

GENERAL
INSTRUCTIONS

THE
MUSEUM

GENERA INSECTORUM

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P. WYTSMAN

ORTHOPTERA

FAM. BLATTIDÆ

SUBFAM. ECTOBINÆ

by R. SHELFORD

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WITH 1 COLOURED PLATE



THE Blattidæ form a family of the order Orthoptera characterised by the deflexed head, the body typically flattened dorso-ventrally, the wings, when present, with the posterior part capable of folding like a fan, the three pairs of legs differing but little from one another and modified for running, the coxæ large and flattened.

Characters. — The *head* is so carried that the vertex is directed forward, the mouth backward and the front downward. It is joined to the thorax by a slender neck, in the thin integument of which occur some chitinised sclerites. The frons is separated from the clypeus by a fine angulate suture. The mouth-parts are of a typically mandibulate type, but little use of them has been made in classification; the labrum is well marked off from the clypeus by a transverse joint; it is orbicular or triangular in shape; the mandibles are toothed; the maxillæ, consisting of *cardo*, *stipes*, *lacinia* and *galea*, bear one pair of five-jointed palpi; the submentum is very large and forms the greater part of the under surface of the head, the labium is deeply cleft and carries a pair of three-jointed palpi, the lingua is a large lobe lying over the cleft of the labium.

The *antennæ* are long, slender and multi-articulate, usually ciliated; in some genera (e. g. *Pseudomops*, *Thyrsocera*, *Hypnorna*) the basal half of the antenna is incrassated and plumose(1).

The *eyes* are usually large and reniform; they are placed on the sides of the head; in many genera they are approximated on the vertex; in the cave-haunting *Nocticola* they are reduced or absent. Close to the insertions of the antennæ occur a pair of small circular areas, yellow in colour, known as the fenestræ or ocelliform spots; in the males of *Corydia* and *Polyphaga* these are replaced by true ocelli.

1) In the genus *Pseudomops* this character is confined to the female sex.

The *pronotum* is large and frequently covers the head entirely; it is most varied in shape and may be orbicular, semi-orbicular, cucullate, with reflected border, rugose or tuberculate. The prosternum is small and inconspicuous.

The *mesonotum* and *metanotum* are very similar to one another in structure; in some genera a small triangular part of the mesonotum, the *scutellum*, is exposed when the tegmina and wings are closed. The meso- and metasternum though larger than the prosternum are not readily to be seen in dried specimens.

The *tegmina* or *elytra* may be completely developed, abbreviated, scale-like or absent; in many genera the males are winged, but the females are apterous (*Polyphaga*, *Deropeltis* etc.).

The tegmina overlap to a greater or less extent; they are horny, coriaceous or membranous; in the genus *Diaphana* they are entirely membranous and transparent, in the genus *Holocompsa* the basal half is coriaceous and opaque, the apical half membranous and transparent, producing the appearance of the tegmen of a Heteropterous bug. Occasionally the tegmina are ciliated (*Polyphaga*, *Corydia*) or covered with a sericeous pile (*Nyctibora*, *Paratropes*). Four main nervures or veins issuing from the base of the tegmen may be distinguished, viz: 1. The mediastinal vein, which runs to the anterior border of the tegmen before its middle; the part of the tegmen between its anterior border and the mediastinal vein is known as the mediastinal area; branches or secondary veins are emitted by the mediastinal vein only towards the anterior border. 2. The radial vein extends to the apex of the tegmen dividing it into two more or less unequal parts, the marginal area and the discoidal area; in some genera the marginal area is almost equal in breadth to the discoidal area, in others it is a narrow strip; branches are given off to the anterior margin of the tegmen (costal veins) and sometimes to the apex. 3. The ulnar or median vein gives off a number of branches to the apex and to the sutural margin of the tegmen, when these branches unite in two main trunks they are termed the anterior ulnar or interno-median and the posterior ulnar or externo-median. 4. The anal vein runs in a curved line to the sutural margin at a point before its middle; it is usually well-marked and sometimes impressed: the part of the tegmen enclosed by it is the anal area, and is occupied by a series of more or less parallel secondary veins, known as the axillary veins, whose number ranges from three to twelve or more. These four main nervures are generally distinct, but in tegmina of corneous texture they tend to disappear; the secondary veins more frequently become obliterated.

