with vein Cu_{1A} not stalked with M_3 5
5. Fore wing with ldc nearly straight..... *Fuscum* group
- Fore wing with ldc incurved or angled..... 6
6. Hind wing with a hair pencil on vein 1A + 2A *Mystes* group
- Hind wing without a hair pencil on vein 1A + 2A.....*Mineas* group

Francisca Group

Nine species and subspecies under this group are known from India of which one species and subspecies is recorded from West Bengal.

1. *Mycalesis anaxias aemata* Fruhstorfer

1911. *Mycalesis anaxias aemata* Fruhstorfer, In Seitz's *Fauna Indo-Australia*, 9 : 353.
 1947. *Mycalesis anaxias aemata*, Talbot, *Fauna Brit. India*, Butterflies, 2 : 119-120.

Material examined : One example, Teesta, Darjiling dist., 2.iv. 1903 (W.H. Evans coll.).

Diagnostic characters : Deep brown. Upperside forewing with a submarginal and a marginal pale line; a subapical oblique white band. Hind wing with ashy-grey band. Underside fore wing a pale border with three ocelli, hind wing with seven ocelli. Wing exp. 48-55 mm.

Distribution : India : West Bengal (Darjiling), Assam (Cachar), Manipur, Nagaland, Sikkim; Bangladesh and Burma.

Remarks : The subspecies is popularly known as 'White-Bar Bushbrown' and is not rare in status. This is the first specific report of the subspecies from Darjiling district, West Bengal.

Mineus group

16 species and subspecies are known under this group from India of which 5 species and subspecies

are known from West Bengal.

Key to the species of Mineus Group

1. Hind wing with the brand large and pale yellow..... *visala* Moore
Hind wing with brand small and not yellow..... .2
2. Hind wing with the brand black*perseus* (Fabricius)
Hind wing with the brand salmonpink or rarely brown.....*mineus* (Linnaeus)

2. *Mycalesis perseus blasius* (Fabricius)

1798. *Papilio blasius* Fabricius, *Ent. Syst. Suppl.*, p. 426.

1947. *Mycalesis perseus blasius*, Talbot, *Fauna Brit. India*, Butterflies, 2 : 132-133.

Material examined : Two (M), 1(F), Tunidighi, 26.xi.1987; 1(M), 1(F), Malan, 30.xi.87, 1(M), Rampur, West Dinajpur, 25.xi.87 (T.R. Mitra and Party coll.); 1 (M), Rajbari, 4.xii. 87, 1 (M), Totapur 11.xii.87; 1(F), Muchia, 12.xii.87; 2(M), Mahadipur, Maldah, 5. xii. 1987 (T.R. Mitra and party coll.); 1 (F), Bishnupur, 17.xii. 1985; 1 (F), Jaypur, 21.xii.85; 1(M), Simlapal, Bankura, 24.xii.85 (D.K. Mandal and D.P. Bhattacharya coll.). Old collections from NZC; 25 exs. Calcutta, 17.v.1885, 18-21, vii^a 1886 and 6-13.xii. 1886; 2 exs. Barrackpore, North 24-Parganas, 27.xi. 1880; 24. xi.1881; 2 exs. Birbhum 29.xi.1879 (de Niceville coll.) and 10 exs. Bholahat, Maldah, No date, (de Niceville and W.H. Irvine coll.).

Diagnostic characters : Upperside fore wing always with an ocellus in area 2. Hind wing usually without ocelli. Ground colour dark to pale brown for both the wings. Underside fore wing with curved series of ocelli from 2 to 5, hind wing with seven ocelli in wet season form. Ocelli reduced in dry season form. Wing exp. 45-55 mm.

Distribution : India : West Bengal (Bankura, Birbhum, Calcutta, Maldah, North 24-Parganas, West Dinajpur), Kerala (Malabar), Orissa, Uttar Pradesh (Lucknow), Peninsular India; and Sri Lanka.

Remarks : Popularly known as the 'Common Bushbrown' the subspecies is very common in status.

3. *Mycalesis mineus mineus* (Linnaeus)

1767. *Papilio mineus* Linnaeus, *Syst. Nat.*, (ed.12), 1:764.

1947. *Mycalesis mineus mineus* Talbot, *Fauna Brit. India*, Butterflies, 2 : 134-136.

Material examined : Two (M), Damdin, Darjiling dist., 12.ix.1978 (A.N.T. Joseph and party coll.).
Wing exp. 51 mm.

Diagnostic characters : Upperside, dark brown. Fore wing with a white centred, fulvous-ringed black ocellus in area 2. Underside fore wing with 2 to 4 ocelli and hind wing 5 to 7 ocelli of which the

posterior four ocelli are in a straight line. Both wings with a discal white band. Ocelli nearly obsolete in dry season form.

Distribution : India : West Bengal (Calcutta, Darjiling), Andamans, Assam (Cachar), Himachal Pradesh (Dharmasala, Kangra), Nagaland, Uttar Pradesh (Kumaon, Mussourie); Burma; China and Nepal.

Remarks ; Popularly known as the 'Dark-Brand Bushbrown' the subspecies is common in status. Except Nepal the subspecies is common from Kulu to Burma, Andaman Islands and China.

4. *Mycalesis mineus polydecta* (Cramer)

1777. *Papilio polydecta* Cramer, *Pap. Exot.*, 2 : 76, pl. 144, figs. E.F. (F).

1947. *Mycalesis mineus polydecta*, Talbot, *Fauna Brit. India*, Butterflies, 2 : 136.

Material examined : One (M), Rydek forest, Jalpaiguri dist. 10.ix.1975 (H.K. Bhowmik and party coll), 2(F), Calcutta, 25. xii. 1879 and 5 exs. Bholahat, Maldah dist. No date, (de Nicevilli coll.). Wing exp. 40-48 mm.

Diagnostic characters : This subspecies is slightly different from the nominotypical form, due to its smaller size.

Distribution : India : West Bengal (Calcutta, Jalpaiguri and Maldah), Orissa, Maharashtra (Bombay), South India; and Sri Lanka.

Remarks : The subspecies popularly known as 'Dark Brand Bushbrown' is recorded for the first time from Jalpaiguri and is very common in status.

5. *Mycalesis visala visala* Moore

1857. *Mycalesis visala* Moore, *Cat. Lep. Ins. E.I.C.*, 1:230.

1947. *Mycalesis visala visala*, Talbot, *Fauna Brit. India*, Butterflies, 2 : 140-143, fig. 51(M).

Material examined : Two (M), 3(F), Teesta valley, 30.i.1953 (M.B. Kripalani and party coll.) and 1 (F), Singla, Darjiling dist., 16.iv.1973 (H.S. Sharma and party coll.); 1 (F), Jhargram, Medinipur dist., 15.ix.1985 (S. Biswas and party coll.); 1(M), Kachujur, Birbhum dist., 8.xi.1974 (A.K. Hazra and party coll.) also 8 exs Calcutta, 7.xii.1879, Nov. 1880, July, Oct. 1885 (de Niceville coll.); 2 exs., Bholahat, No date, (W.H. Irvine coll.) and 3 exs. Bholahat, Maldah dist. No date, (de Niceville coll.). Wing exp. 45-55mm.

Diagnostic characters : Fore wing with apex acute, outer margin straight, a prominent median ocellus on upperside. Underside wet season form, ocellus in area 2 large in fore wing, hind wing with seven ocelli. All Ocelli obsolete or represented by white points in dry season form.

Distribution : India : West Bengal (Birbhum, Calcutta, Darjiling, Maldah, Medinipur), Assam, Madhya Pradesh (Pachmarhi), Nagaland, Sikkim, Uttar Pradesh (Kumaon, Mussourie); also Burma.

Remarks : Popularly known as the Long Brand Bushbrown' the subspecies in common in status except Burma where it is scarce. The subspecies is recorded for the first time from Birbhum, Darjiling, Maldah and Medinipur districts of West Bengal.

Nicotia group

14 species and subspecies are known under this genus from India of which one species is hitherto recorded from West Bengal.

6. *Mycalesis nicotia* Westwood etc.

1850. *Mycalesis nicotia* Westwood, *Gen. Diurn. Lep.*, pl.66, fig.4 (F).

1947. *Mycalesis nicotia*, Talbot, *Fauna Brit. India, Butterflies*, 2 : 156-157.

Material examined : One (M), Rydek forest, Jalpaiguri Dist., 10.ix.1975 (H. K. Bhowmick and party coll.), Wing exp. 51 mm.

Diagnostic characters : Both wings upperside with a large ocellus in area 2 and with submarginal and marginal pale lines. Underside, fore wing with four ocelli and hind wing with seven ocelli. Wing exp. 55-60 mm.

Distribution : India : West Bengal (Jalpaiguri also undivided Bengal), Manipur, Meghalaya (Khasis), Nagaland, Sikkim, Uttar Pradesh (Kumaon, Mussourie) ; and Burma.

Remarks : The subspecies is commonly known as 'Bright-Eye Bushbrown' and is rare in status. It is recorded for the first time from Jalpaiguri district, West Bengal.

Genus *Lethe* Hubner

1819. *Lethe* Hubner, *Verz. bek. Schmett.*, p. 56.

The genus *Lethe* is divided into three groups, *Sura*, *Minerva* and *Yama*.

Key to groups of *Lethe*

1. Hind wing Sc + R₁ about half the length of Rs and underside without an ocellus in area 7.....2
Hind wing Sc + R₁ nearly as long as Rs and underside with an ocellus in area 7.... ***Yama*** group
2. Fore wing upper angle of cell evenly rounded; Sc terminates at costa near end of cell. Hind wing underside more than one band in cell.....***Sura*** group
Fore wing upper angle of cell angled; Sc terminates at costa beyond end of cell. Hind wing underside never more than one band in cell..... ***Minerva*** group

Sura group

21 species and subspecies under this group are known from India of which 5 species and subspecies are hitherto recorded from West Bengal.

Key to the species of *Sura* group

1. Hind wing Cu_{1a} from before end of cell.....2
Hind wing Cu_{1a} from end of cell.....3
2. Hind wing underside ocelli having their centres in a straight line..... *visrava* (Moore)
Hind wing underside ocelli having their centres arranged in an arc..... 4
3. Hind wing underside with dark discal band not widening towards costa.....*goalpara* (Moore)
Hind wing underside with dark discal band widening towards costa..... *sura* (Doubleday)
4. Hind wing underside ocelli in 2 and 6 always large and more prominent than rest.....
..... *sidonis* (Hew.)
Hind wing underside ocelli in 2 and 6 never large or more prominent than rest, all equal.....
..... *nicetas* (Hew.)

7. *Lethe visrava* (Moore)

1865. *Debis visrava* Moore, *Proc. zool. Soc. Lond.*, p.76, pl. 41, fig. 4 (M).

1947. *Lethe visrava*, Talbot, *Fauna Brit. India*, Butterflies, 2 : 170-171.

Material examined : One (M), Darjiling dist., No date, (C. Lynch coll. from NZC). Wing exp. 51 mm.

Diagnostic characters : Upperside male blackish brown. Fore wing with a prominent submarginal white line. Hind wing with a post discal series of black blind ocelli. Underside, fore wing with three or four white centred dark ocelli. Hind wing with six white centred black ocelli. Female fore wing upperside white spotted; hind wing brown spotted. Underside hind wing ocelli black, a submarginal row of ochraceous lunules.

Distribution : India : West Bengal (Darjiling), Manipur, Sikkim; also Bhutan and North Eastern Burma.

Remarks : The species commonly known as 'White-Edged Woodbrown' is rare in status, especially the female.

8. *Lethe sidonis* (Hewitson)

1863. *Debis sidonis* Hewitson, *Exot. Butt.* 3 : 77.

1947. *Lethe sidonis*, Talbot, *Fauna Brit. India*, Butterflies, 2 : 172-175, fig. 61.

Material examined: One (M), 1(F), Ghoombhanjang, Darjiling dist., 25.v.1975 (J.K. Jonathan and party coll.). Wing exp. 45-51 mm.

Diagnostic characters : Vide key.

Distribution : India : West Bengal (Darjiling), also Assam, Manipur, Nagaland, Uttar Pradesh (Garhwal, Kulu, Kumaon, Mussourie), Sikkim; and Afghanistan; Bhutan; Burma and South Tibet.

Remarks : The species popularly known as 'Common Woodbrown' is not rare in status.

9. *Lethe nicetas* (Hewitson)

1863. *Debis nicetas* Hewitson, *Exot. Butt.*, 3 : 78.

1947. *Lethe nicetas*, Talbot, *Fauna Brit. India*, Butterflies, 2 : 179-180.

Material examined : One example, Darjiling. (Purchased, No date, NZC coll.).

Diagnostic characters : Vide key.

Distribution : India : West Bengal (Darjiling), Manipur, Sikkim, Uttar Pradesh (Garhwal, Kangra, Kumaon); and North East Burma.

Remarks : Commonly known as 'Yellow Woodbrown', the species is not rare in status. This is the first specific record of the species from Darjiling, West Bengal.

10. *Lethe goalpara goalpara* (Moore)

1865. *Zophoessa goalpara* Moore, *Proc. zool. Soc. Lond.*, p. 768 (F).

1947. *Lethe goalpara* Talbot, *Fauna Brit. India*, Butterflies, 2 : 185 186.

Material examined : One example from Darjiling in NZC collection. (No other data available).

Diagnostic characters : Vide key. Wing exp. 65-80 mm.

Distribution : India : West Bengal (Darjiling), also Himachal Pradesh (Baghi, Kulu, Narkunda, Simla) and Uttar Pradesh (Kumaon).

Remarks : Popularly known as 'Large Golden-fork', the subspecies is not rare in status except Simla (Narkunda, 2742 m.), where it is rare also this is the first specific report of the subspecies from Darjiling, West Bengal.

11. *Lethe sura* (Doubleday)

1849. *Zophoessa sura* Doubleday, *Gen. Diurn. Lep.*, 1 : pl. 61, fig. 1 (F).
 1947. *Lethe sura*, Talbot, *Fauna Brit. India*, Butterflies, 2 : 187-188.

Material examined : One example, Darjiling, (J. Coline, E.T. Coll. from NZC, no date available).

Diagnostic characters : Vide key.

Distribution : India : West Bengal (Darjiling), Nagaland, Sikkim; also Bangladesh (Sylhet);
 Bhutan; North Burma (Tenasserim).

Remarks : The species is popularly known as C.Lilacform' and is not rare in status.

Minerva group

33 species and subspecies under this group are known from India of which 11 species and subspecies are recorded from West Bengal.

Key to the species of *Minerva* group

1. Hind wing Cu_{1a} from or close to end of cell..... 2
 Hind wing Cu_{1a} always from well before end of cell..... 2
2. Fore wing underside with a pale bar at end of cell..... *baladeva* (Moore)
 Fore wing underside without a pale bar at end of cell..... 3
3. Fore wing upperside with a white band.....*confusa* Auriv.
 Fore wing upperside without a white band..... 4
4. Fore wing underside with a single straight pale band accross cell.....*europa* (Fabr.)
 Fore wing underside without a single straight pale band accross cell..... 5
5. Hind wing underside ocelli in areas 3 and 4, and sometimes in 5, elongate and distorted.....
*rohria* (Fabr.)
 Hind wing underside ocelli in areas 3 and always in 5, rounded but slightly incomplete..... 6
6. Hind wing underside ocelli more or less incomplete..... 7
 Hind wing underside ocelli entire..... 8

7. Hind wing upperside in male marginal area without black spots. Female upperside dusky red...
..... *chandica* (Moore)
- Hind wing upperside in male distal area with prominent black spots. Female upperside bright red
..... *distans* Butl.
8. Fore wing apex not produced..... *serbonis* (Hew.)
- Fore wing apex produced..... *kansa* (Moore)
9. Fore wing upperside with a broad white even band ending at the margin..... *verma* (Koll.)
- Fore wing upperside without a broad white even band ending at margin..... 10
10. Both wings upperside male dark purple blue..... *scanda* (Moore)
- Both wings upperside male dark brown..... *bhairava* (Moore)

12. *Lethe baladeva baladeva* (Moore)

1865. *Zophoessa baladeva* Moore, *Proc. zool. Soc. Lond.*, p. 769, pl. 41, fig. 5 (M).

1947. *Lethe baladeva baladeva*, Talbot, *Fauna Brit. India*, Butterflies, 2 : 194.

Material examined : One example from Darjiling, No date, (de Niceville coll. from NCZ).

Diagnostic characters : Vide key. Wing exp. 67-70 mm.

Distribution : India : West Bengal (Darjiling) also Sikkim.

Remarks : The subspecies commonly known as 'Treble Silverstripe' is rare in status. This is the first specific report of the subspecies from Darjiling, West Bengal.

13. *Lethe europa europa* (Fabricius)

1775. *Papilio europa* Fabricius, *Syst. Ent.*, (3) 1 : 500 (M).

1947. *Lethe europa europa*, Talbot, *Fauna Brit. India*, Butterflies, 2 : 197-198.

Material examined : Material reviewed from the literature.

Diagnostic characters : Vide key. Wing exp. 65-75.

Distribution : India : West Bengal (Calcutta, plains of Bengal), Karnataka (Karwar), Orissa, Tamil Nadu (Nilgiri hills).

Remarks : The subspecies is not represented in the National Zoological Collection from West

Bengal and has been reviewed from the literature. It is popularly known as the 'Bamboo Treebrown' and its larva feeds on bamboo leaves. The species is not rare in status.

14. *Lethe europa niladana* Fruhstorfer

1911. *Lethe europa niladana* Fruhstorfer, *In Seitz's Macrolep. World*, 9 : 315.

1947. *Lethe europa niladana*, Talbot, *Fauna Brit. India, Butterflies*, 2 : 198-199.

Material examined : One example from Calcutta, West Bengal, No date available (de Niceville coll. from NZC).

Diagnostic characters : The subspecies is not sharply distinguished from the nominotypical subspecies and appears to differ by the paler underside and the discal band on fore wing being whiter.

Distribution : India : West Bengal (Calcutta), Assam (Cachar), Punjab, Sikkim, Uttar Pradesh (Kumaon, Mussourie); also Burma; Thailand and Vietnam (Tongking).

15. *Lethe rohria rohria* (Fabricius)

1787. *Papilio rohria* Fabricius, *Mant. Ins.*, 2 : 45.

1947. *Lethe rohria rohria*, Talbot, *Fauna Brit. India, Butterflies*, 2 : 200-201.

Material examined : One example, Darjiling, from NZC collection (no other data available).

Diagnostic characters : Upperside vandyke-brown. Fore wing with apical and costal white spots. Underside hind wing with discal band. Wing exp. 60-70 mm.

