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THE FAUNA OF BRITISH INDIA,

INCLUDING



CEYLON AND BURMA.

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MOTHS.—Vol. I.

BY

G. F. HAMPSON.

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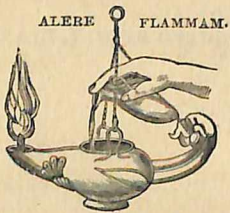
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PREFACE.

ANY attempt to enumerate, describe, and classify the Moths of so large a region as British India must, in the imperfect state of our present knowledge, be very incomplete, and more and better workers in this interesting branch of Natural History cannot be expected to come forward until some handbook is provided for them. It has been hitherto impossible to name any but the commonest Indian Moths without access to a library, which does not exist anywhere in the East except at Calcutta, or to collections of species carefully identified by comparison with the types, which collections do not exist in the East at all; and it is hoped that the publication of the Volumes, of which the present is the first, will be of use to students of the subject, and aid a school of workers in the field for the *Heterocera* such as have arisen for the *Rhopalocera* since the publication of the first volume of Marshall and de Nicéville's 'Butterflies of India.'

As no general revision of the *Heterocera* has been attempted since Guenée's time, and as his system is very much out of date, one of the most difficult parts of the present work has been the scheme of classification and the correct placing of the very numerous species which had been described. It is, however, hoped that, by collating the systems of writers who have worked at special groups, a natural scheme in accordance



with modern ideas on the subject has been evolved, and that the keys and illustrations will render this scheme intelligible to students and enable them to follow the characters given. In the preparation of the system now proposed I have been much indebted to Herr P. C. T. Snellen's 'Vlinders van Nederland,' the only recently attempted classification of the families of Moths that I know of. How admirable a classification it is may be judged of by the fact that I have found his system, based on the small fauna of the Netherlands, applicable with but slight modifications to the large tropical fauna of India.

The material available for study has been almost complete as far as it exists, and the descriptions have been drawn up and the synonymy worked out, in the large majority of cases, from the types of the species, so that it is hoped that comparatively few errors will have crept in. No pains have been spared to compare as large a series of each species as was possible, and as most of the species were originally described from single specimens by their authors, who did not always make sufficient allowance for the variation that is known to exist amongst the Moths of Europe and other countries where they have been largely bred, the synonymy has been lengthy and difficult to unravel; and though some may think that more has been done in uniting species than will be justified by a future study of the subject, yet as the individual peculiarities of each form have been indicated this will but help to show their affinities.

In very few localities in British India have the Moths been collected systematically enough over a large number of years to give results approaching completeness. Sikhim and Ceylon are certainly the best-worked tracts. The former yielded the greater part of the fine collection made by the late W. S. Atkinson, now in the possession of Dr. Staudinger



at Dresden, the only large Indian collection which has not been available for reference. The disadvantage caused by want of access to Mr. Atkinson's Collection has, however, been greatly diminished by the co-types and drawings belonging to Mr. F. Moore, who originally described the collection, being placed freely at my disposal, and by the fact that Mr. H. G. Elwes spent a fortnight at Dresden comparing his magnificent Sikkim Collection with the types there, and making numerous notes, of which I have been allowed the fullest use. I have also examined the more recent collections made in that district by the late Otto Möller and by Messrs. Elwes and Knyvett, which are now described for the first time.

Of the Moths of the N.W. Himalayas, the fine collections of the Rev. J. H. Hocking and Majors Yerbury and Harford (the last of whom made beautiful drawings of the early stages of many species) give a very good idea: all three collections are now in the British Museum. The collection made by Mr. J. H. Leech in Kashmir has been lent to me for study and description of the new species, and free access has been given to me for purposes of comparison to his unrivalled Japanese and Chinese collections.

The Moths of Bombay, Poona, and other localities in W. India have been largely worked by Col. C. Swinhoe, who has lent to me any specimens required for study or figuring from his very large Indian Collection, and has also enabled me to compare Walker's types of Moths in the Oxford Museum, which he is now engaged in arranging, with the British Museum collection; by this comparison numerous valuable facts have been elicited. Of the Moth-fauna of the Nilgiris my own collection gives a fairly complete picture, as, though my collecting did not extend over many years, it was carried on at all the different elevations and on each of the several slopes.



The Ceylonese fauna is perhaps the one that has been the best worked, and the only one where any large study of the earlier stages has been made; the collections of Dr. Thwaites, and the earlier collections of Messrs. Mackwood, E. E. Green, and many others, were all described by Mr. Moore in his 'Lepidoptera of Ceylon,' and the drawings of larvæ figured by him; whilst the later collections of Messrs. Mackwood, Green, Butt, and others, all now in the British Museum, have been described by myself in the part of the 'Illustrations of Heterocera' to be shortly issued.

In the Assamese and Burmese regions the fine collections made by Mr. W. Doherty in Upper Assam, the Nága Hills, and various localities in the Burmese hill-ranges, now in Mr. Elwes's collection, are described for the first time, as also the collection made by Mr. E. Y. Watson in Burma, and presented by him to the British Museum, the collection made by L. Feá and lent to me by the Genoa Museum, and that made by Mr. Doherty in the Tenasserim Valley lent to me by Mr. H. Druce; whilst the collections of the Rangoon Museum, and those made in the Khási Hills by the Rev. W. Hamilton, both described by Col. Swinhoe, have also been available; as also have the few species described from the Andamans and Nicobars. It is, however, from these eastern regions that by far the largest number of novelties will appear, and sufficient is known of the fauna to show how largely Malayan types are there represented.

Thus, although the localities in which systematic collecting has been done are few, they represent all the extremes of the various climatic differences which occur in India, so that it may be assumed that sufficient is known of the Heterocerous fauna to give some approach to completeness, to prove that it is quite as diverse and specialized as in other parts of the world, and to show that the main lines of geographical dis-



tribution, as laid down from the study of the Mammalia, Birds, Reptiles, Fishes, and Butterflies, are applicable also to the Moths, though the more cosmopolitan distribution of the genera and our imperfect knowledge of the Moths of the surrounding regions do not enable us to define the subregions as accurately as in other orders.

To the authorities of the British Museum, and to the assistant-keeper, Mr. A. G. Butler, I am indebted for much help and the fullest opportunities of studying the National Collection, which contains almost all the types of Walker, Butler, Swinhoe, and many others, so that the main portion of the present work had necessarily to be done at the Museum.

To Mr. H. G. Elwes in especial my thanks are due for being the originator of the idea of the work, for reading over and correcting the whole of the proofs, and for much invaluable advice and assistance, besides placing his whole collection at my disposal. Mr. F. Moore has given me free access at any time to his rich collection containing most of his types, and has lent me every specimen and drawing wanted, help all the more generous in that he has his own '*Lepidoptera Indica*,' which will deal with the same subject, in progress. My best thanks are also due to Mr. E. Meyrick for his extremely useful criticism of the key to the families, to Lord Walsingham and Mr. J. H. Durrant for help with the *Tinægeriidae*, to the Hon. W. de Rothschild for the loan of specimens, and to my artist, Mr. H. Knight, for the careful way he has carried out the drawings of structure.

In conclusion, I may say that the other two volumes have made such progress that I hope they will be published within the next three years, bringing the work down to the end of the *Pyrallidæ* proper, which is all that is contemplated for the present. The material for the other families is almost



entirely in Lord Walsingham's collection, and will be worked out by him, so that it will not be necessary for others to deal with it, excepting the *Crambite*, *Phycid*, and *Gallerid* sections of the *Pyrallidæ*, which cannot be satisfactorily worked out till M. Ragonot publishes his monograph in the Romanoff Memoirs.

G. F. HAMPSON.

November 27th, 1892.

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1. <i>semihyalina</i> , <i>Hmpsn.</i>	491	5. <i>marchali</i> , <i>Guér.</i>	505

LEPIDOPTERA HETEROCERA.

BUTTERFLIES and MOTHS, *Lepidoptera*, are for the most part easily distinguishable from other insects by :—(1) the maxillæ being produced into a tubular proboscis, which, however, is entirely obsolete in some groups, such as the *Psychidæ*, *Hepialidæ*, *Phaudinæ*, *Saturniidæ*, and some *Sesiidæ*, *Pyralidæ*, &c. ; (2) by the mandibles being obsolete except in the low forms (*Micropterygidæ*) and a few *Tineidæ* ; (3) by the broad, regularly veined wings, nearly always covered with minute scales, which are modified hairs, all the gradations between the extreme forms of hair and scale being often found on the same insect ; the females, however, of *Psychids* and some *Lymantriidæ*, *Geometers*, *Tineas*, &c. are wingless.

The Larvæ are cylindrical and worm-like, consisting of a head with biting mandibles and eleven somites ; they have three pairs of corneous, jointed, thoracic limbs, and from one to five pairs of abdominal fleshy prolegs, the legs being but rarely absent, as in most *Psychidæ* ; most of the somites have paired, lateral, valved stigmata, for conducting the air-supply to the tracheal system, which ramifies throughout the body. The Larvæ, when full-fed, turn to Pupæ, in which stage the head and thorax are soldered together, as are also the appendages of the head and the limbs. During this stage the whole of the tissues of the body undergo degeneration into a liquid fatty substance, except the nerve-centres and some bodies attached to them known as “imaginal disks,” which are the rudiments of the future body, wings, and legs, and which, by absorbing the products of the degenerated tissues, gradually grow and build up the perfect insect till ready to emerge from the Pupa skin.

The *Heterocera*, or Moths, in their perfect stage, may be known from the *Rhopalocera*, or Butterflies, by the latter having knobbed or dilated antennæ, which in all the families except *Hesperiidæ* have an abruptly rounded extremity ; in most *Hesperiidæ* the knob of the antenna is produced into a hooked tip, gradually fining to a point, and this form of antenna is found in some moths, such as the *Castniidæ* and some *Sesiidæ*, but in these families the “frenulum” or hook for securing the hind wings to the catch or “retinaculum” of the fore wing is always present. This is never developed in any butterfly, whilst the families of moths that have the frenulum absent, the *Saturniidæ*, *Bombycidæ*, *Hepialidæ*, *Lasiocampidæ*, some *Callidulidæ*, &c., never have the antennæ knobbed. Some other families of moths, such as the *Sphingidæ*, and in a lesser degree the *Agaristidæ*, have the antennæ gradually thickened into a club ; but this is very different from the abrupt knob of butterflies, and in these moths again the frenulum is always present.

The head of a Lepidopterous insect consists of three pieces—the occiput or basal piece lying behind the ocelli, the epicranium

behind the antennæ and bearing the eyes and ocelli, and the clypeus, which constitutes the front of the head and is so distinctive of the *Lepidoptera* by reason of its large size. The labrum is very minute

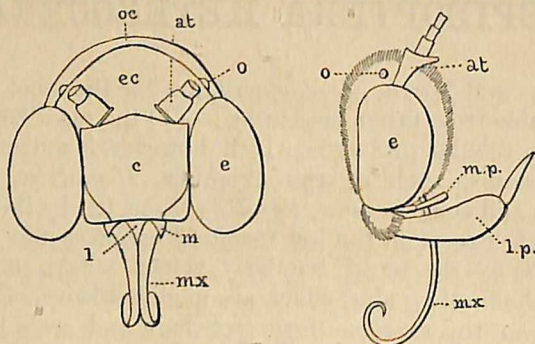


Fig. 1.—Head of a Lepidopterous insect from above and from the side.
(From Packard's Guide, p. 232.)

- | | |
|-----------------------|--------------------|
| at. Antennæ. | ec. Epicranium. |
| c. Clypeus. | oc. Occiput. |
| e. Eye. | m. Mandibles. |
| l. Labrum. | mx. Proboscis. |
| m.p. Maxillary palpi. | l.p. Labial palpi. |
| o. Ocellus. | |

and concealed by the clypeus; the labium is small, short, and triangular; and the mentum nearly obsolete, its place being supplied by the maxillæ, which form a long grooved proboscis. In some important papers by A. Walter*, it is shown that the maxillary palpi, whilst obsolete in some species, are from 1- to 6-jointed in those that possess them; *Micropteryx* has the largest number of joints, 6; in the Tineas and Tortrices the number is very variable; in the Pyrales 4, in the Noctues generally 2, but sometimes 3; in the Bombyces 1 or 2; in *Rhopalocera*, *Sphingidæ*, and most *Geometridæ*, 1.

Mandibles exist in *Micropteryx* and a few other *Tineidæ*; *M. aruncella* and *anderschella* have them toothed and capable of gnawing, whilst in *M. purpurella* and *semipurpurella* they are not denticulated; in these the maxillæ have two palps, whilst in the higher *Lepidoptera* the inner palps are reduced. In the lower forms of *Micropteryx*, which connect the *Lepidoptera* with the lower *Hymenoptera* or *Neuroptera*, the free palps and typical ligula of the lower insects are present, the ligula being formed by the fusion of the inner palps into a short tubule open externally, a short hypopharynx being present on the inner wall. In the higher *Lepidoptera* the mandibles are rudimentary and consist of horny tubules; the labial palpi are generally well developed and consist usually of three joints, their shape being of great use in generic distinction; they may, however, be reduced to two joints or to one, or be entirely absent in the families in which the mouth-parts are obsolete.

* Jena. Zeit. Nat. xviii, pp. 121-173 (1884), and Jena. Ges. 1885, pp. 19-27.

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The antennæ are of very different forms, either (1) filiform, (2) fusiform, or (3) dilate, and are rarely simple, but usually (1) ciliate, (2) with paired bristles at each joint, (3) with both cilia

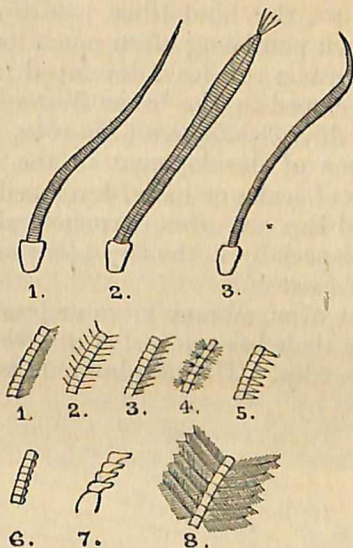


Fig. 2.—Antennæ of moths.

and bristles, (4) fasciculate, (5) toothed, (6) lamellate, (7) serrate, or (8) pectinate, with single or paired branches.

The thorax is small and consists of three pieces—the prothorax bearing the fore legs, the mesothorax the mid legs and fore wings, and metathorax the hind legs and hind wings.

The legs consist of (1) coxa, (2) trochanter, (3) femur, (4) tibia,

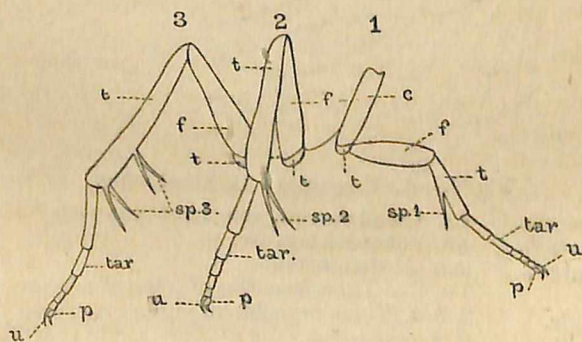


Fig. 3.—Legs of moths. (From Packard's Guide, p. 231.)

- | | | |
|----------------|--------------------------------------|--------------|
| 1. Fore leg. | 2. Mid leg. | 3. Hind leg. |
| c. Coxa. | u. Ungues. | |
| t. Trochanter. | p. Pulvillus. | |
| f. Femur. | sp. 1. Single anterior spur. | |
| t. Tibia. | sp. 2. Paired medial spurs. | |
| tar. Tarsus. | sp. 3. Two pairs of posterior spurs. | |

(5) the 5-jointed tarsus bearing a pair of unguis and the pulvillus. The fore tibiae bear on their inner side a process which is usually small, but large and arising from the femoro-tibial joint in many Psychids and a few other forms. The mid tibiae usually have a terminal pair of spurs, the hind tibiae medial and terminal pairs, the inner spur of each pair being often much longer than the outer spur. The spurs are as a rule least developed in the higher groups of moths, more developed in the lower *Noctuidae* and *Geometridae*, longer still in the *Microlepidoptera* (*Tinidae*, *Pyralidae*, &c.), and reaching the extreme of development in the *Pterophoridae*. The legs often bear tufts of scales or hairs, developed as scent or sensory organs, and the hind legs are often extremely aborted and modified as sensory organs, especially in the *Hepialidae* and in the subfamily *Acidalinae* of the *Geometridae*.

The wings consist of membrane more or less covered with scales or hairs, which have their bases inserted in series of pits, and overlap one another like tiles. The membrane is traversed by systems

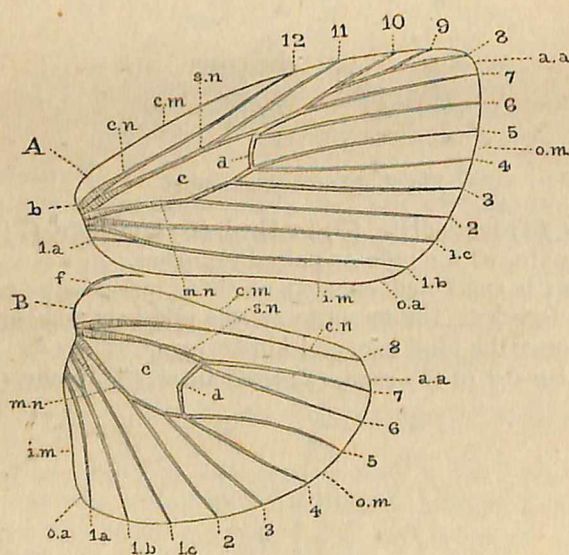


Fig. 4.—A. Fore wing; B. Hind wing.

- | | |
|---------------------|--|
| c.m. Costal margin. | c.n. Costal nerve, vein 12 of fore wing, 8 of hind wing. |
| o.m. Outer margin. | s.n. Subcostal nerve. |
| i.m. Inner margin. | m.n. Median nerve. |
| a.a. Apex. | 1 a, b, c. Three branches of internal nerve. |
| o.a. Outer angle. | 2, 3, 4. Three branches of median nerve. |
| c. Discoidal cell. | 5. Lower radial. |
| d. Discocellulars. | 6. Upper radial. |
| | 7, 8, 9, 10, 11. Five subcostal branches of fore wing. |
| | 7. Subcostal nerve of hind wing. |

of veins, which are tubular structures containing blood-vessels, nerves, and tracheae.

The fore wing typically has 12 veins—the internal nerve with from one to three branches (1 a, b, c), 1 a generally forming a

fork at the base of 1 *b*; the median nervure with its three branches (2, 3, 4); the lower radial (5); the upper radial (6); the subcostal with five branches (7, 8, 9, 10, 11); and the costal nervure (12); but almost any of these may be absent.

The hind wing typically has eight veins, the difference from the fore wing consisting in the absence of four of the subcostals; but vein 11 is probably represented by the bar between veins 7 and 8, present in *Sphingidae*, *Eupterotidae*, *Zygænidæ*, &c. In the *Hepialidae* and *Micropterygidae*, however, twelve veins are present as in the fore wing. Besides the true veins, cross veins, or veinlets between the costal nervure and costa, or between vein 1 *b* and the inner margin of the fore wing, may be present in lowly-organized forms, or even in higher ones. The present form of neururation arose from a system of simple longitudinal veins, which by the union of their basal portions formed the present branching system; thus the discocellulars which close the cell of each wing were formed by the junction of the basal portion of two veins, the basal stem being then aborted, leaving only an outwardly directed fork of which the radials are the extremities; in the cases where the radials are said to arise from the discocellulars, and not from the angles of the

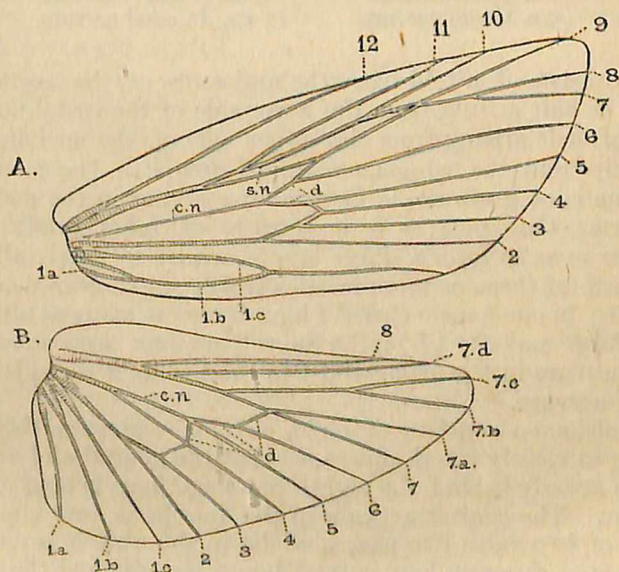


Fig. 5.

- A. Fore wing of *Cossid* (slightly diagrammatic).
c.n. Veinlet in cell, the fork of which forms the discocellulars *d*.
s.n. Stalk of veins 9, 10; 10 anastomosing with 7 and 8 to form the areole.
 B. Hind wing of *Hepialid* (slightly diagrammatic).
 7, *a*, *b*, *c*, *d*. Five subcostal nervules.

cell, the basal portions of one or two other longitudinal veins have also been aborted: the whole process in its various stages is seen to perfection in such lowly forms as many *Cossids*, *Psychids*,

Zygæuids, &c. Thus the neururation of the extinct ancestor of the *Lepidoptera* consisted of at least fifteen simple longitudinal veins to each wing, and probably more, as in many groups vein 1 b of the hind wing is forked at the base.

The fore and hind wings of the majority of families of moths are united by a "frenulum" arising from the base of the costa of the hind wing and fitting into a "retinaculum" on the fore wing,

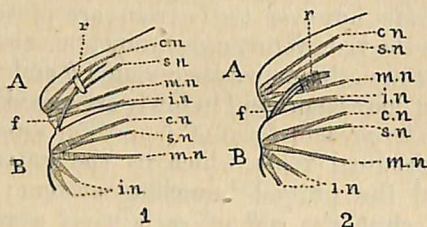


Fig. 6.

1. ♂; 2. ♀.—A. Fore wing; B. Hind wing.
f. Frenulum. s.n. Subcostal nerve.
r. Retinaculum. m.n. Median nerve.
c.n. Costal nerve. i.n. Internal nerve.

which consists of a fold from the underside of the costa, a hook or tuft of hair arising from the lower side of the costal nerve, or a tuft of hair arising from the upper side of the median nerve or rarely from the wing-membrane below it. The form of the frenulum is of great use in determining sex, as in the males of all the forms that possess it it consists of hairs firmly soldered together so as to form a single bristle, whilst in nearly all females it consists of three or more bristles which are shorter than that of the male; in one female *Cossid* I have found as many as nine. Also in the large majority of moths the retinaculum descends from the costal nerve in the male, whilst in the female it ascends from the median nerve.

The abdomen consists of eight or nine segments, the number varying in closely allied genera, so that the genital and anal openings lie usually behind the eighth but sometimes behind the ninth segment. The genital armour in the female is very simple, consisting of two valve-like pieces, whilst in the male it is much more complicated, forming long curved hooks for clasping the abdomen of the female; these are said to be of great use for specific and but little for generic distinction, but the day is far distant when they will have been sufficiently studied to be made use of.

The tendency in *Lepidoptera*, as in other groups, is for forms from the N.W. Himalayas to be large and pale, from the E. Himalayas and Burma to be large and dark, from the arid parts of Continental India to be small and pale, from the moist forests of S. India and Ceylon small and dark. Such geographical forms

have in many cases deservedly received names; they will, however, be treated as of subspecific value only, partly as giving a truer idea of their real value, and partly because the evidence is so often insufficient to show whether the forms are varieties or geographical races, points which must be left to local workers to elucidate.

The range in space given for many of the species will necessarily be found very imperfect; all the large collections in England have, however, been consulted, to make them as correct as possible, and all recorded localities are quoted except a few given by the older authors which are certainly wrong, those that are considered doubtful being indicated by a ?

Transverse markings are described as bands and lines; and longitudinal as fasciæ and streaks.

Species of which specimens were not available, and of which the descriptions are taken from those in print, are indicated by a *.

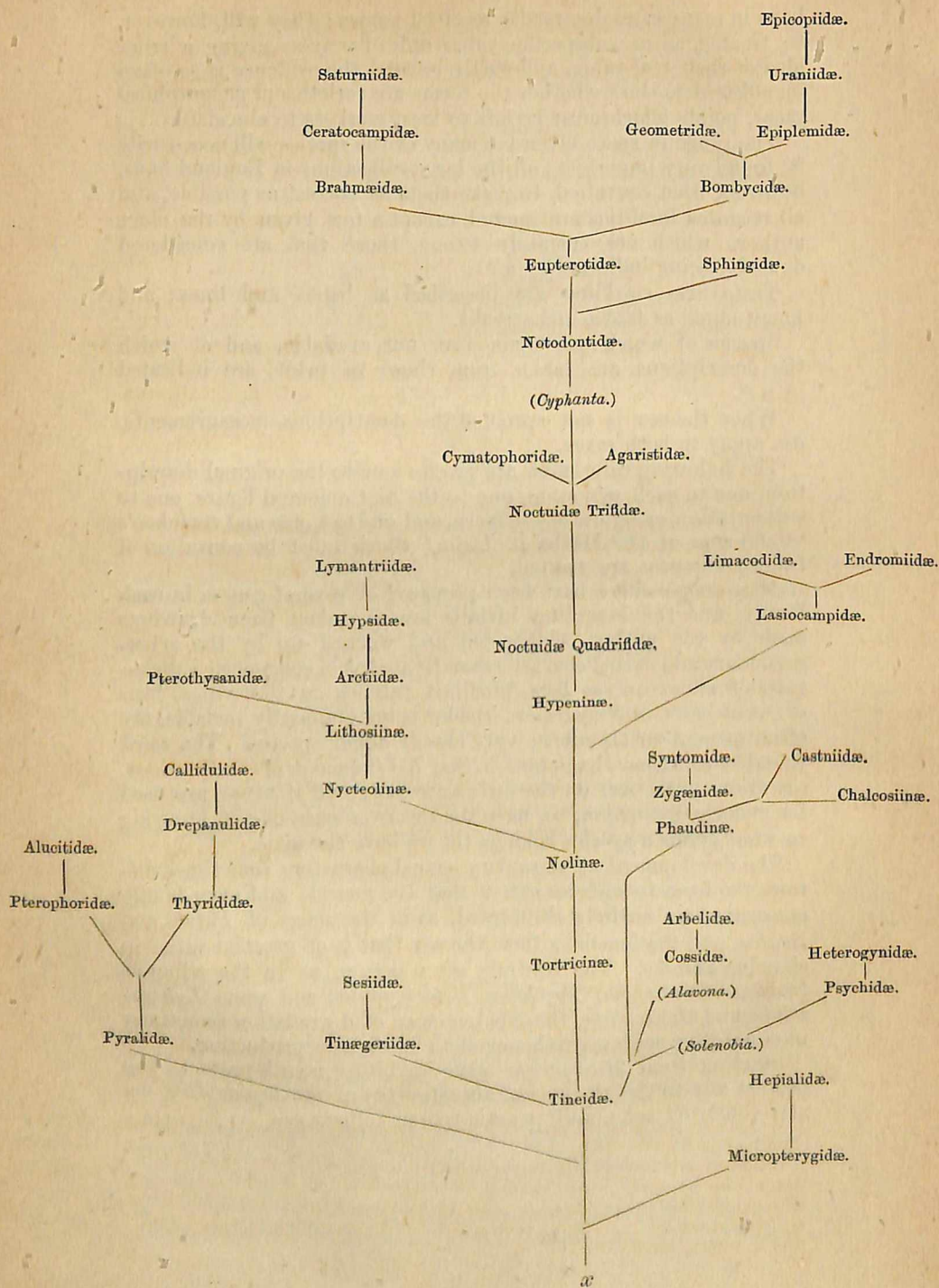
When the sex is not specified the descriptions, measurements, &c. apply to both sexes.

The following references are given: one to the original description, one to each synonym, one to the best coloured figure, one to a description or figure of the larva, and one to Cotes and Swinhoe's 'Catalogue of the Moths of India,' which must be consulted if fuller references are wanted.

Microscopic slides have been prepared of several genera in each family, and the structural details are all taken from drawings made by the author, elaborated and worked up by the artist. Secondary and sexual characters are treated as of subgeneric value—tufts of scales on the legs, modified patches on the wings, fans of scent-hairs, and such-like, besides being eminently variable, are often present or absent in very closely allied species. The most valuable of these characters is the development of pectinations, serrations, cilia, &c. on the male antennæ; but if these are used for generic distinction, we have the inconvenience of not knowing to what genus a species belongs till we have the male.

The development of secondary sexual characters sometimes distorts the form to such an extent that the generic and even family characters are entirely obliterated, as in the males of *Patula* and *Argiva*, and the female is then the sex that is of greatest value in showing affinity. The contrary often occurs, as in the wingless females of *Solenobia*, *Psychida*, *Heterogynida*, and some *Lymantriidæ* and *Geometridæ*, these being cases of degradation sometimes in connection with a parthenogenetic mode of reproduction.

Starting from *Micropteryx* with its biting mouth-parts as the nearest ally to the theoretical ancestor (*x*) of the *Lepidoptera*, we may construct some such genetic tree as follows:—



Key to the Families of Moths.

- | | |
|---|---------------------------------------|
| I. Antennæ knobbed or dilated; frenulum absent | RHOPALOCERA.
(BUTTERFLIES.) |
| II. Antennæ rarely knobbed; frenulum generally present, and always in the forms that have knobbed antennæ | HETEROCERA.
(MOTHS.) |
| A. Fore wing with vein 5 from the centre of discocellulars, or nearer 6 than 4. | |
| a. Frenulum rudimentary | 27. Epicopiidæ. |
| b. Frenulum absent. | |
| a'. Proboscis present; legs with spurs. | |
| a ² . Hind wing with vein 8 remote from 7. | |
| a ³ . Fore wing with veins 6 and 7 stalked | 28. Uraniidæ. |
| b ³ . Fore wing with veins 6 and 7 not stalked | * Ceratocampidæ. |
| b ² . Hind wing with vein 8 nearly touching 7 after end of cell | 2. Brahmæidæ. |
| b'. Proboscis absent; legs without spurs. | |
| a ² . Hind wing with one internal vein..... | 1. Saturniidæ. |
| b ² . Hind wing with two or three internal veins..... | 3. Bombycidæ. |
| c. Frenulum present. | 5. Sphingidæ. |
| a'. Antennæ fusiform | 4. Eupterotidæ. |
| b'. Antennæ filiform. | |
| a ² . Proboscis absent | |
| b ² . Proboscis present. | |
| a ³ . Hind wing with vein 8 curved and almost touching 7 after end of cell; vein 1 a reaching anal angle | 7. Cymatophoridæ. |
| b ³ . Hind wing with vein 8 remote from 7 after end of cell. | |
| a ⁴ . Tarsi short as tibiæ and hairy: stoutly built moths. | 6. Notodontidæ †. |
| b ⁴ . Tarsi long and naked: slightly built moths. | |
| a ⁵ . Fore wing with vein 7 remote from 8, and generally stalked with 6 | 29. Epiplemidæ. |
| b ⁵ . Fore wing with vein 7 given off from 8; hind wing with vein 1 a short or absent..... | 30. Geometridæ †. |

* Not known to occur in India.

† The genus *Cyphanta* has vein 5 of the fore wing from lower angle of cell, and may be a connecting link with the *Noctuidæ*.

‡ Three genera of *Geometridæ* which do not occur in India have vein 8 of the hind wing curved, and nearly touching 7 after end of cell, but are easily distinguished from the *Cymatophoridæ* by the shortness of vein 1 a. In two or three ancestral or distorted genera vein 7 of the fore wing is stalked with 6; and in several genera the frenulum is absent.

- B. Fore wing with vein 5 from lower angle of cell or nearer 4 than 6.
- a. Hind wing with more than 8 veins.
 - a'. Proboscis absent; no mandibles nor ligula 15. **Hepialidæ.**
 - b'. Mandibles, free palps, and ligula present * **Micropterygidæ.**
 - b. Hind wing with not more than 8 veins.
 - a'. Hind wing with vein 8 remote from 7 after origin of veins 6 and 7.
 - a². Frenulum absent.
 - a³. Hind wing with one internal vein; vein 8 with a precostal spur 21. **Pterothysanidæ.**
 - b³. Hind wing with two internal veins.
 - a⁴. Hind wing with a bar between veins 7 and 8 near the base; vein 1 a to middle of inner margin * **Endromiidæ.**
 - b⁴. Hind wing with no bar between veins 7 and 8; vein 1 a to anal angle 20. **Lasiocampidæ.**
 - c³. Hind wing with three internal veins 14. **Arbelidæ.**
 - b². Frenulum present.
 - a³. Hind wing with vein 8 aborted.
 - b³. Hind wing with vein 8 present.
 - a⁴. Antennæ knobbed * **Castniidæ.**
 - b⁴. Antennæ filiform, or rarely dilated.
 - a⁵. Fore wing with vein 1 c present.
 - a⁶. Hind wing with vein 8 free from the base or connected with 7 by a bar.
 - a⁷. Proboscis present . . 11. **Zygænidæ** †.
 - b⁷. Proboscis absent.
 - a⁸. Palpi rarely absent; ♀ winged; larvæ wood-borers 13. **Cossidæ.**
 - b⁸. Palpi absent; ♀ apterous.
 - a⁹. ♀ rarely with legs; ♀ and larvæ case-dwellers 12. **Psychidæ.**
 - b⁹. ♀ and larvæ free.
 - * **Heterogynidæ.**
 - b⁶. Hind wing with vein 8 anastomosing shortly with 7 19. **Limacodidæ.**

* Not known to occur in India.

† In the degraded subfamily *Phaudinæ* the mouth-parts are absent, and in *Himantopterus* there is no frenulum; in *Anomæotes* vein 1 c of the fore wing is absent.

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11

- b*⁵. Fore wing with vein 1 *c* absent.
- a*⁶. Hind wing with vein 8 rising out of 7 24. **Arctiidae** *.
- b*⁶. Hind wing with vein 8 connected with 7 by a bar, or touching it near middle of cell.
- a*⁷. Palpi with the third joint naked and reaching far above vertex of head; proboscis present..... 23. **Hypsiidae**.
- b*⁷. Palpi not reaching above vertex of head; proboscis absent or very minute 22. **Lymantriidae** †.
- c*⁸. Hind wing with vein 8 anastomosing shortly with 7 near the base; proboscis well developed.
- a*⁷. Antennæ more or less dilated..... 25. **Agaristidae**.
- b*⁷. Antennæ filiform.... 26. **Noctuidae** ‡.
- b*¹. Hind wing with vein 8 curved and nearly or quite touching vein 7, or anastomosing with it after origin of veins 6 and 7.
- a*². Hind wing with vein 1 *c* absent.
- a*³. Hind-wing vein 8 with a pre-costal spur 16. **Callidulidae**.
- b*³. Hind-wing vein 8 with no pre-costal spur.
- a*⁴. Hind wing with vein 1 *a* absent or very short 17. **Drepanulidae**.
- b*⁴. Hind wing with vein 1 *a* almost or quite reaching anal angle 18. **Thyrididae**.
- b*³. Hind wing with vein 1 *c* present. 31. **Pyralidae** §.
- C. Fore wing with veins 4 to 11 arising from the cell at almost even distances apart.
- a*. Wings not divided into plumes.
- a*¹. Hind wing with vein 8 coincident with 7 8. **Sesiidae**.

* In a few *Arctiinae* vein 8 of the hind wing is constructed as in *Noctuidae*, but they can be discriminated by the bar form of the retinaculum in ♂; for *Lithosiinae*, *Nycteolinae*, and *Nolinae*, see notes to the subfamilies.

† In the ancestral genus *Ratardea* the frenulum is absent.

‡ A few genera of *Noctuidae* have the proboscis aborted.

§ In a few lowly *Pyralidae* the veins of the fore wing are given off at even distances from the cell, but they can be discriminated by the structure of vein 8 of the hind wings.

- b'. Hind wing with vein 8 free.
 - a². Fore wing with vein 1 b simple or with a very minute fork at base
 - b². Fore-wing vein 1 a forming a large fork with 1 b at base
 - b. Wings divided into plumes.
 - a'. Fore wing divided into at most two ; hind wing into three plumes
 - b'. Fore wing and hind wing each divided into three plumes.....
9. *Tinægeriidae*.
32. *Tineidae*.
33. *Pterophoridae*.
34. *Alucitidae*.

Family SATURNIIDÆ.

Large crepuscular-flying moths. Proboscis absent; palpi minute. Antennæ bipectinated in both sexes, the branches long in ♂, longest at middle and diminishing to base and apex. Legs short, hairy, and without spurs. Fore wing with vein 1 b forked at base; 1 c absent; the discocellulars (when present) emitted from vein 5, which is stalked with 6; veins 10 and 11 absent. Hind wing without a frenulum; a precostal vein slightly developed; the discocellulars emitted from vein 5, which is stalked with 6; one internal vein.

Larvæ smooth, with spiniferous tubercles, dorsal humps, long fleshy spinous processes, or small warts; and forming cocoons, those produced by several of the species giving the Tussur silks of commerce.

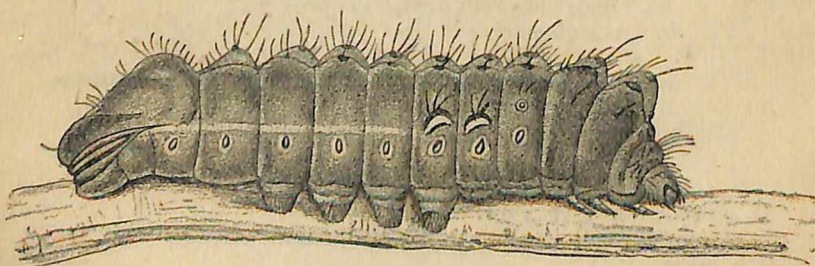


Fig. 7.—Larva of *Antheraea paphia*. ♀. (From Moore, Lep. Ceyl. ii, pl. 125, fig. 1 b.)

Key to the Genera.

- a. Hind wing with anal angle produced into a long tail..... 1. *ACTIAS*, p. 13.
- b. Hind wing with anal angle not produced into a tail.
- a'. The cell of both wings open 2. *ATTACUS*, p. 15.
- b'. The cell of both wings closed.
- a². Veins 5 and 6 of both wings given off far from base.

- a^3 . Fore wing with costa incurved near base, excurved towards apex; the outer margin highly excised ... 3. *ANTHERÆA*, p. 18.
 b^3 . Fore wing with the costa evenly curved; outer margin less excised.
 a^4 . Fore wing with apex rounded.
 a^5 . Tibiæ naked 4. *SATURNIA*, p. 21.
 b^5 . Tibiæ hairy 5. *LOEPA*, p. 25.
 b^4 . Fore wing with apex acute 6. *SALASSA*, p. 26.
 b^2 . Veins 5 and 6 of both wings given off much nearer the base 7. *CRICULA*, p. 28.

Genus **ACTIAS**.

Actias, *Leach*, *Zool. Misc.* ii, p. 25 (1815).

Tropæa, *Hübner*, *Verz.* p. 152 (1818).

Plectropteron, *Hutton*, *Trans. Ent. Soc.* v, p. 45 (1847).

Argema, *Wallengr.* *Öfv. Kongl. Vet.-Ak.* 1858, p. 140.

Type, *A. luna*, *Linn.*, from N. America.

Range. N. America; Natal; Japan; China; throughout India, Ceylon, and Burma; Andamans.

Fore wing with the apex produced and acute. Hind wing with the anal angle produced into a long tail, veins 2, 3, 4 being curved and running to the tip of the tail.

1. *Actias selene*, *Hübner*, *Samml. exot. Schmett.* i. pl. 172, fig. 3; *C. & S.* no. 1534; *Moore*, *Lep. Ceyl.* ii. pl. 126, figs. 1, 1a (larva).
Plectropteron dianæ, *Hutt.* *A. M. N. H.* xvii, 1846, p. 60.

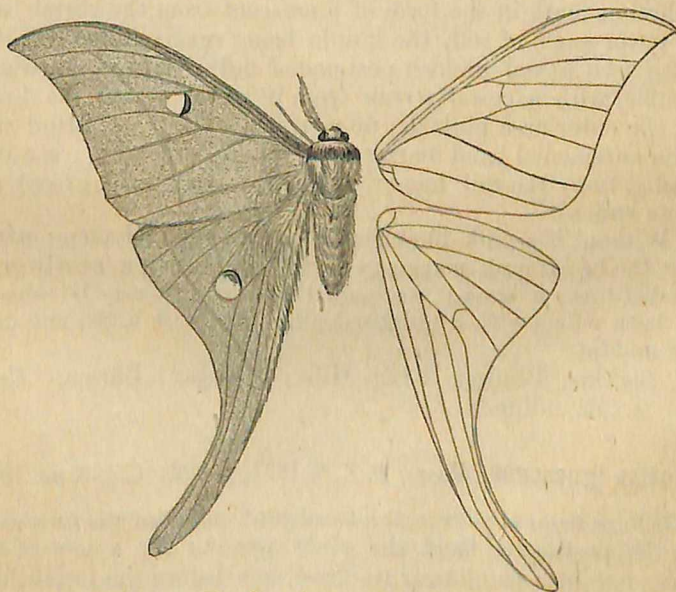


Fig. 8.—*Actias selene*, ♂. ½.

♂. Head, thorax, and abdomen white; palpi pink, prothorax

with a dark pink band; legs pink. Fore wing very pale green, white at base; a dark pink costal fascia, darkest along subcostal nervure; an outwardly-oblique pale yellow antemedial line; two inwardly-oblique slightly curved submarginal lines; a pale yellow marginal band; a dark red-brown lunule at end of cell, with a grey line on it, bounding inwardly a round ochreous spot with pinkish centre. Hind wing similar to the fore wing; the central portion of the tail pinkish.

♀. The outer margin less excised and waved; the yellow markings less developed; the antemedial line of fore wing nearer the base, and that on hind wing absent; the tail less pink.

Larva apple-green; paired dorsal and lateral yellow spinous tubercles on each somite except the last; dorsal yellow hairs; lateral and ventral black hairs; the pad to anal claspers rufous.

Cocoon pale brown and oval.

Hab. China; throughout India, Ceylon, and Burma. *Exp.*, ♂ 132-166, ♀ 140-182 millim.

2. *Actias mænās*, Doubl. *A. M. N. H.* xix, 1847, p. 95, pl. 7, fig. 1; *C. & S.* no. 1533.

Saturnia leto, Doubl. *Proc. Ent. Soc.* 1847, p. li, pl. 15; *C. & S.* no. 1532.

♂. Differs from *selene* in being pale yellow; the collar pink; the thorax and abdomen blotched with pink above. Fore wing pink at base; a broad pinkish antemedial band with waved edges enclosing a yellow spot below the subcostal nervure; the lunule and ochreous mark in the form of a crescent from the costal band to the lower angle of cell, the lunule being reversed and pointing inwards; two waved pinkish postmedial diffused lines, the outer line double, with a costal streak from it to the apex; the lower half of the outer area pinkish; no marginal pink line. Hind wing with the antemedial band narrower than on fore wing; a waved postmedial line; the tail longer, broader, and all pink except the spatulate end.

♀. Without the pink blotches on thorax and abdomen; wings without the broad pink markings; fore wing with a nearly erect antemedial line; a waved postmedial line which may be obsolescent; both wings with a marginal pink line; tail broad and only pink at middle.

Hab. Sikkim; Bhutan; Khási Hills; Sibságar; Burma. *Exp.*, ♂ 158, ♀ 172 millim.

3. *Actias ignescens*, Moore, *P. Z. S.* 1877, p. 602; *C. & S.* no. 1531.

♂. Differs from *mænās* in the basal pink patch of the fore wing joining the postmedial band, the pink covering the whole of the fore wing except a patch near the base, one before the lunule, one on the costa above it, one below the apex, and a spot between veins 2 and 3. Hind wing with the pinkish subbasal band broader

than in *mænas*, with its outer edge more irregular ; the whole tail pinkish, except the tip.

Hab. Andamans. *Exp.* 164 millim.

Genus **ATTACUS**.

Attacus, *Linn. Syst. Nat.* i, pt. 2, p. 808 (1766).

Type, *A. atlas*, *Linn.*

Range. Mexico ; S. America ; Africa ; Japan ; China ; throughout India, Ceylon, and Burma ; Malacca ; Java.

Fore wing with the apex produced and rounded ; the outer margin excised. Hind wing rounded. Cell of both wings open.

4. *Attacus atlas*, *Linn. Syst. Nat.* i, pt. 2, p. 808 ; *C. & S.* no. 1535 ; *Cram. Pap. Exot.* iv, pl. 381, fig. C ; *Moore, Cat. E. I. C.* pl. xx, figs. 2, 2 a (larva).

Saturnia silhetica, *Helper, J. A. S. B.* vi, p. 41 ; *C. & S.* no. 1542.

Attacus taprobanis, *Moore, Lep. Ceyl.* ii, p. 124, pl. 127, figs. 1, 1 a ; *C. & S.* no. 1543.

Head, thorax, and abdomen red-brown ; the basal segment and abdomen pale, and each segment with a pale fringe ; legs brown. Fore wing with the costa brown ; the basal area brown and red-brown edged by red, pale, and black lines, curved from the costa

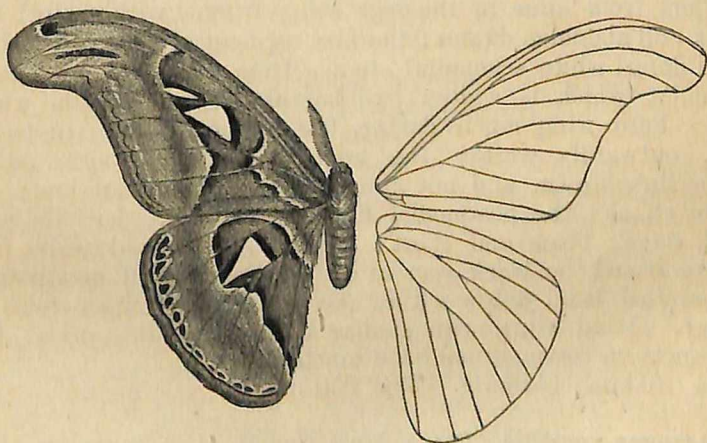


Fig. 9.—*Attacus atlas*, ♂. $\frac{1}{3}$.

to vein 2, then oblique to near base of inner margin ; medial area red-brown ; a large triangular hyaline spot at end of cell with a black edge ; one or two hyaline streaks above it touching the post-medial line, which is black, pale, and red, and curved inwards from the subcostal to vein 2, then outwards to inner margin ; outer

area shading from pink through purplish fuscous to tawny brown; apical area yellow shading to pink; the membrane below the costa crimped and suffused outwardly with blue-grey and ending in a black spot; a dark red streak below vein 8; a yellow-brown marginal band with a highly waved black line on it. Hind wing similar to fore wing; the antemedial line nearly straight; no streak above the hyaline triangular mark; the postmedial line angled towards inner margin but not curved; apical area not variegated; a series of black spots within the black submarginal line which is less waved.

Some specimens are considerably darker than others; the form *taprobanis* from Ceylon has the hyaline spots small and narrow; the hyaline streak of the fore wing absent.

Larva pale green with brownish speckles; 1st, 2nd, and 3rd somites with dorsal prominences; 4th to 11th somites with long fleshy dorsal and subdorsal blue-green spines projecting backwards; a series of lateral blue-black spines on 1st to 5th somites; a similar subdorsal series from 1st to 11th somites, both these series projecting forwards; an oval red ring on anal somite above the claspers.

Cocoon pale greyish brown and pyriform.

Hab. Throughout India, Ceylon, and Burma; Java. *Exp.*, ♂ 224, ♀ 250 millim.

5. *Attacus edwardsi*, White, P. Z. S. 1859, p. 115, pl. 57; C. & S. no. 1538.

Differs from *atlas* in the legs being fringed with white; the thorax and abdomen darker; the first segment of abdomen white; paired dorsal white segmental streaks from the third segment to extremity, which is white; two lateral and two ventral white lines. Fore wing much darker, the antemedial line inwardly black, outwardly white; the triangular hyaline spot edged with yellow-brown, and not touching the postmedial line; no hyaline streak; the postmedial line white and broader; the sub-apical streak black and short; a prominent waved white line between it and the black spot at end of the crimped membrane; the marginal band yellow within the waved black line, which is broader. Hind wing with similar differences from *atlas*; the black spots on the marginal band much larger.

Hab. Sikkim; Shillong. *Exp.* 250 millim.

6. *Attacus cynthia*, Drury, Exot. Ins. ii, pl. 6, fig. 2; C. & S. no. 1537; Moore, Lep. E. I. Co. pl. 20, figs. 3, 3a.
Attacus vesta, Wlk. Cat. xxxii, p. 525; C. & S. no. 1544.
Attacus canningii, Wlk. Cat. xxxii, p. 525; C. & S. no. 1536.
Attacus walkeri, Feld. Wien. ent. Mon. vi, p. 34.
Attacus pryri, Butl. Ill. Het. iii, p. 11, pl. 43, fig. 5.

Head, thorax, and abdomen pale brown; collar and metathorax fringed with white; abdomen with the 1st segment white; a

dorsal white line with segmental white tufts on each side of it; a series of lateral white tufts; paired sublateral and ventral white lines. Wings pale yellowish brown. Fore wing with a white antemedial line, outwardly oblique from the costa to vein 2, then bent back to the base of inner margin; a narrow hyaline lunule on the discocellulars, inwardly edged with fuscous, outwardly with yellow; a postmedial fuscous, white, pink, and pinkish-white band, generally curved and angled at the lunule, sometimes nearly straight; outer area irrorated with fuscous; apical area suffused with pink; a white and dark ocellated mark near the margin between veins 7 and 8, with a waved white line from it to the costa; outer margin pale brown; a dark submarginal line dented between veins 6 and 7. Hind wing similar, the antemedial line oblique and not angled; some fuscous streaks on the marginal band inside the line.

Typical *cynthia* from Java is the palest form, with the pinkish-white suffusion beyond the postmedial band of both wings, which is nearly straight, diffused along the veins; *walkeri*=*canningii*=*vesta* from China and India is darker fulvous, with the postmedial band curved and the suffusion beyond more restricted; while *pryeri* from Japan is again considerably darker. This is the "Arrundi" or "Eria" Moth of silk-culture.

Larva pale green or whitish, with one dorsal and two lateral pairs of darker spines.

Cocoon pale brown.

Hab. Japan; China; Himalayas; Assam; Cachar; Java; and ? Nilgiris. *Exp.*, ♂ 136, ♀ 144 millim.

7. *Attacus ricini*, *Boisd. Ann. Soc. Ent. Fr.* 1854, p. 755; *C. & S.* no. 1541; *Moore, Wardle's Wild Silks*, pl. 8, figs. 1, 2.
Attacus lunula, *Wlk. Cat.* v, p. 1221.
Attacus guerini, *Moore, P. Z. S.* 1859, p. 269; *C. & S.* no. 1539.
Attacus obscurus, *Bull. Trans. Ent. Soc.* 1879, p. 5; *C. & S.* no. 1540.
Saturnia iole, *Westw. P. Z. S.* 1881, p. 144; *C. & S.* no. 1548.

Differs from *cynthia* in the abdomen having segmental bands of white hair above instead of tufts; the colour usually darker. Fore wing with the antemedial line more angled and generally joining the postmedial band; the lunule much shorter; the postmedial band of both wings with fuscous replacing the pink.

The palest form is *ricini*; *obscurus* from Cachar is a large dark form; *guerini* a small dark form; *iole* a sport with the markings faded, the postmedial band of both wings whitish, broad, and diffused.

Hab. China; Sikkim; Assam; ? Ceylon *Exp.*, ♂ 100-108, ♀ 116 millim.

Genus **ANTHERÆA.**

Antheræa, *Hübner*. *Verz.* p. 152 (1818).

Type, *A. paphia*, Linn.

Range. Africa; Japan; China; Philippines; throughout India, Ceylon, and Burma; Andamans; Java.

Fore wing with the costa incurved near base, excurved towards apex, which is rounded; outer margin highly excised. Hind wing rounded; cell of both wings closed.

8. *Antheræa roylei*, *Moore*, *P. Z. S.* 1859, p. 256, pl. 64, fig. 1; *C. & S.* no. 1567.

♂. Antennæ, head, thorax, and abdomen pale brown; collar, prothorax, and basal half of costa of fore wing pinkish brown, powdered with grey. Fore wing pale greenish brown; a pale and red subbasal line from median nervure to inner margin; a similar line across the middle of cell; an almost obsolete postmedial line, on which is placed a round hyaline spot on the discocellulars surrounded by an ocellus, which is greenish with a white and pink lunule on the inner side, and a yellow and black lunule on the outer; a pink and pale submarginal line expanding into a grey patch at apex; a slight yellow marginal line. Hind wing similar to the fore wing, except that there is a single antemedial angulated line; the submarginal line further from the base, and not reaching the costa.

♀ usually with a more ochreous tinge.

Larva: head pinkish brown with dark dots; somites bright apple-green; 1st somite with a blue lateral spot; 2nd to 11th with paired dorsal humps crowned with spinous tubercles; 2nd and 3rd somites with the apical tubercle greenish yellow and three lateral blue spots; a lateral yellow band from 4th somite expanding on anal somite; 4th and 5th somites with the apical tubercle silver, and a silver spot on band; 6th to 10th somites with the apical tubercles blue; 6th and 7th with a silver spot on band; 8th, 9th, and 10th with a blue spot on band. Food-plant "Muhowah," "oak," and "birch."

Cocoon double-walled and thin.

Hab. Mussoorie; Sikhim; Kangra; Khási Hills. *Exp.*, ♂ 124-160, ♀ 190 millim.

9. *Antheræa paphia*, *Linn. Syst. Nat.* i, p. 809.

Antheræa mylitta, *Drury, Exot. Ins.* ii, pl. 5, fig. 1; *C. & S.* no. 1564.

Antheræa sivalica, *Moore, Wardle's Wild Silks*, p. 7; *C. & S.* no. 1557.

Antheræa cingalesa, *Moore, Lep. Ceyl.* ii, p. 122, pl. 125, figs. 1, 1a, b (larva); *C. & S.* no. 1560.

Antheræa nebulosa, *Hutton, Moore, Wardle's Wild Silks*, p. 5.

Antheræa fraterna, *Moore, P. Z. S.* 1888, p. 402; *C. & S.* no. 1560 A.

Antheræa pulchra, *fasciata*, *olivescens*, *ochripicta*, and *versicolor*, *Moore, A. M. N. H.* (6) ix, pp. 448-450.

♂. Differs from *roylei* in the colour being reddish or yellowish; the costal brown and grey fascia of fore wing reaching the apex; the hyaline and ocellated spots much larger, the inner lunule and

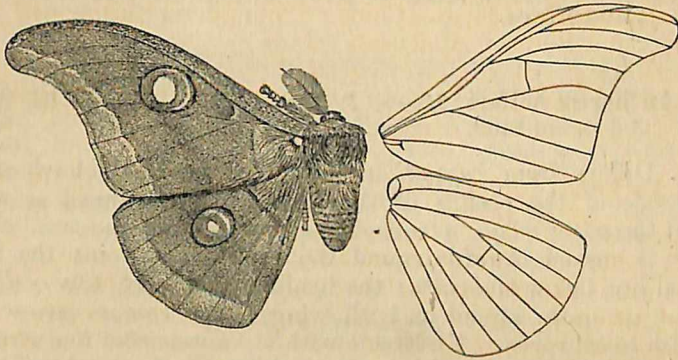


Fig. 10.—*Antheræa paphia*, ♂. $\frac{1}{2}$.

postmedial line bright pink; the submarginal line of the hind wing much nearer the margin; no marginal yellow line.

♀. Either pinkish brown or bright yellowish fawn; the hyaline and ocellated spots usually larger than in the male.

The form *mylitta* is the most yellow; *paphia* is pale brownish yellow; *nebulosa* greenish brown, clouded with fuscous as far as the postmedial line; while *cingalesa*, from Ceylon, is a dark brownish-yellow form.

This is the "Tussur Moth" of the silk-industry.

Larva green, with paired dorsal series of yellow humps; lateral purple-bordered white lunulate spots on 5th and 6th somites; a lateral yellow line from 7th somite ending in a dilated brown band on anal somite; spiracles yellow.

Cocoon brownish grey, hard, oval, and attached by a silken peduncle.

Hab. China; throughout India and Ceylon. *Exp.*, ♂ 140–174, ♀ 150–190 millim.

10. *Antheræa knyveti*, n. sp.

Reddish or olive yellow in colour, as in *paphia*; the costal fascia of fore wing only extending along two-thirds of the costa; the ocelli small, each hyaline spot usually with a dark lunule on its inner edge; the marginal line yellow; the submarginal line of hind wing further from the margin, as in *roylei*.

Differs from *roylei* in its reddish-yellow colour, in the ante-medial line of the hind wing being generally further from the base and touching the ocellus.

Larva differs from *roylei* in having sepia streaks on the head; two silver spots only on the lateral band on 4th and 5th somites;

the apical tubercles on 2nd and 3rd somites blue instead of green. Food-plant "wild cherry" and "birch."

Cocoon small, hard, dark, and pedunculated.

Hab. Sikkim (*Knyvett*). *Exp.* 156 millim. Types in colls. *Knyvett* and *Elwes*.

11. *Antheræa helferi*, *Moore*, *P. Z. S.* 1859, p. 257, pl. 64, fig. 2;
C. & S. no. 1562.

♂. Differs from *knyvetti* in there being a black blotch on the upperside of the ocellus of the hind wing, continued as a line round the outer edge; a conspicuous waved dark postmedial line which is curved inwards round the ocellus, and joins the antemedial line below the costa; the hyaline centres of the ocelli are almost or quite absent on both wings; the colour varies from pinkish to ochreous. Underside with the antemedial line straight.

♀. Yellowish, with the postmedial line of the hind wing but slightly waved.

Hab. Sikkim. *Exp.* 150 millim.

12. *Antheræa assama*, *Westw. Cab. Or. Ent.* p. 41, pl. 20, fig. 2;
C. & S. no. 1559.

? *Saturnia perotteti*, *Guér. Mag. Zool.* 1843, pl. 123; *C. & S.* no. 1566.
Antheræa mesankooria, *Moore, Wardle's Wild Silks*, p. 5; *C. & S.* no. 1563.

♂. Differs from *helferi* in the colour being ochreous brown to dark chestnut-brown; the ocellus of the fore wing entirely yellow-brown. Hind wing, with the inner part of the ocellus dark, the outer part yellow-brown; the postmedial line not waved nor so much curved, nor joining the antemedial line.

♀. The submarginal line of both wings grey.

This is the "Muga" of silk-culture.

Larva bright yellow or dark green, with a brown and yellow streak at the sides; the spiracles black; dorsal spinous tubercles red; head and legs brown; claspers green, the anal pair with a black lateral ring.

The form *perotteti*, from Pondicherry, as figured by Guérin, differs in having the two submarginal lines of each wing waved.

Cocoon brown and non-pedunculate.

Hab. Himalayas from Kangra to Assam, Pondicherry. *Exp.* 150-170 millim.

13. *Antheræa andamana*, *Moore, P. Z. S.* 1877, p. 602; *C. & S.* no. 1558.

♀. Colour as in *roylei*. Fore wing with the dark postmedial line prominent; the submarginal line dark, with a waved line



before it. Hind wing with three waved lines, one at the ocellus, two postmedial.

Hab. Andamans. *Exp.* 186 millim.

14. *Antheræa frithi*, Moore, *P. Z. S.* 1859, p. 256, pl. 65, fig. 1;
C. & S. no. 1561.

♂. Differs from all the preceding species in being brown or pink suffused with yellow; a yellow patch in cell of fore wing, and a larger patch on costa before apex; two postmedial highly lunulate lines; the ocelli as in *paphia*. Underside with the antemedial line waved.

♀. Brownish.

Hab. Sikkim; Bhutan. *Exp.*, ♂ 134–150, ♀ 170 millim.

Genus SATURNIA.

Saturnia, Schrank, *Faun. Boica*, ii, pt. 2, p. 149 (1802).

Phyonia, Hübn. *Verz.* p. 157 (1818).

Rinaca, Wlk. *Cat.* vi, p. 1274 (1855).

Caligula, Moore, *P. Z. S.* 1867, p. 684 (non descr.).

Neoris, Moore, *Trans. Ent. Soc.* (3) i, p. 321 (1862–64).

Type, *S. pini*, Schr., from Europe.

Range. Africa; Palæarctic region; Himalayas; Assam.

Fore wing with the costa evenly arched; the apex rounded; the outer margin but slightly excised. Hind wing rounded. Tarsi naked.

SECT. I. Palpi of moderate size; branches of antennæ in ♂ long.

15. *Saturnia zuleika*, Hope, *Trans. Linn. Soc.* xix, 1848, p. 132, pl. xi, fig. 5; *C. & S.* no. 1574.

♂. Head and thorax dark red-brown; collar white; meta-thorax fringed with white; abdomen brown and grey, with a series of lateral crimson spots and two paired series of black ventral streaks. Fore wing grey, irrorated with brown scales, and suffused with pink towards the apex; marginal area olive-brown; a dark brown patch at base of inner margin, followed by a deep crimson band from median nervure to inner margin, with a dark brown outer edge continued upwards across the cell; a narrow hyaline streak at end of cell surrounded by pinkish, grey, and crimson lines; three highly dentate postmedial lines bent inwards below the ocellus at vein 2; a black triangular patch on the costa before the apex, which is pale buff; two submarginal waved black lines. Hind wing similar, without the dark patch and crimson band at base; an antemedial curved line; the ocellus broader; the disk more suffused with pink; the postmedial lines waved and not bent inwards.

In Nāga specimens the ocelli of both wings are more rounded.
Hab. Sikkim; Nāga Hills. *Exp.* 136 millim.

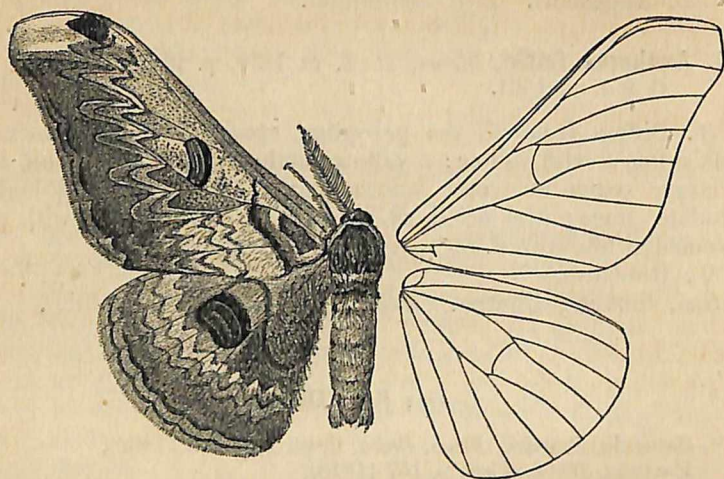


Fig. 11.—*Saturnia zuleika*, ♂. ¾.

16. *Saturnia thibeta*, *Westw.* *P. Z. S.* 1853, p. 166; *C. & S.* no. 1572.
Rinaca extensa, *Butl. Ill. Het.* v, p. 61, pl. 94, fig. 2; *C. & S.* no. 1573.

Differs from *zuleika* in being nearly uniform ochreous, varied slightly with grey and brown; the ocellus rounder, with a narrow fawn ring.

Hab. Tibet; Sikkim, 7000 feet; Assam. *Exp.* 124–146 millim.

17. *Saturnia anna*, *Moore*, *P. Z. S.* 1865, p. 818; *C. & S.* no. 1545.

Head, thorax, and abdomen brown; collar yellow. Fore wing pale yellow, irrorated with black scales; an indistinct basal black patch and antemedial line; the ocellus large and round, red-brown ringed with black, and containing a white lunule and black centre with a white streak on it; the apical patch reddish brown; a submarginal brown line with two series of yellow spots beyond it. Hind wing with the disk slightly suffused with pink; the ocellus as on fore wing except that the outer ring is red-brown with crimson inside it; three postmedial highly dentate lines on both wings.

Hab. Sikkim. *Exp.* 110–120 millim.

SECT. II. Palpi minute; branches of antennæ in ♂ short.

18. *Saturnia grotei*, *Moore*, *P. Z. S.* 1859, p. 265, pl. 65, fig. 2; *C. & S.* no. 1547.

Differs from *anna* in the ground-colour of the wings being brown. Fore wing with the white lunule on the ocellus smaller, and no white streak on the black centre; the submarginal line

ferruginous, no yellow spots. Hind wing with the disk much suffused with crimson; the inner part of the ocellus crimson; two postmedial waved lines.

Hab. Himalayas, from Simla to Sikkim; Tibet. *Exp.*, ♂ 80, ♀ 88 millim.

19. *Saturnia lindia*, *Moore, Trans. Ent. Soc.* 3rd ser. ii, p. 424, pl. 22, fig. 3; *C. & S.* no. 1549.

Saturnia hockingii, *Moore, P. Z. S.* 1888, p. 402; *Butl. Ill. Het.* vii, pl. 124, figs. 2, 3; *C. & S.* no. 1546 A.

♂. Differs from *anna* in the collar and ground-colour being grey. Fore wing: the ocellus with no crimson; the postmedial lines waved, not highly dentate, no yellow spots. Hind wing: the ocellus with crimson only on inner side; two waved postmedial lines.

Hab. Kulu. *Exp.* 86 millim.

20. *Saturnia pyretorum*, *Westw. Cab. Or. Ent.* p. 49, pl. 24, fig. 2; *C. & S.* no. 1550.

Saturnia cidosa, *Moore, Trans. Ent. Soc.* (3) ii, p. 423; *C. & S.* no. 1546.

♂. Differs from *lindia* in the base of the fore wing being mostly dark; the medial area whitish; the postmedial area heavily suffused with fuscous so as almost entirely to obliterate the dentate lines; a white submarginal line; outer margin fuscous; ocellus dark, with a white streak and ringed with yellow and black; two deep red subapical patches. Hind wing similar; the whitish medial area very broad; the waved lines entirely obsolete; an obsolescent red subapical patch.

♀. With a large tuft of hair at end of abdomen.

S. boisduvali, *Ersch.*, from Irkutsk, appears only to differ in having a straighter postmedial line to fore wing.

Hab. China; Sikkim. *Exp.* 103 millim.

21. *Saturnia simla*, *Westw. Cab. Or. Ent.* p. 41, pl. 20, fig. 1; *C. & S.* no. 1571.

Head and thorax pale chestnut; collar grey; metathorax fringed with grey; abdomen with the first segment chestnut, the others greyish brown. Fore wing: costa grey; basal area chestnut, with a dark red line on its outer edge, angled at median nervure, but sometimes almost straight; an oblique chestnut line from the costa before apex nearly meeting the red line on inner margin, the space between the two lines pinkish grey; the area outside the oblique line chestnut; margin brown; an ocellus consisting of a hyaline streak on a dark brown ground surrounded by pale brown, edged inwardly by black, white, and red, outwardly by black; a black mark before the apex, which is pinkish grey; two dentate obsolescent postmedial lines. Hind wing brownish; the upper discal



area pink; an antemedial curved red-brown line; ocellus as on fore wing, but larger and better defined; two waved postmedial red-brown lines; outer area bright chestnut; margin brown. Some specimens are browner than others, especially those from Sikhim.

Cocoon dark and fenestrated.

Hab. N.W. Himalayas. *Exp.* 120–158 millim.

22. *Saturnia huttoni*, *Moore, Trans. Ent. Soc.* (3) i, p. 321; *C. & S.* no. 1551.

♀. Differs from *simla* in the antemedial line of the fore wing being waved; the space between that and the postmedial line darker; the ocellus large, but only the lunulate inner part prominent. Hind wing with the antemedial line straight; the ocellus with the black ring narrow; the postmedial lines less waved, the outer one prominent.

Hab. N.W. Himalayas. *Exp.* 110 millim.

23. *Saturnia cachara*, *Moore, P. Z. S.* 1872, p. 578; *C. & S.* no. 1570.

♂. Differs from *simla* in being without the red tinge. Fore wing without the basal brown patch; the hyaline spot surrounded by a circular flesh-coloured ocellus, inwardly edged by pink, outwardly by black; the waved lines dark. Hind wing with the red and black margins to the ocellus broad; the waved postmedial lines dark; the submarginal pale line waved.

Hab. Cachar. *Exp.* 106 millim.

SECT. III. The branches of antennæ in ♀ much longer; palpi moderate.

24. *Saturnia stoliczkana*, *Feld. Reis. Nov.* pl. 87, fig. 3; *C. & S.* no. 1553.

Neoris shadulla, *Moore, P. Z. S.* 1872, p. 577; *C. & S.* no. 1552.

♀. Head, thorax, and abdomen pale red, the collar white; metathorax fringed with white. Wings with the ground-colour grey. Fore wing with the costa grey; a brick-red basal patch; a dark antemedial line slightly angled at the median nervure; a hyaline lunule bordered inwardly with yellow, black, and white, pink and black outwardly with two waved postmedial diffused lines, beyond which the colour is pale; marginal area pale red. Hind wing similar to fore wing; the white ring extending all round the ocellus.

The Cis-Himalayan form has the ground-colour of the wings pinkish grey.

Hab. N.W. Himalayas; Yárkand; Ladák, 12,000 feet. *Exp.* 16–132 millim.

Genus **LOEPA.**

Loepa, Moore, *Lep. E. I. C.* ii, p. 399 (1858).

Rhodia, Moore, *P. Z. S.* 1872, p. 578.

Type, *L. katinka*, Westw.

Range. Japan; Himalayas; Assam; Yunnan; Java.

Shape and neuration as in *Saturnia*. Tarsi thickly clothed with hair.

25. *Loepa katinka*, Westw. *Cab. Or. Ent.* p. 25, pl. 12, fig. 2; *C. & S.* no. 1554.

Loepa miranda, Moore, *Trans. Ent. Soc.* (3) ii, p. 424; *C. & S.* no. 1555.

Loepa sikkima, Moore, *P. Z. S.* 1865, p. 818; *C. & S.* no. 1556.

Bright chrome-yellow. Fore wing with the costa grey, suffused with fuscous; a subbasal more or less angled pink line; a large rounded or oval ocellus at end of cell, which is pinkish brown,



Fig. 12.—*Loepa katinka*, ♂. †.

containing white and black lunulate marks; a highly waved post-medial dark line; double submarginal lines, the inner line pinkish and angled below the costa, the outer grey and terminating in a black spot between veins 7 and 8, above which is a pinkish patch on the costa, edged exteriorly with white and pink; a series of almost marginal pale lunules. Hind wing differs from the fore wing in the first line being further from the base, narrow, and dark; the subcostal patch and spot absent. Underside with a pink and white apical patch to hind wing developed in *sikkima* and the Javan form.

The form *miranda* is large and pale, with the ocellus small, round, and almost blind; *katinka* is a similar but small form; while *sikkima* is small and dark, much suffused with fuscous



towards the apex of fore wing, in the male the ocellus large and round or elongate, with a prominent pupil. The branches of the antennæ vary much in length.

Larva brown and hairy, with six pink tubercles on each somite; white sublateral irregular blotches from 4th to 10th somites; claspers pink.

Hab. Himalayas; Assam; Yunnan; Java. *Exp.* 90–124 millim.

*26. *Loepa? simplicia*, Maass. & Weym. *Beitr. zur Schmett.* pt. ii, fig. 20; *C. & S.* no 1568.

♂. Yellow. Fore wing with a pink and white antemedial line from the subcostal to the inner margin, bent at the median nervure; an ocellus at end of cell, with white centre ringed with yellow, black, and pink; a subapical pink patch, with dark specks on it, and a straight brown submarginal line from it. Hind wing with the antemedial line angled near inner margin; the ocellus larger than on fore wing; the brown line postmedial, slightly bent and waved, and arising below the costa.

Hab. E. Indies. *Exp.* 160 millim.

27. *Loepa newara*, Moore, *P. Z. S.* 1872, p. 578; *C. & S.* no. 1575.

Head, thorax, and abdomen bright yellow; collar grey; patagia bordered by reddish lines. Fore wing yellow, irrorated with grey, fuscous, and pink scales, except at centre of inner margin and outer area; some pink hairs at base; a grey and fuscous antemedial line, angled at median nervure; a large subtriangular hyaline spot at end of cell; a dark postmedial slightly curved and oblique line; a sickle-shaped white subapical mark, with a black spot above it and a pink streak below it, from which runs a highly waved submarginal line; a marginal olive band. Hind wing yellow; a pink and dark antemedial line; a hyaline spot at end of cell edged with fuscous; a postmedial line, beyond which the area is suffused with pink and fuscous, with a waved outer edge.

Cocoon pale blue-green, and suspended by a silken peduncle.

Hab. Nepal; Sikkim. *Exp.*, ♂ 150, ♀ 142–150 millim.

Genus **SALASSA**.

Salassa, Moore, *P. Z. S.* 1859, p. 246.

Type, *S. lola*, Westw.

Range. Sikkim; Sylhet.

Fore wing with the apex acute; outer margin nearly evenly curved. Hind wing and neurulation as in *Saturnia*. Tarsi naked.

28. *Salassa lola*, Westw. *Cab. Or. Ent.* p. 25, pl. 12, fig. 3; *C. & S.* no. 1569.

♂. Head, thorax, and abdomen brick-red. Fore wing brick-red; an antemedial pale and darker curved line; a hyaline spot beyond the cell very variable in shape and size; a postmedial dark line, with a series of hyaline striæ on it; a submarginal dark band, with its inner and outer edges waved; a grey apical patch. Hind wing similar to fore wing, the ante- and postmedial lines broader; a hyaline spot beyond the cell surrounded by an ocellus, which is

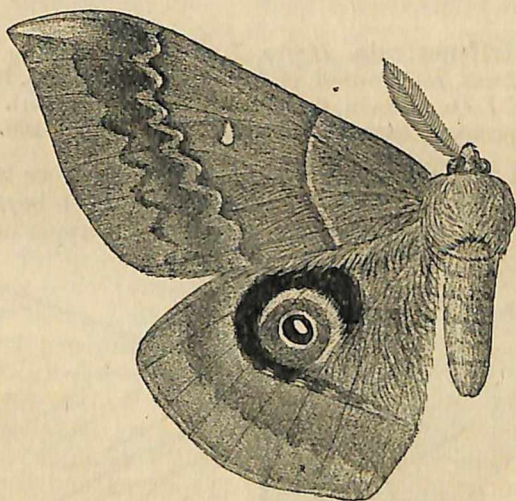


Fig. 13.—*Salassa lola*, ♂. 1.

ringed black, white, and deep red exteriorly; the hyaline striæ obsolete beyond the ocellus. Underside: the basal two-thirds of wings red-brown suffused with grey, except exteriorly; a broad grey submarginal band, with waved outer edge; marginal area brown. Tibiæ and tarsi grizzled.

One specimen taken in March much paler.

♀. Brown with dark and reddish hairs..

Hab. Sikkim; Sylhet. *Exp.*, ♂ 116, ♀ 120–158 millim.

29. *Salassa royi*, *Elwes, P. Z. S.* 1887, p. 447; *id. Trans. Ent. Soc.* 1888, pl. viii, fig. 2; *C. & S.* no. 1550 A.

♂. Differs from *lola* in the colour being very dark purplish red-brown; the hyaline spot large and round; no hyaline striæ on the postmedial line. Hind wing with the outer ring of the ocellus narrow and black, instead of broad and deep red. Underside with the grey suffusion extending to the postmedial line.

♀. Paler; the head and prothorax yellow; the wings clothed with olive-yellow hair; the outer part of the postmedial line greyer.

Hab. Sikkim. *Exp.*, ♂ 140, ♀ 154 millim.

Genus **CRICULA**.

Cricula, *Wlk. Cat.* v, p. 1186 (1855).

Euphranor, *Her.-Schäff. Samml. aus. Eur. Schmet.* p. 61 (1858).

Type, *C. trifenestrata*, *Helf.*

Range. Throughout India, Ceylon, and Burma; Java.

Fore wing with the costa evenly arched; apex rather acute; outer margin highly excised; veins 5 and 6 given off from the subcostal much nearer the base. Hind wing rounded; veins 5 and 6 given off from the subcostal towards the base.

30. *Cricula trifenestrata*, *Helper, J. A. S. B.* vi, p. 45; *Her.-Schäff. Samml. aus. Eur. Schmet.* pl. 17, fig. 80; *C. & S.* no. 1354; *Moore, Lep. E. I. Co.* pl. xviii, fig. 7 a, b (larva and cocoon).
Cricula burmana, *Swinh. Trans. Ent. Soc.* 1890, p. 198.

♂. Brown, ochreous, yellowish, or reddish. Fore wing with a waved antemedial dark line; a small hyaline spot beyond the end of the cell, with one or two others above it, the upper one generally

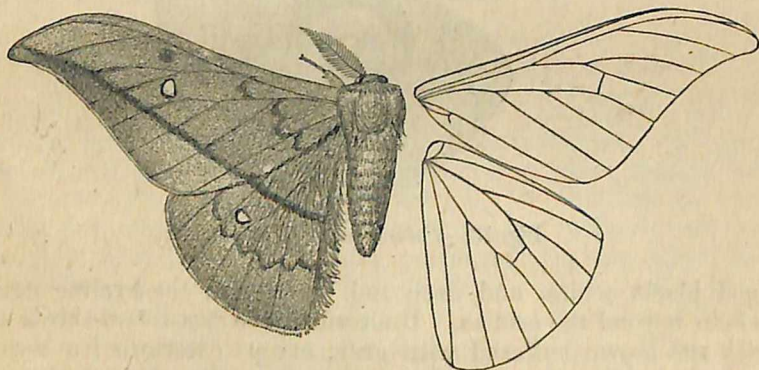


Fig. 14.—*Cricula trifenestrata*, ♂. 1.

represented by a dark spot; an oblique line from the apex to the inner margin beyond the middle, the area beyond it suffused with grey. Hind wing with the oblique line continued to the inner margin before the middle; a hyaline spot beyond the cell; a submarginal waved line. Underside with the basal area suffused with purple.