The *wings* in some genera are reduced or absent, even when the tegmina are well-developed (*Phlebotomus*, *Phenacisma*), but reduction of the tegmina is always accompanied by reduction of the wings. The general form of the expanded wing is a triangle, the apex of the triangle being attached to the metanotum; an anterior part and a posterior part can be distinguished, the anal or dividing vein marking the division of the two parts. The veins of the tegmina have their counterpart in the wing; the ulnar vein nearly always is composed of two distinct branches, the anterior ulnar, which is usually unbranched, and the posterior ulnar, which gives off numerous branches towards the dividing vein and apex of the wing; the dividing vein is unbranched. The posterior part of the wing corresponds to the anal area of the tegmen and is traversed by several radiating axillary veins, which act like the ribs of a fan and on which this part of the wing can fold up, the folded up portion then doubling under the anterior part of the wing. In the Corydinæ the anal area however does not fold up like a fan, but merely doubles under the anterior part of the wing. A small part of the wing known as the triangular apical area occurs in some genera (e. g. *Ectobia*, *Chorisoncava*, *Oxyhaloa*); in these, when the wing is folded, this triangular area is left at the tip of the wing unincorporated in the main fold, but it is doubled over or rolled up and lies on the anterior part of the wing, it also folds on itself along a longitudinal crease; when the wing is expanded this area unfolds and is seen to lie between the dividing vein and the posterior ulnar vein, which are often somewhat distorted to accommodate it. In the genera *Anaplecta* and *Plectoptera* the apical area is large and often equals the rest

of the wing in size, it now doubles by a transverse hinge over the rest of the wing and is also folded in two along a longitudinal crease; it is not veined. In the genus *Diploptera* the large apical area is veined in a complex manner, the venation however being quite separate from that of the basal part of the wing.

The *legs* are very similar to one another, no one pair being modified for leaping or for raptorial purposes; amongst the Panesthinæ they are well adapted for the fossorial habits of this sub-family. The *coxæ* are large and flattened and serve as shields to the ventral surface of the thorax. The trochanters are moderate in size. The femora are generally compressed, with the upper border rounded, the lower border with two keels; the presence or absence of spines on these keels is a character of great taxonomic importance. The tibiæ are heavily armed with spines. The tarsi are five-jointed, the last joint bearing two claws, between which may or may not be present a lobe or arolium; the under-surface of the other joints is generally furnished with pads or pulvilli and sometimes with spines; the first joint is the longest and is termed by most authors the metatarsus.

The *abdomen* is large and consists of ten segments, not all of which however are visible, since some of the apical segments are retracted and inflexed; in each segment a dorsal plate or tergum and a ventral plate or sternum is to be distinguished. The first dorsal plate is very reduced in size and is, as a rule, more or less fused with the metanotum; the first ventral plate may be still more rudimentary. In the male cockroach ten dorsal plates are usually visible, but sometimes only nine; in the female the eighth and ninth terga are concealed beneath the seventh tergum. The tenth dorsal plate is known as the lamina supra-analis, it is different in shape in the two sexes. Nine ventral plates in the male and seven in the female are visible, the last of the series (ninth in the male, seventh in the female) is termed the lamina subgenitalis and bears in the male a pair of unjointed styles; these however may be absent (*Ectobia*, *Panesthia* etc.), or only one may be present, a notch in the subgenital lamina replacing the absent one (*Phyllodromia*, *Temnopteryx*, etc.). In the females of the sub-family Periplanetinæ the hinder part of the seventh ventral plate is divided and modified to form a valvular apparatus, but in all the other sub-families the terminal ventral plate is a simple, semi-orbicular structure. The eighth, ninth and tenth sterna in the female can only be demonstrated by dissection. The tenth segment bears a pair of jointed cerci which may be very long or reduced to a single joint (*Panesthia*). In some species of the sub-families Ectobinæ and Phyllodrominæ, e. g. *Ectobia lapponica*, *Hololampra marginata*, *Phyllodromia incisa* etc., certain glands which appear to be confined to the male sex open to the exterior on the dorsal surface of the abdomen near its apex; the opening is situated as a rule between two terga, generally the seventh and eighth, and these terga are more or less modified. The function of the glands is quite obscure and the term « repugnatorial glands » applied to them by most authors seems singularly inappropriate. *Cosmozosteria ferruginea*, Walk. is said to extrude two bright orange-coloured vesicles from the extremity of the abdomen when irritated, and to emit a most disgusting odour. There are ten pairs of *spiracles*, two of which are thoracic, eight abdominal; the thoracic spiracles are situated between the bases of the legs, they are different in structure to the abdominal spiracles and may possibly be expiratory in their action, whilst the abdominal spiracles may be inspiratory. In some genera (*Epilampra*, *Rhincoda* etc.) the terminal spiracles lie at the base of short spiracular tubes situated at the posterior angles of the ninth abdominal segment.