Distribution : India : West Bengal (Darjiling), also Himachal Pradesh (Kangra, Kulu, Simla), Jammu and Kashmir, Meghalaya (Shillong), Punjab, Sikkim, also Uttar Pradesh (Kumaon, Mussourie); Burma; Java; Malaya; and South China (Yunnan).

Remarks : Popularly known as 'Common Treebrown' the subspecies is common in status. This is the first specific report of the sub species from Darjiling, West Bengal.

16. *Lethe confusa confusa* Aurivillius

1898. *Lethe confusa* Aurivillius, *Ent. Tidskr.*, 18 [1897] : 142.

1947. *Lethe confusa confusa*, Talbot, *Fauna Brit. India, Butterflies*, 2 : 205-207, fig. 67.

Material examined : Material reviewed from the literature.

Diagnostic characters : Hind wing very slightly caudate. Upperside fore wing with apical pale spots and a medial white band. Underside hind wing apical spot larger than that in area 2. Wing exp. 50-55 mm.

Distribution : India : West Bengal (Undivided Bengal), Assam, Meghalaya, Nagaland, Sikkim,

Uttar Pradesh (Kumaon, Mussourie); also Burma; China (South and West); Pakistan (Murree); Thailand; Tibet; Vietnam (Tongking).

Remarks : Due to non availability of the species in the collection it has been reviewed from literature. Popularly known as the 'Banded Treebrown' the subspecies is common in status.

17. *Lethe chandica chandica* (Moore)

1857. *Debis chandica* Moore, *Cat. Lep. Ins. E.I.C.*, 1 : 219.

1947. *Lethe chandica chandica*, Talbot, *Fauna Brit. India*, Butterflies, 2 : 211-213.

Material examined : One example from Darjiling, West Bengal (NZ collection, No other data available).

Diagnostic characters : Upperside both wings velvety brownish-black in male. Fore wing dull ochraceous-red in female with an angulate white bar and two white spots. Hind wing with a curved series of black spots.. Underside both wings with a series of four to six pale ocelli. Hind wing angulated at vein M₃. Wing exp. 65-75 mm.

Distribution : India : West Bengal (Darjiling), Assam, Nagaland, Sikkim, and Burma; Thailand.

Remarks : The species commonly known as 'Angled Red Forester' is not rare in status.

18. *Lethe distans* Butler

1870. *Lethe distans* Butler, *Trans. ent. Soc. Lond.*, pt.4 : 488.

Material examined : Material reviewed from the literature.

Diagnostic characters : Very similar to *chandica*. Vide key for the distinguishing characters. Wing exp. 70-80 mm.

Distribution : India : West Bengal (Darjiling), also Sikkim to Kareon Hills, Burma.

Remarks : Popularly known as Scarce Red Forester', the species is very rare in status.

19. *Lethe serbonis teesta* Talbot.

1876. *Debis serbonis* Hewitson, *Ent. Mon. Mag.*, 13 : 151.

1947. *Lethe serbonis teesta*, Talbot, *Fauna Brit. India*, Butterflies, 2 : 220-221.

Material examined : Material reviewed from the literature.

Diagnostic characters : Upperside rich umber-brown. Fore wing with outer edge of the brand very irregular. Underside with a reddish brown tinge. Fore wing with an ocellus in area 3. Hind wing with a

reddish brown border between the ocelli and the inner submarginal line. Wing exp. 62-66 mm.

Distribution : India : West Bengal (Darjiling) and sikkim.

Remarks : Commonly known as 'Brown Forester', the sub species is rare in status.

20. *Lethe kansa* (Moore)

1857. *Debis kansa* Moore, *Cat. Lep. Ins. E.I.C.*, 1 : 220.

1947. *Lethe kansa*, Talbot, *Fauna Brit. India*, Butterflies, 2 : 223-224.

Material examined : One example from Darjiling, (NZC collection, No other data available).

Diagnostic characters : Upperside brown with olivaceous green or ochraceous red tint. Fore wing with an obscure band from inner margin to veins M_2 or M_3 , three subapical spots. Hind wing with five ocelli, the second and fourth the largest, the third minute. Underside vinaceous brown. Fore wing with five pale ocelli in apical white area. Hind wing with six black ocelli. Wing exp. 65-75 mm.

Distribution : India: West Bengal (Darjiling), Assam, Nagaland, Sikkim, Uttar Pradesh (Kumaon); and Burma; Thailand; Vietnam (Tongking).

Remarks : Popularly known as 'Bamboo Forester', the species is common in status. This is the first specific report of the species from Darjiling, West Bengal.

21. *Lethe verma sintica* Fruhstorfer

1911. *Lethe verma sintica* Fruhstorfer, *In Seitz's Macrolep. World*, 9 : 324.

1947. *Lethe verma sintica*, Talbot, *Fauna Brit. India*, Butterflies, 2 : 230.

Material examined : Material reviewed from the literature.

Diagnostic characters : Brown. Fore wing with a discal white band. Hind wing usually with an ocellus in areas 2 and 3. Underside hind wing the lines bluish. Wing exp. 55-60 mm.

Distribution : India : West Bengal (Undivided Bengal), Arunachal Pradesh, Assam, Manipur, Nagaland, Sikkim; also Burma and Nepal.

Remarks : Due to non availability of the species in the collection, it has been reviewed from the literature. Popularly called as 'Straight-Banded Treebrown' the subspecies is common in status.

22. *Lethe scanda* (Moore)

1857. *Debis scanda* Moore, *Cat. Lep. Ins. E.I.C.*, 1 : 218.

1947. *Lethe scanda*, Talbot, *Fauna Brit. India*, Butterflies, 2:224-25.

Material examined : Material reviewed from the literature.

Diagnostic characters : Male deep indigo blue. Upperside fore wing with a long narrow brand along vein 1A+2A. Hind wing with three dusky black ocelli. Underside fore wing with four ocelli, hind wing with a post discal row of black, white-pupilled ocelli. Female upperside vandyke brown. Fore wing with a yellow discal bar and three ocelli. Hind wing with four ocelli. Underside similar to that of male.

Distribution : India : West Bengal (Darjiling) also Assam, Nagaland and Sikkim.

Remarks : Commonly known as 'Blue Forester' the species is rare in status.

23. *Lethe bhairava* (Moore)

1857. *Debis bhairava* Moore, *Cat Lep. Ins. E.I.C.*, 1 : 217.

1947. *Lethe bhairava*, Talbot, *Fauna Brit. India, Butterflies*, 2 : 228.

Material examined : One (M), Atiamochar, Koch Bihar dist., West Bengal, 2.ix. 1983 (A.K. Mandal and party coll.). Wing exp. 75 mm.

Diagnostic characters : Upperside dark brown. Fore wing with three round yellowish patches beyond the cell and hind wing bearing a post discal series of four blind ocelli, in the male each pale-ringed and in the female encircled by a broad yellow ring. Underside red. Post discal series of ocelli on hind wing with outer reddish rings. Wing exp. 65-75 mm.

Distribution : India : West Bengal (Koch Bihar), Assam, Nagaland, Sikkim; and Bhutan; Burma (Dawna Range).

Remarks : Commonly known as 'Rusty Forester' the species is not rare in status. This is the first record of the species from Koch Bihar and also from West Bengal.

Yama group

Eight species and subspecies under this group are known from India of which two are reported from West Bengal.

Key to the *Yama* group

1. Fore wing upperside always with two pale spots in area 2; 1A+2A, Cu_{1a} and Cu_{1b} and the base yellow.....*pulaha* (Moore)

Fore wing upperside with one pale spot in area 2; none of the veins yellow.....*bhadra* (Moore)

24. *Lethe pulaha pulaha* (Moore)

1857. *Lasiommata pulaha* Moore, *Cat. Lep. Ins. E.I.C.*, 1 : 227.

1947. *Lethe pulaha pulaha*, Talbot, *Fauna Brit. India, Butterflies*, 2 : 232-233.

Material examined : One (F), Rangiroon Forest Rest House, Darjiling dist., West Bengal,

14.iv.1973 (H. S. sharma and party coll.)

Diagnostic characters : Upperside dark brown. Fore wing with two streaks in cell, a streak in area 1 and a spot beyond it; discal and subterminal areas with several large and small spots, all the markings yellowish white. Hind wing dark brown. Underside hind wing with eight large black ocelli. Wing exp. 66-72 mm.

Distribution : India : West Bengal (Darjiling), Sikkim; and Bhutan.

Remarks : Commonly known as 'Veined Lady-rinth' the subspecies is not rare in status and is the first specific report from Darjiling and West Bengal

25. *Lethe bhadra* (Moore)

1857. *Lasiommata bhadra* Moore, *Cat. Lep. Ins. E.I.C.*, 1 : 227.

1947. *Lethe bhadra*, Talbot, *Fauna Brit. India*, Butterflies, 2 : 236.

Material examined : One example, Darjiling, West Bengal, (no other data, old collection from NZC).

Diagnostic characters : Fore wing with a streak in area 1b and a spot beyond it two streaks in the cell, white spots beyond it. Hind wing broadly caudate at vein M_3 , Wing exp. 80-100 mm. Underside hind wing with nine ocelli.

Distribution : India : West Bengal (Darjiling), Assam, Sikkim; and Bhutan; Burma (Karen Hills); Vietnam (Tongking)

Remarks : The species is popularly known as 'Tailed Labyrinth' and is rare in status. This is the first specific report of the species from Darjiling and West Bengal. Lewis (1973) described the species as *Neope bhadra*.

Genus *Pararge* Hubner

1819. *Pararge*, Hubner, *Samml. Exot. Schmett.*, 2 : 59.

Six species and subspecies under this genus are known from India of which one species and subspecies is recorded from West Bengal.

26. *Pararge schakra schakra* (Kollar)

1844. *Satyrus schakra* Kollar, *In Hugel's Kaschmir Reich Siek.* 4 (2) : 446, pl. 15, figs. 3,5.

1947. *Pararge schakra schakra*, Talbot, *Fauna Brit. India*, Butterflies, 2 : 242-243.

Material examined : One example, Darjiling, West Bengal (No other data, old collection from NZC).

Diagnostic characters : Upperside brown. Fore wing with a prominent apical ocellus on a tawny area. Hind wing 2 to 3 marginal ocelli. Underside, fore wing with a subapical ocellus. Hind wing with a curved row of six ocelli. Wing exp. 55-60 mm.

Distribution : India : West Bengal (Darjiling), Himachal Pradesh (Kangra, Simla), Punjab and Uttar Pradesh (Kumaon, Mussourie and Upper Ganges valley); also Pakistan (Baluchistan and Chitral).

Remarks : The subspecies is popularly known as 'Common Wall' and is common in status. This is the first specific report of the subspecies from Darjiling and West Bengal and also from north eastern region of India.

Genus *Rhaphicera* Butler

1867. *Rhaphicera* Butler, *Ann. Mag. Nat. Hist.*, (3) 19:164.

Two species and subspecies under this genus are known from India of which one is recorded from West Bengal.

27. *Rhaphicera moorei moorei* Butler

1867. *Rhaphicera moorei* Butler, *Ann. Mag. Nat. Hist.*, (3) : 19:164, pl. 4, fig. 4.

1947. *Rhaphicera moorei moorei*, Talbot, *Fauna Brit. India*, Butterflies, 2 : 250, fig. 76.

Material examined : Material reviewed from literature.

Diagnostic characters : Upperside ground colour ochraceous yellow. Fore wing distal yellow spot in are 3 bears generally a black dot. Hind wing distal patch in area 4 bears a black dot or spot. Underside hind wing with six ocelli.

Distribution : India : West Bengal (Darjiling), Himachal Pradesh (Kangra, Kulu, Simla), Uttar Pradesh (Garhwal, Kumaon, Mussourie) and Sikkim.

Remarks : The subspecies popularly known as 'Small Tawny Wall', is not rare in status. Due to non availability of the species from West Bengal in the collection it has been reviewed from literature.

Genus *Ypthima* Hubner

1818. *Ypthima* Hubner, *Zutr. Samml. Exot. Schmett.*, p. 17.

Twenty Eight species and subspecies under this genus are known from India of which five species and subspecies are recorded from West Bengal.

Key to the species of *Ypthima* from West Bengal

1. Hind wing underside with a single apical ocellus.....2

- Hind wing underside with more than one apical ocellus..... 3
2. Hind wing underside with ocelli in areas 1 and 2, absent in 3.....*inica* Hewitson
Hind wing underside with three ocelli in areas 1,2 and 3..... *ceylonica* Hewitson
3. Hind wing underside with two apical ocelli much larger than the rest.....*sakra* Moore
Hind wing underside with two apical ocelli not much larger than the rest.....4
4. Both wings underside with coarse striations; subbasal bands prominent *baldus* (Fabricius)
Both wings underside with fine striations; subbasal bands obsolete.....*indecora* Moore

28. *Ypthima inica* Hewitson

1865. *Ypthima inica* Hewitson, *Trans. ent. Soc. Lond.*, (3) 2 : 284, pl. 17, fig. 5(F).
1947. *Ypthima inica*, Talbot, *Fauna Brit. India*, Butterflies, 2 : 319-320.

Material examined : Eighteen (M), 2 (F), Bholahat, Maldah dist., April, 1886 (de Niceville coll.).

Diagnostic characters : Upperside both wings uniform dark brown. Fore wing with a bipupilled subapical ocellus. Hind wing with a unipupilled subtornal ocellus. Underside wet season form, fore wing with a subapical ocellus; hind wing with one apical and two subtornal ocelli. Wing exp. 30-34 mm.

Distribution : India : West Bengal (Bholahat, Maldah dist.), Madhya Pradesh (Mhow) and Punjab.

Remarks : Popularly known as "Lesser Threering" the species is not rare in status. This is the first specific report of the species from Maldah district, West Bengal.

29. *Ypthima ceylonica hubneri* Kirby

1871. *Ypthima hubneri* Kirby, *Syn. Cat. Diurn. Lep.*, P. 95.
1947. *Ypthima ceylonica hubneri*, Talbot, *Fauna Brit. India*, Butterflies, 2 : 329-330.

Material examined : Two (M), Calcutta, 5.vii.1885; 3 (M), Barrackpore, North 24-Parganas, 24,27.xi.1888, 26.v.1886 (de Niceville coll.), 1(M), 1(F), Calcutta, (Purchased coll.); 5(M), 1(F), Calcutta, 28.iii. 1886, August, 1883-84 (de Niceville coll.), 2(M), 1 (F), (Purchased coll.), 1(M), Gonatea, Birbhum dist. (Purchased coll.), 2(M), Calcutta, Dec. 1885 (de Niceville coll.); 5(M), Bholahat, Maldah dist. No date, (de Niceville coll.); 1(M), 2 (F) Bholahat, Maldah dist., No date, (W.H. Irvine coll.); 3(M) Jiyaganj, Murshidabad dist., 6.ii.1986 (I.J. Gupta and party coll.); 2(M), Atiamochar, Koch Bihar, 1.ix. 1983 (A.K. Mandal and party coll.); 2(M), Botanical Gardens, Haora dist., 19.viii. 1986 (S. Ghosh and party coll.).

Diagnostic characters : Greyish brown. Upperside fore wing with a large, black, bipupilled, yellow ringed subapical ocellus. Hind wing with two to three unipupilled post discal ocelli all of which

may be absent. Underside fore wing ocellus as on upperside, hind wing one apical and three typical posterior post discal ocelli placed in a curve.

Distribution : India : West Bengal (Birbhum, Calcutta, Haora, Koch Bihar, Maldah, Murshidabad and North 24-Parganas), Assam, Maharashtra (Mahabaleswar), Nagaland, Orissa, Sikkim, Tamil Nadu (Palni hills, Nilgiri hills), Uttar Pradesh (Dehra Dun); also Burma; Malaya and Nepal.

Remarks : The species popularly known as 'Common Fourring' is very common in status. This is the first specific report of the species from North 24-Parganas, Maldah, Murshidabad, and Koch Bihar districts of West Bengal.

30. *Ypthima indecora* Moore

1882. *Ypthima indecora* Moore, *Proc. zool. Soc. Lond.*, p. 238, pl. 12, fig. 7.

1947. *Ypthima indecora* Talbot, *Fauna Brit. India*, Butterflies, 2 : 336.

Material examined : One (M), 1(F), Bholahat, Maldah dist., No date, (de Niceville coll.).

Diagnostic characters : Upperside fore wing of male with prominent brand, hind wing discal band not visible. Underside both wings straited with dark brown. Hind wing ocelli in echelon of twos, reduced to mere specks in dry forms. Wing exp. 35-40 mm.

Distribution : India : West Bengal (Maldah) also Jammu and Kashmir and Uttar Pradesh (Kangra, Mussourie).

Remarks : The species is commonly known as 'Western Fivering' and is not rare in status. Talbot (1947) treated *indecora* provisionally as a species following Evans (1932) with a note that the species probably represents *philomela* (Linn.). This is the first specific record of the species from Maldah, West Bengal.

31. *Ypthima baldus baldus* (Fabricius)

1775. *Papilio baldus* Fabricius, *Syst. Ent.*, (3) 1 : 829.

1947. *Ypthima baldus baldus*, Talbot, *Fauna Brit. India*, Butterflies, 2 : 337-338.

Material examined : Five (M), 1 (F), Calcutta 24.ii.1880, 14.v.1880, Jan. 1886 and 23.3.1886 (de Niceville coll.); 3 (M), 8 (F) Bholahat, Maldah dist., No date, (de Niceville and W.H. Irvine coll.); 2 (F), Botanical Gardens, Haora, 19.viii. 1986 (S. Ghose and Party coll.) and 1 (F), Jiyaganj, Raichandpur, Murshidabad dist., 6.ii.1986 (I.J. Gupta and Party coll.). Wing exp. 34-45 mm.

Diagnostic characters : Upperside, fore wing, with a subapical black large, bipupilled, yellow. ringed ocellus. Hind wing with two post discal, unipupilled ocelli and one or two tornal ocelli which may be absent. Underside hind wing with two subapical, two median, and two tornal ocelli in echelon. Wing exp. 35-48 mm.

Distribution : India : West Bengal (Calcutta, Haora, Maldah, Murshidabad), also Arunachal

Pradesh, Assam, Nagaland, Uttar Pradesh (Dehra Dun, Kangra, Kumaon, Mussourie) and Sikkim; also Burma and Pakistan (Chamba).

Remarks : The subspecies is popularly known as 'Common Fivering' and is very common in status. This is the first specific report of the species from Haora, Maldah and Murshidabad districts of West Bengal.

32. *Ypthima sakra sakra* Moore

1857. *Ypthima sakra* Moore, *Cat. Lep. Ins. E.I.C., 1* : 236.