♀. Generally redder; three large irregularly shaped hyaline spots beyond the cell of the fore wing, often with one or two small ones inside them.

Larva black-brown; 2nd to 11th somites each with six setiferous tubercles; 1st somite and anal claspers crimson; a pale reddish sublateral stripe; legs and prolegs brown.

Cocoon composed of bright golden-yellow silk firmly united into a network; a race from the Karen Hills spins a solid cocoon.

Hab. Throughout India, Ceylon, and Burma; Andamans; Java.
Exp., ♂ 62–82, ♀ 72–92 millim.



31. *Cricula drepanoides*, Moore, P. Z. S. 1865, p. 817; C. & S. no. 1353.

♂. Differs from *trifenestrata* in the head, thorax, and abdomen being suffused with purplish grey. Fore wing purplish grey, the outer area ochreous; an antemedial irregular line; a large number of hyaline specks and blotches, more or less conjoined in, beyond, and below the end of the cell; the oblique line is bent back to the costa, which it reaches some way before the apex; an oblique streak from the apex meeting the oblique line and then continued as a waved submarginal line. Hind wing reddish ochreous; an antemedial line; a hyaline spot at end of cell surrounded by five small ones; postmedial and submarginal waved lines.

Hab. Sikkim. *Exp.* 68 millim.

The following species formerly recorded as Indian are omitted.

Antheræa pernyi, Guér., C. & S. no. 1564 (part.), is a Chinese non-pedunculate species.

Attacus fenestra, Linn., C. & S. no. 1354 (part.), is *Hylurga fenestra* from Venezuela.

Attacus perspicua, Linn., C. & S. no. 1354 (part.), is *Turckheimia perspicua* from W. Africa.

Bombyx irius and *saturnus*, Fabr., from "India," Syst. Ent. iii, i, p. 409, appear to be African species, but the descriptions are too vague for recognition.

Family BRAHMÆIDÆ.

Proboscis present; palpi large, rounded, and upturned. Antennæ bipectinated in both sexes; mid tibia with a single pair of spurs; hind tibia with two pairs. Frenulum absent. Fore wing with vein 1 *b* forked at the base; 1 *c* absent; 5 from near the upper angle of cell. Hind wing with two internal veins; the cell short, with a veinlet in it; vein 5 from near the upper angle; 6 and 7 given off near the base; 8 free from the root and nearly touching 7 beyond the cell; a precostal vein.

Genus BRAHMÆA.

Brahmæa, Wlk. Cat. vi, p. 1315 (1855).

Type *B. certhia*, Fabr., from China.

Range. E. and W. Africa; Palaearctic Asia; Himalayas; Burma.

Palpi large, rounded, and upturned; antennæ bipectinated in both sexes, the branches short and nearly even throughout. Fore wing with veins 6, 7, 8, 9, 10 stalked together; 7 and 8 being given off on a short stalk. Hind wing with the cell very short and with a veinlet in it; the upper discocellular given off from vein 6.

Larva. The 2nd and 3rd somites swollen and armed with a pair of forwardly projecting lateral spines, which turn into warts at the last moult.

Pupa naked.

32. ***Brahmæa wallichii***, *Gray, Zool. Misc.* p. 39; *C. & S.* no. 1579.
Brahmæa conchifera, *Butl. A. M. N. H.* (5) v, 1880, p. 188; *Ill. Het.* v, pl. 95, figs. 3, 4; *C. & S.* no. 1577.
Bombya spectabilis, *Hope, Trans. Linn. Soc.* xviii, p. 443.
Brahmæa rufescens, *Butl. A. M. N. H.* (5) vi, 1880, p. 62; *C. & S.* no. 1578.

♂. Head black; antennæ brown, with a brown band between their bases; thorax brown, with three pairs of black lines; collar with a pair of black spots; abdomen brown, with paired square

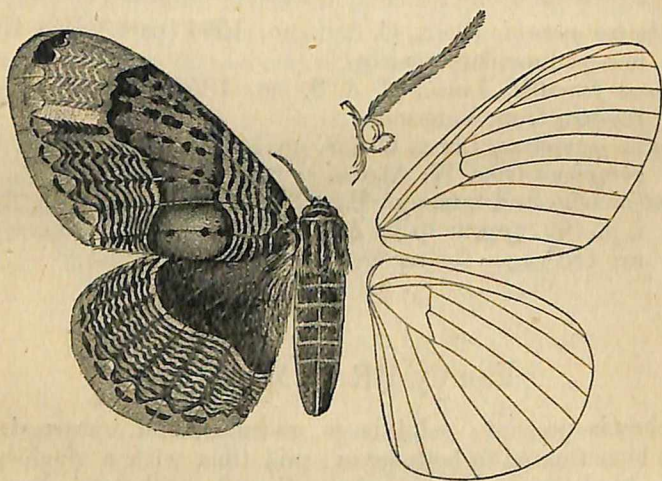


Fig. 15.—*Brahmæa wallichii*, ♂. $\frac{1}{2}$.

segmental black spots: underside of head and thorax black; of abdomen brown, with black lines. Fore wing pale olive-brown; seven waved black lines before the middle; two black medial lines enclosing an irregular space below the costa, then approaching each other at vein 2, and enclosing a round space above inner margin; in these spaces the veins are marked with white and black; eight black lunulate lines on the outer area between vein 5 and the inner margin, some of them in the form of "brackets," the outer series forming ring-marks; apical area with veins 6, 7, 8 marked with white lunules; a black subapical patch, with some fine black lunules from it to vein 6; a yellow streak above vein 5. Hind wing: the basal area deep black, with some brown streaks towards inner margin; outer area yellowish, shading to olive-brown; nine waved lines, expanding into blue-black marks on the veins, with white spots between them; a submarginal broken line. Underside

with the basal half of both wings black, more or less streaked with brown on costa of both wings and beyond cell and on inner margin of fore wing.

The form *conchifera* is slightly paler than typical *wallichii*.

The form *rufescens* has the whole basal area of the fore wing below pale.

Hab. Nepal; Sikhim; Khási Hills; Assam; Upper Burma.
Exp. 150–170 millim.

33. **Brahmæa hearseyi**, *White, Proc. Ent. Soc.* 1861, p. 26.

Brahmæa whitei, *Butl. Ill. Het.* v, p. 62, pl. 95, figs. 1, 2; *C. & S.* n. 1580.

♂. Differs from *wallichii* in the abdominal markings of the upper-side being narrow black and white bands; the ground-colour of both wings paler; the subapical white lunules are joined into waved white lines, one or two of those nearest the base having black lines inside them. Hind wing with pale streaks between the veins from inner margin to vein 6.

Hab. Mussooree; Sikhim; Burma. *Exp.* 116–170 millim.

The following species formerly recorded as Indian is omitted.

Brahmæa certhia, *Fabr., C. & S.* no. 1576, is from China.

Family BOMBYCIDÆ.

Proboscis absent; palpi rather small or absent; antennæ bipectinated in both sexes; legs hairy, without spurs. Frenulum absent; vein 5 of both wings from, or from above, the middle of the discocellulars; veins 7, 8, 9 of fore wing generally more or less bent downwards; vein 1*a* forming or not forming a fork with 1*b*; 1*c*

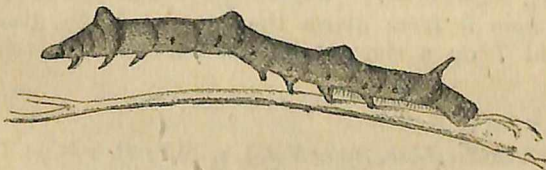


Fig. 16.—Larva of *Ocinara signifera*. †. (From Hutton, *Trans. Ent. Soc.* 1864, pl. 19, fig. 6.)

absent or present. Hind wing with two or three internal veins; vein 8 arising from the base of 7, or free from the base with a bar between them; the inner margin irregular and in part turned over.

Larva elongate and not hairy; dorsal humps on some of the somites, or a horn on the terminal somite, or paired dorsal spines.

Cocoon formed of fine silk, of great commercial value in some species.

Key to the Genera.

- a. Hind wing with vein 8 from the base of 7, and no bar between them.
 - a'. Palpi present.
 - a². Fore wing with veins 7, 8, 9 but slightly bent downwards.
 - a³. Fore wing with veins 6 and 11 from the cell 1. BOMBYX, p. 32.
 - b³. Fore wing with veins 6 and 11 stalked with 7, 8, 9, 10 2. ECTROCTA, p. 33.
 - b². Fore wing with veins 7, 8, 9 much bent downwards 3. OCINARA, p. 34.
 - b'. Palpi absent.
 - a². Fore wing with a veinlet in the cell; veins 7, 8, 9 much bent downwards 4. GUNDA, p. 36.
 - b². Fore wing with no veinlet in the cell; veins 7, 8, 9 not much bent downwards. 5. THEOPHILA, p. 37.
- b. Hind wing with vein 8 free from the root, and a bar between it and vein 7; fore wing with veins 7, 8, 9 not bent downwards.
 - a'. Fore wing with vein 6 stalked with 7, 8, 9, 10 6. MUSTILIA, p. 38.
 - b'. Fore wing with vein 6 from the angle of cell. 7. ANDRACA, p. 40.

Genus **BOMBYX.**

Bombyx, *Hübner. Verz.* p. 190 (1818).

Type, *B. mori*, Linn.

Range. Japan; China; and introduced into India, Europe, &c.

Palpi slight. Fore wing with the outer margin excised below the apex and slightly angled; veins 6 and 11 from the cell; 7, 8, 9, 10 stalked together; 7, 8, 9 but slightly bent downwards. Hind wing with vein 5 from above the centre of the discocellulars; veins 6 and 7 on a short stalk; no bar between veins 7 and 8 near base.

- 34. *Bombyx mori*, *Linn. Syst. Nat.* i, p. 817; *C. & S.* no. 1098.
Bombyx cressi, *Hutt. Trans. Ent. Soc.* (3) ii, 1864, p. 312; *C. & S.* no. 1095.
Bombyx fortunatus, *Hutt. Trans. Ent. Soc.* (3) ii, 1864, p. 312; *C. & S.* no. 1096.
Bombyx sinensis, *Hutt. Trans. Ent. Soc.* (3) ii, 1864, p. 313; *C. & S.* no. 1099.
Bombyx textor, *Hutt. Trans. Ent. Soc.* (3) ii, 1864, p. 309; *C. & S.* no. 1100.
Bombyx arracaniensis, *Hutt. Trans. Ent. Soc.* (3) ii, 1864, p. 313; *C. & S.* no. 1094.

♂. Head, thorax, and abdomen whitish. Fore wing whitish; two dark antemedial lines; a line across the end of cell; a post-

medial line. Hind wing with a dark blotch at centre of inner margin; curved medial and postmedial lines.

♀ with the wings often more or less aborted.

In some specimens the outer line of the fore wing is curved and submarginal, or the markings may be entirely obsolete.

Larva dark grey; the head and first three somites with some

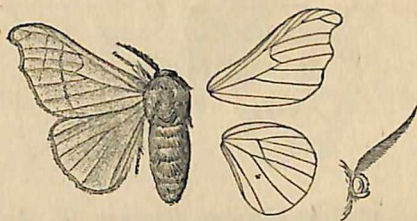


Fig. 17.—*Bombyx mori*, ♀. ♂.

transverse black lines; the first somite with two dark red streaks; the five first somites white below; the 3rd to anal somite with reticulated black dorsal markings; 11th somite with a long horn.

Cultivated forms may be grey or almost white, with the markings almost obsolete.

This species is indigenous to China, and from there introduced all over the world. The forms described by Hutton are simply domesticated races of the larva.

Cocoon yellow or white, the silk closely woven or loose.

Hab. China, and in a domesticated state throughout India and Europe. Exp. 42 millim.

Genus *ECTROCTA*, nov.

Type, *E. diaphana*, Hmps. n.

Range. Burma.

Palpi minute. Fore wing much excised below the apex; veins 6, 7, 8, 9, 10, 11 stalked together; veins 7, 8, 9 not much bent downwards. Hind wing with the outer margin much excised at anal angle; vein 5 from the centre of the discocellulars; veins 6 and 7 stalked.

35. *Ectrocta diaphana*, n. sp.

♀. Head, thorax, and abdomen pale ochreous brown, suffused with fuscous. Wings semidiaphanous white. Fore wing with a fuscous basal patch; a subbasal curved fuscous band; a streak on discocellulars; a doubly curved submarginal line; a large apical patch. Hind wing with an antemedial fuscous spot on inner

margin; a maculate postmedial band; outer margin very slightly suffused with fuscous.

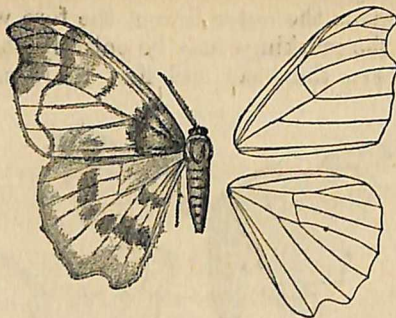


Fig. 18.—*Ectrocta diaphana*, ♀. $\frac{1}{2}$.

Hab. Momeit, Burma (*Doherty*). *Exp.* 54 millim. Type in coll. Elwes.

Genus OCINARA.

Ocinara, *Wlk. Cat.* vii, p. 1768 (1856).

Naprepa, *Wlk. Cat.* v, p. 1152 (1855), nom. præocc.

Trilocha, *Moore, Cat. Lep. E. I. C.* p. 382 (1857).

Ernolatia, *Wlk. Journ. Linn. Soc.* vi, p. 131 (1862).

Chazena, *Wlk. Char. undescr. Het.* p. 21 (1869).

Type, *O. dilectula*, *Wlk.*, from Java.

Range. China; throughout India; Andamans; Borneo; Sumatra; Java.

Palpi minute. Fore wing with vein 6 from or from below the angle of the cell; 7, 8, 9, 10 stalked, 7, 8, 9 much bent downwards; 11 from the cell; vein 1 c present; a veinlet in the cell. Hind wing with vein 5 from the centre of the discocellulars; veins 6 and 7 stalked; three internal veins.

36. *Ocinara signifera*, *Walk. Journ. Linn. Soc.* vi, p. 130 (1862).

Ocinaralactea, *Hutt. Trans. Ent. Soc.* (3) ii, 1864, p. 328, pl. 19, fig. 6 (larva); *C. & S.* no. 1110.

Ocinara diaphana, *Moore, Lep. Atk.* p. 83; *C. & S.* no. 1109.

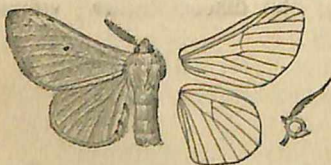


Fig. 19.
Ocinara signifera, ♂. $\frac{1}{2}$.

Head, thorax, and abdomen white. Fore wing white, with an opalescent tinge; some black specks on the costa; two black spots in end of cell, either or both of which may be absent, one beyond the end which may be reduced to a speck; two indistinct curved postmedial lines, the outer with fine black streaks on the veins.

Hind wing white, with a dark speck at end of cell and a faint postmedial line; some black spots on inner margin; cilia chequered fuscous and white.

The form *diaphana* has the black spots on fore and hind wings absent.

Larva brown, with humps on the 2nd, 4th, and 7th somites, and a horn on 10th somite.

Hab. N.W. Himalayas ; Sikkim ; Khási Hills ; Nilgiris ; Andamans ; Sumatra ; Borneo. *Exp.*, ♂ 34-38, ♀ 34-46 millim.

37. **Ocinara apicalis**, *Wlk. Journ. Linn. Soc.* vi, p. 130 (1862).

Ocinara signata, *Wlk. Journ. Linn. Soc.* vi, p. 131.

Ocinara moorei, *Hutt. Trans. Ent. Soc.* (3) ii, 1864, p. 326 ; *C. & S.* no. 1111.

Ocinara lida, *Moore, Cat. E. I. C.* p. 381.

Bombyx plana, *Wlk. Cat.* xxxii, p. 575.

♂. Differs from *signifera* in having a slight ferruginous tinge ; a ferruginous band inside a waved postmedial line on both wings ; the spots at end of cell of fore wing and those on the costa, except the spot at the postmedial line, absent ; the spots on inner margin of hind wing dark ferruginous.

Larva rough and brown, covered with short hair ; a raised ridge on 2nd somite, with a black patch before it ; a horn on 10th somite.

Hab. Hongkong ; Mussooree ; Borneo ; Java. *Exp.* 38 millim.

38. **Ocinara varians**, *Wlk. Cat.* v, p. 1153 ; *C. & S.* no. 1093 ; *Moore, Lep. Ceyl.* ii, pl. 133, figs. 1, 1 a, 1 b (larva).

Naprepa albicollis, *Wlk. Journ. Linn. Soc.* vi, p. 171 ; *C. & S.* no. 1091.

Naprepa cervina, *Wlk. Cat.* xxxii, p. 489 ; *C. & S.* no. 1092.

Chazena velata, *Wlk. Char. undescr. Het.* p. 21.

♂. Head, thorax, and abdomen pale or dark red-brown ; the vertex of head and collar sometimes whitish. Fore wing pale reddish brown or greyish ; two antemedial curved waved lines ; a pale streak on the discocellulars surrounded by a dark patch ; two postmedial curved and waved lines somewhat far apart ; a darker patch on the outer margin below the apex ; the costal edge pale ; cilia dark red-brown. Hind wing pale or dark red-brown, or greyish with the outer area red-brown ; a postmedial indistinct line ; inner area pale, with some dark red strigæ crossing it.

The grey form is *albicollis* ; in the redder form *variens* the markings are often almost obsolete.

Larva elongate and brown, with darker dots and a lateral row of black dots ; a slight dorsal protuberance on each of the thoracic, and on the 5th and 8th somites ; a long slender horn on anal somite.

Cocoon silken, slight in texture ; oval and pale.

Hab. Philippines ; China ; Formosa ; throughout India and Ceylon ; Borneo. *Exp.*, ♂ 26, ♀ 32 millim.

Genus **GUNDA**.

Gunda, *Wlk. Journ. Linn. Soc.* vi, p. 176 (1862).

Norasuma, *Moore, P. Z. S.* 1872, p. 575.

Aristhala, *Moore, P. Z. S.* 1878, p. 704.

Type, *G. ochracea*, Wlk., from Borneo.

Range. Hainan; Sikhim; Ceylon; Java.

Palpi absent. Fore wing with veins 6, 7, 8, 9, 10, 11 stalked; 7, 8, 9 much bent down; a veinlet in the cell. Hind wing with vein 5 from the centre of the discocellulars; veins 6 and 7 stalked.

39. **Gunda javanica**, *Moore, P. Z. S.* 1872, p. 576, pl. 33, fig. 6.

♂. Head, thorax, and abdomen pale brown; the collar fringed with dark brown. Fore wing darkish brown; three transverse

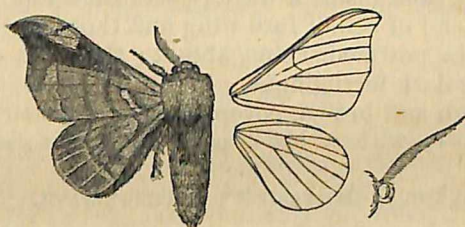


Fig. 20.—*Gunda javanica*, ♂. 1.

indistinct lines; a postmedial more distinct line, highly angulated below the costa; a very dark brown streak from the base to the apex along the costa, leaving a large apical pale patch with an apical dark streak. Hind wing dark brown, with three indistinct lines; inner margin dark with some pale strigæ; two pale sub-marginal specks near anal angle. Underside with the two outer lines of both wings more distinct and waved.

♀. More uniform grey-brown; the dark streak and apical pale patch of the fore wing obsolete, as are the markings of hind wing.

Hab. Sikhim; Java. *Exp.*, ♂ 48, ♀ 66 millim.

40. **Gunda apicalis**, *Hmps. Ill. Het.* ix, ined., pl. 160, fig. 17.

♀. Differs from *javanica* in being much yellower brown; antennæ ochreous; a pale streak on vertex of abdomen. Fore wing with the outer line less angled; the apical dark patch much larger. Hind wing with the lines more distinct.

Hab. Trincomali, Ceylon. *Exp.* 62 millim.

41. **Gunda sikkima**, *Moore, P. Z. S.* 1879, p. 406, pl. 33, fig. 3;

C. & S. no. 1112.

Norasuma variegata, *Hmps. Ill. Het.* ix, ined., pl. 160, fig. 7.

Aristhala thwaitesii, *Moore, Lep. Ceyl.* ii, p. 136; *C. & S.* no. 1113.

♂. Head, thorax, and abdomen red-brown, grizzled with grey.

Fore wing ochreous brown, much suffused with red-brown, especially at inner and outer areas; two dark spots near base; a highly curved subbasal line; two nearly straight medial lines, the outer line met by an oblique streak from the costa across the end of cell; a waved submarginal line; a dark mark at apex. Hind wing red-brown, ochreous towards anal angle and outer margin; two indistinct waved lines; inner area dark red-brown, suffused with grey; two dark marks at anal angle. Underside of hind wing with two dark specks in the cell and the lines more distinct. Where thinly scaled the wing-membrane shows highly iridescent colours.

♀. Yellow; the thorax suffused with reddish brown; the fore wing with reddish brown near inner and outer margins; hind wing suffused with reddish brown at base and near anal angle; the transverse lines as in male, but less distinct.

Hab. Sikhim; Ceylon. *Exp.*, ♂ 42, ♀ 62 millim.

Genus THEOPHILA.

Theophila, Moore, *P. Z. S.* 1867, p. 683.

Type, *T. huttoni*, Westw.

Range. N.W. Himalayas; Sikhim; Bengal and ? Madras.

Palpi absent. Fore wing highly excised below the apex; the outer margin slightly angled; veins 6, 7, 8, 9, 10 stalked together, 7, 8, 9 not much bent downwards. Hind wing with vein 5 from above the middle of the discocellulars; veins 6 and 7 stalked.

42. *Theophila huttoni*, Westw. *Cab. Or. Ent.* p. 26, pl. 12, fig. 4; *Hutt. Trans. Ent. Soc.* 1864-66, pl. 19, fig. 4 (larva); *C. & S.* no. 1103.
Bombyx sherwilli, *Hutt. Trans. Ent. Soc.* (3) ii, 1864, p. 324; *C. & S.* no. 1105.
Bombyx affinis, *Hutt., Geoghegan's Silk in India*, App. A, p. 3; *C. & S.* no. 1101.
Bombyx bengalensis, *Hutt. Trans. Ent. Soc.* (3) ii, 1864, p. 322, pl. 19, fig. 5 (larva); *C. & S.* no. 1102.
Bombyx religiosæ, *Helper, J. A. S. B.* vi, p. 41, pl. 6; *C. & S.* no. 1104.

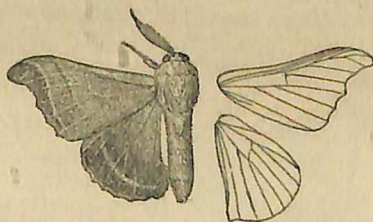


Fig. 21.—*Theophila huttoni*, ♂. †.

Head, thorax, and abdomen grey-brown. The outer margin of both wings more or less crenulate. Fore wing grey-brown, obliquely curved antemedial and medial indistinct dark lines: a

dark line beyond the discocellulars ; an erect postmedial line ; one or two doubly curved submarginal lines ; a large chocolate apical patch. Hind wing darker ; inner margin chequered brown and white ; a slightly curved submarginal line. Underside of hind wing with postmedial and submarginal lines.

Abdomen in some specimens with first and last segments dark.

Larva mottled and streaked with yellow, brown, and black ; the first three somites very much swollen ; paired dorsal spines on 5th to anal somite.

The larva described by Hutton as *bengalensis* was probably a pale variety of the common form, from which it differed in being whitish, marbled with yellowish red and black ; the moth mentioned in connection with it was evidently *Bombyx mori*.

Hab. N.W. Himalayas ; Sikkim ; Assam. *Exp.*, ♂ 40, ♀ 50 millim.

- *43. *Theophila ? lugubris*, *Drury, Exot. Ins.* iii, p. 28, pl. 21, fig. 5 ; *C. & S.* no. 1097.

Head and thorax ash-coloured. Abdomen and wings rusty red ; fore wing with some faint bluish marks near outer margin.

This species is certainly either a *Bombyx* or *Theophila*, and probably the latter, having the outer margin of the fore wing angled.

Hab. Madras ? *Exp.* 48 millim.

Genus MUSTILIA.

Mustilia, *Wlk. Cat.* xxxii, p. 580 (1865).

Type, *M. falcipennis*, *Wlk.*

Range. The Himalayas ; Assam.

Palpi minute ; antennæ of male bipectinated to two-thirds length. Fore wing very much produced at apex, which is acute ; vein 1 *b* forked at base, 1 *c* absent, 3 given off before end of cell, 6 stalked with 7, 8, 9, 10. Hind wing with two internal veins ; a bar between veins 7 and 8 near base.

44. *Mustilia falcipennis*, *Wlk. Cat.* xxxii, p. 581 ; *C. & S.* no. 1482. *Mustilia castanea*, *Moore, Lep. Atk.* p. 82 ; *C. & S.* no. 1481.

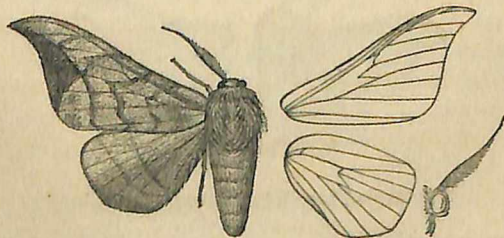


Fig. 22.—*Mustilia falcipennis*, ♂. †.

♂. Head and collar chestnut ; the shaft of antennæ and a

band between their bases whitish; thorax and abdomen purplish red-brown, the latter yellowish towards extremity. Fore wing red-brown, suffused with grey; a highly angled antemedial indistinct line; a black spot at end of cell; a waved medial line; a postmedial line angled below the costa and waved towards inner margin, met by a black and grey oblique line from the apex. Hind wing with the costal half yellow, the inner half red-brown; two dark lines which approach each other on inner margin; a grey patch near anal angle. Underside yellower, with a black spot at end of cell of hind wing.

The form *castanea* is darker; the hind wing more angled and wholly dark chestnut-red, instead of the costal half yellow; the markings similar.

Hab. Sikhim; Bhutan. *Exp.* 52 millim.

45. *Mustilia sphingiformis*, Moore, *P. Z. S.* 1879, p. 407, pl. 33, fig. 4; *C. & S.* no. 1484.

Differs from *falcipennis* in the head and thorax being purplish grey-brown; the abdomen dark brown. Fore wing pale red-brown, with the markings slight and obsolescent, a speck at end of cell; a doubly curved postmedial line; the whole outer area suffused with chestnut from apex to outer angle as far as the postmedial line at middle. Hind wing ochreous, the inner area brown. Cilia of both wings ochreous.

Hab. Mussooree. *Exp.*, ♂ 58, ♀ 82 millim.

46. *Mustilia hepatica*, Moore, *Lep. Atk.* p. 82, pl. 3, fig. 18; *C. & S.* no. 1483.

Mustilia columbaris, Butl. *P. Z. S.* 1886, p. 387, pl. 35, fig. 7.

♂. Pale red-brown, suffused with grey; shaft of antennæ and a band between their bases white. Fore wing with an indistinct waved antemedial line; a dark spot at end of cell; an oblique postmedial line, usually indistinct, angled below the costa and met by an oblique line from the apex. Hind wing with a curved postmedial indistinct line; two dark strigæ on inner margin. Outer area of both wings not suffused with grey; three grey spots towards outer and anal angles.

♀. More uniform chestnut-brown; fore wing with the cell-spot smaller.

The form *columbaris* from Murree is paler and more uniformly suffused with grey.

Larva greenish brown; the hinder part paler; sphingiform in shape, with a long tail on 11th somite; the cuticle of the anterior part of the body is capable of expansion into large lateral wings, which are retracted when at rest.

Hab. Murree; Sikhim. *Exp.*, ♂ 64, ♀ 90 millim.

Genus **ANDRACA**.

Andraca, *Wlk. Cat.* xxxii, p. 581 (1865).

Type, *A. bipunctata*, Wlk.

Range. Sikkim; Assam.

Palpi not very small; antennæ of male bipectinated to tip. Fore wing with the apex produced and acute; vein 1 *b* forked at base, 1 *c* absent, 3 and 4 from angle of cell, 6 from upper angle, 7, 8, 9, 10 stalked. Hind wing with the inner margin excised; two internal veins; a bar between veins 7 and 8 near the base.

47. ***Andraca bipunctata***, *Wlk. Cat.* xxxii, p. 582; *C. & S.* no. 1328.
Andraca trilochoides, *Moore, P. Z. S.* 1865, p. 820; *C. & S.* no. 1329;
Waterh. Aid. ii, pl. 132, figs. 1, 2.

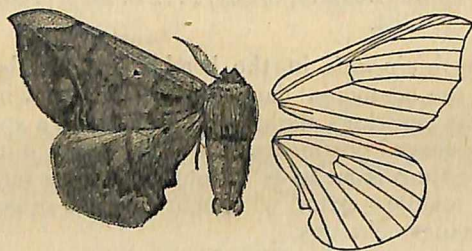


Fig. 23.—*Andraca bipunctata*, ♂. 1.

♂. Antennæ dark brown; head, thorax, and abdomen dark red-brown. Fore wing dark red-brown, with some grey scales below the costa; antemedial and medial dark waved lines, curved below the costa; a postmedial double curved line sharply angled below the costa; a black speck at end of cell. Hind wing dark red-brown; the inner margin black, suffused with grey scales; a black dot at end of cell; two waved medial lines which nearly meet on inner margin. Underside: hind wing with the lines more prominent and hardly waved; the outer margin suffused with grey.

♀. Much paler red-brown; the shaft of antennæ white.

The form *trilochoides* is rather brighter, with more grey suffusion on fore wing.

Hab. Sikkim; Assam. *Exp.*, ♂ 48–56, ♀ 66 millim.

The following species formerly recorded as Indian is omitted.

Hanisa subnotata, Walk., *C. & S.* no. 1106, is from Singapore.

Family EUPTEROTIDÆ.

A family of large-sized moths. The palpi hairy; antennæ pectinated in both sexes; mid tibia with one pair of spurs, hind tibia with two pairs. Frenulum present. Fore wing with vein 1 *b* forked at the base, 1 *c* absent, 5 from or from above the middle of the discocellulars, 10 almost always absent. Hind wing with two internal veins; vein 5 from or from above the middle of the discocellulars; a bar between veins 7 and 8, the latter free from the base.

Larva with five pairs of prolegs, and tufted with hair.

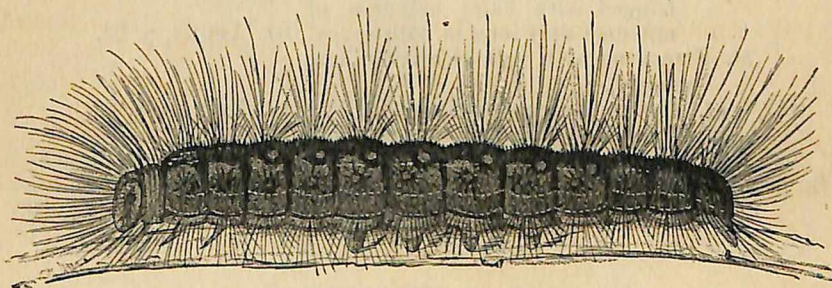


Fig. 24.—Larva of *Eupterote fabia*. ♂.
 (From Moore, Lep. Ceyl. ii, pl. 136, fig. 1 *b*.)

Key to the Genera.

- A. Frons without a corneous ridge.
 - a. Fore wing with an areole; antennæ Saturni-
 form 1. GANGARIDES, p. 42.
 - b. Fore wing with no areole; antennæ
 plumose.
 - a'. Palpi upturned and thickly fringed with
 hair in front.
 - a². Fore wing with veins 7, 8, 9 given
 off before end of cell 2. PANDALA, p. 43.
 - b². Fore wing with veins 7, 8, 9 given
 off from end of cell.
 - a³. Fore wing with upper discocel-
 lular very oblique 3. MELANOTHRIX,
 - b³. Fore wing with upper discocel-
 lular nearly erect. [p. 44.
 - a⁴. The discocellulars angled both
 above and below vein 5 in both
 wings 4. DREATA, p. 44.
 - b⁴. The discocellulars angled above
 vein 5 in both wings.
 - a⁵. Fore wing rounded at apex .. 5. PALIRISA, p. 45.
 - b⁵. Fore wing produced at apex. . 6. TAGORA, p. 46.
 - c⁴. The discocellulars angled at or
 below vein 5 in both wings.
 - a⁵. Hind wing with vein 7 given
 off before the end of the cell. 7. PSEUDOJANA, p. 48.

- δ^5 . Hind wing with veins 6 and 7 stalked or from angle of cell.
 α^6 . Hind wing with the costa straight; vein 8 not remote from 7 8. GANISA, p. 49.
 δ^6 . Hind wing with the costa arched; vein 8 remote from 7 9. APHA, p. 51.
 δ' . Palpi porrect.
 α^2 . Fore wing with vein 11 arising close to 7, 8, 9.
 α^3 . Palpi short and somewhat heavily fringed with hair 11. EUPTEROTE, p. 54.
 δ^3 . Palpi longer and very heavily fringed with hair; branches of antennæ very long in both sexes. 10. APONA, p. 52.
 δ^2 . Fore wing with vein 11 arising long before 7, 8, 9.
 α^3 . The wings broad and rounded .. 12. NISAGA, p. 62.
 δ^3 . The wings long and narrow; fore wing with outer margin oblique. 13. SANGATISSA, p. 63.
 B. Frons with a corneous ridge 14. CNETHOCAMPA, [p. 64.

Genus GANGARIDES.

Gangarides, Moore, P. Z. S. 1865, p. 821.

Type, *G. roseus*, Wlk.

Range. E. Himalayas; Burma; Borneo.

Palpi upturned and very thickly fringed with hair. The antennæ with the branches stiff, decreasing rapidly to apex and Saturniform. Legs very thickly clothed with hairs. Fore wing with the apex produced, the outer margin excised and crenulate; the discocellulars nearly straight; vein 7 anastomosing shortly with 8 and 9 to form an areole. Hind wing with the discocellulars straight; veins 6 and 7 stalked.

48. *Gangarides roseus*, Wlk. Cat. xxxii, p. 513; C. & S. no. 1340.
Gangarides dharma, Moore, P. Z. S. 1865, p. 821, pl. 43, fig. 7;
 C. & S. no. 1339.
Lonomia vittipalpis, Wlk. Char. undescr. Lep. 1869, p. 90; C. & S. no. 1251.

♂. Palpi black, fringed with ochreous hairs; antennæ, head, and thorax ochreous, the latter with a crimson tinge; abdomen crimson above. Fore wing pinkish ochreous, irrorated with brown scales; a curved and waved subbasal dark line; an antemedial slightly waved line; a black dot ringed with white at end of cell; three indistinct waved postmedial lines; a grey and brown curved oblique line from apex; a submarginal lunulate line. Hind wing crimson; the cilia ochreous.

♀. Duller in colour; fore wing with the subbasal line some-

times absent and the speck at end of cell minute; the three post-medial lines prominent.

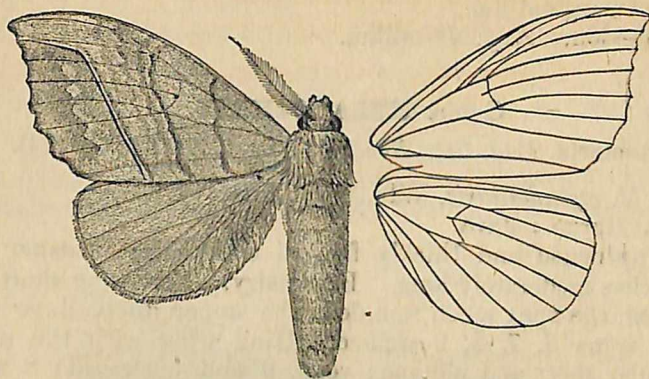


Fig. 25.—*Gangarides rosea*, ♂. 1.

The form *dharma* is much paler ochreous, the hind wing but slightly tinged with crimson; the white cell-spot large, without the black centre.

Hab. Sikkim; Bhutan; Burma. *Exp.*, ♂ 76–96, ♀ 106 millim.

Genus **PANDALA**.

Pandala, *Wlk. Cat. iv. p. 921 (1855).*

Type, *P. dolosa*, *Wlk.*

Range. Ceylon.

Palpi upturned and but slightly fringed with hair. Antennæ with the branches long. Legs with the spurs long. Fore wing short, broad, and rounded; the discocellulars oblique; veins 7, 8,

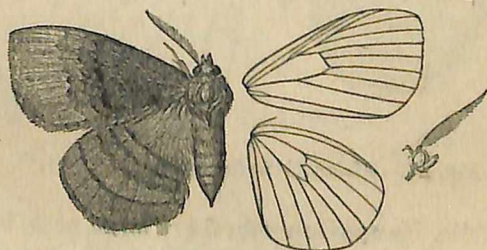


Fig. 26.—*Pandala dolosa*, ♂. 1.

9 stalked and given off before the end of the cell. Hind wing with the discocellulars slightly angled below vein 5; 6 and 7 from angle of cell.

49. ***Pandala dolosa***, *Wlk. Cat. iv, p. 922*; *Moore, Lep. Ceyl. ii, pl. 134, fig. 5*; *C. & S. no. 1338*.

♂. Dark purplish grey; fore wing crossed by three antemedial

indistinct waved lines, three postmedial and one straight sub-marginal line; hind wing by four waved postmedial lines and a curved submarginal line.

Hab. Ceylon. *Exp.* 48 millim.

Genus **MELANOTHRIX.**

Melanothrix, *Feld. Reis. Nov.* pl. 94, fig. 2, *Erkl.* p. 6 (1874).

Type, *M. nymphaliaris*, Wlk., from Java.

Range. Burma; Java.

Palpi upturned and thickly fringed with hair; antennæ with the branches moderately long. Legs hairy. Fore wing short and very broad, the apex much rounded, the upper discocellular very oblique; veins 6, 7, 8, 9 stalked. Hind wing with the upper discocellular short and oblique; veins 6 and 7 stalked; 8 much curved and remote from 7.

50. *Melanothrix leucotrigona*, n. sp.

♂. Head, thorax, abdomen, and wings glossy brown; fore wing with a large shining white triangular mark on the costa

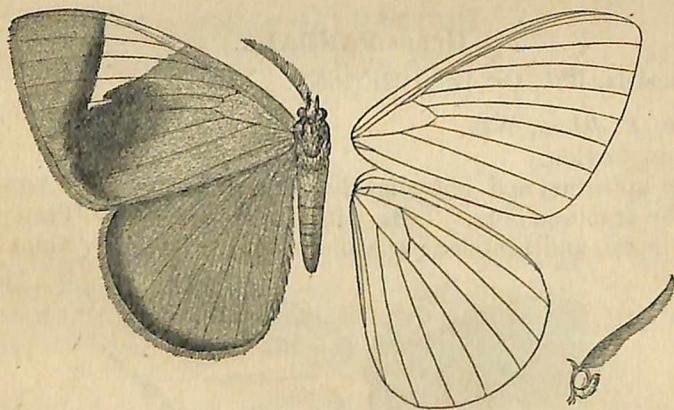


Fig. 27.—*Melanothrix leucotrigona*, ♂. ½.

beyond the middle, its apex on vein 5; a large area below it and its outer edge dark brown; hind wing with a marginal dark brown band.

Hab. Malewoon, Burma. *Exp.* 74 millim. Type in coll. Druce.

Genus **DREATA.**

Dreata, *Wlk. Cat.* iv. p. 902 (1855).

Type, *D. hades*, Wlk.

Range. Assam.

Palpi long and thickly fringed with hair. Fore wing short, with apex rounded; the discocellulars angled above and below vein 5; veins 7, 8, 9 stalked. Hind wing with the discocellulars angled above and below vein 5; 6 and 7 from angle of cell.

51. *Dreata hades*, *Wlk. Cat. iv*, p. 908; *Butl. Ill. Het. v*, pl. 97, fig. 7; *C. & S.* no. 1367.

♂. Head, thorax, and abdomen mouse-brown. Fore wing mouse-brown, the medial area pale; five indistinct waved lines; a

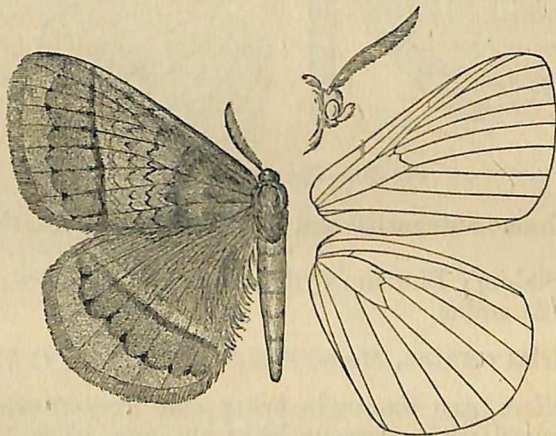


Fig. 23.—*Dreata hades*, ♂. 1.

nearly straight and erect prominent postmedial line; a waved submarginal line. Hind wing pale at base, without the waved lines; the postmedial line not so prominent; a submarginal waved line.

Hab. Assam. *Exp.* 72 millim.

Genus **PALIRISA.**

Palirisa, *Moore, Trans. Ent. Soc.* 1884, p. 360.

Type, *P. lineosa*, *Wlk.*

Range. E. Himalayas and Assam; Burma.

Palpi upturned and thickly fringed with hair. Antennæ with the branches short. Legs with the spurs short. Fore wing very broad, the apex rounded, the discocellulars oblique and angled above vein 5; veins 7, 8, 9 stalked. Hind wing with the discocellulars oblique and angled above vein 5.

52. *Palirisa lineosa*, *Wlk. Cat. iv*, p. 912; *Butl. Ill. Het. v*, pl. 98, fig. 4; *C. & S.* no. 1366.

Pale reddish ochreous. Fore wing crossed by six nearly straight

and erect lines, the fourth slightly waved and often obsolescent, the submarginal line curved and inwardly edged with grey. Hind

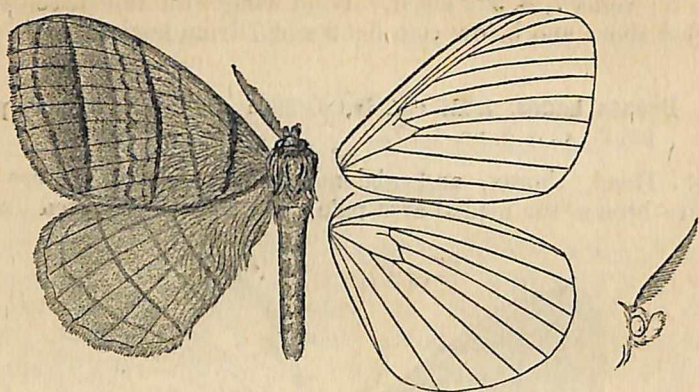


Fig. 29.—*Palirisa lineosa*, ♂. $\frac{2}{3}$.

wing with one antemedial and two postmedial lines, the outer line curved.

Hab. Sikkim; Bhutan; Sylhet; Nága Hills. *Exp.*, ♂ 100–110, ♀ 120–128 millim.

53. *Palirisa cervina*, Moore, *P. Z. S.* 1865, p. 807; *C. & S.* no. 1365.

♂. Differs from *lineosa* in being pale grey-brown; the palpi black, fringed with ochreous hair; antennæ black. Fore wing with only the medial and postmedial rufous lines present, the latter with a waved line beyond it, between which and the postmedial line the colour is darker. Hind wing with three obsolescent lines and no outer line.

In a specimen from Burma the palpi and antennæ are pale.

Hab. Sikkim; Bernardmyo, Burma. *Exp.* 104 millim.

Genus TAGORA.

Tagora, *Wlk. Cat.* v, p. 1188 (1855).

Sphingognatha, *Feld. Reis. Nov.* pl. 94, fig. 1, *Erkl.* p. 9 (1874).

Type, *T. patula*, Wlk.

Range. Throughout India and Ceylon; Sumatra; Borneo.

Palpi upturned and thickly fringed with hair. Fore wing produced at apex and very broad; the discocellulars nearly erect and angled above vein 5; 7, 8, 9 stalked. Hind wing with the discocellulars nearly erect and angled above vein 5; 6 and 7 from angle of cell.

SECT. I. Fore wing with apex much produced in female.

54. *Tagora patula*, *Wlk. Cat.* v, p. 1189; *Bull. Ill. Het.* v, pl. 98, fig. 1; *C. & S.* no. 1359.

Tagora undulosa, *Wlk. Cat.* v, p. 1196; *C. & S.* no. 1360.

Sphingognatha khasiana, Moore, *Lep. Atk.* p. 77.

♂. Head black; basal joint of antennæ with a tuft of pale hair; thorax, abdomen, and wings pale reddish ochreous. Fore wing usually with a hyaline spot at end of cell; two rufous oblique lines from lower angle of cell to inner margin; eight or nine indistinct dark waved lines; a double highly curved rufous postmedial line from the costa near apex to outer angle; a submarginal highly waved irregular indistinct dark line. Hind wing with a rufous

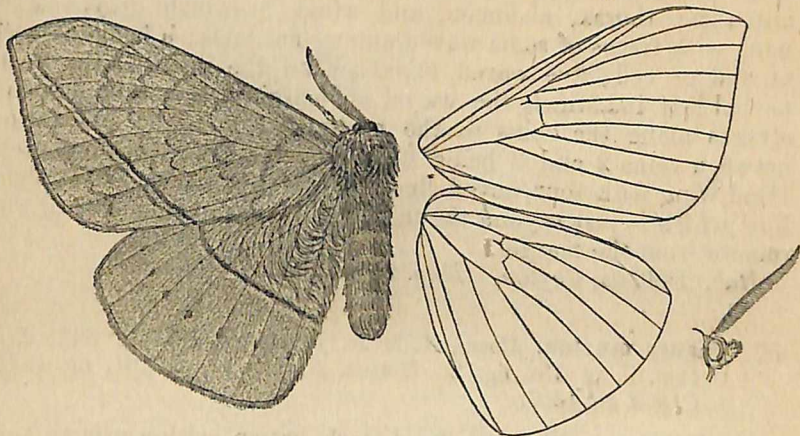


Fig. 30.—*Tagora patula*, ♂. 1.

subbasal line, obsolete except towards inner margin; about four very indistinct waved lines; the rufous postmedial line indistinct; an irregularly placed series of submarginal spots.

One specimen in Mus. Oxon. has vein 7 of the fore wing given off from 6 instead of 8.

♀. Suffused with fuscous; the apex of fore wing produced; the outer area of both wings suffused with grey; the oblique line of both wings single and prominent; the waved lines more distinct; two hyaline spots at end of cell of fore wing; the rufous postmedial line more distinct; a waved submarginal grey line to both wings.

Hab. Sikkim; Assam; Momeit, Burma. *Exp.*, ♂ 100, ♀ 130 millim.

SECT. II. Fore wing with apex slightly produced in female.

55. *Tagora pallida*, *Wlk. Cat.* iv, p. 912; *Butl. Ill. Het.* v, pl. 98, fig. 3; *C. & S.* no. 1362.
Sphingognatha asclepiades, *Feld. Reis. Nov.* pl. 94, fig. 1.

♂. Differs from *patula* in the head being dark red-brown; the tuft on basal joint of antennæ dark. Fore wing without the hyaline spot; the two medial waved lines are distant at costa and inner margin and nearly meet at middle; the double postmedial lines of both wings are dark, narrow, nearer together and less curved.

♀. Much suffused with brown; one hyaline spot at end of cell of fore wing.

Hab. Sylhet; Sumatra; Borneo. *Exp.*, ♂ 120, ♀ 180 millim.

56. *Tagora nigriceps*, *Hmps.* *Ill. Het.* ix, ined., pl. 161, fig. 19.

♂. Head black, with a tuft of pale hair on basal joint of antennæ; thorax, abdomen, and wings brownish grey. Fore wing with traces of some waved antemedial lines; a hyaline speck at end of cell; five waved lines beyond the middle; the postmedial line indistinct, the waved submarginal line sending dark streaks along the veins to the postmedial line, the undulation between veins 2 and 3 being filled in by a dark brown blotch. Hind wing with four waved lines before the postmedial straight line, which is just beyond the middle; the waved submarginal line remote from the margin.

Hab. Deltota, Ceylon. *Exp.* 96 millim.

57. *Tagora murina*, *Moore*, *A. M. N. H.* (4) xx, 1877, p. 347; *Lep. Ceyl.* ii, pl. 136, fig. 2; *Hmps.* *Ill. Het.* ix, pl. 161, fig. 18 ♀; *C. & S.* no. 1357.

♂. Greyish red-brown; head dark brown, with a pale tuft on basal joint of antennæ; fore wing with four indistinct antemedial lines; no hyaline speck at end of cell; five waved postmedial lines, the innermost nearly meeting the outermost antemedial line on the disk; the postmedial straight line double and distinct; the area between it and the outer waved line suffused with grey. Hind wing with four or five waved lines before the straight double line, which is some way beyond the middle; the waved outer line near the margin, the area beyond it suffused with grey.

♀. Much redder brown; fore wing with two hyaline spots at end of cell.

Hab. Pundaloya, Ceylon. *Exp.*, ♂ 84, ♀ 94 millim.

Genus **PSEUDOJANA**, nov.

Type, *P. incandescens*, Wlk.

Range. Sikhim.

Palpi upturned and thickly fringed with hair. Antennæ with the branches rather short in both sexes. Legs with the spurs long. Fore wing broad and rounded, the discocellulars nearly straight; veins 7, 8, 9 stalked. Hind wing with the discocellulars angled below vein 5; 7 given off just before the angle of cell.

58. *Pseudojana incandescens*, *Wlk. Cat.* iv, p. 910; *Butl. Ill. Het.* v, pl. 98, fig. 5; *C. & S.* no. 1363.

Head, collar, and prothorax dark chestnut-brown; meso- and

metathorax dull brown; abdomen bright reddish fulvous. Fore wing greyish brown; traces of a subbasal curved grey line; indistinct antemedial, medial, and postmedial erect straight dark lines, the last inwardly edged with grey; an indistinct submarginal line

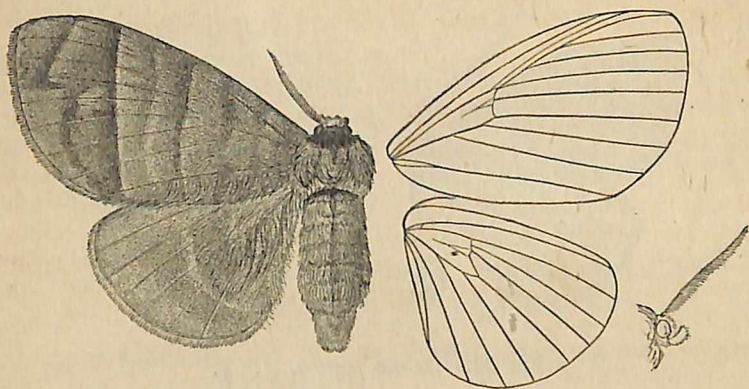


Fig. 31.—*Pseudojana incandescens*, ♂. $\frac{1}{2}$.

angled at vein 4. Hind wing duller brown; an indistinct medial curved line. Underside with a fiery red tinge; the wings crossed by a medial and oblique postmedial line.

Hab. Sikkim. *Exp.* 130 millim.

Genus **GANISA**.

Ganisa, *Wlk. Cat.* v, p. 1190 (1855).

Type, *G. postica*, *Wlk.*

Range. Throughout India and Ceylon.

Palpi upturned and thickly fringed with hair. Fore wing broad, the apex acute and produced; the discocellulars angled below vein 5; veins 7, 8, 9 stalked. Hind wing with the discocellulars oblique; veins 6 and 7 stalked or from cell. Legs with the spurs long.

SECT. I. Hind wing with veins 6 and 7 from angle of cell.

59. *Ganisa postica*, *Wlk. Cat.* v, p. 1190; *C. & S.* no. 1347.

Ganisa plana, *Wlk. Cat.* v, p. 1191; *Butl. Ill. Het.* v, pl. 96, figs. 4, 5; *C. & S.* no. 1346.

Ganisa similis, *Moore, Trans. Ent. Soc.* 1884, p. 359; *C. & S.* no. 1348.

♂. Head very dark brown; thorax, abdomen, and wings purplish grey-brown. Fore wing with an indistinct antemedial oblique line; a black and grey speck at end of cell; five indistinct waved dark lines; a double oblique, nearly straight line from apex to inner margin beyond the middle. Hind wing sometimes with a black speck at end of cell; three waved indistinct lines; the postmedial

line oblique and slightly waved, generally with a series of dark specks beyond it; cilia of both wings red-brown. Underside with the specks at end of cell and waved lines more distinct.

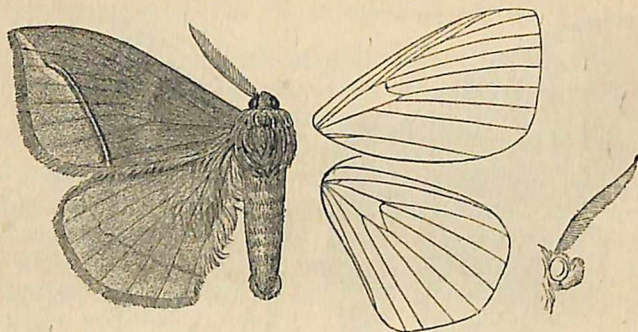


Fig. 32.—*Ganisa postica*, ♂. 1.

♀ with the apex of fore wing more produced.

Hab. Kulu; Kangra; Sikhim; Sylhet; Nágas; Ceylon. *Exp.* 68 millim.

SECT. II. Hind wing with veins 6 and 7 stalked.

60. ***Ganisa pandya***, Moore, *P. Z. S.* 1865, p. 807; *C. & S.* no. 1358.

Ganisa pallida, *Butl. Ill. Het.* v, p. 65, pl. 96, fig. 3; *C. & S.* no. 1345.

♂. Differs from *postica* in being fawn-colour; the head black. Fore wing with a pale speck at end of cell: hind wing without waved lines; a dark spot on inner margin; a medial dark line with ochreous outer edge; a submarginal series of black specks.

Hab. Sikhim; Bhutan; Sylhet. *Exp.* 90 millim.

61. ***Ganisa glaucescens***, *Wlk. Cat.* v, p. 1188; *Butl. Ill. Het.* v, pl. 96, figs. 1, 2; *C. & S.* no. 1356.

♂. Differs from *pandya* in being dark red-brown. Fore wing with a yellow speck at end of cell; two dark indistinct waved lines; the double postmedial line recurved below the costa, with fulvous between the two lines; the area between it and the outer waved line suffused with grey; a marginal grey line. Hind wing with the postmedial line curved; the markings of the outer area as on fore wing.

♀. More ochreous in tone, with hardly any grey suffusion on outer area.

Hab. Sikhim. *Exp.*, ♂ 80, ♀ 94 millim.

Genus **APHA.**

Apha, *Wlk. Cat.* v, p. 1180 (1855).

Prismosticta, *Butl. A. M. N. H.* (5) vi, p. 67 (1880).

Type, *A. subdives*, *Wlk.*

Range. Japan; Sikkim; Assam.

Palpi upturned and slightly fringed with hair. Antennæ with the branches short. Fore wing with the apex acute and produced; the discocellulars nearly straight; veins 7, 8, 9 stalked. Hind wing with the upper discocellular oblique; 6 and 7 stalked; 8 curved and remote from 7.

SECT. I. (*Apha*). Fore wing with vein 8 given off far before the apex; 10 absent.

62. ***Apha subdives***, *Wlk. Cat.* v, p. 1180; *Butl. Ill. Het.* v, pl. 94, figs. 7, 8; *C. & S.* no. 1344.

♂. Head vinous red-brown; thorax and abdomen purplish brown. Wings brownish ochreous. Fore wing with a purplish patch on the costa near the base; about four very indistinct antemedial waved lines; a speck at end of cell; four or five much waved indistinct postmedial lines approaching the antemedial lines below the cell; a very oblique dark and yellow line acutely angled

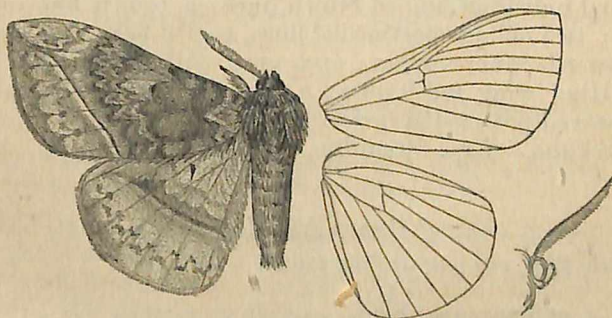


Fig. 33.—*Apha subdives*, ♂. 1.

below the apex and irregularly waved below the costa; outer area yellow, with two waved submarginal lines. Hind wing with traces of antemedial waved lines; an oblique medial line; a doubly dentate submarginal line formed like a series of the letter "W." Underside much more brilliantly coloured.

♀. Paler and yellower.

Hab. Khâsis; Sylhet; Nâgas. *Exp.*, ♂ 72, ♀ 86 millim.

63. **Apha floralis**, *Butl. Ill. Het.* v, p. 64, pl. 94, figs. 5, 6; *C. & S.* no. 1342.

♂. Differs from *subdivis* in the apex of the fore wing being much more produced and the costa straighter; thorax and abdomen ochreous, the former with the collar and tegulæ purplish; the latter with a rufous tinge. Wings bright yellow; fore wing with the area before the postmedial line less irregular; the inner submarginal line doubly dentate; the outer margin suffused with brown; hind wing with the area before the medial line suffused with pink, and the line itself bright pink; the submarginal line reduced to a series of dots on the nervules connected by a faint wavy line. Underside bright chestnut-brown, the outer area yellow.

♀. Without the purple suffusion on the fore wing, and much more pink suffusion.

Hab. Sikhim. *Exp.*, ♂ 64, ♀ 74 millim.

SECT. II. (*Prismosticta*). Fore wing with vein 8 given off near the apex; 10 present.

64. **Apha fenestrata**, *Butl. A. M. N. H.* (5) vi, 1880, p. 68; *id. Ill. Het.* vi, pl. 106, fig. 5; *C. & S.* no. 1107.

♀. Head, thorax, and abdomen red-brown; thorax with an olive tinge. Fore wing olive-brown; the costal and outer areas pale; two medial indistinct angled brown lines; a brown line on discocellulars; two oblique postmedial lines, angled below the costa and waved towards inner margin; apex grey, with a triangular hyaline patch. Hind wing red-brown; a line on discocellulars and two slightly waved postmedial brown lines.

Hab. Sikhim. *Exp.* 50 millim.

Genus **APONA**.

Apona, *Wlk. Cat.* vii, p. 1762 (1856).

Type, *A. cashmirensis*, Koll.

Range. N.W. Himalayas, Nilgiris, Shevaroy; Ceylon.

Palpi slight, porrect, and very hairy. Antennæ with the branches very long and slender in the male, shorter in the female. Legs with the spurs very long. Fore wing broad, with the outer margin rounded; the discocellulars nearly straight; veins 7, 8, 9 stalked. Hind wing with the discocellulars angled below vein 5, which is given off near upper angle of cell; veins 6 and 7 from the angle.

SECT. I. Fore wing with the apex more or less produced.

65. **Apona cashmirensis**, *Koll. Hüg. Kasch.* iv, p. 472, pl. 21, fig. 4; *C. & S.* no. 1349.

Apona pallida, *Wlk. Cat.* vii, p. 763; *C. & S.* no. 1350.

♂. Head, thorax, and abdomen red-brown; shaft of antennæ white. Wings pale red-brown. Fore wing with an indistinct waved subbasal line; a black spot at end of cell; an oblique medial line, with three indistinct waved lines beyond it; a double post-medial line with the interspace pale; a waved submarginal line,

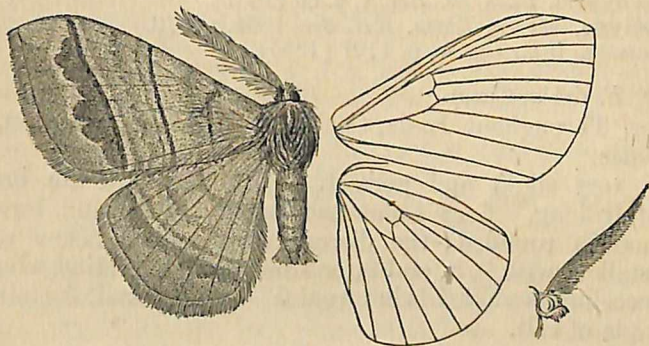


Fig. 34.—*Apona cashmirensis*, ♂. $\frac{1}{2}$.

the space between it and the postmedial line darker; the nervules dark from the medial to submarginal line. Hind wing with no subbasal line; the other lines curved. Cilia of both wings dark.

♀. Pale greyish white; the markings as in male.

Hab. N.W. Himalayas; Sikkim. *Exp.*, ♂ 114, ♀ 96 millim.

SECT. II. Fore wing with the apex not produced.

66. *Apona plumosa*, Moore, *P. Z. S.* 1872, p. 579; *Hmps.* *Ill. Het.* viii, pl. 142, fig. 12; *C. & S.* no. 1351.

♂. Differs from *cashmirensis* in being darker red-brown. Fore wing with the medial line curved below the costa; but faint traces of the waved lines; the postmedial line whitish inwardly, rufous outwardly; the outer area darker, without a waved line, the veins crossing it rufous. Hind wing with the waved and postmedial lines almost obsolete; the outer area dark, without a waved line.

♀. The waved medial lines more distinct on both wings; the postmedial line dark brown.

Hab. Nilgiri plateau. *Exp.*, ♂ 94, ♀ 102 millim.

67. *Apona shevaroyensis*, Moore, *Trans. Ent. Soc.* 1884, p. 373; *C. & S.* no. 1352.

♂. Differs from *plumosa* in being duller brown; fore wing with the antemedial line obsolete; the medial and postmedial lines more oblique; the waved lines more distinct.

Hab. Nilgiri plateau; Shevaroys; Ceylon. *Exp.* 134 millim.

Genus **EUPTEROTE.**

- Eupterote*, *Hübner, Verz.* p. 187 (1818).
Murlida, *Moore, Lep. E. I. C.* p. 422 (1857).
Brachytera, *Feld. Reis. Nov.* pl. 95, fig. 1 (1874).
Horanpella, *Moore, Lep. Ceyl.* ii. p. 143 (1883).
Leptojana, *Butl. Ill. Het.* v, p. 68 (1881).
Pachyjana, *Butl. Ill. Het.* v, p. 69 (1881).
Spalyria, *Moore, Trans. Ent. Soc.* 1884, p. 370.
Messata, *Wlk. Cat.* v, p. 1107 (1855).

Type, *E. fabia*, Cram.

Range. Throughout India, Ceylon, and Burma; Sumatra, Java, Philippines.

Palpi very slight and porrect. Antennæ with the branches moderately long. Legs somewhat hairy. Fore wing broad, the outer margin rounded; the discocellulars angled below vein 5; vein 6 stalked with 7, 8, and 9, or from the cell. Hind wing with the discocellulars angled below vein 5; veins 6 and 7 stalked or from angle of cell.

SECT. I. Female without patches of raised scales.

68. ***Eupterote undata***, *Blanch., Jacq. Voy. Inde, Zool. Ins.* p. 23, pl. 1, fig. 8; *C. & S.* no. 1410.
Dreata undifera, *Wlk. Cat.* iv, p. 904.
Eupterote nigricans, *Moore, Trans. Ent. Soc.* 1884, p. 365; *C. & S.* no. 1397.
Eupterote diabolica, *Swinh. P. Z. S.* 1885, p. 303; *C. & S.* no. 1381.
Eupterote hirsuta, *Swinh. Trans. Ent. Soc.* 1891, p. 139.
Eupterote variegata, *Moore, Trans. Ent. Soc.* 1884, p. 362; *C. & S.* no. 1411.
Eupterote sinuata, *Moore, Trans. Ent. Soc.* 1884, p. 363; *C. & S.* no. 1404.
Eupterote caliginosa, *Moore, Trans. Ent. Soc.* 1884, p. 367; *C. & S.* no. 1372.
Eupterote subdita, *Moore, Trans. Ent. Soc.* 1884, p. 361; *C. & S.* no. 1405.
Eupterote vinosa, *Moore, Trans. Ent. Soc.* 1884, p. 361; *C. & S.* no. 1412.
Eupterote affinis, *Moore, Trans. Ent. Soc.* 1884, p. 369; *C. & S.* no. 1368.
Eupterote cupreipennis, *Moore, Trans. Ent. Soc.* 1884, p. 361; *C. & S.* no. 1379.
Eupterote invalida, *Butl. Ill. Het.* v, p. 68, pl. 97, figs. 3, 4; *C. & S.* no. 1391.
Eupterote persimilis, *Moore, Trans. Ent. Soc.* 1884, p. 368; *C. & S.* no. 1401.
Dreata taoensis, *Moore, P. Z. S.* 1878, p. 848, pl. 53, fig. 7; *C. & S.* no. 1407.
Eupterote similis, *Moore, Trans. Ent. Soc.* 1884, p. 369; *C. & S.* no. 1403.
Eupterote castanoptera, *Moore, Trans. Ent. Soc.* 1884, p. 365; *C. & S.* no. 1374.
Eupterote cinnamomea, *Moore, Trans. Ent. Soc.* 1884, p. 368; *C. & S.* no. 1375.

- Eupterote consimilis*, Moore, *Trans. Ent. Soc.* 1884, p. 364; *C. & S.* no. 1377.
Eupterote dissimilis, Moore, *Trans. Ent. Soc.* 1884, p. 368; *C. & S.* no. 1384.
Eupterote assimilis, Moore (*dissimilis* misprint), *Trans. Ent. Soc.* 1884, p. 363.
Eupterote griseipennis, Moore, *Trans. Ent. Soc.* 1884, p. 362; *C. & S.* no. 1386.
Dreata imbecilis, *Wlk. Cat.* iv, p. 905; *Butl. Ill. Het.* v, pl. 97, fig. 2; *C. & S.* no. 1389.
Eupterote ignavus, *Swinh. P. Z. S.* 1886, p. 440; *C. & S.* no. 1388.
Eupterote suffusa, Moore, *Trans. Ent. Soc.* 1884, p. 362; *C. & S.* no. 1406.
Eupterote fraterna, Moore, *P. Z. S.* 1888, p. 406; *Butl. Ill. Het.* vii, pl. 123, fig. 1; *C. & S.* no. 1385 A.
Eupterote decorata, Moore, *Trans. Ent. Soc.* 1884, p. 369; *C. & S.* no. 1380.

Fore wing with eight indistinct waved lines, any or all of which may become obsolete, this occurring in similarly coloured specimens from the same locality; two postmedial lines which are always present, with a highly waved line beyond them; some forms have three dark spots below the costa between the postmedial and waved lines and two towards inner margin. Hind wing without lines on basal area; five waved lines before the two postmedial lines; some spots between the postmedial and waved lines, which may be obsolete or become a complete series.

The form *nigricans*=*diabolica*, from Jubbulpore, Saugor, Belgaum (♂ 110 millim.), is the darkest; umber-brown, with all the lines and spots inside the waved line present.

Sinuata, from the Himalayas (♂ 116 millim.), has the ground-colour paler umber-brown, especially between the postmedial and waved lines; the markings similar.

Undata=*undifera*=*vinosa*=*affinis*, from Jubbulpore and Sikhim (♂ 94–102, ♀ 106 millim.), has a slightly redder tinge, the collar in some specimens yellowish; female with the ground-colour redder or yellowish.

Caliginosa, from Jubbulpore (♂ 82 millim.), is dusky brown, the submarginal spots well defined.

Subdita, from Jubbulpore (♂ 82 millim.), is a small dark red-brown form, the collar yellowish.

Hirsuta, from Khandalla (♂ 110 millim.), has the collar yellow, wings with the ground-colour yellow and much suffused with reddish umber so as to obscure the waved lines; the spot near inner margin of fore wing black and conspicuous.

Variegata, from Jubbulpore (♂ 92 millim.), is redder in tone, the spot indistinct.

Cupreipennis, from Madras (♂ and ♀ 110 millim.), is nearest *undata*, but has a reddish-coppery tinge; the male has a large black patch on the middle of the costa of the fore wing; the female paler, with the markings rather indistinct.

Invalida = *taoensis* = *imbecilis* = *cinnamomea* = *similis* = *consimilis*



=*castanoptera*=*persimilis*, from throughout India and Burma (♂ 78, ♀ 90 millim.), is paler cinnamon-brown, with no spots inside the waved line; the collar yellowish; female redder.

Dissimilis = *suffusa* = *ignavus* = *assimilis* = *griseipennis*, from N.W. India and Mhow (♂ 81-94, ♀ 94 millim.), has spots inside the waved line.

Fraterna, from Dharmasāla (♂ 90 millim.), is pale vinous brown, with the waved lines obsolescent, except one medial line on fore wing.

Decorata, from the Punjab (♂ 92 millim.), has the ground-colour yellow; the red-brown markings broad and prominent; apex of fore wing suffused with red-brown.

Hab. Throughout N. India, and as far south as the Nilgiris; Burma. *Exp.* 74-110 millim.

69. **Eupterote fabia**, *Cram. Pap. Exot.* iii, pl. 250 B; *C. & S.* no. 1385.
Eupterote gyra, *Swinh. P. Z. S.* 1885, p. 303; *C. & S.* no. 1387.
Eupterote alterata, *Moore, Trans. Ent. Soc.* 1884, p. 366; *C. & S.* no. 1369.
Eupterote discordans, *Butl. Ill. Het.* v, p. 66, pl. 96, figs. 6, 7; *C. & S.* no. 1383.
Eupterote mutans, *Wlk. Cat.* iv, p. 904; *C. & S.* no. 1396.
Eupterote auriflua, *Moore, Trans. Ent. Soc.* 1884, p. 364; *C. & S.* no. 1371.
Eupterote immutata, *Moore, Trans. Ent. Soc.* 1884, p. 366; *C. & S.* no. 1390.
Eupterote permutata, *Moore, Trans. Ent. Soc.* 1884, p. 366; *C. & S.* no. 1400.
Eupterote fasciata, *Moore, Lep. Ceyl.* iii, p. 544, pl. 212, fig. 1.
Eupterote ochripicta, *Moore, P. Z. S.* 1879, p. 410; *Lep. Ceyl.* ii, pl. 136, figs. 1, 1 a, b (larva); *C. & S.* no. 1399.
Eupterote lucia, *Butl. A. M. N. H.* (5) xvi, 1885, p. 346, pl. 8, fig. 4; *C. & S.* no. 1333.

♂. Differs from *undata* in having the ground-colour bright yellow.

♀ of some forms brown, as in *undata*, in others suffused with bright red-brown, in others yellow.

The line drawn between the *fabia* and *undata* sets of forms is purely artificial, and merely for convenience.

The form *discordans*, from Calcutta (♂ 80-94, ♀ 88 millim.), has the male bright yellow, the waved lines, postmedial lines, and outer waved line very prominent; the yellow may have an olive tinge, or the head, thorax, abdomen, and base and outer margin of fore wing may be yellow, whilst the whole medial area is suffused with umber-brown; the female is brown, and similar to that sex of *invalida*.

Mutans=*immutata*=*permutata*=*auriflua*, from Sikhim, Nepal, Malabar (♂ 94, ♀ 106 millim.), is yellow, the waved lines almost obsolete, the postmedial lines and spots red-brown; female much more suffused with red.

Alterata, from Sikkim (♂ 112 millim.), is brighter yellow; all the markings indistinct, except the spots within the waved line of the fore wing; female brown.

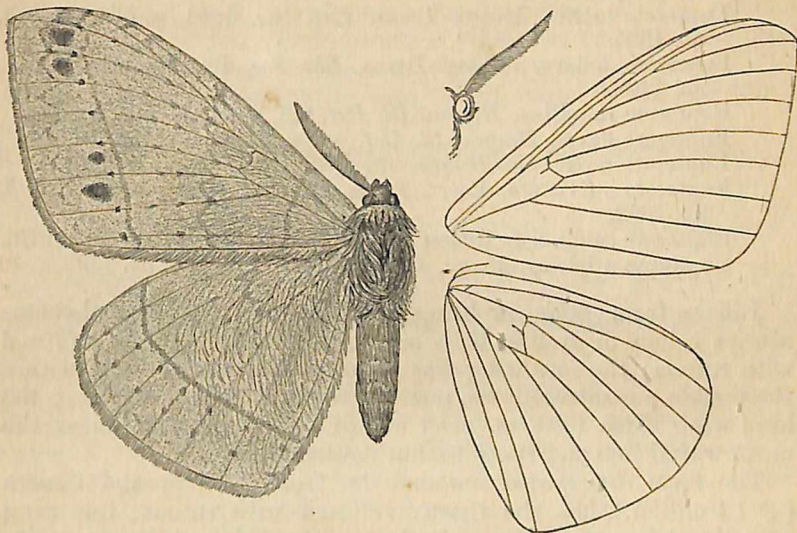


Fig. 35.—*Eupterote fabia*, ♂. 1.

Fabia, from Madras (♂ 90 millim.), is chrome-yellow, the waved lines of both wings obsolescent; the inner postmedial line very strongly marked, the spots below the costa of fore wing forming a blotch; hind wing with the waved outer line obsolete.

Gyra, from Belgaum (♂ 102 millim.), has the spots towards inner margin of fore wing and waved outer line of hind wing present.

Ochripicta=*fasciata*, from Ceylon (♂ 130, ♀ 116–130 millim.), has the spots below the costa of fore wing separate; in the female the colour is mustard-yellow, the waved lines coming out very strongly red-brown, or both wings may be almost wholly suffused with bright chestnut, so as to obscure the markings; head, thorax, and abdomen yellowish brown.

Larva of the form *ochripicta* is dark purplish brown; dorsal tufts of long and short hair; lateral and sublateral short tufts; three paired series of white dots on each somite; a series of red subdorsal spots on 5th to 11th somites.

Cocoon pale brown.

Hab. Sikkim; throughout N. and S. India; Ceylon. *Exp.* 90–130 millim.

70. *Eupterote mollifera*, *Wlk. Cat.* xxxii, p. 376; *C. & S.* no. 1394.
Apha flava, *Moore, Trans. Ent. Soc.* 1884, p. 359; *C. & S.* no. 1341.
Tagora anthereata, *Wlk. Cat.* xxxii, p. 512.

- Bomochroa ornata*, *Feld. Reis. Nov.* pl. 94, fig. 3.
Tagora discrepans, *Moore, Trans. Ent. Soc.* 1884, p. 360; *C. & S.* no. 1355.
Eupterote contaminata, *Moore, Trans. Ent. Soc.* 1884, p. 363; *C. & S.* no. 1378.
Eupterote mollis, *Moore, Trans. Ent. Soc.* 1884, p. 367; *C. & S.* no. 1395.
Eupterote todara, *Moore, Trans. Ent. Soc.* 1884, p. 364; *C. & S.* no. 1408.
Eupterote rufodisca, *Hmps. Ill. Het.* viii, p. 64, pl. 142, fig. 11.
Eupterote flavia, *Hmps. Ill. Het.* viii, p. 64, pl. 142, fig. 10.
Eupterote rectifascia, *Hmps. Ill. Het.* viii, p. 65, pl. 142, fig. 4.
Eupterote lativittata, *Moore, Trans. Ent. Soc.* 1884, p. 367; *C. & S.* no. 1392.
Eupterote canaraica, *Moore, P. Z. S.* 1879, p. 410; *C. & S.* no. 1373.
Eupterote nilgirica, *Moore, Lep. Atk.* p. 77; *C. & S.* no. 1398.

Differs from *fabia* in being smaller, with the ground-colour always yellow or drab in both sexes, often more or less suffused with rufous; the fore wing has at most five waved lines within the double postmedial lines, one of which is often obsolete; the hind wing three lines at most within the postmedial lines; the outer waved line and spots within it variable.

The form *discrepans*=*contaminata*, from Bombay and Canara (♂ 84 millim.), has the thorax suffused with rufous; fore wing with the rufous waved lines obsolete on the disk and inner margin; neither wing with spots inside the outer waved line, but a rufous suffusion between it and the outer postmedial line; a rufous spot on inner margin of hind wing near the base; cilia dark rufous-brown.

Mollifera=*flava*=*anthereata*=*ornata*, from the Nilgiris and Ceylon (♂ 64, ♀ 80 millim.), has, in the male, the fore wing more uniformly suffused with brownish rufous; the spots inside the outer waved line of both wings present, those towards the costa of fore wing grey; female yellower, with the grey spots larger and forming a more complete series.

Mollis=*todara*, from Bombay and the Nilgiris (♂ 64, ♀ 72 millim.), has the cilia yellow, the postmedial lines indistinct, the black spots near inner margin of fore wing prominent, the inner postmedial line of hind wing nearer the base; its variety *rufodisca*, from the Nilgiris (♂ 68 millim.), has the costa and whole medial area of fore wing suffused with rufous.

Flavia, from the Nilgiris (♂ 72 millim.), is much paler yellow; the spots within the outer waved line of both wings dark, not grey; cilia of fore wing brown below the apex.

Rectifascia, from the Nilgiris (♂ 70 millim.), is pale dull brown, the markings indistinct, except the inner postmedial line of both wings, which appears as a strong dark line.

Canaraica=*lativittata*, from Bombay, Canara, and the Nilgiris (84 millim.), has the male yellow, much suffused with red-brown, the outer margin of both wings red-brown; female brownish ochreous, the fore wing with one subbasal, and both wings with one

medial waved line; the postmedial line, the spots, and outer waved line prominent.

Nilgirica is without the postmedial waved line.