Reproduction. — The eggs are laid in a chitinous capsule or ootheca formed inside the body of the mother, who frequently carries it about for some days, protruding from the end of her abdomen, before she deposits it. A few species (*Molytria maculata*, *Epilampra burmeisteri*, *Panchlora vividis*, *Panesthia javanica* etc.) are viviparous. The larvæ are not very dissimilar from the adult, but are of course apterous; the larvæ of winged species can be distinguished by the produced posterior angles of the mesonotum and metanotum, but it is sometimes no easy matter to determine whether an example of an apterous form is immature or adult and no certain diagnostic characters can be offered.

Bionomics. — Very little is known as to the food of the majority of the species of Blattidæ; *Ectobia lapponica* in Northern Europe is said to feed largely on dried fish and Brunner states that dead animal matter is the natural food of this order of insects. The species found in human habitations are very catholic in their tastes and the Panesthinæ seem to derive nourishment from the decayed wood in which they burrow. Many species are nocturnal in their habits and the majority of species spend much of their life hidden under leaves and stones. The genera *Nocticola* and *Spelaoblatta* occur in caves; according to Bolivar these two genera constitute a separate sub-family the Nocticolinæ, but they may be regarded rather as aberrant members of the sub-family Periplanetinæ; the eyes are simple or absent in the three known species. Some species of minute cockroaches have been found in the nests of ants in North and South America and another species has been taken from the nest of a wasp of the genus *Polybia*, occurring in French Guiana. The apterous females of the genus *Rhincoda* and the larvæ of some species of *Epilampra* are amphibious, diving and swimming with great readiness. Certain genera of the sub-family Perisphærinæ are remarkably like millipedes; *Eustegasta buprestoides* closely resembles a Buprestid beetle and some of the species of the genus *Prosoplecta* mimic Coccinellidæ and Galerucidæ; it has been stated by two independent observers that the South American *Achroblatta luteola* mimics the Lampyridæ. *Polyzosteria mitchellii* from Australia is most brilliantly coloured and is probably highly distasteful to insect enemies. *Gromphadorhina portentosa* from Madagascar is said to stridulate loudly, but no apparatus adapted for this purpose has yet been demonstrated.

Distribution. — Owing to human agency certain species (e. g. *Blatta orientalis*, *Periplaneta americana*, *Leucophaea surinamensis*, *Rhypharobia maderae*) have now a world-wide distribution and individuals of other exotic species are continually making an appearance at European ports, whither they have been transported by ships in the foreign trade. The geographical distribution of the different sub-families of Blattidæ will be noticed under their separate headings. The Blattidæ are of considerable geological antiquity as their remains have been found in abundance in beds of the Carboniferous period; a fragment which is considered by some authorities to be a portion of the tegmen of a cockroach has been found in a Silurian sandstone.

Classification. — Linnæus (1766-68) described twelve species of Blattidæ, ten of which were included in the genus *Blatta*; these have now been referred to eight genera and *orientalis* has been selected by almost universal consent as the type of the genus *Blatta*. Thunberg (1826), Serville (1831-39), Blanchard (1837), Burmeister (1839), Stål (1856-61), de Saussure (1862) added considerably to our knowledge of this group of insects, but it was not till the appearance in 1865 of the *Nouveau Système des Blattaires* by Brunner von Wattenwyl that anything approaching a scientific classification of the Blattidæ was attempted. This classic was followed three years later by Francis Walker's *Catalogue of the Blattariae in the British Museum*, in which a large number of new species were described; it is a sufficient commentary on the relative values of these two memoirs to state, that whilst the latter is practically useless to those who have not access to the actual specimens described, the former remains at the present day the most comprehensive and the most useful guide to the Blattidæ that is extant. Stål (1874) submitted Brunner's scheme of classification to some criticisms, but was unable to improve on it to any great extent, and in 1893 Brunner in his final revision of the tribe left it with but few alterations of the first importance. The important memoirs of de Saussure, entitled *Mélanges Orthoptérologiques*, his account of the Orthoptera of Mexico and the memoirs by de Saussure and Zehntner on the Orthoptera of Madagascar and Central America have added so largely to our knowledge that it can be said that the study of the Blattidæ now rests on a sound basis of scientific classification. The *Synonymic Catalogue of Orthoptera* by Kirby, the two volumes of which have appeared recently, renders the task of the recorder much less difficult than in the past. The characters which are of chief value in distinguishing the sub-families of Blattidæ are, the