1847. *Ypthima sakra sakra*, Talbot, *Fauna, Brit. India, Butterflies, 2* : 343-344.

Material examined : One (F), Pakyong, Darjiling dist., 27. iv. 1976 (A.R. Bhaumik and party coll.).
Wing exp. 48 mm.

Diagnostic characters : Upperside fore wing with a large, bipupilled, yellow-ringed ocellus with a dark brown outer ring. Hind wing with four similar unipupilled round ocelli; subapical and tornal ocelli faintly marked or absent. Underside striated with dark brown. Fore wing with a subapical ocellus and a smaller median ocellus which may be absent. Hind wing with five prominent ocelli. Wing exp. 48-55 mm.

Distribution : India : West Bengal (Darjiling dist.) and Sikkim; also Nepal.

Remarks : The subspecies popularly known as 'Himalayan Fivering' is common in status and is recorded for the first time from Darjiling as well as West Bengal.

Genus *Orsotrioena* Wallengren

1859. *Orsotrioena* Wallengren, *Ofv. Kongl. Vet.-Akad. Forh., 15*:79.

One species with three subspecies under this genus are known from India of which one subspecies is recorded from West Bengal.

33. *Orsotrioena medus medus* (Fabricius)

1775. *Papilio medus* Fabricius, *Syst. Ent., (3) 1* : 488.

1947. *Orsotrioena medus medus*, Talbot, *Fauna Brit. India, Butterflies, 2* : 349-350, fig. 93.

Material examined : Two (F), Teesta Valley, Darjiling dist., 30.i.1953. (M.B. Kripalani coll.); 1(M), Sukna, Darjiling dist., 7.i.1976 (G.K. Srivastava & party coll.); 1(M), Puruliya camp, 3.xi.1985 (S. Sen and party coll.); 2(M), Calcutta, August, 1882 and 2(F), Calcutta, 25.xii. 1879 (Purchased, old NZ collection), 1 (M), Gonatea, Birbhum dist., 29.xi.1879 and 2 (M), 1(F), Bholahat, Maldah dist., No date. (de Niceville coll.).

Diagnostic characters : Upperside blackish brown. Underside both wings with distinct submarginal and marginal slender lines, a post discal pure white band, straight and narrow, attenuate at both ends;

fore wing with two and hind wing with three black, white pupilled ocelli. Wing exp. 45-55 mm.

Distribution : India : West Bengal (Birbhum, Calcutta, Darjiling, Maldah and Puruliya), Andaman Island, Assam (Cachar), Hariyana (Ambala), Orissa, Nagaland, Sikkim, Uttar Pradesh (Dehra Dun, Kumaon, Lucknow); also Australia; Burma; China (Hainan); Nepal; New Guinea and Tongking.

Remarks : This is the first specific record of the subspecies from Puruliya, Birbhum and Maldah districts of West Bengal. Popularly known as the 'Migger' the subspecies is common in status.

Genus *Melanitis* Fabricius

1807. *Melanitis* Fabricius, *Illiger Magazin*, 6 : 282.

Nine species and subspecies under this genus are known from India of which two species and subspecies are recorded from West Bengal.

Key to the species of *Melanitis* from West Bengal.

1. Underside with large prominent ocelli in wet season form Ochraceous bar on upperside of fore wing sharply defined in dry season form..... *leda* (Linn.)

Underside with small obscure ocelli in wet season form. Ochraceous bar on upperside of fore wing faintly defined in dry season form *phedima* (Stoll)

34. *Melanitis leda ismene* (Cramer)

1775. *Papilio ismene* Cramer, *Pap. Exot.*, 1 : 40, pl. 26, figs. A.B.

1947. *Melanitis leda ismene*, Talbot, *Fauna Brit. India, Butterflies*, 2 : 366-369.

Material examined : One (F), Calcutta, 24.xi. 1973 (B.C. Bakshi coll.); 2(M), 14.iv.1954 and 3 (M), Nov. 1948 (A.P. Kapur coll.); 1(M), 13.xi. 1955 and 1(F), 3.xii.1953 (S. Ali coll.); 1(M), No date, (de Niceville coll.); 1(F), Barrackpore, North 24-Parganas dist., 14.xi. 1961 (K.V. Lakshminarayana and party coll.); 3 (M), Muhammadabazar, Birbhum dist., 3.iv. 1986 (M.S. Shishodia and party coll.); 1(M), 1 (F), Kenduah, 7.xi.1974 (A.K. Hazra and party coll.); 1 (F), Rajnagar, 8.x.1974 (B.N. Das and party coll.); 1 (F), Tarapith, 7.x.1987 (M. Prasad and party coll.); 1 (M), Shantiniketan, 9.ix. 1974 (B.N. Das and party coll.); 1(M), Phoolia, Nadia dist., 4.xi. 1964 (D.K. Ghosal coll.); 1(M), Bhat Khawa, Jalpaiguri dist, 22.iii. 1986 (A.K. Hazra coll.); 1(F), Panagarh, Barddhaman dist., 9.ii.1983 (S.K. Ghose and party coll.); 1(M), Adra, 6.ix.1986, 1(F), Kalna, 9.ix.1986 (K.K. Roy and party coll.); 1(F), Dhartigram, 12.xii.1985 (B.N. Das and party coll.); 1 (F), Durgapur, 15.x.1985 (S.K. Ghose and party coll.); 1 (M), Jhatipahari, Bankura dist., 9.iii. 1986, 2(F), Kanchanpur forest, 10.iii. 1986 (K.P. Mukherjee and party coll.); 2 (M), Bishnupur, 12.13..xii. 1985; 1(M), Simlapal, 23.xii. 1985; 1(F), Joypur, 22.xii. 1985 (D.K. Mandal and D. P. Bhattacharya coll.); 1(F), Bishnupur camp; 7.xi. 1985 (S.Sen and party coll.); 1(F), Mankunda, Hugli dist., 15.iii. 1984 (S.K. Ghose and party coll); 6 (M), Puruliya, 3.xi. 1985 (S. Sen and party coll.); 1(F), Kurseong, Darjiling dist., 13.v.1979 (M.S. Shishodia and party coll.), 1 (F), Rampur, West Dinajpur dist. 25.xi. 1987 (T.R. Mitra and party coll.); 1 (M), Plassay, Nadia dist., 28.i.1986 (A.R.

Lahiri and party coll.); 3(M), Bholahat, Maldah dist., No date, (de Niceville coll.).

Diagnostic characters : Upperside dull dark brown; fore wing produced and angled or falcate below vein M_2 ; two large prominent black spots with white pupils in areas 3 and 4. Underside ocelli large and prominent in wet season form, faint or absent in dry season form. Wing exp. 60-80 mm.

Distribution : India : West Bengal (Bankura, Bardhaman, Birbhum, Calcutta, Darjiling, Hugli, Jalpaiguri, Maldah, Nadia, North 24-Parganas, Puruliya and West Dinajpur), throughout India including Andaman and Nicobar Islands; also Burma; Borneo; Japan; Malaya; Sri Lanka; Sumatra and Taiwan.

Remarks : Popularly known as 'Common Evening Brown' the subspecies is very common in status.

35. *Melanitis phedima bela* Moore

1857. *Melanitis bela* Moore, *Cat. Lep. Ins. E.I.C.*, 1:223.

1957. *Melanitis phedima bela*, Talbot, *Fauna Brit. India*, Butterflies, 2 : 372-373.

Material examined : 1(M), Kurseong, Darjiling dist., No date, (C. Lynch coll.).

Diagnostic characters : Above blackish brown. Fore wing not produced, usually unmarked or with markings as in *leda* but obscure. Below with small but well defined ocelli in wet season form, obscure in dry season form. Wing exp. 65-85 mm.

Distribution : India : West Bengal (Darjiling), also Arunachal Pradesh, Nagaland, Sikkim; and North Burma.

Remarks : The subspecies is popularly known as 'Dark Evening Brown' and is common in status.

Genus *Cyllogenes* Butler

1868. *Cyllogenes* Butler, *Cat. Satyridae Brit. Mus.*, p.6.

Two species under this genus are known from India of which one is recorded from West Bengal.

36. *Cyllogenes suradeva* (Moore)

1857. *Melanitis suradeva* Moore, *Cat. Lep. Ins., E.I.C.*, 1 :225.

1947. *Cyllogenes suradeva*, Talbot, *Fauna Brit. India*, Butterflies, 2 : 377.

Material examined : One (M), Darjiling, No date, (Lang coll.).

Diagnostic characters : Upperside rich brown with a strong purple tinge. Fore wing with a narrow apical yellow band. Male with a large black brand.

Distribution : India : West Bengal (Darjiling), No date, (Lang coll.).

Remarks : Commonly known as 'Branded Evening Brown' the species is rare in status. This is the first specific report of the species from Darjiling, West Bengal.

Genus *Elymnias* Hubner

1818. *Elymnias* Hubner, *Zutr. Samml. exot. Schmett.*, 1 : figs. 37, 38.

Twelve species and subspecies under this genus are known from India of which three species and subspecies are recorded from West Bengal.

Key to the species of *Elymnias* from West Bengal

1. Hind wing white or yellowish white and unmarked..... *vasudeva* Moore
Hind wing dark brown or reddish brown and marked..... 2
2. Fore wing with a subapical white or bluish white band. Male blackish brown with a purple gloss; female reddish brown with apex and borders dark brown.....*hypermnestra* (Linnaeus)
Fore wing without any subapical band Sexes alike; brown shot with blue . *patna* (Westwood)

37. *Elymnias hypermnestra undularis* (Drury)

1773. *Papilio undularis* Drury, *Ill. Exot. Ins.*, 2, pl. 10, figs. 1 and 2 (M).

1947. *Elymnias hypermnestra undularis*, Talbot, *Fauna Brit. India, Butterflies*, 2 : 386-387.

Material examined : One (F), Calcutta, 27.ii.1969 (P.C. Dhar coll.); 1(M), Sukna, Darjiling district, 7.i. 1976 (G.K. Srivastava and party coll.); 3 (M), Calcutta, 2.xii. 1886, 2 (F), 14.xii.1879;5 (M), 26.xii. 1879; 4 (F), 21.xii. 1879 and 10.xii. 1886; 1(M) Darjiling, No date, (de Niceville coll.).

Diagnostic characters : Vide Key. Wing exp. 72-86 mm.

Distribution : India : West Bengal (Calcutta, Darjiling), Assam (Cachar), Nagaland, Orissa, Sikkim, Uttar Pradesh (Dehra Dun, Kumaon, Mussourie); and Burma.

Remarks : The subspecies is popularly known as 'Common Palmfly and is common in status.

38. *Elymnias patna patna* (Westwood)

1851. *Melanitis patna* Westwood, *Gen. Diurn. Lep.*, 2:405, pl. 68, fig. 2.

1947. *Elymnias patna patna*, Talbot, *Fauna Brit. India, Butterflies*, 2 : 397-398.

Material examined : One (M), Darjiling, (old collection from National Zoological collection, with no date and name of collector).

Diagnostic characters : Vide key. Wing exp. 80-100 mm.

Distribution : India : West Bengal (Darjiling), Assam (Cachar), Nagaland, Sikkim, Uttar Pradesh (Kumaon); and North Burma.

Remarks : The subspecies is commonly known as 'Bluestriped Palmfly' and is not rare in status. This is the first specific report of the subspecies from Darjiling district.

39. *Elymnias vasudeva vasudeva* Moore

1857. *Elymnias vasudeva* Moore, *Cat. Lep. Ins. E.I.C.*, 1:238.

1947. *Elymnias vasudeva vasudeva*, Talbot, *Fauna Brit. India*, Butterflies, 2 : 400.

Material examined : One (M), Darjiling, (Old Collection from NZC with no other details).

Diagnostic characters : Fore wing broad and short, with bluish grey stripes including one in the cell. Underside mottled with black and white. Wing exp. 80-90 mm.

Distribution : India : West Bengal (Darjiling), Sikkim; and Bhutan.

Remarks : Commonly known as 'Jezebel Palmfly' the subspecies is rare in status and resembles the common *Delias aglaia* (Linn.). This is the first specific record of the subspecies from Darjiling, West Bengal.

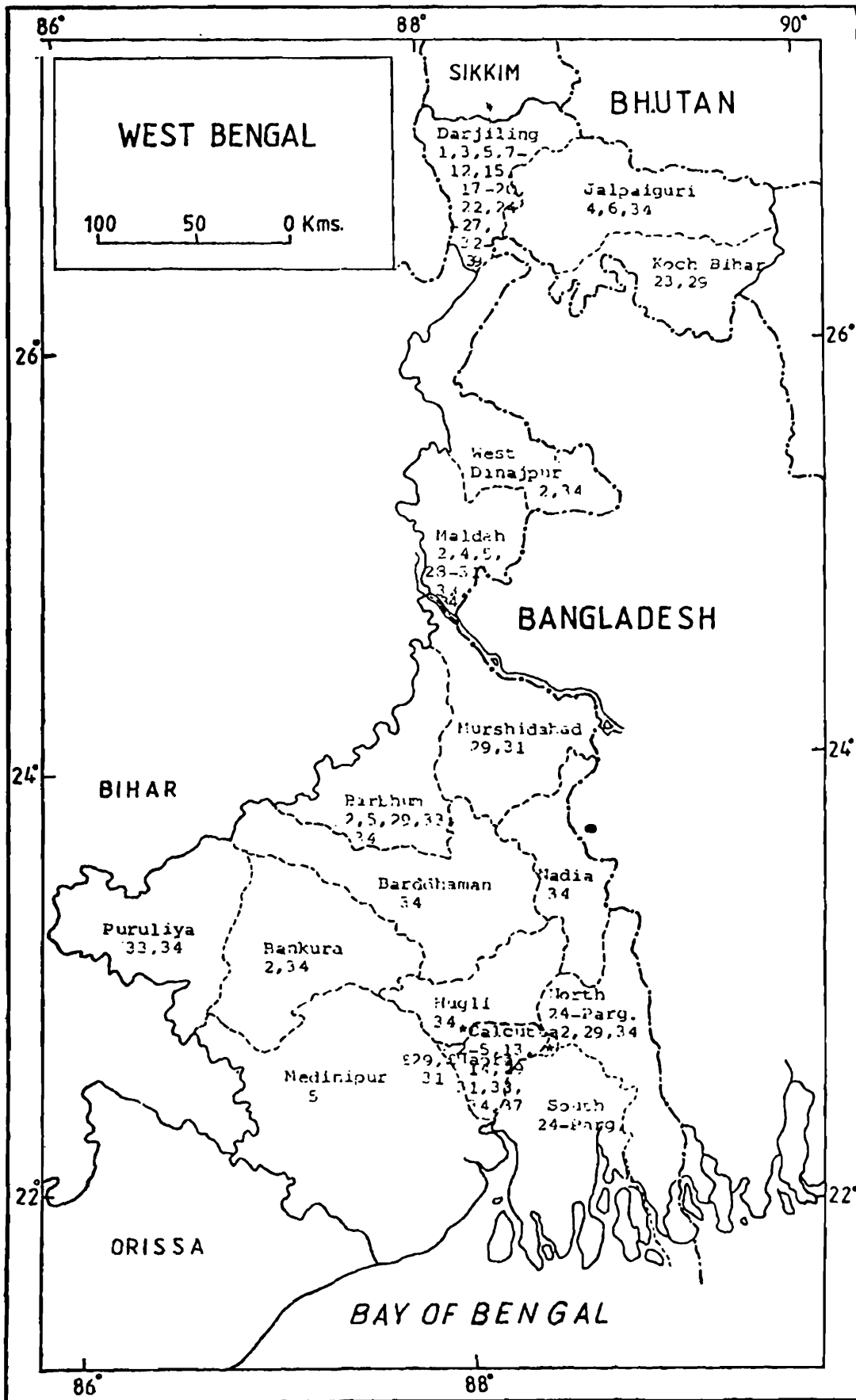
SUMMARY

The paper incorporates a systematic account of 39 species and subspecies under 9 genera of Satyridae from West Bengal of which 22 species and subspecies are either new records from different districts or from the state as a whole. Keys to the genera and species along with diagnostic characters, distribution and remarks have also been incorporated in the present work.

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Map 1

**INSECTA : LEPIDOPTERA : RHOPALOCERA
PAPILIONIDAE AND DANAINAE NYMPHALIDAE**

D.K. MANDAL AND D.R. MAULIK
Zoological Survey of India, Calcutta

INTRODUCTION

The article deals with the faunistic account of Papilionidae and danaine Nymphalidae from West Bengal. In addition to certain old collections, other lots of specimens covering all the seasons between 1955 and 1987 have been cumulatively brought from nearly all of the seventeen districts of the state by different scientists including the authors of the Zoological Survey of India. The areas explored represent the ecosystems from hills and mountains in the north, through the central gangetic, forest and some barren plains, down to the coastal and mangrove belts in the south. The asterisk (*)- marked species, not available in the collections but earlier known from the state, are also incorporated from literature records. Keys to the taxa examined along with distribution and information on status and abundance, bionomics, food-plants, etc., of all the forms under report are provided. The distribution of very common and rare forms of the state fauna is shown by map-plotting their serial number as in the text. The system of Papilionidae and danaine Nymphalidae has respectively been followed *sensu* Hancock (1983) and Ackery & Vane-Wright (1984), the infra-specific nomenclature being adopted after Talbot (1939) for the former family in particular, since Hancock (*loc.cit.*) dealt with the fauna up to the species-level and did not mention names of vicissitude for the infra-specific categories.

The pioneering work on the lepidopteran faunistics with special reference to the related groups from West Bengal dates back to Moore (1865). Other contributions were made by Rothney (1882), de Niceville (1885), Robbe (1892), Sevastopulo (1933, 1944, 1944-'45, 1956) and Sanders (1944-'45) amongst a few others cited by Varshney (1977) and also Mandal (MS). Miscellaneous citations of the state fauna may be cross-referred to Bingham (1905, 1907), Jordan (1908-'10), Fruhstorfer (1910-'11), Evans (1932), Peile (1937), Talbot (1939, 1949) and Wynter-Blyth (1957).

The papilionids are represented by 94 species in 12 genera under two subfamilies, viz., Papilioninae and Parnassiinae, and the danaines (Danidae, as earlier known and now a distinct subfamily of Nymphalidae), by 38 species in 6 genera from India. Of these, 26 species in 6 genera under Papilioninae and 17 species in 5 genera under Danaina constitute the fauna of West Bengal. It is also interesting to note that a couple of the papilionine forms, viz., *Graphium macareus indicus* (Rothschild) and *G. doson eleius* (Fruhstorfer), are restricted to the East Himalaya and the Indian Peninsula respectively. Similarly, amongst the danaines, *Parantica aglea aglea* (Stoll) and *Euploea klugii kollari* C. & R. Felder are restricted to the Indian Peninsula, while *E. crameri nicevillei* (Moore) is endemic in the Sunderbans of the South 24-Parganas district of West Bengal. As many as 13 papilionine forms and only three danaine ones constitute new locality records for the state.