Larva of the form *mollifera* is whitish speckled with black; dorsal tufts of black hairs on each somite arising from a whitish hump; a dorsal blue-black band; a subdorsal pinkish band traversed by a grey line; a series of small lateral black spots; sub-lateral area purplish grey with long hairs; stigmata and legs pink; head black.

Hab. Throughout S. India and Ceylon. *Exp.* 64–84 millim.

71. **Eupterote flavicollis**, *Guér. Voy. Deless. Hist. Nat.* p. 94, pl. 27, fig. 1; *C. & S.* no. 1415.

Bombyx collaris, *Guér. Voy. Deless. Hist. Nat.* p. 95; *C. & S.* no. 1414.

Bombyx adolphæi, *Guér. Voy. Deless. Hist. Nat.* p. 96; *C. & S.* no. 1413.

♂. Differs from typical *mollifera* in the thorax being red-brown. Fore wing with five or six waved lines before the postmedial line, which is curved; the grey spots take the form of a complete waved band and are further from the postmedial line; between the line and grey band is a conjoined series of dark spots, those towards inner margin largest. Hind wing with a single postmedial curved line, and sometimes medial and outer lines. Underside with medial, postmedial, and outer waved lines.

♀. Reddish brown; the collar not yellow; abdomen brown; both wings with an indistinct postmedial line; fore wing with the submarginal grey band nearly straight.

The form *adolphæi* is dark brown, the collar yellow, the fore wing suffused with grey; *flavicollis* is yellowish grey-brown; *collaris* paler and redder.

Hab. Nilgiri plateau. *Exp.*, ♂ 60–72, ♀ 75 millim.

72. **Eupterote diffusa**, *Wlk. Cat.* xxxii, p. 374; *Moore, Lep. Ceyl.* ii, pl. 135, fig. 2; *C. & S.* no. 1382.

♂. Differs from *mollifera* in having the head brown; the thorax, abdomen, and wings vary in colour from greyish white to dull ochreous brown; the postmedial line single, curved on both wings, and much nearer the margin; the waved lines fairly distinct or obsolescent, as are the spots and outer waved line; cilia brown.

Hab. Ceylon. *Exp.* 66 millim.

73. **Eupterote primularis**, *Moore, Trans. Ent. Soc.* 1884, p. 371; *C. & S.* no. 1421.

♂. Differs from *diffusa* in being very pale primrose-yellow; both wings without waved lines near the base; a well-marked medial line, which is curved and waved on the fore wing, waved

on the hind wing. Fore wing with the postmedial line yellow-brown, straight, oblique, and arising from the costa near the apex; the two spots towards inner margin prominent; the outer line more or less prominent; the costa yellow-brown. Hind wing with the postmedial line curved, the spots and outer waved line somewhat indistinct.

Hab. Nilgiris, S. slopes, 3000 feet. *Exp.* 58 millim.

74. **Eupterote geminata**, *Wlk. Cat.* iv, p. 907; *Moore, Lep. Ceyl.* ii, pl. 137, figs. 2, 2 a; *C. & S.* no. 1419.

? *Phalæna petosiris*, *Cram. Pap. Exot.* iv, pl. 397 D; *C. & S.* no. 1402.

Dreata anada, *Moore, Lep. E. I. C.* pl. 365; *C. & S.* no. 1370.

Brachytera phalænaria, *Feld. Reis. Nov.* pl. 95, fig. 1; *C. & S.* no. 1420.

Horanpella placida, *Moore, Lep. Ceyl.* ii, p. 143, pl. 137, figs. 1, 1 a; *C. & S.* no. 1332.

Dreata lineata, *Wlk. Cat.* iv, p. 907; *C. & S.* no. 1430.

♂. Fore wing with a single medial indistinct slightly curved line; both wings with a prominent postmedial slightly curved line.

♀. Duller, the medial line of fore wing absent.

Typical *geminata* is bright ochreous yellow; one or two prominent dark spots below the costa of fore wing and two towards inner margin. Hind wing with similar but less prominent spots. In *anada* and *phalænaria* these spots are absent; *placida* is suffused with dull brown, the spots present, but not prominent; one ♀ has the head and thorax fuscous; *lineata* has the spots absent.

Hab. N. India; Canara; Ceylon. *Exp.*, ♂ 58, ♀ 66–80 millim.

75. **Eupterote minor**, *Moore; Cotes, Museum Notes, ined.*

♂. Differs from *geminata* in the two lines of the fore wing being more erect and curved below the costa; the two lines of the hind wing more curved and less oblique. Head yellowish.

The colour varies from pale dull ochreous to pale reddish, the latter with traces of the submarginal line to both wings.

♀. Dark red-brown; the lines of both wings further apart; a dark spot on the inner line of fore wing at end of cell; cilia grey at tips.

Hab. Shwebo, Burma. *Exp.*, ♂ 46–55, ♀ 50 millim.

76. **Eupterote lineosa**, *Wlk. Cat.* vi, p. 1440; *Butl. Ill. Het.* v, pl. 96, fig. 9; *C. & S.* no. 1418.

Murlida fraterna, *Moore, Trans. Ent. Soc.* 1884, p. 371; *C. & S.* no. 1417.

Fore wing with the postmedial line single, almost straight, and oblique, with at most five waved lines before it; the two spots beyond it towards costa and two towards inner margin generally present; the outer waved line indistinct.

The colour varies from pale primrose-yellow to bright ochreous yellow.

Hab. Nepal; Sikhim; Nilgiris; Ceylon. *Exp.*, ♂ 70-82, ♀ 85-90 millim.

77. **Eupterote undans**, *Wlk. Cat. iv*, p. 905; *Butl. Ill. Het. v*, pl. 97, fig. 6; *C. & S.* no. 1409.

♂. Head, thorax, and abdomen reddish brown; wings grey-brown irrorated with dark scales. Fore wing with six highly waved lines. Hind wing with three nearly straight indistinct lines and a highly waved submarginal line.

Hab. Mahableshwar; Bangalore; Assam; Nilgiris. *Exp.* 60 millim.

78. **Eupterote testacea**, *Wlk. Cat. iv*, p. 906; *Butl. Ill. Het. v*, pl. 97, fig. 1; *C. & S.* no. 1416.

Head and thorax fulvous yellow; abdomen and wings pale ochreous yellow. Fore wing crossed by two antemedial and two medial, nearly straight indistinct dark lines; a double postmedial similar line, the inner line well defined; a waved submarginal line; the basal and outer areas irrorated with dark scales. Hind wing with an antemedial line; a double postmedial line; a diffused submarginal curved line.

Hab. Cachar; Sylhet; Khásis; Bernardmyo, Burma. *Exp.*, ♂ 68, ♀ 86 millim.

79. **Eupterote translata**, *Swinh. P. Z. S.* 1885, p. 304, pl. 21, fig. 5; *C. & S.* no. 1434.

♂. Differs from *testacea* in being pale ochreous brown. Fore wing with antemedial, medial, and postmedial indistinct lines; the prominent postmedial line single; the submarginal line nearer the margin. Hind wing without the antemedial line; the postmedial line single and straighter; the submarginal line better defined.

Hab. Satara; Poona; Nilgiris. *Exp.* 54 millim.

80. **Eupterote flavida**, *Moore, Trans. Ent. Soc.* 1884, p. 372; *C. & S.* no. 1428.

Messata acinea, *Swinh. Trans. Ent. Soc.* 1891, p. 141.

Colour yellow, in typical *flavida* with a slight ruddy tinge. Fore wing crossed by three slightly curved oblique bands of blackish scales from near the apex to inner margin, towards which they diverge; the middle band often obsolete.

Hab. N. Canara; Khandála; Nilgiris. *Exp.* 74 millim.

81. **Eupterote plumipes**, *Wlk. Cat. iv*, p. 907; *C. & S.* no. 1431; *Moore, Lep. Ceyl. ii*, pl. 133, fig. 5.

Messata rubiginosa, *Wlk. Cat. v*, p. 1108.

Messata quadrifasciata, *Moore, P. Z. S.* 1879, p. 409; *C. & S.* no. 1432.

Messata similis, *Moore, Lep. Ceyl. ii*, p. 139, pl. 133, fig. 4; *C. & S.* no. 1433.

♂. Fore wing with three indistinct waved medial bands; an oblique dark band from apex to centre of inner margin; a submarginal indistinct band. Hind wing with traces of medial and submarginal bands in some specimens.

♀. Fore wing with the medial waved lines and submarginal line very indistinct.

The colour in typical *plumipes* is reddish brown, in the female very dark vinous brown; in the form *quadrifasciata* brownish ochreous, in *similis* and *anesceus* yellow.

Hab. Ceylon. *Exp.*, ♂ 64, ♀ 70 millim.

82. *Eupterote vialis*, Moore, *P. Z. S.* 1879, p. 409; *id. Lep. Ceyl.* ii, pl. 134, fig. 4; *C. & S.* no. 1436.

♂. Differs from *plumipes* in the hairs of the thorax being tipped with yellow. Fore wing without the medial and submarginal lines; the oblique band inwardly dark brown, outwardly yellow.

Hab. Ceylon. *Exp.* 71 millim.

SECT. II. Female with patches of raised scales at outer angle of fore wing on underside and at apex of hind wing on upper-side.

83. *Eupterote citrina*, Wlk. *Cat.* iv, p. 905; *C. & S.* no. 1376.

♂. Antennæ rufous; head, collar, and prothorax fuscous; meso- and metathorax pale yellowish white; abdomen pale reddish brown clothed with yellow hair; wings uniform pale yellowish white.

♀. Antennæ, head, and thorax yellowish white; the patches of raised scales ochreous.

Hab. Deccan; Bombay; Central India, and ?Sikhim. *Exp.*, ♂ 84, ♀ 50-86 millim.

84. *Eupterote unicolor*, Hmps. *Ill. Het.* viii, p. 65, pl. 142, fig. 8.

♂. Head, thorax, and abdomen red-brown. Wings vinous red-brown; an almost obsolete postmedial line, curved below the costa, and with traces of some spots beyond it; the abdomen and costa of hind wing sometimes yellowish.

♀. Paler; fore wing with antemedial and medial lines curved below the costa; both wings with the postmedial line, but no spots beyond; the patches of raised scales vinous.

Hab. Madras; Nilgiris. *Exp.*, ♂ 72, ♀ 68 millim.

Genus NISAGA.

Nisaga, Wlk. *Cat.* iv, p. 885 (1855).

Type, *N. simplex*, Wlk.

Range. Assam and throughout S. India.

Palpi very thickly clothed with hair, slight and porrect. Antennæ with the branches very long in male. Fore wing short and broad, the outer margin rounded; the discocellulars angled below vein 5, which is given off near the angle of cell, 11 arising some way before veins 7, 8, 9, which are stalked. Hind wing with the discocellulars angled below vein 5; veins 6 and 7 stalked.

85. **Nisaga simplex**, *Wlk. Cat. iv*, p. 885; *C. & S. no. 1438*.

Nisaga modesta, *Moore, Trans. Ent. Soc. 1884*, p. 373; *C. & S. no. 1437*.

♂. Head, thorax, and abdomen reddish brown. Fore wing whitish, yellowish, or reddish brown; the interspaces with very

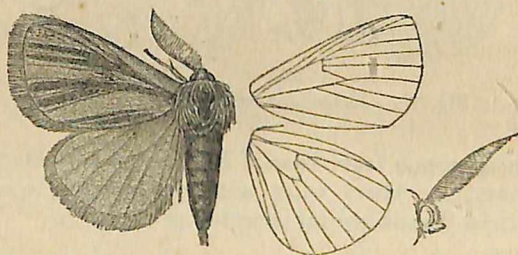


Fig. 36.—*Nisaga simplex*, ♂. 1.

broad dark red-brown streaks, which may be partially or (in the form *modesta*) quite obsolete.

Hab. Khási Hills; throughout S. India. *Exp.* 42–50 millim.

Genus **SANGATISSA**.

Sangatissa, *Moore, Lep. Ceyl. ii*, p. 143 (1883).

Type, *S. subcurvifera*, *Wlk.*

Range. N.W. Himalayas; throughout S. India and Ceylon; Yunnan.

Palpi slight, porrect, and thickly clothed with hair. Antennæ with the branches very long in the male, short in female. Fore wing produced at apex, the outer angle rounded; the discocellulars angled below vein 5, which is given off just below the angle; vein 6 stalked with 7, 8, 9, or from the angle, vein 11 arising some way before the angle. Hind wing narrow; the discocellulars angled below vein 5; veins 6 and 7 stalked.

86. **Sangatissa subcurvifera**, *Wlk. Cat. xxxii*, p. 375; *C. & S. no. 1424*; *Moore, Lep. Ceyl. ii*, pl. 134, fig. 6.

Sangatissa albipars, *Moore, Trans. Ent. Soc. 1884*, p. 372; *C. & S. no. 1422*.

Dreata triseriata, *Butl. P. Z. S.* 1875, p. 393; *C. & S.* no. 1425.

Dreata citrinula, *Wlk. Cat.* xxxii, p. 376; *C. & S.* no. 1423.

Nisaga teta, *Swinh. Trans. Ent. Soc.* 1891, p. 140.

♂. Head, thorax, and abdomen pale brown. Wings whitish brown. Fore wing with three blackish curved bands—one from the

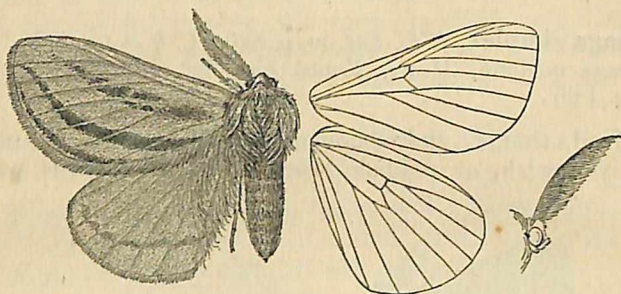


Fig. 37.—*Sangatissa subcurvifera*, ♂. †.

base to near apex, one from base of inner margin to apex, the other on outer margin. Hind wing with submarginal and marginal bands; all these bands are interrupted at the veins.

♀ browner.

The variety *albipars* has the bands obsolescent; the form *triseriata*, from the Pulney Hills, is much yellower in colour; whilst *citrinula*=*teta* is yellow, with the bands obsolete except a trace of the upper one.

Hab. N.W. Himalayas; throughout S. India and Ceylon; Yunnan.
Exp. 60 millim.

Genus **CNETHOCAMPA.**

Cnethocampa, *Steph. Ill. Brit. Ent., Haust.* ii, p. 46 (1829).

Type, *C. processionea*, Linn., from Europe.

Range. Europe; N. India.

Palpi minute, hairy, and porrect; frons with a large corneous ridge hollowed out in front; antennæ bipectinated in both sexes, the branches stiff and longer in the male than in the female; legs hairy; mid and hind tibiæ with minute terminal pairs of spurs; abdomen of female with a large anal tuft. Fore wing with the apex rather produced upwards; vein 5 from the centre of discocellulars; 6 from angle of cell; 7, 8, 9, 10 stalked. Hind wing with veins 3 and 4 stalked, 5 from the centre of discocellulars, 6 and 7 stalked.

87. *Cnethocampa cheela*, *Moore, P. Z. S.* 1883, p. 18, pl. v, figs. 3, 3 a; *C. & S.* no. 1045.

♂. Head, thorax, and abdomen pale and dark brown; antennæ

ochreous. Fore wing grey, with a few dark hairs; subbasal, medial, and postmedial slightly irregular black lines edged with orange,

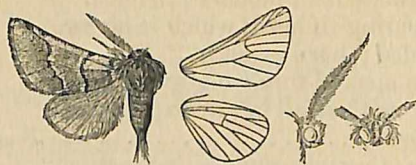


Fig. 38.—*Cnethocampa cheela*, ♂. $\frac{1}{1}$.

the medial line externally, the other two internally. Hind wing pale grey.

♀. Abdomen red-brown, the anal tuft dark brown.

Hab. Simla. *Exp.*, ♂ 34, ♀ 38 millim.

The following species formerly recorded as Indian are omitted.

Apha lanuginosa, Wlk., C. & S. no. 1343. Type lost, description unrecognizable.

Messata tristis, Feld., C. & S. no. 1435, is from *S. Africa*.

Family SPHINGIDÆ.

Diurnal or crepuscular Lepidoptera with powerful flight, which feed on the wing; characterized by the antennæ being gradually thickened into a club, which is pointed at the tip, and nearly always hooked, with a small tuft of hair at the extremity: in the males of nearly all the genera there are bands of cilia on the under surface. Palpi very thickly scaled, the third joint minute and buried in the scales. Legs strong, with well-developed spurs and spined tarsi. Fore wing elongated and narrow; the subcostals very close to the costa; vein 1 forked at base. Hind wing small; costal nervure arising free, with a bar between it and subcostals; two internal veins. The subfamilies and genera are very closely allied and difficult to define; the shape and coloration are eminently variable.

Larva smooth, nearly always with a horn on 11th somite.

Pupa free in the earth.

Key to the Subfamilies.

- a. *Larva*: tapering to head, the thoracic somites retractile; horn long, curved and tuberculate.

Imago: the proboscis very short and thick. 1. *Acherontiinae*.

- b. *Larva* : rugose, tapering to head, which is produced upwards; horn straight.
Imago : the proboscis very short and slight. 2. *Smerinthinæ*.
- c. *Imago* : the proboscis of moderate length.
 a'. *Larva* : tapering to head, which is larger and rounded; horn straight.
Imago : the apex of fore wing much produced; ♂ with small lateral expansions to abdomen 3. *Ambulycinæ*.
- b'. *Larva* : the thoracic somites retractile, the 3rd more or less swollen; horn variable.
Imago : apex of fore wing but slightly produced; ♂ with small lateral expansions to abdomen 4. *Chærocampinæ*.
- d. *Larva* : the thoracic somites non-retractile, curved downwards in repose.
Imago : the proboscis very long; abdomen conical in both sexes 5. *Sphinginæ*.
- e. *Larva* : the thoracic somites tapering to head, which is small; horn long, curved, and smooth.
Imago : abdomen with a medial pair of lateral tufts of hair on last segment more or less developed in both sexes 6. *Macroglossinæ*.

Subfamily ACHERONTIINÆ.

Larva thick, tapering to head, the thoracic somites retractile; the horn more or less recurved at the tip and tuberculate.

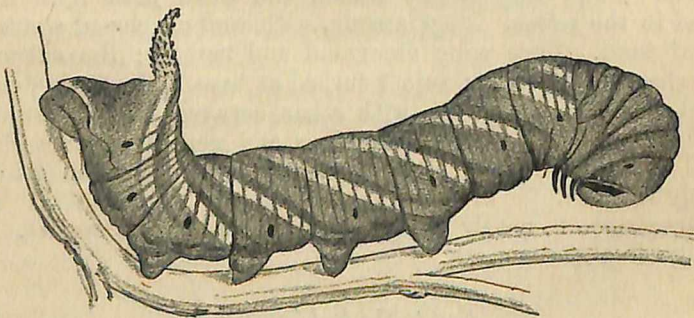


Fig. 39.—Larva of *Acherontia styx*. (From Moore, Lep. Ceyl. pl. 76.)

Pupa without external sheath for proboscis.

Imago with the proboscis short and thick; the antennæ thick at base.

Genus **ACHERONTIA.**

Acherontia, *Ochsen. Schmett. Eur.* iv, p. 44 (1816).

Type, *A. atropos*, L., from Europe.

Range. India ; Java ; China ; Japan ; Philippines ; Europe ; Africa.

Palpi closely appressed to the face and but moderately thick ; legs short and thick. Hind wing with the subcostals stalked.

88. ***Acherontia styx***, *Westw. Cab. Or. Ent.* p. 88, pl. 42, fig. 3 ; *C. & S.* no. 164 ; *Moore, Lep. Ceyl.* ii, pl. 76, figs. 1, 1 a-c (pupa and larva).
Acherontia medusa, *Bull. Trans. Z. S.* ix, p. 597 ; *C. & S.* no. 165.

Head brown ; thorax dark blue-grey, with black lateral lines which meet behind ; the centre of the thorax occupied by a fulvous "skull-mark" with two black "eyes" ; abdomen yellow, with blackish segmental bands and a blue-grey stripe down the vertex. Fore wing mottled with various shades of brown, fulvous, and grey ; three indistinct antemedial lines ; a pale spot in the end of cell ; two lunulate curved postmedial lines. Hind wing yellow

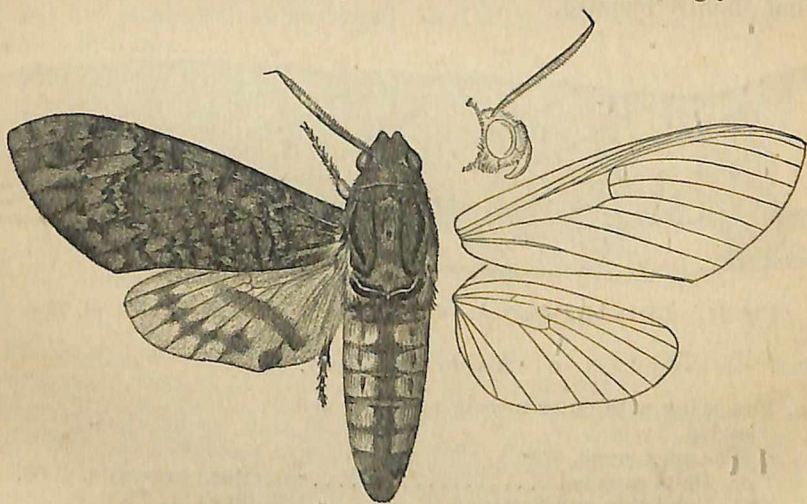


Fig. 40.—*Acherontia styx*, ♂. 1.

with a postmedial black band not reaching the costa or anal angle ; a similar submarginal maculate band.

Differs from *A. atropos* in having two medial bands on the underside of the fore wing instead of one, and no bands on the underside of abdomen.

Larva green, with oblique lateral yellow streaks on somites 4-10.

Hab. Throughout India and Ceylon ; Asia Minor ; China ; Siam ; Borneo ; Celebes ; Timor ; Philippines ; Japan. *Eap.* 106 millim.

89. ***Acherontia lachesis***, *Fabr. Ent. Syst. Suppl.* p. 434.

Acherontia morta, *Hüb. Verz.* p. 140 ; *C. & S.* no. 166 ; *Moore, Lep. Ceyl.* ii, pl. 77, figs. 1, 1 a-c (larva and pupa).

Acherontia satanas, *Boisd. Sp. Gén.* pl. 16, fig. 1.

Acherontia lethe, *Westw. Cab. Or. Ent.* p. 87, pl. 42, fig. 2.

Larger and much darker than *styx*; the segmental bands and grey stripe occupying so much of the abdomen that only small patches of yellow are left. Hind wing with a large black patch at the base; the medial and postmedial bands so broad that only narrow bands of yellow remain. Underside of abdomen banded with black; and the wings banded with black and with a spot in the cell of each.

Larva differs from *styx* in having blue streaks above the yellow ones; before pupating it turns brown and the oblique streaks disappear.

Hab. Throughout India and Ceylon; Siam; Penang; Java; China. *Exp.* 92-134 millim.

Subfamily SMERINTHINÆ.

Larva rugose, tapering to the head, which is more or less produced to a point above; horn straight.

Imago with the proboscis very short and thin; head projecting but slightly forward.

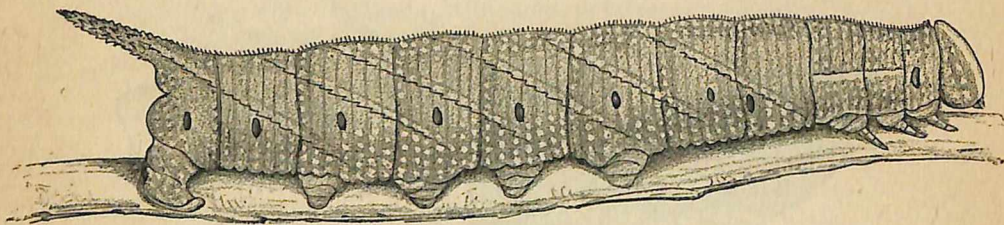


Fig. 41.—Larva of *Polyptychus dyras*. (From Moore, Lep. Ceyl. pl. 78.)

Key to the Genera.

- a. Fore wing with outer margin crenulate or angled.
 - a'. The apex acute.
 - a². Palpi rounded 1. POLYPTYCHUS, p. 68.
 - b². Palpi thin and flattened 2. CYPA, p. 71.
 - b'. Fore wing with apex rounded, spatulate scales on thorax and abdomen; ♂ with claspers highly developed 4. LANGIA, p. 73.
- b. Fore wing with outer margin evenly rounded.
 - a'. Apex acute; spurs long 5. LEUCOPHLEBIA, p. 74.
 - b'. Apex truncate; spurs short, one pair on hind tibia 3. DAPHNUSA, p. 72.

Genus POLYPTYCHUS.

Polyptychus, Hübner, *Verz.* p. 141 (1818).

Marumba, Moore, *Lep. Ceyl.* ii. p. 8 (1882).

Type, *P. dentatus*, Cram.



Range. Japan; China; throughout India and Ceylon; Java; Madagascar; S. Africa; United States.

Palpi rather slight; legs with the spurs short; wings with the outer margins crenulate, varying in amount individually; veins 6 and 7 of hind wing from end of cell or stalked.

90. **Polyptychus dentatus**, *Cram. Pap. Exot.* ii, p. 42, pl. 125 G; *C. & S.* no. 132; *Butl. Tr. Zool. Soc.* ix, pl. 91, fig. 10 (larva).
Sphinx timesius, *Stoll, Suppl. Cram. Pap. Exot.* p. 172; *C. & S.* no. 133.
Polyptychus trilineatus, *Moore, P. Z. S.* 1888, p. 390; *Butl. Ill. Het.* vii, pl. 121, fig. 4; *C. & S.* no. 133 A.
Sphinx modesta, *Fabr. Ent. Syst.* iii, p. 356.

Grey; fore wing with a diffused medial band; oblique ante-medial, postmedial, and submarginal lines, the last curved in some specimens; between the postmedial and submarginal lines is an indistinct waved line; apical area clouded. Hind wing with a waved postmedial line. Cilia chequered brown and white. Under-side: fore wing with submarginal, hind wing with medial and sub-marginal lines.

The form *timesius* is darker, with the waved line on the fore wing obsolescent. In the form *trilineatus* the postmedial line of the fore wing is also obsolete, and on the underside only the sub-marginal line on each wing is present.

Larva green, with yellow marks down the back outlined in pink; oblique dark lateral stripes; horn yellow.

Hab. Bombay; Bengal (*dentatus*); E. Himalayas (*timesius*); N.W. Himalayas (*trilineatus*). *Exp.*, ♂ 90, ♀ 120 millim.

91. **Polyptychus dyras**, *Wlk. Cat.* viii, p. 250; *C. & S.* no. 140; *Moore, Lep. Ceyl.* ii, pl. 78, figs. 1, 1 a-c (larva and pupa).
Triptogon cristata, *Butl. P. Z. S.* 1875, p. 253; *C. & S.* no. 136.
Triptogon gigas, *Butl. P. Z. S.* 1875, p. 253; *C. & S.* no. 137.
Triptogon albicans, *Butl. P. Z. S.* 1875, p. 254; *C. & S.* no. 139.
Triptogon ceylanica, *Butl. P. Z. S.* 1875, p. 255; *C. & S.* no. 141.
Triptogon silhetensis, *Butl. P. Z. S.* 1875, p. 255; *C. & S.* no. 142.
Triptogon oriens, *Butl. P. Z. S.* 1875, p. 255; *C. & S.* no. 143.
Triptogon massurensis, *Butl. P. Z. S.* 1875, p. 256; *C. & S.* no. 144.
Triptogon fuscescens, *Butl. P. Z. S.* 1875, p. 256; *C. & S.* no. 145.
Treptogon piceipennis, *Butl. A. M. N. H.* (4) xx, p. 393.
Smerinthus sperchius, *Mén. En. Corp. An. Mus. Acad. Sci. Petrop.* ii, p. 137.
Triptogon andamana, *Moore, P. Z. S.* 1877, p. 595; *C. & S.* no. 148.
Triptogon rectilinea, *Moore, P. Z. S.* 1879, p. 388; *C. & S.* no. 149.
Smerinthus indicus, *Wlk. Cat.* viii, p. 254; *C. & S.* no. 150.
Triptogon sinensis, *Butl. P. Z. S.* 1875, p. 254.
Triptogon javanica, *Butl. P. Z. S.* 1875, p. 254.

Pale brown; a dark line, which is obsolete in some specimens, from head to end of abdomen. Fore wing with a subbasal line; three antemedial lines converging towards inner margin; two

oblique slightly bent postmedial lines, the outer one obsolescent; another postmedial line, curved from the costa to vein 2, then recurved upwards and inwards and enclosing a red-brown spot surrounded by an indistinct line; two curved submarginal lines.

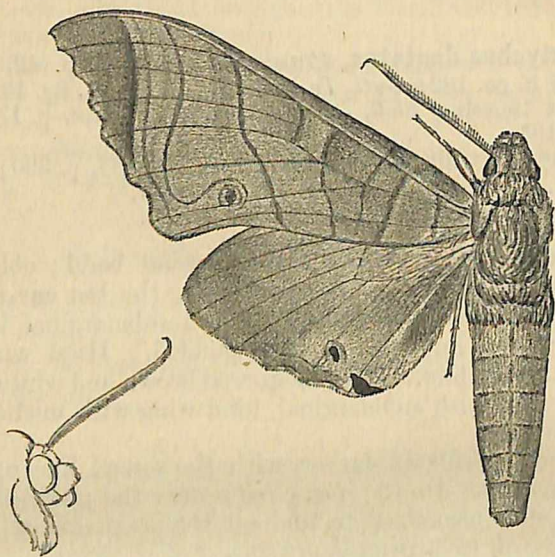


Fig. 42.—*Polyptychus dyras*, ♂. 1.

Hind wing red-brown, the area at anal angle paler, with two red-brown spots on it. Underside of fore wing with only the lines on the outer half present; hind wing with two postmedial straight lines and two submarginal curved lines.

The darkest form is *cristata* from Sikhim, in which both wings are suffused with brown and the lines on the fore wing are straighter and more oblique, the uppermost of the anal spots on the hind wing is obsolete, as also is the outermost of the two postmedial lines on the underside of both wings; in *piceipennis*, from Japan, the fore wings have an olive tinge and the lines are more bent, the hind wing is dark, but both anal spots are present as also traces of the outer postmedial line; *rectilinea* is a small dark form with the spots at anal angle conjoined; *ceylanica* = *fuscescens* = *oriens* = *silhetensis* is larger than the last and rather paler; in *sperchius*, from Japan, the fore wing is clouded in parts; *gigas* is a large form, the fore wing pale, the hind wing dark; *dyras* = *sinensis* = *javanica* is again rather paler and smaller; *indicus* is a small pale starved specimen; the palest form *albicans*, from the N.W. Himalayas, has the spots at the anal angle, and in some specimens the lines, almost obsolete.

Exp. 94–114 millim., (*gigas*) 150 millim., (*indicus*) 60 millim.

Larva blue-green with short white granular spines; lateral oblique streaks on 5th–10th somites; 4th somite with a black-ringed white ocellus; horn yellow.

Hab. N.W. and E. Himalayas; Assam; Canara; Ceylon; Andamans; Japan; China; Siam; Java.

92. *Polyptychus spectabilis*, *Butl. P. Z. S.* 1875, p. 256; *Trans. Zool. Soc.* ix, pl. 93, fig. 1; *C. & S.* no. 147.

♂. Differs from *dyras* in the fore wing being variegated with different shades of brown and purplish grey; the lines are similar except that there is a medial line present enclosing between it and the first postmedial line a bright coloured patch very variable in extent. Underside with the area before the apex of the fore wing suffused with pink and grey; the apex and outer angle fulvous yellow instead of chocolate; hind wing suffused with pink and grey, the anal angle yellow.

Hab. Sikhim. *Exp.* 94–120 millim.

Genus *CYPA*.

Cypa, *Wlk. Cat.* xxxi, p. 41 (1864).

Type, *C. ferruginea*, *Wlk.*

Range. Sikhim; Tavoy; Ceylon.

The palpi flattened and thin; hind wing with the subcostals on a long stalk.

93. *Cypa decorata*, *Moore, P. Z. S.* 1872, p. 568; *C. & S.* no. 146.

♀. Dark olive-brown. Fore wing with the outer margin highly excised between veins 4 and 7, and much angulated towards outer angle; suffused with pale pink; a large irregular medial brown patch bordered with pink on the costa and partly including a pale reniform spot, beneath which is a dark brown "inverted-comma" shaped mark; two curved postmedial pink lines, the inner one waved near the inner margin; some diffused brown streaks near outer angle; a triangular brown-edged patch on the costa before the apex, with a short white streak below it. Hind wing with a broad black and narrow pink streak near anal angle.

Hab. Sikhim. *Exp.* 72 millim.

94. *Cypa decolor*, *Wlk. Cat.* viii, p. 255; *C. & S.* no. 131.

Cypa incongruens, *Butl. Ill. Het.* v, p. 12, pl. 80, figs. 8, 9; *C. & S.* no. 77.

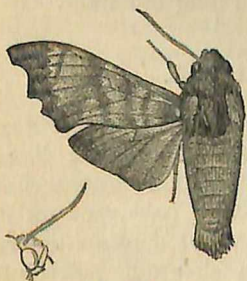


Fig. 43.

Cypa decolor, ♂. 1.

Fore wing highly angled and crenulate. Dark red-brown; the fore wing suffused with darker patches, especially at the middle; a dark speck at end of cell, and two indistinct submarginal waved lines. Hind wing with the cilia white towards anal angle, which is less produced in the female than in the male.

Hab. Sikhim; Tavoy. *Exp.* 62 millim.

95. *Cypa ferruginea*, *Wlk. Cat. xxxi*, p. 42; *Moore, Lep. Ceyl. ii*, pl. 79, fig. 3; *C. & S. no. 78*.

Fore wing with the outer margin hardly angulated or crenulate and more uniform in colour.

C. decolor and *ferruginea* may prove to be varieties of the same species.

Hab. Ceylon. *Exp.* ♀ 60 millim.

96. *Cypa floralis*, *Butl. Trans. Z. S. ix*, p. 639; *Ill. Het. v*, pl. 81, fig. 1; *C. & S. no. 138*.

Antennæ pink; head and thorax green; abdomen olive. Fore wing with outer margin evenly curved, green with a pink patch on base of inner margin; an oblique postmedial dark line; some brown on the nervules beyond the cell and at outer angle. Hind wing bright pink; the outer margin broadly olive; cilia whitish towards anal angle. Underside green; fore wing with the whole basal half except the costa pink, an indistinct line beyond the cell from the costa to vein 5, an oblique white and green postmedial line, an indistinct submarginal lunulate line; hind wing crossed by three oblique white and green lines.

Hab. Sikhim. *Exp.* ♀ 114 millim.

Genus **DAPHNUSA**.

Daphnusa, *Wlk. Cat. viii*, p. 237 (1856).

Type, *D. ocellaris*, *Wlk.*

Range. Sikhim; Burma; Borneo.

The apex of fore wing more rounded and truncate; the outer margin straight and but slightly oblique; hind wing with the apex rounded; the anal angle with a rounded lobe; the outer margin not crenulate; the tuft on vertex of head highly developed. Spurs very short, hind tibiæ with only the terminal pair.

SECT. I. Veins 6 and 7 of hind wing on a long footstalk.

97. *Daphnusa ocellaris*, *Wlk. Cat. viii*, p. 238.

Daphnusa orbifera, *Wlk. Journ. Linn. Soc. vi*, p. 85.

♂. Pale reddish brown or dark olive-brown; collar and vertex of thorax darker. Fore wing with two waved subbasal lines angled outwards at vein 1, where they join an oblique antemedial band; a crenulated postmedial band with a large pale spot on it at inner margin, the inner side having some red dentate marks on it; two crenulated submarginal lines; a chestnut patch on the costa before apex. Hind wing red-brown, with some bright chestnut lines above anal angle. Underside: fore wing with

two crenulated submarginal lines; hind wing with curved medial and postmedial lines.

♀. Darker brown; a dark brown band on metathorax.

Hab. Borneo; Bassein, Burma. *Exp.*, ♂ 80–92, ♀ 112 millim.

SECT. II. Veins 6 and 7 of hind wing from end of cell.

98. *Daphnusa porphyria*, *Butl. Trans. Z. S.* ix, p. 640; *C. & S.* no. 152.

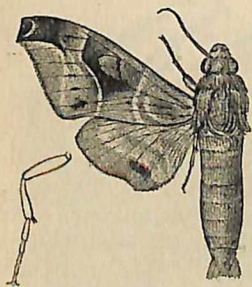


Fig. 44.

Daphnusa porphyria, ♂. †. *Hab.* Sikkim. *Exp.* ♂ 60 millim.

Brown; fore wing variegated with ferruginous and olive-brown; a dark patch below the end of the cell; another at apex enclosed by a white lunule with a dark streak below it; a spot near outer angle. Hind wing brown, with a dark spot above the lobe at anal angle. Underside with a submarginal pale line to both wings; the apex of fore wing dark, with the apical lunule as above.

Genus **LANGIA**.

Langia, *Moore, P. Z. S.* 1872, p. 567.

Type, *L. zenzeroides*, *Moore*.

Range. Himalayas and Khási Hills.

Palpi rounded. Fore wing with the apex more rounded; the outer margin much more crenulate towards outer angle; the thorax, abdomen, and parts of fore wing covered with peculiar spatulate scales, giving a very rough appearance; male with the claspers extremely developed; subcostals of hind wing from end of cell.

99. *Langia zenzeroides*, *Moore, P. Z. S.* 1872, p. 567; *C. & S.* no. 134. *Langia khasiana*, *Moore, P. Z. S.* 1872, p. 568; *C. & S.* no. 135.

Head pale; thorax—the vertex leaden with some ochreous lines, the sides dark brown; metathorax covered with light and dark brown spatulate scales, as is also the abdomen. Fore wing with the costal area leaden grey, whitish below the cell, dark grey towards inner and outer margins; three very oblique dark lines from the apex to near centre of inner margin; a whitish submarginal line; outer margin with light and dark lunules in the crenulations. Hind wing brown, with some dark brown and whitish lines near anal angle; a marginal dark line; cilia whitish towards anal angle.

The form *khasiana* is slightly darker.

Larva. Green, covered with raised tubercles; a subdorsal line of tubercles from the head to the horn.

Hab. Simla ; Dharmasála ; Sikhim ; Khásis. *Exp.* 126-160 millim.

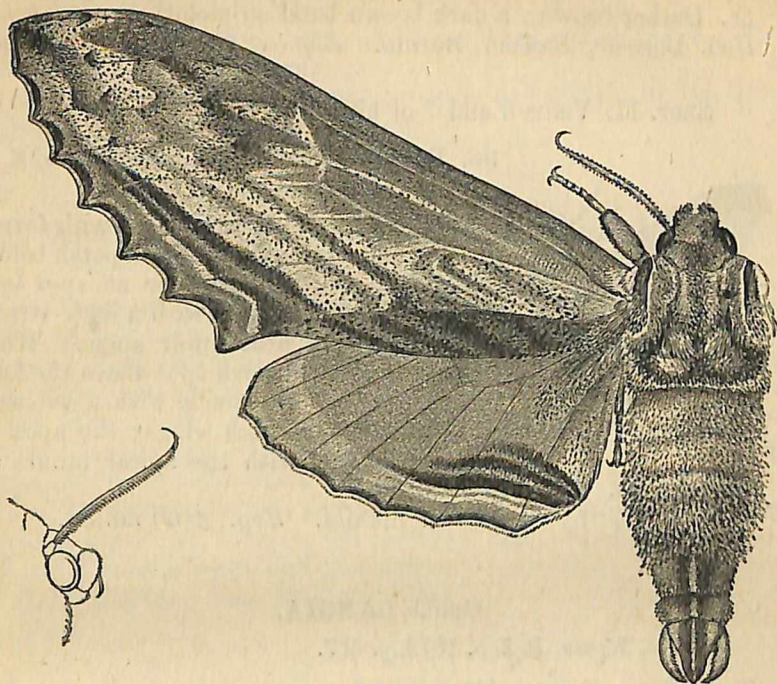


Fig. 45.—*Langia zenzeroides*, ♂. †.

Genus **LEUCOPHLEBIA.**

Leucophlebia, Westw. *Cab. Or. Ent.* p. 46 (1848).

Type, *L. lineata*, Westw.

Range. Throughout India and Ceylon ; Java ; China.

Fore wing with the apex hardly produced ; the outer margin evenly rounded. Palpi rounded.

100. *Leucophlebia lineata*, Westw. *Cab. Or. Ent.* p. 46, pl. 22, fig. 2
C. & S. no. 153 ; Moore, *Lep. Mus. E. I. C.* pl. 8, fig. 5 (larva).
Leucophlebia rosacea, Butl. *P. Z. S.* 1875, p. 15, pl. 2, fig. 4 ; C. & S.
no. 154.

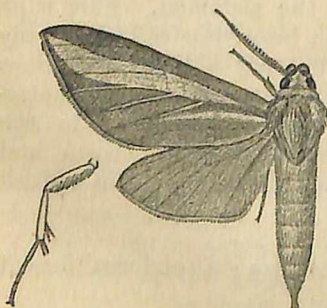


Fig. 46.

Leucophlebia lineata, ♂. †.

Palpi and frons brown ; antennæ ochreous ; vertex of head and sides of thorax and abdomen pale pink ; a brownish ochreous stripe on vertex of thorax and abdomen. Fore wing bright pink ; a yellow stripe from the base of cell to apex, widest beyond the cell ; a short narrow yellow streak in the interno-median interspace from the base ; veins 2, 3, and 4 white, with some diffused fuscous below them. Hind wing tawny. Cilia yellowish white.

The form *rosacea*, from S. India and Ceylon, is rather smaller and darker than typical *lineata*.

Larva green covered with tubercles; a broad white lateral stripe; head white, with a pink streak on gulæ; horn and legs pink.

Hab. Chekiang; Nepal; Cachar; S. India; Ceylon; Java. *Exp.*, ♂ 70, ♀ 80 millim.

101. **Leucophlebia emittens**, *Wlk. Cat.* xxxv, p. 1858; *C. & S.* no. 156. *Leucophlebia bicolor*, *Butl. P. Z. S.* 1875, p. 16; *id. Ill. Het.* v, pl. 80, fig. 6; *C. & S.* no. 155.

Leucophlebia damascena, *Butl. P. Z. S.* 1875, p. 392; *id. Ill. Het.* v, pl. 80, fig. 7; *C. & S.* no. 157.

Differs from *lineata* in the palpi and frons being pink; fore wing with the yellow streak broader and extending below the cell; veins 2, 3, and 4 yellow, without fuscous below them; outer margin of hind wing narrowly pink; thorax with a narrow tawny streak on vertex.

The type of *emittens* has all the pink parts dusky brown, but as the pink reappears below it is probably a discoloured specimen; the N.W. Himalayan form *bicolor* is paler than the form *damascena*.

Hab. N.W. Himalayas; Sikhim; Bombay; Central India; Burma. *Exp.* 55-65 millim.

Subfamily AMBULYCINÆ.

Larva. Anterior segments tapering slightly towards the head, which is larger and rounded; horn oblique, not curved.

Imago. Proboscis moderately long; antennæ slender; abdomen of male with lateral angular expansions.

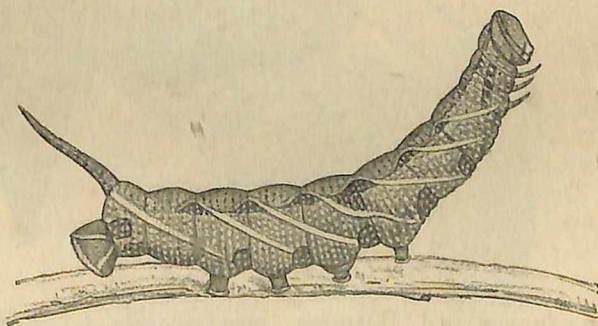


Fig. 47.—Larva of *Ambulyx semifervens*. (From Moore, *Lep. Ceyl* pl. 80.)

Key to the Genera.

- | | |
|---|---------------------|
| a. Fore wing with apex rounded and obtuse | 1. CALYMNIA, p. 76. |
| b. Fore wing with apex acute | 2. AMBULYX, p. 77. |

Genus **CALYMNIA**.

Calymnia, *Wlk. Cat.* viii, p. 123 (1856).

Type, *C. panopus*, Cram.

Range. India; Ceylon; Java.

Antennæ gradually diminishing to a long hook. Fore wing long, the costa curved, apex rounded and obtuse, the outer margin oblique and excised; the subcostals of hind wing from the angle of cell; the discocellulars but slightly angled.

102. *Calymnia panopus*, *Cram. Pap. Exot.* iii, p. 50; *Moore, Lep. Ceyl.* ii, pl. 81, figs. 1, 1 a, 1 b (pupa and larva); *C. & S.* no. 186.
Calymnia pavonica, *Moore, P. Z. S.* 1877, p. 596; *C. & S.* no. 187.

Head, thorax, and terminal segments of abdomen golden brown; the proximal segments pale. Fore wing purplish flesh-colour; some brown waved lines near the base; then an oblique band; some waved brown lines from the costa to lower angle of cell; an oblique postmedial band; a highly waved and irregular whitish submarginal line; a dark ocellus near outer angle. Hind wing flesh-colour, the outer area brown; the disk suffused with pink; antemedial, medial, and two postmedial lines, the last two angled below the costa. Underside much mottled with yellow.

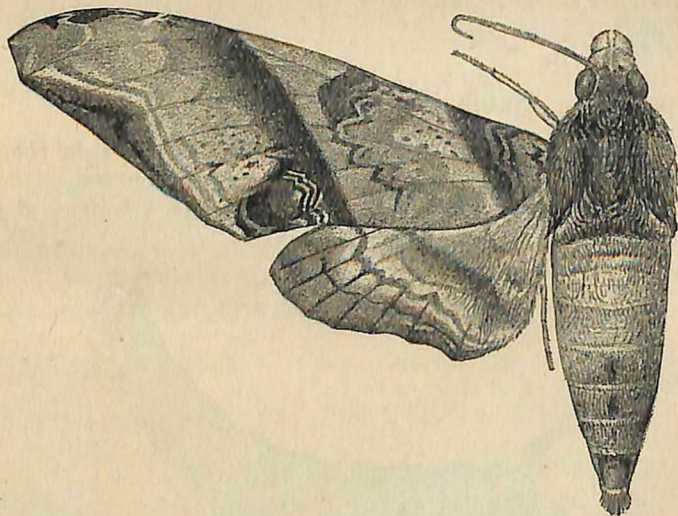


Fig. 48.—*Calymnia panopus*, ♂. 1.

The Andaman and Burmese form *pavonica* is much darker, especially the basal segments of the abdomen.

Larva grey and granulose, with a subdorsal yellow spotted line from the head to the horn; the 4th to 10th somites with oblique yellow lateral stripes; horn tuberculate.

Hab. Throughout India, Ceylon, Burma, and the Andamans.
Exp., ♂ 132, ♀ 134 millim.

Genus **AMBULYX.**

Ambulyx, *Westw. Cab. Or. Ent.* p. 61 (1848).

Dahira, *Moore, P. Z. S.* 1888, p. 390.

Clanis, *Hübner. Verz.* p. 138 (1818), gen. non descr.

Type, *A. substrigilis*, *Westw.*

Range. India; Japan; Africa; W. Indies; S. America.

The apex of fore wing more acute, the outer margin evenly curved.

103. *Ambulyx substrigilis*, *Westw. Cab. Or. Ent.* p. 61, pl. 30, fig. 2; *C. & S.* no. 118.

Ambulyx schauffelbergii, *Brem. Schmett. Nörd. Chin.* p. 12.

Ambulyx maculifera, *Wlk. Cat.* xxxv, p. 1851; *Butl. Ill. Het.* v, pl. 80, fig. 3; *C. & S.* no. 119.

Ambulyx consanguis, *Butl. Ill. Het.* v, p. 11, pl. 80, fig. 4; *C. & S.* no. 120.

Ambulyx liturata, *Butl. P. Z. S.* 1875, p. 250; *id. Tr. Zool. Soc.* ix, pl. 91, figs. 2 & 3 (larva and pupa).

Ambulyx rhodoptera, *Butl. P. Z. S.* 1875, p. 251; *id. Tr. Zool. Soc.* ix, pl. 93, fig. 8; *C. & S.* no. 121.

Ambulyx auripennis, *Moore, P. Z. S.* 1879, p. 388; *Lep. Ceyl.* ii, pl. 79, figs. 1, 1 a, 1 b (larva and pupa); *C. & S.* no. 128.

Ambulyx placida, *Moore, P. Z. S.* 1888, p. 390; *Butl. Ill. Het.* vii, pl. 121, fig. 1; *C. & S.* no. 127 A.

Ambulyx sericeipennis, *Butl. P. Z. S.* 1875, p. 251; *C. & S.* no. 122.

The hind wing crenulate. Pale ochreous or greyish brown to purplish brown in colour; an olive-green band between the antennæ; lateral olive-green bands on the thorax meeting on metathorax; abdomen with two olive blotches on the fifth segment, and one on the seventh in some specimens; sides of palpi

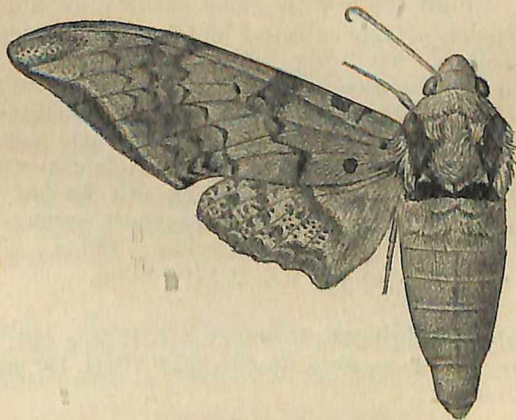


Fig. 49.—*Ambulyx substrigilis*, ♀. 1.

and pectus ferruginous; some specimens with a ferruginous line down the vertex of abdomen. Fore wing with a basal olive speck; a subbasal olive blotch on the costa, and another below the median

nervure, the former being obsolete in some of the forms; two irregularly dentate, more or less obsolete antemedial lines, and two similar lunulate postmedial lines; a curved band from apex to outer angle, the inner part of which is light, the outer dark. Hind wing ochreous, mottled with fuscous; an erect medial, and curved more or less lunulate postmedial band; some specimens with the anal half of the margin dark.

One Burmese specimen is greyish, the olive markings on thorax and at base of fore wing very prominent, the waved lines well defined. The next palest form *placida* is greyish, with the markings of fore wing ill-defined; *auripennis* is ochreous; *rhodoptera* has a reddish tinge; in *substrigilis* = *sericeipennis* = *schauffelbergii* the markings are more prominent; *liturata* has a purplish tinge with streaks on the nervules; in *consanguis* the costal olive blotch is present, and there is an olive blotch near outer angle; whilst *maculifera* is the darkest form, being purple-brown in colour.

Larva pale green with darker granular spots; a white dorso-lateral line; pale yellow oblique streaks on 5th to 10th somites; horn purple, with white granular spots.

Hab. N.W. Himalayas; Sikkim; Assam; Silhet; Ceylon. *Exp.*, ♂ 100, ♀ 130 millim.

104. **Ambulyx semifervens**, *Wlk. Cat. xxxi*, p. 38.

Ambulyx turbata, *Butl. Tr. Zool. Soc.* ix, pl. 93, fig. 7; *C. & S.* no. 124.

Ambulyx thwaitesii, *Moore, Lep. Ceyl.* ii, p. 11, pl. 80, figs. 1, 1 a, 1 b (larva and pupa); *C. & S.* no. 129.

Ambulyx lahora, *Butl. P. Z. S.* 1875, p. 251; *C. & S.* no. 123.

Ambulyx subocellata, *Feld. Reis. Nov.* pl. 76, fig. 3.

The lateral olive bands on the thorax much narrower than in *substrigilis*. Fore wing with some small grey annular marks taking the place of the subbasal blotches; the antemedial lines much less dentate.

The form *semifervens* = *thwaitesii* is pale ochreous; *turbata* = *lahora* dark ferruginous red, the intermediate gradations occurring.

Larva olive-green above, bluish at sides with pale granulated spots; a white-spotted subdorsal line and lateral stripes; subdorsal and lateral purplish patches on 5th to last somites; a purplish streak on 2nd and 3rd somites; horn green.

Hab. Throughout India and Ceylon; China; Java; New Guinea; Ternate. *Exp.*, ♂ 90, ♀ 110 millim.

105. **Ambulyx rubiginosa**, *Moore, P. Z. S.* 1888, p. 391.

Ambulyx rubescens, *Butl. Ill. Het.* vii, p. 26, pl. 121, fig. 2; *C. & S.* no. 61 a.

The hind wing not crenulate; colour dark red-brown slightly suffused with grey. Fore wing with numerous indistinct waved lines; hind wing brighter red; thorax and abdomen yellow below.

Hab. N.W. Himalayas. *Exp.* ♂ 80 millim.

106. **Ambulyx rubricosa**, *Wlk. Cat. viii*, p. 122; *C. & S.* no. 127.

Hind wing broader, the outer margin more rounded. Shafts of antennæ and a band between their bases white; head and vertex of thorax olive-brown; sides of thorax purplish; abdomen greenish, with a red-brown line down the vertex. Fore wing bright glaucous green, with olive-green markings and a patch of purplish grey on inner margin; two indistinct waved antemedial lines; an oblique band from centre of costa to outer angle; a spot at lower end of cell; two lunulate postmedial lines and one waved; outer area olive with some white on it; a white streak from apex and white spots on outer margin. Hind wing brilliant crimson, the base and a diffused postmedial band darker; traces of a medial line; inner area brownish, marked with grey. Underside bright orange suffused with red, and with the markings red.

Hab. Sikkim, and ? Calcutta. *Exp.* ♂ 132 millim.

107. **Ambulyx junonia**, *Butl. Ill. Het. v*, p. 9, pl. 80, fig. 2; *C. & S.* no. 125.

Hind wing hardly angled at anal angle. Differs from *rubricosa* in having no white shaft to, or band between, the antennæ; fore wing with the ante- and postmedial lines obsolete; the whole inner area purplish grey; a large purplish-grey patch on outer margin, the outline between it and the green at apex irregular. Hind wing with a green line traversing the crimson beyond the cell; a large dark ocellus centred with grey below the lower angle of cell; the outer and inner areas brown. Underside greenish yellow, with some crimson on the disk of fore wing; the markings brown.

Hab. Bhutan; Nága Hills. *Exp.* 104 millim.

108. **Ambulyx elwesi**, *Druce, Ent. Mo. Mag. xix*, p. 17; *C. & S.* no. 126; *Waterh. Aid*, ii, pl. 136, fig. 3.

Head, thorax, and abdomen brown. Fore wing rich brown, the area from near the base of costa to outer angle ochreous, crossed by a purplish-grey longitudinal stripe; apex olive-green; a yellow spot at end of cell. Hind wing bright pink; the outer half deep brown, with a line near anal angle. Underside paler.

Hab. Sikkim. *Exp.* ♂ 100 millim.

109. **Ambulyx phalaris**, *Cram. Pap. Exot. ii*, p. 83, pl. 149 A (1777); *C. & S.* no. 163 (part).
Clanis nicobariensis, *Schwarz, Kleem. Beit. ii*, p. 1 (1796).

Head, thorax, and fore wing dark red-brown; abdomen and hind wing paler, the latter with a black patch at the base. Fore wing with two ante- and three postmedial waved lines; a large pale patch on the costa from before the middle to outer margin, leaving the apex dark, the pale patch widest beyond the cell.

Underside: fore wing with a pale triangular patch before the apex; hind wing with three faint transverse lines.

Hab. Sikkim. *Exp.* ♀ 146 millim.

110. **Ambulyx bilineata**, *Wlk. Cat.* xxxv, p. 1857; *C. & S.* no. 159; *Butl. Ill. Het.* v, pl. 81, fig. 4.

Differs from *phalaris* in being much paler; the pale patch on fore wing only indicated by a pale dash from the end of the cell towards the outer margin; the black patch on hind wing larger; but chiefly differing in having a streak of black hairs on the underside of fore wing below the median nervure and vein 2.

Hab. Shanghai; Sikkim. *Exp.*, ♂ 128, ♀ 150 millim.

111. **Ambulyx deucalion**, *Wlk. Cat.* viii, p. 236; *C. & S.* no. 158.

Differs from *bilineata* in being without the pale dash beyond the cell of the fore wing.

Hab. Shillong. *Exp.* ♀ 144 millim.

112. **Ambulyx pagana**, *Fabr. Sp. Ins.* ii, p. 146; *C. & S.* no. 163 (part.).

Basiana cervina, *Wlk. Cat.* viii, p. 237; *C. & S.* no. 160.

Differs from *deucalion* in being much redder in tone, and in wanting the black patch at base of hind wing and black streak on underside below the median nervure of fore wing.

The form *cervina* is smaller and paler. *Phalaris*, *bilineata*, *deucalion*, and *pagana* may possibly be varieties of one species.

Larva green, with 7 oblique lateral stripes and short aborted horn.

Hab. Sikkim; Bengal; Madras. *Exp.*, (*pagana*) ♂ 140, ♀ 160 millim; (*cervina*) 110 millim.

113. **Ambulyx exusta**, *Butl. P. Z. S.* 1875, p. 252; *id. Trans. Zool. Soc.* ix, pl. 93, fig. 4; *C. & S.* no. 162.

Differs from *pagana* in having the vertex of the thorax dark; fore wing with a pale irregular indistinct band before the margin; hind wing with two indistinct postmedial and prominent submarginal and marginal dark lines. Underside of fore wing with three postmedial lines, of hind wing with two.

Hab. N.W. Himalayas. *Exp.* 80 millim.

114. **Ambulyx ornea**, *Westw. Cab. Or. Ent.* p. 13, pl. 6, fig. 3; *C. & S.* no. 183.

Smerinthus pudorinus, *Wlk. Cat.* viii, p. 253; *C. & S.* no. 161.

Head, thorax, abdomen, and fore wing reddish ochreous; the fore wing with broad greyish ante- and postmedial bands; a greyish band along inner margin with some dark strigæ on it; a dark speck at the end of the cell. Hind wing pink; a grey patch at anal angle with some dark streaks on it.

Hab. Almorah; Central India. *Exp.*, ♂ 54, ♀ 80 millim

Subfamily CHÆROCAMPINÆ.

Larva with the anterior somites retractile; the third more or less swollen; the third and sometimes some of the other somites laterally ocellated; horn variable.

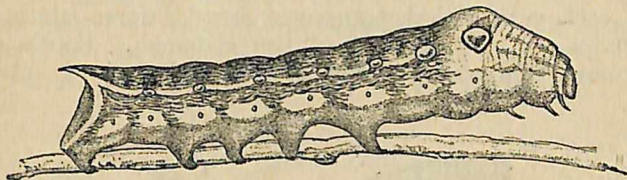


Fig. 50.—Larva of *Chærocampa theylia* (from Hmps. Ill. Het. ix. pl. 175. fig. 1).

Pupa without external sheath for the proboscis.

Imago. Proboscis large; apex of fore wing but slightly produced; male with small lateral expansions to abdomen.

Key to the Genera.

- a*. Hind wing with apex acute.
 - a'*. Palpi with first joint not hollowed out.
 - a*². Antennæ gradually fining to a long hook.
 - a*³. Fore wing slightly excised below apex 1. ACOSMERYX, p. 81.
 - b*³. Fore wing very acute at apex.... 2. AMPELOPHAGA, p. 83.
 - b*². Antennæ abruptly hooked.
 - a*³. Legs with spurs of moderate length. 3. CHÆROCAMPA, p. 84.
 - b*³. Legs with spurs very long 4. DAPHNIS, p. 94.
 - c*². Antennæ very thick before the hook. 5. DILEPHILA, p. 97.
 - b'*. Palpi with first joint hollowed out 6. THERETRA, p. 99.
- b*. Hind wing with apex rounded; antennæ gradually fining to a long hook.
 - a'*. Hind wing with outer margin straight. 7. ELIBIA, p. 100.
 - b'*. Hind wing with outer margin excurved. 8. ANGONYX, p. 101.

Genus ACOSMERYX.

Acosmeryx, *Boisd. Sping.* p. 214 (1875).

Type, *A. ancea*, Cram.

Range. Japan; throughout India and Ceylon; Borneo; Java.

Antennæ rather slight, the hook long; palpi broad at tip; fore wing slightly excised below the apex.

115. *Acosmeryx ancea*, Cram. *Pap. Exot.* iv, p. 124, pl. 355 A;
Butl. Trans. Zool. Soc. ix, pl. 90, figs. 11, 12 (larva and pupa);
C. & S. no. 46.

Philampelus sericeus, *Wlk. Cat.* viii, p. 181; *C. & S.* no. 45; *Butl. Ill. Het.* v, pl. 78, fig. 2.

Acosmeryx pseudonaga, *Butl. Ill. Het.* v, p. 2, pl. 88, fig. 3; *C. & S.* no. 47.

Acosmeryx cinerea, *Butl. P. Z. S.* 1875, p. 245; *C. & S.* no. 44; *Moore, Lep. Ceyl.* ii, pl. 89, figs. 2, 2 a (larva and pupa).

Acosmeryx shervillei, *Boisd. Sp. Gén.* i, p. 217.

Acosmeryx anceoides, *Boisd. Sp. Gén.* i, p. 216.

Greyish brown; the vertex of head dark; pro-, meso-, and meta-thorax each with a dark transverse streak; dorso-lateral oblique dark stripes on each segment of the abdomen. Fore wing with nine curved and waved antemedial dark lines, the interspaces

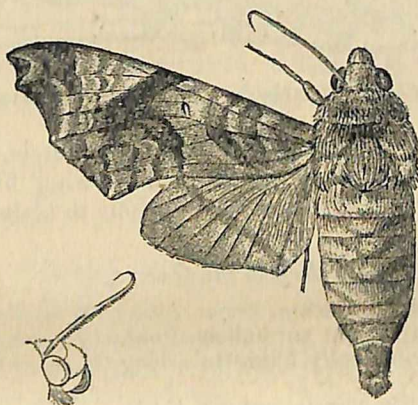


Fig. 51.—*Acosmeryx anceus*, ♂. 1.

between three of the pairs of lines being filled in with dark brown, so as to form one subbasal and two antemedial bands; a dark-ringed pale speck at end of cell, the pale centre being sometimes obsolete; four postmedial curved lines; an oblique dark band from beyond the middle of the costa to outer angle, in some of the forms produced outwards along vein 5 so as to be more oblique; a pale submarginal obsolescent line from below the apex to outer angle, sometimes carried out to the margin at vein 4. Hind wing brownish fuscous, with traces of a pale patch and dark lines near anal angle. Underside more or less suffused with ferruginous, ochreous, and grey; the outer margin of both wings dark; hind wing with five indistinct lines.

The form *ancea* is brownish grey, a small dark specimen from Bhutan being nearest Cramer's figure; in *sericea* the grey parts are suffused with purple or pinkish; in *pseudonaga* the ground-colour is darker and more suffused; whilst the colour of *cinerea* is more uniform greyish fuscous; the dark and light forms appear to occur irrespective of locality.

Larva green; a series of brown dorsal spots and of lateral oblique stripes on fifth to tenth somites; an ocellated spot on fourth somite; a black stripe from first to fourth somite, with a yellow line above it; horn brown.

Hab. Himalayas; N.E. India; S. India; Ceylon; Penang; Borneo; Java; Amboina; Japan. *Exp.* 80–110 millim.

116. *Acosmeryx naga*, Moore, *Cat. Lep. E. I. C. i*, p. 271; *C. & S.* no. 48.

Differs from typical *ancea* in the antemedial lines of the fore wing being more angled outwards; the postmedial streak more oblique and almost reaching the middle of outer margin; the submarginal pale line reaching the outer angle and not bent out to the margin at vein 4.

Hab. N.W. and E. Himalayas. *Exp.* 100 millim.

Genus **AMPELOPHAGA.**

Ampelophaga, Bremer & Grey, *Beitr. Schmett. nördl. China*, p. 11 (1853).

Type, *A. rubiginosa*, Br. & Gr., from Japan.

Range. Japan; Himalayas.

Palpi reaching top of head and pointed at the tip; apex of fore wing acute.

117. *Ampelophaga rubiginosa*, Bremer & Grey, *Schmett. nördl. China*, p. 11; *Mén. Cat. Lep. Petr.* pl. 12, fig. 2.

Ampelophaga romanovi, Staud. *Rom. Mém.* iii, p. 158, pl. ix, fig. 1 a.

Ampelophaga fasciosa, Moore, *P. Z. S.* 1888, p. 391; *C. & S.* no. 49; *Butl. Ill. Het.* vii, pl. 121, fig. 3.

Antennæ whitish; head, thorax, and abdomen ruddy olive-brown; a white line on vertex of thorax and abdomen. Fore wing olive-brown, with the markings very indistinct; traces of two

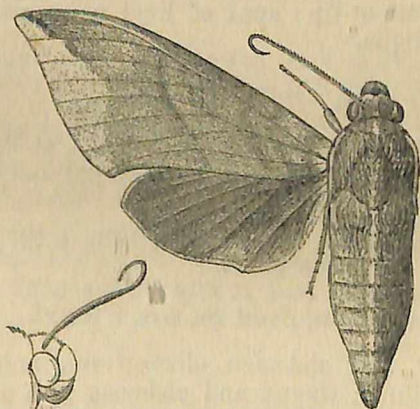


Fig 52.—*Ampelophaga rubiginosa*, ♂. †.

antemedial, one postmedial, and one submarginal line; a dark mark on discocellulars; a triangular patch on costa at apex. Hind

wing fuscous, with the cilia pale. Underside pinkish, each wing with two faint transverse lines.

Larva pale pinkish brown, with numerous short dark strigæ; narrow dorsal and subdorsal lines; a yellow dark-ringed ocellus on the fourth somite, with a black centre speckled with white; a yellow black-ringed ocellus on fifth somite; horn black.

Hab. ? Japan; Amur; N.W. Himalayas; Sikhim; Nágas. *Exp.*, ♂ 90, ♀ 100 millim.

118. *Ampelophaga dolichoides*, *Feld. Reis. Nov.* pl. 76, fig. 8; *C. & S.* no. 51.

Differs from *rubiginosa* in having the palpi pale and with no ruddy tinge. Fore wing with antemedial, medial, and postmedial nearly straight oblique lines, which are pale, outwardly edged by dark brown; a waved and curved submarginal line; no apical triangular patch. Underside less pink.

Hab. Sikhim. *Exp.* 100 millim.

Genus **CHÆROCAMPA.**

Chærocampa, *Dup. Lép. France, Suppl.* ii, p. 159 (1835).

Isoples, *Hüb. Verz.* p. 135 (gen. indescr.) (1818).

Xylophanes, *Hüb. Verz.* p. 136 (gen. indescr.) (1818).

Hippotion, *Hüb. Verz.* p. 135 (gen. indescr.) (1818).

Panacra, *Wlk. Cat.* viii, p. 154 (1856).

Gnathothlibus, *Wallengr. Öfv. Kongl. Vetens.-Akad. Förh.* 1858, p. 137.

Hathia, *Moore, Lep. Ceyl.* ii, p. 19 (1882).

Type, *C. elpenor*, Linn.

Range. Universally distributed.

Antennæ with the hook short and slight; the palpi moderately broad and quadrate at tip; apex of hind wing rather acute; the discocellulars oblique.

A. *Hind wing crimson.*

119. *Chærocampa elpenor*, *Linn. Syst. Nat.* i, pt. 2, p. 801 (1867);

Westw. & Humphr. Brit. Moths, pl. 5, figs. 7, 8; *C. & S.* no. 79.

Chærocampa macromera, *Butl. P. Z. S.* 1875, p. 7; *id. Ill. Het.* v, pl. 79, fig. 3; *C. & S.* no. 80.

Chærocampa fraterna, *Butl. P. Z. S.* 1875, p. 247; *id. Ill. Het.* v, pl. 79, fig. 4; *C. & S.* no. 81.

Chærocampa lewisii, *Bull. P. Z. S.* 1875, p. 247.

Chærocampa rivularis, *Boisd. Sp. Gén.* i, p. 280.

Head, thorax, and abdomen olive-green; antennæ, sides of palpi, and head pink; thorax and abdomen with pink dorsal and lateral stripes. Fore wing olive-green; the costa pink; an oblique pink band from beyond end of cell to inner margin; another from apex to inner margin; outer margin broadly pink; inner margin with some white near base. Hind wing with the basal half black, the outer half pink, with a little olive-green

towards apex. Underside with the whole of both wings, except the costa and part of disk, suffused with pink.

Typical *elpenor* = *lewisii* from Europe, Japan, and N.W. India is smaller, with the pink on hind wing and underside rather less developed; in the form *fraterna* from the W. Himalayas the colour is rather duller and the pink on underside more evenly disposed over the disk of both wings than in the eastern form *macromera*.

Larva brown or green, with numerous black strigæ; some indistinct black dorsal lines on first two somites; a black blotch on third somite; pale ocelli on black blotches on fourth and fifth somites.

Hab. Europe; Japan; Sind; Himalayas; Shillong; Nágas; Manipur. *Exp.* (*elpenor*) 64 millim., (*macromera*) 80 millim.

120. **Chærocampa alecto**, *Linn. Syst. Nat.* i, p. 802 (1767); *C. & S.* no. 83; *Cram. Pap. Exot.* ii, pl. 137 D; *Butl. P. Z. S.* 1880, pl. 39, fig. 8 (larva).

Sphinx cretica, *Boisd. Ann. Soc. Linn. Paris*, 1827, p. 118.

Head, thorax, and abdomen pale brown; antennæ and sides of thorax whitish; abdomen with a black lateral patch near base. Fore wing pale brown, with a dark speck at end of cell; six faint oblique lines from near apex to inner margin. Hind wing pink, with a large black patch at base; outer margin black; anal angle flesh-colour, as is the underside.

The form *cretica*, *Boisd.*, from Turkey and Afghanistan, is paler.

Larva green, speckled with yellow; a dorsal green line; a subdorsal yellow stripe and series of yellow ocelli with green centres on fourth to eleventh somites, decreasing in size posteriorly.

Hab. Turkey; China; Formosa; throughout India and Ceylon; Borneo, Java. *Exp.*, ♂ 90, ♀ 106 millim.

121. **Chærocampa eson**, *Cramer, Pap. Exot.* iii, p. 57.

Chærocampa elegans, *Butl. P. Z. S.* 1875, p. 8, pl. 2, fig. 1; *C. & S.* no. 84.

Chærocampa gracilis, *Butl. P. Z. S.* 1875, p. 8, pl. 2, fig. 2.

Differs from *alecto* in the abdomen having faint ochreous stripes and wanting the black patches; the black patch at base of hind wing smaller.

The form *eson* from S. Africa is rather broader and larger than the N. African and Asiatic form.

Hab. Throughout Africa; China; India; Java; Borneo. *Exp.* 70–90 millim.

122. **Chærocampa theylia**, *Linn. Syst. Nat.* i, p. 803 (1767); *C. & S.* no. 85; *Moore, Lep. Ceyl.* ii, pl. 84, fig. 5; *Hmps. Ill. Het.* ix, pl. 175, fig. 1 (larva).

Chærocampa rafflesii, *Butl. Trans. Z. S.* ix, p. 556; *Moore, Lep. Ceyl.* ii, pl. 84, fig. 3; *C. & S.* no. 86; *Hmps. Ill. Het.* ix, pl. 175, fig. 3 (larva).

Chærocampa vinacea, *Hmps.* *Ill. Het.* ix, ined., pl. 157, fig. 26, pl. 175, figs. 2, 2a (larva and pupa).

Sphinx boerhaviæ, *Fabr. Syst. Ent.* p. 542.

Sphinx pluto, *Fabr. Gen. Ins.* p. 274, ii, 148. 40.

Sphinx pinastrina, *Martin, Pysche*, pl. 30, fig. 85.

Pergesa vampyrus, *Fabr. Mant. Ins.* ii, p. 98; *C. & S.* no. 58.

Sphinx octopunctata, *Gmel. Syst. Nat.* i, pt. 5, p. 2386.

Differs from *eson* in being smaller and without the black patch at base of hind wing.

Larva brown, with numerous dark strigæ on dorsal area; lateral area whitish, ventral grey; a large ochreous ocellus on fourth somite, outlined in black and centred with pink above, black below; a series of six decreasing ocelli on an ochreous line from 5th to 10th somites, ochreous, outlined in black and centred with brown; horn pale, short, and rapidly running to a point. Feeds on *Rubiaceæ*.

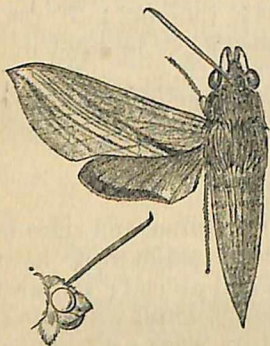


Fig. 53.
Chærocampa theylia, ♂. 1.

The form *rafflesi* is rather darker and brighter coloured than *theylia*. The *larva* is dark chocolate-brown, some seven white subdorsal spots on thoracic somites; seven ocelli on 4th to 10th somites, the first largest, ochreous white, outlined in black and with an ochreous-speckled black centre, the others centred with brown: horn dark brown, the tip ochreous, blunt, and of even diameter throughout, from its base crimson streaks extend forward and backward. Feeds on the same *Rubiaceæ* as *theylia*.

The form *vinacea*, again, is rather darker and brighter coloured, with the *larva* pale brown, a narrow dorsal black line from 1st to 4th somite; pale subdorsal streaks on the same somites; oval ocelli on fourth and fifth somites, ochreous, outlined in black and centred with brown, on which in the first ocellus is an ochreous streak, which in the second is crimson; horn long, straight, and pointed, brown with a white tip, with dark streaks extending forward and backward from its base. Feeds on *Impatiens*.

The imagos of these three forms are almost indistinguishable, and whether we have here three good species breeding true, or the larvæ are in some way affected in form of horn, as well as colour and the number of ocelli, by some conditions of life, we have no evidence to show; all were bred, preserved, and drawn in the same locality by that most careful observer, Mr. E. E. Green of Ceylon, who informs me that the larva of *vinacea* refuses to eat the food-plants of the others.

Hab. China; Formosa; throughout India and Ceylon; Java; Borneo. *Exp.* 60 millim.

123. *Chærocampa celerio*, *Linn. Syst. Nat.* i, p. 800; *C. & S.* no. 88; *Moore, Lep. Ceyl.* ii, pl. 84, fig. 4; *Moore, Lep. E. I. C.* pl. xi, figs. 1, 1a (larva and pupa).
Sphinx tisiphone, *Linn. Syst. Nat.* i, p. 803.
Hippotion ocys, *Hübner. Verz.* p. 135.
Phalæna inquilinus, *Harris, Ex.* p. 93.

Head and thorax as in *eson*; abdomen with a white spot on each segment between the dorsal white lines; a pair of silvery lateral strigæ on each segment. Fore wing paler; some silvery streaks on the median nervure; the nervules beyond the cell streaked with silvery white and black; a silvery-white line from apex to near base of inner margin, followed by some ochreous and pale brown lines; a white submarginal line; the markings are thus similar to *oldenlandiæ*, except that the lines that come out white are different. Hind wing with the base and anal angle bright pink; disk blackish; the outer area ochreous brown, with a black submarginal line and the nervules between it and the cell black.

Larva brown; a series of whitish ocelli with darker centres from 4th to 10th somites; horn and underside white.

Hab. Europe; Africa; the whole of India and Ceylon; Java; Borneo; Timor; Australia; Fiji. *Exp.* 66–74 millim.

B. *Hind wing fuscous, with a more or less defined pale or crimson submarginal band.*

124. *Chærocampa lycetus*, *Cram. Pap. Exot.* i, p. 96, pl. 61 D; *C. & S.* no. 94.
Chærocampa rosina, *Butl. P. Z. S.* 1875, p. 248, pl. 37, fig. 6; *C. & S.* no. 91.
Chærocampa drancus, *Cram. Pap. Exot.* ii, p. 56, pl. 132 F; *C. & S.* no. 89.
Chærocampa prunosa, *Butl. P. Z. S.* 1875, p. 622; *C. & S.* no. 108; *Moore, Lep. Ceyl.* ii, pl. 84, fig. 2.

Differs from *theylia* in being brownish in colour, with but a slight pink tinge; sides of abdomen golden yellow; the two dorsal lines paler. Fore wing with the oblique stripes from the apex silvery white. Hind wing blackish, with some flesh-coloured suffusion on the submarginal area. Underside more ochreous and less pink than in *theylia*.

The form *lycetus* = *rosina* from Mussooree and Sikhim is pinker in tone and has more flesh-colour on the hind wing than *drancus* = *prunosa* from Ceylon.

Hab. Mussooree; Sikhim; Ceylon. *Exp.* 68 millim.

125. *Chærocampa oldenlandiæ*, *Fabr. Syst. Ent.* p. 542; *Moore, Lep. Ceyl.* ii, pl. 85, figs. 1, 1a (larva); *C. & S.* no. 90.
Chærocampa puellaris, *Butl. P. Z. S.* 1875, p. 623; *C. & S.* no. 92.
Xylophanes gortys, *Hübner. Samml. exot. Schm.* figs. 513, 514.

Differs from *lycetus* in being greyish brown without pink suffu-

sion; the two dorsal lines on abdomen silvery white, as also the oblique stripes on fore wing; the sides of abdomen ochreous, not golden. Hind wing with the submarginal band ochreous and narrow.

The form *puellaris* from the N.W. Himalayas is small and pale.

Larva pale purplish brown; a subdorsal line of yellow and white spots with a pale lateral line below them on the thoracic somites; black-ringed ocelli on 4th to 10th somites, the first two centred with blue, the posterior with purple. In the early stages these posterior ocelli are centred with crimson, and there are dorsal bands of yellow specks.