presence or absence of spines on the lower borders of the femora, the shape of the supra-anal lamina and of the sub-genital lamina in the female, the presence or absence of arolia between the tarsal claws, and the structure of the wings.

KEY TO THE SUB-FAMILIES

1. *Femora spined beneath.*
 2. *Last ventral segment of the female large, without valves.*
 3. *Supra-anal lamina of both sexes usually transverse, narrow. Wings when present with an apical field, ulnar vein simple or bifurcate. Posterior femora usually sparsely armed with spines beneath.* 1. Subfam. ECTOBINÆ.
 - 3'. *Supra-anal lamina of both sexes more or less produced, triangular or emarginate. Wings when present with or without triangular apical field, ulnar vein ramose. Posterior femora usually strongly spined beneath.*
 4. *Supra-anal lamina of both sexes triangular, entire. Cerci projecting considerably beyond this lamina.*
 5. *Pronotum and tegmina smooth. The radial vein of the wings usually giving off to the anterior margin several parallel costal veins. Tarsi with no pulvilli.* 2. Subfam. PHYLLODROMINÆ.
 - 5'. *Pronotum and tegmina covered with a silky pile. The radial vein of the wings giving off to the anterior margin irregular costal veins. Tarsi provided with pulvilli.* 3. Subfam. NYCTIBORINÆ.
 - 4'. *Supra-anal lamina of the male more or less quadrate, with obtuse angles, of the female broadly rounded or lobate. Cerci not projecting beyond this lamina. Tarsi with distinct pulvilli. The ulnar vein of the wings emitting parallel branches towards the dividing vein* 4. Subfam. EPILAMPRINÆ.
 - 2'. *The last ventral abdominal segment of the female provided with valves* 5. Subfam. PERIPLANETINÆ.
- 1'. *Femora unarmed beneath (A few exceptions).*
 2. *Supra-anal lamina of both sexes more or less produced, its posterior margin notched.* 6. Subfam. PANCHLORINÆ.
 3. *Claws with a distinct arolium* 7. Subfam. BLABERINÆ.
 - 3'. *Claws without or with a minute arolium.*
 4. *Wings with a folded fan-like anal field. Pronotum smooth* 8. Subfam. CORYDINÆ.
 - 4'. *Anal field of the wings with a single fold. Pronotum more or less pilose* 9. Subfam. ONYHALOINÆ.
 - 2'. *Supra-anal lamina of both sexes short, transverse, its posterior margin straight or rounded.*
 3. *Subgenital lamina of the male somewhat produced, furnished with a single style. Claws with a distinct arolium (except in the genus Paranauphœta).*
 4. *Anterior part of the wings pointed, or the wings with much produced apical field, or wings twice as long as elytra, folded in repose*

- 4'. *Anterior part of the wing rounded, with no apical field* 10. Subfam. PERISPILÆRINÆ.
 3'. *Subgenital lamina of the male very small, with no styles. Claws with
 no arolia* 11. Subfam. PANESTHINÆ.

SUBFAM. ECTOBINÆ

Characters. — Antennæ setaceous or plumose. Tegmina of horny texture or coriaceous, fully developed, scale-like or absent. Wings, when present, with prominent triangular apical field or with a large reflected and folded apical area, the ulnar vein simple or bifurcate except in the genus *Anaplectoidea* where it is ramose. Legs slender, femora usually sparsely armed beneath. Supra-anal lamina of both sexes various in shape but typically narrow and transverse. Ootheca with a longitudinal crest and before deposition carried with the crest uppermost and the eggs disposed vertically (1).