MATERIAL AND METHOD

The material examined comprise 208 specimens in 20 species and 5 genera of Papilioninae and 300 specimens in 13 species and 5 genera of Danainae.

As to the collecting methodology adopted in the field, large collapsible nets have been used for catching high-settling forms and small school-boys' nets or folding pocket-nets, for the low-lying individuals. The task is meticulous enough, since the surveyors have to wait patiently until the insects settle on suitable niches and then to net them with side-ways sweeps with plenty of follow throughs, taking care not to damage either nets or specimens particularly on bushes and thorns. For the capture of specimens settling on grounds, the net-frame-works need to be dropped over the insects and the bags to be held in the upward direction and when the specimens fly upward, the nets have to be grasped below to imprison the elements. Quite a few specimens have also been caught in flight. The slow-flying and warning colour-possessing danaines have been collected rather at ease. Collecting has been forthwith followed by fixing the specimens. For this, the specimens have quickly been secured in net-folds and their thorax pinched. Absorbent pads dampened with Benzene have been proved as an effective killing medium and preferred to the Cyanide treatment, since the specimens killed by Benzene never lose their colour and its action has been so rapid that mouth of the glass-vials could be placed against the insects in nets to quieten them before their transfer to the killing bottles. After killing, the specimens have been put into envelopes bearing temporary labels of locality, date of collection and name of collector, before being placed into air-tight boxes containing a few moth-balls. The envelopes soaking atmospheric moisture in tropical climate have often been dried in direct sunlight so as to prevent the material from damage.

The material, thus collected and processed in the fields, have been brought to the laboratory, permanently labelled, preserved and maintained with proper chemicals in cabinet-drawers or store-boxes and made ready for study. The diagnostic characters of different taxa with particular reference to the structure of antennae, tophies, wing-ventation, legs, etc., together with patterns, textures and colourations of scales have been microscopically observed and compared with the named material of National Zoological Collections (N.Z.C.) For rendering the scales, particularly those covering the wings, temporarily transparent, a special and highly inflammable laboratory chemical, called Toluene (C₇H₈, mol.wt.92.14), is very often applied with brush on wing-membranes to have a clear view of ventation under microscope. After authentic identification up to species or infra-specific level, as the case may be, the specimens in good condition have been added to N.Z.C.

SYSTEMATIC ACCOUNT

Order LEPIDOPTERA

Suborder RHOPALOCERA

Key to the families

Fore legs developed in both sexes; tibial epiphysis present. Fore wing 3A always free at base
 Papilionidae

[Antennae long and slender] Subfamily Papilioninae

Fore legs imperfect in one or both sexes; tibial epiphysis absent. Fore wing 3A not always free at base, some- times stalked with 2A Nymphalidae

[Male abdominal hair-pencils paired and eversible. Female fore tarsi clubbed and ankylosed] Subfamily Danaïnae

Family I. PAPILIONIDAE

Subfamily PAPILIONINAE

Key to the tribes

1. Tibiae and tarsi scaled. Fore wing basal spur weak Leptocircini

[Fore wing middle discocellular down- curved and straight] Subtribe Leptocirciti

[Antennae less than half length of fore wing. R3 free from R4; hind wing R1 fused with Sc and tail, when present, never longer than main part of hind wing] Genus *Graphium* Scopoli

Tibiae and tarsi unscaled. Fore wing basal spur strong 2

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

[Antennae with paired ventral sense- pits. Male scent organ never as a shiny streak on hind wing anal fold] subtribe Troiditi

Tibio-tarsal rows of spines regular, being dorso-ventrally separated by an impressed space. Hind wing pre- costal vein simple and curved distad Papilionini

Tribe LEPTOCIRCINI

Subtribe TEINOPALPITI

Genus *Teinopalpus* Hope (1843)

1.* *Teinopalpus imperialis* Hope (1843)

T.i. imperialis Hope

1843. *Teinopalpus imperialis* Hope, *Trans. Linn. Soc. Lond.*, **19** : 131, pl. 14, figs. 1.2.

1983. *Teinopalpus imperialis*: Hancock, *Smithersia*, **2** : 46 (ssp. *imperialis*, Talbot, 1939, p. 247).

Distribution : India : West Bengal (Darjiling); Manipur, Meghalaya and Sikkim.

Elsewhere : Bhutan, Nepal and North Burma.

Remarks : This rare, magnificent and sexually dimorphic butterfly occurs at c 2000-3500 metres on mountain tops amidst timber forests. Capture is very difficult due to its remarkably strong, rapid and dashing flight. Food-plant is *Daphne nipalensis* (Thymeliaceae). The female was first seen on the wing above the Rungarun Forest bungalow at Darjiling by Bingham (1907).

Subtribe LEPTOCIRCITI

Genus *Graphium* Scopoli (1777)

Key to the subgenera

1. Middle discocellular much shorter than upper discocellular; hind wing with submarginal blue scales. Pattern primitive-banded *Pazala* Moore
 [Fore wing bars 5 and 7 medially weakened, bar 6 free] *alebion* group
 [Hind wing underside with a complete discal row of pale spots] *sp. eurous* (Leech)
 Middle discocellular not much shorter than upper discocellular ; hind wing with-out submarginal blue scales. Pattern variable 2
2. Pattern primitive-banded or mimetic. Tail present in non-mimetic species *Pathysa* Reakirt
 Pattern modified or specialised; never mimetic. Tail reduced or absent *Graphium* Scopoli

Subgenus *Pazala* Moore (1888)

alebion group

2. *Graphium (Pazala) eurous* (Leech, 1815)

G. (P.) e. sikkimica (Heron)

1899. *Papilio sikkimica* Heron. *Ann. Mag. nat. Hist.*, (7) 3 : 120.

1983. *Graphium (Pazala) eurous* : Hancock, *Smithersia*, 2 : 46 (ssp. *sikkimica*, Talbot, 1939, p.204, fig.54).

Material examined : One ex., 3 kms. west of Rambh Forest Rest House, Darjiling district, 14.iv.1973, H.S. Sharma and party coll.

Diagnosis : Fore wing upperside with the fourth transverse black band from the base crossing the cell and reaching beyond the median vein; post-discal band reaching the anal vein.

Distribution : India : West Bengal (Darjiling); Arunachal Pradesh, Assam and Sikkim.

Elsewhere : Nepal.

Remarks : The butterfly, a new record for West Bengal, is local in status, being found in open places amidst wooded country between c 1000 and 2700 metres during April-May. It is fond of resting on tree-

tops round which it circles in swift flight often en masse. The female, however, is less lively, flying close to the ground and wandering further afield from the selected localities. Food-plant is *Machilus odoratissimus* (Lauraceae).

Subgenus *Pathysa* Reakirt (1865)

Key to the species-groups

Pattern never mimetic. Fore wing bars 6 and 7 fused; hind wing tail long and sword-like
..... *antiphates* group

Pattern always mimetic. Fore wing bar 6 and 7 free; hind wing tail absent *macareus* group

[Hind wing underside with a small yellow tornal spot. Male scent-organ strongly developed]
..... *macareus* (Godart)

antiphates group

Key to the species

Hind wing underside with a discal row of red spots *nomius* (Esper)

Hind wing underside without red discal spot *antiphates* (Cramer)

3. *Graphium (Pathysa) nomius* (Esper, 1785-'98)

G. (P.) n. nomius (Esper)

1785-'98. *Papilio nomius* Esper, *Ausl. Schmett.*, p. 210, pl. 52, fig. 3.

1983. *Graphium (Pathysa) nomius* : Hancock, *Smithersia*, 2 : 46 (ssp. *nomius*, Talbot, 1939, p. 207, fig. 55a, b, pl. I, figs. 22-23).

Material examined : 2 exs., Calcutta, -iv.-, *Old Colln.*; 3 kms. west of Rambh Forest Rest House, Darjiling district, 14.iv.1973, H.S. Sharma and party coll.

Diagnosis : Fore wing bar 3 not extending beyond cell, underside without short black costal line near base; hind wing anal area profusely dusted white.

Distribution : India : West Bengal (Calcutta and Darjiling); also parts of East to North-West Himalaya and rest of eastern, northern and southern Peninsula. Elsewhere : Sri Lanka.

Remarks : This widely distributed and locally common nominal subspecies exhibits low, straight and fast flight from the plains up to c 1000 metres amidst hilly and forested country. The male is fond of settling in congregation on damp roads and wet mud during hot season. It also visits flowers. Pupation takes place not on food-plants, but unusually under stones, tree-roots and in crevices. Food-plants are *Polyalthia longifolia* and *Saccopetalum tomentosum* (Anonaceae).

4. *Graphium (Pathysa) antiphates* (Cramer, 1775)
G. (P.) a. pompilius (Fabricius)

1787. *Papilio pompilius* Fabricius, *Mant. Ins.*, 2 : 8.

1983. *Graphium (Pathysa) antiphates* : Hancock, *Smithersia*, 2 : 46 (ssp. *pompilius*, Talbot, 1939, p.215).

Material examined : One ex., Calcutta, 15.iv.1951, *Old Colln.*

Diagnosis : All the black markings in both fore and hind wings narrow and shortened; hind wing anal area with a small grey patch at the apices M1 Culb areas.

Distribution : India : West Bengal (Calcutta); Arunachal Pradesh, Assam and Sikkim.
 Elsewhere : Bhutan, Burma, Hainan, Thailand and Vietnam.

Remarks : A new record for West Bengal, the subspecies keeps from the plains to low hills amidst wet forest regions, where it is common. The element shows quick circling flight around tree-tops in the sunshine and is extremely fond of settling on wet sand and roads. The food-plants are *Anona elegans*, *A. lawii* and *A. zeylanica* (Anonaceae).

macareus group

5. *Graphium (Pathysa) macareus* (Godart, 1819)
G. (P.) m. indicus (Rothschild)

1895. *Papilio macareus indicus* Rothschild, *Nov. Zool.*, 2 : 457.

1983. *Graphium (Pathysa) macareus* : Hancock, *Smithersia*, 2 : 46 (ssp. *indicus*, Talbot, 1939, p. 233, fig. 65).

Material examined : One ex., 3 kms. south of Rambh, Darjiling district, 2.iii.1973, *H.S. Sharma* and party coll.

Diagnosis : Fore wing upperside broadly white-striped, cell-stripes undivided and two anal stripes free in male. In female, fore wing white discal stripes broader than the intermediate black vein-stripes. In both sexes, hind wing cell entirely white.

Distribution : India : West Bengal (Darjiling); Arunachal Pradesh and Sikkim.

Remarks : A new record for West Bengal, the sub-species is restricted in the East Himalaya. This sexually dimorphic butterfly is a forest-dweller and exhibits sluggish flight. The specimen examined is a female which differs from the male characters, as cited above from literature. The male is known to be not rare, while the female is very rare and mimicks *Parantica aglea* (Stoll), a danaine species. Food-plant is unknown, though Hancock (1983) mentioned for certain members of the species-group the food-plant belonging to Aquifoliaceae.

Subgenus *Graphium* Scopoli (1777)

Key to the species-groups

1. Thorax with dorso-lateral grey stripes. Fore wing dark bars prominently angled, underside with costal base red-scaled; hind wing underside with red spots never in M3- or Cula- area. Tailed ...
 *agamemnon* group
 [Fore wing upperside with a pale cell -spot divided and a submarginal row of green spots]
 *agamemnon* (Linnaeus)
 Thorax without dorso-lateral grey stripes. Fore wing dark bars not angled, underside with costal base white-scaled; hind wing underside with red spots never in M1-area2
2. Fore wing dark bars straight. Tail absent *eurypylus* group
 [Fore wing upperside with a single cell-spot and submarginal row of green spots; hind wing underside with a red-centered costal bar separated from basal dark band]
 *doson* (C.&R. Felder)
 Fore wing dark bars fused in cell. Tail present *sarpedon* group
 [Wings black with a green band; fore wing upperside without submarginal row of green spots]
 *sarpedon* (Linnaeus)

eurypylus group

6. *Graphium (Graphium) doson* (C. & R. Felder, 1864)

Key to the subspecies

- Fore wing discal band moderately broad, spots in the apical half small and yellowish green
 *eleius* (Fruhstorfer)
- Fore wing discal band very much broad, all spots large and whitish green *axion* (C.&R. Felder)

(a) *Graphium (Graphium) doson eleius* (Fruhstorfer)

1908. *Papilio doson eleius* Fruhstorfer, *Ent. Zeit.*, **21** (34) : 209.

1983. *Graphium (Graphium) doson* : Hancock, *Smithersia*, **2** : 47 (ssp. *eleius*, Talbot, 1939, p.223, pl.I, figs. 20-21).

Material examined : 6 exs. : Eden Gardens, Calcutta, 26.viii.1955, 8.vii.1958, 7.v.1965, S.K. Sen, P.C. Dhar, S. Ali and parties coll.; Sodepur, Natagar, North 24-Parganas district, 20.x.1984, S.K. Ghosh and party coll.

Diagnosis : Vide key.

Distribution : India : West Bengal (Calcutta and North 24-Parganas); also southern Peninsula.

Remarks : Restricted in the Peninsular belts, the subspecies is not rare amidst damp and forested areas in the plains and also at low elevations. It prefers hot climate and shows little voltinism. The food-plants of this and the following subspecies are rather difficult to ascertain, but these are known for the species as Anonaceous stuff comprising *Anona lawii*, *Polyalthia longifolia* and *Saccopetalum tomentosum* and also Lauraceous stuff comprising but only one species of *Cinnamomum*.

(b) *Graphium (Graphium) doson axion* (C.&R. Felder)

1864. *Papilio axion* C.&R. Felder, *Verh. zool.-bot. Ges. Wien.*, 14 : 305.

1983. *Graphium (Graphium) doson* : Hancock, *Smithersia*, 2 : 47 (ssp. *axion*, Talbot, 1939, p.223, fig.61).

Material examined : One ex., Rydak, Jalpaiguri district, 9.ix.1975, H.K. Bhowmik & party coll.

Diagnosis : Vide key.

Distribution : India : West Bengal (Jalpaiguri); Arunachal Pradesh, Assam, Sikkim and Uttar Pradesh.

Elsewhere : Bhutan, Burma, South China, Thailand and Vietnam.

Remarks : The specimen examined may be referred to the summer brood, form *praestabilis* (Fruhstorfer), which differs from the spring brood, f. *acheron* (Moore), by the fore wing anal vein and hind wing median vein less black and fore wing underside submarginal spots smaller. Moore (1885) described the element in question as "acheron" from North Bengal where it seems to be rare in status. This is a hilly butterfly occurring up to c 1600 metres in association with *Graphium sarpedon luctatus*.

agamemnon group

7. *Graphium (Graphium) agamemnon* (Linnaeus, 1758)

G. (G.) a. agamemnon (Linnaeus)

1758. *Papilio agamemnon* Linnaeus, *Syst. Nat.*, ed.10: 462.

1983. *Graphium (Graphium) agamemnon* : Hancock, *Smithersia*, 2 : 47 (ssp. *agamemnon*, Talbot, 1939, p.230, fig. 64).

Material examined : One ex., Rongpo, near Mine Campus, Darjiling district, 20.v.1979, H.S. Sharma and party coll.

Diagnosis : Fore wing upperside spots yellow-green, three discal patches between lower angle of cell and lower median, which are broader than their interspaces.

Distribution : India : West Bengal (Darjiling); Arunachal Pradesh and Uttar Pradesh.

Elsewhere : Bali, Philippines and South China.

Remarks : A new record for West Bengal, the butterfly is common near settlements, but also occurs in a good number in the plains, woods and hills during rainy season. It is fond of visiting the flowers of *Lantana*. Females are very frequently caught while ovipositing, though the specimen examined is a male. The food-plants are preferred as young trees and bushes including the Anonaceous stuff like *Anona discolor*, *A. muricata*, *A. reticulata*, *A. squamosa*, *Polyalthia longifolia* and *Saccopetalum tomentosum* and also Magnoliaceous species of *Michelia*.

sarpedon group

8. *Graphium (Graphium) sarpedon* (Linnaeus, 1758)
G. (G.) s. luctatius Fruhstorfer

1907. *Graphium sarpedon luctatius* Fruhstorfer, *Ent. Zeit.* **21** (30) : 183.

1983. *Graphium (Graphium) sarpedon* : Hancock, *Smithersia*, **2** : 47 (ssp. *luctatius*, Talbot, 1947, p. 491).

Material examined : 4 exs. : Rydak Forest, Jalpaiguri district, 9.ix.1975, H.K. Bhowmik and party coll.; Malda, Maldah district, 19.vi.1987, K.P. Mukherjee and party coll.

Diagnosis : Both fore and hind wings with broad discal band which is white across the median vein of the latter.

Distribution : India : West Bengal (Jalpaiguri and Maldah); also East to North-west Himalaya.
 Elsewhere : Burma, Hainan, Lesser Sunda Island, Philippines, Sundaland and Vietnam.

Remarks : A new record for West Bengal, the butterfly is a strong flier over tree-tops, progressing with skipping flight and being common in lower hills. It prefers open country including gardens to the woods or forests. It is often of aubernal and crepuscular habit, feeding on *Lantana* and seen in congregation at damp patches and on wet roads in company of *Graphium doson axion*. The larval food-plants include *Camphora officinalis*, *Cinnamomum zeylanicum*, *Machilus micrantha*, *M. odoratissima*, etc. (Lauraceae).

Tribe TROIDINI

Subtribe TROIDITI

Key to the genera

Fore wing R2 arising opposite Cula. Pattern black with white and red spots. Tailed. Hind wing never with golden transparent scales *Atrophaneura* Reakirt

[Wings without white marginal spots. Antennae black, with club curved]
 Subgenus *Atrophaneura* Reakirt

Fore wing R2 arising opposite Culb. Pattern dark with pale spots. Tailless. Hind wing with golden transparent scales *Troides* Hiibner

[Hind wing black and yellow; in male, Sc+R1 curved towards apical margin and anal fold with an eversible area of dense wooly scales] Subgenus *Troides* Hiibner

[Fore wing without iridescent sheen. Thorax laterally red] *helena* group

[Male with fore wing upperside glossy black and hind wing golden with black borders and veins. Female hind wing with discal row of large triangular black spots] *helena* (Linnaeus)

Genus *Atrophaneura* Reakirt (1865)

Subgenus *Atrophaneura* Reakirt (1865)

Key to the species groups

Male scent-organ well developed and wooly; abdominal fold very broad and rolled-up *nox* group

[Fore wing underside bluish black in the basal half, in female with a large pale posterior patch; hind wing metallic blue. Male with black-brown scent-fold with long fringes] *varuna* (White)

Male scent-organ reduced or absent; abdominal fold narrow or vestigial *polydorus* group

nox group

9. *Atrophaneura* (*Atrophaneura*) *varuna* (White, 1842)

A. (A.) v. *astorion* (Westwood)

1842. *Papillio astorion* Westwood, *Ann. Mag. nat. Hist.*, 9 : 37.