Hab. Egypt; throughout Asia; Philippines; Java; Aru. *Exp.* 80 millim., (*puellaris*) 54 millim.

126. *Chærocampa silhetensis*, *Wlk. Cat.* viii, p. 143; *Butl. Trans.*

Zool. Soc. ix, pl. 92, fig. 8 (larva and pupa); *C. & S.* no. 93.

Chærocampa bisecta, *Moore, Lep. E. I. C.* p. 278.

Xylophanes pinastrina, *Moore, Lep. Ceyl.* ii, p. 18, pl. 87, fig. 2.

Differs from *oldenlandiæ* in being very much paler, with but one white line down centre of abdomen. Fore wing with only the line beyond the oblique brown band silvery; the others ochreous.

Larva green, with the dorsal area red-brown; a subdorsal paler line with equal-sized ocelli from 4th to 10th somites with green centres; horn red-brown.

Hab. Throughout India and Ceylon; Java; Borneo; Formosa; Japan. *Exp.* 60–68 millim.

127. *Chærocampa vigil*, *Guér. Deless. Voy.* ii, p. 80, pl. 23, fig. 1; *C. & S.*

no. 71; *Moore, Lep. Ceyl.* ii, pl. 87, figs. 3, 3 a, b (larva and pupa).

Panacra lignaria, *Wlk. Cat.* viii, p. 156.

Sphinx phœnix, *Herr.-Schüffer, Eur. Schmett.* pl. 83, fig. 478.

Head and thorax brown, with pale lateral streaks; abdomen brown, with numerous dark strigæ and pairs of pale lateral strigæ on each segment. Fore wing brown; the lines much as in *celerio*, but without any silvery markings, those on the median nervure being absent and the oblique line from the apex (which is much more curved) and those towards outer margin being pale ochreous brown. Hind wing smoky brown, with traces of a darker submarginal line.

Larva pale green or brown, with black dorsal dots; an ocellus on 4th somite, which is blue centred with yellow in the green form, ochreous with black ring and centre in the brown form; a subdorsal line from 5th to 11th somite; horn purplish in the green form.

Hab. Throughout India and Ceylon; Andamans; Philippines; Australia; New Hebrides. *Exp.* 64–74 millim.

128. *Chærocampa insignis*, *Butl. A. M. N. H.* (5) x, p. 432; *C. & S.* no. 75.

Differs from *vigil* in the pale lines on the vertex of abdomen coming out more strongly. Fore wing with black lines developed beyond the cell parallel to the oblique pale line, which is wider and more curved and broadly edged on the outer side with black; the dark submarginal line waved; cilia black, not chequered. Hind wing suffused with pinkish beyond the middle; a dark submarginal line and marginal band. Underside pinkish.

Hab. Andamans. *Exp.* ♀ 60 millim.

129. *Chærocampa busiris*, *Wlk. Cat.* viii, p. 158; *Butl. Ill. Het.* v, pl. 79, fig. 2; *C. & S.* no. 62.

Fore wing highly angled at vein 5 in both sexes.

Head and thorax dark green; palpi pinkish brown; delicate pinkish lines above the eyes and outlining the collar and patagia; abdomen brownish, with darker lateral patches on the first two segments. Fore wing with a brown patch at the base marbled with darker lines and extending further along the costa than the inner margin; a white patch at base of inner margin; a green medial band, wide at costa; a black speck at end of cell; marginal area pale brown with three dark curved lines, the submarginal line waved and white near the apex. Hind wing dark brown; a pale brown marginal line, widest at anal angle, where there are some indistinct lines inside it. Underside green at base, marbled with reddish, purplish, and grey towards outer margin.

Hab. Sikkim; Sylhet. *Exp.*, ♂ 66, ♀ 82 millim.

130. *Chærocampa variolosa*, *Wlk. Cat.* viii, p. 156; *C. & S.* no. 69. *Panacra vagans*, *Butl. Ill. Het.* v, p. 4, pl. 78, fig. 7; *C. & S.* no. 74.

Head and thorax olive-green and brown, with numerous brown lines; abdomen with a golden tinge, mottled with purplish grey towards base. Fore wing olive-green, marbled with purplish grey at base; three oblique lines from the apex to centre of inner margin; a submarginal line. Hind wing brown, with some pale marks towards anal angle. Underside of body and wings beautifully suffused with golden yellow; postmedial lines developed on both wings.

Hab. Sikkim; Bhutan; Borneo. *Exp.* 80 millim.

131. *Chærocampa metallica*, *Butl. P. Z. S.* 1875, p. 6; *C. & S.* no. 68. *Panacra perfecta*, *Butl. P. Z. S.* 1875, p. 391; *id. Ill. Het.* v, pl. 78, fig. 8; *C. & S.* no. 73.

Differs from *variolosa* in the olive-green and brown tints of both upper and under side being replaced by ochreous and red-brown tints.

The female (*metallica*) has the fore wing broader, with the outer margin more excised below the apex.

Hab. Sikkim. *Exp.* 64–70 millim.

132. *Chærocampa automedon*, *Wlk. Cat.* viii, p. 154; *Butl. Ill. Het.* v, pl. 79, fig. 1; *C. & S.* no. 65.

Panacra truncata, *Wlk. Cat.* viii, p. 160.

The outer margin of fore wing angled at vein 5, more so in the male than in the female.

Markings similar to those of *metallica*; the coloration much duller, being pale ochreous speckled with brown. Underside nearly uniform dull ochreous; one postmedial line coming out as specks on the nervules, the others obsolescent on fore wing, obsolete on hind wing; outer margin rather darker.

Female with the fore wing broader.

Hab. Sikkim; Sylhet; Pegu; Rangoon. *Exp.* 54 millim.

133. *Chærocampa mydon*, *Wlk. Cat.* viii, p. 155; *Butl. Ill. Het.* v, pl. 78, fig. 9; *C. & S.* no. 66.

Panacra scapularis, *Wlk. Cat.* viii, p. 157; *Moore, Lep. E. I. C.* pl. ix, figs. 5, 5a (larva and pupa); *C. & S.* no. 70.

Panacra frena, *Swinh. Cat. Lep. Mus. Oxon.* p. 12, pl. i, fig. 5.

Fore wing less produced at apex; the outer margin more erect and excurved at median nervules.

Differs from *metallica* in the postmedial lines of fore wing being much more erect and highly waved; the white on vertex of thorax and proximal segments of abdomen comes out very strong in some specimens; the markings of the upperside and mottlings of the underside vary from ochreous to red-brown.

Larva greenish, with dark dorsal and lateral stripes and dorsal spots; a purplish ocellus on 4th somite.

Hab. Sikkim; Calcutta; Sylhet; Assam; Java. *Exp.*, ♂ 56, ♀ 62 millim.

134. *Chærocampa assamensis*, *Wlk. Cat.* viii, p. 160; *C. & S.* no. 64.

The fore wing highly angled at vein 5 in both sexes.

Head, thorax, and abdomen pale greyish brown; paired dark brown streaks with pale streaks below them from top of head to second segment of abdomen. Fore wing greyish brown, with a black speck at base and streak on inner margin; a large black patch on the discocellulars, with a triangular patch above and beyond it; traces of a dark line from the end of the cell to the inner margin; a faint waved postmedial line met by a reddish oblique streak from the apex, with some paler marks on it towards inner margin. Hind wing purplish fuscous, with an obsolescent paler submarginal line; the inner margin pale; a streak of dark



hairs along vein 1 *a*. Underside clouded with ochreous and ferruginous, leaving an irregular dark outer margin to both wings.

C. borneensis, Butl., from Borneo, is a race of this species.

Hab. Sylhet. *Exp.* ♂ 55 millim.

135. *Chærocampa gloriosa*, Butl. *P. Z. S.* 1875, p. 246; *id. Ill. Het.* v, pl. 78, fig. 6; *C. & S.* no. 61.

Head and vertex of thorax and abdomen olive-green; antennae, palpi, and sides of thorax and abdomen crimson. Fore wing olive-green; the costa, antemedial, medial, postmedial, and submarginal maculate irregular bands crimson; outer margin darker olive; a marginal pale pink line; cilia crimson; a black speck at end of cell. Hind wing smoky black, suffused with blood-red towards outer margin. Almost the whole of underside crimson, except a black blotch towards base of fore wing; each wing with three transverse waved lines.

Hab. Sikhim. *Exp.* ♂ 86 millim.

136. *Chærocampa olivacea*, Moore, *P. Z. S.* 1872, p. 567; *C. & S.* no. 55.

Head, thorax, abdomen, and fore wing olive-brown. Fore wing with three reddish curved antemedial lines; a black spot at end of cell; three slightly waved postmedial lines; a short oblique grey stripe from the apex continued as an indistinct lunulate line to the outer angle. Hind wing smoky black; a diffused ferruginous submarginal band. Underside suffused with ochreous and ferruginous; outer margin of both wings darker.

Hab. Simla; Sikhim; Sylhet; Khâsis; Shillong. *Exp.* 74–80 millim.

137. *Chærocampa velata*, Wlk. *Cat.* xxxv, p. 1853; Butl. *Ill. Het.* v, pl. 78, fig. 5; *C. & S.* no. 54.

Pergesa aurifera, Butl. *P. Z. S.* 1875, p. 7; *id. Ill. Het.* v, pl. 78, fig. 4; *C. & S.* no. 60.

Zonilia acuta, Wlk. *Cat.* viii, p. 195; *C. & S.* no. 52.

Pergesa ægrota, Butl. *P. Z. S.* 1875, p. 246; *id. Tr. Zool. Soc.* 1876, pl. 92, fig. 2; *C. & S.* no. 59.

Olive-brown; the head and thorax with a greyish lateral band; abdomen with paired dark dorsal specks on each segment; the sides yellow, with a black speck on each segment; white below. Fore wing with three waved antemedial black lines; a dark annulus at end of cell; three dark postmedial waved lines. Hind wing smoky brown, with a paler patch towards anal angle. Underside clouded with ochreous and reddish.

In the variety *aurifera* the waved lines of the fore wing are reduced to a series of black specks.

The form *acuta* is yellowish brown, with the dark markings of

the fore wing obsolescent; the yellow submarginal band of the hind wing narrow but continued to the costa. The form *ægrotæ* is similarly coloured, but has a dark brown blotch on the antemedial band of the fore wing below the costa and blotches on the postmedial lines; the hind wing has the submarginal band broader, its outer edge being defined by a black line.

Hab. Sikkim; Sylhet. *Exp.* 68–88 millim.

138. **Chærocampa castanea**, Moore, *P. Z. S.* 1872, p. 567; *C. & S.* no. 57.

Head and thorax dark red-brown, with lateral grey stripes; abdomen paler. Fore wing dark red-brown; two faint antemedial curved lines; two nearly straight postmedial oblique lines; an irregular grey marginal band. Hind wing uniform dark brown. Underside red-brown; each wing with two postmedial wavy lines and irregular dark border.

Hab. Bombay; Satara. *Exp.* 66 millim.

139. **Chærocampa helops**, *Wlk. Cat.* viii, p. 180.

Philampelus orientalis, *Feld. Reis. Nov.* pl. 77, fig. 1; *C. & S.* no. 130.

Head, thorax, and abdomen olive-brown; thorax with a pale lateral streak; abdomen with a pale patch on vertex of 1st segment and black lateral patches on 1st two segments. Fore wing grey-brown; a large olive-brown basal patch with a pale edge; a black speck at end of cell, beyond which the area is suffused with brown; a subapical olive-brown patch, with a wavy black line on its outer edge continued as an obsolescent line to outer angle. Hind wing smoky black, with a pale patch at anal angle. Underside ochreous, suffused and speckled with black.

Hab. Sikkim; Penang; Borneo. *Exp.* 116 millim.

140. **Chærocampa lucasi**, *Wlk. Cat.* viii, p. 141; Moore, *Lep. E. I. C.* pl. xi, figs. 3, 3 a (larva and pupa); *C. & S.* no. 95.

Chærocampa tenebrosa, Moore, *P. Z. S.* 1877, p. 595; *id. Lep. Ceyl.* ii, pl. 86, figs. 2, 2 a (larva); *C. & S.* no. 96.

Chærocampa rhesus, *Boisd. Sphing.* p. 254.

Ochreous brown; the antennæ, front of head, and sides of thorax paler. Fore wing with a black speck at end of cell; two oblique indistinct lines from near the apex to near base of inner margin; three similar lines from the apex nearly parallel to outer margin. Hind wing smoky black, paler towards anal angle. Underside with a slight rosy tinge.

The form *tenebrosa* is darker on both upper and under sides than *lucasi*, which again is darker than *rhesus*, but these differences are varietal, not local.

Larva brown with darker specks; a pale lateral line on thoracic somites; an ocellus on 4th somite, which is white, centred with

crimson, with a black ring on an ochreous ground; a fine subdorsal line on the posterior somites, with leaden oblique streaks below it.

Hab. Throughout India and Ceylon; Andamans; Borneo; Java; China; Australia. *Exp.* 80 millim.

141. *Chærocampa butus*, *Cram. Pap. Exot.* ii, p. 88, pl. 152.

Sphinx velox, *Fabr. Ent. Syst.* iii, p. 378; *C. & S.* no. 97.

Sphinx clotho, *Drury, Exot. Ins.* ii, p. 48; *Moore, Lep. Ceyl.* ii, pl. 87, fig. 1; *C. & S.* no. 98.

Chærocampa gonograptæ, *Butl. P. Z. S.* 1875, p. 249; *Hmps. Ill. Het.* ix, pl. 175, fig. 10 (larva); *C. & S.* no. 101.

Chærocampa aspersata, *Kirby, Trans. Ent. Soc.* 1877, p. 241; *C. & S.* no. 99; *Waterh. Aid.* i, pl. 97.

Chærocampa punctivenata, *Butl. P. Z. S.* 1875, p. 248; *C. & S.* no. 100.

Differs from *lucasi* in having the fore wing longer, with the apex more pointed; head and thorax greenish; abdomen with black lateral patches on the first segment. Underside more ochreous.

In the form *butus=velox=clotho=aspersata* one of the oblique lines from the apex of the fore wing is prominent; in the forms *gonograptæ* and *punctivenata* this line is obsolescent, in the last-named coming out as specks on the nervules.

Larva pale green or brown, speckled with dark striæ; 4th somite with a green ocellus, edged with yellow above, pink below, with a lineal white centre; a pale lateral line from 5th somite to horn, which is purplish; legs pink, claspers green.

Hab. Throughout India, Ceylon, and Burma; Andamans; Borneo; Java. *Exp.* 88–106 millim.

142. *Chærocampa mirabilis*, *Butl. P. Z. S.* 1875, p. 248; *id. Trans. Zool. Soc.* ix, pl. 92, fig. 1; *C. & S.* no. 82.

Head, thorax, and first two segments of abdomen olive-green; sides of head and thorax white; distal segments of abdomen ruddy brown. Fore wing olive-green, the base darker; a dark green antemedial waved line and postmedial curved line; a dark speck at end of cell. Hind wing ruddy brown with traces of a submarginal line. Underside: fore wing brown at base and outer margin; the postmedial area pink; an oblique postmedial brown line; hind wing pink, the outer margin brown; a medial curved brown line.

Hab. N.W. Himalayas. *Exp.* 86 millim.

143. *Chærocampa lineosa*, *Wlk. Cat.* viii, p. 144; *Butl. Ill. Het.* v, pl. 79, fig. 7; *C. & S.* no. 104.

Chærocampa major, *Butl. P. Z. S.* 1875, p. 249; *C. & S.* no. 103.

Chærocampa minor, *Butl. P. Z. S.* 1875, p. 249; *C. & S.* no. 102.

Head, thorax, and abdomen green; head and thorax with a pale

lateral band; thorax with a pale band on vertex; abdomen with four pale dorsal lines. Fore wing green, with a black patch at base of inner margin; a black dot at end of cell; about seven indistinct oblique lines from the apex. Hind wing black, with a diffused pale submarginal band. Underside ochreous, suffused with red and speckled with black; some black in cell of fore wing and post-medial dark lines.

In the variety *major* prominent pale stripes appear between the oblique lines of the fore wing.

In some specimens the second or third line from the outer margin of the fore wing becomes double towards inner margin.

Hab. Mussooree; Sikhim; Assam; Sylhet. *Exp.* 86–108 millim.

C. Hind wing dull red or orange.

144. *Chærocampa pallicosta*, *Wlk. Cat.* viii, p. 145; *Moore, Lep. Ceyl.* ii, pl. 84, fig. 6; *C. & S.* no. 106.

Head and thorax red-brown, with a lateral white streak. Fore wing red-brown, with the costa paler; a pale speck at end of cell; a white line along inner margin; a postmedial lunulate diffused dark line and traces of a submarginal line. Abdomen, hind wing, and underside pinkish ferruginous; cilia of hind wing white.

Hab. Assam; Sylhet; E. Pegu; Ceylon; Hongkong. *Exp.* 82 millim.

145. *Chærocampa erotus*, *Cram. Pap. Exot.* ii, p. 12; *C. & S.* no. 107. *Chærocampa erotus*, *var. andamanensis*, *Kirby, Trans. Ent. Soc.* 1877, p. 242; *Waterh. Aid.* ii, pl. 141, fig. 1. *Gnathothlibus erotoides*, *Wallengr. Wien. ent. Mon.* iv, p. 43.

Brighter in colour than *pallicosta*. Fore wing with a slight purplish suffusion and clouded in parts beyond the middle; two indistinct antemedial curved lines, and two similar postmedial lines. Hind wing bright orange-yellow, with a diffused red-brown band along outer margin except at apex and anal angle; cilia red-brown. Throat and first joint of palpus pure white.

Hab. Andamans; Australia; Solomon Isl. *Exp.* 96–114 millim.

Genus **DAPHNIS.**

Daphnis, *Hübner. Verz.* p. 134 (1818).

Type, *D. nerii*, Linn.

Range. Europe; Africa, Mauritius; throughout India; Ceylon; Borneo; Java; Amboina; New Hebrides.

The tibial spurs considerably longer than in *Chærocampa*; the palpi slightly more rounded at apex; outer margin of fore wing as in the typical species.

146. *Daphnis nerii*, *Linn. Syst. Nat.* i, p. 798; *C. & S.* no. 112; *Moore, Lep. Ceyl.* ii, pl. 82, figs. 1, 1 a (larva and pupa).

Head green, rufous in front; a grey band on vertex. Thorax green, the collar outlined in grey; a triangular grey patch on the vertex. Abdomen paler green, with oblique lines at the side;

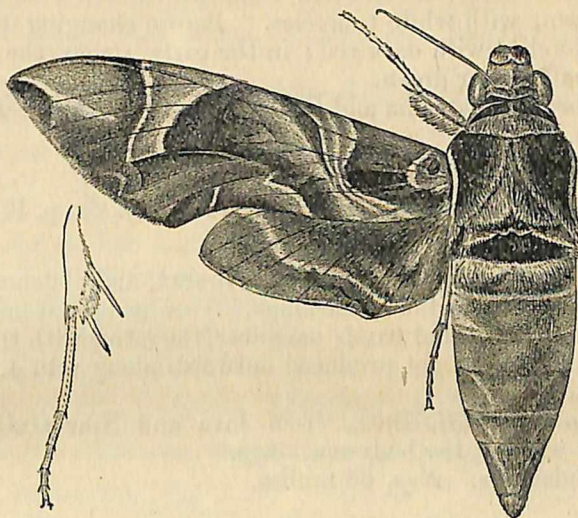


Fig. 54.—*Daphnis nerii*, ♀. 1.

paired dark green lateral blotches on penultimate, and a single dorsal blotch on ultimate segment. Fore wing dark green; a white patch with a black spot on it at base; some medial whitish conjoined bands, rosy towards hind margin; an outwardly oblique band from costa to vein 4; an oblique streak from apex to vein 6; a triangular purplish patch from below the cell to near outer margin. Hind wing fuscous, with a pale curved submarginal line, beyond which the area is olivaceous. Underside suffused with chestnut; a white submarginal line to both wings; a white speck at end of cell of hind wing.

Larva green, with a bluish lateral band from 4th somite to horn, with white oval spots on it, and others above and below it; 3rd somite with a blue ocellus; horn yellow.

Hab. Europe; S. Africa; Mauritius; Aden; throughout India and Ceylon. *Exp.* 70–120 millim.

147. *Daphnis hypothous*, *Cram. Pap. Exot.* iii, p. 165; *Moore, Lep. Ceyl.* ii, pl. 83, figs. 1, 1 a (larva and pupa); *C. & S.* no. 113.

Differs from *nerii* in having the head and collar uniformly dark purple-brown; thorax and first two segments of abdomen dark green, with a white fringe to the first; the other segments dark olive-brown, with the streaks and spots as in *nerii*. Wings similarly marked, but very much darker on both upper and under side; a white spot at apex of fore wing and at end of cell of fore wing on the underside.

Larva green, with yellow dots at sides; a darker dorsal line; a subdorsal purple-red band, edged with yellow on thoracic somites and with white from 4th somite; a blue ocellus on 3rd somite; a series of blue white-centred ocelli from 5th to 10th somites; horn purple-brown, with white tubercles. Before changing the larva becomes blotched with dark red; in the early stages the ground-colour is pale red or green.

Hab. Throughout India and Ceylon; Java; Borneo. *Exp.* 98–124 millim.

148. **Daphnis andamanus**, *Druce*, *Ent. Mo. Mag.* xix, p. 16; *C. & S.* no. 116.

Differs from *hypothous* in the head, thorax, and abdomen being uniform red-brown without markings. Fore wing red-brown, the subbasal and postmedial bands narrower, the latter with the angles at veins 1 and 5, but not produced outwards along vein 4. Hind wing red-brown.

Allied to *horsfieldi*, *Butl.*, from Java and New Guinea, but redder and without the body-markings.

Hab. Andamans. *Exp.* 68 millim.

149. **Daphnis layardi**, *Moore*, *Lep. Ceyl.* ii, p. 16, pl. 84, fig. 1; *C. & S.* no. 117.

Differs from *hypothous* in being ruddy brown, not olive in hue; abdomen with a pale fringe to each segment. Underside with the white spots at apex of fore wing and at end of cell of each wing minute.

Hab. Ceylon. *Exp.* 86 millim.

150. **Daphnis ernestinus**, *Moore*, *Lep. Ceyl.* iii, p. 534, pl. 211, fig. 1.

Differs from *layardi* in being pale greyish brown; sides of thorax but slightly darker; no dark patches at end of abdomen. Fore wing with the basal black spot on a grey patch; the pale antemedial area wider; the dark postmedial area with a diffused and not angulate outer margin; the markings towards outer margin very faint. Hind wing uniform dark brown, with a pale submarginal line.

Hab. Pundaloya, Ceylon. *Exp.* 64 millim.

151. **Daphnis bhaga**, *Moore*, *P. Z. S.* 1865, p. 794; *C. & S.* no. 115.

Differs from *layardi* in the head, thorax, and abdomen being uniform brown, except that the last two segments of the abdomen have a dark triangular dorsal patch. Fore wing highly excised below the apex; the basal markings absent and replaced by an oblique pale line; the medial pale shade more diffused; the dark postmedial patch with more angulate outer edge; a curved line

across the apex as well as the oblique line; no triangular marginal patch below the apex. Hind wing more excised before anal angle; uniform dark brown, the pale submarginal line only appearing near anal angle. Underside without the red suffusion.

Hab. Sikkim; N.E. Bengal; Singapore. *Exp.* 84 millim.

152. *Daphnis minimus*, *Butl. Trans. Zool. Soc.* x, p. 573, pl. 92, fig. 5; *C. & S.* no. 114.

Head and collar grey-brown; tegulæ olivaceous; abdomen grey-brown, with some olivaceous marks towards the extremity. Fore wing grey-brown, with an olivaceous curved subbasal band; a medial band widest and angled below the costa; two postmedial curved lines; a series of marginal dark marks. Hind wing and underside uniform grey-brown.

Hab. S. India. *Exp.* 44 millim.

Genus *DILEPHILA*.

Deilephila, *Ochs. Eur. Schmett.* iv, p. 42 (1816).

Type, *D. livornica*, *Esp.*

Range. Europe; Canaries; N. Africa; Madagascar; Afghanistan; Himalayas; China; Hawaii; N. and S. America.

Differs from *Chærocampa* in the end of each antenna being much thicker, with the hook very short; outer margin of fore wing as in typical *Chærocampa*.

153. *Dilephila livornica*, *Esp. Schmett.* ii, pp. 87, 196, pl. 8, fig. 4; *C. & S.* no. 109.

Sphinx kœchlini, *Fuessly, Arch. Ins. Gesch.* pl. 33, figs. 1-5 (larva and pupa).

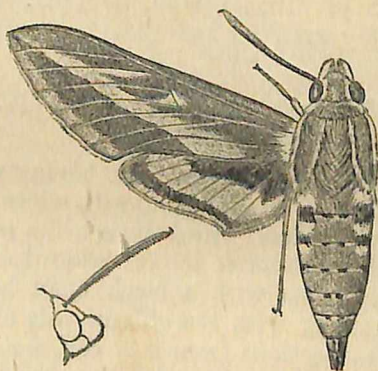


Fig. 55.—*Dilephila livornica*, ♂. 1.

Head and thorax olive, white lines above the eyes and along sides of thorax, met on metathorax by white lines from the vertex of thorax; abdomen olive, with white lateral segmental patches and black segmental lines with three white dorsal specks on each.

Fore wing olive-green, with a black and white patch at base; a white patch at lower end of cell; an oblique whitish band from apex to near base of inner margin; a grey marginal band; nervules beyond the cell white. Hind wing pink, with the basal area black; a submarginal black band; anal area white.

Larva black with numerous yellow dots; head dull pink; a pink semicircular mark on 1st somite; dorsal line yellow; each somite blotched with red and bordered with black, which expands into a subquadrate patch on 4th to 10th somites; a series of semicircular yellow ocelli on a subdorsal yellow line with pink centres; horn black, with red tip.

Hab. Europe; N. Africa; Aden; N.W. Himalayas; China.
Exp. 74–94 millim.

154. *Dilephila euphorbiæ*, *Linn. Syst. Nat.* i, pt. 2, p. 802; *Kirby, Eur. Butt. & Moths*, pl. 18, fig. 1 a (larva).

Deilephila lathyrus, *Wlk. Cat.* viii, p. 172; *C. & S.* no. 110; *Butl. Ill. Het.* v, pl. 80, fig. 1.

Differs from *livornica* in wanting the white lines from vertex of thorax; abdomen without dorsal marks and with the black and white lateral marks only on the first two segments. Fore wing with a whitish band narrowing to the inner margin and extending on the costa from before the middle to the apex; speckled with brown and sometimes with a rosy tinge, and enclosing an oval olive patch beyond the cell.

The Himalayan form *lathyrus* averages rather larger than the European *euphorbiæ*.

Larva black, dotted with yellow; a dorsal red stripe; a lateral red stripe spotted with yellow; a series of equal-sized yellow ocelli.

Hab. Europe; N.W. Himalayas to Naini Tal. *Exp.* (*euphorbiæ*) 60–80 millim., (*lathyrus*) 76–92 millim.

155. *Dilephila galii*, *Roth, Natur.* vii, p. 107 (1775); *Kirby, Eur. Butt. & Moths*, pl. 18, fig. 2 a (larva).

Differs from *euphorbiæ* in the thorax having a black line above the lateral white streak; the abdomen with white segmental specks on the vertex, more or less joined by a white line; the fifth and sixth segments with prominent lateral white bands; the 3rd segment in some specimens with a black band behind the lateral white band. Fore wing with the oblique pale band not reaching the apex, and the projections from it at centre and near apex not reaching the costa. Hind wing with the submarginal black band broader.

Larva green, with a yellow dorsal line; large black-ringed yellow lateral spots on each segment; claspers and anal segment reddish; ventral surface yellow.

Hab. Europe; Gurais Valley, Kashmir, 6000 feet. *Exp.* ♂ 64–72 millim., ♀ 84 millim.

156. *Dilephila dahlia*, Geyer, *Samml. Sphing.* figs. 161-164.
Deilephila robertsi, Butl. *P. Z. S.* 1880, p. 412, pl. 39, figs. 9, 10
 (larva & pupa); *C. & S.* no. 111.

Differs from *galii* in the thorax having two white stripes, the tegulae being fringed with white on the inner side also; abdomen as in *euphorbiae*. Fore wing as in *galii*, hind wing with the band pinker.

Some specimens have the segments of abdomen fringed with blue scales and the veins on outer area of fore wing streaked with white.

Larva dark grey, spotted with white; alternate red and yellow dorsal stripes; a yellow lateral stripe; each segment with two large black-ringed or irregular white spots and three small ones. Horns, legs, and spiracles red.

Hab. Europe; Kandahar; Simla. *Exp.* 82 millim.

Genus THERETRA.

Theretra, Hübn. *Verz.* p. 135 (1818).

Type, *T. nesus*, Drury.

Range. China; India; Borneo; Java.

Differs from *Chærocampa* in having the basal joints of the palpi hollowed out, with an orifice towards the exterior beset with (?) sensory setæ.

157. *Theretra nesus*, Drury, *Exot. Ins.* ii, p. 46, pl. xxvii, fig. 1;
C. & S. no. 105; Moore, *Lep. Ceyl.* ii. pl. 86, fig. 1; *id.* *Cat.*
E. I. C. pl. xi. figs. 2, 2a (larva and pupa).

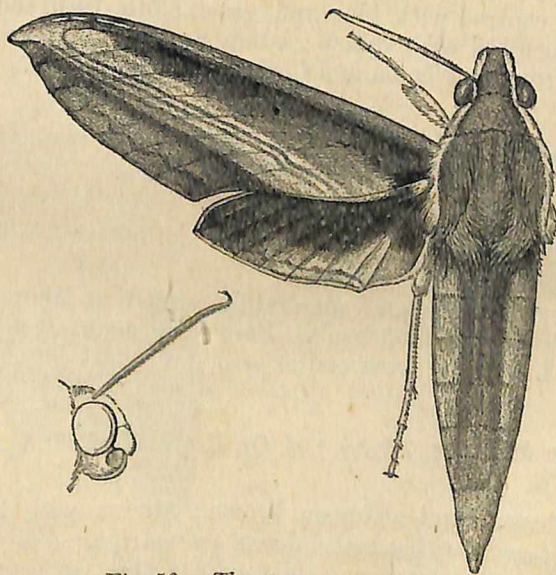


Fig. 56.—*Theretra nesus*, ♂. $\frac{1}{2}$.

Sphinx equestris, Fabr. *Ent. Syst.* iii, p. 365.

Chærocampa nesus, var. *rubicundus*, Schaufuss, *Nunq. Otiosus*, i, p. 18.

Head, thorax, and a stripe down centre of abdomen green suffused with ferruginous; thorax with a lateral grey stripe; abdomen golden yellow at sides. Fore wing olive-brown, the base green with a patch of black and white on the inner margin; a black dot at end of cell; a postmedial waved oblique line met by three straight oblique lines from the apex at inner margin; two submarginal lines. Hind wing black-brown; the anal angle ochreous, which colour extends towards the apex as a submarginal band. Underside suffused with reddish ochreous.

Larva blue-green, a subdorsal line with oblique streaks below it on 4th–10th somites; 4th somite with a black-ringed green ocellus centred with black; horn yellow.

Hab. Hongkong, throughout India, Ceylon, and Burma; Borneo; Java. *Exp.* 92–122 millim.

158. *Thereetra actea*, *Cram. Pap. Exot.* iii, p. 93, pl. 248 A; *C. & S.* no. 53; *Moore, Lep. Ceyl.* ii, pl. 88, figs. 1, 1 a (larva and pupa).

Differs from *nessus* in the head, thorax, and abdomen being purplish grey; vertex of head and a dorso-lateral stripe to thorax and abdomen green. Fore wing purplish grey; a green oblique central area from below apex to inner margin with some indistinct lines on it; an irregular dark outer area with some yellow inside it. Hind wing with anal patch and submarginal band pointed.

Larva green; a dark dorsal line; a subdorsal pale line on thoracic somites; 4th somite with a large ocellus, white ringed with brown and centred with blue and green; 5th–10th somites with blue ocelli centred with yellow; lateral area whitish; horn yellow.

Hab. Throughout India and Ceylon; Borneo; Java. *Exp.* 74–80 millim.

Genus **ELIBIA**.

Elibia, *Wlk. Cat.* viii, p. 148 (1856).

Type, *E. dolichus*, Westw.

Range. N.E. India; Sumatra.

Palpi very thickly and quadrately scaled at apex; antennæ gradually fining to a long hook. Fore wing acute at apex; veins 6 and 7 of hind wing from end of cell.

159. *Elibia dolichus*, *Westw. Cub. Or. Ent.* p. 61, pl. 30, fig. 1; *C. & S.* no. 50.

Head, thorax, and abdomen brown; thorax with three pale stripes; abdomen with a broad dorsal pale stripe. Fore wing pale brown, with dark brown very oblique lines, the two broadest from near the apex; a small ring-spot at end of cell. Hind wing bluish at base, the outer area blackish; cilia chequered white and brown.

Underside pale; a waved submarginal line to fore wing; hind wing with two waved lines.

Hab. Sikkim; Sylhet; Assam; Sumatra. *Exp.* 120 millim.

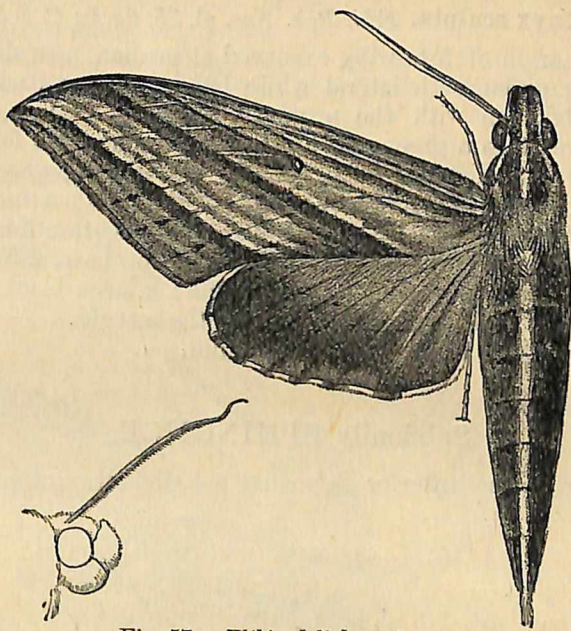


Fig. 57.—*Elibia dolichus*, ♂. 1.

Genus **ANGONYX.**

Angonyx, *Boisd. Sping.* p. 317 (1875).

Microlophia, *Feld. Reis. Nov.* pl. 75 (1874), gen. indescr.

Type, *A. testacea*, Wlk.

Range. Sylhet; S. India; Ceylon; Siam.

Antennæ gradually tapering to a long hook. Palpi very broad at apex. Fore wing with the outer margin excurved at middle; hind wing with the apex rounded.

160. *Angonyx testacea*, *Wlk. Cat.* viii, p. 102; *Moore, Lep. Ceyl.* ii, pl. 89, fig. 1; *C. & S.* no. 63.

Angonyx emilia, *Boisd. Sp. Gén.* p. 318.

Panaera ella, *Butl. P. Z. S.* 1875, p. 246.

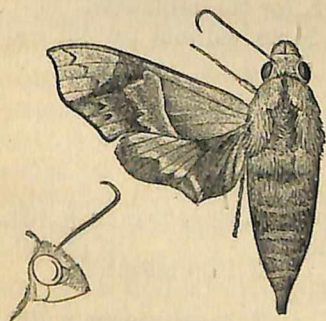


Fig. 58.

Angonyx testacea, ♂. 1.

Head, thorax, and abdomen uniform dark green. Fore wing dark green, with a grey band beyond the middle not reaching the costa, beyond which the wing is clouded with black; a waved submarginal line; cilia black. Hind wing dark red-brown, dark brown at base; outer margin with a

broad irregular brown band ; some grey towards anal angle. Under-side reddish ochreous, greenish towards outer margin.

Hab. Sylhet ; Nilgiris ; Ceylon. *Exp.* 58 millim.

161. *Angonyx sculpta*, *Feld. Reis. Nov.* pl. 75, fig. 9; *C. & S.* no. 76.

Outer margin of fore wing excurved at median nervule. Head and thorax green, with lateral white bands ; thorax dark grey on vertex ; abdomen with the proximal segments orange at sides, black above, with a green spot on third segment ; the fourth segment grey, the distal segments black. Fore wing green, a grey streak at base ; a pale line along inner margin ; a postmedial pale band not reaching the costa ; a submarginal dentate line, beyond which the area is grey. Hind wing orange at base, diffused outwards along the costa and to anal angle ; a large black patch on outer margin, with two grey spots near the margin.

Hab. Siam ; S. India. *Exp.* 60 millim.

Subfamily SPHINGINÆ.

Larva with the anterior segments but slightly smaller than the

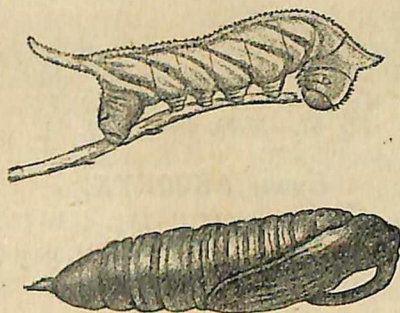


Fig. 59.—Larva and pupa of *Pseudosphinx cyrtolophia*. (From Butler, *Tr. Z. S.* ix, pl. 91.)

posterior ; the head curved downwards in repose ; horn (when present) long and curved.

Pupa generally with an external sheath for the proboscis.

Imago with the proboscis very long. Male without lateral expansions to abdomen.

Key to the Genera.

- a. Palpi quadrately scaled at apex.
 - a¹. Fore wing but slightly acute at apex.
 - a². Hind wing with discocellulars curved 1. *PROTOPARCE*, p. 102.
 - b². Hind wing with discocellulars straight and oblique 2. *PSEUDOSPHERIX*, [p. 104.]
 - b'. Fore wing more produced and acute at apex 3. *APOCALYPSIS*, p. 107.
- b. Palpi rounded at apex 4. *NEPHELE*, p. 108.

Genus **PROTOPARCE.**

Protoparce, *Burmeister*, *Abh. nat. Gesell. Halle*, iii, pt. 2, p. 63 (1855).
Hyloicus, *Hübner*, *Verz.* p. 138 (1816), gen. indescr.

Type, *P. rustica*, Wlk., from Brazil.

Range. Universally distributed.

Palpi quadrately scaled at apex. Veins 6 and 7 of hind wing arising from the angle of the cell; the upper discocellular bent out to the origin of vein 5.

162. *Protoparce convolvuli*, *Linn. Syst. Nat.* i, p. 798; *C. & S.* no. 168.

Protoparce orientalis, *Butl. Tr. Z. S.* ix, p. 609; *C. & S.* no. 167;
Moore, Lep. Ceyl. ii, pl. 75, figs. 1, 1 a-e (larva and pupa).

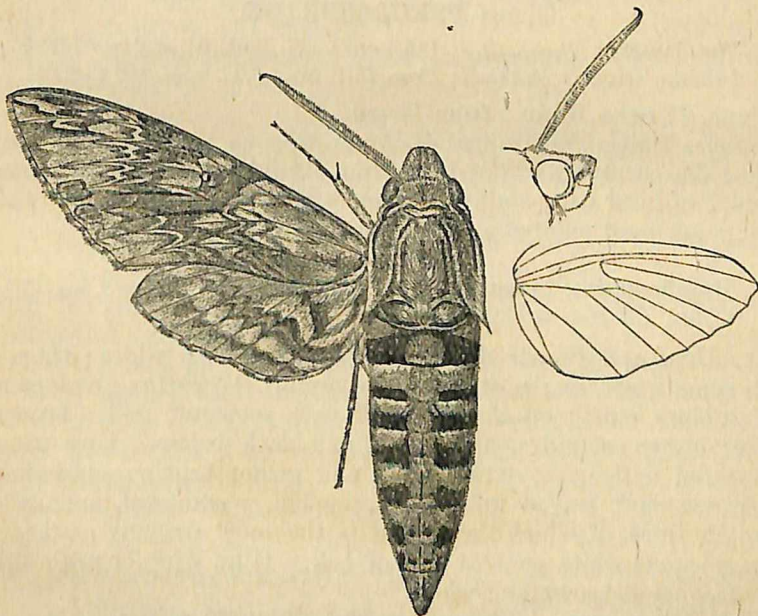


Fig. 60.—*Protoparce convolvuli*, ♂. 1.

Head, thorax, and a streak down the vertex of abdomen grey; abdomen with lateral transverse bands of pink and black to each segment; grey below. Fore wing grey, with black streaks below veins 2 and 3; a highly dentate dark postmedial line met by an irregular black streak from the apex. Some specimens are much clouded with fuscous, which sometimes takes the form of a broad medial band leaving two small pale spots in the end of the cell. Hind wing grey; antemedial, medial, and postmedial piceous bands, the two former meeting at anal angle, the two latter lunulate.

Larva green, the horn yellow; a series of oblique lateral pink and white stripes on the fourth to tenth somites; stigmata ringed with yellow and black. The European form has a black spot above each lateral stripe, the absence of which is the only character relied on for separating *orientalis*.



Hab. Europe; Africa; Asia; Borneo; Java; Celebes; Lombock; Ternate. *Exp.*, ♂ ♀ 80–120 millim.

163. **Protoparce uniformis**, *Butl. P. Z. S.* 1875, p. 261; *C. & S.* no. 182.

♂. Grey; palpi black; thorax with the vertex surrounded with black; abdomen brownish grey. Fore wing with an obsolescent curved diffused medial band; two similar postmedial bands bent inwards at vein 2. Hind wing and underside uniform brownish grey.

Hab. N.W. Himalayas. *Exp.* 54 millim.

Genus **PSEUDOSPHINGX.**

Pseudosphinx, *Burmeister, Abh. nat. Gesell. Halle*, iii, pt. 2, p. 65 (1855).
Diludia, *Grote & Robinson, Proc. Ent. Soc. Phil.* v, p. 188 (1865).

Type, *P. tetro*, Linn., from Brazil.

Range. India; W. Indies; S. America.

The discocellulars of the hind wing straight and oblique; veins 6 and 7 of hind wing stalked or from angle of cell; palpi with the third joint more pointed and less broad.

164. **Pseudosphinx inexacta**, *Wlk. Cat.* viii, p. 208; *C. & S.* no. 170; *Butl. Ill. Het.* v, pl. 81, fig. 8.

♂. Head and thorax dark brown grizzled with white; thorax with some white marks at sides and round the vertex; abdomen with a black streak on the vertex of each segment, golden brown above, brown at sides, and white and black below. Fore wing variegated with grey, dark brown, and golden brown; somewhat indistinct dark waved antemedial, medial, postmedial, and submarginal lines, of which the medial is the most strongly marked; a conspicuous white spot at end of cell. Hind wing brown; the cilia chequered brown and white.

Hab. Mussooree; Khásis; Bombay. *Exp.* 86 millim.

165. **Pseudosphinx grisea**, n. sp.

♂. Differs from *inexacta* in the ground-colour of the head, thorax, and abdomen being grey; the black lines similar, but with no white on thorax. Fore wing similarly marked, but with the ground-colour grey. Hind wing pale fuscous; cilia grey, with black points at the nervules, not chequered black and white.

Hab. Kulu (*Graham-Young*). *Exp.* 52 millim. Type in coll. Leech.

166. **Pseudosphinx fo**, *Wlk. Cat.* viii, p. 195; *Butl. Ill. Het.* v, pl. 81, fig. 9; *C. & S.* no. 172.

Head, thorax, abdomen, and fore wing greyish brown or olive-brown; abdomen with yellow lateral segmental patches. Fore wing crossed by subbasal, antemedial, medial, and postmedial double

waved black lines ; a conspicuous white spot in end of cell. Hind wing dark brown.

Hab. Sikkim. *Exp.* 64–68 millim.

167. ***Pseudosphinx nyctiphanes***, *Wlk. Cat.* viii, p. 209; *Butl. Ill. Het.* v, pl. 81, fig. 7; *C. & S.* no. 169.

Dark brown ; thorax with black streaks at sides nearly meeting behind, where there are a few blue scales ; head, thorax, and abdomen white below ; abdomen with white segmental streaks at sides. Fore wing variegated with various shades of brown and grey scales and crossed by numerous waved dark lines, of which about six are medial and one submarginal ; a pale speck in end of cell. Hind wing dark brown, with an obsolescent pale medial band ; cilia brown and whitish.

Hab. Sylhet ; Andamans ; Perak ; Singapore. *Exp.*, ♂ 120, ♀ 140 millim.

168. ***Pseudosphinx cyrtolophia***, *Butl. P. Z. S.* 1875, p. 259 ; *id. Trans. Zool. Soc.* ix, pl. 92, fig. 6, pl. 91, figs. 11, 12, 13 (larva and pupa) ; *C. & S.* no. 171.

Differs from *nyctiphanes* in the palpi being black at sides. Fore wing with no postmedial waved line below. Hind wing with the pale band on underside medial, straight, and oblique, not postmedial, curved, and waved.

The type and only known specimen is in very bad condition.

Larva grass-green ; a white dorsal stripe from 2nd somite to horn ; a pink dorsal oval ring-mark on 1st and 2nd somites ; a larger one from 2nd to 4th somites ; lateral oblique pink stripes from 5th to 10th somites.

Hab. Madras. *Exp.* 83 millim.

169. ***Pseudosphinx discistriga***, *Wlk. Cat.* viii, p. 209 ; *Moore, Lep. Ceyl.* ii, pl. 73, figs. 1, 1 a, 1 b (pupa and larva) ; *C. & S.* no. 176.

Diludia melanomera, *Butl. P. Z. S.* 1875, p. 13 ; *C. & S.* no. 177.

Diludia macromera, *Butl. A. M. N. H.* (5) x, p. 435.

Diludia grandis, *Butl. P. Z. S.* 1875, p. 260 ; *C. & S.* no. 175.

Diludia rubescens, *Butl. P. Z. S.* 1875, pp. 260, 623 ; *C. & S.* no. 178.

Macrosila obliqua, *Wlk. Cat.* viii, p. 208 ; *C. & S.* no. 174.

Anceryx inerceta, *Walk. Cat.* xxxi, p. 36 ; *C. & S.* no. 179.

Diludia vates, *Butl. P. Z. S.* 1875, p. 13 ; *C. & S.* no. 180.

Anceryx pinastri, *Wlk. Cat.* viii, p. 223.

Head, thorax, abdomen, and fore wing grey ; dark brown bands along sides of palpi and thorax meeting on metathorax, where there are a few blue and yellow scales ; a dark line down vertex of abdomen and paired more diffused subdorsal lines. Fore wing with some dark strigæ from the costa ; two dark streaks in the interspaces below veins 2 and 3 ; a dark streak from the costa before the apex, curved down to vein 6, then upwards and bent back before reaching the apex ; a series of submarginal lunules ; cilia chequered brown and white. Hind wing brown, with

a pale patch with two dark lines across it near anal angle. Under-side paler, with indistinct transverse lines.

There are four well-marked varieties which are not locally constant :—

- (1) *rubescens*, a dark red-brown form with a prominent oblique black streak from costa of fore wing to lower end of cell; hind wing very dark.
- (2) *discistriga*=*melanomera*=*macromera*=*grandis*, a grey form, much powdered and suffused with dark brown.
- (3) *obliqua*, a whitish-grey form with a prominent black streak on fore wing as in *rubescens*, but continued to the outer

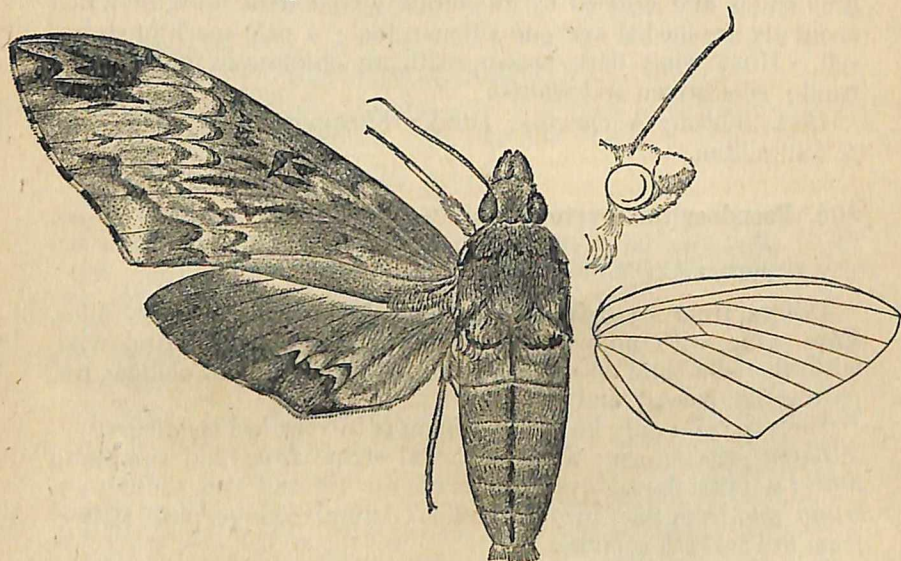


Fig. 61.—*Pseudosphinx discistriga*, ♂. $\frac{1}{2}$.

margin; hind wing very dark; the patch at anal angle remaining pale.

- (4) *incrcta*=*vates*, a pale form but slightly powdered with brown.

Larva green, with white specks on the vertex of somites 1, 2, and 3; oblique white lateral stripes on somites 4–11, with brown streaks above them on somites 4 and 10.

Hab. China and throughout India and Ceylon. *Exp.* 90–140 millim.

170. *Pseudosphinx concolor*, n. sp.

♂. Head, thorax, and abdomen grey; sides of head black; collar fringed with black, and tegulæ streaked with black. Fore wing grey; traces of a medial ferruginous band most prominent on inner area; two black streaks in the interspaces between veins 2 and 4; dark points on the cilia at veins. Hind wing reddish brown, the cilia uniform grey.

Differs from the European *pinastri* and allies in the uniform

colour of abdomen; fore wing in having no black streak from apex; cilia not chequered black and white.

Hab. Subathu; Simla (*Harford*). *Exp.* 50 millim. Type in B. M.

Genus **APOCALYPSIS.**

Apocalypsis, *Butl. Trans. Zool. Soc.* ix, p. 641 (1876).

Type, *A. velox*, *Butl.*

Range. Sikkim; Khási Hills.

Differs from *Pseudosphinx* in the fore wing being more produced and pointed at apex, the outer margin more oblique and straight, not crenulate.

171. **Apocalypsis velox**, *Butl. Tr. Z. S.* ix, p. 641; *C. & S.* no. 173.

Head dark brown; thorax dark brown, with pale paired lines on each side of vertex; abdomen dark brown, with a series of black dorsal streaks and black segmental lines with white specks on them. Fore wing dark brown; white spots at extremities of the veins,

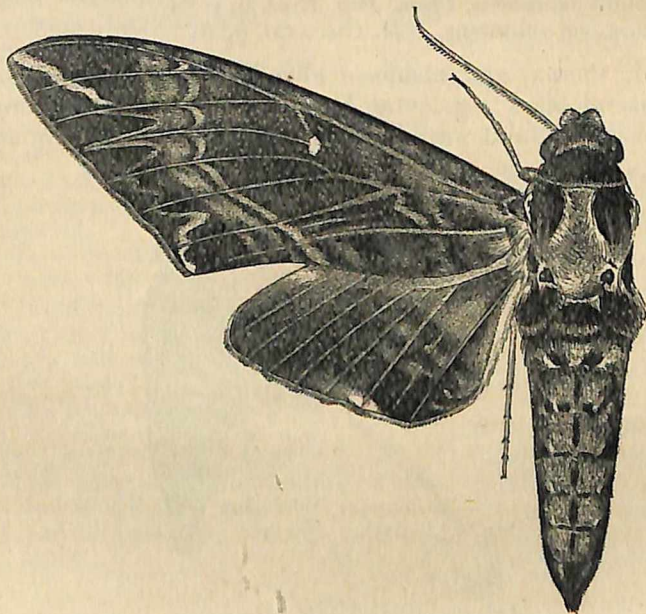


Fig. 62.—*Apocalypsis velox*, ♂. $\frac{1}{2}$.

which are pale; pale obliquely waved antemedial double lines; a curved postmedial pale band formed of three conjoined lines; a yellow streak from the apex continued as a very dentate line to outer angle. Hind wing dark brown, with traces of lines near anal angle; inner margin ochreous; cilia chequered ochreous and brown. Underside of both wings brown with medial and postmedial indistinct lines.

Hab. Sikkim; Khásis. *Exp.* 136 millim.

Genus **NEPHELE**.

Nephele, *Hübner. Verz.* p. 133 (1818).

Type, *N. hespera*, Fabr.

Range. Throughout India and Ceylon; Australia; Madagascar; Africa.

Antennæ with the terminal hook rather short and slight; palpi with the second joint very broad and rounded. Wings rather short and broad; apex of fore wing but slightly acute.

Pupa with the anterior somites narrow; no external sheath for proboscis.

172. *Nephele hespera*, *Fabr. Syst. Ent.* p. 546; *Moore, Lep. Ceyl.* ii, pl. 72, figs. 1, 1 *a*, *b* (pupa and larva); *C. & S.* no. 185.

Sphinx chiron, *Cram. Pap. Exot.* ii, p. 62.

Sphinx didyma, *Fabr. Sp. Ins.* ii, p. 148.

Sphinx quaterna, *Charpentier, Ed. Esper's Exot. Schmett.*, *Sph.* pl. 1, fig. 2.

Sphinx morpheus, *Cram. Pap. Exot.* ii, p. 84.

Perigonia obliterans, *Wlk. Cat.* xxxi, p. 28.

Head, thorax, and abdomen olive-brown or green; abdomen with lateral black segmental bands. Fore wing olive-brown or green, with six faint waved lines and an angled submarginal line,

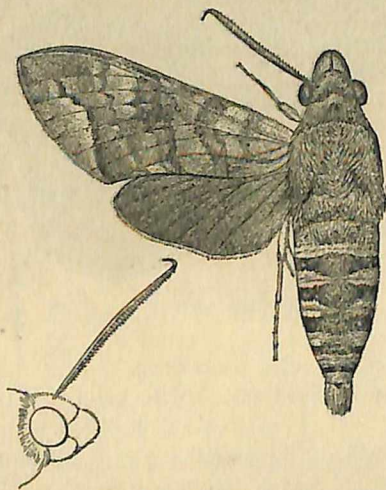


Fig. 63.—*Nephele hespera*, ♂. 1.

the space between it and outer margin paler; at the end of the cell are two conspicuous silvery white spots, which may be reduced to a small speck or be altogether obsolete. Hind wing red-brown; the cilia ochreous. Underside paler, each wing with two transverse lines.

Larva green, with a pale stripe from 7th to 11th somites.

Hab. Throughout India and Ceylon; Australia.

Subfamily MACROGLOSSINÆ.

Larva with the thoracic somites retractile and tapering to head ; horn long and curved.

Imago. One medial and two lateral tufts of hair at end of abdomen.

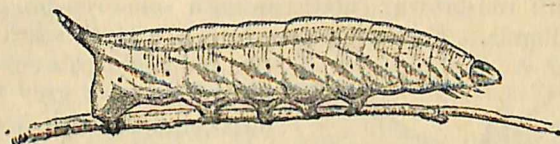


Fig. 64.—Larva of *Macroglossa gilia* (from Hmps. Ill. Het. ix, pl. 175, fig. 6).

Key to the Genera.

- a. Fore wing more than twice length of antennæ.
 - a'. Antennæ gradually fining to a long hook ; anal tufts small 7. RHODOSOMA, p. 122.
 - b'. Antennæ abruptly hooked ; anal tufts large 6. SATASPES, p. 121.
- b. Fore wing less than twice length of antennæ.
 - a'. Antennæ gradually fining to a long hook ; outer margin of fore wing angulate, inner margin excised 1. GURELCA, p. 109.
 - b'. Antennæ abruptly hooked ; margins evenly rounded.
 - a². Fore wing with vein 6 from end of cell ; hind wing with veins 3, 4, and 6, 7, from end of cell.
 - a⁴. Antennæ abruptly thickening to the club [p. 111. 2. RHOPALOPSYCHE,
 - b⁴. Antennæ gradually thickening to club [p. 112. 3. MACROGLOSSA,
 - b³. Cell of hind wing short 4. HEMARIS, p. 119.
 - b². Fore wing with vein 6 given off after end of cell ; hind wing with veins 3, 4, and 6, 7 stalked ; the cell extremely short 5. CEPHONODES, p. 120.

Genus GURELCA.

Gurelca, *Kirby, Proc. Roy. Dubl. Soc.* ii, p. 330 (1880).

Type, *G. hyas*, Wlk.

Range. N. India ; Mhow ; Java ; China ; Japan.

Antennæ gradually fining to a long hook. Palpi with the second joint rather broad ; crest on head well developed. Fore wing with outer margin angled.

SECT. I. Hind wing with the costa much excised.

173. *Gurelca hyas*, *Wlk. Cat.* viii, p. 107; *Butl. Trans. Zool. Soc.* ix, pl. 90, figs. 1-3 (larva and pupa); *C. & S.* no. 40.

Head, thorax, and abdomen grey-brown; the collar and tegulæ outlined with red-brown; abdomen with some red-brown lateral segmental marks. Fore wing grey-brown, a black speck at base;

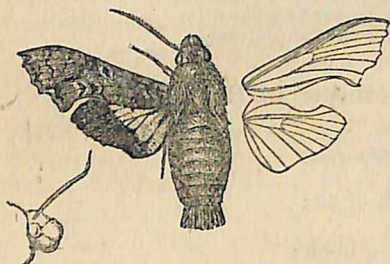


Fig. 65.—*Gurelca hyas*, ♂. †.

two indistinct pale curved antemedial lines; a grey streak on discocellulars, with a dark red-brown patch on each side of it; two highly angulate postmedial lines, with a pale line between them from vein 3 to inner margin; a red-brown streak below vein 4; a red-brown mark on inner margin before the outer angle; a curved submarginal line; a subtriangular dark marginal patch below the apex. Hind wing yellow, with an annular spot on discocellulars; a broad evenly curved marginal brown band. Underside of both wings ochreous, much marbled and suffused with red-brown and brown, with a broad, irregular, marginal, grey-brown band; inner area of hind wing yellow.

Larva green variegated with red-brown; or else red-brown with the thoracic somites green; lateral oblique streaks from 5th to 9th somites.

Hab. Hongkong; Sikkim; Sylhet; Mhow; Java. *Exp.* 40 millim.

174. *Gurelca masuriensis*, *Butl. P. Z. S.* 1875, p. 244, pl. 36, fig. 3; *C. & S.* no. 37.

Lophura himachala, *Butl. P. Z. S.* 1875, p. 621; *C. & S.* no. 42.

Lophura erebina, *Bull. P. Z. S.* 1875, p. 621; *C. & S.* no. 43.

Differs from *hyas* in the thorax and abdomen being more marbled with red-brown. Fore wing with the markings confused by being more marbled; the dark mark on inner margin near outer angle absent. Hind wing much more produced at apex; the marginal band broader at the costa, narrower towards anal angle, with its inner edge straight.

Hab. Mussooree; N.E. Himalayas. *Exp.* 50 millim.

- *175. *Gurelca macroglossoides*, *Wlk. Cat.* xxxv, p. 1851; *C. & S.* no. 56.

From the description this species would appear to differ from *hyas* and *masuriensis* in the fore wing being "powdered with cinereous bloom," with some oblique irregular lines; a black sub-

costal streak intersected by a forked, slightly gilded line; an undulated gilded submarginal line. Hind wing with part of the base dark, the yellow band with curved margin.

Hab. Sikkim. *Exp.* 48 millim.

SECT. II. The costa of hind wing very slightly excised before the apex.

176. *Gurelca pusilla*, *Butl. P. Z. S.* 1875, p. 244; *C. & S.* no. 38.
Lophura pumilio, *Boisd. Spec. Gén.* i. p. 311; *C. & S.* no. 39.

♂. Differs from *hyas* in there being a black spot at end of cell of fore wing; a broad, oblique dark band from costa beyond the cell to centre of inner margin. Hind wing with the marginal band red-brown. Underside; fore wing with the marginal band narrow at outer angle; hind wing with medial and postmedial curved lines; no marginal band.

Hab. Cachar; Sylhet. *Exp.* 30 millim.

Genus RHOPALOPSYCHE.

Rhopalopsyche, *Butl. P. Z. S.* 1875, p. 239.

Type, *R. nycteris*, Koll.

Range. Himalayas and Peninsular India.

Antennæ clubbed, the basal half thin, the hook short and slight; with no bands of ciliæ in male. Palpi with the apex porrect and acutely scaled; fore wing not more than twice the length of antennæ, the outer margin excurved. Flight diurnal.

177. *Rhopalopsyche nycteris*, *Koll. Hügl. Kaschm.* iv, p. 458, pl. 19, fig. 5; *C. & S.* no. 8.
Macroglossa volucris, *Wlk. Cat.* viii, p. 94.

Head, thorax, and abdomen grey-brown; abdomen with lateral yellow bands on the first three segments; the penultimate segment fringed with white; four lateral tufts increasing in size posteriorly, the first two white, the others black tipped with orange, anal tufts black. Fore wing grey-brown; some subbasal indistinct lines; an antemedial band, recurved towards the base at inner margin; three postmedial curved lines; a square brown spot on the costa before the apex, with a black spot below it, from which a waved oblique line runs to the apex. Hind wing black-brown with a broad medial yellow band.

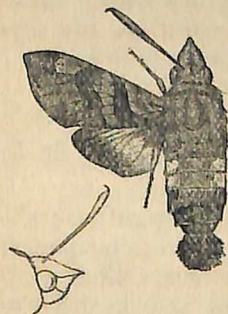


Fig. 66.—*Rhopalopsyche nycteris*, ♂. 1.

Hab. Himalayas; Khásis; Burma. *Exp.* 41 millim.

178. *Rhopalopsyche bifasciata*, *Butl. P. Z. S.* 1875, p. 239, pl. 36, fig. 4; *C. & S.* no. 7.

Differs from *nycteris* in having the antemedial band darker; the interspace between the first two postmedial lines filled in with dark so as to form a band. Hind wing with the band extending nearly to the base and bright orange in colour, as are the lateral bands on abdomen.

Hab. Nilgiris, 3000–8000 feet. *Exp.* 42 millim.

Genus **MACROGLOSSA.**

Macroglossum, *Scop. Intr. Hist. Nat.* p. 414 (1777).

Rhamphoschisma, *Wallengr. Œfv. af Kongl. Vet.-Akad.* xv, p. 139 (1858).

Type, *M. stellatarum*, Linn.

Range. Europe; Africa; Asia; and Australasian region.

Antennæ gradually thickening to a club; male with tufts of cilia. Fore wing with outer margin evenly rounded.

The species are numerous, closely allied, and difficult to discriminate.

GROUP I. Male with the costa of hind wing evenly arched.

A. *Hind wing dark red.*

179. *Macroglossa fervens*, *Butl. P. Z. S.* 1875, p. 4, pl. 1, fig. 3; *C. & S.* no. 15.

Macroglossa regulus, *Boisd. Spec. Gén.* i. p. 335; *C. & S.* no. 14.

Head and thorax olive-green; basal segments of abdomen olive-green above, reddish yellow at sides; distal three segments black; the penultimate segment fringed with white; anal tufts black, tipped with fulvous. Fore wing dark red-brown, with a prominent antemedial dark band; two postmedial lines, one fine, the other diffused; an obscure dark mark on the costa before the apex, with a black streak below it. Hind wing bright red with dark border. Underside: palpi white; thorax ochreous; abdomen red-brown and brown, with lateral white tufts on 4th segment; wings red, with base yellow and outer border brown.

Hab. Kanara; Nilgiris, 3000–4000 feet. *Exp.* 44 millim.

180. *Macroglossa vialis*, *Butl. P. Z. S.* 1875, p. 240, pl. 36, fig. 5; *C. & S.* no. 12.

Differs from *fervens* in the head and thorax being rufous; abdomen red-brown, the terminal segments not black; the lateral yellow bands less developed; the lateral tufts rufous. Fore wing with the dark antemedial band less prominent and nearer the base; the postmedial lines less angled. Hind wing with the dark margin broader.

Hab. Kanara. *Exp.* 44 millim.

181. **Macroglossa gyrans**, *Wlk. Cat. viii*, p. 91; *Moore, Lep. Ceyl.* ii, pl. 93, fig. 1; *C. & S.* no. 13.

Differs from *fervens* in the head and thorax being grey-brown : the basal segments of abdomen red-brown above, each segment fringed by a few metallic blue scales, the penultimate segment with longer white fringe, the distal segments less black. Fore wing grey-brown, with three antemedial fine lines and three post-medial curved lines. Hind wing with the dark border diffused. Underside of thorax white; wings duller red, except at inner margin of hind wing.

Hab. Throughout India and Ceylon; Siam. *Exp.* 48 millim.

182. **Macroglossa afflictitia**, *Butl. P. Z. S.* 1875, p. 240, pl. 36, fig. 7; *C. & S.* no. 11.

Macroglossa zena, *Boisd. Sphing.* p. 337; *C. & S.* no. 18 (part.).

Differs from *gyrans* in the terminal segments of the abdomen being brown above, with lateral black patches; no white fringe to penultimate segment. Fore wing with the antemedial lines replaced by a band as in *fervens*. Hind wing with the base brown, the marginal brown band broad. Underside with the inner area of hind wing yellower.

Hab. Simla; S. India; Ceylon. *Exp.* 52 millim.

B. *Hind wing with a yellow band.*

183. **Macroglossa stellatarum**, *Linn. Syst. Nat.* i, 2, p. 803; *Esp. Schmet.* ii. pl. 13, figs. 1-3 (larva and pupa); *C. & S.* no. 9.

Head, thorax, and abdomen pale grey-brown; abdomen with pale yellow lateral marks on 4th segment, the tufts at sides of distal segments black and white and well developed. Fore wing grey-brown, with one antemedial and one postmedial line prominent, the former waved, the latter curved; the first two antemedial lines obsolescent, as also are the first and third post-medial lines; the first two postmedial lines close together; the dark mark near apex almost obsolete. Hind wing dusky at base; medial area reddish yellow; outer margin reddish.

Larva purplish brown or greenish, with numerous white specks; a whitish subdorsal line ending in the bluish horn; a yellow subspiracular line; head ochreous.

Hab. Palearctic region; N. Africa; Sind; Punjab; Cochin China. *Exp.* 44-54 millim.

184. **Macroglossa belis**, *Cram. Pap. Exot.* i, p. 147, pl. 94 c; *Butl. Trans. Zool. Soc.* ix, pl. 90, figs. 6 & 7 (larva and pupa); *C. & S.* no. 18 (part.).

Macroglossa troglodytus, *Boisd. Sphing.* p. 344.

Macroglossa opis, *Boisd. Sphing.* p. 345.

Macroglossum assimilis, *Swains. Zool. Ill.* ser. i. 1820, vol. i. pl. 64.

Macroglossa phyrhula, *Boisd. Sphing.* p. 338.

Differs from *afflictitia* in the head, thorax, abdomen, and fore

wings being redder brown; the two lines forming the antemedial band of the fore wing not filled in with black; the postmedial lines not so parallel, the second being nearer the first at the costa, the third at inner margin; the patch near apex reddish brown, with no dark streak below it. Hind wing with band reddish yellow.

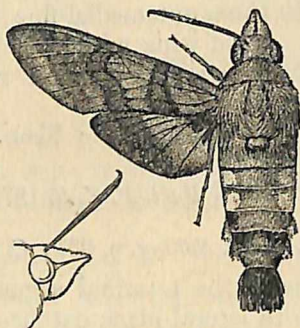


Fig. 67.—*Macroglossa belis*, ♂. ♀.

The form *trogodytus* is rather narrower winged.

Larva black; the head red; a white subdorsal line; the sides spotted and streaked with red and yellow.

Hab. China and throughout India and Ceylon. *Exp.* 46–60 millim.

185. *Macroglossa belia*, *Hmpsn*, *Ill. Het.* ix, ined., pl. 157, fig. 15.

♀. Differs from *belis* in the antemedial band of the fore wing being much broader; the postmedial band broader and more angulate below the costa; the third postmedial line absent. Hind wing with the marginal dark border broader and more even. Underside: abdomen paler; wings with the transverse lines absent.

Hab. Trincomali, Ceylon. *Exp.* 58 millim.

186. *Macroglossa proxima*, *Butl.* *P. Z. S.* 1875, p. 4, pl. i, fig. 1; *C. & S.* no. 20; *Moore, Lep. Ceyl.* ii. pl. 91, figs. 1, 1a, 1b (larva and pupa).

Macroglossa luteata, *Butl.* *P. Z. S.* 1875, p. 241; *C. & S.* no. 19.

Macroglossa obscura (Up. Tenasserim), *Swinh. Trans. Ent. Soc.* 1890, p. 162 (nec *Butl.*).

Head, thorax, and abdomen rufous (in Malaccan and Tenasserim specimens dark brown); abdomen without the lateral black marks on distal segments; the anal tufts ruddy at tips. Fore wing with all the lines obsolescent, the postmedial lines less bent; the markings being reddish and ill-defined. Hind wing with the band pure yellow and narrower, so that the marginal dark border is broader. Underside as in *belis*.

Larva dark violet-brown, with white dorsal specks; a subdorsal yellow line on 2nd to 4th somites and 10th and 11th somites; white subspiracular spots on 7th to 11th somites; horn long and

tuberculate. In a later stage there are yellow and olive-brown transverse dorsal lines and yellow lateral spots, or the lateral spots may be pinkish dashed with yellow; the horn short.

Hab. Sylhet; Cachar; Kanara; Ceylon; Tenasserim; Malacca.
Exp. 50–60 millim.

187. **Macroglossa semifasciata**, n. sp.

♂. Differs from *proxima* in having prominent black lateral patches to the abdomen; underside with paired ventral dark patches. Fore wing with the lower part of the interspace between the antemedial lines filled in with black; the postmedial lines excurved.

Hab. E. Pegu; Labuan. *Exp.* 62 millim. Type in B. M.

188. **Macroglossa bengalensis**, *Boisd. Sphing.* p. 341; *C. & S.* no. 28.

Macroglossa taxicolor, *Moore, P. Z. S.* 1879, p. 387; *id. Lep. Ceyl.* ii. pl. 90, fig. 3; *C. & S.* no. 22.

Macroglossa corythus (N. India), *Boisd. Sphing.* p. 339 (nec *Wlk.*).

Differs from *proxima* in the lines of the fore wing being much better defined, two of them forming an antemedial and two others a postmedial band filled in with reddish brown; the dark sub-apical streak well developed. Hind wing with the yellow band varying rather in width. Abdomen with a dark dorsal spot on the terminal segment.

Larva green, with a yellow streak from the 9th segment to the horn; or pale brown with black streaks above the yellow streak and stigmata, and others forming a broken subdorsal line.

Hab. Nilgiris, 6000 feet; Pondicherry; Ceylon. *Exp.* 56 millim.

189. **Macroglossa sitiene**, *Wlk. Cat.* viii, p. 92; *C. & S.* no. 24.

Macroglossa nigrifasciata, *Butl. P. Z. S.* 1875, p. 241, pl. 37, fig. 3; *C. & S.* no. 34.

Macroglossa orientalis, *Butl. Trans. Z. S.* ix, p. 528; *C. & S.* no. 27.

Differs from *bengalensis* in the thorax being olive-brown. Fore wing without the reddish tinge; the antemedial band filled in with black, and recurved along inner margin; the first two post-medial lines rather more angled below the costa; the black sub-apical streak and spot on terminal segment of the abdomen strongly developed. Underside with three transverse lines on hind wing.

The form *sitiene* has the yellow band on the hind wing rather narrower than in *nigrifasciata*=*orientalis*.

Hab. Cachar; Moulmein; Ceylon; Amboina; Formosa. *Exp.* 54–60 millim.

190. **Macroglossa glaucoptera**, *Butl. P. Z. S.* 1875, p. 241, pl. 36, fig. 9; *C. & S.* no. 35.

♂. Differs from *bengalensis* in the whole base of the fore wing

being black-brown, with no grey band between the lines; the whole exterior area also very dark, so that the medial and post-medial grey bands are obscured, and the lines and subapical markings obliterated. Hind wing with the yellow band very narrow. Head dark grey; thorax and abdomen bright rufous, the latter with yellow and black lateral markings on the anterior segments; the anal tuft black, with the tip rufous.

♀. Thorax and abdomen olivaceous; the fore wing not quite so dark as in the male; hind wing with the band broader.

Hab. Ceylon. *Exp.* 52 millim.

191. **Macroglossa walkeri**, *Butl. P. Z. S.* 1875, p. 4.

Macroglossa bombylans, *Boisd. Sphing.* p. 334; *C. & S.* no. 16.

Head, thorax, and abdomen olive-green, the last with yellow lateral bands on anterior segments, the 4th also with a rufous band; the terminal segments black with some rufous scales; the penultimate segment fringed with white; palpi and pectus white below; abdomen rufous, with white lateral tufts to 3rd and 4th segments. Fore wing red-brown, with a black antemedial band recurved along inner margin; the first two postmedial lines prominent; the third and subapical markings obsolescent. Hind wing with a narrow yellow band, which is broken at the middle in the male. Underside dark red-brown, with the lines very faint; the base of both wings white.

Hab. Japan; China; Himalayas, and throughout N. India. *Exp.*, ♂ 44, ♀ 52 millim.

192. **Macroglossa avicula**, *Boisd. Sphing.* p. 334.

Macroglossa obscuripennis, *Butl. Trans. Z. S.* ix, p. 633.

Only differs from *walkeri* in the fringe to penultimate segment of the abdomen and the lateral tufts on 3rd and 4th segments being yellow; the hind wing with the yellow band quite obsolete.

In *walkeri* and *avicula* the club of the antennæ in the males is very thick.

Hab. Java and ? Central India (*ap. Boisd.*). *Exp.* 44 millim.

*193. **Macroglossa lepcha**, *Butl. Trans. Z. S.* ix, p. 635; *C. & S.* no. 17.

Differs from *walkeri* in the terminal segments of the abdomen being olive-green, not black. Fore wing with the two postmedial lines more distinct, with a dark mark on the outer one at inner margin; the subapical marks more prominent, continued as a waved submarginal line to outer angle.

Hab. Calcutta. *Exp.* 56 millim.

194. **Macroglossa insipida**, *Butl. P. Z. S.* 1875, p. 242; *C. & S.* no. 10; *Moore, Lep. Ceyl.* ii, pl. 92, figs. 3 a, b (larva and pupa).
Macroglossa catapyrrha, *Butl. P. Z. S.* 1875, p. 243, pl. 36, fig. 6; *C. & S.* no. 26.

Head and thorax grey, with a rufous line on vertex; tegulae rufous, fringed with grey; abdomen grey, the 2nd, 3rd, and 4th segments with yellow lateral bands and paired dark spots on the vertex; some darker marks on terminal segments; anal tuft grey at base, black at tip; palpi white below; thorax pale brown; abdomen rufous, with white lateral tufts. Fore wing grey; two indistinct subbasal lines; an antemedial curved dark band; three postmedial double curved lines; the subapical markings prominent and continued towards outer angle as a submarginal line. Hind wing with a yellow band constricted at middle. Underside rufous yellow; both wings with an irregular dark margin; hind wing with three transverse lines, of which there are traces on the fore wing.

In typical *insipida* there is a pinkish suffusion to the body and fore wing. Both forms occur in Ceylon, but *catapyrrha* only in N. India.

Larva pale red with purplish dots; a pale subdorsal line with dark margins; dark lateral oblique stripes from 3rd to 10th somites; horn black. Early stage dull brown.

Hab. N.W. Provinces; Sikhim; Bhutan; Ceylon. *Exp.* 40–48 millim.

195. **Macroglossa gilia**, *Herr.-Schäffer, Samml. aussereur. Schmett.* pp. 59, 79, pl. 23, fig. 107; *C. & S.* no. 25; *Hmps. Ill. Het.* ix, pl. 175, fig. 6 (larva).

Differs from *insipida* in the head, thorax, abdomen, and fore wing being grey without a rufous tinge; tegulae grey, without the pale fringe. Fore wing with the antemedial band wide at inner margin and straighter.

Larva bright green; a pale dorsal stripe with brown line through it; a pale subdorsal stripe, with red-brown edge above; dorsal area speckled with brown; spiracles black, with oblique brown stripes between them; lateral area speckled with white; horn black, with yellow tip; legs pink.

Hab. Throughout India and Ceylon; Java; China. *Exp.* 44–54 millim.

196. **Macroglossa divergens**, *Wlk. Cat.* viii, p. 94; *Moore, Lep. Ceyl.* ii, pl. 92, fig. 2; *C. & S.* no. 33.

Head, thorax, and first two segments of abdomen rufous; tegulae fringed with grey; 3rd and 4th segments of abdomen with lateral yellow bands and paired black dorsal spots; a black dorsal spot on terminal segment; underside reddish. Fore wing greyish brown; the antemedial band wide and recurved along inner margin; two

curved postmedial diffused bands, which are dark with red-brown on their inner sides; the subapical markings indistinct. Hind wing and underside as in *sitiene*.

Hab. Ceylon. *Exp.* 54 millim.

197. **Macroglossa imperator**, *Butl. P. Z. S.* 1875, p. 243, pl. 37, fig. 4; *C. & S.* no. 31.

Differs from *divergens* in the dark stripe on vertex of head and thorax being much broader and more prominent; tegulæ rufous, but without the pale fringe. Fore wing with the antemedial band much broader, especially at inner margin; the postmedial band black, much broader, and angled at vein 6, where it is joined to the subapical markings; the submarginal line obsolescent. Hind wing with the yellow band broader and hardly constricted at middle. Underside with the lines on hind wing rather more prominent.

Hab. Sikkim; Nilgiris; Ceylon. *Exp.* 74 millim.