KEY TO THE GENERA

1. *Wings fully developed.*
 2. *Wings with triangular apical field.*
 3. *Radial and ulnar veins of tegmina separate.*
 4. *Sub-genital lamina of male without modified appendages.*
 5. *Pronotum and tegmina not pubescent.*
 6. *Antennæ setaceous, posterior ulnar vein of tegmina flexuose* Genus THEGANOPTERYX, Brunner.
 - 6'. *Antennæ more or less plumose, posterior ulnar vein of tegmina angulate* Genus HEMITHYRSOCERA, Saussure.
 - 5'. *Pronotum and tegmina pubescent* Genus MALLOTOBIATTA, Saussure & Zehntner.
 - 4'. *Sub-genital lamina of male with lobiform or hook-like appendages* Genus ESCALA, Shelford.
 - 3'. *Radial and ulnar veins of tegmina fused together at their bases* Genus ECTOBIA, Stephens.
 - 2'. *Wings with large reflected apical area.*
 3. *Ulnar vein of wings simple or bifurcate* Genus ANAPLECTA, Burmeister.
 - 3'. *Ulnar vein of wings ramose* Genus ANAPLECTOIDEA, Shelford.
- 1'. *Wings rudimentary or absent* Genus HOLOLAMPRA, Saussure.

I. GENUS ECTOBIA, STEPHENS

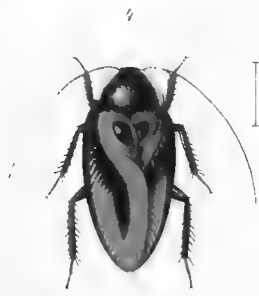
Ectobia. Stephens, Ill. Brit. Ent. Mandib. Vol. 6, p. 45 (1835).

Characters. — Antennæ setaceous. Tegmina when folded not covering the scutellum, the radial and ulnar veins fused at their bases. Triangular apical field of the wings conspicuous. Femora

(1) This character appears also amongst certain genera of *Phylloclorinæ*, e. g. *Ellipsidium*, Saussure.

GENERA INSECTORUM

ORTHOPTERA



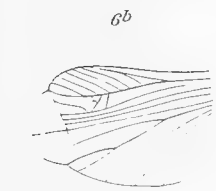
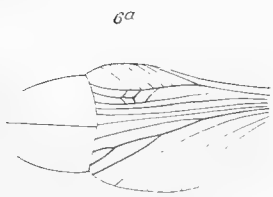
Anaplecta pallicornis



Anaplecta varipennis



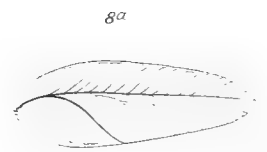
Hemithyrocera lateralis



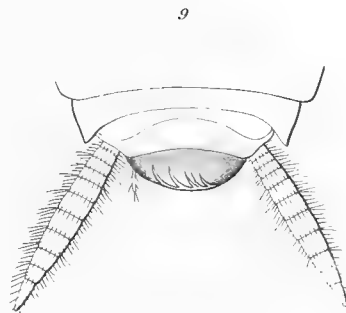
Anaplecta varipennis



Ectobia lapponica



Ectobia lapponica



Escala circumducta



Ectobia pirspicillaris



Hololampra carpetana



Theganopteryx aethiopia

FAM. BLATTIDÆ
SUBFAM. ECTOBINÆ

with two spines on the anterior margin beneath. Supra-anal lamina in both sexes transverse and narrow. Sub-genital lamina of male without styles.

Geographical distribution of species. — Europe, North America, Africa, Australia.