1983, *Atrophaneura* (*Atrophaneura*) *varuna* : Hancock, *Smithersia*, 2:47(ssp. *astorion*, Talbot, 1939, p. 73, pl.III, fig.2.

Material examined : One ex., Rongpo, Andhari-Khola, Darjiling district, 30.v.1974, J.K. Jonathon and party coll.

Diagnosis : In male, fore wing underside without white stripes before the distal margin. In female, fore wing upperside with light area shaded black-blue and hind wing cell dark.

Distribution : India : West Bengal (Darjiling); Arunachal Pradesh, Assam, Sikkim and Uttar Pradesh.

Elsewhere : Burma.

Remarks : A new record for West Bengal, the sub-species is not rare in status. Its uniform dark colour renders it inconspicuous in the jungle and thus it is difficult to account for being further protected by disagreeable odour. The specimen examined is a male, while the female is known to act as a good model of *Princeps memnon agenor*, (1 F) *f. butlerianus* elsewhere. The food-plant apparently belongs to Aristolochiaceae.

polydorus group

Key to the species

Hind wing upperside with complete discal and submarginal rows of red spots *hector* (Linnaeus)

Hind wing upperside with incomplete discal row of white spots, submarginal row of spots being absent
..... *aristolochiae* (Fabricius)

10. Atrophaneura (Atrophaneura) hector (Linnaeus, 1758)

1758. *Papilio hector* Linnaeus, *Syst. Nat.*, ed. 10 : 459.

1983. *Atrophaneura (Atrophaneura) hector* : Hancock, *Smithersia*, 2 : 47.

Material examined : One ex., Calcutta., *Old Colln.*

Diagnosis : *Vide key.*

Distribution : India : West Bengal (Calcutta and Hugli); Andamans, Bihar, Orissa and also southern Peninsula. Elsewhere : Bangladesh and Sri Lanka.

Remarks : The species, which is rare in West Bengal but common elsewhere, feeds on *Aristolochia indica* (Aristolochiaceae). It is at home in jungles and open countries and very fond of flowers. Also, it is known to mimick the female of *Princeps polytes romulus*, (1 F) *f. romulus* Cramer, from Orissa (*vide Mandal and Nandi, 1983*). The butterfly was earlier mentioned also from Chandanagore of Hugli district by Bingham (1907). It does not exhibit subspecific variation.

11. Atrophaneura (Atrophaneura) aristolochiae (Fabricius, 1775)**A. (A.) a. aristolochiae** (Fabricius)

1775. *Papilio aristolochiae* Fabricius, *Syst. Ent.*, p. 443.

1983. *Atrophaneura (Atrophaneura) aristolochiae* : Hancock, *Smithersia*, 2:47(*ssp. aristolochiae*, Talbot, 1939, p. 86, figs. 15-16, pl.I, figs. 3-4).

Material examined : 58 exs. : Susunia Forest, 2..xi. 1974, A.K. Hazra and party coll., Jangal Mahal, 5 kms. south of Joypur Forest Rest House, Bankura district, 20.xii.1985, D.K. Mandal and party coll.; Gouripur Forest, 10.xi.1974, A.K. Hazra and party coll., Ballavpur, Islambazar, 14-15. iii. 1986, K.P. Mukherjee and party coll., Rampurhat, Birbhum district, 5.iv. 1986, M.S. Shishodia and party coll.; Calcutta, 25.i.1880, *Old Colln.*; iv. 1896, 10.vi.1907, *Old Collns.*, 1 km. South of Rauang Forest Rest House on the bank of Rayang River, Darjiling district, 28.iii.1973, H.S. Sharma and party coll.; Mankundu, altara, Hugli district, 10.iii. 1984, S.K. Ghosh and party coll.; Rydak Forest, Jalpaiguri district, 8.ix.1975, Sahapur, Maldah district, 18.ix.1975, H.K. Bhowmik and party coll.; Chandrakona Road, Jhargram (Arabati Forest, New Roybari), Salboni forest, Medinipur district, 2-3, 20, 27-28.x.1974, Behrampur, 3.xi., Beldanga, Murshidabad district, 5.xi., Purulia, Puruliya district, 17.xi.1974, A.K. Hazra and party coll.

Diagnosis : Fore wing black from base to beyond the origin of Culb, with short stripes in dorsum; hind wing upperside without cell-spot and underside with a red distal spot in the inner area.

Distribution : India : West Bengal (Bankura, Birbhum, Calcutta, Darjiling, Hugli, Jalpaiguri, Maldah, Medinipur, Murshidabad and Puruliya); almost throughout the rest of mainland. Elsewhere : Nearly cosmopolitan in the Indian subregion except Burma. Also extends to Java.

Remarks : The subspecies is very common in the plains particularly during and after the monsoon. It has the habit of occasional roosting in companies and uses the spatulate tail mainly for propulsion in flight. The food-plant is the same as of the preceding butterfly. The specimens examined are referable to a couple of morphs, viz., *f. aristolochiae* (Fabricius) and *f. diphilus* (Esper), the latter differing from the former by the hind wing white spots close against the cell.

Genus *Triodes* Hübner (1819)

Subgenus *Troides* Hübner (1819)

helena group

12. *Troides (Troides) helena* (Linnaeus, 1758)

T. (T.) h. cerberus (C.&R. Felder)

1864. *Papilio cerberus* C. & R. Felder, *Verh. zool.-bot. Ges. Wien.*, **14** : 291.

1983. *Troides (Troides) helena* : Hancock, *Smithersia*, **2**:47 (ssp. *cerberus*, Talbot, 1939, p. 66).

Material examined : One ex., Darjiling district, *Old Colln.*

Diagnosis : Fore wing vein-stripes distinct, cell with a white stripe towards the base; hind wing golden subcostal patch large.

Distribution : India : West Bengal (Darjiling); also, the rest of the East Himalaya including Assam and Sikkim, extending to the eastern and southern Peninsula. Elsewhere : Bangladesh, Bhutan, Burma, Indonesia, Nepal, Malaysia and Vietnam.

Remarks : A new record for West Bengal, the subspecies is not rare and known to be more variable in North India and North Burma than in the Malayan subregion due to the fact that in the former areas there is a pronounced cold and dry season. Food-plant belongs to Aristolochiaceae. The specimen examined is referred to the (1 M) *f. cerberus* (C & R. Felder), the characters of which are cited above. This is the largest of all the Indian butterflies keeping on high soaring flight at day time in dense jungles.

Tribe PAPILIONINI

Key to the genera

Mimetic of Danainae. Hind wing tailless *Chilasa* Moore

[Frons with lateral cream stripes. Thorax and abdomen pale-spotted] Subgenus *Chilasa* Moore

Non-mimetic of Danainae. Hind wing often tailed. Frons and thorax with lateral lines.
 *Princeps* Hiibner

Genus *Chilasa* Moore (1881)

Subgenus *Chilasa* Moore (1881)

Key to the species groups

Hind wing blue spots present *clytia* group

[Hind wing underside with a row of yellow marginal spots] *clytia* (Linnaeus)

Hind wing blue spots absent *agestor* group

[Fore wing dark brown, with a blue spot at end-cell and blue discal stripes]
 *slateri* (Hewitson)

clytia group

13. *Chilasa (Chilasa) clytia* (Linnaeus, 1758)

C. (C.) c. clytia (Linnaeus)

1758. *Papilio clytia* Linnaeus, *Syst. Nat.*, ed. 10 : 479.

1983. *Chilasa (Chilasa) clytia* : Hancock, *Smithersia*, 2 : 48 (ssp. *clytia*, Talbot, 1939, p. 116, figs. 28-29, pl.I, figs. 5-6.

Material examined : 42 exs., : Calcutta 14, 29.ii., 22, 28.iii. 1880; Teesta, 20.v.1906, *Old Collns.*, Kalimpong, 23.v.1979, Sevok Forest, Darjiling District, 12.v.1987, Raja Bhatkawa Forest, Jalpaiguri district, 9.v.1987, *R.Ram* and party coll.; Sarsanka, 8 kms. from Zilla Bungalow, Danton, Medinipur district, 12.iii. 1984, *K. Rai* and party coll.

Diagnosis : Fore wing submarginal white spots irregular.

Distribution : India : West Bengal (Calcutta, Darjiling, Jalpaiguri and Medinipur); also throughout the rest of mainland. Elsewhere : Burma.

Remarks : A new record for West Bengal, the butterfly is very common in the plains and low hills. It exhibits much variability especially of the hind wing markings, which may be suppressed or enlarged. Food-plants are *Alseodaphne semicarpifolia*, *Cinnamomum zelanica* and species of *Litsea* (Lauraceae). The pupa is a wonderful example of camouflage, being fixed to a branch so that it exactly resembles the end of a broken-off twig. Amongst the specimens examined, majority are referable to the *f. clytia*

(Linnaeus), mimicking *Euploea core* (Cramer), with rich dark brown ground colour and cream-coloured markings, while the minority are referable to the *f. dissimilis* (Linnaeus), mimicking *Tirmula limniace* (Cramer), with black ground colour and cream stripes both the models belonging to the danaine Nymphalidae.

agestor group

14. **Chilasa (Chilasa) slateri** (Hewitson, 1859)

C.(C.) s. slateri (Hewitson)

1859. *Papilio slateri* Hewitson, *Exot. Butt.*, 2 : pl.4.

1983. *Chilasa (Chilasa) slateri* : Hancock, *Smithersia*, 2 : 48 (ssp. *slateri*, Talbot, 1939, p. 111).

Material examined : One ex., Tindharia, Darjiling district, 26.iii. 1978, A.R. Bhowmik and party coll.

Diagnosis : Fore wing discal stripes whitish blue between all the veins and cell-spot concolourous; hind wing without white stripes before distal margin.

Distribution : India : West Bengal (Darjiling); Assam, Meghalaya, Nagaland and Sikkim. Elsewhere : North Burma and Vietnam.

Remarks : A new record for West Bengal, the butterfly is rare and occurs at low elevations. It is univoltine and slow-flier, mimicking *Euploea* species. Food-plant is unknown.

Genus **Princeps** Hübner (1807)

Key to the subgenera

Never with metallic band. Frons, thorax and abdomen not overlaid with metallic green scales. Pattern black and yellow, without dispersed cream scales on wings and submarginal spots not prominent, Often mimetic of Troidini **Menelaides** Hiibner

With or without metallic band. Frons, thorax and abdomen often overlaid with metallic green scales. Pattern may be as above, but sub- marginal spots quite prominent. Rarely mimetic of Troidini **Princeps** Hiibner

Subgenus **Menelaides** Hübner (1819)

Key to the species-groups

1. Sexs similar. Non-mimetic. Tailed2
- Sexes dissimilar. Mimetic. Male without androconia and may be tailless3

2. Male with androconia dense and hairy *helenus* group
 [Fore wing without stripes; hind wing white patch extending over R5-M2 areas and underside with red sub-marginal lunules] *helenus* (Linnaeus)
 Male without androconia *nephelus* group
 [Hind wing white patch extending over R5-M3 areas and underside with yellow submarginal lunules] *nephelus* (Boisduval)
3. Male hind wing with dispersed blue scales and without tail; wing bases red below *memnon* group
 Male hind wing with white discal band and tail; wing bases not red below *polytes* group
 [Male fore wing with distinct marginal white spots and hind wing with discal white band. Female hind wing with red or white discal spots] *polytes* (Linnaeus)

bootes group

15. * **Princeps (Menelaides) janaka** (Moore, 1857)
P.(M.) j. janaka (Moore)

1857. *Papilio janaka* Moore, *Cat. Lep. Mus. E.I.C.*, 1 : 97.
 1983. *Princeps (Menelaides) janaka* : Hancock, *Smithersia*, 2 : 48 (ssp. *janaka*, Talbot, 1939, p. 136, fig. 36b, nec sp. *bootes*).

Distribution : India : West Bengal (Darjiling); also the rest of the East Himalaya including Arunachal Pradesh, Assam and Sikkim, and West Himalaya including Uttar Pradesh : Garhwal to Mussoorie.

Remarks : This is a rare butterfly occurring at moderate elevations amidst hills during the spring. Food-plant is unknown. Bingham (1907) observed this butterfly in the Rungarun Forest at Darjiling.

memnon group

Key to the species

- Hind wing with an anal white-edged ocellus *alcmenor* (C.&R. Felder)
 Hind wing without anal white-edged ocellus *memnon* (Linnaeus)

16. **Princeps (Menelaides) alcmenor** (C. & R. Felder, 1864)

P.(M.) a. rhetenor (Westwood)

1841. *Papilio rhetenor* Westwood, *Arcana Ent.*, 1 : 59, pl. 16, figs. 1, 1a.
 1983. *Princeps (Menelaides) alcmenor* : Hancock, *Smithersia*, 2 : 48 (ssp. *rhetenor*, Talbot, 1939, pl. 138, fig. 37a-d, nec. sp. *rhetenor*).

Material examined : One ex., Tindharia, Darjiling district, 27.iii.1978, A.R. Bhowmik and party coll.

Diagnosis : Fore wing base slenderly streaked red; hind wing elongate, blue - scaled and underside base to anal area broadly striped red.

Distribution : India : West Bengal (Darjiling); Arunachal Pradesh, Assam, Sikkim and also West Himalaya. Elsewhere : Bhutan, Burma and Nepal.

Remarks : A new record for West Bengal, the butterfly is not rare and reportedly occurs throughout the summer, ascending to c 2000 metres. The specimen examined is a male and the female is known to mimick a couple of species belonging to the *latreillei* group, viz., *Atrophaneura (Atrophaneura) dasarada* (Moore) and *A. (A.) polyeuctes philoxenus* (Gray), both, however, being presently unseen in West Bengal. Food-plant of *P. (M.) alcmenor rhetenor* is unknown.

17. * **Princeps (Menelaides) polymnestor** (Cramer, 1775)
P.(M.) p. polymnestor (Cramer)

1775. *Papilio polymnestor* Cramer, *Pap. Exot.*, 1:83, pl.53, figs. A,B.

1983. *Princeps (Menelaides) polymnestor* : Hancock, *Smithersia*, 2 : 48 (ssp. *polymnestor*, Talbot, 1939, p.126, fig. 30a,b,pl.I, figs. 10-11).

Distribution : India : West Bengal (Calcutta); also East Himalaya and almost throughout the rest of the Peninsula.

Remarks : The butterfly is not rare in the plains during the summer. It is often seen hovering over garden flowers. The food-plants are *Atalantia* species, *Citrus decumana* and *Glycosmis pentaphylla* (Rutaceae). The element was earlier reported from Calcutta by Talbot (1939).

18. **Princeps (Menelaides) memnon** (Linnaeus, 1758)
P.(M.) m. agenor (Linnaeus)

1758. *Papilio agenor* Linnaeus, *Syst. nat.*, ed. 10:460.

1983. *Princeps (Menelaides) memnon* : Hancock, *Smithersia*, 2 : 48 (ssp. *agenor*, Talbot, 1939, p. 129, figs. 32-33).

Material examined : Teesta, 20.iii.1907, *Old Colln.*, Kalimpong, Darjiling district, 23.v.1979, M.S. Shishodia and party coll.; Garumara, 28.viii.1983, A.K. Mondal and party coll., Mendabari Forest, Chilapata, Jalpaiguri district, 16.x.1987, S.K. Tandon and party coll.

Diagnosis : Male fore wing upperside deep blue with pale internervular streaks. Female polyphenic.

Distribution : India : West Bengal (Calcutta, Darjiling and Jalpaiguri); Andaman and Nicobar Islands. Arunachal Pradesh, Assam, Nagaland and Sikkim. Elsewhere : Burma.

Remarks : The subspecies is not rare at low elevations. It is very interesting for polyphenism, though

the specimens examined are referable to only one male morph, i.e., (1 M) f. *agenor* (Linnaeus), with or without a short dark red streak at the base of fore wing and both wings with distinct blue adnervular streaks not reaching the outer margin. The food-plants are *Citrus* species (Rutaceae). The morph under study was not hitherto known from West Bengal, although another morph, i.e., *polymnestoroides* (Moore) in both sexes, was earlier known from Calcutta.

helenus group

19. *Princeps* (Menelaides) *helenus* (Linnaeus, 1758) P. (M.) h. *helenus* (Linnaeus)

1758. *Papilio helenus* Linnaeus, *Syst. Nat.*, ed. 10 : 459.

1983. *Princeps* (Menelaides) *helenus* : Hancock, *Smithersia*, 2 : 48 (ssp. *helenus*, Talbot, 1939, p.167, fig. 44 a, b).

Material examined : 4 exs., Rongpo, Andharikhola, 30.v.1974, J.K. Jonathon and party coll., Kalimpong, Tindharia, Darjiling district, 27.iii.1978, 23.v.1979, A.R. Bhowmik, M.S. Shishodia and parties colls.

Diagnosis : Fore wing underside with grey, long internervular streaks ; hind wing upperside white patch not touching the cell and underside subterminal lunules reduced between Rs and Cula.

Distribution : India : West Bengal (Darjiling); also East Himalaya and Uttar Pradesh including Mussoorie. Elsewhere : Burma, Malay Peninsula and Thailand.

Remarks : A new record for West Bengal, the butterfly is common in evergreen jungles with heavy rainfall. Since it is a powerful flier and often found away from its jungle haunts, it is difficult to catch inspite of its abundance. Food-plants are *Citrus* species, *Glycosmis pentaphylla* and *Zanthoxylum rhetsa* (Rutaceae). The specimens examined belong to the summer-brood, being larger than the spring-brood.

polytes group

20. *Princeps* (Menelaides) *polytes* (Linnaeus, 1758) P.M. p. *romulus* (Cramer)

1775. *Papilio romulus* Cramer, *Pap. Exot.*, 1 : 67, pl. 43, fig. A.

1983. *Princeps* (Menelaides) *polytes* : Hancock, *Smithersia*, 2 : 48 (ssp. *romulus*, Talbot, 1939, p. 178, figs. 46-48, pl. I, figs. 18a-b, 19).