198. **Macroglossa rectifascia**, *Feld. Reis. Nov.* pl. 75, fig. 7; *C. & S.* no. 32; *Moore, Lep. Ceyl.* ii, pl. 90, fig. 2.

Differs from *imperator* in the head and thorax being greyish black, the latter with a rufous patch posteriorly. Fore wing with the basal third blue-black; the two postmedial lines nearer together and not filled in with black, but angled so as to join the subapical markings; the outer area much clouded with black. Hind wing with the ground-colour almost black.

Hab. Formosa; Nilgiris; Ceylon. *Exp.* 48–64 millim.

199. **Macroglossa faro**, *Cram. Pap. Exot.* iii, p. 165, pl. 285 c.

Differs from *rectifascia* in the thorax and abdomen being pale red-brown; a rufous stripe on head and thorax. Fore wing lighter in colour, with the area beyond the postmedial lines less clouded with black.

Hab. Java and ? Coromandel (*ap. Cram.*). *Exp.* ♂ 76 millim.

200. **Macroglossa hemichroma**, *Butl. P. Z. S.* 1875, p. 243, pl. 37, fig. 1; *C. & S.* no. 29.

Differs from *faro* in having the whole basal half of the fore wing grey, with a sharp outwardly oblique margin defining the olive-brown outer area; the lines indistinct.

Hab. Sylhet. *Exp.* 70 millim.

GROUP II. Male with the costa of the hind wing produced into a triangular lobe covered with black scales, which is folded over on the upper surface of the wing.

201. *Macroglossa interrupta*, *Butl. P. Z. S.* 1875, p. 242, pl. 37, fig. 2;
C. & S. no. 23.

Macroglossa aquila, *Boisd. Sphing.* p. 340; *C. & S.* no. 21.

♂. Head, thorax, and abdomen red-brown; abdomen with broad yellow and black lateral bands on the 3rd and 4th segments; underside bright red, with some white on the first three segments; small white lateral tufts; a white spot on the penultimate segment; palpi and pectus white. Fore wing brown, with a purplish gloss; the basal area suffused with black, obscuring the lines; the three postmedial lines present; a dark mark on the outer margin below the apex above the usual subapical streak. Hind wing with the yellow band much indented. Underside red; hind wing with three transverse lines.

Hab. Sikkim; Sylhet. *Exp.* 54 millim.

Genus HEMARIS.

Hemaris, *Dalm. Vet. Akad. Handl.* p. 207 (1816).

Type, *H. scabiosa*, Zell., from Europe.

Range. Nearctic and Palæarctic regions.

Disk of wings usually hyaline; the palpi much shorter than in *Macroglossa*, the shape and antennæ similar. Fore wing with vein 10 absent, 9 sending some veinlets to the costa and anastomosing with 8 just before the apex; cell of hind wing short.

202. *Hemaris fuciformis*, *Linn. Syst. Nat.* i, (2) p. 803,

Hemaris simillima, *Moore, P. Z. S.* 1888, p. 391; *C. & S.* no. 4 A.

Head, thorax, and abdomen clothed with long, fine, olive-green pile; the 3rd and 4th segments of abdomen dark red; anal tufts black. Fore wing hyaline, with costa and inner margin olive-green; the outer margin with a broad dark-red band; a discocellular black band. Hind wing hyaline, the inner margin olive-green, the outer margin dark red; the cilia brown.

Hab. Europe; Kangra. *Exp.* 46 millim.

203. *Hemaris saundersi*, *Wlk. Cat.* viii, p. 83; *C. & S.* no. 4.

Differs from *fuciformis* in the head, thorax, and abdomen being normally scaled. Fore wing without the discocellular band; the

marginal band narrow at outer angle. Hind wing without the red border.

Hab. N.W. Himalayas ; Punjab. *Exp.* 56 millim.

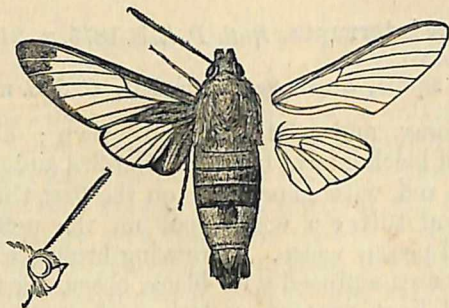


Fig. 68.—*Hemaris saundersi*, ♂. ½.

204. *Hemaris rubra*, n. sp.

Antennæ black: palpi black at sides, white below; head and thorax dull greenish olive; abdomen black, clothed with olive down above, the second segment with a broad white band, the 3rd, 4th, and 5th segments each with a slight white dorsal dash, lateral white tufts on 5th and 6th segments, anal tuft black. Fore wing red-brown, the base olive; traces of a pale medial oblique band; a dark marginal line. Hind wing bright red-brown, with a dark marginal line; cilia grey. Underside of head, thorax, and base of wings whitish. One male has the down on abdomen black.

Hab. Sind and Guraïs Valleys, Kashmir (*Leech*); Balta (*McArthur*). *Exp.*, ♂ 48–52, ♀ 58 millim. Type in coll. *Leech*.

Genus **CEPHONODES.**

Cephonodes, *Hübner. Verz.* p. 131 (1816).

Type, *C. hylas*, *Fabr.*

Range. S. and W. Africa, Madagascar; Japanese, Indian, Malayan, and Australian regions.

Fore wing with vein 6 given off after the end of the cell, 10 absent, 9 sending veinlets to the costa and anastomosing with 8. Hind wing with the cell extremely short, veins 3 and 4 and 6 and 7 stalked.

205. *Cephonodes hylas*, *Linn. Mant.* p. 539; *Moore, Lep. Ceyl.* ii, pl. 93, figs. 4 a, b (larva and pupa); *C. & S.* no. 5.

Sphinx picus, *Cram. Pap. Exot.* ii, p. 83.

Macroglossum kingii, *McLeay, King's Surv. Austr.* App. p. 465.

Macroglossa cunninghami, *Schaufuss, Nung. Otiosus*, i, p. 22.

Macroglossa apus, *Boisd. Faun. Ent. Madag.* pl. 79.

Differs from *Hemaris saundersi* in the marginal borders being very narrow and black; the abdomen varies in colour from yellow to green; in typical *hylas* the 3rd and 4th segments are bright red, in the variety *cunninghami* only the 4th is red, but there is more red on the terminal segments below.

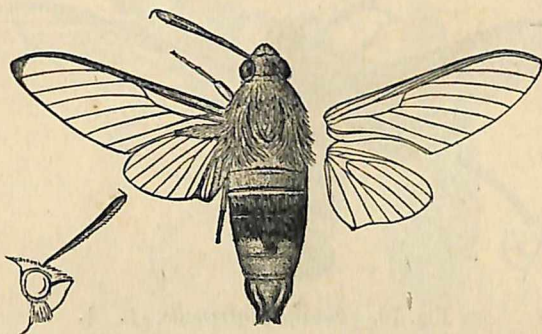


Fig. 69.—*Cephonodes hylas*, ♂. 1.

Larva green; a white-bordered blue dorsal line and whitish subdorsal line ending in a yellow streak at base of horn; head and spiracles blue.

Hab. W. and S. Africa; Japan; throughout India to Australia and Gilbert Islands. *Exp.* 64 millim.

Genus SATASPES.

Sataspes, Moore, *Lep. E. I. C. i*, p. 261.

Type, *S. infernalis*, Westw.

Range. China; Himalayas; Assam; S. India.

Antennæ of nearly equal breadth throughout; hook short and slight; male with tufts of ciliæ very long. Palpi with the second joint of moderate size and roundly scaled. Fore wing much produced at apex; the discocellulars very oblique, with vein 5 given off below the centre; vein 10 absent, 9 sending veinlets to the costa and anastomosing with 8 before the apex. Anal tufts large.

206. *Sataspes infernalis*, Westw. *Cab. Or. Ent.* p. 61, pl. 30, fig. 3; *C. & S.* no. 1.

Sataspes uniformis, Butl. *P. Z. S.* 1875, p. 3; *C. & S.* no. 2.

Head greyish black; collar and thorax with golden-yellow hairs mingled with the black; abdomen black, with a few scattered yellow hairs, the last two or three segments yellow above; anal tuft black. Wings black; fore wing with a purplish gloss; the base grey; an antemedial grey band; costa of hind wing white. Underside uniform black.

In the form *uniformis* the last two segments of the abdomen are entirely or almost black.

Hab. Nepal; Sikhim; Bhutan; Assam; Burma; Coimbatore.
Exp. 66 millim.

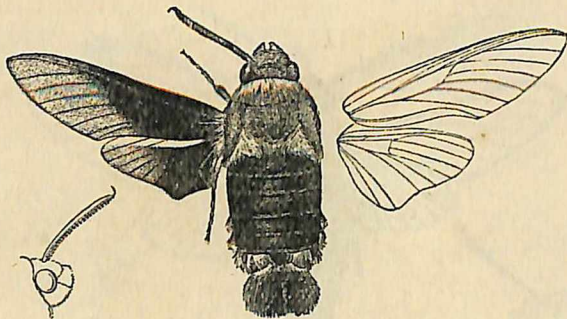


Fig. 70.—*Sataspes infernalis*, ♂. †.

207. *Sataspes ventralis*, *Butl. P. Z. S.* 1875, p. 3; *C. & S.* no. 3.
Sataspes tagalica, *Boisd. Sphing.* p. 278, pl. 10, figs. 3, 4.

Differs from *infernalis* in the last four or five segments of the abdomen being yellow below. Fore wing with a steely green gloss.

Hab. Sikhim; Sylhet; Burma; Hongkong. *Exp.* 66 millim.

Genus RHODOSOMA.

Rhodosoma, *Butl. Trans. Z. S.* ix, p. 534 (1876).

Type, *R. triopus*, Westw.

Range. Sikhim; Assam.

Antennæ gradually decreasing to the hook, which is long. Palpi with the apex quadrately scaled. Abdomen truncate at apex; the anal and lateral tufts very short. Fore wing much produced and broad. Hind wing also broad.

208. *Rhodosoma triopus*, *Westw. Cab. Or. Ent.* p. 14, pl. 6, fig. 4;
C. & S. no. 36.

Head and thorax olive-green or fulvous with two yellow stripes; abdomen black, with lateral crimson bands on segments 2 to 5, that on the 4th being the most extensive; fulvous dorsal and lateral spots on segments 5 to 8; anal tuft black, the lateral tufts fulvous. Fore wing brownish black, crossed by three ante-medial outwardly oblique black bands; a large white quadrate spot beyond the discocellulars; postmedial, submarginal, and marginal black bands. Hind wing black, with a large white patch on the costa before the apex; some fulvous postmedial specks on the nervules; anal angle with a crimson and white patch. Underside: thorax fulvous; abdomen red, with four pairs of black

spots. Fore wing suffused with red-brown. Hind wing red, with medial and postmedial black lines.

Hab. Sikkim ; Assam. *Exp.* 68-78 millim.

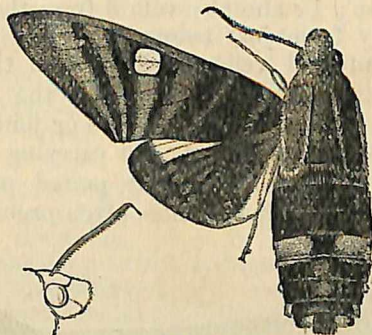


Fig. 71.—*Rhodosoma triopus*, ♂. †.

Species formerly recorded as Indian, which are omitted.

Cephonodes cyaniris, Kirby, C. & S. no. 6. This was a *lapsus calami* for *cynniris*, Guér. Icon. Ins. p. 495, from Mauritius. The Dublin specimen recorded from Sylhet was without locality, and is either that species or *janus*, Miskin, P. Roy. Soc. Qd. viii, pt. 1, 1890, p. 6, from Australia.

Macroglossa fringilla, Boisd., C. & S. no. 30. This species is allied to the Australian *errans*, and is probably not Indian. The markings of the fore wing are too vaguely described for identification.

Sphinx bubastus, Cram., C. & S. no. 72, is probably a *Caliomma* from America.

Chærocampa stipularis, Swinh., C. & S. no. 87, = *Deilephila komarovi*, Chr. Rom. Mém. ii, p. 169, pl. xv, fig. 2, is from Afghanistan.

Smerinthus kindermanii, Led., C. & S. no. 151, is from Kandahar.

Hyloicus asiaticus, Butl., C. & S. no. 181, = *pinastri*, Linn. The register of the type, which was bought from a dealer, is "probably Scinde," and is almost certainly wrong.

Sphinx sanguinosa, Martyn, C. & S. no. 184, is *Empyreuma lichas*, Fabr., a Zygænid from the W. Indies.

Sphinx minus, Fabr., C. & S. no. 67. The description is too vague for identification, and the habitat may not be India.

Sphinx asiliformis, Fabr., C. & S. nos. 41, 205, is from the W. Indies, and is probably a Zygænid.

Family NOTODONTIDÆ.

A family of moths superficially resembling the *Noctuidæ*.

Mid tibia with one pair of spurs; hind tibia with two pairs; tarsi short and hairy. Fore wing with vein 1 *a* forming a fork with 1 *b* at the base; 1 *c* absent; vein 5 from the middle of discocellulars, or rarely from just below upper angle of cell*. Hind wing with two internal veins; vein 5 from the centre of the discocellulars or rarely absent; 8 free from the base, curved, and running close along the subcostal nervure or joined to it by a bar.

Larva without the anal prolegs, and carrying the anal somites more or less erect; these often bear paired processes, and are sometimes swollen; the other somites often prominently humped.

Pupa naked.

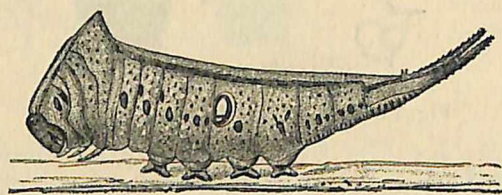


Fig. 72.—Larva of *Cerura liturata*. †. (From Moore, Lep. Ceyl. ii, pl. 120, fig. 1 a.)

Key to the Genera.

- A. Fore wing with vein 5 from middle of discocellulars.
 - a. Fore wing with no tuft of scales on inner margin.
 - a'. End of abdomen with a tuft of long spatulate scales.
 - a². Fore wing with vein 10 anastomosing with 8 to form the areole 1. TARSOLEPIS, p. 126.
 - b². Fore wing with vein 9 anastomosing with 8 to form the areole 2. DUDUSA, p. 128.
 - b'. End of abdomen without a tuft of spatulate scales.
 - a². Hind wing with vein 5 present.
 - a³. Fore wing produced and narrow.
 - a⁴. Fore wing with the inner margin produced into a triangular lobe. 10. NORRACA, p. 137.
 - b⁴. Fore wing with the inner margin produced into a rounded lobe. . 9. TURNACA, p. 136.
 - c⁴. Fore wing with the inner margin evenly curved.
 - a⁵. Fore wing with the apex acute.
 - a⁶. Fore wing very long.
 - a⁷. Fore wing with no areole. 5. BARADESA, p. 131.
 - b⁷. Fore wing with an areole. 6. RACHIA, p. 131.
 - b⁶. Fore wing shorter.
 - a⁷. Palpi upturned 12. PYDNA, p. 138.
 - b⁷. Palpi porrect 13. RAMESA, p. 142.

* Except in the genus *Cyphanta*, which may be the connecting link with the *Noctuidæ*.

- b*³. Fore wing with the apex rounded.
- a*⁶. Fore wing with vein 9 anastomosing with 8 to form the areole.
- a*⁷. Fore wing with vein 5 from centre of discocellulars.
- a*⁸. Palpi slight and fringed with hair 11. NIGANDA, p. 138.
- b*³. Palpi broad and rounded 8. GARGETTA, p. 135.
- b*⁷. Fore wing with vein 5 from near upper angle of cell 23. DAMATA, p. 156.
- b*⁸. Fore wing with vein 10 anastomosing with 8 to form the areole 7. PHALERA, p. 133.
- b*³. Fore wing not produced and broad.
- a*⁴. Fore wing with no areole.
- a*⁵. Fore wing with the outer margin very irregular 17. ZARANGA, p. 146.
- b*⁵. Fore wing with the outer margin evenly curved.
- a*⁶. Hind wing with veins 2 and 3 from cell.
- a*⁷. Fore wing with vein 7 given off nearer the apex than 10 18. FENTONIA, p. 147.
- b*⁷. Fore wing with vein 7 given off further from the apex than 10.
- a*⁸. Fore wing broad, the outer margin not crenulate.
- a*⁹. Hind wing with veins 7 and 8 not bent upwards to the costa . 19. STAUIOPUS, p. 149.
- b*⁹. Hind wing with veins 7 and 8 bent upwards to the costa 21. LIPAROPSIS, p. 154.
- b*³. Fore wing narrower, the outer margin crenulate. 27. PHEOSIA, p. 160.
- b*⁵. Hind wing with veins 2 and 3 stalked [p. 158.
25. METASCHALIS,
- b*⁴. Fore wing with an areole.
- a*⁵. Fore wing with vein 9 anastomosing with 8 to form the areole.
- a*⁶. Fore wing with vein 6 from angle of cell 14. ZANA, p. 144.
- b*⁶. Fore wing with vein 6 from beyond angle of cell.
- a*⁷. Fore wing with the areole long; vein 6 from before the end of it.
- a*⁸. Fore wing with the apex acute 15. ANTICYRA, p. 144.
- b*⁸. Fore wing with the apex rounded 26. CHADISRA, p. 159.

- b^7 . Fore wing with the areole short, vein 6 from the end of it 22. CERURA, p. 155.
 b^5 . Fore wing with vein 10 anastomosing with 8 to form the areole.
 a^6 . Fore wing with vein 6 from beyond the angle of cell.
 a^7 . Fore wing with vein 5 from near upper angle of cell 24. DICRANURA, p. 157.
 b^7 . Fore wing with vein 5 from centre of discocellulars.
 a^8 . Palpi short and porrect. 16. ANTHEUA, p. 145.
 b^8 . Palpi upturned, reaching vertex of head .. 20. SOMERA, p. 153.
 b^6 . Fore wing with vein 6 from angle of cell
 a^7 . Fore wing with the areole short, vein 7 from its end. 34. BESAIA, p. 171.
 b^7 . Fore wing with the areole long, vein 7 from before its end 35. CLEAPA, p. 171.
 b^2 . Hind wing with vein 5 absent.
 a^3 . Fore wing with the apex rounded. 36. ICHTHYURA, p. 172.
 b^3 . Fore wing with the apex acute and produced 3. HAPIGIA, p. 129.
 b . Fore wing with a prominent tuft of scales on middle of inner margin.
 a' . Hind wing with veins 2 and 3 from cell.
 a^2 . Fore wing with no areole 28. NOTODONTA, p. 162.
 b^2 . Fore wing with an areole.
 a^3 . Fore wing with the outer margin irregular; thorax with an erect tuft of hair 4. NADATA, p. 130.
 b^3 . Fore wing with the outer margin crenulate [p. 166.
 c^3 . Fore wing with the outer margin not crenulate 30. LOPHOPTERYX, [p. 163.
 b' . Hind wing with veins 2 and 3 stalked.. 29. HYPERÆSCHRA,
 c . Fore wing with prominent tufts of scales at middle of inner margin and at outer angle. 31. MEGACERAMIS, [p. 167.
 a' . Fore wing with vein 10 anastomosing with 8 to form the areole 33. SPATALIA, p. 168.
 b' . Fore wing with vein 9 anastomosing with 8 to form the areole 32. APELA, p. 168.
 B . Fore wing with vein 5 from lower angle of cell 37. CYPHANTA, p. 174.

Genus TARSOLEPIS.

Tarsolepis, *Butl. A. M. N. H.* (4) x, p. 125 (1872).

Type, *T. remicauda*, Butl.

Range. Sikhim; Borneo.

Palpi porrect, first two joints hairy; third short and naked.

Hind femur with a tuft of long hair from near the extremity. Abdomen long, with a large tuft of spatulate scales at extremity. Fore wing long, with the apex acute, the outer margin crenulate; vein 6 from angle of cell, the areole short; veins 9 and 10 given off near the apex. Hind wing with the cell short; vein 8 connected with 7 by a bar; traces of forked veinlets in the cell of both wings.

SECT. I. Antennæ of male simple.

209. *Tarsolepis fulgurifera*, *Wlk. Cat.* xiv, p. 1347; *Butl. Ill. Het.* vi, pl. 106, fig. 9; *C. & S.* no. 1201.

♂. Palpi and head pale and dark brown; a black band behind the antennæ; thorax and abdomen fawn-colour; dark transverse lines across the pro-, meso-, and metathorax; abdomen with lateral segmental fuscous bands. Fore wing fawn-colour, the inner area dark brown from the lower angle of cell to inner margin near the base and to outer margin below the apex; two oblique dark subbasal lines from median nervure to vein 1 *b*; a black longitudinal mark above inner margin on the dark area, outlined with pale and black lines; a whitish streak below vein 2, with a rufous line through it; a silvery streak below vein 4; black streaks in the interspaces, growing short towards the apex; outer margin whitish, with ochreous and brown lines; the cilia fulvous. Hind wing fuscous; the basal area whitish, with a large fuscous spot at end of cell. Hind leg wanting.

Hab. Nāga Hills. *Exp.* 120 millim.

SECT. II. Antennæ of male with the proximal two thirds bipectinate.

210. *Tarsolepis remicauda*, *Butl. A. M. N. H.* (4) x, p. 125, pl. viii.

♂. Differs from *fulgurifera* in the head being without the black

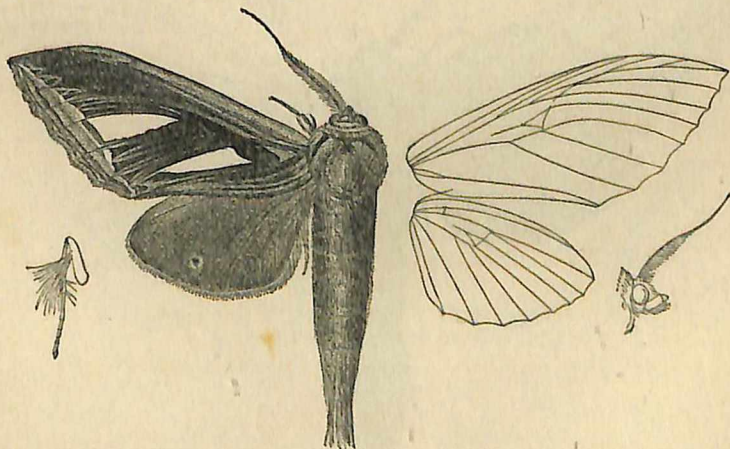


Fig. 73.—*Tarsolepis remicauda*, ♂. 1.

band; the abdomen more fuscous. Fore wing more uniformly suffused with brown; the black mark above inner margin reduced

to a slight streak; a large triangular silvery mark in the interno-median interspace, outlined with rufous brown; a similar mark between veins 3 and 4; outer area dull brown, with a waved sub-marginal line. Hind wing more suffused with fuscous over the basal area. Hind leg with the femoral tuft brilliant scarlet.

Hab. Sikkim; Borneo. *Exp.* 80 millim.

Genus **DUDUSA.**

Dudusa, *Wlk. Cat.* xxxii, p. 446 (1864).

Type, *D. nobilis*, Wlk., from China, Malacca, Sumatra.

Range. China; Sikkim; Nāga Hills; Malacca; Sumatra.

Palpi porrect, the first two joints hairy, the third short and naked; antennæ with the branches short and stiff, and only extending to just beyond the middle; abdomen with a large terminal tuft of spatulate scales. Hind femur with no tuft. Fore wing long, the apex acute, outer margin crenulate; vein 6 from angle of cell; the areole long, with vein 10 given off from it. Hind wing with a bar between veins 7 and 8; traces of forked veinlets in the cell of both wings.

211. *Dudusa sphingiformis*, *Moore*, *P. Z. S.* 1872, p. 577, pl. 34, fig. 1; *C. & S.* no. 1188.

♂. Antennæ and front of head black; thorax pale ochreous; collar and tegulæ with slight dark lines; abdomen black; the

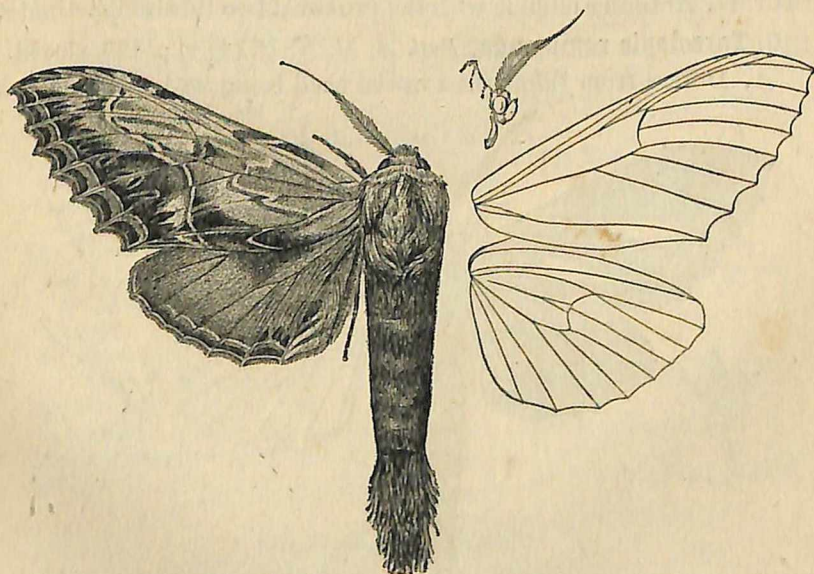


Fig. 74.—*Dudusa sphingiformis*, ♂. 1.

terminal tuft brownish. Fore wing pale ochreous, suffused with

brown and with black towards outer margin; some black strigæ on costa, and blackish streaks and lunules towards outer margin; a doubly curved pale postmedial line; pale lunulate submarginal and marginal lines. Hind wing smoky black, with a darker spot at end of cell; indistinct waved submarginal and marginal pale lines. Underside pale, with a prominent black lunulate band to both wings.

Hab. Sikkim, Nāga Hills. *Exp.* 96 millim.

Genus **HAPIGIA.**

Hapigia, *Guen. Noct.* ii. p. 376 (1852).

Type, *H. nodicornis*, *Guen.*, from S. America.

Range. S. America; Madras.

Palpi upturned, the second joint fringed with very long hairs, third joint naked. Antennæ ciliate. Fore wing long, the apex acute, the outer margin very obliquely rounded; veins 7, 8, 9, 10 stalked; no areole. Hind wing with vein 5 absent; 6 and 7 stalked; 8 connected by a bar with 7.

The typical section has the third joint of palpi free and vein 6 of fore wing from angle of cell.

SECT. II. Palpi with the hair on 2nd joint extending to apex of 3rd joint. Fore wing with vein 6 from above angle of cell.

212. *Hapigia obliqua*, *Wlk. Cat.* xxxiii, p. 766; *C. & S.* no. 2335.

♀. Head and thorax pale chestnut-brown; apex of palpi black.

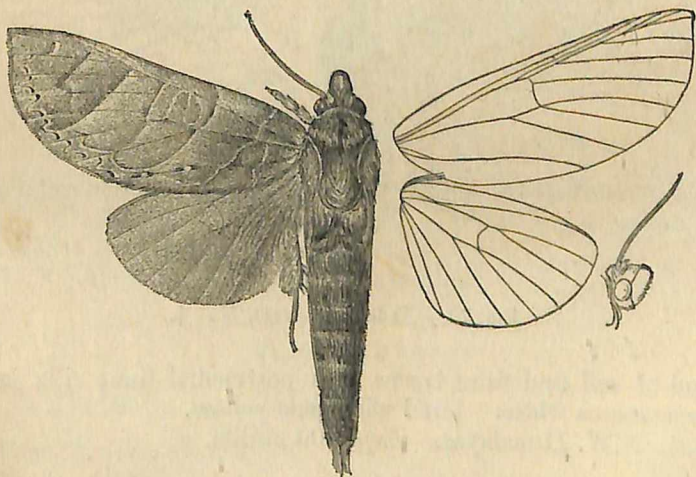


Fig. 75.—*Hapigia obliqua*, ♀. †.

Fore wing pale chestnut-brown, with four very oblique indistinct

lines the orbicular and reniform spots elongate; a dark lunulate submarginal line incurved below the costa. Abdomen and hind wing fuscous brown.

Hab. Madras. *Exp.* 104 millim.

Genus **NADATA.**

Nadata, *Wlk. Cat.* v, p. 1062 (1855).

Type, *N. gibbosa*, Abb., from N. America.

Range. N. America; Japan; Himalayas.

Palpi with the first two joints thickly fringed with scales, the third naked and very short. Antennæ with the branches short, stiff, and reaching two thirds of length. Thorax with a long upright tuft of hair on the vertex. Fore wing with the outer margin crenulate or irregular; vein 6 given off beyond the cell; 9 and 10 anastomosing with 8 to near apex; a tuft of scales on inner margin. Hind wing with veins 6 and 7 stalked, 8 running close along 7 before end of cell.

Fore wing with outer margin more irregular in the Indian species than in the typical American and Japanese forms.

213. *Nadata niveiceps*, *Wlk. Cat.* xxxii, p. 554; *C. & S.* no. 1189.

♀. Head, thorax, and fore wing very pale grey-brown; abdomen orange-yellow above. Fore wing with an indistinct brown mark

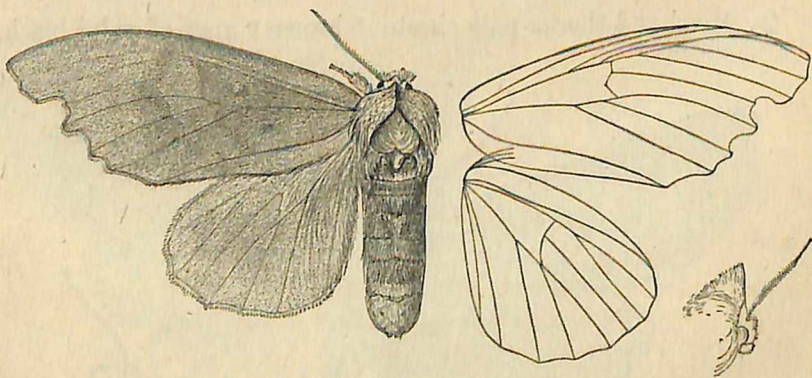


Fig. 76.—*Nadata niveiceps*, ♀. 1.

at end of cell and faint traces of a postmedial line; cilia in the emarginations white. Hind wing pale yellow.

Hab. N.W. Himalayas. *Exp.* 100 millim.

Genus **BARADESA.**

Baradesa, Moore, P. Z. S. 1883, p. 16.

Type, *B. lithosioides*, Moore.

Range. Sikkim; Sylhet.

Palpi upturned, reaching above vertex of head, the first two joints clothed with hair, the third very short and naked. Fore wing long and narrow, the apex acute; vein 6 given off after the angle of cell; 9 and 10 anastomosing with 8 to near apex. Hind wing with veins 6 and 7 stalked; 8 running close along 7 to near end of cell.

214. *Baradesa lithosioides*, Moore, P. Z. S. 1883, p. 17, pl. 5, fig. 2; C. & S. no. 1216.

♂. Head and thorax brown; abdomen yellow, the extremity greyish brown. Fore wing brown, suffused with darker brown,

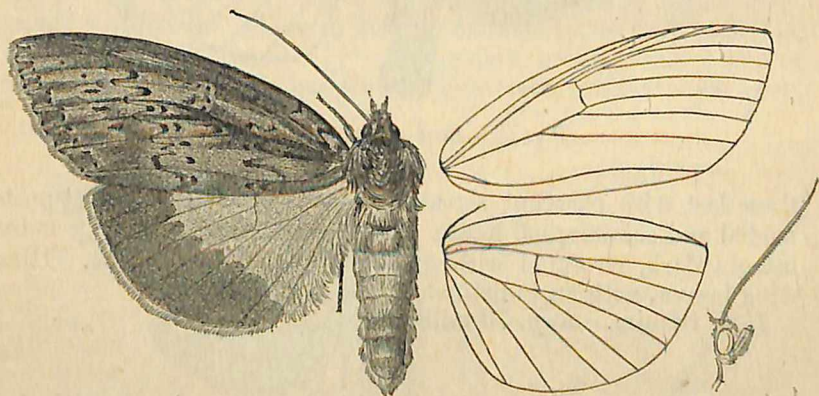


Fig. 77.—*Baradesa lithosioides*, ♂. 1.

with numerous black lunulate marks, forming ill-defined lines; a series of marginal black loops. Hind wing bright yellow; the outer area fuscous; the cilia yellow.

Hab. Sikkim; Sylhet. Exp. 88 millim.

Genus **RACHIA.**

Rachia, Moore, Lep. Atk. p. 70 (1879).

Type, *R. plumosa*, Moore.

Range. Sikkim.

Fore wing very long, the costa arched, apex acute; veins 6, 7, 8, 9, 10 stalked. Hind wing with veins 6 and 7 stalked; 8 running close beside 7 at middle of cell. Femora and tibiae very hairy.

SECT. I. Palpi short and porrect : antennæ of male with the branches very long, slender, and extending to apex.

215. *Rachia plumosa*, Moore, *Lep. Atk.* p. 70; *P. Z. S.* 1879, p. 405, pl. 34, fig. 1; *C. & S.* no. 1209.

♂. Head and collar dark brown; thorax and abdomen paler brown. Fore wing pale red-brown, the whole wing suffused with dark brown except the inner area, a submarginal band, and some postmedial streaks below the costa and in and beyond end of cell,

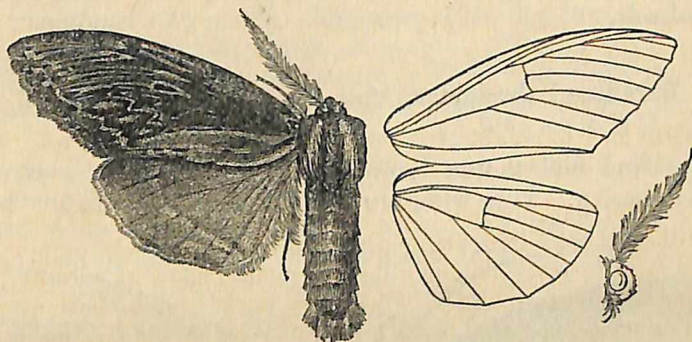


Fig. 78.—*Rachia plumosa*, ♂. 1.

these last with chestnut streaks on them; indistinct wavy postmedial and submarginal lines; vein 1 streaked with black; outer margin dark, irrorated with grey and spotted with black. Hind wing brown, with an indistinct curved postmedial line.

Hab. Sikkim. *Exp.* 79 millim.

SECT. II. Palpi longer and upturned; antennæ of male with the branches stiff, the terminal one-fourth filiform.

216. *Rachia striata*, n. sp.

♂. Palpi black at sides. Head, thorax, and abdomen pale brown. Fore wing pale brown, slightly clouded with fuscous, especially towards apex; black streaks above veins 6 and 4; an indistinct fuscous postmedial band recurved at vein 3 to base of inner margin; a black streak on centre of inner margin; a black band from centre of outer margin to inner margin before outer angle; some dark grey on outer margin, widest at outer angle. Hind wing pale, with an indistinct postmedial line and a short submarginal band at anal angle.

Hab. Sikkim (Möller). *Exp.* 80 millim. Type in coll. Elwes.

Genus **PHALERA**.

Phalera, *Hübner. Verz.* p. 146 (1816).

Type, *P. bucephala*, Linn., from Europe.

Range. Europe; Japan; China; throughout India and Burma; Java.

Palpi upturned, the first two joints clothed with hair, the third short and naked; antennæ fasciculate in male, ciliate in female; abdomen long. Fore wing long and narrow; vein 5 given off from near upper angle of cell; 6 from beyond the angle; 9 and 10 anastomosing strongly with 8. Hind wing with vein 5 from below angle of cell; 6 and 7 on a long stalk; 8 running close along 7 before the end of cell.

217. *Phalera parivala*, *Moore, Lep. E. I. C.* p. 434; *Butl. Ill. Het.* vi, pl. 103, fig. 2; *C. & S.* no. 1518.

♂. Palpi dark brown; frons chestnut; vertex of head buff-coloured; thorax buff, fringed with dark brown; the tegulæ grey, mixed with brown; abdomen brown, some specimens with indistinct fuscous segmental bands. Fore wing dark brown, with traces of waved dark lines; the basal and outer areas suffused with grey;

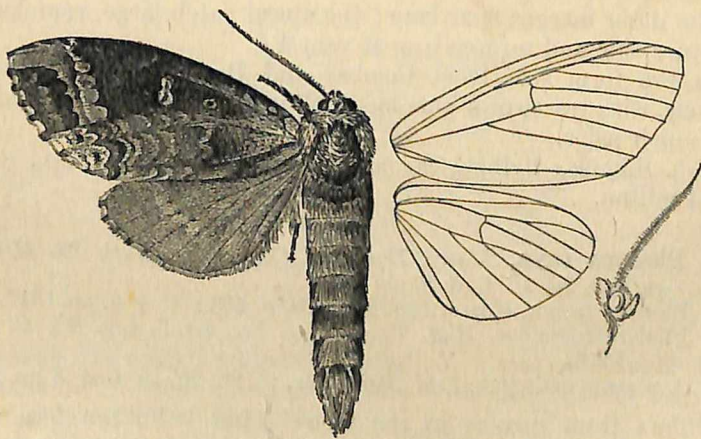


Fig. 79.—*Phalera parivala*, ♂. $\frac{1}{2}$.

basal area defined by an indistinct waved rufous line; orbicular and reniform spots somewhat indistinct; a large apical brownish-buff patch extending as a series of lunulate submarginal marks to vein 3; an indistinct waved submarginal black line; cilia bright chestnut. Hind wing fuscous; the cilia chequered white and fuscous.

Hab. Sikkim; Nilgiris. *Exp.* 80–90 millim.

218. **Phalera sangana**, Moore, *Lep. E. I. Co.* p. 433; *Butl. Ill. Het.* vi, pl. 103, fig. 4; *C. & S.* no. 1521.
Phalera arenosa, *Butl. A. M. N. H.* (5) vi, p. 66; *C. & S.* no. 1514.
Phalera stigmigera, *Butl. A. M. N. H.* (5) vi, p. 66; *C. & S.* no. 1523.

♂ differs from *parivala* in the frons being black, the vertex of head white, the vertex of thorax dark brown; the abdomen with prominent dark segmental bands. Fore wing suffused over the whole area with grey or ochreous grey; the subbasal line black; the submarginal lunulate band darker, with its lower part attenuated; a purplish mark near outer angle.

Hab. Sikkim; Bhutan. *Exp.* 82–93 millim.

219. **Phalera torpida**, *Wlk. Cat.* xxxii, p. 431.

♂ differs from *sangana* in the vertex of the head being buff; the abdomen uniform fuscous; fore wing slightly suffused with grey; the apical patch pale and small, and only extending to vein 5, no mark near outer angle; hind wing darker fuscous.

Hab. Sikkim. *Exp.*, ♂ 62–67, ♀ 78 millim.

220. **Phalera procera**, *Feld. Reis. Nov.* pl. 96, fig. 1; *C. & S.* no. 1519.
Phalera bobi, *Swinh. P. Z. S.* 1885, p. 302, pl. 21, fig. 6; *C. & S.* no. 1515.

Differs from *sangana* in the fore wing having a large dark patch on the inner margin near base; the apical patch large, rounded on its inner side and terminating at vein 4.

In the form *bobi*, from Bombay and Burma, the hind wing is fuscous, with traces of a pale medial line; in *procera*, from Sikkim, it is much paler.

Hab. Sikkim; Sylhet; Nágas; Bombay; Burma. *Exp.*, ♂ 81, ♀ 84 millim.

221. **Phalera raya**, Moore, *Lep. E. I. Co.* p. 433; *Butl. Ill. Het.* vi, pl. 103, fig. 1; *C. & S.* no. 1520.

Phalera grotei, Moore, *Lep. E. I. Co.* p. 434; *C. & S.* no. 1517.

Phalera cossoides, *Wlk. Trans. Ent. Soc.* ser. 3, i, p. 80; *C. & S.* no. 1516.

Acrosema ambouinæ, *Feld. Reis. Nov.* pl. 96, fig. 2; *C. & S.* no. 1513.

Differs from *procera* in the frons being buff; the fore wing heavily suffused with silvery grey on basal and inner areas; the apical patch paler.

Larva bluish white, with a paired subdorsal series of setiferous warts; lateral area yellow, with a red band; prolegs black, red at extremities; head reddish; stigmata black; pairs of anterior and posterior setiferous processes, which disappear in the final stage, when the ground-colour becomes white instead of blue and yellow.

Hab. Sikkim; Nágas; Calcutta; Simla; Bombay; Nilgiris.
Exp., ♂ 76, ♀ 82 millim.

Genus **GARGETTA.**

Gargetta, *Wlk. Cat.* xxxii, p. 455 (1864).

Thacona, *Wlk. Journ. Linn. Soc.* vii, p. 169 (1864).

Porsica, *Wlk. Cat.* xxxv, p. 1823 (1866).

Type, *G. costigera*, Wlk.

Range. Himalayas; Sylhet; Burma.

Palpi upturned, reaching vertex of head, the first two joints hairy; the third short and naked. Fore wing long and narrow, with a tuft of long hair in the male from below vein 1, near the base; vein 5 from the middle of discocellulars; vein 9 anastomosing with 8 to near apex; the areole short, with vein 10 given off from it. Hind wing with the costa arched at centre; vein 5 from centre of discocellulars; 6 and 7 stalked, 8 nearly touching 7 at middle of cell.

SECT. I. (*Gargetta*). Male with branches of antennæ of moderate length and reaching apex.

222. *Gargetta costigera*, *Wlk. Cat.* xxxii, p. 455; *Bull. Ill. Het.* vi, pl. 103, fig. 6; *C. & S.* no. 4821.

Dull brown; the head darker. Fore wing with the apex and inner areas slightly suffused with grey; some short dark waved

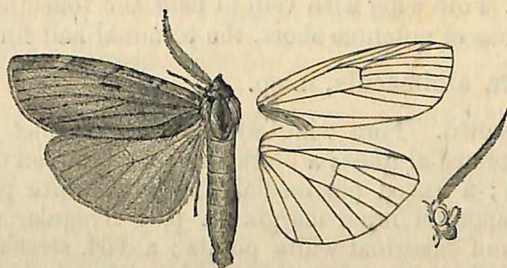


Fig. 80.—*Gargetta costigera*, ♂. †.

lines from the costa; a black longitudinal streak at end of cell; an indistinct waved submarginal line with grey points on it; a series of marginal white specks.

Hab. Mandi, N.W. Himalayas; Sikkim; Moulmein. *Exp.*, ♂ 46, ♀ 54 millim.

223. *Gargetta nagaensis*, n. sp.

♂ differs from *costigera* in the head, thorax, and fore wing being more uniform darker brown; fore wing with the outer margin more erect; the streak in cell less prominent; a straight white marginal line to both wings instead of the grey points.

Hab. Naga Hills, 6000 feet (*Doherty*). *Exp.* 62 millim. Type in coll. Elwes.

224. *Gargetta curvaria*, n. sp.

♂ differs from *costigera* in the head being pale. Fore wing with a greyish subbasal patch on inner margin, generally with a dark patch beyond it; no black streak at end of cell; the orbicular and reniform marks well defined and ochreous; the waved line with grey points postmedial; the marginal points dark. Hind wing with traces of a medial pale band.

Hab. Sikkim; Momeit. *Exp.* 42 millim. Type in B. M.

SECT. II. (*Thacona*). Male with branches of antennæ very short; the terminal half filiform.

225. *Gargetta ingens*, *Wlk. Cat.* xxxv, p. 1823; *Butl. Ill. Het.* vi, pl. 104, fig. 9; *C. & S.* no. 4816.

♂. Head and collar black-brown; thorax and abdomen pale grey-brown; the extremity of the latter ochreous. Fore wing grey-brown, with large dark patches at middle of costa and apex with strigæ between them; dark patches suffused with grey below end of cell and at outer angle; reniform indistinctly outlined with grey; an indistinct pale waved submarginal line. Hind wing slightly suffused with fuscous.

Hab. Sikkim; Sylhet. *Exp.* 56 millim.

SECT. III. Fore wing with vein 11 bent and touching areole; branches of antennæ short, the terminal half filiform.

226. *Gargetta albimacula*, n. sp.

♂. Dull brown. Fore wing with very indistinct waved subbasal and antemedial lines; a blackish streak between the orbicular and reniform; a waved postmedial line with white points, and a large white spot on inner margin; a pale irregular submarginal line; a series of marginal white points; a dark streak from apex. Hind wing with the basal half whitish, with a dark medial line; the outer area fuscous; a marginal series of white points.

Hab. Sikkim. *Exp.* 50 millim. Type in B. M.

Genus **TURNACA.**

Turnaca, *Wlk. Cat.* xxxii, p. 454 (1864).

Ambadra, *Swinh., C. & S.* p. 183 (1887).

Type, *T. acuta*, *Wlk.*

Range. Bengal and throughout S. India.

Palpi upturned, reaching vertex of head; the first two joints smoothly scaled, the third short; antennæ with the branches short, serrate at apex. Fore wing long and narrow, the apex very acute in male, less so in female; inner margin with a rounded lobe; vein 6 from angle of cell; 7, 8, 9, 10 stalked; no areole. Hind wing with veins 6 and 7 stalked; a bar between veins 7 and 8.

227. *Turnaca acuta*, *Wlk. Cat.* xxxii, p. 454; *C. & S.* no. 1511.
Corma Ernestina, *Swinh. P. Z. S.* 1885, p. 302, pl. 20, fig. 2; *C. & S.*
 no. 1233.
Pydna indica, *Moore, Lep. Atk.* p. 67; *C. & S.* no. 1183.

Palpi dark at sides; head, thorax, and fore wing pale brown, irrorated with greyish fuscous; the last with an indistinct series of postmedial dark specks curved inwards above inner margin; abdomen and hind wing paler.

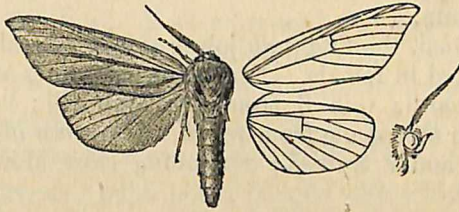


Fig. 81.—*Turnaca acuta*, ♂. 1.

Some specimens have the apex less acute than others; the form *indica* is paler, with the submarginal specks more prominent.

Hab. Bombay; Ranchee; Calcutta; Canara; Bangalore. *Exp.*,
 ♂ 54, ♀ 42 millim.

Genus NORRACA.

Norraca, *Moore, P. Z. S.* 1881, p. 340.

Type, *N. longipennis*, Moore.

Range. Ceylon.

Palpi upturned, the first two joints smoothly scaled, the third short; antennæ slightly ciliate. Abdomen long. Fore wing long and narrow, with a dentate lobe on inner margin; vein 6 from angle of cell; 9 and 10 anastomosing with 7 and 8 to form a small areole. Hind wing with veins 6 and 7 on a long stalk, 8 running close along 7 to near end of cell.

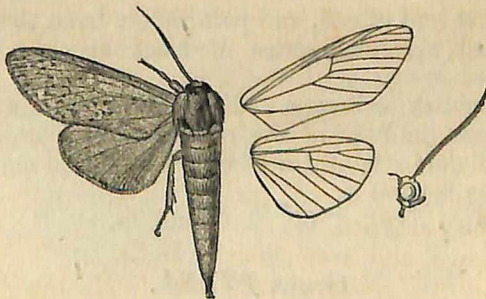


Fig. 82.—*Norraca longipennis*, ♂. 1.

228. *Norraca longipennis*, *Moore, P. Z. S.* 1881, p. 340.

♂. Head, thorax, and fore wing ochreous, the last with traces

of four or five waved fuscous lines beyond the middle; abdomen and hind wing with a reddish tinge.

Larva sphingiform, with a horn on anal somite.

Hab. Ceylon; Penang. *Exp.* 48 millim.

Genus **NIGANDA.**

Niganda, Moore, *Lep. Atk.* p. 63.

Type, *N. strigifascia*, Moore.

Range. Sikkim.

Palpi upturned, the first two joints smoothly scaled. Antennæ minutely ciliated in female. Fore wing very long and narrow, the apex rather acute; vein 6 from angle of cell; 9 anastomosing with 8 to form the areole from which 10 is given off. Hind wing with veins 6 and 7 stalked; 8 running close along 7 before the end of the cell.

229. *Niganda strigifascia*, Moore, *Lep. Atk.* p. 63, pl. 3, fig. 15;
C. & S. no. 1153.

♂. Pale ochreous brown; the outer area of wings greyish. Fore wing with a striated white streak from the base to beyond end

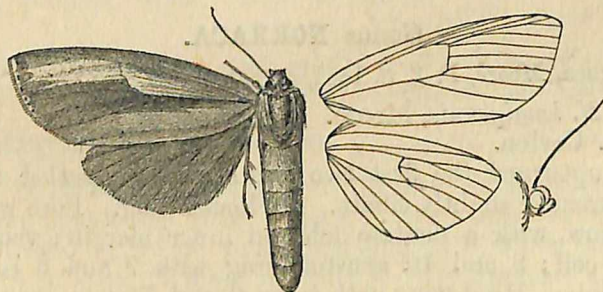


Fig. 83.—*Niganda strigifascia*, ♀. †.

of cell, angled at end of cell, and pale yellow from thence to apex; postmedial and marginal series of black specks. Hind wing reddish fuscous.

♀. Pale reddish ochreous. Fore wing with a pale yellow streak from near the base of the cell to outer margin, narrowing at the discocellulars; faint traces of a postmedial darker line and series of specks beyond it.

Hab. Sikkim. *Exp.*, ♂ 55, ♀ 62 millim.

Genus **PYDNA.**

Pydna, Wlk. *Cat.* vii, p. 1753 (1855).

Bireta, Wlk. *Cat.* vii, p. 1754 (1855).

Torona, Wlk. *Cat.* xxxii, p. 467 (1864).

Menapia, Wlk. *Cat.* xxxii, p. 461 (1864).

Ceira, Wlk. *Cat.* xxxii, p. 462 (1864).

Type, *P. testacea*, Wlk.

Runge. Japan; China; and throughout India, Ceylon, and Burma.

Palpi upturned, reaching above vertex of head, fringed with hair in front, the 3rd joint short. Fore wing produced, longer and narrower in female than male; vein 6 from the angle of cell; 9 or both 9 and 10 anastomosing with 8 to form the areole. Hind wing with veins 6 and 7 stalked; 8 running close along 7 before the end of cell.

SECT. I. (*Pydna*). Fore wing with the areole short; vein 10 given off after it.

A. Female with antennæ slightly pectinated.

230. ***Pydna testacea***, *Wlk. Cat.* vii, p. 1754; *C. & S.* no. 1184.

Menapia kamadena, *Moore, P. Z. S.* 1865, p. 812; *C. & S.* no. 1512.

♂. Pale ochreous; palpi black, fringed with white. Fore wing suffused with fuscous; a black speck at base and another at end of cell; an indistinct subbasal waved and curved line; a highly waved and curved antemedial line; two very oblique lunulate indistinct lines from the apex to centre of inner margin; a waved submarginal indistinct line; a black speck at end of cell. Abdomen and hind wing reddish ochreous.

♀ with the fore wing longer, the abdomen and hind wing white, ochreous, or reddish fuscous.

Another form is paler, the fore wing slightly irrorated with black scales; the markings almost obsolete; female with a dark blotch in the cell and another beyond it.

Hab. Sikhim. Exp., ♂ 60–66, ♀ 62–96 millim.

*231. ***Pydna decurrens***, *Moore, Lep. Atk.* p. 66; *C. & S.* no. 1144.

♀. Differs from the pale ochreous form of *testacea* in having a sharply angulated antemedial band; a curved postmedial band sending two streaks to a submarginal maculate line; an oblique streak from apex.

Hab. Khâsis. Exp. 53 millim.

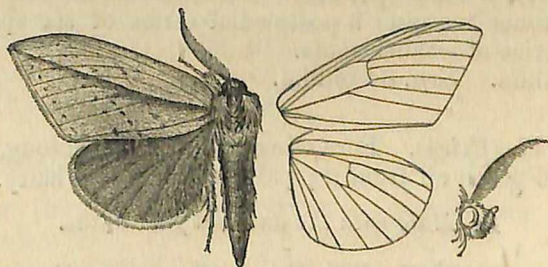


Fig. 84.—*Pydna longivitta*, ♂. 1.

232. ***Pydna longivitta***, *Wlk. Cat.* vii, p. 1754; *C. & S.* no. 1186.

Menapia xanthophila, *Wlk. Cat.* xxxii, p. 462; *Butl. Ill. Het.* vi, pl. 104, fig. 1; *C. & S.* no. 1187.

♂. Head and thorax rufous; abdomen ochreous. Fore wing ochreous, with a curved ferruginous band from the base to the apex; numerous indistinct waved lines. Hind wing fuscous-brown.

Hab. Simla; Sikhim; Nágas; Rangoon. *Exp.* 56 millim.

233. *Pydna nana*, *Swinh. P. Z. S.* 1889, p. 407.

♂ differs from *longivitta* in the band of the fore wing terminating before the apex; two series of ferruginous submarginal specks; costa and cilia rufous.

Hab. N. Canara; Nilgiris. *Exp.* 42 millim.

234. *Pydna pallida*, *Butl. A. M. N. H.* (4) xx, 1877, p. 473; *id. Ill. Het.* ii, pl. 25, figs. 10, 11.

Pydna notata, *Swinh. Trans. Ent. Soc.* 1891, p. 479, pl. xix, fig. 16.

♂. Differs from the pale form of *testacea* in not having the black speck at end of cell of fore wing; some orange scales along median nervure and vein 4; the inner area suffused with brown; submarginal and marginal series of black specks.

♀ with the apex of fore wing generally more produced and acute; a black cell-spot sometimes present.

Hab. Japan; Chekiang; Sikhim. *Exp.*, ♂ 50-54, ♀ 54-56 millim.

B. *Male antennæ fasciculate, female ciliated; the palpi shorter and slight.*

235. *Pydna ochracea*, *Moore, Lep. Atk.* p. 65; *C. & S.* no. 1147.

♀ uniform orange-yellow; the palpi blackish at sides.

Hab. Sikhim. *Exp.* 79 millim.

236. *Pydna galbana*, *Swinh. P. Z. S.* 1886, p. 438, pl. xl, fig. 5; *C. & S.* no. 1185.

♀. Ochreous white; the vertex of thorax and abdomen brown; fore wing with a black spot below the centre of cell and one above centre of inner margin; a postmedial series of six spots and a marginal series of smaller spots.

Hab. Sikhim. *Exp.* 34 millim.

SECT. II. (*Ceira*). Fore wing with the areole long, vein 10 given off from it; palpi and legs less hairy.

A. *Male with the antennæ fasciculate.*

237. *Pydna metaphæa*, *Wlk. Cat.* xxxii, p. 462; *Moore, Lep. Ceyl.* ii, pl. 119, fig. 3; *C. & S.* no. 1146.

Differs from *testacea* in the thorax and fore wing being pale ochreous, with less rufous irroration; some specimens have a large

black spot below the origin of vein 2 and the short streak beyond the cell prominent, in others these marks are quite obsolete; the rufous line from apex and the submarginal line better defined. Abdomen and hind wing darker brown, without the red tinge.

Hab. Ceylon. *Exp.*, ♂ 50, ♀ 62 millim.

233. *Pydna eupatagia*, n. sp.

♂. Head and thorax olive-brown; collar and patagia violaceous grey; abdomen red-brown, the extremity grey. Fore wing whitish; the inner area violaceous grey; a dark speck near the base and streak on median nervure; traces of an antemedial dentate line; a reddish patch in end of cell; a denticulate postmedial dark line met by an oblique streak from the apex and with some rufous suffusion beyond it; a series of submarginal black specks. Hind wing fuscous with the apex whitish.

The form from the N.W. Himalayas is paler, with the markings of the fore wing less prominent.

Hab. N.W. Himalayas (*Harford*); Sikhim (*Knyvett*). *Exp.*, ♂ 52, ♀ 36 millim. Type in coll. Knyvett.

239. *Pydna aurata*, *Moore*, *Lep. Atk.* p. 64; *C. & S.* no. 1150.

♂. Head and thorax orange fulvous, the collar grey; abdomen fuscous. Fore wing fulvous yellow, the basal and costal areas golden; an orange streak from the base below median nervure; some oblique orange strigæ from the costa; a black spot at end of cell; a postmedial curved series of dark specks; traces of a submarginal line; a marginal series of white lunules. Hind wing fuscous; the cilia ochreous.

Hab. Sikhim; Khásis. *Exp.* 50 millim.

240. *Pydna fasciata*, *Moore*, *Lep. Atk.* p. 66; *C. & S.* no. 1182.

♂. Head and thorax ochreous brown; abdomen deep fuscous, the dorsal tufts on first two segments long. Fore wing ochreous, irrorated with brown and suffused with fuscous; some fine pale streaks in the cell; a dark mark with some grey scales on it below the cell; the reniform spot pale; a double postmedial series of brown specks and marginal series of black specks. Hind wing dark fuscous.

Hab. Khásis. *Exp.* 50 millim.

241. *Pydna sikkima*, *Moore*, *Lep. Atk.* p. 64; *C. & S.* no. 1152.

Head and thorax bright ochreous; collar pinkish grey; metathorax with a fuscous tuft; abdomen dull ochreous, fuscous at extremity, and with a long tuft of hair. Fore wing bright ochreous, with a slight fuscous suffusion on inner and outer areas; traces of a discoidal spot and medial and postmedial waved lines; an indistinct series of postmedial specks on the nervules; two very indistinct waved submarginal lines; a marginal series of black specks, promi-

ment towards apex. Hind wing smoky grey, the margin and cilia ochreous. Underside yellow, the disk and inner area of both wings suffused with black.

Hab. Sikkim. *Exp.*, ♂ 62, ♀ 64 millim.

242. *Pydna nigropuncta*, n. sp.

♂. Head, thorax, and abdomen brown. Fore wing pale brownish ochreous, with a slight red-brown suffusion; traces of waved ante- and postmedial red-brown lines, two indistinct series of postmedial specks on the nervules; a prominent dark spot below vein 5, with a red-brown streak from it to the apex; traces of a submarginal line; a marginal series of black specks. Hind wing fuscous, the cilia ochreous. Underside fuscous; the costa of fore wing and outer margin of both wings yellow.

Hab. Sikkim (*Möller*). *Exp.* 46 millim. Type in coll. Elwes.

243. *Pydna nigrofasciata*, n. sp.

♂. Differs from *nigropuncta* in being pale olive-brown without the red-brown suffusion. Fore wing with a prominent black fascia from the base to near centre of outer margin, with some fuscous suffusion above it; a short black oblique subapical streak; the marginal series of specks indistinct. Hind wing paler. Underside with the outer margin of both wings slightly ochreous.

Hab. Sikkim (*Elwes*). *Exp.* 47 millim. Type in coll. Elwes.

*244. *Pydna basistriga*, *Moore, Lep. Atk.* p. 65; *C. & S.* no. 1143.

♂. Differs from *nigropuncta* in having the head, thorax, abdomen, and fore wing pale yellow; the hind wing whitish.

Hab. Sikkim. *Exp.* 56 millim.

B. *Male with the antennæ bipectinate, the branches long.*

245. *Pydna ferrifera*, *Wlk. Cat.* xxxii, p. 468; *C. & S.* no. 1115.

Ceira junctura, *Moore, Lep. Atk.* p. 65; *C. & S.* no. 1145.

Ceira postica, *Moore, Lep. Atk.* p. 66; *C. & S.* no. 1148.

♂. Yellowish white; differs from *longivitta* in the band of the fore wing being much more diffused and ill defined; the veins streaked with ferruginous; the inner series of submarginal specks curved to the centre of inner margin; the cilia pale. Hind wing yellowish white.

Hab. Sikkim. *Exp.* 48 millim.

Genus **RAMESA**.

Ramesa, *Wlk. Cat.* v, p. 1016 (1855).

Type, *R. tosta*, *Wlk.*

Range. Sikkim; Burma; Ceylon.

Palpi obliquely porrect, the second joint hairy. Antennæ

serrate and fasciculate. Fore wing rather narrow; vein 6 from the angle of cell; 9 and 10 anastomosing with 8 to form the areole. Hind wing with veins 6 and 7 stalked; 8 running close along 7 to towards the end of the cell.

246. *Ramesa tosta*, *Wlk. Cat. v*, p. 1017; *Butl. Ill. Het. vi*, pl. 104, fig. 5; *C. & S.* no. 1527.

Ramesa luridivitta, *Hmps. Ill. Het. ix*, ined., pl. 160, fig. 12.

Head and thorax red-brown. Fore wing ochreous, slightly suffused with red-brown, and streaked with dark brown along the

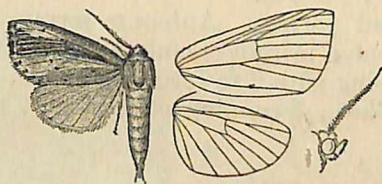


Fig. 85.—*Ramesa tosta*, ♂. 1.

basal half of the costal area to the lower angle of the cell, and extending along veins 4 and 5 to the outer margin; shorter streaks below the apex, and a paler streak along inner margin; postmedial and submarginal series of dark specks; cilia fuscous. Abdomen and hind wing paler.

The Ceylon race *luridivitta* is much darker; the head, thorax, and fore wing wholly dark brown, the last with rufous streaks from lower end of cell to outer margin and apex.

Hab. Burma; Ceylon. *Exp.*, ♂ 32, ♀ 36 millim.

247. *Ramesa fuscipennis*, n. sp.

♂. Head and thorax dull brown; abdomen with a reddish tinge. Wings dull brown: fore wing with the reniform spot small and indistinct, and with pale outline; an indistinct postmedial series of specks; a marginal black series with white specks inside them.

Hab. Burma. *Exp.* 44 millim. Type in coll. Moore.

*248. *Ramesa divisa*, *Moore, Lep. Atk.* p. 65; *C. & S.* no. 1151.

♂. Differs from *fuscipennis* in being red-brown. Fore wing with pale flesh-coloured streaks on inner area and towards apex; some dark specks towards inner margin within the postmedial series. Hind wing with some dark spots on outer margin.

Hab. Sikkim. *Exp.* 56 millim.

*249. ? *Ramesa albistriga*, *Moore, Lep. Atk.* p. 64; *C. & S.* no. 1149.

♂. Brown. Head, thorax, and a tuft at end of abdomen grey-brown. Fore wing with some grey streaks along median nervure;

an indistinct double waved antemedial dark line; a dark spot at end of cell; a pinkish streak from lower angle of cell to outer margin; four or five indistinct waved postmedial lines; a marginal series of dark specks.

Hab. Sikhim. *Exp.* 50 millim.

Genus **ZANA**.

Zana, *Wlk. Cat.* vii, p. 1700 (1855).

Type, *Z. lignosa*, Walk.

Range. Almora; Madras.

Palpi slight and porrect. Antennæ serrate in female. Fore wing broad, the outer margin crenulate; vein 6 from the angle of cell; 9 anastomosing with 8 to form the areole. Hind wing with veins 6 and 7 stalked; 8 running close along 7 to near the end of the cell.

250. *Zana lignosa*, *Wlk. Cat.* vii, p. 1700; *Butl. Ill. Het.* vi, pl. 104, fig. 4; *C. & S.* no. 1510.

♀. Head and thorax pale buff; abdomen bright orange above, with a paired series of lateral black spots. Fore wing grey, with pale

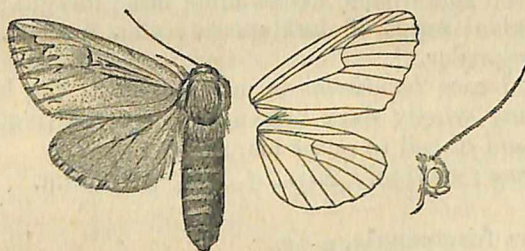


Fig. 86.—*Zana lignosa*, ♀. †.

yellow patches below and beyond the cell; brown streaks along median nervure and on discocellulars; a highly dentate brown line from apex to lower angle of cell; brown streaks on each side of the veins on outer margin; a waved marginal black line. Hind wing pale yellow.

Hab. Almora; Madras. *Exp.* 44–56 millim.

Genus **ANTICYRA**.

Anticyra, *Wlk. Cat.* v, p. 1091 (1855).

Dinara, *Wlk. Cat.* vii, p. 1699 (1855).

Type, *A. combusta*, Wlk.

Range. Philippines; N.W. Himalayas; Karáchi; Poona; Java.

Palpi slight and porrect. Antennæ fasciculate. Fore wing broad, the apex rather acute; vein 6 given off beyond the end of

cell; 9 anastomosing with 8 to form the areole, which is long. Hind wing with veins 6 and 7 stalked; 8 running close along 7 to near the end of the cell.

251. *Anticyra combusta*, *Wlk. Cat.* v, p. 1092; *Moore, Lep. E. I. Co.* pl. 13 a, fig. 5, and pl. 23, figs. 3, 3 a (larva); *C. & S.* no. 1135.
Dinara lineolata, *Wlk. Cat.* vii, p. 1700.

Head and collar buff; thorax brown with the patagia grey; abdomen orange above with a series of black lateral spots; the

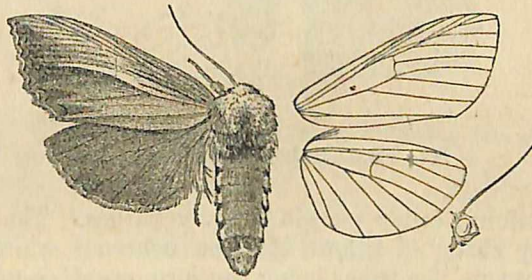


Fig. 87.—*Anticyra combusta*, ♂. †.

penultimate segment fuscous, the terminal ochreous. Fore wing pale yellow; the inner half irrorated with a few black scales and suffused with brown, especially between veins 2 and 4; brown streaks below the costa, in the cell, and between the nervules of the yellow area towards outer margin; a waved marginal brown line. Hind wing fuscous.

Larva. Blue-green, with a few long hairs: head black.

Hab. Philippines; N.W. Himalayas; Karáchi; Poona; Java.
Exp., ♂ 52–60, ♀ 54–72 millim.

Genus **ANTHEUA**.

Antheua, *Wlk. Cat.* iii, p. 766 (1855).

Type, *A. varia*, *Wlk.*, from Natal.

Range. S. Africa; throughout India and Ceylon; Java.

Palpi slight and porrect. Antennæ pectinate to apex, the branches short. Fore wing broad, the apex rather acute; vein 6 from angle of cell; 9 and 10 anastomosing with 8 to form the areole. Hind wing with veins 6 and 7 stalked; 8 running close along 7 to near the end of cell.

252. *Antheua servula*, *Drury, Ins. Exot.* ii, p. 20, pl. xi, fig. 4; *C. & S.* no. 1497.

Antheua discalis, *Wlk. Cat.* iii, p. 767; *Moore, Lep. E. I. Co.* pl. 13 a, fig. 4, and pl. 23, figs. 2, 2 a (larva); *C. & S.* no. 1136.

Antheua exanthemata, Moore, *Lep. Ceyl.* ii, p. 111, pl. 119, fig. 2;
C. & S. no. 1137.

Head, thorax, and abdomen fulvous yellow suffused with rufous. Fore wing fulvous yellow, irrorated with a few rufous scales; a brown patch below the end of cell; costa and inner margin

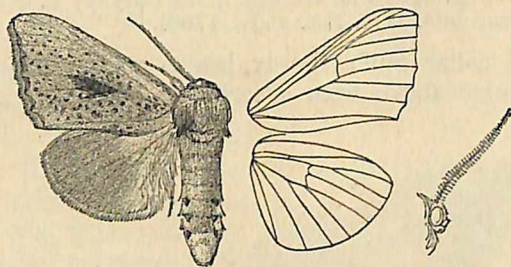


Fig. 88.—*Antheua servula*, ♂. $\frac{1}{2}$.

narrowly rufous; outer margin broadly rufous. The hind wing may be any shade of colour between ochreous white and dark brownish fuscous, the latter being the form *exanthemata*.

Larva. Brown with a yellow lateral line and paired subdorsal and sublateral red spots; the stigmata white; the head streaked with black.

Hab. Throughout India, Ceylon, and Burma; Java. *Exp.* 46–50 millim.

Genus **ZARANGA.**

Zaranga, Moore, *Trans. Ent. Soc.* 1884, p. 357.

Type, *Z. pannosa*, Moore.

Range. N.W. Himalayas.

Palpi short and porrect. Antennæ bipectinated to near apex, the branches short. Fore wing with the outer margin highly irregular; vein 6 from angle of cell; 7, 8, 9, 10 stalked. Hind wing with the outer margin waved, and excised towards anal angle; vein 5 from middle of discocellulars; 6 and 7 stalked; a bar connecting 7 and 8.

253. *Zaranga pannosa*, Moore, *Trans. Ent. Soc.* 1884, p. 357; *C. & S.* no. 1217.

♂. Head, thorax, and abdomen brown; metathorax fringed with yellow; antennæ tipped with white; tarsi banded with white. Fore wing dark brown, a white speck at base; a large pale red-brown patch on inner margin, nearly joined by a similar patch occupying all the apical area except the costa and apex; an indistinct antemedial waved line; black lines on each side of discocellulars; an indistinct waved postmedial line, white at costa

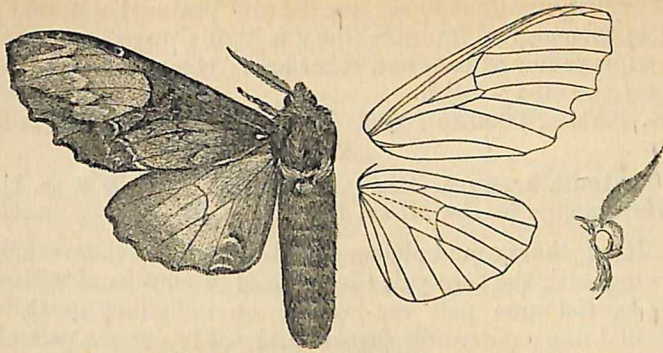


Fig. 89.—*Zaranga pannosa*, ♂. 1.

and towards inner margin. Hind wing fuscous; the disk whitish two pale streaks above anal angle.

Hab. Simla. *Exp.* 74 millim.

Genus **FENTONIA**.

Fentonia, *Butl. Trans. Ent. Soc.* 1881, p. 20.

Type, *F. ocypete*, Brem.

Range. Japan; Amur; N.W. Himalayas; Sikkim; Canara.

Palpi upturned and short, the first two joints fringed with hair, the third short and naked. Abdomen long. Fore wing rather long; veins 6, 7, 8, 9, 10 stalked, or 10 from cell; 7 given off nearer the apex than 10; no areole. Hind wing with veins 6 and 7 stalked; 8 running close along 7 to near the end of cell.

SECT. I. Hind wing with the stalk of veins 6 and 7 short.

a. *Antennae of male with branches short and reaching the apex.*

254. ***Fentonia argentifera***, *Moore, P. Z. S.* 1865, p. 813; *C. & S.* no. 1167.

Head and thorax grey, marked with brown; abdomen yellow

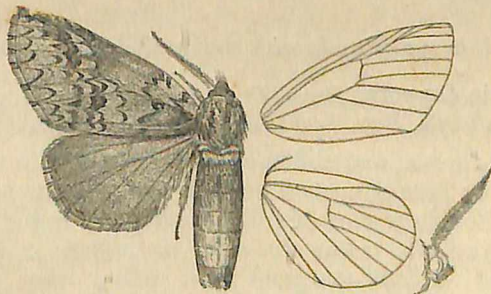


Fig. 90.—*Fentonia argentifera*, ♂. 1.

with the tip grey. Fore wing silvery grey; two pairs of subbasal

waved brown or rufous lines; medial and postmedial waved lines; a double submarginal lunulate line; a highly waved marginal line. Hind wing yellow at base and inner area; the outer area brownish fuscous; the cilia whitish.

Hab. Sikkim, 7000 to 10,000 feet. *Exp.*, ♂ 60, ♀ 62 millim.

255. **Fentonia brunnea**, *Moore, Lep. Atk.* p. 60; *C. & S.* no. 1169.
Heterocampa basalis, *Moore, Lep. Atk.* p. 61; *C. & S.* no. 1168.

♂. Head, thorax, and abdomen red-brown, the thorax brighter. Fore wing with the base pale; a subbasal fuscous band with waved edges; medial area pale red-brown; an indistinct much waved postmedial line; outer area fuscous and red-brown; a pale oblique streak from the apex and submarginal series of black specks. Hind wing reddish brown.

The form *basalis* has the ground-colour of fore wing greyish.

Hab. Sikkim. *Exp.* 48 millim.

- *256. **Fentonia obliquiplaga**, *Moore, Lep. Atk.* p. 61; *C. & S.* no. 1172.

♂. Head and thorax blackish; abdomen yellowish brown, the extremity blackish. Fore wing pale vinous brown; an oblique subbasal black band with dentate edges; a broad marginal blackish band with waved inner edge and series of submarginal black specks on it. Hind wing pale brown, the inner area yellowish.

Hab. Sikkim. *Exp.* 60 millim.

257. **Fentonia apicalis**, *Moore, Lep. Atk.* p. 68, pl. iii, fig. 12; *C. & S.* no. 1525.

Head and thorax greyish black-brown; antennæ fulvous. Fore wing pale chestnut-brown, suffused with darker brown near the base; numerous black spots between the veins; a pale band from the costa before the apex narrowing to outer margin above the angle; the outer area suffused with fuscous. Hind wing fuscous brown.

Hab. Sikkim. *Exp.* 48 millim.

b. *Antennæ of male with terminal one-third serrate.*

258. **Fentonia ocypete**, *Brem. Bull. Acad. Pétersb.* iii. p. 481 (1861).
Fentonia lævis, *Bull. Trans. Ent. Soc.* 1881, p. 20.

♂. Head, thorax, and abdomen pale grey. Fore wing grey; a black streak on base of median nervure; double antemedial dentate dark lines; double postmedial lines excurved round end of cell and angled inwards below the cell; an indistinct dentate submarginal line; a dark marginal line. Hind wing pale grey; a slight brown patch at anal angle; a marginal brown line and a line through the cilia.

Hab. Japan; Amur; Simla. *Exp.* 48 millim.



SECT. II. Hind wing with the stalk of veins 6 and 7 very long; antennæ of male with the branches longer.

259. *Fentonia tenebrosa*, *Wlk. Cat.* vii, p. 1725; *C. & S.* no. 1089.

Phineca canities, *Swinh. P. Z. S.* 1889, p. 407.

♂. Head, thorax, and abdomen grey-brown. Fore wing grey, suffused with fuscous scales; two curved antemedial black lines with a few silvery scales on them, the upper part of the space between them filled in with fuscous; traces of a postmedial curved line; a series of submarginal black streaks on the veins. Hind wing fuscous.

Hab. N. Canara. *Exp.* 28–30 millim.

Genus **STAUROPUS.**

Stauropus, *Germa*, *Prod.* p. 45 (1811).

Netria, *Wlk. Cat.* vi, p. 1504 (1855).

Type, *S. fagi*, Linn., from Europe.

Range. Europe; Japan; throughout India and Ceylon; Andamans; Java.

Palpi short and slight, or rarely longer and upturned. Fore wing broad, the subcostal vein hairy on underside; vein 6 from angle of cell; 7, 8, 9, 10 stalked; no areole. Hind wing with veins 6 and 7 stalked; 8 running close along 7 to near end of cell.

SECT. I. Male with antennæ fasciculate; female simple.

260. *Stauropus maculatus*, *Moore, Lep. Atk.* p. 60; *Waterh. Aid.* ii, pl. 132, fig. 6; *C. & S.* no. 1171.

Head, collar, and patagia grey; thorax brown. Fore wing grey, the medial and apical areas suffused with reddish brown; one sub-basal and seven medial waved dark lines, the middle lines red-brown and ill defined on the disc; a submarginal series of dark spots; cilia chequered grey and brown. Abdomen and hind wing pale with a reddish tinge, the former grey at extremity.

Hab. Sikkim; Nágas. *Exp.*, ♂ 44, ♀ 53 millim.

SECT. II. (*Stauropus*). Male with antennæ pectinated, female ciliated.

261. *Stauropus alternus*, *Wlk. Cat.* v, p. 1020; *Moore, Lep. Ceyl.* ii, pl. 119, figs. 1, 1a, b (larva); *C. & S.* no. 1129.

Stauropus indicus, *Moore, P. Z. S.* 1879, p. 404; *C. & S.* no. 1131.

Stauropus albescens, *Moore, P. Z. S.* 1879, p. 404; *C. & S.* no. 1128.

♂. Head and thorax brownish grey; abdomen grey-brown, with the dorsal tufts on first six segments darker. Fore wing

brownish grey, with indistinct ante- and postmedial pale waved lines; a submarginal series of rust-red spots with pale lunules inside them. Hind wing whitish, with the costal and inner areas

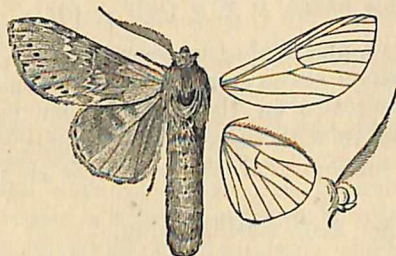


Fig. 91.—*Stauropus alternus*, ♂. 1.

brown; both wings with a marginal series of pale and red-brown lunules. Underside brown.

♀ with the hind wing uniform brown.

The form *albescens*, from Bombay and Ganjam, is more uniform pale grey; the hind wing hardly suffused with brown.

Larva dark red-brown; a pale dorsal line; grey subdorsal streaks on 5th and 6th somites; paired dorsal prominences on 6th to 8th somites; the terminal somite swollen and carried over the back, with two angular processes from the extremity; the anal prolegs absent; 2nd and 3rd pairs of legs long.