1. *E. lapponica*, Linnaeus, Syst. Nat. (ed. 10), p. 425. n. 8 (1758) (British Islands, N. Europe, Mountains of S. Europe, Servia). — **Plate, Fig. 3, 8a, 8b.**
2. *E. albicincta*, Brunner von Wattenwyl, Verh. Zool.-Bot. Ges. Wien, Vol. 11, p. 98, 286 (1861) (Dalmatia, Tuscany).
3. *E. nicænsis*, Brisout, Bull. Soc. Ent. Fr. (2), Vol. 10, p. 68 (1852) (S. France, Spain, Tyrol).
? tridentina, Targioni-Tozzetti, Bull. Soc. Ent. Ital. Vol. 13, p. 180 (1881).
4. *E. Panzeri*, Stephens, Illustr. Brit. Ent. Mand. Vol. 6, p. 47, n. 5 (1835) (British Islands, N. Europe, Spain, Dalmatia).
5. *E. perspicillaris*, Herbst, Fuessly, Arch. Ent. p. 186, pl. 49, f. 11 (1786) (British Islands, S. and Mid-Europe, Algeria). — **Plate, Fig. 7.**
livida, Fabricius, Ent. Syst. Vol. 2, p. 10, n. 23 (1793).
Brunneri, Seoane, Mitt. Schweiz. Ent. Ges. Vol. 5, p. 485 (1879).
6. *E. vittiventris*, Costa, Ann. Acad. Asp. Nat. Vol. 1, p. 111 (1847) (Italy, Spain, Algeria, Cape of Good Hope).
7. *E. Duskei*, Adelung, Hor. Soc. Ent. Ross. Vol. 38, p. 127 (1904) (Mid-Russia).
8. *E. africana*, Saussure, Abh. Senckenb. Ges. Frankf. Vol. 21, p. 569 (1899) (E. Africa).
9. *E. flavocincta*, Scudder, Journ. Boston Soc. Nat. Hist. Vol. 7, p. 419, n. 3 (1862) (W. United States, N. America).
10. *E. apicifera*, Tepper, Trans. Roy. Soc. S. Austral. Vol. 17, p. 35 (1893) (S. Australia).
11. *E. minima*, Tepper, ibidem, Vol. 19, p. 147 (1895) (Victoria, Australia).
12. *E. sublucida*, Tepper, ibidem, p. 147 (1895) (Victoria, Australia).
13. *E. tasmanica*, Brancsik, Jahresb. Ver. Trencsin. Comit. Vol. 19, p. 244, pl. 7, f. 1 (1897) (Tasmania).
14. *E. maori*, Rehn, Proc. U. S. Nat. Mus. Vol. 27, p. 541 (1904) (New Zealand).

Doubtful species :

15. *E. (?) marcida*, Erichson, Arch. f. Naturg. Vol. 8, p. 248 (1842) (Tasmania).
16. *E. (?) margarita*, Tepper, Trans. Roy. Soc. S. Austral. Vol. 19, p. 148 (1895) (Victoria, Australia).

2. GENUS THEGANOPTERYX, BRUNNER VON WATTENWYL

Theganopteryx. Brunner von Wattenwyl, Nouv. Syst. des Blatt. p. 53 (1865).

Characters. — Allied to *Ectobia*, Westwood, but the radial and ulnar veins of the tegmina separate; triangular apical field of the wings generally smaller. Ulnar vein of the wings simple or bifurcate. Femora with numerous spines. Supra-anal lamina transverse or produced and triangular. Sub-genital lamina of the male with or without styles.

Geographical distribution of species. — Tropical Asia and Africa, Central and South America, (?) Australia.

1. *T. apicigera*, Walker, Cat. Blatt. Brit. Mus. p. 227 (1868) (Borneo, Sumatra, Java).
2. *T. parvula*, Walker, Cat. Blatt. Brit. Mus. p. 108 (1868) (India).
3. *T. senegalensis*, Saussure, Rev. Zool. (2), Vol. 20, p. 354 (1868) (Senegal, Sierra Leone).
Blatta fulvipes, Walker, Cat. Blatt. Brit. Mus. p. 105 (1868).
Blatta amona, Walker, ibidem, p. 229 (♂) (1868).
4. *T. gambiensis*, Shelford, Trans. Ent. Soc. Lond. p. 236 (1906) (Gambia).
5. *T. aethiopica*, Saussure, Ann. Mus. Stor. Nat. Genova, Vol. 35, p. 72 (1895) (Gold Coast).
— **Plate, Fig. 1.**
6. *T. nitida*, Borg, Bih. Svenska, Akad. Vol. 18, Afd. 5, n. 10, p. 4, pl. 1, f. 8 (1904) (Cameroons).