Material examined : 44 exs. : Bhatapur side of Darakeshwar, 20.xi., Panchubagan, 22.xi.1974, A.K. Hazra and party coll., 2 kms. west of Simlipal Forest Rest House, Bankura district, 24.xii.1985. D.K. Mandal and party coll.; Santiniketan, Birbhum district, 5.x. 1974, B.N. Das and party coll.; Rongpo, 29.v.1974, J.K. Jonathon and party coll., D.F.O. Office campside, Kalimpong, Darjiling district, 3.ix.1974, H.S. Sharma and party coll.; Chandanagar, Hugli district, 9.xi. 1965. K. K. Ray and party coll.; Arabati Forest, 26.xi.1974, P.T. Cherian and party coll., West of Digha sea beach, Medinipur district, 27.ix.1983, A.K. Hazra and party coll.; Kaliganj, Nadia district, 19.xii.1985, B.N. Das and party coll.:

Sodepur, North 24-Parganas district, 20.x.1984, S.K. Ghosh and party coll.; Matta Point Hills, Puruliya district, 16.xi.1974, A.K. Hazra and party coll.

Diagnosis : Male fore wing with prominent terminal white spots; hind wing upperside discal white band of uniform width and underside submarginal lunules red. Female polyphenic.

Key to the forms

1. Fore wing white marginal spots narrower anteriorly than posteriorly. Non-mimetic2
Fore wing marginal spots absent. Mimetic3
2. Hind wing discal band narrower and underside submarginal lunules red. Very common
..... (1 M) f. *romulus* (Cramer)
Hind wing discal band broader and underside submarginal lunules ochraceous. Very rare
..... (1 F) f. *cyrus* (Fabricius)
3. Fore wing with a short subapical and long discal light oblique band; hind wing with all the markings red. Mimicking *Atrophaneura hector* (Linnaeus). Locally common and very rare at Darjiling (1 F) f. *romulus* (Cramer)
Fore wing without subapical and discal band; hind wing with discal spots white, but without white cell-spot. Mimicking *Atrophaneura aris-olochiae* (Fabricius). Very common
..... (1 F) f. *stichius* Hiibner

Distribution : India : West Bengal (Bankura, Birbhum, Darjiling, Hugli, Medinipur, Nadia, North 24 Parganas and Puruliya); also East to North-west Himalaya and rest of the eastern and southern Peninsula. *Elsewhere* : Burma, Borneo, Malay Peninsula, Sri Lanka and Sulawesi.

Remarks : The subspecies is very common in the plains and lightly wooded countries particularly during the pre-winter and winter seasons. This is also as interesting as the subspecies *agenor* in showing polyphenism. The food-plants include cultivated *Citrus* and also other plants in nature, viz., *Aegle marmelos*, *Citrus medica*, *Glycosmis pentaphylla*, *Murraya koenigii* and *Zanthoxylum rhetsa* (Rutaceae). The specimens examined are referable to the morphs as indicated above (*vide* key to the forms).

nephelus group

21. **Princeps (Menelaides) nephelus** (Boisduval, 1836).
P.(M.) n. chaon (Westwood)

1845. *Papilio chaon* Westwood, *Arc. Entom.*, 2 : 97, pl. 72, fig. 1.

1983. *Princeps (Menelaides) nephelus* : Hancock, *Smithersia*, 2 : 48 (ssp. *chaon*, Talbot, 1939, p. 172, nec sp. *chaon*).

Material examined : one ex., Jaianti Forest, Jalpaiguri district, 8. v. 1987, R. Ram and party coll.

Diagnosis : Upperside fore wing stripes yellowish and hind wing 4th patch shorter than the 3rd; both wings underside with cell-stripes prominent.

Distribution : India : West Bengal (Jalpaiguri); Arunachal Pradesh, Assam, Orissa and Sikkim.

Elsewhere : Burma, Nepal, Thailand and Vietnam.

Remarks : A new record for West Bengal, the subspecies is not rare in the wooded hills at a range of elevations lower than that of *P. helenus* (Linnaeus). Food-plants are unknown. The nominal subspecies is exclusively known from Java and not India and elsewhere as earlier cited by Mandal and Nandi (1987). Also, the sexual variations as mentioned by Mandal and Nandi (1983), have been further compared from the named material of National Zoological Collections at Z.S.I. and noted that these are not stable.

Subgenus **Princeps** Hiibner (1807)

Key to the species-groups

Black with yellow postdiscal bands and submarginal spots, basal areas with dispersed yellow scales which form streaks in fore wing cell. Frons, thorax and abdomen with yellow lines. Male and roconia absent *demoleus* group

[Tailless] *demoleus* (Linnaeus)

Black with metallic blue and green patches, basal areas on upperside with dispersed metallic scales and on underside with cream scales. Frons, thorax and abdomen never with yellow lines, but overlaid with metallic green scales. Male androconia present *paris* group

[Tailed. Hind wing with inner edge of subapical green patch straight and diffused] *polyctor* (Boisduval)

demoleus group

22. **Princeps (Princeps) demoleus** (Linnaeus, 1758)

P. (P) d. demoleus (Linnaeus)

1758. *Papilio demoleus* Linnaeus, *Syst. Nat.*, ed. 10 : 464.

1983. *Princeps (Princeps) demoleus* : Hancock, *Smithersia*, 2 : 48(ssp. *demoleus*, Talbot, 1939, p. 189, fig. 50).

Material examined : 26 exs. : Bhatapur side, Darakeshwar, 20. xi. 1974, A. K. Hazra and party coll., Jangal Mahal, south of Jaipur Forest, 20. xi. 1985, Simlipal Forest, 24. xii. 1985, D. K. Mandal and party coll., Pokasna, Bankura district, 7. iii. 1986, K. P. Mukherjee and party coll.; - ix. 1886, 30. viii. 1960. *Old Collns.*, Alipur, Calcutta, 30. vii. 1957, A. P. Kapur and party coll.; Botanical Gardens, Haora district. 4. ix. 1940., M. A. Majeed coll.; Uttarpara, 14. ix. 1957, R. K. Varshney and party coll., Tarakeshwar, Hugli district 15. x. 1965, K. Rai & party coll.; Chandrakona, Medinipur district, 27. vi. 1974, A. K. Hazra and party coll.; Dunlop bridge, 17. v. 1965, H. C. Ghosh and party coll., Sodepur, North 24-Parganas district, 10, 20. x. 1984, S. K. Ghosh and party coll.; Sonarpur, 29. ix. 1961, K. Rai and party coll., Subhasgram,

Kodalia, South 24-Parganas district, 29.v.1965, S.C. Mitra and party coll.

Diagnosis : Fore wing cell subapically with two separate patches and a spot behind the discal band; hind wing red spot proximally reduced and separated from blue lunule by a black spot.

Distribution : India : West Bengal (Bankura, Calcutta, Darjiling, Haora, Hugli, Jalpaiguri, Medinipur, North and South 24-Parganas); also North-west to East Himalaya and rest of the Peninsula.
Elsewhere : East Palaearctic, North Burma and Sri Lanka.

Remarks : This widely distributed butterfly is very common, flying in swarms more in low lands amidst gardens than in woods almost round the year. It is known to extend sparsely in the Himalaya including the North Bengal belts like Darjiling and Jalpaiguri. It flies slowly at leisure, but hurries off in swift and irregular flight, when alarmed. In old age, the yellow markings on the wings frequently turn to a deep orange. Seasonal dimorphism is not marked. The food-plants are the cultivated species of *Citrus* apart from *Aegle marmelos*, *Murrya koenigii*, *Ruta* spp., etc. (Rutaceae).

palinurus group

23. * **Princeps (Princeps) crino** (Fabricius, 1793)

1793. *Papilio crino* Fabricius, *Ent. Syst.*, 3 : 5.

1983. *Princeps (Princeps) crino* : Hancock, *Smithersia*, 2 : 48.

Distribution : India : West Bengal (Calcutta); also northern and southern Peninsula.
Elsewhere : Sri Lanka.

Remarks : The species, which is not rare, is known to occur in the plains and hills during spring. Its flight is very swift. It prefers dry jungles where the food-stuff, *Chloroxylon swietenia* (Rutaceae) grows. There is an aberrant male morph, *montanus* (C. & R. Felder), which differs from the normal male of this butterfly by the absence of fore wing wooly scent-streaks. The distribution of *P. crino* in "Lower Bengal" including Calcutta was noted by Talbot (1939). Subspecific or geographical variation of the species is unknown.

paris group

24. **Princeps (Princeps) polyctor** (Boisduval, 1836)

P. (P.) p. ganesa (Doubleday)

1842. *Papilio ganesa* Doubleday, in Gray, *Zool. Misc.*, p. 73.

1983. *Princeps (Princeps) polyctor* : Hancock, *Smithersia*, 2 : 48 (ssp. *ganesa*, Talbot, 1939, p.146).

Material examined : 7 exs. along the bank of River Rayang, 1 km. south of Rayang Forest House, 28.iii.1974, H.S. Sharma and party coll., Sevok Forest, Darjiling district, 18.v.1987; Jaianti Forest, Jalpaiguri district, 8.v.1987, R. Ram and party coll.

Diagnosis : Fore wing discal band broad green; hind wing blue patch reaching Sc + R1 where it

is more or less strongly produced distad.

Distribution : India : West Bengal (Darjiling and Jalpaiguri); Arunachal Pradesh, Assam, Meghalaya, Nagaland and Sikkim.

Elsewhere : North Burma.

Remarks : A new record for West Bengal, the butterfly is the most beautiful of all the Indian counterparts of *Lepidoptera*. It is locally common, the males of which rest on moist sand of river banks amidst warm valleys in particular during March-October. The seasonal variations, however, are not marked. While the adult attractants are the flowers of *Buddleia* species, the food-plant in the districts surveyed is mainly *Limonia acidissima* (Rutaceae).

25. * **Princeps (Princeps) arcturus** (Westwood, 1842)

P. (P.) a. arcturus (Westwood)

1842. *Papilio arcturus* Westwood, *Ann. Mag. nat. Hist.*, **9** : 37.

1983. *Princeps (Princeps) arcturus* : Hancock, *Smithersia*, **2** : 48 (ssp. *arcturus*, Talbot, 1939, p.152, fig. 39a-c).

Distribution : India : West Bengal (Darjiling); also other parts of East Himalaya.

Elsewhere : Bhutan and Burma to Nepal.

Remarks : This locally common subspecies is confined to the cold-temperate forest region. In fact, the maximum altitude (c 2400 metres) for the preceding species is the minimum altitude for the butterfly in question which is known to fly up to c 3700 metres at the most. Its niches are mainly the clearings and open nullahs in forest region. Wynter-Blyth (1957) reported the butterfly from Darjiling where it is multivoltine during April-November. Amongst five broods, the first and the last are small, while the three others are comparatively much larger and beautifully coloured, flying in the rainy season. Food-plant is unknown.

26. * **Princeps (Princeps) krishna** (Moore, 1857)

P. (P.) k. krishna (Moore)

1857. *Papilio krishna* Moore, *Cat. Lep. Mus. E.I.C.*, **1** : 108, pl. 2a, fig. 6.

1983. *Princeps (Princeps) krishna* : Hancock, *Smithersia*, **2** : 48 (ssp. *krishna*, Talbot, 1939, p.154).

Distribution : India : West Bengal (Darjiling); Assam, Manipur, Nagaland and Sikkim.

Elsewhere : Bhutan and Burma.

Remarks : The subspecies, which is not rare, frequents bare places on mountains where the slopes are covered with forests of chestnut, oak and magnolia. Food-plant is unknown. It is rather very difficult to capture this high soaring butterfly. Bingham (1907) first reported the element from the Rungarun Forest, Darjiling.

Family II. NYMPHALIDAE

Subfamily DANAINAE

Key to the tribes

- Pulvilli and paronychialia of mid- and hind legs vestigial; tarsal claws curved at tips only Danaini
- Pulvilli and paronychialia of mid- and hind legs functional; tarsal claws evenly curved throughout their length Euploeini
- [Hind wing precostal vein arising from Sc + R1 beyond origin of Rs] Subtribe Euploeina

Tribe DANAINI

Key to the subtribes

- Hind wing precostal vein simple; male hind wing with a pouched or pocketed cubital organ Danaina
- Hind wing precostal vein forked or elbowed; male hind wing lacking cubital pouch or pocket Amaurina
- [Hind wing cross-veins m1 - m2 and m2 -m3 forming angle] Genus *Parantica* Moore

Subtribe AMAURINA

Genus *Parantica* Moore(1880)

Key to the species

- Forewing R1 and Sc anastomosed; wing pattern elements white *aglea* (Stoll)
- Fore wing R1 and Sc separate; wing pattern elements not white *melaneous* (Cramer)

27. *Parantica aglea* (Stoll, 1782)

Key to the subspecies

- Fore wing hyaline markings along dorsum and those in both wing-cells quite narrow; marginal series of spots small *aglea* (Stoll)
- Fore wing hyaline markings along dorsum and those in both wing-cells quite broad; marginal series of spots large *melanoides* Moore

(a) *Parantica aglea aglea* (Stoll)1782. *Papilio aglea* Stoll, in Cramer, *Pap. Exot.*, 4 : 173, Pl. 377, fig. E.1984. *Parantica aglea aglea* : Ackery & Vane-Wright, *Milkweed butterflies*, p. 175, pl. 1, fig. 2.*Material examined* : 2 exs. : iii. -. Old Colln., Calcutta, 24. ix. 1964, P.C. Dhar and party coll.*Diagnosis* : Vide key.*Distribution* : India : West Bengal (Calcutta and North 24 -Parganas) ; also rest of the Peninsula.

Remarks : This is a fairly common subspecies occurring along shady paths, being most active in the late afternoon and favouring open or partially cultivated localities in areas of heavy rainfall. Its flight is slow and weak. De Nice'ville (1885) earlier reported this butterfly as "*Danais (Parantica) aglea*" from Barrackpore of North 24-Parganas. The food-plants are *Calotropis* sp., *Tylophora ovata*, *T. tenuis* (Asclepiadaceae) and also *Cryptolepis buchmanii* (Periplocaceae). The adult attractants are the flowers, damaged leaves and stems of plants belonging to Asteraceae, Euphorbiaceae, Fabaceae and Verbenaceae.

(b) *Parantica aglea melanoides* Moore1883. *Parantica melanoides* Moore, *Proc. zool. Soc. Lond.*, 1883 : 247.1984. *Parantica aglea melanoides* : Ackery & Vane-Wright, *Milkweed butterflies*, p. 175.

Material examined : 12 exs., Andharikhola, 2 kms. south-west of Rongpo Forest Rest House, 6. iii. 1973, 1 km. south of Rayang Forest Rest House, along the bank of River Rayang, Darjiling district, 18. iii. 1973, H.S. Sharma and party coll.; Rydak Forest, Jalpaiguri district, 31. ix. 1975, A. K. Bhowmik and party coll.

Diagnosis : Vide key.*Distribution* : India : West Bengal (Darjiling and Jalpaiguri); Arunachal Pradesh, Assam, Himachal Pradesh, Jammu and Kashmir and Sikkim.

Elsewhere : Bangladesh, Burma, Hainan, Malaya, Nepal, Thailand and Vietnam.

Remarks : The subspecies is very common in the rainy belts of the Himalaya where it occurs up to c 2000 metres; it is however, very rare in the dry North-West Himalaya like Simla of Himachal Pradesh. Food-plant is preferred as *Tylophora carnosa* (Asclepiadaceae). Amongst the specimens examined, some may be referred to the morph *phormis* (Fruhstorfer) being smaller and with narrower light markings.

28. *Parantica melaneus* (Cramer, 1775)*P. m. plataniston* (Fruhstorfer)1910. *Danaida melaneus plataniston* Fruhstorfer, in Seitz, *Macrolep. World*, 9 : 210.1984. *Parantica melaneus plataniston* : Ackery & Vane-Wright, *Milkweed butterflies*, p. 179.*Material examined* : 3 exs., Darjiling district, Old Coll.; Jaianti Forest, Jalpaiguri district, 8. v. 1987.

R. Ram and party coll.

Diagnosis : Hind wing underside with less red-brown scaling over the cell and post-cellular spots, this area being whiter.

Distribution : India : West Bengal (Darjiling and Jalpaiguri); Arunachal Pradesh, Assam, Manipur, Nagaland, Sikkim and Uttar Pradesh (Kumaon).

Elsewhere : Burma, China, Indo-China and Thailand.

Remarks : A new record for West Bengal, the butterfly is not rare and typically inhabits upland forests up to c 2800 metres, being not much active during early morning mists. Adults are known to suck human sweat and to occur on sand and wet moss. The adult attractants comprise flowers, often in association with aphids, and dried bait of plants belonging to Asteraceae, Boraginaceae and Verbenaceae and food-plant is *Cynanchum* sp. (Asclepiadaceae).

Subtribe DANAINA

Key to the genera

Hind wing submarginal series of spots evenly aligned and close to marginals *Danaus* Kluk

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

Genus *Tirumala* Moore (1880)

Key to the species

Larger species being less boldly marked *septentrionis* (Butler)

Smaller species being more boldly marked. *limniace* (Cramer)

29. *Tirumala limniace* (Cramer, 1775)

T.l. leopardus (Butler)

1866. *Danaus limniace* var. *leopardus* Butler, *Proc. zool. Soc. Lond.*, 1866 : 52.

1984. *Tirumala limniace leopardus* : Ackery & Vane-Wright, *Milkweed butterflies*, p. 198.

Material examined : 23 exs.: 2 kms. north of Jaypur Forest, Bankura district, 21. iii. 1985, D. K. Mondal and party coll.; Bolepur, 21. v. 1885, *Old Colln.*, Durgapur, Bardhaman district, 5. x. 1985, S.K. Ghosh and party coll.; Bholahat, Birbhum district, -----, *Old Colln.*, -----, -----, 28. xii. 1879, -- ii. -iii. 1911, *Old Colln.*, Gorla, 21. ix. 1961, Eden Gardens, Calcutta, 8. iii. 1965, H. N. Singh coll., Sonada, 24. iii. 1978, Teesta, Darjiling district, 8. iv. 1978, A.R. Bhowmik and party coll. ; Botanical Gardens, 22. ii. 1960, H. N. Singh coll., Andul, Haora district, 28. iii. 1964, G.S. Arora and party coll.; Bandel, Hugli district, 26. iv. 1964, ---coll., Gobardanga, 18. ix. 1965, H.C. Ghosh and party coll., Barrackpur, North 24-Parganas district, 28. x. 1965, O. B. Chhotani and party coll.; Sonarpur, South 24-Parganas district 28.

vi. 1961, A. P. Kapur and party coll.

Diagnosis : Fore wing width of streaks beyond end-cell not less than half their length; hind wing black cell-streak absent and submarginal dots large. Male sex-mark as a pendulous pouch on the hind wing underside anal area.