Hab. Sylhet; Bombay; Ganjam; Canara; Ceylon; Rangoon; Java. *Exp.*, ♂ 44, ♀ 62 millim.

262. *Stauropus sikkimensis*, Moore, *P. Z. S.* 1865, p. 811, pl. 43, fig. 5; *C. & S.* no. 1132.

Stauropus berberisæ, Moore, *P. Z. S.* 1888, p. 400; *Butl. Ill. Het.* vii, pl. 125, fig. 4; *C. & S.* no. 1130 A.

♂. Differs from *alternus* in the antemedial line of the fore wing being more irregular, the postmedial line more curved and less dentate, and both with dark outlines; a spot of dark raised scales below the middle of the cell, two towards the end of it; two submarginal series of spots of dark raised scales and marginal lunular series. Hind wing whitish, the costal area dark.

♀ darker than the male.

Typical *sikkimensis*, from Sikkim, has the base of fore wing greyish; the medial area of fore wing and costa of hind wing suffused with dark green; in *berberisæ*, from Kangra, the fore wing is wholly suffused with brown.

Larva similar to that of *alternus*.

Hab. Kangra; Umballa; Sikkim. *Exp.*, ♂ 44; ♀ 60 millim.

263. *Stauropus dentilinea*, Hmps. *Ill. Het.* viii, p. 60, pl. 141, fig. 10.

Head, thorax, and abdomen grey and fuscous. Fore wing grey, irrorated with fuscous scales, and slightly suffused with brown on

basal and outer areas ; very indistinct ante- and postmedial waved dark lines ; a submarginal series of dark spots ; a prominent dentate marginal dark line. Hind wing fuscous ; the costa pale.

Hab. Nilgiri plateau ; Ceylon. *Exp.* 45 millim.

264. **Stauropus apicalis**, *Moore, Lep. Atk.* p. 59 ; *C. & S.* no. 1130.

♂. Fore wing comparatively longer than in the preceding species. Head and collar fuscous brown ; thorax grey ; abdomen fulvous brown, the extremity grey. Fore wing grey, irrorated with fuscous scales ; a brown streak on the middle of the costa, one postmedial, and one subapical below the costa. Hind wing pale fuscous brown.

Hab. Sikkim. *Exp.* 62 millim.

SECT. III. (*Netria*). Both sexes with antennæ pectinated.

265. **Stauropus viridescens**, *Wlk. Cat.* vi. p. 1504 ; *Moore, Lep. Ceyl.* ii, pl. 120, figs. 2, 2a (larva and pupa).

Netria griseata, *Hmps. Ill. Het.* ix, ined., pl. 160, fig. 14.

Stauropus virescens, *Moore, P. Z. S.* 1879, p. 404 ; *C. & S.* no. 1134.

♂. Head and thorax green ; abdomen brown, with the extremity green. Fore wing green ; two indistinct subbasal waved dark lines, two antemedial, three postmedial, and one submarginal ; the orbicular and reniform spots paler. Hind wing fuscous brown. Underside paler.

♀ with the fore wing suffused with brown on basal area, and on medial area between the first antemedial and last postmedial lines.

The form *griseatus*, from Trincomali, Ceylon, has the female very much paler, with hardly a trace of green suffusion ; fore wing with the ground-colour greyish white, the bands brown ; hind wing pale and but slightly suffused with fuscous.

Larva thickened at middle ; anal segment bifid ; green, with a dorsal purple line ; the spiracles white ; a sublateral yellow line ; gulae, fore legs, and mid claspers purple.

Hab. Sikkim ; Nágas ; Ceylon ; Java. *Exp.*, ♂ 50-70, ♀ 82-100 millim.

266. **Stauropus pallidifascia**, n. sp.

♂. Head and thorax brown, grizzled with white and the central part of collar fringed with white ; abdomen paler. Fore wing with the basal area grey-green, bounded by a double antemedial brown line ; a double postmedial line excurved between veins 2 and 4, the area between the two double lines pale ochreous suffused with brown scales, and with the orbicular and reniform

spots indistinctly paler; outer area grey-green; a waved dark submarginal line. Hind wing whitish, the costal and inner areas suffused with red-brown, the apex grey-green.

Hab. Sikkim. *Exp.* 46 millim. Type in coll. Knyvett.

267. *Stauropus albivertex*, n. sp.

♂. Palpi and sides of head black, the vertex white; thorax dark iron-grey; abdomen greyish brown, the basal segments red-brown. Fore wing iron-grey; an irregularly waved antemedial line and waved oblique postmedial line. Hind wing nearly white; some dark hairs on inner area, and some brown on the margin at anal angle.

Hab. Gura Valley, Kashmir (*Leech*). *Exp.* 70 millim. Type in coll. *Leech*.

268. *Stauropus fasciatus*, *Moore*, *Lep. Atk.* p. 58; *C. & S.* no. 980.

Palpi black, fringed with white; head ochreous white; thorax grey and fuscous; abdomen brownish grey, the extremity grizzled. Fore wing grey irrorated with fuscous, some darker suffusion at base; three indistinct waved antemedial lines; a postmedial irregular line, expanding into ill-defined blotches below the costa, at middle and inner margin; a waved submarginal dark line. Hind wing pale, with a large apical dark spot.

A male from Sikkim has the collar white, and a large white blotch below the centre of the costa of fore wing in and below the cell: in a female from Sikkim the head also is white; the fore wing wholly white, except the basal area, the inner area, and a patch on the costa beyond the middle, which are brown.

Hab. Dalhousie; Sikkim; Khandāla; Andamans. *Exp.*, ♂ 52, ♀ 54 millim.

269. *Stauropus griseus*, *Hmps.* *Ill. Het.* viii, p. 59, pl. 141, fig. 16.
Lymantria canescens, *Hmps.* *Ill. Het.* ix, ined., pl. 160, fig. 6.

♀. Antennæ brownish ochreous; head and collar dark brown; thorax and fore wing dark brown grizzled with grey, the latter with traces of dark ante- and postmedial lines. Abdomen and hind wing paler brown.

♂ with the whole fore wing, except the costa, much darker brown as far as the postmedial line; the waved submarginal line more distinct.

Hab. Nilgiris, southern slopes, 3000 feet; Ceylon. *Exp.*, ♂ 50, ♀ 63 millim.

270. *Stauropus orbifer*, n. sp.

♀. Head red-brown; thorax and abdomen pure white. Fore wing red-brown with a purplish tinge; the whole inner area,



embracing the basal half of cell and area below vein 2, white with buff patches on median nervure and towards outer angle; a large round white apical patch with buff centre; the red-brown area with some indistinct lines on it; the orbicular and reniform spots outlined with grey; a series of white submarginal specks. Hind wing red-brown; the basal and inner area whitish.

Hab. Sikkim. *Exp.* 55 millim. Type in coll. Knyvett.

271. **Stauiropus basiniger**, *Moore*, *P. Z. S.* 1865, p. 805; *C. & S.* no. 1002.

♀. Pale brown; collar blackish. Fore wing with the basal area blackish, bounded by a curved black line; a double incurved waved postmedial line, prominent towards inner margin; a submarginal series of black lunules.

Hab. Dehra Dun; Balasore. *Exp.* 64 millim.

272. **Stauiropus vinaceus**, *Moore*, *P. Z. S.* 1879, p. 404, pl. 33, fig. 1; *C. & S.* no. 1133.

♀. Head, thorax, and abdomen grey-brown. Fore wing brown, slightly irrorated with grey; the basal area pale; traces of a double oblique waved antemedial line and postmedial double series of specks; two red-brown streaks beyond the cell; a submarginal dark line bordered inwardly with white, curved in its upper portion, dentate towards inner margin. Hind wing brown.

Hab. "India." *Exp.* 56 millim.

273. **Stauiropus plagiviridis**, *Moore*, *Lep. Atk.* p. 61; *C. & S.* no. 1173.

♂. Head and thorax dark red-brown; antennæ and abdomen pale red-brown, the latter greyish at extremity. Fore wing red-brown, with subbasal, ante- and postmedial highly irregular broad bands of a beautiful silvery green, with bright green lines on them; a waved submarginal green line. Hind wing ochreous; an indistinct line from middle of costa to anal angle, beyond which the area is suffused with red-brown.

Hab. Sikkim. *Exp.* 54 millim.

Genus **SOMERA.**

Somera, *Wlk. Cat.* iv, p. 882 (1855).

Type, *S. viridifusca*, *Wlk.*

Range. Sikkim; Sylhet; Ceylon.

Palpi upturned, reaching vertex of head; the first two joints fringed with hair. Antennæ with the branches long and reaching the apex. Legs hairy. Fore wing broad, the subcostal nervure

and cell clothed with long hairs on underside; vein 6 given off just beyond the angle of cell; 9 and 10 anastomosing with 8 to form the areole. Hind wing with veins 6 and 7 stalked; 8 running close along 7 to near the end of the cell.

274. *Somera viridifusca*, Wlk. Cat. iv, p. 882; *Butl. Ill. Het.* vi, pl. 104, fig. 7; *C. & S.* no. 1059.

♂. Palpi brown; vertex of head and thorax green; abdomen fuscous, with the extremity green. Fore wing bright green, with a brown patch below and beyond the end of cell; two subbasal

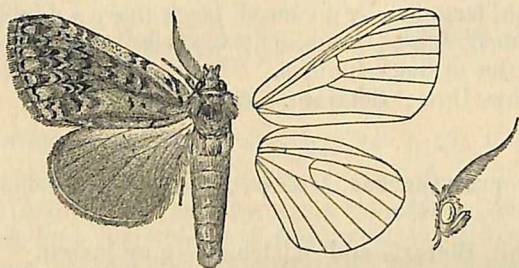


Fig. 92.—*Somera viridifusca*, ♂. 1.

waved dark lines; two antemedial; four postmedial and one submarginal, the last with brownish blotches on it. Hind wing fuscous brown.

The brown patch on the fore wing is often absent.

Hab. Sikkim; Sylhet; Ceylon. *Exp.* 58 millim.

Genus **LIPAROPSIS**, nov.

Type, *L. postalbida*, Hmps.

Range. Nāga Hills.

Palpi slight and porrect. Antennæ with the branches long in male. Mid tibiæ with one pair of spurs; hind tibiæ without spurs. Fore wing with vein 2 curved; 5 from near upper angle of cell; 6, 7, 8, 9, 10 stalked. Hind wing broad, the costa arched; vein 5 from near the upper angle of cell; 6 and 7 stalked; 7 and 8 recurved upwards to the costa.

275. *Liparopsis postalbida*, n. sp.

♂. Head and thorax grey; vertex of thorax slightly suffused with brown; abdomen white. Fore wing with the base white, edged by some diffused dark scales, beyond which the area is suffused with red-brown to a double indistinct outwardly-oblique antemedial line, a broad medial white area irrorated with dark

scales, and continued along the costa to the apex, an indistinct double waved postmedial line; the outer area from vein 4 to outer angle suffused with red-brown. Hind wing pure white.

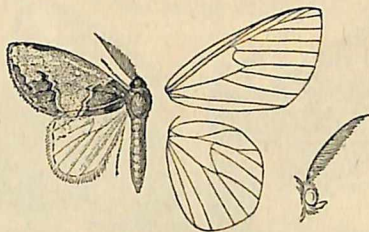


Fig. 93.—*Liparopsis postalbida*, ♂. 1.

Hab. Nāga Hills, 6000 feet (*Doherty*). *Exp.* 38 millim. Type in coll. *Elwes*.

Genus **CERURA**.

Cerura, *Schrank*, *Fauna Boica*, ii, 2 Abth. p. 155 (1802).

Harpyia, *Ochs. Eur. Schmett.* iii, p. 19 (1810).

Type, *C. furcula*, *Schr.*, from Europe.

Range. N. America; Europe; China; throughout India and Ceylon.

Palpi slight and porrect; antennæ with the branches long and reaching the apex. Legs hairy. Fore wing broad; veins 6 and 10 given off from end of areole, which is short and formed by 9 anastomosing with 8. Hind wing with veins 6 and 7 stalked; 8 running close along 7 to near the end of the cell.

276. *Cerura liturata*, *Wlk. Cat.* v, p. 988; *Butl. Ill. Het.* vi, pl. 106, fig. 7; *C. & S.* no. 1127.

Cerura damodara, *Moore, P. Z. S.* 1865, p. 812; *C. & S.* no. 1123.

Harpyia kandyia, *Moore, Lep. Ceyl.* ii, p. 108, pl. 120, figs. 1, 1 a (larva and pupa); *C. & S.* no. 1126.

Harpyia wisei, *Swinh. Trans. Ent. Soc.* 1891, p. 139, pl. viii, fig. 3.

Pure white; palpi black; collar, tegulæ, and thorax spotted with black; abdomen either banded or almost completely suffused with black, leaving a white patch with a black semicircular mark on the last segment. Fore wing with two waved subbasal lines from the costa to median nervure, some black spots below the median nervure; a highly waved antemedial band; a waved medial line; a black line on discocellulars surrounded by a black ring-mark; three waved postmedial lines; the last with some black spots beyond it; a marginal and ciliary series of black spots. Hind wing more or less suffused with fuscous; two indistinct medial lines and a series of marginal black spots.

The palest and smallest form (♂ 46 millim.) is from Madras, in which all the black markings are slender; the hind wing pure white with small marginal black specks; *liturata* (62 millim.) has

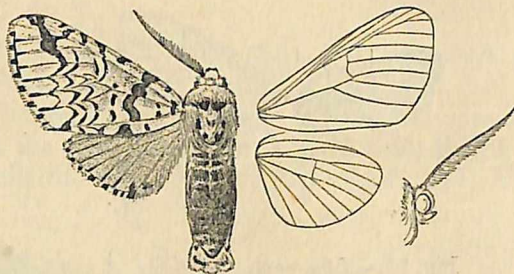


Fig. 94.—*Cerura liturata*, ♂. 1.

the black ring-mark round the discocellular line of the fore wing incomplete, the hind wing slightly suffused with fuscous, except at base; *wisei* (♀ 90 millim.) has the antemedial band of the fore wing wider, the ring round the discocellular line complete, the hind wing wholly, but slightly, suffused with black; *damodara* (70 millim.), from China and Bengal, has the abdomen almost wholly black, the black ring-mark of fore wing sometimes filled in with black; *kandyia*, from Ceylon (60 millim.), is again rather darker, the hind wing being blacker.

Hab. China; Sikhim; Assam; Bombay; Madras; Ceylon.
Exp., ♂ 46–70, ♀ 62–90 millim.

277. *Cerura prasana*, Moore, *P. Z. S.* 1865, p. 812; *C. & S.* no. 1125.

♂. Differs from *liturata* in the head, thorax, and abdomen being white, with hardly a trace of black markings; the terminal segments of abdomen black with a white anal tuft. Fore wing with pale centres to the ante- and postmedial bands, the latter interrupted at middle; some black strigæ from costa, and minute specks near base; the dentate lines absent.

Hab. N.E. Bengal. *Exp.* 40 millim.

Genus DAMATA.

Damata, Wlk. *Cut.* v, p. 1044 (1855).

Type, *D. longipennis*, Wlk.

Range. Sikhim; Nāga Hills; Cambodia.

Palpi porrect and hairy. Antennæ with the branches very long and ceasing abruptly one-fourth from apex. Fore wing long and narrow; vein 5 from just below the angle of cell; 6 and 10 from end of areole, which is formed by 9 anastomosing with 7 and 8. Hind wing with vein 5 from near upper angle of cell; 6 and 7 stalked; 8 running close along 7 to towards the end of cell.

278. *Damata longipennis*, *Wlk. Cat.* v, p. 1044; *Butl. Ill. Het.* vi, pl. 106, fig. 10; *C. & S.* no. 1179.

♂. Antennæ black; head and thorax dark chocolate; patagia white fringed with red; abdomen brown, with slight white lateral tufts. Wings white. Fore wing irrorated with black scales;

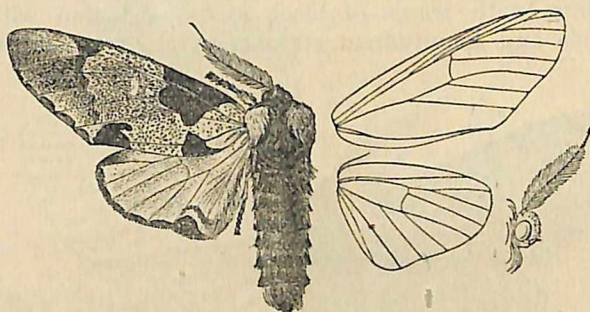


Fig. 95.—*Damata longipennis*, ♂. 1.

large triangular chocolate marks on costa and inner margin before and after the middle; a series of small marginal spots; cilia copper-coloured. Hind wing with a short brown line from the inner margin above the anal angle and patch at angle; the margin narrowly brown; cilia chequered copper and white.

Hab. Sikkim. *Exp.* 70 millim.

279. *Damata microsticta*, n. sp.

♂. Differs from *longipennis* in the thorax and patagia being grey. Fore wing more thickly irrorated with fuscous, so that it appears grey; the triangular marks much smaller and black; the spot towards outer angle absent; series of small black spots on the nervules beyond the cell, in interno-median interspace, and on vein 1; no marginal spots. Hind wing with a slight fuscous patch and streak at anal angle. Cilia of both wings chequered fuscous and white.

Hab. Nāga Hills, 6000 feet (*Doherty*); Cambodia. *Exp.* 56 millim. Type in coll. Elwes.

Genus DICRANURA.

Dicranura, *Boisd. Ind. Meth.* p. 54 (1829).

Type, *D. vinula*, *Linn.*, from Europe.

Range. Europe; Japan; China; N.W. Himalayas.

Palpi slight and porrect; antennæ with the branches long and slender and reaching the apex. Abdomen and legs hairy. Fore wing broad; vein 5 from just below upper angle of cell; 6 from end of areole, which is formed by 9 and 10 anastomosing with 7

and 8. Hind wing with veins 6 and 7 stalked; 8 running close along 7 to towards the end of cell.

280. *Dicranura himalayana*, Moore, *P. Z. S.* 1888, p. 400; *Butl. Ill. Het.* vii, pl. 125, fig. 3; *C. & S.* no. 1124.

Head, thorax, and abdomen covered with long brownish-grey hair; thorax with traces of black spots; abdomen with smoky black bands and longitudinal streaks on the terminal segments.

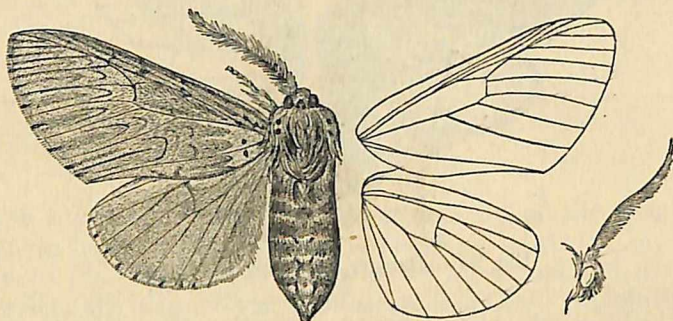


Fig. 96.—*Dicranura himalayana*, ♂. †.

Fore wing grey with a basal whitish patch; a black speck at base; a series of subbasal black spots; two highly dentate postmedial indistinct fuscous lines; a series of marginal spots. Hind wing paler fuscous grey, with a series of marginal spots.

One female has two prominent black streaks on the thorax; fore wing with prominent double black antemedial lines, and all the markings stronger. Closely allied to the European *erminea*, Esp.

Hab. Dharmasāla. *Exp.*, ♂ 60, ♀ 80 millim.

Genus **METASCHALIS**, nov.

Type, *M. disrupta*, Moore.

Range. Sikhim.

Palpi porrect, stout and thickly scaled. Antennæ bipectinate almost to tips in male, the branches short, the basal joint tufted. Fore wing rather long and narrow: vein 5 from just above centre of discocellulars; 6, 7, 8, 9, 10 stalked. Hind wing with veins 3 and 4 stalked, 5 from the centre of the discocellulars; 6 and 7 stalked; 8 running close along 7 at middle of cell.

281. *Metaschalis disrupta*, Moore, *Lep. Atk.* p. 62; *C. & S.* no. 1155.

♂. Palpi, antennæ, thorax, and abdomen red-brown; vertex of head and coxæ of fore legs creamy white; tarsi banded with white. Fore wing dark brown; the costa and area above vein 1 suffused with red-brown; a white spot followed by an orange spot in end

of cell; a black spot on discocellulars from which a golden-yellow streak proceeds to a large creamy white patch on outer margin below the apex. Hind wing pale fuscous.

Hab. Sikkim. *Exp.* 50 millim.

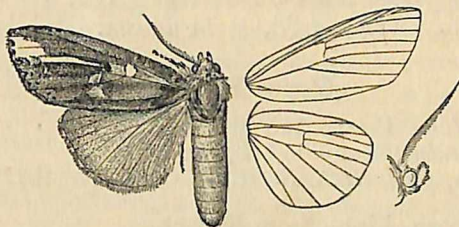


Fig. 97.—*Metaschalis disrupta*, ♂. 1.

Genus **CHADISRA.**

Chadisra, *Wlk. Trans. Ent. Soc. ser. 3, i, 1862, p. 81.*

Type. *C. bipars*, Wlk.

Range. Ceylon; Borneo.

Palpi upturned in male, reaching vertex of head, the first two joints fringed with hair, the third short; slight and porrect in female. Antennæ fasciculate in male, ciliate in female. Fore wing rather narrow, the apex rounded; vein 6 given off beyond the angle of cell; 9 anastomosing with 8 to form the areole, which is long. Hind wing with veins 6 and 7 stalked; 8 running close along 7 to towards the end of the cell.

282. **Chadisra bipars**, *Wlk. Trans. Ent. Soc. ser. 3, i, 1862, p. 82; C. & S. no. 1138.*

Pheosia basalis, *Moore, Lep. Ceyl. ii, p. 113, pl. 121, figs. 1, 1 a (larva and pupa); C. & S. no. 1206.*

♂. Head, thorax, and abdomen red-brown. Fore wing with the basal area red-brown with fine pale streaks; a black medial

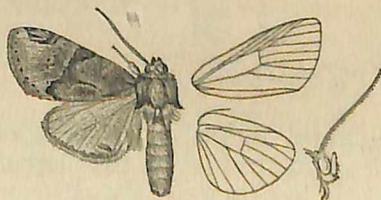


Fig. 98.—*Chadisra bipars*, ♂. 1.

line bent inwards at vein 2; two waved postmedial lines, with brown patches between them at costa and inner margin, and with black dentate marks on them; a submarginal series of specks. Hind wing pale fuscous, the margin darker; a pale streak at anal angle; cilia whitish towards apex.

♀. Head, thorax, and base of fore wing ochreous white; the markings of the fore wing more distinct.

Larva greenish white above, green below; pale green oblique lateral lines; a grey-bordered yellow dorsal line with a red tubercle on 11th somite; head black-lined; legs green.

Hab. Ceylon. *Exp.*, ♂ 38, ♀ 44 millim.

Genus **PHEOSIA.**

Pheosia, *Hübner. Verz.* p. 145 (1816).

Hoplitis, *Hübner. Verz.* p. 147 (1816).

Hupodonta, *Butl. A. M. N. H.* (4) xx, p. 475 (1877).

Type, *P. dictæa*, Linn., from Europe.

Range. Europe; Japan; and throughout India.

Palpi slight and porrect. Fore wing rather long and narrow; vein 5 given off just below the angle of the cell; 6, 7, 8, 9, 10 stalked, or 10 from cell; no areole. Hind wing with veins 6 and 7 stalked; 8 running close along 7 before the end of the cell.

SECT. I. Antennæ of male with short stiff branches; the terminal one-fourth filiform.

283. *Pheosia fasciata*, *Moore, P. Z. S.* 1888, p. 401; *Butl. Ill. Het.* vii, pl. 125, figs. 9, 10; *C. & S.* no. 1207 A.

Head and thorax grey, with a few red-brown hairs; abdomen grey. Fore wing whitish ochreous, suffused in parts with pale

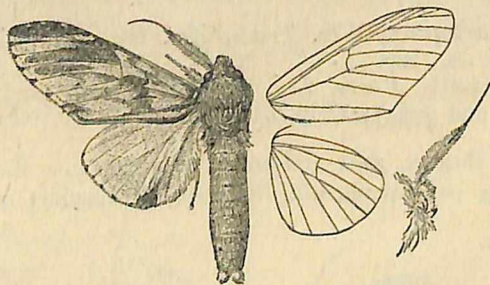


Fig. 99.—*Pheosia fasciata*, ♂. 1.

brown; some red-brown strigæ and streaks on and below the costa; a series of short streaks on the nervules towards outer margin; inner margin red-brown; cilia chequered pale and red-brown. Hind wing ochreous white; the outer margin slightly clouded with brown, especially at anal angle.

Larva pale green; head streaked with dark red, a series of dorsal quadrate red marks largest from 7th to anal somite; the 4th to anal somites in some specimens wholly striated with red-brown; a long dorsal process on 4th somite.

Hab. Dharmasala, Sikhim. *Exp.*, ♂ 42, ♀ 50 millim.



284. *Pheosia pulcherrima*, Moore, *P. Z. S.* 1865, p. 814, pl. 43, fig. 4; *C. & S.* no. 1160.

Hupodonta corticalis, Butl. *A. M. N. H.* (4) xx, 1877, p. 475.

Head and collar red-brown; thorax and abdomen reddish ochreous. Fore wing pale brown, suffused in parts with red-brown and fuscous, the inner area ochreous except at outer angle; a large medial patch of fuscous suffusion from costa to vein 2; three indistinct dentate postmedial curved lines; a red-brown line, followed by an ochreous line, and a dark grey band with a black line on it on outer margin. Hind wing fuscous; an ochreous patch with dark and red-brown lines on it at anal angle. Under-side fuscous; hind wing with a postmedial curved line.

Hab. Japan; Sikhim. *Exp.*, ♂ 56, ♀ 64 millim.

285. *Pheosia excurvata*, n. sp.

♂. Head and thorax grizzled brown and grey; abdomen pale fuscous. Fore wing pale brown, with a slight vinous tinge and fuscous suffusion; a black streak along median nervure from the base; an indistinct waved antemedial line; black streaks in the end of cell and on the nervules beyond it; two postmedial lines very highly excurved below the costa, the inner line indistinct. Hind wing pale fuscous; cilia of both wings chequered pale and dark.

Hab. Sikhim. *Exp.* 50 millim. Type in coll. Knyvett.

286. *Pheosia grisea*, Swinh. *Cat. Het. Mus. Oxon.* ined.

♂. Head, thorax, and abdomen brownish grey. Fore wing with an indistinct dark subbasal line; a spot on the costa before the middle; medial and postmedial lines, the latter bent inwards at vein 3; two curved oblique submarginal lines, far apart at costa, approaching each other towards inner margin. Hind wing white, with a brownish-grey patch at anal angle.

Hab. "N. India." *Exp.* 48 millim.

287. *Pheosia strigata*, Moore, *Lep. Atk.* p. 68, pl. iii, fig. 13; *C. & S.* no. 1204.

Head and thorax grey; frons and a streak on vertex of thorax blackish; antennæ fulvous. Fore wing longitudinally marked pale and dark chestnut-brown; a basal grey patch; short costal grey streaks before the apex, with a dark curved fascia from them to the apex; a waved marginal brown line. Hind wing white; the costa brownish; a large black spot speckled with grey on outer margin near anal angle.

Hab. N.E. Bengal; Canara. *Exp.*, ♂ 66, ♀ 76 millim.

SECT. II. Antennæ of male ciliated.

88. **Pheosia sikkima**, *Moore, Lep. Atk.* p. 69; *C. & S.* no. 1208.

♂. Head black; collar grey; thorax and abdomen red-brown. Fore wing very dark red-brown; a large pale red-brown patch from middle of costa to apex; inner margin pale red-brown; indistinct dark lines across end of cell and on discocellulars. Hind wing uniform fuscous.

Hab. Sikkim. *Exp.* 56 millim.

Genus **NOTODONTA**.

Notodonta, *Ochs. Eur. Schmett.* iii, p. 45 (1810).

Peridea, *Steph. Ill. Brit. Ent., Haust.* ii, p. 32 (1829).

Type, *N. dromedarius*, Linn., from Europe.

Range. Europe; Himalayas; Nāga Hills.

Differs from *Pheosia* in the branches of the antennæ of the male being longer, and in the fore wing having a prominent tuft of scales on inner margin.

289. **Notodonta albifascia**, *Moore, Lep. Atk.* p. 69; *C. & S.* no. 1205.

♂. Head and thorax red-brown; patagia and metathorax fringed with dark scales; abdomen pale red-brown. Fore wing with a broad whitish fascia from base to near apex, leaving the

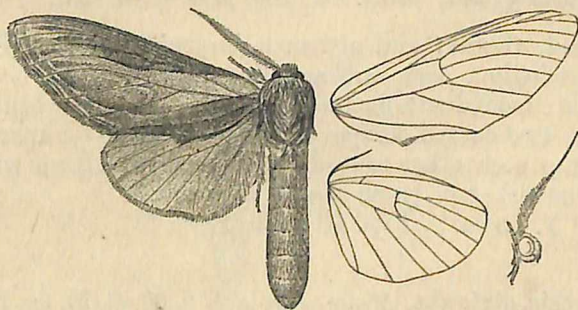


Fig. 100.—*Notodonta albifascia*, ♂. $\frac{1}{4}$.

costal, inner, and outer areas pale red-brown; veins 5 and 6 streaked with black at their origins; an indistinct pale submarginal line; the tuft of scales dark. Hind wing pale with a reddish tinge.

Hab. Sikkim. *Exp.* 70 millim.

290. **Notodonta gigantea**, *Elwes, P. Z. S.* 1890, p. 399.

♀. Head, thorax, and abdomen pale brown; basal segments of abdomen fuscous above; all the segments with paired lateral ochreous tufts. Fore wing red-brown; the medial costal area



suffused with grey; some dark red-brown irregular marks on basal area; reniform pale, with a red-brown streak on the discocellulars; a highly dentate double postmedial line; a series of indistinct lunulate submarginal marks; a marginal dark line; the tuft of scales dark with a black line above it. Hind wing yellow; the veins black.

Hab. Kulu; Sikhim. *Exp.* 126 millim.

291. *Notodonta moorei*.

Notodonta sikhima, *Moore, Lep. Atk.* p. 68 (nom. præocc.); *C. & S.* no. 1192.

Head and collar grey, the latter fringed with brown; patagia black; thorax and abdomen pale brown. Fore wing grey; basal area dark brown, with a double subbasal waved line, and bounded by a double waved line; a white blotch on the discocellulars and speck at origin of vein 2; three dark postmedial blotches on costa, between veins 4 and 5, and on inner margin, with traces of a waved line before them; a marginal series of dark spots; the tuft of scales dark brown. Hind wing grey; a fuscous post-medial slightly irregular band, with a waved line before it.

Hab. Sikhim. *Exp.*, ♂ 70, ♀ 92 millim.

92. *Notodonta sikkima*, *Moore, P. Z. S.* 1865, p. 812; *C. & S.* no. 1174.

Heterocampa irrorata, *Moore, Lep. Atk.* p. 60; *C. & S.* no. 1170.

Head, thorax, and fore wing uniformly clothed with light and dark brown, greenish-yellow, and white scales. Fore wing with the veins slightly streaked with black. Abdomen and hind wing pale red-brown; the former darker at extremity.

The form *irrorata* is paler.

Hab. Sikhim. *Exp.*, ♂ 60, ♀ 48–56 millim.

293. *Notodonta rufa*, n. sp.

♀. Head and thorax dark red-brown, the collar grizzled; abdomen fuscous. Fore wing dark brown; indistinct ante- and post-medial waved dark lines; the latter edged with grey at costa; two dark specks on discocellulars; irregularly placed dark streaks in the marginal interspaces, slight pale streaks from base below median nervure and on inner margin. Hind wing fuscous, with traces of a medial line.

Hab. Nāga Hills (*Doherty*). *Exp.* 54 millim. Type in coll. Elwes.

Genus **HYPERÆSCHRA**.

Hyperæschra, *Butl. A. M. N. H.* (5) vi, p. 65 (1830).

Type, *H. pallida*, *Butl.*

Range. Kangra; Sikhim; Ceylon; Singapore.

Palpi upturned, fringed with hairs in front; antennæ with

short stiff branches reaching the apex in male. Fore wing rather long, the outer margin evenly curved, a tuft of scales on inner margin; vein 6 from angle of cell; 9 and 10 anastomosing with 8 to form the areole. Hind wing with veins 6 and 7 stalked; 8 running close along 7 to towards the end of cell.

SECT. I. Female with antennæ pectinate.

294. **Hyperæschra pallida**, *Butl. A. M. N. H.* (5) vi, 1880, p. 65; *Ill. Het.* vi, pl. 104, fig. 6; *C. & S.* no. 1530.

♀. Head and thorax brown and grey. Fore wing grey suffused with brown, especially along inner margin, beyond the lower angle of cell, and at apex; a black streak from the base below median nervure; a short streak in the cell above the origin of vein 2, one beyond the cell between veins 3 and 4, and two subapical streaks; a waved postmedial dark line. Hind wing pale brown.

Hab. Sikkim; Singapore. *Exp.* 54 millim.

SECT. II. Female with antennæ ciliate.

295. **Hyperæschra basistriga**, *Moore, P. Z. S.* 1888, p. 400; *Butl. Ill. Het.* vii, pl. 125, figs. 5 & 6; *C. & S.* no. 1168 A.

♂. Differs from *pallida* in being darker; the dark streak from the base of the fore wing shorter and broader; the paired ante- and postmedial waved lines more distinct, as also is the submarginal series of lunules; no black streak in the cell above vein 2; a black streak on the discocellulars. Hind wing white.

♀. Hind wing pale fuscous.

Hab. Kangra; Dharmasāla. *Exp.*, ♂ 52, ♀ 56 millim.

296. **Hyperæschra tenebrosa**, *Moore, P. Z. S.* 1865, p. 815; *C. & S.* no. 1524.

♂. Dark brown: fore wing with a pale fascia on inner area, extending and narrowing along the outer margin to the apex; a large pale patch on the apical portion of the costa; indistinct dentate postmedial and submarginal lines. Hind wing duller brown.

Hab. Sikkim. *Exp.* 58 millim.

297. **Hyperæschra basalis**, *Moore, P. Z. S.* 1865, p. 813; *C. & S.* no. 1190.

Head, thorax, and the basal two thirds of fore wing dark purplish red-brown, the vertex of thorax and base of fore wing paler, the latter with pale streaks; outer area of fore wing greenish grey;

dark postmedial spot on the costa; a series of postmedial dark

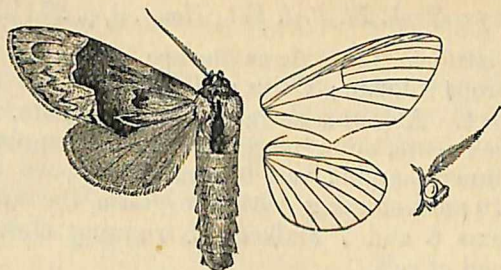


Fig. 101.—*Hyperæschra basalis*, ♂. †.

specks; a broken waved submarginal line; a series of marginal specks. Abdomen and hind wing fuscous.

Hab. Sikhim. *Exp.* 50 millim.

298. ***Hyperæschra nigribasis*, n. sp.**

♂. Head and thorax smoky black; abdomen fuscous. Fore wing with the base black as far as the antemedial curved double line, the area beyond which is fuscous; a black spot at end of cell; reniform pale and elongate; an indistinct double postmedial waved line; a dentate submarginal indistinct line from below the apex, the area beyond it with an olive tinge; the costa towards apex, interspace between veins 4 and 5, and area near outer angle also with an olive tinge. Hind wing fuscous, with traces of a pale medial line.

Hab. Sikhim. *Exp.* 54 millim. Type in coll. Knyvett.

299. ***Hyperæschra dentata*, Hmps. Ill. Het. ix, ined., pl. 160, fig. 11.**

♀. Head and thorax brownish grey with brown markings. Fore wing brownish grey suffused with brown; some dark streaks along the veins at base; a waved antemedial line, highly dentate towards inner margin; a dark streak on the discocellulars; dentate postmedial and submarginal lines; a waved marginal line; abdomen and hind wing grey-brown.

Hab. Trincomali, Ceylon. *Exp.* 56 millim.

*300. ? ***Hyperæschra variegata*, Moore, Lep. Atk. p. 61; C. & S. no. 1175.**

♂. Head and collar olive-green; thorax and abdomen grey-brown. Fore wing purplish brown, suffused with yellow near base; a pale patch at end of cell; a yellow patch on costa before apex; a marginal yellow band. Hind wing brown, the area in the cell paler; a submarginal dark line and yellow patch at anal angle.

Hab. Sikhim. *Exp.* 58 millim.

Genus **LOPHOPTERYX.**

Lophopteryx, Steph. Ill. Brit. Ent., Haust. ii, p. 26 (1829).

Type, *L. camelaria*, Linn., from Europe.

Range. Europe; Japan; China; Sikhim.

Palpi porrect. Antennæ serrate and fasciculate. Fore wing broad, the apex acute, outer margin crenulate, a pronounced tuft of scales on inner margin; vein 6 from just above the angle of cell; 9 and 10 anastomosing with 8 to form the areole. Hind wing with veins 6 and 7 stalked; 8 running close along 7 to towards the end of cell.

SECT. I. Fore wing with inner margin nearly straight beyond the lobe.

301. ***Lophopteryx saturata***, Wlk. Cat. xxxii, p. 415; Butl. Ill. Het. vi, pl. 107, fig. 1.

♂. Head, thorax, and abdomen dark red-brown; an indistinct waved subbasal line; paired dentate oblique ante- and postmedial lines; the reniform spot pale; cilia rufous at outer angle. Hind wing fuscous; a patch at anal angle composed of short rufous,

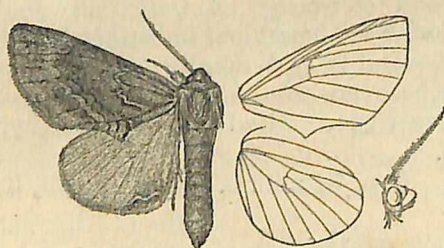


Fig. 102.—*Lophopteryx saturata*, ♂. †.

pale and dark brown bands suffused with grey; underside with some pale strigæ on the costa before apex.

Hab. Sikhim. Exp., ♂ 42, ♀ 60 millim.

302. ***Lophopteryx atrofusa***, n. sp.

♂. Differs from *saturata* in being much darker; the thorax and fore wing suffused with black-brown and irrorated with bluish-grey scales, the latter without markings, except for traces of a postmedial line appearing as two pale dentitions below the costa. Hind wing with one whitish line above the anal grey patch.

Hab. Sikhim (Möller). Exp. 37–44 millim. Type in coll. Elwes.

303. *Lophopteryx flavistigma*, Moore, *Lep. Atk.* p. 67; C. & S. no. 1163.

♂. Differs from *saturata* in the fore wing being without the subbasal waved lines; the ante- and postmedial lines single, dentate and curved, instead of waved and oblique. Hind wing with the patch and streak at anal angle sometimes minute. Underside with pale marks on the costa towards apices of fore and hind wings.

Hab. Sikkim. *Exp.* 44 millim.

SECT. II. Fore wing with the inner margin slightly excised beyond the lobe.

304. *Lophopteryx ferruginosa*, Moore, *Lep. Atk.* p. 67; *Waterh. Aid.* ii, pl. 132, fig. 5; C. & S. no. 1162.

♂. Differs from *flavistigma* in the markings of the fore wing being obscured by fuscous suffusion; the antemedial dentate line oblique; the reniform hardly visible; the postmedial line more recurved. Hind wing fuscous, without anal patch or streak. Underside of hind wing with a spot on the discocellulars and curved postmedial line.

Hab. Murree; Sikkim; Naga Hills. *Exp.* 38–46 millim.

Genus **MEGACERAMIS**, nov.

Type, *M. lamprolepis*, Hmps.

Range. Sikkim.

Palpi small and porrect. Antennæ fasciculate in the male. Head, thorax, and patagia very thickly scaled. Fore wing with vein 6 from angle of cell; 9 and 10 anastomosing with 8 to form the areole, which is short. Hind wing with veins 3 and 4 stalked, 5 from the middle of the discocellulars; 6 and 7 stalked; 8 running close along 7 at middle of cell.

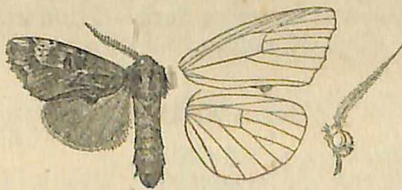


Fig. 103.—*Megaceramis lamprolepis*, ♂. 1.

305. *Megaceramis lamprolepis*, n. sp.

♂. Head, thorax, and abdomen red-brown; patagia very dark red-brown, fringed with glittering scales. Fore wing bright red-

brown, suffused in parts with purplish and irrorated with a few white scales; some ochreous streaks towards the apex; a medial series of dark specks joined by a curved postmedial series on inner margin; a dark streak on discocellulars; the tuft composed of glittering dark scales. Hind wing fuscous. Underside of both wings with a waved postmedial line.

Hab. Sikkim (*Elwes*). *Exp.* 36 millim. Type in coll. *Elwes*.

Genus **APELA**.

Apela, *Walk. Cat.* v, p. 1092 (1855).

Type, *A. divisa*, *Wlk.*

Range. Nepal.

Palpi upturned and slender; antennæ ciliate in female. Fore wing very broad, the costa arched, the apex acute; the inner margin with a dentate lobe, and a tuft of scales on it beyond which the margin is excised; a tuft of scales at outer angle; vein 5 from near angle of cell; 7 and 10 from end of the long areole, which is formed by 9 anastomosing with 8. Hind wing with veins 6 and 7 stalked; a bar between veins 7 and 8.

306. *Apela divisa*, *Walk. Cat.* v, p. 1093; *C. & S.* no. 1181.

♀. Ochreous brown. Fore wing with two very indistinct ante-

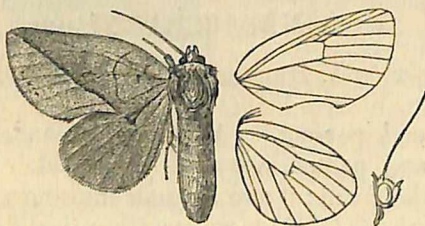


Fig. 104.—*Apela divisa*, ♀. 1.

medial curved lines; an oblique line from the apex to the lobe on inner margin; the tuft of scales dark. Hind wing fuscous brown.

Hab. Nepal. *Exp.* 46 millim.

Genus **SPATALIA**.

Spatalia, *Hübner. Verz.* p. 145 (1816).

Rosama, *Wlk. Cat.* v, p. 1066 (1855).

Caschara, *Wlk. Journ. Linn. Soc.* vi, p. 133 (1862).

Allata, *Wlk. Journ. Linn. Soc.* vi, p. 140 (1862).

Celeia, *Wlk. Cat.* xxxii, p. 463 (1864).

Type, *S. argentina*, *Schiff.*, from Europe.

Range. Europe; Japan; China; Himalayas; Canara; Nilgiris; Borneo; Java.

Palpi porrect and hairy; abdomen with lateral tufts of hair and two large terminal tufts. Fore wing with the inner margin more or less lobed and excised; a large tuft of scales on the lobe, and a tuft at outer angle; vein 6 from the angle of cell; 9 and 10 anastomosing with 8 to form the areole. Hind wing with veins 6 and 7 on a short stalk; 8 running close along 7 to towards the end of cell.

SECT. I (*Spatalia*). Antennæ of male with the branches short and stiff.

307. *Spatalia argentifera*, Wlk. Journ. Linn. Soc. vi, p. 140.

Celeia plusiata, Wlk. Cat. xxxii, p. 463; C. & S. no. 1156.

Celeia sikkima, Moore, Lep. Atk. p. 63; C. & S. no. 1157.

♂. Head, thorax, and abdomen pale and dark brown. Fore wing pale brown, with some dark and red-brown suffusion below

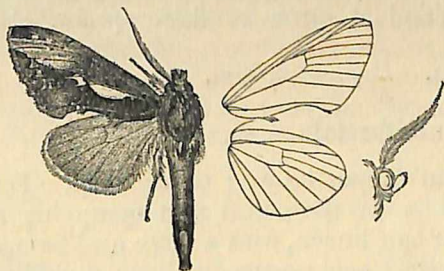


Fig. 105.—*Spatalia argentifera*, ♂. †.

the median nervure near the base; a silver streak along the median nervure from below the middle of the cell to lower angle, with a spot beyond it, and sending spurs outwards along veins 2 and 3, which may be separated into spots; some dark brown suffusion at apex and middle of outer margin; an ill-defined dark or red-brown submarginal line. Hind wing fuscous.

Some specimens have the head, thorax, and fore wing very much darker.

In the form *argentifera* = *plusiata* from Canara and Borneo the silver streak is broad; *sikkima* is darker, with the streak narrow.

Hab. Sikkim; Canara; Bangalore; Borneo. *Exp.* 50–54 millim.

308. *Spatalia gemmifera*, Moore, Lep. Atk. p. 62, pl. iii, fig. 14; C. & S. no. 1203.

♂. Head and thorax chestnut-brown; abdomen pale sienna-brown; a small silvery white spot below the base of the cell and a large triangular spot at origin of vein 2; a dark brown streak from the lower angle of cell to outer margin below apex; some black dots near apex; a submarginal series of pale spots; the tuft on inner margin black. Hind wing pale sienna-brown.

Hab. Sikkim. *Exp.* 50 millim.

Palpi porrect and slightly scaled. Antennæ with the branches rather short and reaching the apex. Fore wing short and broad;

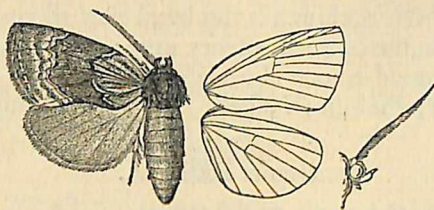


Fig. 107.—*Cleapa latifascia*, ♀. 1.

vein 6 from angle of cell, 9 and 10 anastomosing with 8 to form a long areole. Hind wing with veins 6 and 7 stalked; 8 running close along 7 to towards the end of the cell.

315. *Cleapa latifascia*, *Wlk. Cat.* v, p. 1037; *C. & S.* no. 1176.

♀. Head and thorax dark brown. Fore wing dark brown, with some pale red-brown on inner basal and outer areas; two dark streaks in the cell; a double antemedial indistinct waved line; a similar but curved postmedial line, with a black spot beyond it on inner margin; traces of a pale waved submarginal line. Abdomen and hind wing fuscous.

Hab. Moulmein; Rangoon. *Exp.* 42 millim.

Genus **ICHTHYURA.**

Ichthyura, *Hübner. Verz.* p. 162 (1816).

Gaugamela, *Wlk. Journ. Linn. Soc.* vi, p. 138 (1862).

Uxela, *Wlk. Cat.* xxxv, p. 1982 (1866).

Type, *I. anastomosis*, Linn., from Europe.

Range. N. America; Europe; Japan; China; throughout India and Ceylon, Borneo, Java.

Palpi porrect and slender. Antennæ with the branches long and reaching the apex. Fore wing rather narrow; vein 5 from near upper angle of cell; 6, 7, 8, 9, 10 stalked; no areole. Hind wing with vein 5 absent; 6 and 7 on a short stalk; 8 running close along 7 to towards the end of cell. Fore leg with the tarsal joints very short, broad, and thickly fringed with hair.

316. *Ichthyura anachoreta*, *Fabr. Mant. Ins.* ii, p. 120.

Ichthyura fulgurita, *Wlk. Cat.* xxxii, p. 433; *C. & S.* no. 1195.

Ichthyura javana, *Moore, Lep. E.I.C.* p. 352, pl. xvi, figs. 7, 7a (larva).

Nerice pallida, *Wlk. Cat.* v, p. 1077; *C. & S.* no. 1180.

Head, thorax, and abdomen grey-brown; palpi fringed with dark brown; frons dark brown, a dark streak from the vertex of head to vertex of thorax. Fore wing grey-brown; two pale

oblique antemedial lines, the outer bent outwards near inner margin; a slightly curved postmedial line; the whole apical area beyond the cell dark grey-brown down to vein 3, with an irregular

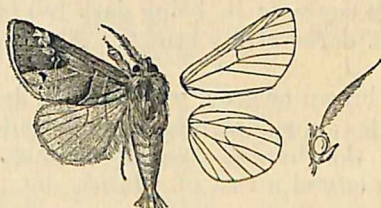


Fig. 108.—*Ichthyura anachoreta*, ♂. 1.

series of postmedial white spots on it from the costa to vein 3, and some red suffusion beyond them; an indistinct series of submarginal black spots, the one between veins 2 and 3 prominent and placed further from the margin. Hind wing pale fuscous.

The Indian form *fulgurita* (♂ 34, ♀ 45 millim.) generally has some black suffusion beyond the outer antemedial line near the inner margin, this being wanting in the European, Japanese, and Chinese typical form; the form *javana* (♂ 26, ♀ 32 millim.; types bred) is smaller and paler; *pallida* (♀ 54 millim.) is a large pale form from Nepal.

Larva pale brown, covered sparsely with short pale hair; a dorsal hump on 4th somite, with paired white spots on each side of it; an indistinct dark dorsal line; lateral area streaked with dark brown.

Hab. Europe; Japan; China; throughout India and Ceylon; Java. *Exp.* 26–54 millim.

317. *Ichthyura costicomma*, n. sp.

Differs from *anachoreta* in wanting the dark streak on head and thorax. Fore wing with an oblique line in addition to the two antemedial lines from the costa before the middle to inner margin at the postmedial line, beyond which the area is bright red-brown suffused with dark brown, except near inner margin beyond the postmedial line; three regularly-disposed postmedial white spots below the costa; a well-defined submarginal waved dark line.

Hab. Canara; Nilgiris. *Exp.*, ♂ 28, ♀ 32 millim. Type ♂ in Mus. Oxon., ♀ in B.M.

318. *Ichthyura cupreata*, Butl. P. Z. S. 1886, p. 387.

♀. Head, thorax, and fore wing pale reddish brown. Fore wing with two pale oblique antemedial lines, the first angled at median nervure, the second curved to near inner margin; a medial outwardly-curved line joining a straight postmedial line at inner margin; reniform filled in with fuscous; an indistinct lunulate submarginal line. Abdomen and hind wing paler.

Hab. Campbellpur, Punjab. *Exp.* 30 millim.



319. *Ichthyura restituta*, *Wlk. Cat.* xxxii, p. 433; *Moore, Lep. Ceyl.* ii, pl. 122, figs. 1, 1 a, b (larva and pupa); *C. & S.* no. 1197.
Ichthyura indica, *Moore, P. Z. S.* 1865, p. 813; *C. & S.* no. 1196.

♂. Differs from *cupreata* in being dark red-brown; the vertex of head and thorax dark velvety brown. Abdomen and hind wing dark brown.

Larva purplish brown or grey, with pinkish dorsal tubercles on 4th and 11th somites; a sublateral series of small tubercles; slight lateral dark lines; the thoracic somites each with a white black-centred spot; two lateral series of whitish dots and some dorsal ones.

Hab. Bengal; S. India; Ceylon. *Exp.* 26–34 millim.

320. *Ichthyura undulata*, *Hmps. Ill. Het.* viii, p. 60, pl. 141, fig. 3.

♀. Pale olive-brown. Fore wing with some dark suffusion above centre of inner margin and below apex; the two antemedial lines dentate, the outer line oblique and angled near inner margin; the postmedial waved and curved; the dark waved submarginal line well defined. Abdomen and hind wing rather paler, the latter with an indistinct curved postmedial line with a pale spot on it at inner margin.

The race from the N.W. Himalayas differs from the typical Nilgiri form in the male having the thorax and fore wing ferruginous, the latter with the two inner and outer lunulate lines grey with dark edges and a black speck at the end of the cell; hind wing with the postmedial line and white spot more distinct. The female is darker; fore wing with the space between the inner lines and also the outer area suffused with dark grey.

Hab. N.W. Himalayas; Nilgiris, N. slopes, 3500 ft. *Exp.* 30 millim.

- *321. *Ichthyura ferruginea*, *Moore, P. Z. S.* 1865, p. 813; *C. & S.* no. 1194.

♀. Pale red-brown. Head and vertex of thorax dark brown. Fore wing with slightly curved subbasal and straight ante- and postmedial lines, with a short oblique line between them above inner margin; two dark marks at end of cell; two indistinct series of submarginal spots.

Hab. N.E. Bengal. *Exp.* 40 millim.

Genus CYPHANTA.

Cyphanta, *Wlk. Cat.* xxxiii, p. 855 (1865).

Type, *C. xanthoclora*, *Wlk.*

Range. Sikhim.

Palpi upturned reaching above vertex of head, the first two joints fringed with hair, the third naked. Antennæ simple. Legs hairy;

mid tibiae with one pair of spurs, hind tibiae with two pairs. Fore wing with a tuft of scales at centre of inner margin; the apex produced and acute; veins 4 and 5 from angle of cell, 6 from upper angle; 7, 8, 9, 10 stalked. Hind wing with veins 3 and 4 from angle of cell; 5 from centre of discocellulars; 6 and 7 stalked; 8 running close along 7 to middle of cell.

322. *Cyphanta xanthochlora*, *Wlk. Cat.* xxxiii, p. 856; *Butl. Ill. Het.* vi, pl. 107, fig. 3; *C. & S.* no. 1229.

Head pale brown; palpi orange; collar bright green; thorax chocolate-brown. Abdomen orange. Fore wing bright green; an

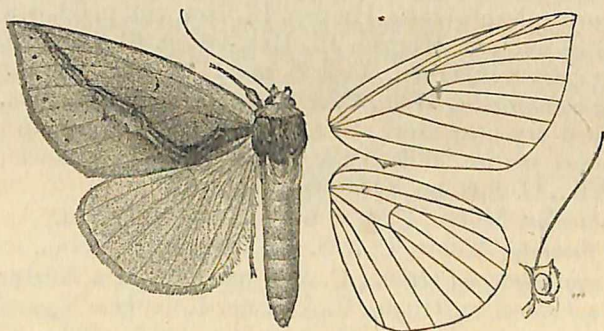


Fig. 109.—*Cyphanta xanthochlora*, ♂. †.

oblique band composed of a purplish ground with three red-brown lines on it from the costa near apex to inner margin at middle, then bent inwards to the base above inner margin; a brown speck on median nervure, one at end of cell, and a submarginal series. Hind wing orange, some specimens with submarginal fuscous streaks on the veins. Underside orange; both wings with fuscous cell-spots and postmedial lines.

Hab. Sikkim. *Exp.*, ♂ 70, ♀ 76 millim.

323. *Cyphanta chortochlora*, n. sp.

♂. Head and palpi dark brown above, pale below; prothorax grass-green, meso- and metathorax dark brown; abdomen ochreous suffused with fuscous. Fore wing grass-green; a brown mark enclosing a green spot on inner basal area; a black speck at end of cell; some small obliquely placed postmedial pale spots edged with brown. Hind wing ochreous, the outer area suffused with fuscous. Underside ochreous, each wing with a cell-spot and dark postmedial line, which is obsolescent on fore wing, curved on hind wing.

Hab. "Himalayas." *Exp.* 56 millim. Type in coll. Moore.

Species formerly recorded as Indian which are omitted.

- Arunda opponens*, Wlk., C. & S. no. 1116. Type lost, description unrecognizable.
- Sybrida inordinata*, Wlk., C. & S. no. 1114, is a Pyrale.
- Paravetta discinota*, Moore, C. & S. no. 1158, is a Pyrale.
- Paravetta sikkima*, Moore, C. & S. no. 1159, is a Pyrale.
- Cetola dentata*, Wlk., C. & S. no. 1166 = *Ramesa ligniferata*, Wlk., C. & S. no. 1526, is a Noctua.
- Tricæna denticulata*, Moore, Butl. Ill. Het. vii, p. 45, is a Noctua.
- Hyboma divisa*, Moore, Butl. Ill. Het. vii, p. 45, is a Noctua.
- Hyboma umbrifera*, Butl. Ill. Het. vii, p. 46, is a Noctua.
- Euscotia inextricata*, Moore, Butl. Ill. Het. vii, p. 47, is a Noctua.
- Ichthyura submarginalis*, Hmps. Ill. Het. viii, p. 60, is a Noctua.
- Ingura cornucopia*, Hmps. Ill. Het. viii, p. 61, is a Noctua.
- Ingura cristatrix*, Guen., C. & S. no. 1198, is a Noctua.
- Ingura subapicalis*, Wlk., C. & S. no. 1199, is a Noctua.
- Ichthyura argentea*, Butl., C. & S. no. 1193, is a Tinea.
- Thyacidia postica*, Wlk., C. & S. no. 1060 = *Drymonia denotata*, Wlk., C. & S. no. 1165, is a Noctua.
- Calpe bicolor*, Moore, C. & S. no. 1218, is a Noctua.
- Calpe fasciata*, Moore, C. & S. no. 1219, is a Noctua.
- Calpe minuticornis*, Guen., C. & S. no. 1220, is a Noctua.
- Calpe ophideroides*, Guen., C. & S. no. 1221, is a Noctua.
- Dabarita icterica*, Swinh., C. & S. no. 1117 = *Calpe bifasciata*, Hmps. Ill. Het. viii, p. 61, is a Noctua.
- Calpe orthograpta*, Butl., C. & S. no. 1222, is a Noctua.
- Gadera incitans*, Wlk., C. & S. no. 1223, is a Noctua.
- Oræsia argyrosigna*, Moore, C. & S. no. 1224, is a Noctua.
- Oræsia emarginata*, Fabr., C. & S. no. 1225, is a Noctua.
- Oræsia provocans*, Wlk., C. & S. no. 1226, is a Noctua.
- Oræsia rectistria*, Guen., C. & S. no. 1227, is a Noctua.
- Oræsia vagabunda*, Swinh., C. & S. no. 1228, is a Noctua.
- Arsacia frontirufa*, Swinh., C. & S. no. 1230, is a Noctua.
- Arsacia saturalis*, Wlk., C. & S. no. 1231, is a Noctua.
- Callænia elongata*, Butl., C. & S. no. 1528, is a Noctua.
- Callænia pullata*, Moore, C. & S. no. 1529, is a Noctua.
- Notodonta ejecta*, Wlk., C. & S. no. 1191. Type lost, description unrecognizable.
- Elydna transversa*, Wlk., C. & S. no. 1122, is a Noctua.
- Hyperæschra annulata*, Swinh. Trans. Ent. Soc. 1890, p. 189, is a Noctua.
- Sphetta moorei*, Swinh., C. & S. no. 1141, is a Noctua.
- Sphetta biocellata*, Moore, C. & S. no. 1140, is a Noctua.
- Sphetta apicalis*, Wlk., C. & S. no. 1139, is a Noctua.
- Danaka pyraliformis*, Moore, C. & S. no. 1210, is a Pyrale.
- Culasta indecisa*, Moore, C. & S. no. 1232, is a Noctua.
- Oxicesta marmorea*, Moore, C. & S. no. 1214, is a Noctua.
- Gluphisia sinuata*, Moore, C. & S. no. 1178, is a Noctua.

Ptilophora kashghara, Moore, C. & S. no. 1200, is from Turkestan.

Moma champa, Moore, C. & S. no. 1213, is a Noctua.

Family CYMATOPHORIDÆ.

A family of moths resembling the *Noctuidæ* in appearance. Proboscis present. Antennæ usually rather thickened and flattened. Mid tibia with one pair of spurs, hind tibia with two pairs. Fore wing with vein 1 *a* short and slight, not forming a fork with 1 *b*; 1 *c* absent; 5 from the centre of the discocellulars; veins 7 and 8 stalked, and 9 and 10 stalked and almost or quite anastomosing with 7 and 8 to form an areole. Hind wing with two internal



Fig. 110.—Larva of *Thyatira batis*. ♂. (From Buckler, Larvæ Brit. Butt. Moths, pl. liv, fig. 2.)

veins; vein 5 from the centre of discocellulars, or generally from below the centre; veins 6 and 7 given off not far from the base; 8 bent down and quite or almost touching 7 after the bifurcation.

Larva: Noctuaform, with five pairs of prolegs*.

Key to the Genera.

- | | |
|--|--------------------------|
| a. Fore wing with a tuft of scales at outer angle. | 1. HABROSYNE, p. 178. |
| b. Fore wing with no tuft of scales at outer angle. | |
| a'. Fore wing with vein 6 from angle of cell. | |
| a ² . Fore wing short and broad | 2. THYATIRA, p. 180. |
| b ² . Fore wing long, narrow, and arched . . | 6. TOXOIDES, p. 185. |
| b'. Fore wing with vein 6 from above angle of cell. | |
| a ² . Fore wing with apex rounded; hind wing with outer margin rounded . . . | 3. GAURENA, p. 181. |
| b ² . Fore wing with apex acute; hind wing with outer margin slightly angled. | |
| a ³ . Antennæ thickened and flattened in both sexes | 4. POLYPLOCA, p. 182. |
| b ³ . Antennæ filiform and ciliated in both sexes | 5. NEMACEROTA, [p. 185.] |

* After the *Cymatophoridæ* would follow the *Noctuidæ*, if the *Heterocera* could be arranged in a linear series.

Genus **HABROSYNE.**

Habrosyne, *Hübner. Verz.* p. 236 (1816).

Type, *H. derasa*, Linn.

Range. N. America; Europe; Japan; Himalayas.

Palpi porrect, the first two joints heavily scaled, the third short and naked. Antennæ with the joints rather broad and flattened; collar and patagia thickly fringed with hair; terminal segments of abdomen with thick lateral tufts of hair. Fore wing with a tuft of scales at outer angle; vein 6 from angle of cell; 7 and 8 stalked; 9 and 10 stalked, and almost anastomosing with 7 and 8 to form a short areole. Hind wing with vein 5 from near lower angle of cell.

324. *Habrosyne derasa*, Linn. *Syst. Nat.* i, p. 851; *Buckler, Larvæ Brit. Butt. Moths*, pl. 54, fig. 1 (larva).

Habrosyne fraterna, Moore, *P. Z. S.* 1888, p. 406; *Butl. Ill. Het.* vii, pl. 125, fig. 11; *C. & S.* no. 1629 A.

Gonophora indica, Moore, *P. Z. S.* 1867, p. 44; *Waterh. Aid.* i, pl. 9.

Head and thorax golden brown, the collar with fine dark lines; abdomen pale fuscous. Fore wing silvery grey; a large golden-brown triangular patch from the costa near base and at apex to

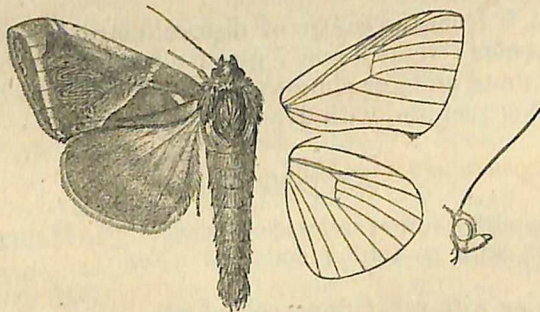


Fig. 111.—*Habrosyne derasa*, ♂. 1.

inner margin near outer angle, bordered inwardly by a white line which sends a tooth obliquely towards the base; a whitish streak along the costa crossed by some wavy brown lines; small black striae towards the apex; orbicular and reniform spots with pale outline; an extremely undulated quadruple postmedial line from vein 6 to near inner margin; a slightly curved or almost straight submarginal pale band; a wavy marginal pale line; cilia pale, with a dark line through them. Hind wing fuscous.

The form *indica*, from Sikhim, is rather larger and brighter, whilst *fraterna*, from Dharmasāla, is slightly greyer than the European *derasa*.

Larva reddish brown; a dark dorsal line; subdorsal round



white spots on 4th, 5th, and 6th somites, the two posterior spots sometimes obsolete.

Hab. Europe; Dharmasála; Sikhim; Burma. *Exp.* 40–54 millim.

325. **Habrosyne plagiosa**, *Moore, Lep. Atk.* p. 90; *C. & S.* no. 1631.

♀. Head and thorax pinkish brown, the collar, meso- and meta-thorax fringed with brown hair. Fore wing pinkish brown; an antemedial oblique pink line met below the costa by an oblique line from near the base; the area beyond the antemedial line suffused with brown; some short faint wavy brown lines from the costa; orbicular spot represented by a speck; reniform elongate, with a dark outline; a faint wavy double postmedial line filled in with bright chestnut towards inner margin; a curved pink band from apex to outer angle. Hind wing fuscous.

Hab. Sikhim. *Exp.* 56 millim.

326. **Habrosyne armata**, *Moore Lep. Atk.* p. 90; *Waterh. Aid.* ii, pl. 117; *C. & S.* no. 1629.

♂. Head and thorax pale ferruginous, the latter tinged with pink. Fore wing ferruginous, some pale marks at base; a pinkish oblique line from costa near base to inner margin beyond the middle; a postmedial pink patch on the costa; a double highly wavy postmedial line; a curved submarginal pink band, with a grey patch on its inner edge; two whitish marginal lines. Hind wing pale fuscous.

Hab. Khási Hills. *Exp.* 66 millim.

327. **Habrosyne argenteipuncta**, n. sp.

♀. Head, thorax, and abdomen brown; thorax with paired tufts of pale grey, brown-tipped scales from below the patagia. Fore wing olive-brown; some blue-grey streaks from the costa; a silvery subbasal spot below the median nervure; a medial dark band with wavy edges occupying the middle third of the wing, with some yellow on its outer edge towards inner margin; the reniform outlined with blue-grey; marginal area suffused with blue-grey. Hind wing fuscous.

Hab. Sikhim (*Knyvett*). *Exp.* 38 millim. Type in coll. Elwes.

328. **Habrosyne sanguinea**, *Moore, Lep. Atk.* p. 90; *C. & S.* no. 1632.

♂. Head and thorax bright ferruginous red; abdomen fuscous. Fore wing with a bright ferruginous basal patch, bearing a silvery spot below the median nervure, and with creamy white on its outer edge; the outer half of wing dark ferruginous brown, with a bright ferruginous streak and patch on inner margin, the latter with a wavy white inner edge; two bright ferruginous patches

on costa with white inner edges; the waved lines as in *derasa*.
Hind wing dark fuscous.

Hab. Sikhim. *Exp.* 44 millim.

Genus **THYATIRA**.

Thyatira, *Hübner. Verz.* p. 236 (1816).

Type, *T. batis*, Linn.

Range. Europe; Palæarctic Asia; Himalayas; Borneo; Java.

Palpi upturned, the first two joints heavily fringed with hair, the third joint of moderate length and naked; antennæ ciliated; collar and patagia fringed with long hair; third segment of abdomen with a tuft of dark scales. Fore wing with the apex rounded; thickly scaled; vein 6 from the angle of cell; 9 and 10 stalked, and almost anastomosing with 7 and 8 to form a short areole. Hind wing with vein 5 from near the lower angle of cell.

329. *Thyatira batis*, *Linn. Syst. Nat.* i, p. 836; *Buckler, Larvæ Brit.*

Butt. Moths, pl. 54, fig. 2; *C. & S.* no. 1524.

Thyatira cognata, *Moore, P. Z. S.* 1888, p. 406; *Butl. Ill. Het.* vii, pl. 125, fig. 12.

Thyatira decorata, *Moore, P. Z. S.* 1881, p. 328, pl. 37, fig. 1; *C. & S.* no. 1625.

Thyatira vicina, *Guen. Noct.* i, p. 13.

Head and thorax pinkish white, with fine brown lines. Fore wing brown; a large basal pink patch with two brown spots on it towards inner margin, and bordered by a black line; two pinkish

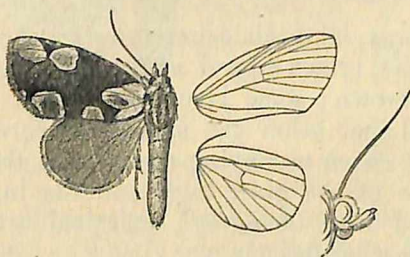


Fig. 112.—*Thyatira batis*, ♂. †.

patches below the costa towards apex, one on inner margin, and a larger one with brown centre at outer angle, with a small spot on the margin above it; some waved medial and postmedial lines. Hind wing and abdomen fuscous.

The variety *cognata* is without the pink patch on inner margin of fore wing, and has a waved marginal black line; *decorata*, from Sikhim, has an extra pinkish spot in the cell of the fore wing, a smaller one beyond, and a more complete marginal series; the

palpi are usually pink; and it is probably a distinct species. *Vicina*, from Java, is like the typical form, but browner.

Larva brown; the 1st somite purplish, the 2nd and 3rd yellowish; paired dorsal hump on 2nd and 5th to terminal somites; oblique lateral dark stripes on 4th to 10th somites.

Hab. Europe; N.W. Himalayas; Sikhim; Java. *Exp.* 46 millim.

Genus GAURENA.

Gaurena, *Wlk. Cat.* xxxii, p. 619 (1864).

Type, *G. florens*, Wlk.

Range. Sikhim; Assam Hills.

Only differs from *Thyatira* in having vein 6 of the fore wing given off beyond the angle of cell.

330. *Gaurena florens*, *Wlk. Cat.* xxxii, p. 620; *Butl. Ill. Het.* vi, pl. 109, fig. 4; *C. & S.* no. 1627.

Head and thorax olive-brown. Fore wing olive-brown suffused with yellow, the markings pale yellow and white; a spot near base, a subbasal waved band; a spot in the cell, and a larger spot

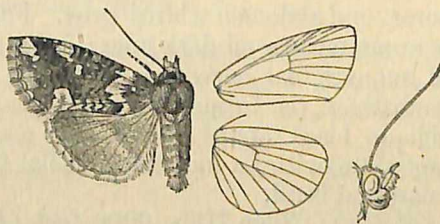


Fig. 113.—*Gaurena florens*, ♂. 1.

at the end of it; a postmedial patch on the costa; another at apex, and one at outer angle; submarginal and marginal series of lunulate spots; costa and veins 1 and 2 spotted with yellow. Abdomen and hind wing pale yellowish fuscous.

Hab. Sikhim. *Exp.* 40 millim.

331. *Gaurena aurofasciata*, n. sp.

♂. Differs from *florens* in the head and thorax being olive; the subbasal band of the fore wing broader; no white spot at middle of cell; the spot at end of cell oblong and golden; a complete postmedial band between the patches on costa and outer angle; the submarginal and marginal lunules absent, except two above outer angle.

Hab. Sikhim (*Elwes*). *Exp.* 40 millim. Type in coll. Elwes.



332. *Gaurena florescens*, *Wlk. Cat.* xxxii, p. 620; *Butl. Ill. Het.* vi, pl. 109, fig. 5; *C. & S.* no. 1628.

Differs from *florens* in the head and thorax being spotted with yellow; the waved subbasal band of the fore wing replaced by a spot on the costa and one below median nervure; the spot at end of cell large; the postmedial spot placed below the costa; the patches at apex and near outer angle smaller; the marginal series larger.

Hab. Sikkim; Khásis; Nágas. *Exp.* 42 millim.

333. *Gaurena fuscescens*, n. sp.

♂. Head and thorax dark fuscous; abdomen pale. Fore wing dull brown suffused with fuscous; traces of numerous waved dark lines; a pale speck below median nervure near the base; an indistinct dark spot on discocellulars; a pale patch at apex. Hind wing pale fuscous, with an indistinct paler band just beyond the middle.

Hab. Nága Hills, 6000 feet (*Doherty*). *Exp.* 40 millim. Type in coll. Elwes.

334. *Gaurena lichenea*, n. sp.

♂. Head, thorax, and abdomen whitish grey. Fore wing whitish grey, crossed by numerous waved dark lines; indistinct antemedial, postmedial, and submarginal curved dark bands; orbicular and reniform spots indistinct, the former figure-of-8-shaped, the latter elongate; an oblique black apical streak and marginal lunulate line. Hind wing white, with an indistinct medial fuscous line and broad blackish marginal band.

Hab. Sikkim (*Möller*); Nága Hills, 6000 feet (*Doherty*). *Exp.* 38 millim. Type in coll. Elwes.

Genus POLYPLOCA.

Polyploca, *Hüb. Verz.* p. 273 (1816).

Palimpsestes, *Hüb. Verz.* p. 273 (1816).

Saronaga, *Moore*, *P. Z. S.* 1881, p. 330.

Type, *P. ridens*, *Fabr.*, from Europe.

Range. Europe; N.W. Himalayas; Sikkim; Nága Hills.

Palpi with the first two joints hairy, the third porrect, rather long and naked. Antennæ with the joints wide and flattened; patagia heavily fringed with hair. Fore wing thickly scaled, the apex acute and rather produced; vein 6 from above the angle of cell; vein 9 anastomosing with 7 and 8 to form an areole. Hind wing with vein 5 from just below the middle of discocellulars or just above the lower angle of cell, or stalked with vein 4. Head and frons tufted; abdomen with a tuft on 3rd segment.

335. *Polyploca orbicularis*, Moore, P. Z. S. 1888, p. 407; C. & S. no. 1644 c.

Head and thorax grey-brown; the collar with a darker edge; abdomen fuscous, the tuft on 3rd somite blackish. Fore wing grey-brown; a dark spot at base; a waved subbasal line; curved

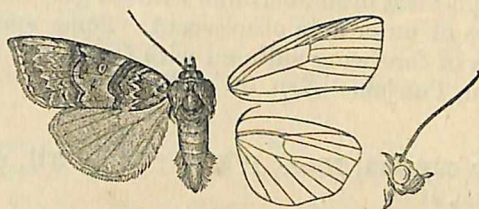


Fig. 114.—*Polyploca orbicularis*, ♂. †.

treble ante- and postmedial lines; the orbicular and reniform spots whitish or reddish outlined with black; a waved line beyond the postmedial line and another submarginal commencing as a black oblique streak from the apex; a waved marginal line; some dark specks on costa near apex. Hind wing fuscous.

Hab. Dharmasāla; Sikkim. *Exp.* 44 millim.

336. *Polyploca anguligera*, n. sp.

♂. Differs from *orbicularis* in the double antemedial lines of the fore wing being straighter; the double postmedial lines highly angled outwards beyond the cell; the oblique streak from apex more prominent.

Hab. Nāga Hills (*Doherty*). *Exp.* 42 millim. Type in coll. Elwes.

337. *Polyploca renalis*, Moore, P. Z. S. 1888, p. 407; C. & S. no. 1644 d.

Differs from *orbicularis* in the lines of the fore wing being less well defined; the ante- and postmedial lines more dentate, the latter highly angulate; the orbicular and reniform spots ochreous, with tufts of raised dark scales on their lower edges. Abdomen and hind wing darker.

Hab. Dharmasāla. *Exp.* 42 millim.

338. *Polyploca albidisca*, Warr. P. Z. S. 1888, p. 299; C. & S. no. 1642 a.

Polyploca dubia, Warr. P. Z. S. 1888, p. 300; C. & S. no. 1644 b.

♀. Differs from *orbicularis* in the collar being without the dark outline. Fore wing with the dark speck further from the base and oblique, with a white spot inside it; three waved antemedial black lines at even distances apart; the lines of the outer area

more irregular; the orbicular and reniform spots formed by black streaks with a few orange scales round them, the area below them grey.

The form *dubia* is without the white speck at base of fore wing, the innermost of the three lines is obsolescent, and another is developed outside them, so that the series becomes medial; the orbicular and reniform spots less prominent and without grey suffusion below them; the lines of outer area obsolescent. Some specimens have the medial area of fore wing suffused with fuscous.

Hab. Kangra, Punjab. *Exp.* 36 millim.

339. *Polyploca cuprina*, Moore, *P. Z. S.* 1881, p. 331, pl. 37, fig. 3;
C. & S. no. 1644.

Head and thorax grey-brown; abdomen paler. Fore wing grey-brown with a faint greenish tinge; indistinct double ante- and postmedial curved and waved lines, and traces of other waved single lines; a dark streak on the discocellulars, with a black spot inside it; a waved submarginal pale line. Hind wing pale fuscous.

Hab. Sikkim. *Exp.* 38 millim.

340. *Polyploca albicosta*, Moore, *P. Z. S.* 1867, p. 45; *C. & S.* no. 1626.

♂. Head and thorax dark brown; abdomen paler. Fore wing dark brown; the costal area suffused with white and greenish at base; numerous transverse waved dark lines, of which the most distinct are one antemedial and one postmedial; orbicular and reniform spots large and confluent, their upper portions outlined with black; an oblique black apical streak; a lunulate marginal line. Hind wing pale fuscous, with slightly darker medial and broad marginal bands.

The race from the N.W. Himalayas has the palpi and basal joint of antennæ pink; the collar fringed with pink; fore wing with the costal area suffused with pinkish white; the orbicular and reniform spots on a diffused yellow patch.

Hab. Simla; Sikkim. *Exp.* 48-50 millim.

341. *Polyploca albibasis*, n. sp.

♀. Head, thorax, and abdomen grey, slightly tinged with rufous. Fore wing with the costa much arched at base and the apex very acute; silvery grey; the base white; a whitish fascia along the costa from one-fifth from base to apex; waved ante- and postmedial dark lines and submarginal series of white specks. Hind wing pale fuscous, the outer area darker.

♂. In specimens from Simla the ground-colour of the fore wing is greenish: a fine white submarginal line is present, and the hind wing is pale ochreous.

Hab. Simla; Sikkim. *Exp.* 68 millim. Type in coll. Elwes.

Genus **NEMACEROTA**, nov.

Type, *N. cinerea*, Warr.

Range. Punjab; Sikhim.

Antennæ slender and ciliate, simple in female. Palpi upturned, reaching vertex of head; the first two joints hairy, the third naked and short. Fore wing with the apex acute and rather produced; slightly scaled; vein 6 from above angle of cell; veins 9 and 10 not quite anastomosing with 7 and 8 to form the areole. Hind wing with vein 5 from the centre of the discocellulars.

342. *Nemacerota cinerea*, Warr. *P. Z. S.* 1888, p. 300; *C. & S.* no. 1644 E.