Distribution : India : West Bengal (Bankura, Bardhaman, Birbhum, Calcutta, Darjiling, Haora, Hugli, North and South 24-Parganas); almost throughout the rest of mainland and also Andaman and Nicobar Islands. Elsewhere : Burma, China, Indo-China, Pakistan, Sri Lanka, Thailand, Western Malaysia and Vietnam.

Remarks : The subspecies is very common in the plains, but also ascends in the Himalaya up to c 2000 metres. This is fond of resting in crowds on low bushes and often drinks at wet places on the road. It shows slow and flapping flight, but during migration it flies more quickly. The food-plant comprises *Asclepias* and *Calotropis* spp., *Dregea volubilis*, *Hoya* sp., *Marsdenia tenacissima* (Asclepiadaceae) and *Epibaterium* sp. (Menispermaceae). The adult attractants are the flowers, dried bait, damaged leaves, stems and withered shoots of the plants belonging to Asteraceae, Boraginaceae, Euphorbiaceae, Fabaceae, Verbenaceae, etc. The male pouches of the specialised scales are stroked by the abdominal brushes to scatter aphrodisiac for attracting the females.

30. *Tirumala septentrionis* (Butler, 1874)

T. s. septentrionis (Butler)

1874. *Danais septentrionis* Butler, *Ent. Mo. Mag.*, 11 : 163.

1984. *Tirumala septentrionis septentrionis* : Ackery & Vane-Wright, *Milkweed butterflies*, p. 199.

Material examined : 2 exs., 3 kms, south-east of Rongpo Forest Rest House, Darjiling district. 10. iv. 1973, H. S. Sharma and party coll.

Diagnosis : Fore wing subapical streaks long and blue-green, cell-streak thick black, being coincident with the cell-wall on hind wing having narrow greenish internervular areas.

Distribution : India : West Bengal (Darjiling); Arunachal Pradesh, Assam, Himachal Pradesh, Jammu and Kashmir, Nagaland, Orissa, Sikkim, and Uttar Pradesh. Elsewhere : Bhutan, Burma, China, Malaya, Nepal, Sumatra, Thailand and Vietnam.

Remarks : A new record for West Bengal, the subspecies is common at moist places on the ground in extreme dry weather. It favours both wooded and open countries ascending to c 2000 metres in the Himalaya. Food-plants are *Vallaris dichotoma* (Apocynaceae), *Dregea volubilis* (Asclepiadaceae), etc. The adult attractants are the plants belonging to Asteraceae, Boraginaceae, Euphorbiaceae and Verbenaceae.

Genus *Danaus* Kluk (1802)

Key to the subgenera

Apex of fore wing underside with ground colour uniformly dark brown distal to white preapical transverse bar *Salatura* Moore

Apex of fore wing underside with some light brown markings distal to pale preapical transverse bar
 *Anosia* Hübner

[Hind wing underside with submarginal series of markings obscured, long veins scaled pale whitish and discocellulars with a series of black spots at origins of M1-M3] sp. *chrysippus* (Linnaeus)

Subgenus *Salatura* Moore (1880)

Key to the species

Hind wing underside with a narrow but distinct dark border filling about 1/3rd of cell M3 and surrounding the marginal and submarginal pattern elements *genutia* (Cramer)

Hind wing underside without distinct dark border, if present, filling about half of cell M3
 *melanippus* (Cramer)

31. *Danaus (Salatura) genutia* (Cramer, 1779)

D. (S.) g. genutia (Cramer)

1779. *Papilio genutia* Cramer, *Pap. Exot.*, 3 : 23, pl. 206, figs. C.D.

1984. *Danaus (Salatura) genutia genutia* : Ackery and Vane-Wright, *Milkweed butterflies*, p. 205, pl. 16, figs. 94.

Material examined : 30 exs. : Jangalmahal, 2 kms. south of jaypur Forest Rest House, Bankura district, 24.xi.1985, D.K. Mondal and party coll.; Kanksa Forest, Panagarh, Bardhaman district, 8.ii.1984, S.K. Ghosh and party coll.; Calcutta, -.-.vii.-.-.-., *Old Collns.*; Rongpo, Darjiling district, 8.iv.1974, R.K. Sharma and party coll.; Altara, Mankundu, Hugli district, 15.iii.1984, S.K. Ghosh and party coll.; Beldanga, Murshidabad district, 5.xi.1974, A.K. Hazra and party coll.; Krishnapur, Sodepur, North 24-Parganas district, 20.ix.1984, S.K. Ghosh and party coll.

Diagnosis : Fore wing upperside with a large white subapical spot separated from a small and white submarginal spot. Male with pouch on hind wing.

Distribution : India : West Bengal (Bankura, Bardhaman, Calcutta, Darjiling, Hugli, Murshidabad and North 24-Parganas); rest of East Himalaya up to North-west Himalaya (up to Himachal Pradesh), the peninsular belts and also Andaman and Nicobar Islands.

Elsewhere : Afghanistan, Burma, Japan, Nepal, Pakistan, Sri Lanka, South-East China, Thailand and Vietnam.

Remarks : This is a very common butterfly which in the older literature is often referred to "*plexippus*" The history of the application of the name *genutia* to this butterfly is dealt with at length in Opinion 282, 1954. A slow flier close to the ground, the butterfly occurs in different niches including mangrove and also areas of secondary growth like scrubs, light forests and open countries. It occurs up to c 2500 metres in the Himalaya. While the adult attractants are the flowers and dry baits of plants belonging to a number of natural orders from Amaranthaceae to Verbenaceae, the food-plants are *Asclepias curassavica*, *Ceropegia intermedia*, *Cynanchum dalhousiae* and others of Asclepiadaceae. This element

also associates with other danaines on migration. In dry regions, there is a tendency for the tawny part of the hind wing to be replaced by white, thus approaching the next species.

32. *Danaus (Salatura) melanippus* (Cramer, 1777)

D. (S.) m. indicus (Fruhstorfer)

1899. *Salatura melanippus indicus* Fruhstorfer, *Berl. Ent. Zeit.*, **44** : 75.

1984. *Danaus (Salatura) melanippus indicus* : Ackery & Vane-Wright, *Milkweed butterflies*, p. 207.

Material examined : 5 exs., Calcutta, 18.xii.1878, -.iii.-, -.--.-., *Old Colln.*; Sunderban, -.ii.-., *Old Colln.*, Gochara, South 24-Parganas district, 26.x.1960, *H.L. Pal Coll.*

Diagnosis : Similar to the last species, but the hind wing being largely white.

Distribution : India : West Bengal (Calcutta and South 24-Parganas); Assam and Orissa.
Elsewhere : Indo-China, Malaya, Nepal, South Burma, Sumatra and Thailand.

Remarks : The subspecies, which is rare in West Bengal, was earlier described from south Bengal as *Danaus hegesippus* by Moore (1865) and reported from Calcutta by de Nice'ville (1885). It shows slow and skipping flight and is typically a low land species, occurring along forest margins, pathways and grassy or bushy areas. Adult attractants are the flowers and roots of plants belonging to Asteraceae and Verbenaceae. The food-plants comprise *Gymnema* sp. and *Tylophora cissoides* (Asclepiadaceae).

Subgenus *Anosia* Hiibner (1816)

33. *Danaus (Anosia) chrysippus* (Linnaeus, 1758)

D. (A.) c. chrysippus (Linnaeus)

1758. *Papilio chrysippus* Linnaeus, *Syst. Nat.*, ed.10 : 471.

1984. *Danaus (Anosia) chrysippus chrysippus* : Ackery & Vane-Wright, *Milkweed butterflies*, p. 209, pl.19, fig. 112. pls. IX, X, figs. 98, 115.

Material examined : 140 exs. : Binai Jheel, 4 kms. south-west of Jamuna Bandh, Bishnupur, Bankura district, 18.xii.1985, *D.K. Mandal* and party coll., 2.iii.1986, *K.P. Mukherjee* and party coll.; Balagarh, 3.x.1985, Dhatrigram, 12.xii.1985, *B.N. Nandi* and party coll., Durgapur, Barddhaman district, 15.x.1985, *S.K. Ghosh* and party coll.; Bolepur, 12.vi.1885, *Old Colln.*, Chandrapur, Siuri, 9.xi.1974, *A.K. Hazra* and party coll., Ballavpur, 15.iii.1986, Sainthia, 19.iii.1986, Birchandrapur, Birbhum district, 1.iv.1986, *M.S. Shishodia* and party colls.; 15.ii.1880, Old Collns., Dhapha, 9.iii.1961, *R.K. Varshney* and party coll., 6.v.1961, *H.N. Singh* coll., 10.xi.1961, *K. Rai* and party coll., Eden Gardens, 16.xi.1964, Salt Lake, 27.xii.1964, *S. Ali* coll., Hati Garden, Alipur, Calcutta, 19.i.1967, *K. Rai* and party coll.; Teesta. Darjiling district, 10.ii.1963, *M.B. Kripalani* and party coll.; Santragachi, Haora district, 19.ix.1964, *K. Rai* and party coll.; Bandel, 14.i.1960, Bhadreswar, 5.iii.1964, *S. Ali* coll., Tarakeswar, 16.ix.1965, *K. Rai* and party coll., Chandanagar, Hugli district, 20.x.1965, *K.S. Pradhan* and party coll.; Gorumara, Jalpaiguri district, 28.viii.1983, *A.K. Mondal* and party coll.; Arabati Forest, 20.xi.1974, Sankarpur Forest, 16 kms. east of Digha, Medinipur district, 25.xii.1985, *A.K. Hazra* and party coll.; Ranaghat, Nadia district.

18.viii.1965, *P.K. Maiti* and party coll.; Barrackpur, Panpara, 14.xi.1961, *V.K. Lakshminarayana* and party coll., Dunlop Bridge. 17.vi.1965, *H.C. Ghosh* and party coll., Krishnapur, Natagarh, Sodepur, North 24-Parganas district, 20.x.1984, *S.K. Ghosh* and party coll.; Laksmikantapur, 15.x.1965, Sonarpur, 26.xi.1965, *R.N. Tiwari* and party coll., Hard-wood Point, Kakdweep, South 24-Parganas district, 18.ii.1984, *S.K. Ghosh* and party coll.

Diagnosis : Hind wing upperside tawny, veins not black and 4 small black spots around end-cell, these being 3 in female; male with pouch.

Distribution : India : West Bengal (Bankura, Bardhaman, Birbhum, Calcutta, Darjiling, Haora, Hugli, Jalpaiguri, Medinipur, Nadia, North and South 24-Parganas); also throughout the outer Himalaya and rest of the Peninsula.

Elsewhere : Different belts of the Oriental Region, extending to Japan in the Far East and Asia Minor in the Middle East of the Palaearctic.

Remarks : Very common in status, the subspecies was earlier recorded from West Bengal by Moore (1865) and from Calcutta by Marshall & de Nice'ville (1883), de Nice'ville (1885) and Sevastopulo (1933). The species has a slow flight close to the ground, occurring in the plains and hills where it often ascends to c 2500 metres. It is associated with open country and areas of secondary growth, but with widespread tree-felling it is more commonly found in some previously forested areas. Flowers of innumerable plants and also carnivore droppings are found to be attractive. The element is extremely polyphagus feeding on plants belonging to the natural orders starting from Asclepiadaceae to Scrophulariaceae. Mimicry, polymorphism, behaviour and parasites have been dwelt upon by Sukul & Jana (1972), Gupta (1977), Agrawal, et al (1978) and Mathur & Mathur (1979). Amongst the specimens examined, some may be referred to the rare morph *alcippoides* (Moore) from Calcutta, with hind wing more or less white.

Tribe EUPLOEINI

Subtribe EUPLOEINA

Key to the genera

Hind wing base without precostal cell.....*Euploea* Fabricius

Hind wing base with a distinct parallel-sided precostal cell*Idea* Fabricius

[Fore wing postdiscal dark markings united to form a band, merging with the dark apex]
..... *agamarschana* (C. & R. Felder)

Genus *Euploea* Fabricius (1807)

Key to the species

1. Recurrent veinlet of fore wing discal cell distinct 3
- Recurrent veinlet of fore wing discal cell absent or indistinct 2

2. Male androconial brand in fore wing cell Culb elongate, about as long as the width of the cell, and proximally aligned with the point of origin of Culb *midamus* (Linnaeus)
- Male androconial brand in fore wing cell Culb short, distally displaced from the point of origin of Culb *klugii* Moore
3. Male with small off-white or light brown alar patch on hind wing upperside within discal cell, discal area being covered with dense spatulate scales *mulciber* (Cramer)
- Male without such alar patch, but fore wing with one androconial brand in cell Culb 4
4. Male androconial brand short, distally displaced from point of origin of Culb ... *core* (Cramer)
- Male androconial brand long, commencing level with or proximal to point of origin of Culb *algea* (Godart)

34. * *Euploea sylvester* (Fabricius, 1793)
E. s. hopei C. & R. Felder

1865. *Euploea hopei* C. & R. Felder, *Reise Nov., Lep.*, 2 (2) : 328.

1984. *Euploea sylvester hopei* : Ackery & Vane-Wright, *Milkweed butterflies*, p.213.

Distribution : India : West Bengal (Darjiling); Assam, Nagaland and Sikkim.
Elsewhere : Bangladesh and Burma.

Remarks : This is not a rare butterfly, showing rapid and sailing flight and settling on mud, flowers or dry twigs. It inhabits the hills, ascending to low elevations in West Bengal. Heavily wooded country and forest margins are the most preferred habitats. It flies together with *E. core*. The adult attractants are the damaged leaves of *Parsonsia lata* (Apocynaceae), while the food-plants are *Ichnocarpus frutescens* (Apocynaceae), different species of *Ficus* (Moraceae), *Hoya* and *Cynanchum* spp. (Asclepiadaceae). The element was earlier recorded as "*Stictoploea binotata*" from Darjiling by Butler (1878).

35. *Euploea mulciber* (Cramer, 1777)
E. m. mulciber (Cramer)

1777. *Papilio mulciber* Cramer, *Pap. Exot.*, 2 : 45, pl.127, figs. C, D.

1984. *Euploea mulciber mulciber* : Ackery & Vane-Wright, *Milkweed butterflies*, p.215, pl.23, figs. 134-135.

Material examined : 12 exs., Singla, -.-.-, *Old Colln.*, Teesta, -.ii.1973, M.B. Kripalani and party coll., Rangli Tea Estate, 3 kms. east of Torik, 25.iii.1973, A.K.Bhowmik and party coll., Bista Sanctuary, Andharikhola, 9.ix.1973, 30.v.1974, J.K. Jonathon and party coll., 6 kms. east of Rongpo Forest Rest House (c 2000 metres), on the way to Mansong, Darjiling district, -.- 1973, H.S. Sharma and party coll.; Bali, Hugli district, -.iii.1886, *Old Colln.*; Bhutta, Jalpaiguri district, 7.ix.1975, H.K. Bhowmik and party coll.

Diagnosis : Sexually dimorphic : male glossy black, fore wing upperside shot blue, with pale discal, end-cell and marginal spots, hind wing upperside immaculate, cell with small yellow specialised scales and apical half overlaid with grey scales. Female dark brown, fore wing upperside spots white, hind wing upperside streaked narrow white and with white marginal spots.

Distribution : India : West Bengal (Darjiling, Hugli and Jalpaiguri); Andaman and Nicobar Islands, Arunachal Pradesh, Assam, Himachal Pradesh, Nagaland and Sikkim.

Elsewhere : Burma, China, Malaya, Nepal and Vietnam.

Remarks : This is a common subspecies, occurring up to c 2000 metres in the East Himalaya and also in the plains. The male flies above the ground, while the female flies amidst the shrubby vegetations. The male is often found basking in the sun and may be attracted to salt sources, mammal pellets, dog dung, urine, mud and wet rocks. Both sexes have a characteristically unpleasant smell. The adult attractants are the flowers of plants belonging to Asteraceae, Boraginaceae, etc., while the food-plants are *Nerium* spp. (Apocynaceae), *Aristolochia* sp. (Aristolochiaceae), etc. The male also acts as model for certain butterflies, particularly *Chilasa paradoxa* and also chalcosine moths.

36. *Euploea midamus* (Linnaeus, 1758)

E. m. rogenhoferi C. & R. Felder

1865. *Euploea rogenhoferi* C. & R. Felder, *Reise Nov.* 2(2) : 325.

1984. *Euploea midamus rogenhoferi* : Ackery & Vane-Wright, *Milkweed butterflies*, p. 217.

Material examined : One ex., Mirik Hill, Darjiling district, 3.xi.1974, S.K. Gupta and party coll.

Diagnosis : Dark velvety brown. Fore wing upperside totally glossed brilliant blue, cell-spot and discal series of violet spots, marginal series white; hind wing upperside glossed blue in the middle, unspotted except in the margin. Male fore wing upperside with a long brand.

Distribution : India : West Bengal (Darjiling); Assam, Nagland and Sikkim, up to the eastern border of West Himalaya.

Elsewhere : Burma and Nepal.

Remarks : Rare in West Bengal, the subspecies was earlier described as *Isamia splendens* by Moore (1890) from Darjiling. The specimen examined is a male which may be referred to the morph *irawada* Moore, with fore wing spots quite prominent. The butterfly has an indolent sailing flight above ground. It inhabits forests at lower hills and also plains frequenting sheltered valleys. Male patrols with its abdominal hair-pencils extended and are attracted to flowers of the plants belonging to Asteraceae, Boraginaceae, etc. The food plants are *Nerium oleander*, *Stropanthus dichotomus* and other species (Apocynaceae) and also *Ficus ampelos* (Moraceae).

37. *Euploea klugii* Moore (1858)

(a) *E. k. klugii* Moore

1858. *Euploea klugii* Moore, in Horsfield & Moore, *Cat. Lep. Mus. E.I.C.*, 1 : 130.

1984. *Euploea klugii klugii* : Ackery & Vane-Wright, *Milkweed butterflies*, p. 219, pl.31, fig. 169-170.

Material examined : 3 exs., Rydak Forest, Jalpaiguri district, 8.ix.1975, H.K. Bhowmik and party coll.

Diagnosis : Male fore wing with a large white spot before 4 blue-white ones beyond the cell, submarginal row of large wedge-shaped spots, a row of white marginal dots and short brand. Female fore wing terminal spots lacking, otherwise similar to the male except for the sex mark.

Distribution : India : West Bengal (Jalpaiguri and Maldah); Assam, Meghalaya, Nagaland and Sikkim.

Elsewhere : Bangladesh, Bhutan, Burma and Nepal.