Pale grey. Fore wing with two short dark streaks at the base; the basal area brownish and bounded by an indistinct waved dark

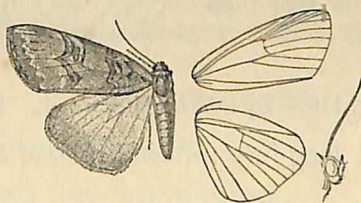


Fig. 115.—*Nemacerota cinerea*, ♂. †.

line; an indistinct double postmedial waved line and pale waved submarginal line. Hind wing paler.

Hab. Thandiáni, Punjab. *Exp.* 40 millim.

343. *Nemacerota alternata*, Moore, *P. Z. S.* 1881, p. 331, pl. 37, fig. 2; *C. & S.* no. 1643.

♀. Head and thorax grey-brown; the vertex of head and collar red-brown; abdomen paler. Fore wing greenish; ante- and post-medial pinkish bands and curved and waved black lines well defined towards the costa; traces of other single lines. Hind wing pale fuscous.

Hab. Sikhim. *Exp.* 42 millim.

Genus **TOXOIDES**, nov.

Type, *T. longipennis*, Hmps.

Range. Sikhim.

Palpi upturned, reaching vertex of head, the second joint fringed with hair, the third naked and porrect; antennæ flattened and with short fasciculated cilia. Fore wing very long and narrow, the costa highly arched, the apex obtuse; vein 6 from angle of cell; 7 and 8 on a long stalk; 9 and 10 stalked. Hind wing with the

outer margin slightly angled at vein 3; veins 3 and 4 from angle of cell; 5 from centre of discocellulars.

344. *Toxoides longipennis*, n. sp.

♂. Head pale, slightly tinged with rufous; thorax grizzled brown and grey, the collar tinged with rufous; abdomen pale fuscous. Fore wing grey suffused with fuscous, especially from end of cell to apex; the base and costa rufous; numerous faint

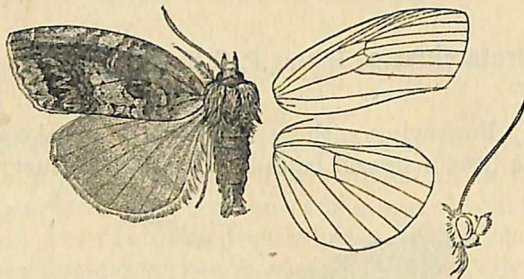


Fig. 116.—*Toxoides longipennis*, ♂. $\frac{1}{4}$.

waved lines. Hind wing fuscous, with traces of a medial line; the cilia paler.

Hab. Sikkim. *Exp.* 58 millim. Type in coll. Knyvett.

Species formerly recorded as Indian which are omitted.

| | |
|---|--------------------------------|
| <i>Risoba basalis</i> , Moore, | C. & S. no. 1633, is a Noctua. |
| „ <i>confluens</i> , Moore, | „ „ 1634, „ |
| „ <i>diversipennis</i> , Wlk., | „ „ 1635, „ |
| „ <i>literata</i> , Moore, | „ „ 1636, „ |
| „ <i>obstructa</i> , Moore, | „ „ 1637, „ |
| „ <i>prominens</i> , Moore, | „ „ 1638, „ |
| „ <i>repugnans</i> , Wlk., | „ „ 1639, „ |
| „ <i>vialis</i> , Moore, | „ „ 1640, „ |
| <i>Pitrassa variegata</i> , Moore, | „ „ 1645, „ |
| „ <i>vitellina</i> , Moore, | „ „ 1646, „ |
| <i>Tyrracona obliqua</i> , Moore, | „ „ 1647, „ |
| „ <i>transversa</i> , Moore, | „ „ 1648, „ |
| <i>Sydiva nigrogrisea</i> , Moore, | „ „ 1649, „ |
| <i>Osica undulata</i> , Moore, | „ „ 1650, „ |
| <i>Lazanda fasciata</i> , Wlk., C. & S. no. 1651 = <i>Labanda muscosa</i> ,
Wlk., C. & S. no. 3016, is a Noctua. | |

Family SESIIDÆ.

Diurnal Lepidoptera, which feed on the wing and settle on leaves in hot sunshine; the flight very rapid.

Antennæ often dilated or knobbed. Legs often with thick tufts of hair; mid tibiæ with one pair of spurs; hind tibiæ with two pairs. Frenulum present. Wings generally more or less hyaline; fore wing with veins 1 *a* and 1 *b* forming a fork at base; 1 *c* absent; veins 4 to 11 given off at almost even distances from the cell. Hind wing with three internal veins; vein 8 coincident with 7.

Many species are close "mimics" of various Hymenopterous forms.

Larva: a fleshy internal feeder on bark or pith, with five pairs of prolegs.

Pupa armed with hooks for movement in the galleries.

Key to the Genera.

a. Hind legs without tufts of hair on the joints.

a'. Fore wing with veins 7 and 8 stalked.

*a*². Proboscis wanting.

*a*³. Fore wing with vein 5 present.

Hind wing with veins 3 and 4 from angle of cell.

*a*⁴. Hind wing with discocellulars oblique; palpi of medium length

1. TROCHILIUM, p. 188.

*b*⁴. Hind wing with discocellulars nearly erect; palpi longer ..

2. SPHECODOPTERA, p. 189.

*b*³. Fore wing with vein 5 absent ..

3. ANTHRENOPTERA, [p. 190.

*b*². Proboscis present.

*a*³. Hind wing with discocellulars almost erect.

*a*⁴. Fore wing with vein 2 present.

Hind wing with veins 3 and 4 from cell.

*a*⁵. Hind tarsi of moderate length, and not fringed with scales.

*a*⁶. Abdomen with lateral tufts on the terminal segments

4. TRILOCHANA, p. 190.

*b*⁶. Abdomen with the terminal tuft only

5. SCIAPTERON, p. 191.

*b*⁵. Hind tarsi extremely long and fringed with scales on the last four joints above .

6. MACROTARSIPUS, p. 194.

*b*⁴. Fore wing with vein 2 absent.

Hind wing with veins 3 and 4 stalked

7. ICHNEUMENOPTERA, [p. 194.

- b*³. Hing wing with discocellulars oblique 8. SESIA, p. 196.
- b*¹. Fore wing with veins 7 and 8 not stalked.
- a*². Palpi upturned. Hind wing with vein 3 from end of cell 9. ADIXOA, p. 198.
- b*². Palpi porrect. Hind wing with veins 2 and 3 from a point before end of cell. 10. TRICHOCEROTA, p. 199.
- b*. Hind legs with tufts of hair on the joints.
- a*¹. Legs with moderate or slight tufts on the joints.
- a*². Fore wing with veins 5 and 7 present.
- a*³. Hind wing with veins 2 and 3 from a point.
- a*⁴. Fore wing with veins 7 and 8 stalked 11. TINTHIA, p. 199.
- b*⁴. Fore wing with veins 7 and 8 not stalked 12. CERATOCOREMA, p. 200.
- b*³. Hind wing with veins 3 and 4 from angle of cell 13. ASCHISTOPHLEPS, p. 200.
- b*². Fore wing with veins 5 and 7 absent. Hind wing with veins 3 and 4 stalked 14. OLIGOPHLEBIA, p. 201.
- b*¹. Hind legs with immensely developed hairy clothing.
- a*². Hind legs with the hair evenly disposed. Hind wing with vein 3 from before end of cell; 6 and 7 stalked 15. MELITTIA, p. 202.
- b*². Hind legs with the hair disposed in uneven tufts. Hind wing with vein 3 from end of cell; veins 6 and 7 not stalked; club of antenna greatly developed. 16. LENYRA, p. 205.

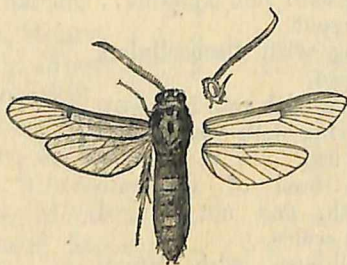


Fig. 117.—*Trochilium ommatæforme*, ♂. 1.

Genus **TROCHILIUM.**

Trochilium, Scop. *Int. Hist. Nat.* p. 414 (1777).

Sphecia, Hübn. *Verz.* p. 127 (1818).

Type, *T. apiforme*, Cl., from Europe.

Range. The Palæarctic Region.

Antennæ of male pectinated; palpi upturned and reaching the

top of head ; mid and hind femora but slightly hairy. Fore wing with veins 7 and 8 stalked. Hind wing with veins 3 and 4 from end of cell, the discocellulars very oblique.

345. *Trochilium ommatiæforme*, Moore, MS.

♂. Palpi yellow ; antennæ, thorax, and abdomen red-brown, with a few yellow scales ; legs yellow. Wings hyaline, the veins and margins very narrowly brown.

Hab. Baluchistan. *Exp.* 38 millim.

346. *Trochilium ignicolle*, n. sp.

Antennæ rufous ; palpi yellow ; vertex of head rufous ; collar fiery orange ; thorax brown ; abdomen brown, the second segment fringed with red, the terminal segments fiery orange. Wings hyaline, with narrow brown margins ; costa of fore wing brown ; the costal, median, and internal nervures slightly streaked with red.

Hab. Simla (*Harford*). *Exp.*, ♂ 36, ♀ 46 millim. Type in B. M.

Genus **SPHECODOPTERA**, nov.

Type, *S. repanda*, Walk.

Range. N. India.

The third joint of palpus longer than in *Trochilium* ; the tibiæ, especially those of hind legs, much more thickly clothed with hair. Hind wing with veins 3 and 4 stalked ; discocellulars more erect. Antennæ almost simple, with a slight bristle to each segment.

347. *Sphecodoptera repanda*, Wlk. Cat. viii, p. 11 ; C. & S. no. 189.

♂. Antennæ orange, black towards tips ; legs fulvous, tibiæ with some black hairs ; palpi, collar, and tegulæ with some yellow scales ; thorax and abdomen black, the former with a yellow stripe on vertex, the latter with fulvous segmental bands, the last two

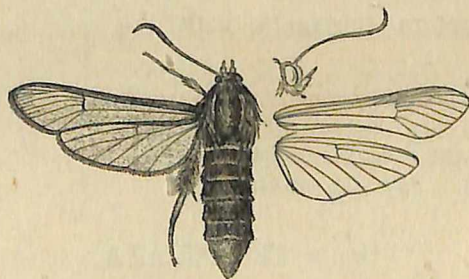


Fig. 118.—*Sphecodoptera repanda*, ♂. 1.

segments fulvous. Wings hyaline, with the veins and margins narrowly fulvous ; slight black streaks in the interspaces of fore wing towards apex, and the costa and discocellulars streaked with orange.

Hab. Simla. *Exp.* 50 millim.

348. *Sphecodoptera flavicollis*, n. sp.

♀. Differs from *repanda* in the antennæ being wholly black and shorter; collar yellow; two yellow streaks on meso- and meta-thorax, the latter fringed with yellow; abdomen bright yellow, the first two segments black, the 3rd, 4th, and 5th segments with terminal black bands, decreasing in width posteriorly. Legs yellow; hind legs with a black patch on the inside at end of tibia. Wings as in *repanda*; fore wing without the black streaks in the interspaces towards apex.

Hab. Skardo, Kashmir, 8000 feet (*Leech*). *Exp.* 48 millim. Type in coll. *Leech*.

Genus **ANTHRENOPTERA.**

Anthrenoptera, *Swinh. Cat. Het. Mus. Oxon.* p. 35 (ined.).

Type, *A. contracta*, Walk.

Range. Assam.

♂. The antennæ more heavily pectinated than in *Trochilium*; the third joint of palpi but slightly longer; fore wing narrower, with vein 5 wanting; hind wing with veins 3 and 4 stalked; tibiæ fringed with hair, especially those of hind legs.

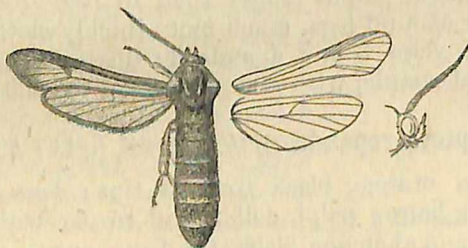


Fig. 119.—*Anthrenoptera contracta*, ♂. †.

349. *Anthrenoptera contracta*, Walk. *Cat.* viii, p. 11; *C. & S.* no. 188.

♂. Differs from *Sphecodoptera repanda* in the tegulæ being wholly yellow; the margins of wings more broadly fulvous; fore wing with a large apical fulvous patch.

Hab. Assam. *Exp.* 34 millim.

Genus **TRILOCHANA.**

Trilochana, *Moore, Lep. Atl.* p. 9 (1879).

Type, *T. scolioides*, Moore.

Range. Sikkim; Burma.

The apex of the fore wing somewhat pointed; abdomen with lateral tufts on last two segments; the anal tuft largely developed. Venation, antennæ, palpi, and legs as in *Sphecodoptera*.

- *350. *Trilochana scolioides*, Moore, *Lep. Atk.* p. 10, pl. ii, fig. 2;
C. & S. no. 206.

Antennæ dark brown. Palpi, thorax, and abdomen purple-brown, the segments of the last fringed with grey; the last two segments at sides and below and anal tuft red, some black hairs fringing the tuft above. Legs clothed with long black hairs, hind tarsi yellowish. Wings shining olive-green, a short narrow transparent basal streak on fore wing and two triangular streaks on the hind wing.

Hab. Sikhim. *Exp.* 47 millim.

351. *Trilochana ignicauda*, n. sp.

♂. Differs from *scolioides* in the head, thorax, abdomen, and wings being uniform dark purplish metallic blue; abdomen with the lateral and anal tufts fiery red. Fore wing without a hyaline

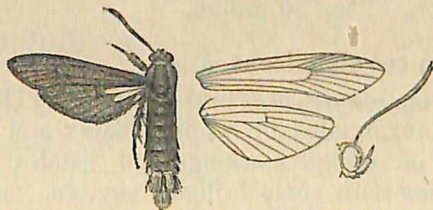


Fig. 120.—*Trilochana ignicauda*, ♂. †.

streak; hind wing with three hyaline streaks at base. Underside with the outer half of wings bronzy. Palpi fringed with grey hairs; legs uniform black.

Hab. Momeit, Burma (*Doherty*). *Exp.* 29 millim. Type in coll. Elwes.

Genus SCIAPTERON.

Sciapteron, Staudgr. *Stettin. Ent. Zeit.* 1856, p. 195.

Pramila, Moore, *Lep. Atk.* p. 9 (1879).

Pseudosesia, Feld. *Sitzungsb. Akad. Wiss. Wien*, xliii, 1, p. 28 (1861).

Type, *S. tabaniforme*, Rott., from Europe.

Range. The Palaearctic Region; Sikhim; Burma.

Palpi upturned, the third joint short, as in *Trochilium*. Venation of fore wing as in that genus; hind wing with the discocellulars but slightly oblique; veins 3 and 4 from end of cell. Anal tuft strongly developed; hind tibiæ but slightly fringed with hair.

SECT. I. Male with antennæ bipectinated.

352. *Sciapteron flammans*, n. sp.

Palpi, head, and legs orange-yellow, with a few black scales on them; antennæ orange; collar black, fringed with yellow; thorax black, the tegulæ and metathorax fringed with yellow; abdomen blue-black, each segment with a bright yellow band; anal tuft black and orange. Fore wing clothed with orange and black scales,

the veins black. Hind wing hyaline; the veins orange and black; outer margin and cilia black.

Hab. Murree. *Exp.*, ♂ 26, ♀ 31 millim. Type in coll. Leech.

SECT. II. Male with antennæ fasciculated.

353. **Sciapteron grotei**, *Moore*, *P. Z. S.* 1879, p. 414; *C. & S.* no. 207.

Sciapteron rangoonensis, *Swinh. Trans. Ent. Soc.* 1890, p. 165.

♂. Antennæ and vertex of head black; palpi and frons yellow; genæ white; thorax black, with lateral yellow streaks; metathorax with a yellow band; abdomen black, with yellow bands on all except the 1st and 3rd segments; anal tuft black, shading to brown; legs yellow and black; tarsi white-ringed. Wings yellowish hyaline; fore wing with the margins and discocellulars broadly black, narrowly so in hind wing.

Hab. Rangoon. *Exp.* 30 millim.

354. **Sciapteron cæruleimicans**, n. sp.

♂. Differs from *rangoonensis* in the palpi being black and orange; the frons grey, surrounded by white; thorax and abdomen with barely a trace of orange markings and bands; legs with less yellow; fore wing with some brilliant sky-blue metallic scales at and beyond the lower end of the cell.

Hab. E. Pegu, 1000 ft., Apr. (*Doherty*). *Exp.* 30 millim. Type in coll. Elwes.

355. **Sciapteron atkinsoni**, *Moore*, *Lep. Atk.* p. 9, pl. ii, fig. 1; *C. & S.* no. 190.

♀. Head, thorax, and abdomen bluish black; legs brown; palpi below and tarsal joints fringed with white. Wings hyaline; veins, costa, cilia, and a narrow discocellular streak to the hind wing black. Fore wing with a broad orange-red black-bordered discocellular streak.

Hab. Sikhim. *Exp.* 35 millim.

SECT. III. Male with antennæ simple.

356. **Sciapteron noblei**, *Swinh. Trans. Ent. Soc.* 1890, p. 166.

Sciapteron jucunda, *Swinh. Trans. Ent. Soc.* 1890, p. 167.

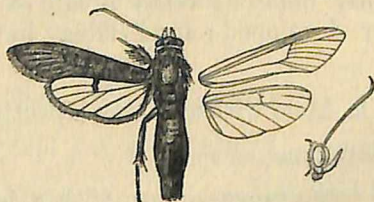


Fig. 121.—*Sciapteron noblei*, ♂. †.

The antennæ fulvous; palpi yellow. Head black; genæ white; tegulæ more or less fulvous; thorax and abdomen blue-black, with



traces of orange bands above and white below ; anal tuft blue-black above, with some orange below in one male, wholly orange in another male, this being the form named *jucunda* ; in the female black, with the tip orange. Legs black ; the tibiæ and tarsi ringed with fulvous and white. Fore wing metallic blue-black, with a purple tinge. Hind wing hyaline, the veins and margins narrowly black ; cilia brownish.

Hab. Rangoon. *Exp.* 34 millim.

*357. *Sciapteron sikkima*, *Moore, Lep. Atk.* p. 9 ; *C. & S.* no. 208.

♂. Differs from *noblei* in the antennæ being black above ; the thorax with a chrome-yellow streak on each side. Fore tarsi white ; mid and hind tarsi spotted with white.

Hab. Sikkim. *Exp.* 30 millim.

358. *Sciapteron metallicum*, n. sp.

Differs from *noblei* in the thorax being wholly blue-black ; abdomen blue-black, the segments slightly fringed with yellow ; palpi black, with some grey hairs ; thorax greyish below ; tarsi black.

Hab. Karen Hills (*Fea*). *Exp.* 32 millim. Type in coll. Moore.

359. *Sciapteron gracile*, *Swinh. Trans. Ent. Soc.* 1890, p. 168.

♀. Antennæ, head, and thorax orange-yellow ; abdomen black above, with the 1st and 3rd segments and anal tuft orange, and traces of orange bands below. Fore wings orange, powdered with a few black scales. Hind wing hyaline ; the veins orange ; cilia of both wings black. Legs orange and black.

Hab. Rangoon. *Exp.* 34 millim.

360. *Sciapteron cupreivitta*, n. sp.

♂. Palpi yellow ; frons grey, surrounded by white ; head, thorax, and abdomen blue-black, the 5th segment of the last banded with yellow ; anal tuft blue-black, with two tufts of yellow scales above ; tibiæ banded with yellow ; tarsi yellow. Fore wing above brown, suffused with blue-black ; slight yellow hyaline streaks between the nervules ; a brilliant coppery-red streak in the end of the cell ; below coppery gold. Hind wing with the discocellular band coppery ; the veins, margins, and cilia brown.

Hab. Eastern Pegu, 1000 feet, April (*Doherty*). *Exp.* 28 millim. Type in coll. Elwes.

361. *Sciapteron tenuimarginatum*, n. sp.

♀. Differs from typical *Sciapteron* in vein 5 of hind wing arising from near the upper angle of cell. Palpi yellow ; frons white ;

antennæ orange; head and thorax dark, much marked with yellow; abdomen dark, the segments fringed with yellow. Legs yellow, some dark hairs on end of hind tibia. Wings hyaline, the veins, margins, and discocellulars of fore wing very narrowly dark.

Hab. Karen Hills (*Fea*). *Exp.* 32 millim. Type in coll. Moore.

Genus **MACROTARSIPUS**, nov.

Type, *M. albipunctus*, Hmps. n.

Range. Burma.

Palpi and neurulation as in *Sciapteron*, except that vein 6 of the hind wing is from the upper angle of cell. Antennæ simple and very long. Legs very long; hind tarsi extremely elongate, the four terminal joints thickly fringed with scales above.

362. **Macrotarsipus albipunctus**, n. sp.

♂. Antennæ, head, thorax, and abdomen metallic blue-black. Palpi blue-black, white below. Legs blue-black, coxæ of fore legs

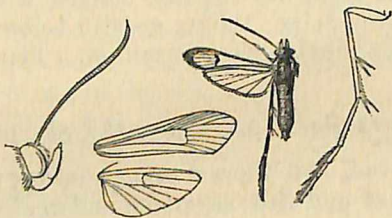


Fig. 122.—*Macrotarsipus albipunctus*, ♂. 1.

fringed with white; a ring of white scales on hind tibia at each pair of spurs, and at end of first joint of tarsus. Wings hyaline: the veins narrowly black; the margins and discocellulars of fore wings somewhat broadly black.

Hab. Bhámo, Burma (*Fea*). *Exp.* 24 millim. Type in coll. Moore.

Genus **ICHNEUMENOPTERA**, nov.

Type, *I. auripes*, Hmps. n.

Range. Bengal; Assam; Burma.

♂. Palpi with the third joint longer than in *Sciapteron*. Antennæ long and simple. Legs naked. Abdominal tuft long. Fore wing with vein 2 absent; the stalk of veins 7 and 8 shorter. Hind wing with veins 3 and 4 stalked; 6 from near the upper angle of the cell.

363. **Ichneumenoptera auripes**, n. sp.

♂. Palpi yellow below, black above. Frons white; antennæ, head, thorax, abdomen, and anal tuft black with a few scattered

yellow scales. Fore legs orange with the coxæ yellow. Hind legs with the femur blue-black, tibia orange with a blue-black

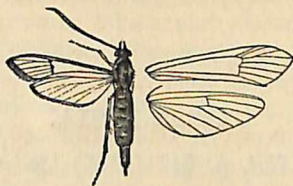


Fig. 123.—*Ichneumonoptera auripes*, ♂. 1.

band, tarsus blue banded with white. Wings transparent, the veins and margins narrowly black with a few yellow scales; cilia brown.

Hab. Sibságar; E. Pegu, 4000 feet, April; Tenasserim valley (*Doherty*). *Exp.* 26 millim. Type in coll. Elwes.

364. *Ichneumonoptera flavicincta*, n. sp.

♂. Differs from *auripes* in each segment of the abdomen being fringed with yellow. Mid and hind legs black, ringed with yellow. Fore wing with the margins and discocellular band more broadly black. (Fore legs wanting.)

Hab. Tenasserim Valley (*Doherty*). *Exp.* 19 millim. Type in coll. Druce.

365. *Ichneumonoptera xanthosoma*, n. sp.

♂. Differs from *auripes* in the frons and vertex of head being metallic blue, a white stripe down each side of frons; head fringed with yellow behind; collar metallic blue; thorax yellow striped with black; abdomen yellow. Each segment fringed with black; legs yellow, hind tibia with two blue-black spots above.

Hab. Moulmein. *Exp.* 20 millim. Type in coll. Moore.

366. *Ichneumonoptera flavipalpus*, n. sp.

♂. Differs from *auripes* in the palpi being wholly yellow; the frons dark; thorax and abdomen brown, suffused with yellow. Fore wing hyaline; the veins and margins, a discocellular band, and the outer area, brown suffused with yellow. Hind wing hyaline; the veins and margins narrowly brown. Legs wholly yellow.

Hab. Barrackpore. *Exp.* 20 millim. Type in coll. Moore.

367. *Ichneumonoptera ignifera*, n. sp.

♂. Palpi black above, yellow below; frons surrounded by white; antennæ, thorax, and abdomen black, anal tuft fiery red; abdomen red and white below towards extremity. Fore wing yellowish hyaline; the veins, discocellular band, and margins narrowly

brown, the outer margin with a broad brown band. Hind wing hyaline, the veins and margins narrowly brown.

Hab. Karen Hills (*Fea*); Bernardmyo (*Doherty*). *Exp.* 28 millim. Type in coll. Moore.

Genus **SESIA**.

Sesia, *Fabr. Syst. Ent.* p. 547 (1775); *Schrank, Fauna Boica*, ii, 1, p. 153 (1801).

Egeria, *Fabr. Illig. Mag. Ins.* vi, p. 288 (1807).

Type, *S. tipuliformis*, Clerk, Europe.

Range. All the regions, except Australasian.

Palpi slightly longer and more slender than in the preceding genera. Hind wing with the discocellulars oblique, the venation otherwise as in *Sciapteron*. Anal tuft large in the male.

In the typical section the antennæ are heavily ciliated in the male.

SECT. II. The antennæ simple in the male.

368. *Sesia quinquecincta*, n. sp.

Head and thorax blue-black; abdomen black, with five broad yellow bands; anal tuft and legs blue-black, the latter slightly fringed with white; coxæ of legs white. Wings hyaline; the veins, margins, and cilia smoky brown; costa and discocellular streak of fore wing blue-black. Hind tibiæ not fringed with hair.

Hab. Bernardmyo, Burma, 6000 feet, May (*Doherty*). *Exp.* 24 millim. Type in coll. Elwes.

369. *Sesia minuta*, *Swinh. Trans. Ent. Soc.* 1890, p. 171, pl. vi, fig. 5.

♀. Antennæ black; palpi ochreous; frons with the centre grey surmounted by white; collar whitish; thorax with a few orange scales; abdomen black, the 2nd, 4th, and 5th segments with yellow bands above; all the segments white—banded below. Legs black and ochreous. Fore wing hyaline with opal tints, the veins and margins dark, and the whole outer area suffused with purplish fuscous; a prominent orange discocellular band. Hind wing hyaline, the veins and margins narrowly black. Underside of fore wing with the basal part yellow. Hind tibiæ slightly hairy.

Hab. Rangoon. *Exp.* 24 millim.

370. *Sesia uncinata*, n. sp.

Differs from *minuta* in the third segment of the abdomen only having a yellow band. Fore wing with the margins narrowly black; the area beyond the cell hyaline, with a few yellow scales beyond the discocellulars and near the apex.

Hab. Karen Hills (*Fea*). *Exp.* 18 millim. Type in coll. Moore.

371. *Sesia xanthosticta*, n. sp.

♂. Palpi dark above, yellow below; frons black and surrounded by yellow. Antennæ, head, thorax, and abdomen black; abdomen with a yellow dorsal patch on first segment; a yellow sublateral line. Legs black, with some yellow on femora and tibiæ. Fore wing black, with a hyaline patch edged with yellow in the cell; a yellow patch beyond the cell, the veins crossing it black. Hind wing hyaline, the base and costa slightly yellow; the veins, outer margins, and cilia black.

Hab. Kashmir (*Leech*). *Exp.* 18 millim. Type in coll. *Leech*.

372. *Sesia tricincta*, *Moore, Lep. Atk.* p. 8; *C. & S.* no. 194.

♂. Brown; the antennæ grey at base; the palpi below, collar, streaks at sides of thorax, and basal medial and anal bands of abdomen yellow. Legs brown, tarsi with white bands. Wings opalescent hyaline, with narrow purple-brown borders and discocellular bands.

Hab. Sikkim. *Exp.* 22 millim.

*373. *Sesia flava*, *Moore, Lep. Atk.* p. 8; *C. & S.* no. 193.

Antennæ yellow with the tips brown; palpi, collar, and streaks on vertex and sides of thorax yellow; abdomen brown, with yellow segmental bands; anal tuft yellow. Legs yellow, banded with brown. Fore wing hyaline, the base and apex yellowish; veins and margins narrowly brown. Hind wing hyaline, with the cilia brown.

Hab. Sikkim. *Exp.* 17 millim.

374. *Sesia flavicaudata*, *Moore, Lep. Ceyl.* iii, p. 559, pl. 211, fig. 12.

♂. Purple-black; genæ white; palpi below, collar, and a narrow band on the fifth abdominal segment yellow; anal tuft orange.

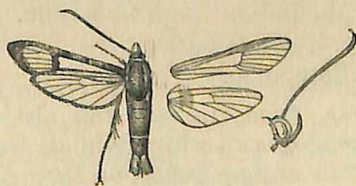


Fig. 124.—*Sesia flavicaudata*, ♂. 3.

Legs banded with yellow. Wings hyaline, with the veins, margins, and discocellular band purple-black, broadly so on fore wing, narrowly on hind wing.

Hab. Punduloya, Ceylon. *Exp.* 17 millim.

375. *Sesia flavipes*, *Hmps.* *Ill. Het.* ix, ined., pl. 157, figs. 19, 20.

Metallic blue-black; palpi, collar, and tibiæ orange. Abdomen with narrow segmental orange bands expanding into wide lateral patches; anal tuft blue-black above, orange below. Wings hyaline; the margins, discocellulars, and veins purple-black: fore wing with the margins broadly black, and nearly the whole outer area dark with narrow yellow streaks between the veins. *Female* with the abdominal orange bands broader.

Hab. Bangalore; Punduloya, Ceylon. *Exp.*, ♂ 16, ♀ 14 millim.

Genus **ADIXOA**, nov.

Type, *A. alterna*, Walk.

Range. S. India; Tenasserima.

♂. Antennæ with fascicles of cilia; palpi as in *Sciapterion*. Fore wing with veins 7 and 8 not stalked; the venation otherwise as in *Sciapterion*. Fore legs with a strong tibial tuft of hair; the other pairs but slightly hairy.

376. *Adixoa alterna*, *Wlk. Cat.* xxxi, p. 10; *C. & S.* no. 192.

♂. Purple-brown; frons, collar, tegulæ, and metathorax yellow. Abdomen with lateral yellow spots on the first and fourth seg-

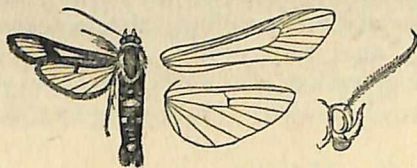


Fig. 125.—*Adixoa alterna*, ♂. $\frac{1}{2}$.

ments, one each on the vertex of the second and seventh segments; anal tuft black, the base of the tuft above and below yellow. Fore wing purple-brown suffused with yellow; a hyaline streak in the cell and four beyond. Hind wing hyaline; the veins, margins, and discocellular band purple-black.

Hab. Coimbatore, S. India. *Exp.* 28 millim.

377. *Adixoa auricollum*, n. sp.

♂. Palpi, antennæ, head, thorax, and abdomen blue-black; frons white, head fringed with white behind; collar fringed with orange; abdomen with orange bands on three last segments and on all the segments below. Legs blue-black; fore leg with the tarsi white; hind leg with some pale hairs on tibia. Fore wing blue-black, with hyaline spaces in and below the cell, and a small quadritid space beyond. Hind wing hyaline, with broad blue-black margins and discocellular band.

Hab. Tenasserim Valley (*Doherty*). *Exp.* 25 millim. Type in coll. Druce.

Genus **TRICHO CEROTA**, nov.

Type, *T. ruficincta*, Hmps. n.

Range. Burma.

Antennæ with tufts of long cilia arising from serrations. Palpi somewhat slight and porrect. Fore wing with vein 4 absent; 7 and 8 not stalked. Hind wing with veins 2 and 3 from near together and some way before the end of the cell; vein 6 from the upper angle of the cell. Hind tibiæ naked.

378. *Trichocerota ruficincta*, n. sp.

♂. Palpi reddish; head, thorax, and abdomen black; thorax with slight reddish streaks; abdomen with red bands on the fifth

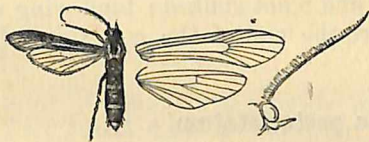


Fig. 126.—*Trichocerota ruficincta*, ♂. ♀.

and seventh segments. Fore wing dark reddish brown, with slight hyaline streaks in the cell and between veins 2, 3, and 4. Hind wing yellowish hyaline; the veins, margins, and cilia black.

Hab. Eastern Pegu, 500 feet, April (*Doherty*). *Exp.* 22 millim. Type in coll. Elwes.

Genus **TINTHIA**.

Tinthia, *Walk. Cat.* xxxi, p. 23 (1864).

Type, *T. varipes*, Walk., from Celebes.

Range. Japan; China; Celebes; S. India.

Antennæ slender and serrated in both sexes, hardly dilated before the end; palpi slight and porrect. Legs with slight tufts of hair at the joints. Wings very narrow; fore wing with the venation of *Sesia*; hind wing with veins 2 and 3 given off at a point before the end of the cell; 6 and 7 from the upper angle of cell; discocellulars nearly erect.

379. *Tinthia cupreipennis*, *Walk. Cat.* xxxi, p. 11; *C. & S.* no. 191.

♂. Brown with iridescent colours; the palpi, tufts on legs, and



Fig. 127.—*Tinthia cupreipennis*, ♂. ♀.

narrow segmental bands to the abdomen ochreous; anal tuft

black, orange at the tip. Fore wing irrorated with ochreous scales. Hind wing hyaline, the veins and margins dark.

Hab. Coimbatore, S. India. *Exp.* 18 millim.

Genus **CERATOCOREMA**, nov.

Type, *C. postcristatum*, Hmpsn.

Range. Ganjam ; Poona.

Antennæ with two series of very long cilia. Palpi short and porrect. Fore leg with tibia slightly hairy ; mid leg with the tibia and first tarsal joint strongly tufted with hair ; hind leg with two tufts of hair on the tibia and one on the first tarsal joint. Abdomen short and stout, with lateral anal tufts. Wings short ; fore wing with veins 7 and 8 not stalked ; hind wing with veins 2 and 3 from a point before the end of the cell, vein 6 from upper angle of cell.

380. **Ceratocorema postcristatum**, n. sp.

♂. Head, thorax, and abdomen reddish brown ; anal tufts reddish at base, black at tip. Mid legs clothed with reddish



Fig. 128.—*Ceratocorema postcristatum*, ♂. †.

hairs, those on the first tarsal joint blue-black ; hind legs clothed with mingled reddish and blue-black hairs. Wings yellowish hyaline, the veins and margins red-brown, narrowly so on the hind wing.

Hab. Berhampore, Ganjam (*Minchin*) ; Poona. *Exp.* 16 millim. Type in coll. Elwes.

Genus **ASCHISTOPHLEPS**, nov.

Type, *A. lampropoda*, Hmpsn.

Range. Assam ; Pegu.

♂. Antennæ simple. Palpi upturned, the third joint long and slightly porrected. Mid legs with terminal tufts of hairs on the tibiæ ; hind legs with two strong tufts on the tibiæ, and the first tarsal joint strangly tufted. Abdomen slight in the typical species. Wings rather short ; fore wing with veins 7 and 8 not stalked ; hind wing as in *Sciapteron*.

381. **Aschistophleps lampropoda**, n. sp.

♂. Head, thorax, and abdomen black. Hind legs with the tibiæ fringed with yellow hairs near the base, the rest of the tibiæ

and first tarsal joint with orange hairs mixed with a few silvery scales; the distal tarsal joints black. Wings yellow hyaline, the

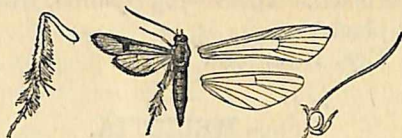


Fig. 129.—*Aschistophleps lampropoda*, ♂. 1.

veins, margins, and a broad discocellular streak to fore wing black; cilia black; inner margin of hind wing orange.

Hab. Margarita, Assam, May (*Doherty*). *Exp.* 20 millim. Type in coll. Elwes.

382. *Aschistophleps melissoides*, n. sp.

♀. Abdomen apiform. Palpi white; head, thorax, and abdomen black; tibiae and first tarsal joint of mid and hind legs clothed with black, grey, and white hairs. Wings hyaline, with the veins and margins black; fore wing with a black band occupying the middle third of the wing, and sending three spurs outwards along costa, vein 5, and inner margin.

An excellent mimic of the smaller Indian bee, *Apis indica*.

Hab. Eastern Pegu, 1000 feet, April (*Doherty*). *Exp.* 20 millim. Type in coll. Elwes.

Genus OLIGOPHLEBIA.

Oligophlebia, *Hmps.* *Ill. Het.* ix, ined.

Type, *O. nigralba*, *Hmps.*

Range. Ceylon.

Antennae minutely ciliated. Palpi upturned. Fore tibia with a terminal tuft of hair; mid legs with a small median and large terminal tuft to the tibia, the first two joints of the tarsus tufted; hind tibia with a very large terminal tuft. Fore wing with veins 5 and 7 absent. Hind wing with the discocellulars erect; veins 3 and 4 stalked.

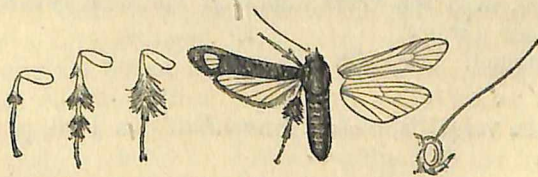


Fig. 130.—*Oligophlebia nigralba*, ♂. 1.

383. *Oligophlebia nigralba*, *Hmps.* *Ill. Het.* ix, ined., pl. 157, fig. 21.

♂. Head and thorax black; frons, genae, palpi below, and pectus

silvery white. Legs black, the tibiæ and tarsi ringed with white. Fore wing black, with a hyaline patch on the disk crossed by veins 4 and 6, which are black. Hind wing hyaline, with the veins and margins narrowly black.

Hab. Ceylon. *Exp.* 15 millim.

Genus **MELITTIA**.

Melittia, *Walk. Cat. viii*, p. 66 (1856).

Type, *M. satyriniformis*, Hübn., from N. America.

Range. S. and W. Africa. The Oriental region to Celebes and Gilolo; Nearctic and Neotropical regions.

Antennæ with fascicles of cilia in the male, simple in the female; much dilated before the tip, which is pointed. Palpi erect and rather slender, the 2nd joint slightly hairy. Hind leg with the tibia and tarsus clothed with thick long hair down to the ungues, and used for steadying the insect in the air whilst feeding from flowers. Fore wing with shape and venation of *Sciapteron*. Hind wing with vein 3 given off before the end of the cell; vein 6 present. Anal tuft slight.

384. ***Melittia astarte***, *Westw. Cab. Or. Ent.* p. 61, pl. 30, fig. 4; *C. & S.* no. 195.

Glossy brassy black. Antennæ ringed with lead-colour beyond the middle. Head, collar, and first and last segments of abdomen orange. Hind legs inwardly black; outwardly orange with a few white hairs. Fore wing brassy black, with no hyaline streaks. Hind wing hyaline, the veins orange; a black marginal line. Cilia of both wings orange.

Hab. Central India. *Exp.* 25 millim.

385. ***Melittia pellecta***, *Swinh. Trans. Ent. Soc.* 1890, p. 169, pl. vi, fig. 2.

♀. Black; thorax fulvous, with a greenish tinge; abdomen with a few terminal grey scales to each segment. Hind legs black, with a few grey hairs. Fore wing black, with very slight hyaline streaks between some of the veins and irrorated with grey scales. Hind wing hyaline, with the veins and cilia black; a few silvery-blue scales on inner margin.

Hab. Rangoon. *Exp.* 38 millim.

386. ***Melittia volatilis***, *Swinh. Trans. Ent. Soc.* 1890, p. 170, pl. vi, fig. 3.

♀. Differs from *pellecta* in the thorax being black; the fore wing with no grey scales. Hind wing with a large silvery-blue patch on inner margin. Hind legs with more grey hairs.

Hab. Rangoon. *Exp.* 24 millim.

387. **Melittia eurytion**, *Westw. Cab. Or. Ent.* p. 62, pl. 30, fig. 5;
C. & S. no. 197.

Melittia strigipennis, *Walk. Cat.* xxxi, p. 17.

Differs from *volatilis* in the thorax being olive-green; the abdomen with more distinct silvery segmental bands. Fore wing with the hyaline streaks in, below, and beyond the cell considerably

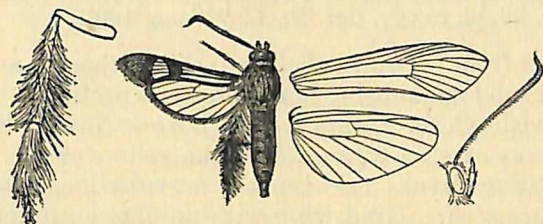


Fig. 131.—*Melittia eurytion*, ♂. †.

more extensive, those beyond being either three or four in number; some grey scales on the apical area. Hind legs clothed with black and chocolate-brown hairs, with a few grey hairs above and tufts below.

Hab. Japan; throughout N.E. India and Burma; Poona; Java; Gilolo. *Exp.* 24–30 millim.

388. **Melittia indica**, *Butl. A. M. N. H.* (4) xiv, p. 411; *C. & S.* no. 199.
Melittia staudingeri, *Boisd. Léop. Hét.* i, p. 478; *C. & S.* no. 203.

♂. Antennæ, head, thorax, and fore legs red-brown, darkest in Sikhim specimens; pectus yellow. Hind legs black, with a tuft of pale yellow hairs on the outside of the tibia. Abdomen black-brown, with narrow yellowish segmental bands; white below. Fore wing with five hyaline streaks between the nervules. Hind wing with pale greenish blue on inner margin.

Hab. Sikhim; Sylhet; Tenasserim. *Exp.* 32 millim.

389. **Melittia grandis**, n. sp.

♂. Thorax olive-green. Abdomen dark green, with yellow rings; pectus yellow, with lateral purplish patches; fore legs black, yellow, and orange. Hind legs with the femur and tibia clothed with black hairs, some yellow hairs on the inner side of the femur; the hairs on the outside of the tibia and all those clothing the tarsus fiery orange. Fore wing with no recurrent streak in the cell; the apical hyaline area large and embracing the fork of the subcostals. Hind wing with a few bluish scales on the inner margin; cilia of both wings brown.

Hab. Sikhim (Möller). *Exp.* 50 millim. Type in coll. Elwes.

390. **Melittia newara**, *Moore, Lep. Atk.* p. 10; *C. & S.* no. 201.

♂. Differs from *indica* in the thorax being bright golden yellow, the vertex slightly black. Fore wing with the apical

hyaline space larger, leaving a narrow marginal band. Hind wing with no blue on inner margin. Hind legs with a few red hairs from the joint of femur and tibia. Abdomen yellow below.

Hab. Sikkim. *Exp.* 35 millim.

391. *Melittia kuluana*, Moore, *P. Z. S.* 1888, p. 392; *Butl. Ill. Het.* vii, p. 98, pl. cxxxv, fig. 12; *C. & S.* no. 199 A.

♂. Differs from *indica* in the head, collar, thorax, and first two segments of abdomen being olive-brown; pectus and abdomen below yellowish white. Hind legs with a few fulvous hairs on the tibia and tarsus externally, as well as the yellow ones. Fore wing with the hyaline streaks between the nervules longer and leaving a small apical patch. Hind wing with no blue on inner margin.

Hab. Kulu. *Exp.* 30 millim.

392. *Melittia notabilis*, Swinh. *Trans. Ent. Soc.* 1890, p. 168, pl. vi, fig. 1.

♀. Head, thorax, and first three segments of abdomen fulvous above, the other segments black with narrow yellow segmental bands; abdomen yellow below; pectus yellow and white. Hind legs black, with some tufts of yellow hair on the outside of the tibia and first joint of tarsus; wings fulvous at base and inner margin; fore wing irrorated with brown scales; the hyaline streaks of the same extent as in *eurytion*; cilia of both wings brown.

Hab. Rangoon. *Exp.* 40 millim.

393. *Melittia gigantea*, Moore, *P. Z. S.* 1879, p. 413; *Waterhouse, Aid.* ii, pl. 131, fig. 4; *C. & S.* no. 198.

Differs from *notabilis* in the fore wing having the hyaline streaks between the nervules rather longer; the apical area powdered with grey scales; the costa ochreous; the recurrent black streak in the cell short. Hind legs with the tufts of hair externally fulvous, internally yellow on the tibia, black on the tarsus.

Hab. Mussooree. *Exp.* 44 millim.

394. *Melittia chalciformis*, Fabr. *Ent. Syst.* iii, pt. 1, p. 382.

Melittia bombyliformis, Cram. *Pap. Exot.* iv, p. 241, pl. 400 c; *C. & S.* no. 196.

Melittia porcus, Westw. *Cab. Or. Ent.* p. 62; *C. & S.* no. 202.

Head brown; thorax fulvous with the vertex brown; the first two segments of abdomen fulvous; the other segments black with narrow yellow segmental bands; yellowish white below; palpi and pectus yellow and white. Hind legs black; the tibiæ and tarsi tufted externally with yellow and fulvous hairs. Wings slightly

fulvous at base; fore wings irrorated with brown and grey scales; the hyaline streaks as in *eurytion*; cilia of both wings brown.

Hab. Ceylon; Central India; Bombay; Ganjam; Moulmein; Sylhet; Tenasserim; Java. *Exp.*, ♂ 32, ♀ 34–36 millim.

395. *Melittia nepcha*, Moore, *Lep. Atk.* p. 10; *C. & S.* no. 200.

Melittia dorsatifomis, *Hmps.* *Ill. Het.* viii, p. 43, pl. cxxxix, fig. 21.

Melittia congruens, *Swinh. Trans. Ent. Soc.* 1890, p. 169, pl. vi, fig. 4.

Differs from *chalciformis* in having the collar blue-black; mid tibia with blue bands; hind legs with white hairs replacing the yellow ones, with a few blue scales at joint of femur and tibia. Fore wing with the hyaline streaks in and below the cell broader; the apical hyaline area typically large and having a narrow black margin; in the Pegu and Perak specimens it only just embraces the fork of the subcostals, whilst in the Rangoon specimen, *congruens*, it does not include the fork at all.

Hab. Sikkim; Nilgiris; Rangoon; Pegu; Tenasserim; Perak. *Exp.* 28–32 millim.

Genus LENYRA.

Lenyra, *Walk. Cat.* viii, p. 71 (1856).

Type, *L. astaroth*, Westw.

Range. Sikkim; Assam; Sylhet.

♂. Head comparatively small, palpi slight and porrect; antennæ simple, thickened distally into a pronounced club. Thorax and abdomen covered with small closely appressed scales. Fore and mid pairs of legs without long hairs. Hind legs clothed with thick tufts of hair of irregular length. Fore wing with the apex much rounded; vein 2 given off some way before the end of the cell; 9 stalked with 7 and 8.

396. *Lenyra astaroth*, Westw. *Cab. Or. Ent.* p. 14, pl. vi, fig. 5; *C. & S.* no. 204.

♂. Entirely black, shot with brilliant metallic iridescent

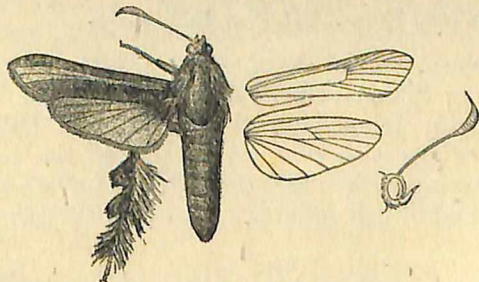


Fig. 132.—*Lenyra astaroth*, ♂. †.

colours. Hind leg in Sikkim specimens clothed entirely with

deep blue-black hairs, some of them on the outside of tibia being tipped with white; whilst in the Sylhet specimen the hair on the inside of the tibia is fuscous black.

Hab. Sikkim; Assam; Sylhet. *Exp.* 46-51 millim.

The following species formerly recorded as Indian are omitted.

Thyris asiliformis, Fabr., C. & S. no. 205, is probably a W. Indian *Zygænid*.

Sura chalybea, Butl., C. & S. no. 209, is from Singapore.

Family TINÆGERIIDÆ*.

Small day-flying moths, mostly with brilliant colours; the antennæ thickly fringed with long scales along the whole or part of their length; palpi long, slender, and sickle-shaped. Wings long, narrow, and pointed; fore wing with vein 1 *b* slightly forked or simple at the base, veins 7 and 8 stalked; hind wing more or less hyaline, three internal veins, vein 8 free from the root. Legs often clothed with long scales above or on the spurs, which are long.

Larvæ (of known species) feeding in webs.

Key to the Genera.

- a. Antennæ fringed along whole upperside;
fore wing with vein 2 from end of cell.... 1. SNELLENIA, p. 206.
- b. Antennæ only fringed on median joints; fore
wing with vein 2 from before end of cell.
 - a'. Fore wing with vein 6 present; hind tibiæ [p. 207.
with the spurs tufted 2. CÆDEMATOPODA,
 - b'. Fore wing with vein 6 absent; hind tibiæ
with the spurs not tufted 3. ERETMOCERA, p. 208.

Genus SNELENIA.

Snellenia, Wlsm. *Trans. Ent. Soc.* 1889, p. 13.

Type, *S. coccinea*, Wlsm.

Range. Japan; Sikkim; Australia.

Antennæ thickly fringed on the upperside. Palpi erect and slender. Fore wings with vein 1 *b* forked at the base, 7 and 8 stalked. Hing wing with vein 1 *a* short, 1 *b* furcate at base, 3 and 4 stalked; the end of cell square. Legs slightly tufted at base of spurs.

* This family is shown by Lord Walsingham, in his Monograph, *Trans. Ent. Soc.* 1889, to be allied to *Tinthia* in the *Sesiidæ* on the one hand, and on the other to the subfamilies of *Tineidæ*, the *Gelechiinæ*, *Dasycerinae*, and *Butalinæ*.

397. *Snellenia coccinea*, *Wlsm. Trans. Ent. Soc.* 1889, p. 15, pl. ii.

♂. Head, thorax, and abdomen black. Fore wing scarlet, with small black spots at the base of costa and inner margin; a bluish-

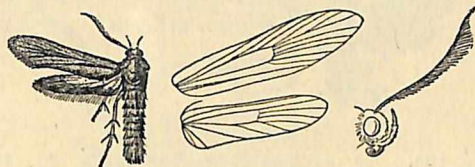


Fig. 133.—*Snellenia coccinea*, ♂. ♀.
(From Walsingham, *Trans. Ent. Soc.* 1889, pl. ii.)

black metallic spot at end of cell. Hind wing black; the costal area to beyond the middle rosy pink. Cilia of both wings black. Underside with the outer area of both wings suffused with fuscous.

Hab. Sikkim, 5000 feet. *Exp.* 15 millim.

398. *Snellenia tarsella*, *Wlsm. Trans. Ent. Soc.* 1889, p. 15, pl. vi, fig. 3.

♀. Differs from *coccinea* in the thorax being scarlet, the fore wing scarlet with the veins marked with black lines; the inner area blackish. Hind wing rather paler than the fore wing, the outer area broadly blackish. Tarsi white-ringed.

Hab. Sikkim. *Exp.* 28 millim.

Genus CEDEMATOPODA.

Cedematopoda, *Zell. Vet. Ak. Handl.* 1852, p. 96 (1854).

Atkinsonia, *Stainton, Trans. Ent. Soc.* v, p. 125 (1859).

Type, *C. princeps*, Z., from Natal.

Range. Japan; India; Natal.

Antennæ with the median segments fringed with scales; palpi very long and slender. Wings pointed; fore wing with vein 1 forked at the base, 2 given off before the end of cell; hind wing with vein 1 a short, the lower angle of cell rounded. Legs, especially the hind legs, with the spurs tufted.

399. *Cedematopoda clerodendronella*, *Staint. Trans. Ent. Soc.* v, p. 125; *Wlsm. Trans. Ent. Soc.* 1889, p. 21, pl. vi, fig. 7; C. § 8. no. 4940.

Head and frons purple; palpi with the second joint orange, the third purple. Antennæ purple-black. Fore wing brilliant coppery red. Hind wing reddish orange; the cilia of both wings greyish.

Thorax coppery red; abdomen blue-black, with a narrow white medial band. Legs black with white spots.

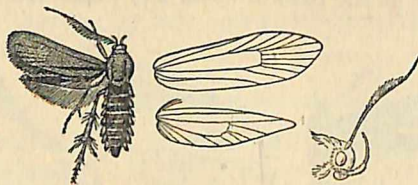


Fig. 134.—*Edematopoda clerodendronella*, ♂. $\frac{2}{1}$.
(From Walsingham, Trans. Ent. Soc. 1889, pls. iv. & vi.)

Larva dirty brown; the head reddish brown; the first somite black. Feeds on *Clerodendron*, drawing together the tops with a web.

Hab. Calcutta. Exp. 13–14 millim.

Genus ERETMOCERA.

Eretmocera, Zell. *Vet. Ak. Handl.* 1852, p. 96 (1854).

Staintonia, Stgr. *Stettin. ent. Zeit.* xx, p. 250 (1859).

Exodomorpha, Wlk. *Cat.* xxix, p. 833 (1864).

Castorura, Meyr. *Proc. Linn. Soc. N. S. W.* ser. 2, i, p. 1047 (1887).

Type, *E. fuscipennis*, Zell., from S. Africa.

Range. Africa; India; Australia.

Antennæ as in *Edematopoda*; the third joint of palpi not quite so long. The upper angle of cell of both wings produced; fore wing with vein 1 *b* not forked, 6 absent; hind wing with vein 1 *b* not forked. Legs without tufts of scales.

400. *Eretmocera impactella*, Wlk. *Cat.* xxix, p. 637; *Wlsm. Trans. Ent. Soc.* 1889, p. 34, pl. vi, fig. 18; *C. & S.* no. 4939.

Head and thorax cupreous; collar, tegulæ, metathorax, and abdomen yellow, the latter with the second, third, and terminal

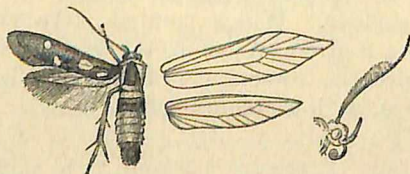


Fig. 135.—*Eretmocera impactella*, ♂. $\frac{2}{1}$.
(From Walsingham, Trans. Ent. Soc. 1889, pls. v. & vi.)

segments cupreous. Fore wing cupreous, with four yellow spots. Hind wing paler.

Hab. N.E. India. Exp. 15 millim.

Family SYNTOMIDÆ.

Small or medium-sized moths of semi-diurnal habit; the palpi small and porrect. Antennæ simple, ciliated, or pectinated, with

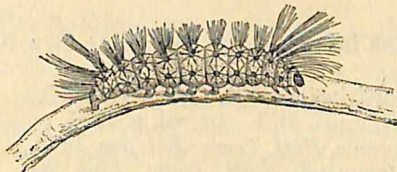


Fig. 136.—Larva of *Euchromia polymena*. $\frac{1}{2}$.
(From Moore, Lep. Ceyl. ii, pl. 94, fig. 6 a.)

short dilated branches; spurs on tibiæ always short or wanting. Fore wing with vein 1 *b* forked at the base, 1 *c* absent. Hind wing with vein 8 obsolete, its position indicated by a slight fold.

Larva: short and cylindrical, with thick, close, or sparse tufts of hair.

Cocoon silken and closely woven.

Key to the Genera.

- a. Hind wing with vein 6 wanting; vein 2 present.
 - a'. Hind wing with vein 5 absent.
 - a². Abdomen with the distal segments not dilated and hairy; fore wing with vein 7 present.
 - a³. Fore wing with vein 3 from before end of cell; 4 and 5 not stalked. [p. 209.]
 - a⁴. Hind wing with vein 3 wanting .. 1. SYNTOMOIDES,
 - b⁴. Hind wing with vein 3 present.
 - a⁵. Hind tibia with two pairs of spurs. 2. SYNTOMIS, p. 212.
 - b⁵. Hind tibia with one pair of spurs; fore wing broader and more rounded. 3. CALLITOMIS, p. 224.
 - b³. Fore wing with vein 3 from end of cell; 4 and 5 stalked. 4. TRICHÆTA, p. 225.
 - b². Abdomen with the distal segments dilated and hairy; fore wing with vein 7 absent. 5. PSICHOTOË, p. 225.
- b'. Hind wing with vein 5 present 6. NACLIA, p. 226.
- b. Hind wing with vein 6 present, vein 2 absent . 7. EUCHROMIA, p. 226.

Genus SYNTOMOIDES, nov.

Type, *S. imaon*, Cram.

Range. Throughout India, Ceylon, and Burma to Malacca and Sumatra.

Mid tibiæ with one pair of minute spurs, hind tibiæ with two pairs. Fore wing with vein 3 from before end of cell, 4 and 5 from the end. Hind wing with vein 3 absent.

SECT. I. Antennæ almost simple in both sexes.

A. *Abdomen with two bands.*

401. **Syntomoides imacon**, *Cram. Pap. Exot.* iii, p. 94, pl. 248 E; *C. & S.* no. 245.

Syntomis approximata, *Wlk. Cat.* xxxi, p. 79.

Syntomis fusiformis, *Wlk. Cat.* vii, p. 1595.

Syntomis sargania, *Butl. Trans. Ent. Soc.* 1879, p. 4; *C. & S.* no. 259.

Syntomis cupreipennis, *Butl. Journ. Linn. Soc., Zool.* xii, p. 347; *C. & S.* no. 229.

Syntomis mota, *Swinh. Trans. Ent. Soc.* 1891, p. 134.

Frons and collar yellow; metathorax with a yellow streak; abdomen with the first yellow band sometimes obsolescent. Fore wing

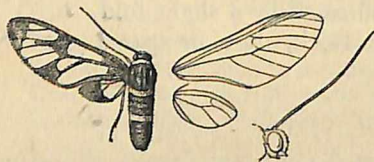


Fig. 137.—*Syntomoides imacon*, ♂. †. with the hyaline patches large, one filling the cell, another nearly the whole interno-median interspace, one at junction of veins 2 and 3, two subapical and two submarginal; in some specimens there is a long streak between veins 5 and 6, which is the form named *S. sargania*, in others it is reduced to a spot, and in others entirely wanting. Hind wing with a subbasal hyaline patch extending hardly, or not at all, beyond the cell. Tips of antennæ and proximal joints of tarsi white. The spots of the fore wing vary considerably in size.

Hab. Sikhim; Khási Hills; and throughout the plains of India, Ceylon, and Burma; Sumatra. *Exp.* 34 millim.

402. **Syntomoides godartii**, *Boisd. Mon. Zyg.* p. 115, pl. 7, fig. 3; *C. & S.* no. 241.

Syntomis fytchei, *Moore, P. Z. S.* 1871, p. 246; *C. & S.* no. 239.

Syntomis artina, *Butl. Journ. Linn. Soc., Zool.* xii, p. 347; *C. & S.* no. 221.

Similar to *imacon*, except that the frons is yellowish or dirty white. Fore wing with the spot between veins 5 and 6 never present. Hind wing hyaline, with narrow black margins.

Hab. Sikhim; Khásis; Nágas; Manipur; Yunnan; Bengal; Ceylon; Coromandel; Malacca. *Exp.* 32 millim.

403. **Syntomoides hydatina**, *Butl. Journ. Linn. Soc., Zool.* xii, p. 346; *C. & S.* no. 244.

♀. Differs from *imacon* in the markings of the fore wing being

reduced to two widely-separated spots in the interno-median interspace, a small subapical and two small submarginal spots.

The last two may possibly be varieties of *imaon*.

Hab. Calcutta; Central India. *Exp.* 24 millim.

B. *Abdomen with five yellow bands.*

404. *Syntomoides hyalina*, *Moore, Lep. Atk.* p. 13; *C. & S.* no. 243.

♀. Frons white; antennæ black with white tips; collar and thorax black; abdomen with the distal segments steel-blue. Fore wing hyaline, with the veins black; the margins narrowly black, widest at apex and centre of inner margin. Hind wing hyaline, with costa and outer margin broadly black, the latter dentate near vein 2; inner margin orange. Tarsi black.

Hab. Sikkim; Nāga Hills. *Exp.* 40 millim.

405. *Syntomoides volans*, *Swinh. Trans. Ent. Soc.* 1890, p. 173, pl. vi, fig. 6.

♀. Differs from *hyalina* in the frons being grey-brown and the tips of antennæ not white.

Hab. Karen Hills. *Exp.* 30 millim.

SECT. II. Antennæ bipectinated in male, the branches short and dilated distally, serrated in female.

A. *Abdomen with two yellow bands in male, one in female.*

406. *Syntomoides incipiens*, *Wlk. Cat.* xxxi, p. 68; *C. & S.* no. 266.

♂. Black; the frons, collar, and tegulæ yellow. Fore wing with a subbasal, two medial, one subapical, and two submarginal hyaline spots. Hind wing with a subbasal joined to a submarginal spot. Tarsi black.

♀ with the end of abdomen dilated and with a tuft of ochreous hairs.

Hab. S. India and Kanthalla, Ceylon. *Exp.* 17 millim.

B. *Abdomen with one basal yellow band in both sexes.*

407. *Syntomoides brachypecten*, *Hmps. Ill. Het.* ix, ined., pl. 157, fig. 23.

♂. Differs from *incipiens* in having the collar and tegulæ black.

Hab. Anuradhapura, Ceylon. *Exp.* 14 millim.

C. Each segment of abdomen fringed with yellow.

408. **Syntomoides microchilus**, n. sp.

Head, thorax, and abdomen brown; collar, tegulæ, and meta-thorax yellow; each segment of abdomen fringed with yellow. Frons yellow; legs brown; antennæ white at tips. Fore wing hyaline; a narrow, discocellular, brown band; margins narrowly brown; the outer marginal band widest from apex to vein 5 and between veins 2 and 3. Hind wing hyaline, with narrow brown margins.

Hab. Tenasserim Valley (*Doherty*). *Exp.* 20 millim. Type in coll. Druce.

Genus **SYNTOMIS**.

Syntomis, *Ochs. Eur. Schmett.* ii. p. 103 (1808).

Hydrusa, *Wlk. Cat.* i. p. 255 (1854).

Eressa, *Wlk. Cat.* i. p. 149 (1854).

Trianeura, *Butl. Journ. Linn. Soc., Zool.* xii, p. 353 (1876).

Type, *S. phegea*, Cram., from Europe.

Range. Europe; the whole of Africa and Asia; Borneo; Sumatra; Java; Australia.

Differs from *Syntomoides* in having vein 3 of the hind wing present.

Larva thickly covered with hair; the cocoon hairy.

SECT. I. Antennæ almost simple in both sexes.

A. *With one yellow band to abdomen on sixth segment.*

409. **Syntomis unifascia**, n. sp.

♀. Frons white. Black shot with blue. Wings with the spots small. Fore wing with one subbasal, two medial, one subapical, and two submarginal hyaline spots. Hind wing with one subapical spot; tarsi black.

Hab. Sikhim. *Exp.* 34 millim. Type in B. M.

B. *Abdomen with two yellow bands.*

1. *The frons yellow.*

410. **Syntomis atkinsoni**, *Moore, P. Z. S.* 1871, p. 245, pl. 18, fig. 2;
C. & S. no. 223.

Collar black; a yellow patch on metathorax. Fore wing with one subbasal, two medial, two subapical, and two submarginal hyaline spots. Hind wing with a large basal hyaline spot; the inner margin yellow. Tips of antennæ and first tarsal joints white.

Hab. Sikhim; Cachar; Yunnan; Burma; Tenasserim. *Exp.* 30 millim.

411. *Syntomis bicincta*, Koll. H $\ddot{u}$ gel's *Kaschmir*, iv, p. 460, pl. 19, fig. 8; *C. & S.* no. 226.

Collar black. Fore wing as in *atkinsoni*, except in having but one subapical spot. Hind wing with a subapical spot as well as subbasal. The spots of both wings are somewhat variable in size.

Hab. Kulu; Kangra; Sikhim; Khási Hills. *Exp.*, ♂ 30, ♀ 40 millim.

412. *Syntomis cyssea*, Cram. *Pap. Exot.* iv, p. 124, pl. 355 B; *C. & S.* no. 230.

Syntomis schœnerrii, Boisd. *Mon. Zyg.* p. 112, pl. 7, fig. 1.

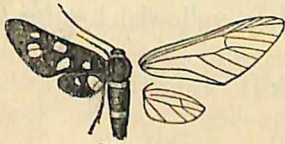


Fig. 138.

Syntomis cyssea, ♂. $\frac{1}{2}$ of fore wing.

Hab. Himalayas, from Kangra to Sikhim; Continental India and Ceylon. *Exp.* ♀ 32 millim.

Collar yellow. The spots of both wings usually smaller than in *bicincta*, and often yellowish and with an extra spot between the two medial ones of fore wing. In some specimens there is a small patch of white cilia near the apex of fore wing.

413. *Syntomis minor*, Warren, *P. Z. S.* 1888, p. 294; *C. & S.* no. 252 A.

♂. Wings with the hyaline spots very small. Fore wing with one subbasal, two medial, one subapical, and two submarginal spots. Hind wing with subbasal and subapical spots.

Hab. Punjab. *Exp.* 20 millim.

414. *Syntomis insueta*, Swinh. *Cat. Het. Mus. Oxon.* p. 41.

♀. Wings shot with copper. Fore wing with only two hyaline spots, one in the cell, one in interno-median interspace. Hind wing with a subbasal spot.

Hab. Barrackpore. *Exp.* 32 millim.

2. The frons black.

415. *Syntomis georgina*, Butl. *Journ. Linn. Soc., Zool.* xii, p. 345; *C. & S.* no. 240.

Syntomis cysseoides, Butl. *Journ. Linn. Soc., Zool.* xii, p. 346; *Moore, Lep. Ceyl.* ii, p. 35, pl. 95, fig. 1; *C. & S.* no. 231.

Similar to *cyssea* except for the black frons. The spots vary considerably in size.

Hab. N.W. Himalayas; Continental India and Ceylon. *Exp.* 22-32 millim.

416. **Syntomis albapex**, *Hmps. Ill. Het.* ix, ined., pl. 157, fig. 1.

♂. Fore wing with only two hyaline spots, one in interno-median interspace, one between veins 3 and 4; cilia conspicuously white below the apex. Hind wing with the two hyaline spots small.

Hab. Ceylon. *Exp.* 34 millim.

417. **Syntomis gelatina**, *Hmps. Ill. Het.* viii, p. 43, pl. 139, fig. 1.

♀. Fore wing with a hyaline patch filling the cell, another the interno-median interspace; two large subapical, and three sub-marginal spots. Hind wing hyaline, with black margins; a black streak running up vein 2.

This species has the greater part of the wings yellowish hyaline, the veins black.

Hab. Nilgiris, 6000 feet. *Exp.* 26 millim.

C. Abdomen with two yellow bands and lateral spots on the intermediate segments.

418. **Syntomis extensa**, *Wlk. Cat.* xxxv, p. 1863; *C. & S.* no. 237; *Hmps. Ill. Het.* viii, pl. 143, fig. 14.

Frons and collar brown. Wings brown; the fore wing much elongated with an oblique series of hyaline spots, one subbasal below median nervure, one filling the end of cell, sometimes with a small one below it, and two beyond the cell (in the Bombay specimen only one). Hind wing with a subbasal spot. Antennæ tipped with white; tarsi not white.

Hab. Nilgiris, 6000–7000 feet; Bombay; Matheran; Mahableshwar. *Exp.* 42–50 millim.

419. **Syntomis lucina**, *Butl. Journ. Linn. Soc., Zool.* xii, p. 345; *C. & S.* no. 250.

Frons yellow. Antennæ tipped with white; first joint of tarsi white. Only differs from *bicincta* in the yellow lateral spots to abdomen; in the Sikhim specimen the lateral pair of spots is expanded into a complete band on the segment next the second abdominal band.

Hab. Sikhim; Nepal. *Exp.* 34 millim.

420. **Syntomis khasiana**, *Butl. Journ. Linn. Soc., Zool.* xii, p. 345; *C. & S.* no. 246.

Differs from *lucina* in the tegulæ being yellow; the end of the abdomen bluish; the hyaline spots of wings not yellowish.

Hab. Khási Hills. *Exp.*, ♂ 30, ♀ 36 millim.



D. *Abdomen with four yellow bands ; the second and last three segments being without bands.*

The frons yellow.

421. **Syntomis flavifrons**, n. sp.

♂. Collar and tegulæ yellow. Wings marked as in *bicincta*, but for the lower medial spot of the fore wing being larger and squarer. Tips of antennæ and first joint of tarsi white.

Hab. Momeit, Burma, 2000 feet, June (*Doherty*). *Exp.* 34 millim. Type in coll. Elwes.

422. **Syntomis quadrifascia**, n. sp.

♀. Collar and thorax black. Fore wing with the hyaline spots very large—one filling the whole cell, another almost the whole interno-median interspace; one long subapical streak, and two submarginal ones. Hind wing hyaline, with the veins and margins black; a black streak running up vein 2. Tarsi black.

Hab. Bernardmyo, Burma, 6000 feet, May (*Doherty*). *Exp.* 38 millim. Type in coll. Elwes.

E. *Abdomen with six yellow bands ; the last two segments without bands.*

1. *The frons white.*

423. **Syntomis divisa**, *Wlk. Cat.* i, p. 131; *C. & S.* no. 236; *Butl. Ill. Het.* i, p. 16, pl. 6, fig. 14.

Syntomis disrupta, *Moore, P. Z. S.* 1878, p. 845, pl. 53, fig. 5; *C. & S.* no. 235.

Frons and genæ white; tegulæ yellow; yellow lateral spots on meso- and metathorax. Fore wing with the hyaline patch in the interno-median interspace broken up into two, sometimes three, spots; one or two subapical and three marginal spots. Hind wing with a large subbasal patch and a subapical one traversed by vein 3; this patch being sometimes small, sometimes large, and joined to the subbasal patch. Proximal joints of tarsi white; abdomen steel-blue.

The hyaline spots vary much in extent: in Sikhim specimens they are smallest, one having only one subapical spot to the fore wing; in examples from Sylhet they are larger; largest in Burmese specimens, this last being the form named *S. disrupta*, *Moore*.

Hab. Sikhim; Khásis; Sylhet; Burma. *Exp.* 36–40 millim.

424. **Syntomis masoni**, *Moore, P. Z. S.* 1878, p. 845, pl. 53, fig. 4; *C. & S.* no. 251.

Differs from *divisa* in having the collar yellow; the interno-

median hyaline patch of fore wing entire; the black border of hind wing not dentate at vein 2.

Hab. Upper Tenasserim. *Exp.* 50 millim.

425. **Syntomis diaphana**, *Koll. Hügel's Kaschmir*, iv, p. 460, pl. 19, fig. 7.

Syntomis ænone, *Butl. Journ. Linn. Soc., Zool.* xii, p. 344; *C. & S.* no. 256.

Collar, tegulæ, and metathorax yellow. Fore wing with the interno-median hyaline patch unbroken; two subapical streaks, one between veins 5 and 6; and three submarginal streaks. Hind wing with a large hyaline patch crossed by veins 1, 2, and 3; the margins black.

Hab. Almorah; Mussooree; Kashmir; Sibságar; Burma. *Exp.* 48 millim.

426. **Syntomis melæna**, *Wlk. Cat.* i, p. 133; *C. & S.* no. 252; *Butl. Ill. Het.* i, p. 17, pl. 6, fig. 10.

Two yellow streaks on vertex of thorax; the first four abdominal bands white; otherwise similar to *diaphana*.

Hab. ? Simla; Nepal; Sikkim; Khásis; Assam; Shillong; Burma. *Exp.*, ♂ 50, ♀ 58 millim.

427. **Syntomis albifrons**, *Moore, P. Z. S.* 1878, p. 845, pl. 53, fig. 6; *C. & S.* no. 218.

♀. Tegulæ and streaks on vertex of thorax white; bands on metathorax and abdomen yellow; the first four abdominal bands narrow. Wings shot with purple. Fore wing with the hyaline patch in interno-median interspace not extending to near outer margin; only a small spot between veins 2 and 3, and the subapical and submarginal spots smaller than in *diaphana* and *melæna*.

Hab. Momeit, Burma; Tenasserim. *Exp.* 60 millim.

2. *The frons yellow.*

428. **Syntomis discinota**, *Moore, Lep. Atk.* p. 13; *C. & S.* no. 234.

♂. Frons pale yellow; collar, tegulæ, meso- and metathorax spotted with yellow; abdomen with the bands incomplete on the vertex; the black parts shot with green; wings yellowish hyaline; the veins and margins narrowly black; the outer black margin dentated at vein 2 of both wings. First joint of tarsi white.

In this species veins 5 and 6 of the fore wing are very close together, as also in *sladeni*, *divisa*, and others; but as, in closely allied species, there is every gradation between the extremes of separation and approximation, this point is of no use in classifica-

tion ; and in the same way the closeness with which vein 4 of the hind wing approaches the costa differs in allied forms.

Hab. Khási Hills ; Tenasserim. *Exp.* 40 millim.

429. **Syntomis fervida**, *Wlk. Cat. i*, p. 131 ; *C. & S.* no. 238 ; *Butl. Ill. Het. i*, p. 18, pl. 6, fig. 16.

♀. Frons orange ; the yellow markings on thorax and abdomen larger and brighter, the latter being nearly complete on the vertex. Wings with the base and inner margin orange ; the hyaline parts darker yellow than in *discinota* ; veins 5 and 6 of fore wing not so close together, and in some specimens with a black mark between them at their bases. First joint of tarsi white.

Hab. Eastern Pegu ; Moulmein. *Exp.* 36–44 millim.

430. **Syntomis newara**, *Moore, Lep. Atk.* p. 12 ; *C. & S.* no. 254.

♀. Bands of abdomen quite complete on vertex. Wings as in *fervida*, but not marked with orange at the base and inner margin. Fore wing with veins 5 and 6 far apart ; a black band on the discocellulars ; the black margin uneven, and running inwards at veins 2 and 3, and 5 and 6. Hind wing with the black margin very narrow. Legs almost entirely yellow ; tarsi not white.

Hab. Bhutan ; Sikhim. *Exp.* 44 millim.

F. *Abdomen with a yellow band on each segment.*

1. *The tip of abdomen yellow.*

a. *Frons brown.*

*431. **Syntomis lepcha**, *Moore, Lep. Atk.* p. 12 ; *C. & S.* no. 248.

Collar and four thoracic stripes yellow ; abdominal bands narrow ; tip reddish. Wings yellowish hyaline ; veins and cilia black. Fore wing with an elongated black hexagonal streak at the end of cell and short apical marginal band dilated and ending at vein 6. Hind wing with marginal black band decreasing from apex. Tarsi not white.

Hab. Sikhim. *Exp.* 25 millim.

b. *The frons yellow.*

432. **Syntomis sladeni**, *Moore, P. Z. S.* 1871, p. 245, pl. 18, fig. 5 ; *C. & S.* no. 261.

Collar, tegulæ, meso- and metathorax yellow. Wings as in *discinota*. Tarsi white.

Hab. Yunnan ; Bernardmyo, Burma ; E. Pegu. *Exp.* 36 millim.



433. *Syntomis grotei*, Moore, *P. Z. S.* 1871, p. 245, pl. 18, fig. 4;
C. & S. no. 242.

♂. Similar to *sladeni*, but fore wing with a black band across the interno-median hyaline space; the spot between veins 2 and 3 not approaching the outer margin, and no streak between veins 5 and 6.

Hab. Yunnan; Upper Tenasserim. *Exp.* 36 millim.

434. *Syntomis vitrea*, *Wlk. Cat.* vii, p. 1594; *C. & S.* no. 270.
Syntomis austeni, Moore, *P. Z. S.* 1879, p. 389; *C. & S.* no. 224.

♀. Differs from *sladeni* in veins 2 and 3 of fore wing arising and running close together for their whole length, and the interspace between 5 and 6 being wholly filled in by black; the hyaline parts of both wings yellowish.

S. davidi, Pouj., from Tibet, only differs from this species in veins 2 and 3 of fore wing not arising close together.

Hab. N.E. Bengal; Sylhet. *Exp.* 40 millim.

435. *Syntomis submarginalis*, *Wlk. Char. undescr. Het.* p. 89;
C. & S. no. 262.

Similar to *grotei*, except that the fore wing has yellow streaks along the costa and inner margin, and both wings have yellow marks beyond the submarginal hyaline spots; these yellow marks are much more extensive in Sikhim specimens than in the Burmese one.

Hab. Sikhim, 4000 feet; Bernardmyo, Burma, 6000 feet. *Exp.* 36 millim.

436. *Syntomis tigrina*, *Wlk. Cat.* xxxi. p. 71.

♂. Fore wing elongated. Hind wing with the inner margin expanded into a large lobe. Wings entirely yellow, with the cilia of both wings and veins of fore wing black. Marks on head, thorax, and abdomen as in preceding species.

Hab. Burma; Cambodia. *Exp.* 36 millim.

437. *Syntomis chlorocera*, n. sp.

♂. Antennæ wholly yellow and thickly scaled above. Fore wing with no subbasal spot, two large medial spots, one small subapical and a double submarginal spot. Hind wing with the subbasal joined to the subapical spot and tinged with yellow. Tibiæ and tarsi banded with yellow.

Hab. Naga Hills. *Exp.* 20 millim. Type in coll. Elwes.

2. *Abdomen with the tip black.*

a. *The frons yellow.*

438. *Syntomis luteifascia*, n. sp.

♂. Collar orange; orange spots on meso-, meta-, and vertex of

thorax ; abdomen with broad orange bands. The hyaline spots of both wings large, one filling the cell, one subbasal in the interno-median interspace, two subapical and four submarginal; the one between veins 5 and 6 minute and near the outer margin. Hind wing with some orange on inner margin; the subbasal and subapical hyaline spots connected together.

Hab. Nāga Hills. *Exp.* 32–36 millim. Type in coll. Elwes.