Remarks : The subspecies is rare in West Bengal. It was also reported from Maldah of North Bengal by Bingham (1905). This element is known to be very variable both in spotting and the extent of the blue-shot area. It prefers lowland with wet forested areas, but sometimes ascends to c 1500 metres in the Himalaya. During dry periods the butterfly obtains moisture from sandy stream-beds. It is rather very sedentary and local in habitat. The adult attractants are the flowering shrubs growing on sandy river-banks, while the food-plants are *Ficus* spp. and *Streblus asper* (Moraceae).

(b) * *Euploea klugii kollari* C. & R. Felder

1865. *Euploea kollari*, C. & R. Felder, *Reise Nov., Lep.*, 2 (2) : 325.

1984. *Euploea klugii kollari* : Ackery & Vane-Wright, *Milkweed butterflies*, p. 219.

Distribution : India : West Bengal (Calcutta and North 24-Parganas); Karnataka, Maharashtra, Orissa and Tamil Nadu.

Remarks : This subspecies, which seems to be not rare in West Bengal, is confined to the peninsular belt of India. It was earlier reported from Calcutta by de Nice'ville (1885) and from Barrackpur of the North 24-Parganas district by Rothney (1882). The butterfly, showing no violet reflection on wings, flies in Calcutta all the year round in company with *E. core*. It is fond of damp places affecting the banks of nullahs in the monsoon months. The food-plant is *Ficus hispida* (Moraceae).

38. * *Euploea radamanthus* (Fabricius, 1793)
E. r. ramsayi (Moore)

1890. *Danisepa ramsayi* Moore, *Lep. Ind.*, 1 : 111, pl.39, figs. 1, 1a-b.

1984. *Euploea radamanthus ramsayi* : Ackery & Vane-Wright, *Milkweed butterflies*, p. 220.

Distribution : India : West Bengal (District unknown); Arunachal Pradesh and Assam to Sikkim.
Elsewhere : Nepal.

Remarks : The butterfly, known earlier as *E. dioeletianus ramsayi*, was previously recorded from "Bengal" by Moore (1865). It is not rare in the deep outlying valleys from April to December. The female is forest-lover, while the more widespread male frequents the banks of rocky streams, forest roads and quarries. The butterfly settles on damp sand, excrement, mud, wild grasses, tree-trunks and heaps of wood-

ash. While the specific food-plants are unknown, the adult attractants are mainly the flowers of the plants belonging to Asteraceae, Boraginaceae, etc.

39. * *Euploea doubledayi* C. & R. Felder (1865)
E. d. doubledayi C. & R. Felder

1865. *Euploea doubledayi* C. & R. Felder, *Reise Nov., Lep.*, 2 (2) : 337.

1984. *Euploea doubledayi doubledayi* : Ackery & Vane-Wright, *Milkweed butterflies*, p. 225, pl.35, figs. 198-199.

Distribution : India : West Bengal (District unknown); Assam, Manipur, Nagaland and Sikkim.
Elsewhere : Bangladesh and Burma.

Remarks : This less frequent butterfly was earlier recorded from Bengal by Moore (1865). It is a forest-dweller with a preference to open woodland up to c 600 metres. Individuals have affinities to salt sources and mud. The adult attractants are flowers of *Xerospermum intermedium* (Sapindaceae). The food-plant is unknown.

40. *Euploea algea* Godart, (1819)
E. a. deione Westwood

1848. *Euploea deione* Westwood, *Cab. Or. Ent.*, p. 76, pl.37, fig.3.

1984. *Euploea algea deione* : Ackery & Vane-Wright, *Milkweed butterflies*, p.227, pl.38, figs. 214-215.

Material examined : 7 exs., along the bank of Andharikhola stream, Darjiling district, 15.v.1987, R. Ram and party coll.; Bulanghat, 7.ix.1975, H.K. Bhowmik and party coll., Hasimara, 19.viii.1986, T.K. Pal and party coll., Jaianti Forest, Jalpaiguri district, 8.v.1987, R. Ram and party coll.

Diagnosis : Male fore wing upperside deep glossy black, brilliantly blue shot, with small white cell-spot and one to three discal spots and also with a long brand; hind wing upperside deep glossy brown and with marginal spots incomplete or absent. Female ground colour deep brown.

Distribution ; India : West Bengal (Darjiling and Jalpaiguri); Assam, Manipur, Meghalaya, Nagaland and Sikkim.
Elsewhere : Burma and Tibet.

Remarks : This is not a rare subspecies which has a lazy and gliding flight, keeping close to the ground amidst forests near water courses, in scrub jungles, open cultivated areas and meadows. The adult attractants are the flowers, dead twigs and fruits of plants belonging to Asteraceae, Boraginaceae and Sapindaceae. The food-plants are *Ichnocarpus frutescens* (Apocynaceae) and *Ficus* spp. (Moraceae).

41. *Euploea core* (Cramer, 1780)
E. c. core (Cramer)

1780. *Papilio core* Cramer, *Pap. Exot.*, 3 : 133, pl.266, figs. E,F.

1984. *Euploea core core* : Ackery & Vane-Wright, *Milkweed Butterflies*, p.228, pl.39, figs. 222-223.

Material examined : 59 exs., Jangal mohal, 5 kms. south of Jaypur Forest Rest House, 20.xii.1985. 2 kms. west of Jaypur Forest Rest House, Bankura district, 25.xii.1985, D.K. Mondal and party coll.; Gonpur Forest, Siuri, 10.xi.1974, Kachijur, 8.xi.1977, A.K. Hazra and party coll., Illambazar, Birbhum district, 10.iii.1986, K.P. Mukherjee and party coll.; -.-., Old Colln., 21.x.1957, A.P. Kapur and party coll., Batanagar, South 24-Parganas district, 27.iv.1960, H.N. Singh coll.; Alipur, 27.ii.1965, P.C. Dhar and party coll., Hati Garden, Calcutta, 19.i.1967, K. Rai and party coll.; Teesta, Darjiling district, -.ii.1953, M.B. Kripalani and party coll.; Bhadreswar, Hugli district, 24.iv.1966, P. Pal and party coll.; Chandrakona Road, 27.xi.1974, Salbani, 5.x.1983, Shankarpur Forest, 16 kms. east of Digha, Medinipur district, 25.xii.1985, A.K. Hazra and party coll.; Natagrah, Sodepur, North 24-Parganas district, 20.xi.1984, S.K. Ghosh and party coll.; Dyha Forest, Puruliya district, 17.xi.1974, A.K. Hazra and party coll.; Hardwood Point, Kakdweep, South 24-Parganas district, 18.ii.1984, S.K. Ghosh and party coll.

Diagnosis : Wings glossy brown with marginal white spots. Male fore wing upperside with a short band; female fore wing underside with a cell-spot.

Distribution : India : West Bengal (Bankura, Birbhum, Calcutta, Darjiling, Hugli, Medinipur, North 24-Parganas, Puruliya and South 24-Parganas); throughout the rest of the mainland.

Elsewhere : Burma, Nepal and Pakistan.

Remarks : This is a very common subspecies found in gardens at Calcutta, where it flutters sluggishly from flower to flower. It is fond of resting on wet places in the road. It is found in a broad spectrum of habitats from forests to open grounds, ranging upward to c 2500 metres in the Himalaya. It is frequently observed in clusters, apparently feeding on exposed roots and dead sticks. It is mimicked by *Chilasa* sp. and also by the female of *Hypolimnas bolina* (Linn.) The adult attractants are the plants belonging to the natural orders ranging from Apocynaceae to Verbenaceae. Food-plants are also many, belonging to Apocynaceae, Asclepiadaceae, Moraceae, Periplocaceae, Rubiaceae, etc. Amongst the specimens examined, those from the plain districts may be referred to the morph *core* (Cramer) with the fore wing spots more or less equal or reduced in size, and those from the Darjiling district, to the morph *vermiculata* Butler with these spots increasing in size towards apex.

42. * *Euploea crameri* Lucas (1853)

E. c. nice'villei (Moore)

1890. *Tronga nice'villei* Moore, *Lep. Ind.*, 1 : 77, pl.20, figs. 1, 1a-c.

1984. *Euploea crameri nice'villei* : Ackery & Vane-Wright, *Milkweed butterflies*, p. 232.

Distribution : India : West Bengal (South 24-Parganas).

Remarks : This is a very rare subspecies, being hitherto endemic in Sunderbans of the South 24-Parganas district, whence it was described by Moore (1890). The butterfly is a resident of the mangrove belt, though Fruhstorfer (1910-'11) mentioned it being accidentally introduced by shipping on the small, flat alluvial island of Sunderbans at the estuary of the Ganges. The adult attractant is *Ceriops tegal* (at flowers), while the food-plants are *Parsonsia* spp. (Apocynaceae).

Genus *Idea* Fabricius (1807)43. *Idea agamarschana* (C. & R. Felder, 1865)*I. a. agamarschana* (C. & R. Felder)

1865. *Hestia agamarschana* C. & R. Felder, *Reise Nov.*, 2 (2) : 351, pl.43, fig.7.

1984. *Idea agamarschana agamarschana* : Ackery & Vane-Wright, *Milkweed butterflies*, p.241, pl.58, fig. 306.

Material examined : One ex., Sunderbans, South 24-Parganas district, ---, *Old Collection*.

Diagnosis : Fore wing subapical cell-band and submedian band broad and hind wing veins distally with cuff-shaped figures.

Distribution : India : West Bengal (South 24-Parganas); Andaman Islands and Assam.

Elsewhere : Bangladesh, South Burma and Thailand.

Remarks : Talbot (1949) mentioned this subspecies as very common in the mangrove jungle and tidal creek at Akhiaghat, head of the Naf Estuary that separates the district of Chittagong in Bangladesh from Arrakan. It is, however, rare in the Sunderbans of West Bengal, where it is recorded new. The butterfly, erroneously considered as "*lynceus*" from the Sunderbans and elsewhere by Wynter-Blyth (1957), is unmistakable for its characteristic wing markings, slow-flapping habit and association with flora of secondary growth amidst dark forests. The adult attractants and food-plants are unknown. The specimen examined may be referred to the morph *arrakana* (Fruhstorfer) with wings yellowish and fore wing apical spots diffused. This is the Sunderban race extending southwards to Arrakan.

SUMMARY

Systematic account of 43 species in 11 genera of papilionine and danaine butterflies together from West Bengal is presented in the light of latest trend of taxonomy. This is preceded by a brief discussion on earlier investigation of the state fauna and material and method. The work is based on both the old and recent material brought to the Zoological Survey of India by various survey parties. Only ten butterflies, of which the representatives are not available in the collections, are reviewed from literature. Keys to the taxa from higher to lower grades of the material examined together with a couple of maps showing distribution and also status, bionomics, food-plants, etc., of the forms under report are incorporated. In all, sixteen butterflies are recorded new for West Bengal.

ACKNOWLEDGEMENTS

The authors are grateful to the Director, Zoological Survey of India, for kindly providing the laboratory facilities for their work.

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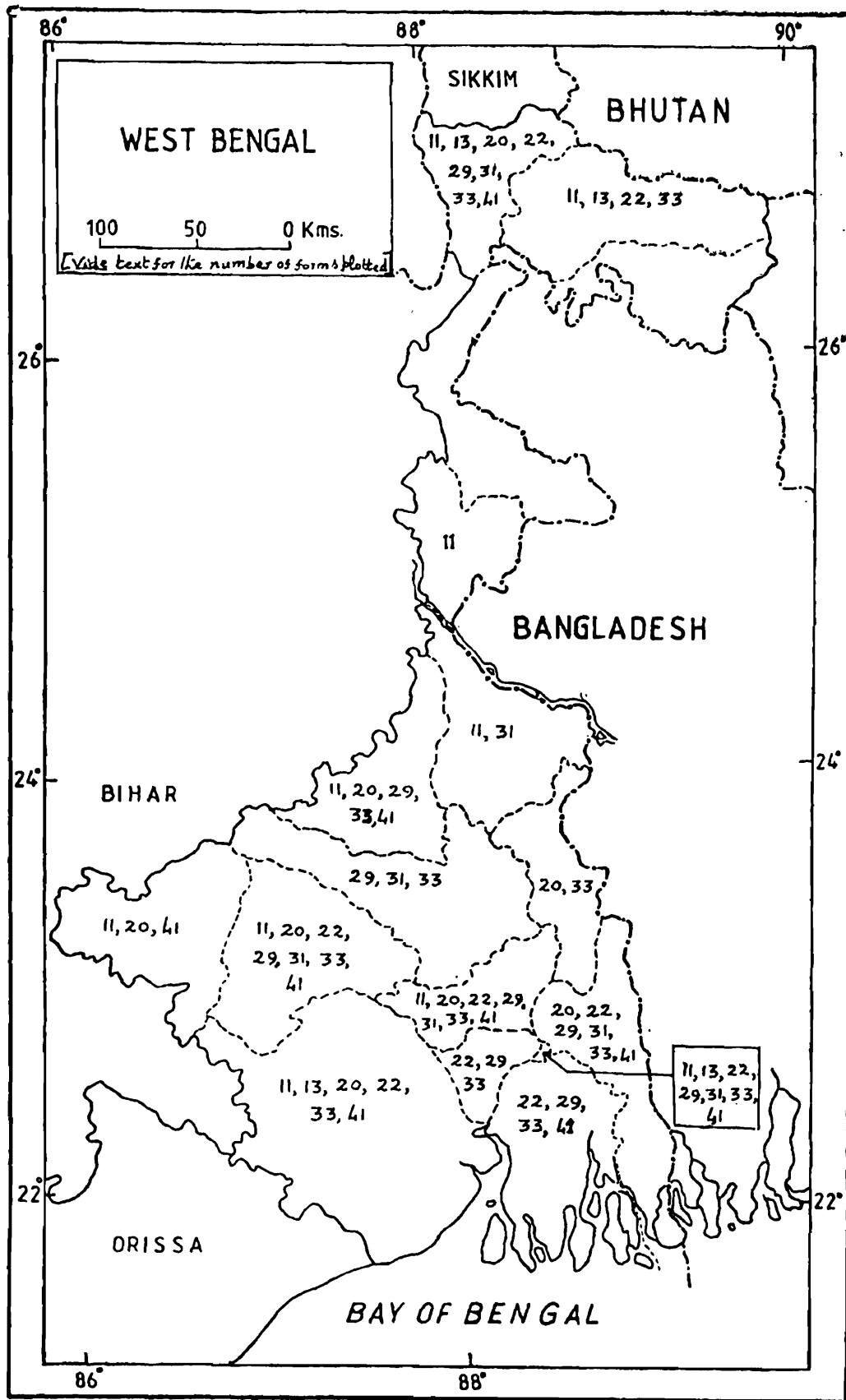


Fig 1. Map of West Bengal showing distribution of common species of Papilionidae and Danaine Nymphalidae (Lepidoptera)

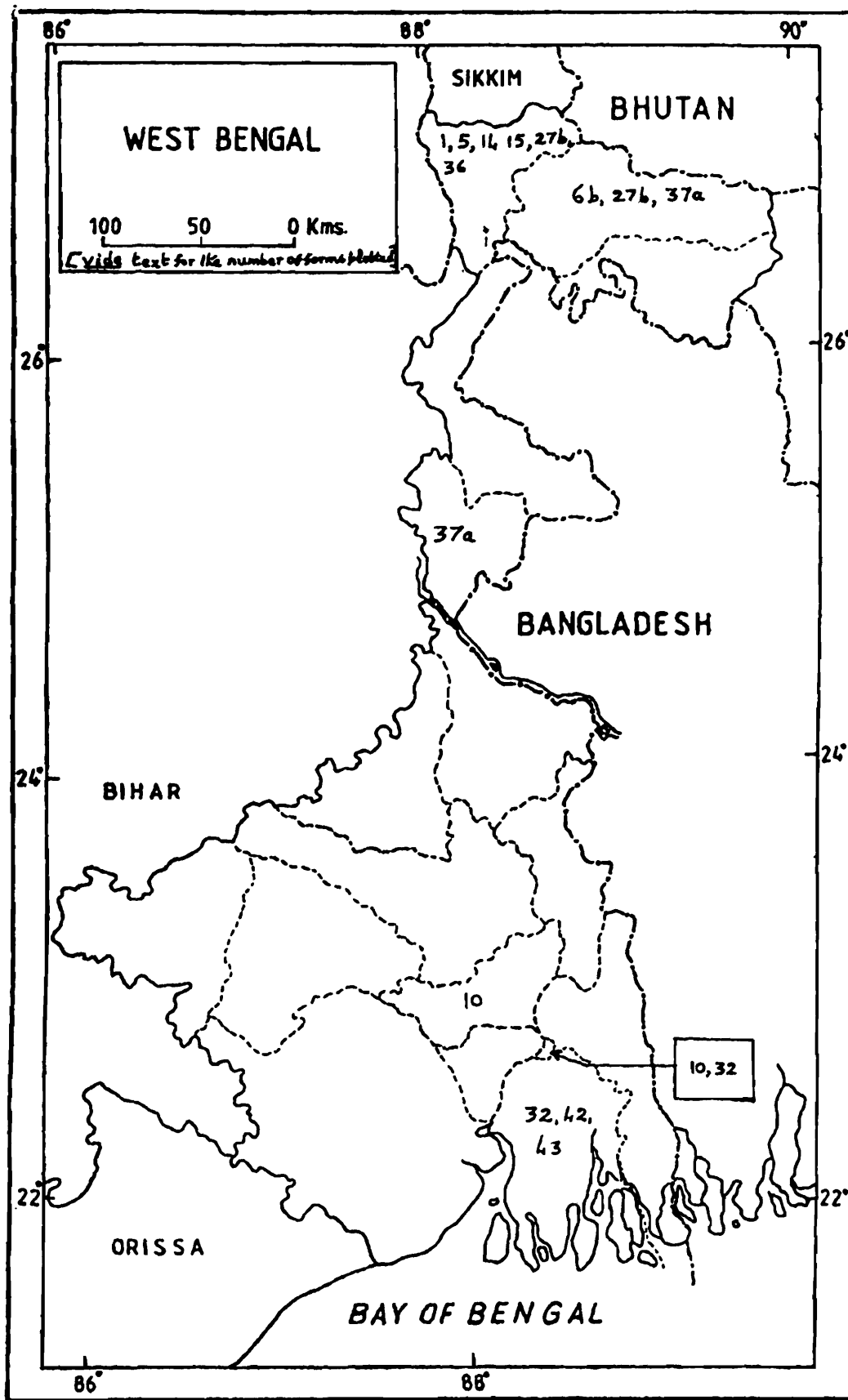


Fig 2. Map of West Bengal showing distribution of rare species of Papilionidae and Danaine Nymphalidae (*Lepidoptera*)