439. **Syntomis berinda**, *Moore*, *P. Z. S.* 1878, p. 845, pl. 53, fig. 8; *C. & S.* no. 225.

♂. Collar, tegulae, and metathorax spotted with orange; abdomen with narrow orange bands. Fore wing with five hyaline spots—one subbasal, two medial, one subapical, and a double submarginal one. Hind wing with a large hyaline yellow-tinged spot occupying the greater part of the wing.

Hab. Upper Tenasserim. *Exp.* 30 millim.

440. **Syntomis huebneri**, *Boisd. Mon. Zyg.* p. 127, pl. 8, fig. 4; *C. & S.* no. 296.

Syntomis marsdeni, *Moore, Lep. E. I. Co.* ii, p. 323.

Syntomis xanthomela, *Wlk. Journ. Linn. Soc.* iii, p. 184.

Syntomis contermina, *Wlk. Cat.* xxxi, p. 78.

Collar, tegulae, and metathorax orange; abdominal orange bands broad. Fore wing with one subbasal, two medial, one or two subapical, and two submarginal hyaline spots. Hind wing with a large basal hyaline patch tinged with yellow towards inner margin, and two minute subapical spots.

Hab. Bombay; Singapore; Java; C. York. *Exp.* 22 millim.

441. **Syntomis wimberleyi**, *Swinh. P. Z. S.* 1889, p. 400, pl. 43, fig. 1.

♀. Collar, tegulae, and metathorax yellow; abdominal yellow bands rather narrow. Wings marked as in *berinda*, but yellow not hyaline.

Hab. Andamans. *Exp.* 28 millim.

b. *The frons dark.*

442. **Syntomis passalis**, *Fabr. Sp. Ins.* ii, p. 159; *C. & S.* no. 257.

Syntomis creusa, *Cram. Pap. Exot.* iii, p. 94, pl. 248 f; *Boisd. Mon. Zyg.* p. 121, pl. 7, fig. 7.

Syntomis montana, *Butl. Journ. Linn. Soc., Zool.* xii, p. 349; *C. & S.* no. 253.

Some traces of orange-red on vertex of thorax; bands of abdomen orange-red and rather narrow. Wings black, shot with purple. Fore wing with some orange-red at base and along inner margin; the hyaline spots small, one subbasal, two medial, one subapical, and two submarginal. Hind wing with one small submarginal spot.



The form *montana* has all the spots rather larger, the two in the interno-median interspace of the fore wing being almost joined.

Hab. Assam and throughout Continental India and Ceylon.
Exp. 40 millim.

443. *Syntomis formosæ*, *Butl. Journ. Linn. Soc., Zool.* xii, p. 346.
Syntomis emma, *Butl. Journ. Linn. Soc., Zool.* xii, p. 350.

Collar yellow; thorax black; abdominal yellow rings narrow. Fore wing with one subbasal, two medial, one or two subapical, and a double submarginal rather small hyaline spot. Hind wing with the large subbasal joined to the subapical spot.

Hab. China; Formosa; Margarita, Assam; E. Pegu, 2000 feet.
Exp., ♂ 26, ♀ 28 millim.

444. *Syntomis eressoides*, n. sp.

♀. Collar yellow; thorax black; abdomen with the yellow bands rather narrow. Fore wing hyaline, with a black discocellular band; veins and margins black; outer black margin broad from apex to vein 5, and dentate at vein 2. Hind wing hyaline, with the veins and margins black; apex broadly black.

Hab. Momeit, Burma. *Exp.* 28 millim. Type in coll. Elwes.

c. *The frons white.*

445. *Syntomis cherria*, *Moore, Lep. Atk.* p. 12; *C. & S.* no. 228.

♂. Brownish black, pro- and metathorax with an orange spot on each; abdomen with an orange band on each segment. Fore wing with a long hyaline streak in the cell; another below it; two subapical and two submarginal streaks. Hind wing hyaline, with the apex and outer margin dark.

Hab. Khâsi Hills. *Exp.* 36 millim.

SECT. II. (*Hydrusa*). Antennæ serrated in male, and simple in female.

446. *Syntomis multigutta*, *Wlk. Cat.* i, p. 134; *C. & S.* no. 268; *Butl. Ill. Het.* i, pl. 7, fig. 3.

Head, vertex of thorax, and spots on vertex and sides of abdomen blue-black in male, black in female; collar, tegulæ, and abdomen scarlet. Wings yellow hyaline; the veins and margins black.

In some specimens the black on apex of fore wing and outer margin of hind wing is broad, and every gradation to a narrow, even, marginal band to both wings is found.

Hab. Nepal; Sikkim; Tibet; Burma. *Exp.*, ♂ ♀, 25-26 millim.

447. *Syntomis blanchardi*, *Pouj. Bull. Soc. Ent. Fr.* 1884, p. cxxxvi.

♂. Differs from *multigutta* in the thorax having paired pale streaks on each side of the vertex; the ground-colour of abdomen pale, crimson towards the apex below. Wings with the hyaline parts not yellowish. Fore wing with the outer margin excurved from veins 2 to 5; a broad black band on the discocellulars; the apical black band extending down to vein 4, and sending a tooth inwards along vein 5. Hind wing with the apical band rather narrow and extending only to vein 2.

Hab. China; Sikkim. *Exp.* 24 millim.

448. *Syntomis nigra*, n. sp.

♂. Head, thorax, and abdomen black; collar and abdominal segments slightly fringed with yellow; two slight yellow streaks on metathorax. Fore wing hyaline; the veins and margins narrowly black; a broad black band on discocellulars; the interspace between veins 5 and 6 black; a black marginal patch from the apex to vein 4. Hind wing hyaline; the veins and margins narrowly black; a large black apical patch.

Hab. Simla (*Harford*). *Exp.* 25 millim. Type in B. M.

449. *Syntomis serrata*, n. sp.

Antennæ with distal part white above; frons, tegulæ, and metathorax yellow; abdomen greenish black, with yellow bands on the first six segments. Wings hyaline, with the veins and margins black. Veins 3 and 4 of hind wing arise from a point at lower angle of cell.

This species bears a great resemblance to *divisa*, the hyaline patch in the interno-median interspace is unbroken, and a black streak between veins 5 and 6 present.

Hab. Khási Hills (*Elwes*). *Exp.* 38 millim. Type in coll. Elwes.

SECT. III. (*Eressa*). Antennæ bipectinate in male, the branches short and dilated distally; serrate in female.

A. *The bands on abdomen yellow.*

450. *Syntomis aperiens*, *Wlk. Cat.* xxxi, p. 68; *C. & S.* no. 220.

Syntomis lydia, *Swinh. Trans. Ent. Soc.* 1891, p. 134, pl. viii, fig. 7.

Trianeura moorei, *Butl. Journ. Linn. Soc., Zool.* xii, p. 354; *C. & S.* no. 271.

Black; abdomen with a basal yellow band; female with an ochreous anal tuft. Fore wing with the hyaline patches large; a spot in cell; an elongate patch in interno-median interspace; one between veins 2 and 3; two subapical; two submarginal. Hind wing with a hyaline patch below and beyond the cell crossed by veins 2 and 3.



In the form *lydia* the spots of the fore wing are all run together, and the hind wing is wholly hyaline except for narrow black margins.

Hab. Nilgiris, 3000 to 7000 feet. *Exp.*, ♂ 24, ♀ 28 millim.

451. *Syntomis ochreipuncta*, n. sp.

♂. Dark brown; head and tegulæ yellow; abdomen with two yellow bands and lateral yellow spots on the intermediate segments. Fore wing with one subbasal, two medial, one small subapical, and two small submarginal ochreous spots. Hind wing with a large ochreous patch on the disk. First joint of tarsi yellow.

Hab. Ganjam. *Exp.* 18 millim. Type in coll. Elwes.

452. *Syntomis baiæa*, *Swinh. Trans. Ent. Soc.* 1891, p. 473, pl. 19, fig. 10.
Syntomis actea, *Swinh. Trans. Ent. Soc.* 1891, p. 474, pl. 19, fig. 7.

♂. Frons, collar, tegulæ, a spot on vertex of thorax and metathorax yellow; abdomen with seven yellow bands, the last segment blue-black; antennæ white at tips. Fore wing hyaline; the veins, margins, a broad discocellular band running inwards between veins 5 and 6, black; the black margin expanded between veins 2 and 3 and a black streak along vein 3. Hind wing hyaline, yellow on inner margin; veins narrowly black, costa and outer margin broadly so.

♀ with a large yellow patch on last segment of abdomen.

In the form *actea* nearly the whole interspace between veins 5 and 6 of the fore wing is black, the distance between these veins being variable.

Hab. Khási Hills. *Exp.*, ♂ 34, ♀ 40 millim.

453. *Syntomis era*, *Swinh. Trans. Ent. Soc.* 1891, p. 473, pl. 19, fig. 15.

♀. Differs from *baiæa* in having two yellow streaks on vertex of thorax; no yellow patch on last segment of abdomen; the margins narrowly black, the outer margin rather broadly and irregularly so; the veins yellow, some yellow within the black margins; a black lunule on discocellulars. Hind wing with the veins and margins yellow; the outer margin black, decreasing in width from apex to anal angle.

Hab. Khási Hills. *Exp.* 50 millim.

454. *Syntomis musa*, *Swinh. P. Z. S.* 1885, p. 290, pl. 20, fig. 1; *C. & S.* no. 274.

Eressa politula, *Swinh. Cat. Het. Mus. Oxon.*, ined.

Dull black; a large yellow spot on prothorax and streak on metathorax; abdomen with yellow spots on vertex and sides of



each segment; female with an ochreous anal tuft. Fore wing with a hyaline spot in cell; one in interno-median interspace, and one in each marginal interspace. Hind wing with a hyaline patch on disk, divided into four by the veins.

Hab. Kangra; Nāga Hills; Bombay; Nilgiris; Ceylon; Burma.
Exp., ♂ 26, ♀ 34 millim.

455. *Syntomis confinis*, *Wlk. Cat. i*, p. 149; *C. & S. no.* 273.

♂. Differs from *musa* in the tip of antennæ being white; in having no yellow streak on the metathorax, and the hyaline patch in the interno-median interspace of fore wing extending to near outer margin.

Hab. Almora; Kulu. *Exp.* 24 millim.

456. *Syntomis subaurata*, *Wlk. Cat. i*, p. 149; *C. & S. no.* 275; *Moore, Lep. Ceyl. ii*, p. 36, pl. 95, fig. 4.

Differs from *musa* in being smaller, and in the interno-median hyaline patch of fore wing extending to near base of wing.

Hab. Ceylon and ? Calcutta. *Exp.* 20 millim.

457. *Syntomis affinis*, *Moore, P. Z. S. 1877*, p. 596, pl. 59, fig. 3; *C. & S. no.* 272.

♂. Ground-colour darker than in preceding three species; the spot and streak on thorax bright orange; spots of fore wing smaller, and in hind wing reduced to a small spot beyond the cell.

Hab. Andamans; ? Travancore, Calcutta, and Khási Hills. *Exp.* 22 millim.

*458. *Syntomis aterea*, *Cram. Pap. Exot. iv*, p. 240, pl. 400 A; *C. & S. no.* 222.

♂. Abdomen with two yellow bands. Fore wing with minute subbasal and subapical, two small medial, and two small submarginal hyaline spots. Hind wing with a small subbasal spot.

This species may not be Indian.

Hab. Coromandel coast. *Exp.* ♂ about 20 millim.

B. *Abdomen with crimson bands.*

459. *Syntomis erythrosoma*, n. sp.

♂. Head and thorax black; collar and tegulæ pale crimson; abdomen greenish black, the basal and fifth segments banded with crimson, the intervening segments with ventral crimson bands. Wings hyaline, the veins and margins narrowly black; fore wing

with a black spot on discocellulars, and black marginal patches between veins 2 and 3, 5 and 6, and at apex.

Hab. Matelei, Burma (*Fea*). *Exp.* 22 millim. Type in Mus. Genova.

460. *Syntomis pectoralis*, *Wlk. Cat. i*, p. 133; *C. & S.* no. 258.

Black, with the frons, tegulæ, and tip of antennæ white; first three segments of abdomen crimson. Fore wing with a milky hyaline patch filling the greater part of the subbasal and medial areas; two subapical and two submarginal spots. Hind wing hyaline, with narrow black margins.

Hab. Moulmein; E. Pegu; Cambodia. *Exp.* 26 millim.

461. *Syntomis thoracica*, *Moore, A. M. N. H.* (4) xx, 1877, p. 343; *id. Lep. Ceyl.* ii, p. 38, pl. 95, fig. 7; *C. & S.* no. 304.

Differs from *pectoralis* in the pectinations of the male antennæ being longer; the frons and tegulæ black, and only the first two segments of the abdomen being crimson. Hind wing with the veins black.

Hab. Ceylon. *Exp.*, ♂ 26, ♀ 28 millim.

Genus CALLITOMIS.

Callitomis, *Butl. Journ. Linn. Soc., Zool.* xii, p. 351 (1876).

Type, *C. syntomoides*, *Butl.*

Range. Kashmir; Sikkim; Nāga Hills.

Antennæ with minute spines as well as cilia; hind tibiæ with a terminal pair of spurs only; wings much broader than in *Syntomis*.

462. *Callitomis syntomoides*, *Butl. Journ. Linn. Soc., Zool.* xii, p. 351; *C. & S.* no. 264.

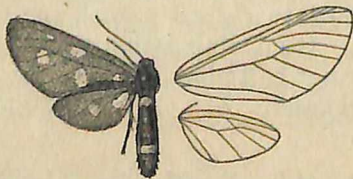


Fig. 139.—*Callitomis syntomoides*, ♂. †.

♂. Greenish black; abdomen with two orange bands. Fore wing with an obsolescent subbasal, two medial, one subapical, and one double submarginal ochreous spot. Hind wing with subbasal and submarginal spots.

Hab. Sind Valley, Kashmir; Simla. *Exp.* 34 millim.

463. *Callitomis leucosoma*, *Butl. Journ. Linn. Soc., Zool.* xii, p. 351; *C. & S.* no. 263.

♀. Head, thorax, and abdomen pale ochreous; antennæ and legs greenish black. Wings dull and semitransparent brown, marked as in *syntomoides*, except that the subbasal spot of hind wing is larger and ochreous; the spots of fore wing smaller and ochreous.

Hab. Kashmir. *Exp.* 30 millim.

464. *Callitomis multifasciata*, n. sp.

♂. Collar yellow; abdomen with a yellow band on each segment. Wings as in *leucosoma*, but duller, with the spots larger.

Hab. Sikkim; Nāga Hills. *Exp.* 29 millim. Type in coll. Elwes.

Genus TRICHÆTA.

Trichæta, *Swinh. Cat. Het. Mus. Oxon.* p. 52, *ined.*

Type, *T. teneiformis*, Wlk.

Range. N.W. Himalayas.

♂. Antennæ ciliated; tibiæ without spurs. Fore wing with vein 3 from end of cell, 4 and 5 stalked.

465. *Trichæta teneiformis*, *Wlk. Cat.* vii, p. 1595; *C. & S.* no. 269.



Fig. 140.—*Trichæta teneiformis*, ♂. 1.

♂. Black; collar, metathorax, and paired dorso-lateral spots on each segment of abdomen yellow. Fore wing with a hyaline spot in the cell; a long spot in interno-median interspace; a single subapical and two submarginal spots. Hind wing with a hyaline patch below the cell crossed by veins 2 and 3.

Hab. Simla. *Exp.* 21 millim.

Genus PSICHOTOË.

Psichotoë, *Boisd. Mon. Zyg.* p. 129 (1829).

Type, *P. duvauceli*, Boisd.

Range. Plains of N. India.

Antennæ serrated in male. Fore wing broad, the apex rounded; venation as in *Syntomis*. Abdomen with the distal segments dilated and hairy.

466. *Psychotoë duvauceli*, *Boisd. Mon. Zyg.* p. 129, pl. 8, fig. 5; *C. & S.* no. 265.



Fig. 141.—*Psychotoë duvauceli*, ♂. †.

♂. Head, thorax, and abdomen black, the last with two orange bands. Wings uniform fuscous hyaline.

Hab. Karáchi, Sind; Calcutta. *Exp.* 18 millim.

Genus **NACLIA**.

Naclia, *Boisd. Ind. Meth.* p. 60 (1840).

Dysauxes, *Hüb. Verz.* p. 171 (1818), gen. non descr.

Type, *N. ancilla*, Linn., from Europe.

Range. Europe; N.W. Himalayas.

Palpi slight and porrect. Antennæ simple. Mid tibia with one pair, hind tibia with two pairs of spurs. Venation as in *Syntomis*, except that vein 5 of the hind wing is present.

467. *Naclia punctata*, *Fabr. Sp. Ins.* ii, p. 207.

Naclia ancilla (var.), *Esp. Schmett. Eur.* pl. 85, fig. 3.

Head and thorax brown; collar and abdomen yellow, each segment of the latter with a black spot on vertex and ventral brown bands. Fore wing brown; a white spot at centre of cell, with a crescent-shaped spot below it; a postmedial spot below the costa, with a bifid spot below it on each side of vein 4. Hind wing yellow, with brown spots at base and end of cell; a broad irregular marginal brown band.

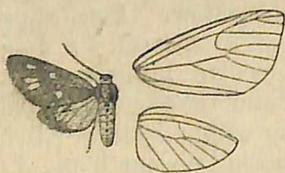


Fig. 142.

Naclia punctata, ♂. †.

Hab. Europe; Kashmir, 8000 feet. *Exp.* 28 millim.

Genus **EUCHROMIA**.

Euchromia, *Hüb. Verz.* p. 121 (1818).

Type, *E. sperchia*, Cram., from Ashanti.

Range. African, Indian, Malayan, and Australian regions.

Antennæ bipectinated in both sexes, more heavily in the male than the female. Palpi longer than in preceding genera. Mid and hind tibiæ with minute terminal pairs of spurs. Hind wing with vein 2 absent; veins 6 and 7 from the angle of cell or stalked.

SECT. I. Hind wing with veins 3 and 4 stalked.

468. *Euchromia magna*, Swinh. Trans. Ent. Soc. 1891, p. 133, pl. viii, fig. 1.

Blue-black; antennæ with the distal part white; abdomen with two yellow bands. Fore wing with a small subbasal, two large medial, one subapical, and two submarginal hyaline spots. Hind wing with a large basal hyaline patch crossed by the subcostal and median veins and a submarginal spot crossed by veins 4 and 6.

Hab. N. Canara; Trincomali, Ceylon. *Exp.* 44 millim.

SECT. II. Hind wing with veins 3 and 4 from angle of cell.

469. *Euchromia polymena*, Linn. Syst. Nat. i, pt. 2, p. 806; C. & S. no. 287; Moore, Lep. Ceyl. ii, pl. 94, figs. 6, 6a (larva).

Black; head with blue spot on the vertex; the frons white; tegulæ with a white spot; collar and 1st, 4th, and 5th abdominal segments crimson, the 2nd, 3rd, and 6th edged with metallic blue.

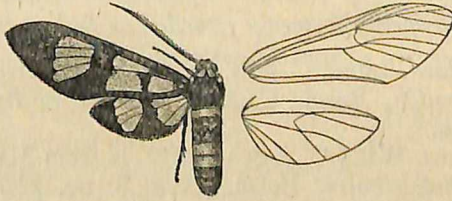


Fig. 143.—*Euchromia polymena*, ♂. †.

Fore wing with a basal metallic blue spot and two at end of cell; large orange subbasal, bifid medial, and quadrifid postmedial orange spots. Hind wing with trifid basal and quadrifid postmedial orange spots. Coxæ of fore legs and three spots on pectus white.

Larva reddish, with red tubercles; long anterior and posterior tufts of hair and shorter dense medial dorsal tufts: feeds on *Convolvulaceæ*. Pupa in a hairy cocoon.

Hab. Plains of India; Nágas; Malabar; Ceylon; Andamans; China; Penang; Ternate; Celebes. *Exp.*, ♂ 44, ♀ 52 millim.

470. *Euchromia orientalis*, Butl. Journ. Linn. Soc., Zool. xii. p. 364; C. & S. no. 286.

Euchromia fraterna, Butl. Journ. Linn. Soc., Zool. xii, p. 364; C. & S. no. 283 A.

Similar to *polymena*, but with the 6th abdominal segment also crimson, in the form named *fraterna* only edged with crimson.

A variety occurs which has the red collar and abdominal rings



turned to orange or yellow; the two yellow spots below the cell of the fore wing may be conjoined or separate.

Hab. Burma. *Exp.* 44–50 millim.

471. ***Euchromia laura***, *Butl. Journ. Linn. Soc., Zool.* xii, p. 364;
C. & S. no. 285.

♂. Differs from *orientalis* in having the tegulæ blue and no subbasal orange spot to fore wing.

The locality is doubtful, and it may not be Indian.

Hab. E. India? *Exp.* 50 millim.

- *472. ***Euchromia amœna***, *Moschl. Stettin. Ent. Zeit.* 1872, p. 350;
C. & S. no. 281.

♀. The 1st abdominal segment white, the 4th and 5th golden yellow. Fore wing with the subbasal yellow spot in interno-median interspace joined to the medial spot.

Nearest to the Javan *horsfieldi*, Moore, and possibly not Indian.

Hab. ? Sylhet. *Exp.* 44 millim.

The following species formerly recorded as Indian are omitted.

Syntomis cerbera, Linn., *C. & S.* no. 227, is S. African.

Syntomis latreillii, Boisd., *C. & S.* no. 247, is from Java and Amboina.

Syntomis libera, Wlk., *C. & S.* no. 249, is from Malacca.

Syntomis ochsenheimeri, Boisd., *C. & S.* no. 255, is from the Congo.

Syntomis siamica, Wlk., *C. & S.* no. 260, is from Siam.

Syntomis diptera, Fabr., *C. & S.* no. 233—Fore wing with five hyaline spots, hind wing with a yellow spot. *Hab.* E. India—is too vague for identification.

Euchromia creusa, Linn. = *thelebas*, Cram., *C. & S.* nos. 283, 290, is from Celebes, Ceram, Gilolo, Australia.

Euchromia rhebus, Cram., *C. & S.* no. 288, is African.

Euchromia siamensis, Butl., *C. & S.* no. 289, is not Indian.

Family ZYGÆNIDÆ.

Closely allied to the *Syntomidæ*, but distinguished by vein 1c of the fore wing being present, except in *Anomæotes*; vein 8 of the hind wing present and connected with 7 by a bar; veinlets in the cell of both wings generally present. Frenulum present, except in *Himantopterus*.

Larva short and cylindrical or fusiform.

Pupa in a silken cocoon.

Key to the Subfamilies.

- a.* Mouth-parts present.
a'. Antennæ not flabellate at tip 1. *Zygæninae*.
b'. Antennæ highly or somewhat flabellate at tip. 2. *Chalcosiinae*.
b. Mouth-parts wanting 3. *Phaudinae*.

Subfamily ZYGÆNINÆ.

Small or medium-sized moths, of semidiurnal habit and rather elongate narrow wings. Antennæ simple, ciliated, or pectinated,



Fig. 144.—Larva of *Zygæna filipendulæ*. †.

with short branches. Palpi short and porrect. Legs with the spurs almost always minute or wanting.

Larva short and cylindrical.

Pupa in a close-woven silken cocoon.

Key to the Genera.

- a.* Antennæ dilated distally. Fore wing with veins 9, 10, 11 stalked together..... 1. ZYGÆNA, p. 230.
b. Antennæ not dilated distally.
a'. Fore wing with all the veins from the cell.
*a*². Hind wing with vein 6 absent.
*a*³. Wings short and broad.
*a*⁴. Hind wing with all the veins from the cell.
*a*⁵. Hind tibiæ with one pair of spurs; antennæ of male with few branches [p. 231]. 2. DENDROCERA,
*b*⁵. Hind tibiæ with two pairs of spurs; antennæ of male with many branches..... [p. 232]. 3. CHRYSARTONA,
*b*⁴. Hind wing with veins 3 and 4 stalked [p. 233]. 4. BRACHARTONA,
*b*³. Wings long and narrow.
*a*⁴. Hind wing with vein 5 remote from 7.
*a*⁵. Fore wing very narrow; antennæ of male pectinated.
*a*⁶. Palpi long 6. ARTONA, p. 234.
*b*⁶. Palpi very short..... 7. TABEMA, p. 236.
*b*⁵. Fore wing broader; antennæ of male simple 18. ARÆOCERA, p. 244.
*b*⁴. Hind wing with vein 5 arising close to 7 19. ARACHOTIA, p. 245.
*c*³. Fore wing produced at apex and broad..... 13. PHACUSA, p. 240.

- b*². Hind wing with vein 6 present.
*a*³. Abdomen not tufted at end.
*a*¹. Hind wing long and narrow 14. GOË, p. 242.
*b*¹. Hind wing broad and rounded.... 12. CLELEA, p. 239.
*b*³. Abdomen tufted at end 8. LOPHOSOMA, p. 237.
*b*¹. Fore wing with veins 7 and 8 stalked.
Hind wings with veins 6 and 7 stalked;
2, 3, 4 from lower angle of cell; 5
from upper angle; palpi upturned; legs
with long spurs [p. 233.
5. CALLARTONA,
*c*¹. Fore wing with veins 8 and 9 stalked. [p. 238.
*a*². No veinlets in the cell 9. MONOSCHALIS,
*b*². Veinlets in the cell of both wings 17. PLATYZYGÆNA,
*d*¹. Fore wing with veins 8, 9, 10 stalked. [p. 243.
*a*². Hind wing with all the veins from the
cell 10. THYRASSIA, p. 238.
*b*². Hind wing with vein 2 from angle of
cell; veins 3, 4, 5 stalked 11. PROCOTES, p. 239.
*e*¹. Fore wing with veins 5, 6, 7 stalked to-
gether. Hind wing with veins 2 and 5 [p. 242.
absent 15. EPHEMEROIDEA,
*f*¹. Fore wing with veins 9 and 10 stalked .. 16. PIAROSOMA, p. 243.

Genus ZYGÆNA.

Zygæna, *Fabr. Syst. Ent.* p. 550 (1775).

Type, *Z. filipendulæ*, Linn., from Europe.

Range. The whole Palæarctic region, including Afghanistan, the Himalayas, and Japan; S. Africa.

Antennæ simple and dilated distally into a club, the tip pointed. Fore wing with veins 9, 10, 11 stalked. Hind wing with all the veins from the cell. Legs with no spurs.

A. Fore wing with yellow spots.

473. *Zygæna cashmirensis*, Koll. *Hügel's Kaschmir*, iv, p. 459, pl. 19, fig. 6; *C. & S.* no. 213.

Zygæna asoka, Moore, *P. Z. S.* 1879, p. 389; *C. & S.* no. 212.

Fore wing black shot with green, with five yellow spots. Hind wing crimson, with some black on the costa near the base and a

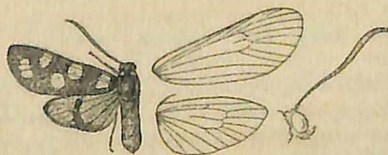


Fig. 145.—*Zygæna cashmirensis*, ♂. 1.

black medial band which may be broken at middle; margin black, narrow at middle. A pair of yellow lateral spots on the collar.

Male with three, female with two crimson rings on the terminal segments of abdomen.

In the var. *asoka* the spots on fore wing are smaller. Hind wing with black the predominant colour, the crimson being reduced to patches. Males from Nepal in the British Museum are exactly intermediate between the two forms.

Hab. Kashmir; Kangra; Punjab; Nepal. *Exp.*, ♂ 30, ♀ 38 millim.

474. *Zygæna erythrosoma*, n. sp.

♀. Differs from typical *cashmirensis* in being without the yellow spots on the collar, and in having the whole of the terminal segments of the abdomen crimson.

Hab. Almora. *Exp.* 36 millim. Type in B. M.

B. *Fore wing with red spots.*

475. *Zygæna afghana*, Moore, *Lep. E. I. Co.* p. 286, pl. vii a, fig. 1; *C. & S.* no. 211.

♀. Fore wing with the spots red, with narrow white edges and very large, the basal spot occupying the whole base of wing; the interno-median spot joined to the subcostal one. Hind wing red, with narrow black border. Collar and abdomen, except basal segments, red.

Hab. Afghanistan; Quetta. *Exp.* 28 millim.

Genus **DENDROCERA.**

Dendrocera, *Hmps.* *Ill. Het.* ix, ined.

Type, *D. quadripunctata*, *Hmps.*

Range. Ceylon.

Antennæ bipectinated in male, simple in female, the branches in the former sex widely separated, the secondary branches standing out from them in the same plane. Palpi porrect and of moderate length. Mid and hind tibiæ with one pair of spurs. Wings short and broad. Hind wing with the upper portion of cells shorter than the lower; vein 6 absent.

476. *Dendrocera quadripunctata*, *Hmps.* *Ill. Het.* ix, ined., pl. 157, fig. 2.

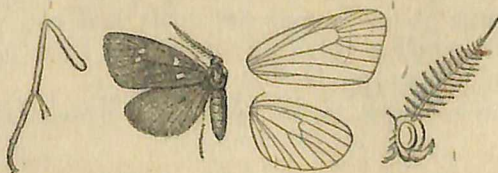


Fig. 146.—*Dendrocera quadripunctata*, ♂. ♀.

Purplish fuscous. Fore wing with two antemedial and two postmedial ochreous spots.

Hab. Ceylon. *Exp.* 14 millim.

Genus **CHRYSARTONA.**

Chrysartona, *Swinh. Cat. Het. Mus. Oxon.* p. 56, *ined.*

Type, *C. stipata*, Wlk.

Range. Himalayas and Burma.

Antennæ bipectinated in male, simple in female. Palpi short and porrect. Mid tibiæ with one pair of minute spurs, hind tibiæ with two pairs. Wings short and broad; all the veins from the cell; hind wing with vein 6 absent.

In *Procris*, to which *stipata* has been referred, vein 6 of the hind wing is present.

477. *Chrysartona stipata*, *Wlk. Cat. i*, p. 114; *Butl. Ill. Het. i*, p. 13, pl. 7, fig. 9; *C. & S.* no. 214.

Head, thorax, legs, the base of costa of fore wings above, and of both wings below metallic coppery green or blue. Wings black: fore wing with two antemedial and two postmedial white spots:

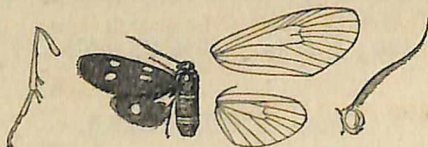


Fig. 147.—*Chrysartona stipata*, ♂. †.

hind wing with a single or double antemedial and one postmedial spot; cilia white at apex of both wings and anal angle of hind wing. Abdomen black, banded with white below.

Hab. Kangra; Sikhim; Bernardmyo, Burma. *Exp.*, ♂ 18, ♀ 20 millim.

478. *Chrysartona refulgens*, n. sp.

♀. Head, thorax, and abdomen suffused with metallic copper; underside of thorax metallic copper and green; abdomen with whitish bands. Wings black; fore wing with a coppery spot at base; two large yellow antemedial spots and two postmedial; hind wing with a yellow patch on inner area from base to near anal angle and a large spot beyond the cell.

Hab. Matelei, Burma (*Fea*). *Exp.* 26 millim. Type in Mus. Genova.

Genus **BRACHARTONA.**

Brachartona, *Hmps.* *Ill. Het.* viii, p. 44 (1891).

Type, *B. quadrimaculata*, Moore.

Range. N.W. Himalayas; Tenasserim.

Antennæ bipectinated in the male, ciliated in the female. Fore wing with veins 8 and 9 from cell. Hind wing with veins 3 and 4 stalked; 6 absent.

SECT. I. Male with antennæ long, the branches slender.

479. *Brachartona quadrimaculata*, Moore, *P. Z. S.* 1879, p. 390; *C. & S.* no. 298.

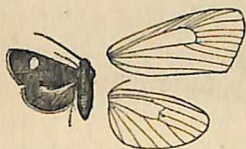


Fig. 148.—*Brachartona quadrimaculata*, ♂. 1.

Dull purplish black. Fore wing with a large ochreous spot beyond the cell. Hind wing with an ochreous streak beyond the cell, curving up to the costa beyond it.

Hab. Mussooree; Kangra; Dharmasala. *Exp.* 18 millim.

Sect. II. Male with short antennæ, the branches stout and decreasing to apex.

480. *Brachartona catoxantha*, n. sp.

♂. Upperside uniform dark brown; frons and palpi yellow, the former with a black spot at middle; underside of the thorax, abdomen, and the legs yellow. Fore wing brown below, with yellow patches on the costa at base and apex; hind wing brown; the costal area yellow, the veins on it black.

Hab. Tenasserim Valley (*Doherty*). *Exp.* 16 millim. Type in coll. Druce.

Genus **CALLARTONA**, nov.

Type, *C. purpurascens*, *Hmps.*

Range. Nilgiris.

Palpi upturned, reaching the top of head. Fore wing with veins 7 and 8 stalked. Hind wing with veins 2, 3, and 4 from close to the lower end of cell, 5 from near upper end, 6 and 7 stalked. Tibiæ of mid and hind legs with the spurs long.

481. *Callartona purpurascens*, *Hmps.* *Ill. Het.* viii, p. 44, pl. 139, fig. 4.

♀. Black, with a brilliant purple shot; head and tegulæ yellow.

Fore wing with two large yellow triangular spots on the costa. Hind wing with a yellow streak below the cell, curving up to the costa beyond it. Legs yellow.

Hab. Nilgiris, W. slopes, 3000 feet. *Exp.* ♀ 22 millim.

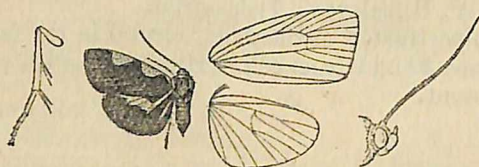


Fig. 149.—*Callartona purpurascens*, ♀. 1.

Genus **ARTONA.**

Artona, *Wlk. Cat.* ii, p. 439 (1854).

Balatæa, *Wlk. Cat.* xxxi, p. 110 (1864).

Bintha, *Wlk. Cat.* xxxi, p. 127 (1864).

Rhaphidognatha, *Feld. Wien. Ent. Mon.* vi, p. 31 (1862).

Type, *A. discivitta*, *Wlk.*

Range. Amur; China; Japan; Himalayas; South Indian Hills; Nāga Hills; Burma; Perak; Java; Amboina.

Antennæ bipectinated in male, minutely ciliated in female, the distal portion slighter. Palpi long and porrect. Fore wing very narrow, with all the veins from the cell. Hind wing with vein 5 from middle of discocellulars, vein 6 absent. Mid and hind tibiæ with a terminal pair of minute spurs.

A. Abdomen with no yellow.

482. *Artona postvitta*, *Moore, Lep. Atk.* p. 13; *C. & S.* no. 297.

Dark brown; hind wing with a broad medial white fascia; cilia whitish; tarsal joints white.

Hab. Sikhim. *Exp.* 20 millim.

483. *Artona postalba*, *Elwes, P. Z. S.* 1890, p. 379, pl. xxxii, fig. 16.

♂. Brown. Fore wing with a slight yellow streak from the base; two medial and two postmedial yellow spots; cilia pale yellow. Hind wing with the disk white; cilia blackish.

Hab. Sikhim, 12,000 feet. *Exp.* 18 millim.

B. Abdomen of male black, with yellow segmental bands; female yellow above.

484. *Artona discivitta*, *Wlk. Cat.* ii, p. 440; *C. & S.* no. 293; *Butl. Ill. Het.* v, pl. 84, fig. 8.

♂. Dark purplish brown; head at sides and tegulæ yellow. Fore wing with a yellow streak from base to end of cell; a spot

beyond and rather above the cell. Hind wing with a yellow streak below the cell and a spot beyond it. Cilia dark.

Hab. Almora; Nilgiris; Shevaroyes. *Exp.* 20 millim.

485. *Artona zebraica*, *Butl. Journ. Linn. Soc., Zool.* xii, p. 356; *id. Ill. Het.* v, pl. 84, fig. 9; *C. & S.* no. 299.

Artona fulvida, *Butl. Journ. Linn. Soc., Zool.* xii, p. 356; *C. & S.* no. 295.

Artona nigrescens, *Butl. Journ. Linn. Soc., Zool.* xii, p. 356; *C. & S.* no. 300.

♂. Fore wing with a subcostal as well as the medial streak from the base, and both interrupted at middle; a spot below the end of the cell, and two postmedial spots. Hind wing with the whole basal area yellow, except a costal dark streak; outer margin dark.



Fig. 150.—*Artona zebraica*, ♂. 1.

♀. The abdomen yellow above, with a narrow black line on the first two segments; the eighth segment with the sides black, and sometimes also the vertex.

Some males have the abdomen coloured as in the females. In Mandi, Moulmein, and Kangra specimens the cilia are dark, in those from the Naga Hills and Perak the tips are yellow.

Hab. Kulu; Mandi; Kangra; Sikhim; Nagas; Perak. *Exp.* 20–24 millim.

486. *Artona zebra*, *Elwes, P. Z. S.* 1890, p. 379, pl. xxxii, fig. 11.

♂. Differs from *zebraica* in the subcostal and medial streaks of the fore wing being short and each followed by a large spot; a subapical elongate spot; no spot below the end of cell. Hind wing with two yellow streaks from the base. Cilia yellow, brown at apex of both wings.

Hab. Sikhim, 11,000 feet. *Exp.* 18 millim.

487. *Artona sikkimensis*, *Elwes, P. Z. S.* 1890, p. 379, pl. xxxii, fig. 17.

♂. Fore wing with the subcostal yellow streak, the spot below end of cell, and subapical elongate spot only. Hind wing with one streak from base. Cilia dull yellow.

Hab. Sikhim, 12,000 feet. *Exp.* 21 millim.

488. *Artona confusa*, *Buhl. Journ. Linn. Soc., Zool.* xii, p. 357; *id. Ill. Het.* v, pl. 84, fig. 10; *C. & S.* no. 292.

♂. The abdomen banded with black. Antennæ with the tips yellow; head black; collar and tegulæ yellow. Fore wing with the subcostal and medial basal streaks; the subapical and post-medial spots single and very large. Hind wing yellow, with broad black border.

♀. The abdomen yellow, with the last two segments black, the tips yellow.

Hab. N.W. Himalayas; Sikhim. *Exp.* 26 millim.

Genus **TASEMA**.

Tasema, *Wlk. Cat.* vii, p. 1597 (1856).

Type, *T. bipars*, *Wlk.*

Range. Kāngra; Nāga Hills; Calcutta; Burma.

Antennæ bipectinated in male, simple in female. Palpi very short. Fore wing narrow, the outer margin erect; all the veins from the cell. Hind wing with vein 6 absent.

489. *Tasema bipars*, *Wlk. Cat.* vii, p. 1597; *C. & S.* no. 216.

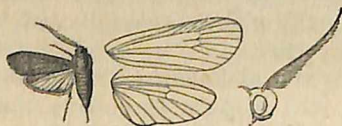


Fig. 151.—*Tasema bipars*, ♂. †.

♂. Black. Hind wing hyaline; the costal area and margins black.

Hab. Kāngra; Nāgas. *Exp.* 16 millim.

490. *Tasema longipennis*, n. sp.

♂. Fore wing longer, with outer margin more oblique than in *bipars*. Hind wing more thickly clothed with black hair-like scales.

Hab. Bernardmyo, Burma, 6000 feet (*Doherty*). *Exp.* 20 millim. Type in coll. Elwes.

491. *Tasema fuliginosa*, *Moore, Lep. Atk.* p. 14; *C. & S.* no. 294.

Dark brown; the antennæ, palpi, costa, and discocellulars of fore wing black.

Hab. Calcutta. *Exp.*, ♂ 15, ♀ 17 millim.

492. *Tasema nigra*, n. sp.

♂. Differs from *fuliginosa* in being uniform smoky black, not brown.

♀. The pectinations of antennæ shorter than in *fuliginosa*; end of abdomen with a tuft of ochreous hairs.

Hab. Bernardmyo, Burma (*Doherty*). *Exp.*, ♂ 15, ♀ 17 millim. Type in coll. Elwes.

Genus **LOPHOSOMA.**

Lophosoma, *Swinh. Cat. Het. Mus. Oxon.* p. 59, *ined.*

Type, *L. cupreum*, Wlk.

Range. Himalayas; Bengal; Ganjam; Andamans.

Antennæ bipectinate in male, simple in female, the terminal portion thinner. Palpi short and porrect. Wings narrow; outer margin of fore wing oblique; hind wing with vein 6 present. Mid tibia with one pair, hind tibia with two pairs of minute spurs. Abdomen with lateral tufts of hair on terminal segments.

493. *Lophosoma cupreum*, *Wlk. Cat.* vii, p. 1596; *C. & S.* no. 301.

Frons, genæ, and a few of the scales on collar and tegulæ golden metallic. Antennæ, vertex of head, thorax, and fore wing dark brown, shot with blue, especially in Sikhim specimens; metathorax metallic copper; abdomen purplish, with coppery bands to each segment; lateral tufts black, with a purple gloss. Fore wing with basal hyaline streaks below the costa and median nervure; a hyaline spot at end of cell and one

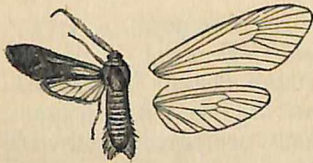


Fig. 152.—*Lophosoma cupreum*, ♂. 1.

below it. Hind wing hyaline, with the costa and outer margin black.

Tascia, Wlk., type *chrysoletus*, in which this species has been placed, is a very distinct African genus.

Hab. Kulu; Sikhim; Andamans. *Exp.* 24 millim.

494. *Lophosoma quadricolor*, *Wlk. Cat.* vii, p. 1596; *C. & S.* no. 302.

♂. Head, thorax, and fore wings brown, shot with green. Hind wing with the costal area fuscous, the rest hyaline. Abdomen copper-coloured, the last two segments purplish.

Hab. Bengal; Ganjam. *Exp.* 20 millim.

Genus **MONOSCHALIS.**

Monoschalis, *Hmps.* *Ill. Het.* ix, *ined.*

Type, *M. virescens*, *Hmps.*

Range. Ceylon.

♂. The antennæ bipectinated. Palpi short and porrect, Tibiæ with no spurs. Fore wing with veins 8 and 9 stalked. Hind wing with vein 6 present.

495. *Monoschalis virescens*, *Hmps.* *Ill. Het.* ix, *ined.*, pl. 157, fig. 11.

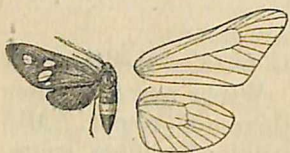


Fig. 153.—*Monoschalis virescens*, ♂. 1.

♂. Black, shot with green: abdomen with 4th and 5th segments yellow. Fore wing with a hyaline spot in end of cell, a large spot below the end; a bifid submarginal and small spot near outer angle.

Hab. Colombo, Ceylon. *Exp.* 22 millim.

Genus **THYRASSIA.**

Thyrassia, *Butl. Journ. Linn. Soc., Zool.* xii, p. 355 (1876).

Type, *T. subcordata*, *Wlk.*

Range. Plains of N. India, S. India, and Ceylon.

Antennæ bipectinated in both sexes, more heavily in the male than the female. Palpi short and porrect. Tibiæ with no spurs. Fore wings with veins 8, 9, and 10 stalked together. Hind wing with all the veins from the cell, 8 absent.

496. *Thyrassia subcordata*, *Wlk. Cat.* i, p. 132; *C. & S.* no. 280; *Butl. Ill. Het.* i, p. 19, pl. vii, fig. 5.

Thyrassia aurodisca, *Hmps.* *Ill. Het.* viii, p. 44, pl. cxxxix, fig. 10.

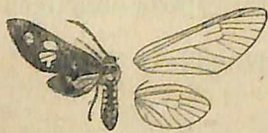


Fig. 154.—*Thyrassia subcordata*, ♂. 1.

Frons, collar, metathorax, and lateral streaks on each abdominal segment orange. Fore wing dark brown; a yellowish or whitish hyaline spot at end of cell, a trifid spot below it, a bifid or trifid subapical spot. Hind wing with an orange patch occupying the basal inner area and curving up to the costa beyond the cell.

T. aurodisca, the southern form, has the orange of hind wing more extensive and the border narrower.

Hab. Plains of N. India, S. India, and Ceylon. *Exp.*, ♂ 24, ♀ 26 millim.

Genus **PROCOTES**.

Procotes, *Butl. Journ. Linn. Soc., Zool.* xii, p. 355 (1876).

Type, *P. diminuta*, Wlk.

Range. Ceylon.

♂. Antennæ bipectinated. Palpi short and porrect. Tibiæ without spurs. Abdomen with short lateral tufts of hair on the last segment. Fore wing with veins 4 and 5, and 8, 9, 10 stalked. Hind wing with veins 3, 4, 5 stalked.

497. *Procotes diminuta*, *Wlk. Cat. i*, p. 230; *Moore, Lep. Ceyl. ii*, p. 37, pl. 95, fig. 3; *C. & S. no.* 217.

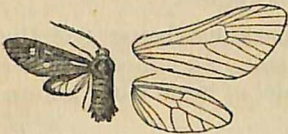


Fig. 155.—*Procotes diminuta*, ♂. 1.

♂. Black, shot with blue-green. Fore wing with a hyaline spot in the end of cell, a long streak below it, and one beyond it. Hind wing with the area below and beyond the cell hyaline.

Hab. Trincomali, Ceylon. *Exp.* 23 millim.

Genus **CLELEA**.

Clelea, *Wlk. Cat. ii*, p. 465 (1854).

Type, *C. sapphirina*, Wlk.

Range. China; Formosa; Sikhim; Khási and Nága Hills; Burma.

Antennæ bipectinate in male, nearly simple in female. Palpi of moderate length and porrect. Fore wing with all the veins from the cell. Hind wing broad, with all the veins from the cell.

498. *Clelea sapphirina*, *Wlk. Cat. ii*, p. 465.

♂. Black: the shaft of antennæ, head, and legs above metallic blue. Fore wing with short metallic blue streaks from the base along the costa and inner margin; a transverse antemedial band broken at middle; a subapical almost complete ring with a submarginal spot below it; a marginal line. Hind wing with a metallic blue streak sometimes present near inner margin. Underside of fore wing with some blue marginal streaks at apex;

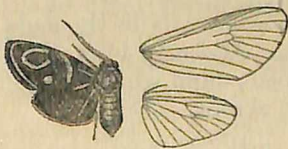


Fig. 156.—*Clelea sapphirina*, ♂. 1.

hind wing streaked with blue throughout. Cilia whitish.

♀. The frons, collar, and tegulæ blue, a streak on vertex of thorax, and at sides of meso- and metathorax; shaft of antennæ more vivid blue.

Abdomen in both sexes sometimes entirely brown, sometimes



with blue segmental lines, sometimes with the terminal segments entirely metallic blue above.

Hab. Sikkim; Momeit, Burma, 2000 feet; China. *Exp.*, ♂ 24, ♀ 30 millim.

499. *Clelea discriminis*, *Swinh. Trans. Ent. Soc.* 1891, p. 475.

Differs from *sapphirina* in the streaks from the base of the fore wing being green, and the lower one being along the median nervure; the subapical markings more parallel; the marginal line and blue on hind wing absent. Underside with a streak on median nervure of fore wing and several streaks on the hind wing.

Hab. Sikkim; Nāga Hills, 3000 feet. *Exp.* 27 millim.

500. *Clelea nigroviridis*, *Elwes, P. Z. S.* 1890, p. 380.

♂. Differs from *sapphirina* in the markings being metallic green not blue, and those of the fore wing being all joined together so as to form reticulations; the underside of fore wing almost without markings.

Differs from *chala*, Moore, from Formosa, in having no metallic colour on the end of abdomen and the markings being green not blue.

Hab. Nāgas; Bernardmyo, Burma, 6000 feet. *Exp.* 27 millim.

501. *Clelea plumbeola*, n. sp.

Black; fore wing with antemedial and broad and somewhat irregular postmedial plumbeous bands.

Hab. Bernardmyo, Burma, 6000 feet (*Doherty*). *Exp.* 20 millim. Type in coll. Elwes.

Genus PHACUSA.

Phacusa, *Wlk. Cat.* i, p. 150 (1854).

Notioptera, *Butl. Journ. Linn. Soc., Zool.* xii, p. 355 (1876).

Type, *P. tenebrosa*, Wlk.

Range. N.W. Himalayas; Assam Hills; Burma; Nicobars; Java; Celebes; Philippines.

Antennæ bipectinated in both sexes, more heavily in the male than the female. Palpi short and porrect. Mid and hind tibiæ with minute terminal spurs. Wings broad; hind wing with all the veins given off from the cell. Vein 12 absent.

SECT. I. Fore wing with veins 8 and 9 stalked.

502. *Phacusa dolosa*, *Wlk. Cat.* vii, p. 1594; *C. & S.* no. 278; *Butl. Ill. Het.* v, p. 27, pl. 84, fig. 11.

♂. Blue-black. Fore wing with three small medial white streaks; two minute subapical and two larger submarginal spots. Hind wing with a minute submarginal spot.

Hab. ? Assam. *Exp.* 30 millim.

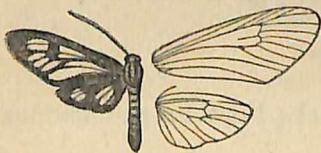
503. *Phacusa properta*, *Swinh. P. Z. S.* 1889, p. 400, pl. xliii, fig. 6.

Shafts of antennæ bluish green; collar, metathorax, and 6th and 7th segments of abdomen, and lateral spots on some of the others, copper-coloured. Fore wing with hyaline streaks above and below costal nervure; a large spot filling the cell; another below it; two subapical and two submarginal spots. Hind wing hyaline, with the veins and margins black.

Hab. Nāga Hills; Rangoon; Nicobars. *Exp.* 30 millim.

504. *Phacusa tenebrosa*, *Wlk. Cat. i.* p. 150; *C. & S.* no. 303; *Butl. Ill. Het. i.* p. 20, pl. 12, fig. 1.

Bronzy black. Head, collar, metathorax, base of fore wing, and a band on each segment of abdomen, except the last, copper-coloured. Markings as in *properta*.



In some specimens the fore wing has a hyaline streak below the costa another on inner margin and one between vein 5 and 6; in others these are all absent. In some specimens the hyaline spots of the hind wing are all joined together, in others reduced in size, and the sub-

basal series separated from the subapical by a black band.

Hab. Momeit, Burma; Almorah. *Exp.* 33 millim.

SECT. II. Fore wing with vein 8 from the cell.

505. *Phacusa cyanocera*, n. sp.

♂. Black. The shaft of antennæ blue; head, collar, and tegulæ with a few copper scales; abdomen greenish black; veins and margins of wings black. Wings hyaline; fore wing with a copper spot at base; the inner margin broadly black, with a copper spot at middle.

Hab. Bernardmyo, Burma (*Doherty*). *Exp.* 32 millim. Type in coll. Elwes.

SECT. III. Fore wing with vein 10 out of 9.

506. *Phacusa khasiana*, *Moore, Lep. Atk.* p. 12; *C. & S.* no. 215.

♀. Antennæ, head, thorax, and abdomen greenish black. Wings hyaline, with the veins and margins black; the inner margins of fore wing, costa of hind wing, and discocellulars of both wings broadly so.

Hab. Khasis; Nāgas, 4000 feet. *Exp.* 36 millim.

Genus **GOË**, nov.

Type, *G. diaphana*, Hmps.

Range. Burma.

♂. Antennæ bipectinated; palpi short and porrect. Wings

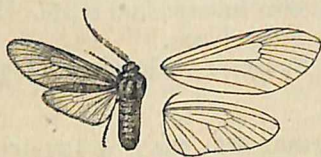


Fig. 158.—*Goë diaphana*, ♂. 1.

rather narrow. Fore wing with apex rounded and outer margin oblique. Hind wing with vein 8 present. Tibiæ without spurs.

507. *Goë diaphana*, n. sp.

♂. Black; the wings diaphanous black; the veins and margins narrowly black.

Hab. Bernardmyo, Burma, 6000 feet (*Doherty*). *Exp.* 28 millim. Type in coll. Elwes.

Genus **EPHEMEROIDEA**, nov.

Type, *E. ariel*, Hmps.

Range. Burma.

♂. Antennæ with the branches rather short. Palpi long. Fore wing with the cell very narrow at base, expanded at the end; veins 5, 6, and 7 stalked together. Hind wing with veins 5 and 6 absent. Legs without spurs.

508. *Ephemeroidea ariel*, n. sp.

Head, thorax, and abdomen black, with copper and green reflections. Wings hyaline, the veins and margins narrowly black; the inner margin of fore wing and costa of hind wing broadly so.

Hab. Bernardmyo, Burma, 6000 feet, May (*Doherty*). *Exp.* 20 millim. Type in coll. Elwes.

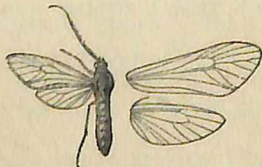


Fig. 159.—*Ephemeroidea ariel*, ♂. 1.

509. *Ephemeroidea flavocincta*, n. sp.

♀. Antennæ black; head, collar, and tegulæ brilliant metallic green; thorax black above, green below; abdomen with the two

basal and three terminal segments black above, green below, the third, fourth, and fifth segments bright yellow. Wings hyaline the veins and margins black; fore wing with some yellow at base. Femora and tibiæ metallic green; tarsi white.

Hab. Matelei, Burma (*Fea*). *Exp.* 28 millim. Type in Mus. Genova.

Genus **PIAROSOMA**, nov.

Type, *P. albicinctum*, Hmps. n.

Range. Burma.

♂. Thorax and abdomen stout; branches of antennæ short. Fore wing with the apex somewhat truncate and outer margin

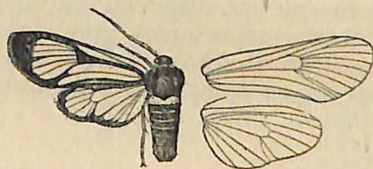


Fig. 160.—*Piarosoma albicinctum*, ♂. 1/2

rounded; vein 2 from lower angle of cell; 9 and 10 stalked. Hind wing broad, with veins 2 and 3 from a point near angle of cell.

510. **Piarosoma albicinctum**, n. sp.

♂. Blue-black; collar and first segment of abdomen white; the other segments slightly fringed with white. Wings whitish hyaline; the veins black. Fore wings with the apex and outer and inner margins, the cell, and streaks along veins 2 and 11, and for a short way from margin along 5 broadly black. Hind wing with the black margin dentate at vein 2.

Hab. Bernardmyo, Burma, 6000 feet (*Doherty*). *Exp.* 36 millim. Type in coll. Elwes.

Genus **PLATYZYGÆNA**.

Platyzygæna, *Swinh. Cat. Het. Mus. Oxon.* p. 59, *ined.*

Type, *P. mölleri*, Elw.

Range. Sikkim; Assam.

♀. Antennæ simple. Palpi very minute. Thorax and abdomen stout; wings broad; fore wing with veins 8 and 9 stalked; hind wing with all the veins from the cell.

511. **Platyzygæna mölleri**, *Elw. P. Z. S.* 1890, p. 385, pl. xxxii, fig. 13.

♀. Head, thorax, and abdomen blue-black, the last with white

segmental bands; proboscis crimson. Fore wing black at base, followed by a broad white band, with four black spots on it below the costa, median, interno-median, and sub-median nervures; the

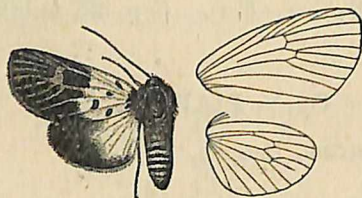


Fig. 161.—*Platyzygæna mölleri*, ♀. †.

one below the interno-median displaced outwards; the outer half of wing black, with the veins on it grey; a grey discocellular band. Hind wing with the basal area white to the middle of costa and near anal angle; apical area and outer margin black.

Hab. Sikkim; Assam. *Exp.* 36 millim.

Genus **ARÆOCERA**, nov.

Type, *A. cyanescens*, Hmps. n.

Range. Japan; China; Sikkim; Burma.

Antennæ simple in both sexes. Tibiæ without spurs in male; female with minute spurs. Fore wing broad, the costa arched and apex acute. Hind wing with vein 6 absent.

512. *Aræocera cyanescens*, n. sp.

♂. Head, thorax, and abdomen black. Fore wing fuscous, shot with purple. Hind wing fuscous.

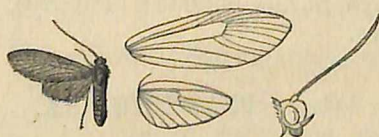


Fig. 162.—*Aræocera cyanescens*, ♂. †.

Hab. Momeit, Burma (*Doherty*). *Exp.* 20 millim. Type in coll. *Elwes*.

513. *Aræocera posthyalina*, n. sp.

♀. Differs from *cyanescens* in the thorax and abdomen being shot with purple, and in the hind wing being hyaline, suffused with black towards the margins.

Hab. Sikkim (*Elwes*). *Exp.* 28 millim. Type in coll. *Elwes*.

Genus **ARACHOTIA.**

Arachotia, Moore, *Lep. Atk.* p. 14 (1879).

Type, *A. flaviplaga*, Moore.

Range. Sikkim; Naga Hills.

Antennæ long, bipectinated in male with the branches short, simple in the female. Palpi short and porrect. Mid and hind tibiæ with minute terminal pairs of spurs. Wings narrow. Hind wing with vein 5 arising close to 7.

514. *Arachotia flaviplaga*, Moore, *Lep. Atk.* p. 14; C. & S. no. 393.

Metallic blue-green; antennæ broadly banded with white towards the tips. Frons ochreous; abdomen with ochreous ventral and lateral bands. Fore wing with an ochreous subbasal band from median nervure to inner margin; a large hyaline spot in end of cell and two below it, and seven streaks between the nervules beyond.

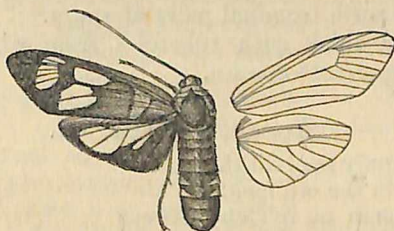


Fig. 163.—*Arachotia flaviplaga*, ♀. †.

Hind wing with the costa white above; a hyaline patch filling the lower part of the cell and interspaces below and beyond; the veins, margins, and inner lobe of wing black. Pectus with ochreous spots.

Hab. Sikkim; Naga Hills. *Exp.*, ♂ 35, ♀ 44 millim.

515. *Arachotia vespoides*, Moore, *P. Z. S.* 1879, p. 390; C. & S. no. 394.

♀. Antennæ black; palpi yellow with black tips. Frons grey; abdomen with yellow bands on the first six segments above, grey below. Wings hyaline, yellow at base; fore wing with the margins, the subcostal, median, and discocellular veins black, the marginal band dentated at vein 2. Hind wing with the costa white, the marginal band black and dentated at vein 2.

Hab. N. India. *Exp.* 40 millim.

Subfamily CHALCOSIINÆ.

The antennæ bipectinated to the tips in both sexes, more heavily in the male than the female, the branches dilated distally; the tip of antenna somewhat flabellate. Palpi minute and porrect. Fore

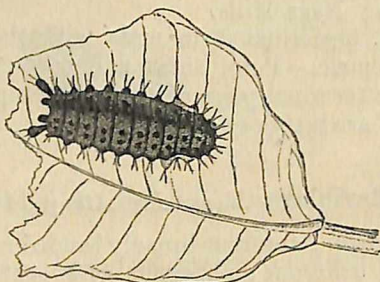


Fig. 164.—Larva of *Trypanophora taprobanes*. ♂.
 (From Moore, Lep. Ceyl. ii. pl. 95, fig. 8 a.)

wing with a veinlet in the cell more or less developed. Mid and hind tibiæ with minute terminal pairs of spurs.

Larva short and thick with tubercles, from which arise short hairs, and forming a close cocoon.

Key to the Genera.

- a. Wings not uniformly semi-diaphanous.
 - a'. Fore wing with the cell long.
 - a². Fore wing with no veinlets between vein 12 and the costa.
 - a³. Fore wing with the veins nearly straight.
 - a⁴. Wings long and *Zygæniiform*; hind wing with all the veins from the cell.
 - a⁵. Fore wing with veins 9 and 10 stalked 1. CALLIZYGÆNA, p. 248.
 - b⁵. Fore wing with veins 7, 8, and 9 stalked 2. TRYPANOPHORA, p. 249.
 - b⁴. Wings long but considerably broader.
 - a⁵. Hind wing with all the veins from the cell.
 - a⁶. Fore wing with vein 7 given off further from the cell than 9 8. HERPA, p. 257.
 - b⁶. Fore wing with vein 7 given off nearer the cell than 9.
 - a⁷. Fore wing with veins 4 and 5 stalked
 - a⁸. Fore wing with vein 11 anastomosing with 12. 9. PINTIA, p. 258.
 - b⁸. Fore wing with vein 11 not anastomosing with 12.

- a*⁹. Fore wing with vein 6 absent, 7 from cell, 8 and 9 stalked. 3. PHLEBOHECTA, p. 251.
- b*⁹. Fore wing with vein 6 present, 7, 8, and 9 stalked 4. SORITIA, p. 251.
- c*⁹. Fore wing with veins 6, 7, 8, and 9 stalked together 10. HETERUSIA, p. 259.
- b*⁷. Fore wing with veins 4 and 5 from cell 5. PIDORUS, p. 254.
- c*⁴. Hind wing broader and more rounded.
- b*⁵. Hind wing with veins 4 and 5 not stalked.
- a*⁶. Fore wing with vein 11 not anastomosing with 12.
- a*⁷. Hind wing with veins 4 and 5 from cell.
- a*⁸. Fore wing with veins 4 and 5 on a long stalk; ♂ with large claspers. 11. MILLERIA, p. 262.
- b*⁸. Fore wing with veins 4 and 5 on a short or no stalk; ♂ with small claspers 12. CHALCOSIA, p. 264.
- b*⁷. Hind wing with veins 4 and 5 stalked 13. CORMA, p. 268.
- b*⁶. Fore wing with vein 11 anastomosing with 12.
- a*⁷. Fore wing with vein 6 from below angle of cell. 15. POMPELON, p. 271.
- b*⁷. Fore wing with vein 6 from angle of cell or stalked with 7, 8, and 9. 14. CYCLOSLIA, p. 269.
- d*⁴. Wings very short and broad.
- a*⁵. Fore wing with vein 11 not anastomosing with 12 6. HETEROPAN, p. 256.
- b*⁵. Fore wing with vein 11 anastomosing with 12 7. ARBUDAS, p. 257.
- e*⁴. Wings long and very broad; fore wing with the apex square; veins 7, 8, and 9 stalked; ♂ with claspers very large 16. AMESIA, p. 272.
- b*³. Fore wing with veins 4 and 5 much curved.
- a*⁴. Fore wing with vein 3 not stalked with 4 and 5.
- a*⁵. Fore wing with vein 10 not stalked with 7, 8, and 9 17. ERASMIA, p. 273.
- b*⁵. Fore wing with vein 10 stalked with 7, 8, and 9 19. CADPHISES, p. 275.
- b*⁴. Fore wing with vein 3 stalked with 4 and 5; 10 with 7, 8, and 9. Hind wing with veins 4 and 5 stalked, and all these much curved 18. CAMPYLOTES, p. 274.

- b*². Fore wing with veinlets between vein 12 and the costa.
*a*³. Fore wing not produced at apex; veins 6, 7, 8, and 9 stalked together.
*a*⁴. Fore wing with no bar between veins 1 *b* and *c*; the stalk of veins 7, 8, and 9 much curved; veins 10 and 11 anastomosing with 12 20. ISBARTA, p. 276.
*b*⁴. Fore wing with a bar between veins 1 *b* and *c*; stalk of veins 7, 8, and 9 not much curved; vein 10 not anastomosing with 12 21. CALLAMESIA, p. 277.
*b*³. Fore wing much produced at apex, the outer margin very oblique; veins 7, 8, and 9 stalked.
*a*⁴. Hind wing rounded 22. GYNAUTOCERA, p. 278.
*b*⁴. Hind wing with outer margin extremely produced 23. HISTIA, p. 279.
*b*¹. Fore wing with the cell short; veins 4 and 5 stalked; 6, 7, 8, and 9 stalked; hind wing with vein 6 absent 24. CANERCES, p. 281.
b. The wings uniformly semi-diaphanous; fore wing with veins 4 and 5 stalked, and 7, 8, 9 stalked.
*a*¹. Fore wing narrow and rounded at apex 25. PHILOPATOR, p. 281.
*b*¹. Fore wing shorter and quadrate 26. AGALOPÉ, p. 282.
*c*¹. Fore wing long and quadrate.
*a*². Hind wing not produced into a tail.. 27. CHELURA, p. 283.
*b*². Hind wing produced into a tail 28. ELCYSMA, p. 284.

Genus CALLIZYGÆNA.

Callizygæna, *Feld. Reis. Nov., Het. Erk.* pls. 75–107, p. 2 (1875).

Type, *C. nivimacula*, Feld.

Range. The Peninsula of India and Ceylon.

Antennæ bipectinated in both sexes. Palpi short and porrect. Fore wing with veins 9 and 10 stalked. Hind wing with vein 6 given off from discocellulars. Abdomen of male with thick lateral tufts of hair. Shape as in *Zygæninæ*.

516. *Callizygæna nivimacula*, *Feld. Reis. Nov.* pl. 83, fig. 4; *C. & S.* no. 291.



Fig. 165.—*Callizygæna nivimacula*, ♂. $\frac{1}{4}$.

♀. Black; collar, and 2nd, 3rd, and 6th segments of abdomen crimson above. Wings blackish fuscous; fore wing with a slight greenish tinge; a large white spot at end of cell.

Hab. Trincomali, Ceylon. *Eap.* 30 millim.

517. *Callizygæna auricincta*, *Swinh. Cat. Het. Mus. Oxon.* p. 62.

♂. Black; the shaft of antennæ, head, prothorax, and tegulæ metallic blue; collar crimson; abdomen with the 3rd, 4th, and last three segments golden above; the lateral tufts black. Fore wing irrorated with metallic-blue scales, especially near the base of costa; a large white spot at end of cell. Hind wing fuscous hyaline.

Hab. Nilgiris. *Exp.* 26 millim.

518. *Callizygæna gana*, *Swinh. Trans. Ent. Soc.* 1891, p. 133, pl. viii, fig. 12.

♂. Differs from *auricincta* in the lateral tufts of the abdomen being crimson.

Hab. Ganjam. *Exp.* 28 millim.

Genus TRYPANOPHORA.

Trypanophora, *Kollar, Hügel's Kaschmir*, iv, p. 457 (1848).

Type, *T. semihyalina*, Koll.

Range. China; India, Burma, and Ceylon.

Antennæ with the pectinations short; very short in female. Palpi minute and porrect. Fore wing with veins 7, 8, and 9 stalked, either 7 or 9 being given off furthest from the cell. Hind wing with vein 6 absent.

519. *Trypanophora semihyalina*, *Koll. Hügel's Kaschmir*, iv, p. 457, pl. 19, figs. 1-4; *Moore, Lep. E. I. Co.* ii, pl. xiv, fig. 6 (larva); *C. & S.* no. 306.

Trypanophora argyrosbila, *Wlk. Cat.* xxxi, p. 126.

Syntomis humeralis, *Wlk. Cat.* vii, p. 1593.

Trypanophora atkinsoni, *Moore, Lep. Atk.* p. 15; *C. & S.* no. 305.

Syntomis glaucopoides, *Wlk. Cat.* xxxi, p. 69; *C. & S.* no. 279.

Blue-black; antennæ sometimes whitish towards the tips. Frons white in the Hongkong and some N. India specimens,

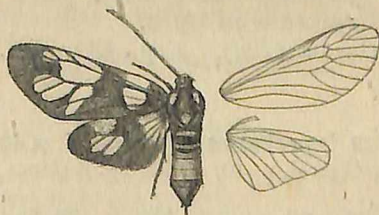


Fig. 166.—*Trypanophora semihyalina*, ♀. 4.

yellow in the others. Tegulæ black in one Hongkong specimen, whitish in another; orange in some Indian and red in others.

Orange spots on pro- and metathorax, either or both of which may be absent. Abdomen: the 5th and 6th segments with orange bands; the anterior segments sometimes with orange lateral spots, which in some specimens form complete rather narrow bands. Fore wing with one or two subbasal hyaline streaks above the subcostal and one below the median nervure; in some specimens the base of wing is yellowish; the outer discal area hyaline, which varies in extent from filling the outer part of the cell and the interspaces beyond, leaving only the veins and margins black, to slight hyaline streaks between veins 2, 3, 4, and 10, 11, 12, the spots in the end of cell and the interspace below being replaced by ochreous. Hind wing with costal area pale ochreous; a black patch towards end of cell; all the interspaces below and beyond with hyaline streaks; the outer margin irregularly black. In the female the hyaline patch is sometimes as complete as in the male, sometimes reduced to three short streaks beyond the cell; the base of the wing being sometimes ochreous. Pectus with yellow spots.

In typical *semihyalina* the discal hyaline patches of the fore wing are large; the frons and tegulæ orange; the abdomen with only two bands: in *argyropsila* the frons is white, the tegulæ white or black, the abdomen with the bands on the proximal segments complete: in *humeralis* the discal patches are much reduced and sometimes almost absent, the tegulæ orange, and abdomen with only two bands; but none of these characters are locally constant.

Larva reddish brown, the tubercles dark brown; head and legs red, the anterior somites yellow at sides and below.

Hab. Hongkong; Kashmir; Kangra; Sikhim; Calcutta; E. Pegu. *Exp.*, ♂ 31-36, ♀ 38-50 millim.

520. *Trypanophora flavalis*, n. sp.

♀. Antennæ black, white at three-fourths from base; frons, collar, tegulæ, the vertex of thorax, and broad segmental band to the abdomen orange. Fore wing orange, the veins and margins black; the outer part of cell and the interspaces beyond hyaline, leaving a narrow orange band within the black margin. Hind wing orange; the outer margin black, expanding into a patch near anal angle; veins 2, 3, and 4 streaked with black.

Hab. Matelei, Burma (*Fea*). *Exp.* 43 millim. Type in Mus. Genova.

521. *Trypanophora taprobanes*, *Wlk. Cat. ii*, p. 435; *C. & S.* no. 307; *Moore, Lep. Ceyl. ii*, p. 40, pl. 95, fig. 8 (larva, 8a).

Dark indigo-blue; an orange streak on metathorax; pectus crimson. Fore wing with a large discal hyaline patch filling the end of the cell and the interspaces above, beyond, and below it, and crossed by the black veins. Hind wing wholly blue.

Larva purple-brown; two dorsal and two lateral rows of seti-

ferous tubercles, the lower lateral tubercle of 1st somite long; lateral yellow blotches on 10th and 11th somites.

Hab. Ceylon. *Exp.*, ♂ 28, ♀ 44 millim.

Genus **PHLEBOHECTA**, nov.

Type, *P. fuscescens*, Moore.

Range. Sikkim; Burma.

Fore wing with veins 4 and 5 stalked; vein 6 absent, 8 and 9 stalked. Hind wing with vein 8 present. The wings rather narrow and apices rounded. Antennæ with very minute pectinations in the female. Mid and hind tibiæ with a minute terminal pair of spurs.

522. **Phlebohecta fuscescens**, Moore, *Lep. Atk.* p. 16; *C. & S.* no. 445; *Elw. P. Z. S.* 1890, p. 386, pl. xxxii, fig. 12.

♂. Fuscous; the collar pale red; the disk of hind wing below the cell paler.

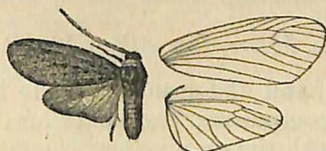


Fig. 167.—*Phlebohecta fuscescens*, ♂. 1.

♀ with the inner area of the hind wing below the cell yellowish white.

Hab. Sikkim, 3000 feet. *Exp.*, ♂ 29, ♀ 36 millim.

523. **Phlebohecta flavicosta**, *Elw. P. Z. S.* 1890, p. 386, pl. xxxii, fig. 1.

♀. Differs from *fuscescens* in the costal fascia of the fore wing being bright golden yellow; the costa, apex, and apical half of the outer margin of the hind wing golden yellow. A specimen from Bernardmyo has the margins of the fore and hind wing pale yellowish white and much narrower than in the typical Sikkim specimen.

Hab. Sikkim; Burma. *Exp.* 42–50 millim.

Genus **SORITIA**.

Soritia, *Wlk. Cat.* ii, p. 435 (1854).

Retina, *Wlk. Cat.* ii, p. 438 (1854).

Type, *S. leptalina*, Koll.

Range. China; the Himalayas; Assam; Burma; Malay Peninsula; Borneo.

Palpi minute. Antennæ very minutely pectinated in the female.

Fore wing with veins 4 and 5 stalked, 7, 8, and 9 stalked. Mid and hind tibiæ with minute terminal pairs of spurs.

524. *Soritia rubrivitta*, *Wlk. Cat. ii*, p. 439; *C. & S.* no. 440; *Butl. Ill. Het. v*, p. 25, pl. 84, fig. 4.

♀. Head, thorax, and abdomen greenish brown; collar crimson. Fore wing dark olive-green, with a broad crimson fascia from the base along the costa, then curving down to the outer angle. Hind wing dark brown.

Hab. Sikkim; Sibságar; Sylhet. *Exp.* 38 millim.

525. *Soritia leptalina*, *Koll. Hügel's Kaschmir*, p. 461; *C. & S.* no. 447. *Soritia sexpunctata*, *Wlk. Cat. ii*, p. 432; *C. & S.* no. 449. *Heterusia octopunctata*, *Mösch. Stettin. Ent. Zeit.* 1872, p. 344; *C. & S.* no. 379.

Heterusia pulchella, *Koll. Hügel's Kaschmir*, p. 461; *C. & S.* no. 380.

Eterusia triliturata, *Wlk. Cat. xxxi*, p. 119; *C. & S.* no. 387.

Beterusia cicada, *Feld. Reis. Nov.* pl. 83, fig. 8; *C. & S.* no. 369.

Heterusia flavomaculata, *Mösch. Stettin. Ent. Zeit.* 1872, p. 343; *C. & S.* no. 376.

Soritia olivascens, *Moore, Lep. Atk.* p. 16; *C. & S.* no. 448.

♂. Head, thorax, and abdomen black, the last sometimes with a blue shot; collar crimson; tegulæ yellow. Fore wing dark brown, with a greenish tinge; a yellow triangular patch occupying the whole basal area except the margins, this may be reduced to a narrow streak and four obliquely placed spots or to any intermediate state; a yellow spot beyond the end of the cell. Hind wing yellow, with the outer margin black, widest at apex; this may be reduced to spots beyond the cell and the apex alone black, or the darkness of the wing may be increased by a black suffusion along the veins and inner margin. The yellow on both wings may be either very pale or bright and dark.

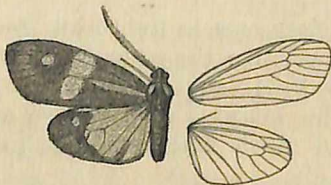


Fig. 168.—*Soritia leptalina*, ♂.

♀. Head and collar crimson; thorax yellow, abdomen white with metallic blue bands: wings bright yellow, with a blue spot between veins 2 and 3, and another between veins 3 and 4 of the fore wing; hind wing with a blue spot between veins 3 and 4, and sometimes one between 4 and 5, these two forms being named *sexpunctata* and *octopunctata*. In other specimens the ground-colour is very pale yellow, the veins of the fore wing being bright yellow, and in others again there is also a bluish suffusion between



the nervules and along the inner margin of the fore wing, and the outer area of the hind wing is suffused with black, this being typical *leptalina* = *pulchella* = *triliturata*.

Hab. Himalayas; Sylhet; Bernardmyo, Burma. *Exp.*, ♂ 32-40, ♀ 40-50 millim.

526. *Soritia shahama*, Moore, P. Z. S. 1865, p. 801; C. & S. no. 383; *Waterh. Aid.* ii, pl. 127, fig. 3.

♂. Differs from the dark form of *leptalina* in the collar not being crimson; the abdomen with lateral yellow bands; the post-medial band of four spots is white, as also the spot at end of cell of fore and hind wings. Underside: fore wing with white sub-marginal streaks; hind wing with the costal and apical areas white.

♀ with the postmedial band of white spots absent; the one at end of cell yellow. Hind wing with the basal area whitish.

Hab. Sikkim. *Exp.* 58 millim.

527. *Soritia viridivena*, n. sp.

♀. Head, thorax, abdomen, and legs black, metallic blue-green below. Fore wing black, with a broad yellow outwardly-oblique medial band; the veins green. Hind wing bright golden-yellow; the base black; the apex with a broad black border, continued as a narrowing line to the anal angle. Underside with exterior area shot with blue.

In this and the following species the stalk of veins 4 and 5 of the fore wing is short.

Hab. Sylhet; Naga Hills, 5000 feet, July (Doherty). *Exp.* 44 millim. Type in B. M.

528. *Soritia nigribasalis*, n. sp.

♀. Differs from *viridivena* in the band of the fore wing being narrow and placed further from the base; the basal area of the hind wing to near the end of cell and anal angle black, leaving a yellow band broadest at the costa, obsolescent towards anal angle.

Hab. Sikkim (Möller). *Exp.* 44 millim. Type in coll. Elwes.

529. *Soritia circinata*, Herr.-Schäffer, Samml. aussereur. Schmett. p. 57, figs. 156, 157; C. & S. no. 370.

Eterusia fasciata, Wlk. Char. undesr. Het. p. 5; C. & S. no. 375.

♂. Differs from *nigribasalis* in the abdomen being shot with brilliant blue. Hind wing black, with an apical yellow band, broad at the costa, narrowing to vein 1b, with four black spots on it between the nervules and a narrow marginal black line.

Hab. Sikkim; Assam. *Exp.* 63 millim.