7. *T. Saussurei*, nom. nov., Saussure, Ann. Mus. Stor. Nat. Genova, Vol. 35, p. 71 (1895) (Somaliland).
8. *T. vinula*, Stål, Öfv. Vet.-Akad. Förh. Vol. 13, p. 166 (1865) (Natal).
9. *T. massuae*, Saussure & Zehntner, in Grandidier, Hist. Nat. Madag. Orth. Vol. 1, p. 28 (1895) (E. Africa).
10. *T. hova*, Saussure & Zehntner, ibidem, p. 7, n. 1 (1895) (Madagascar).
11. *T. malagassa*, Saussure & Zehntner, ibidem, p. 8, n. 2 (1895) (Madagascar).
12. *T. tricolor*, Saussure & Zehntner, ibidem, p. 9, n. 3, pl. 1, f. 2 (1895) (Madagascar).
13. *T. conspersa*, Saussure, Soc. Ent. Zurich, Vol. 6, p. 26 (1891) (Madagascar).
14. *T. bidentata*, Saussure & Zehntner, in Grandidier, Hist. Nat. Madag. Orth. Vol. 1, p. 11, pl. 1, f. 1, 1a, d (1895) (Madagascar).
15. *T. molesta*, Saussure & Zehntner, ibidem, p. 12, n. 6 (1895) (Madagascar).
16. *T. punctulata*, Saussure & Zehntner, ibidem, p. 15, n. 10 (1895) (Madagascar).
17. *T. punctata*, Saussure, Soc. Ent. Zurich, Vol. 6, p. 26 (1891) (Madagascar).
18. *T. difficilis*, Saussure, Abh. Senckenb. Ges. Frankf. Vol. 21, p. 572 (1899) (Madagascar).
19. *T. fallax*, Saussure, Mém. Soc. Sc. Phys. Nat. Genève. Vol. 20, p. 233 (1869) (Mexico).
20. *T. pilosella*, Saussure & Zehntner, Biol. Centr. Amer. Orth. Vol. 1, p. 17, n. 2 (1893) (Peru).
21. *T. lucida*, Brunner von Wattenwyl, Nouv. Syst. des Blatt. p. 62 (1865) (? Australia).

3. GENUS HEMITHYRSOCERA, SAUSSURE

Hemithyrsocera. Saussure, Soc. Ent. Zurich, Vol. 8, p. 57 (1893).

Characters. — Antennæ more or less incrassated and pilose. Anterior ulnar vein of the tegmina bifurcated, branches of posterior ulnar vein angulate. Ulnar vein of the wings simple or bifurcate, a conspicuous triangular apical field. Femora strongly spined in some species. Supra-anal lamina more or less produced and triangular.

Geographical distribution of species. — Tropical Asia.

1. *H. histrio*, Burmeister, Handb. Ent. Vol. 2, p. 490 (1838) (Great Sunda Islands, Penang, Celebes).
Blatta lateralis, Serville, Hist. Ins. Orth. p. 107 (1839).
Phylodromia inversa, Brunner von Wattenwyl, Nouv. Syst. Blatt. p. 96 (1865).
Pseudomops fissa, Walker, Cat. Blatt. Brit. Mus. p. 213 (1868).
Theganopteryx jucunda, Saussure, Mém. Soc. Sc. Phys. Nat. Genève, Vol. 20, p. 232 (1869).
Thyrsocera lineaticollis, Bolivar, An. Soc. Esp. Hist. Nat. Vol. 19, p. 302 (1890).
2. *H. nigra*, Brunner von Wattenwyl, Nouv. Syst. des Blatt. p. 120, n. 5 (1865) (India, China, Indo-China).
Ellipsidium subcinctum, Walker, Cat. Blatt. Brit. Mus. p. 85, n. 5 (1868).
Theganopteryx indica, Saussure, Mém. Soc. Sc. Phys. Nat. Genève, Vol. 20, p. 230, pl. 3, f. 16 (1869).
3. *H. soror*, Brunner von Wattenwyl, Nouv. Syst. des Blatt. p. 120, n. 6 (1865) (Java).
4. *H. suspecta*, Bolivar, Ann. Soc. Ent. Fr. p. 288 (1897) (India).
5. *H. ferruginea*, Brunner von Wattenwyl, Ann. Mus. Stor. Nat. Genova, Vol. 33, p. 22, pl. 1, f. 6 (1893) (Burma).
6. *H. communis*, Brunner von Wattenwyl, ibidem, p. 23 (1893) (Burma).
7. *H. lateralis*, Walker, Cat. Blatt. Brit. Mus. p. 213 (1868) (Burma, Siam, India). — **Plate, Fig. 2.**
Thyrsocera major, Brunner von Wattenwyl, Ann. Mus. Stor. Nat. Genova, Vol. 33, p. 22, pl. 1, f. 7 (1893).
8. *H. ignobilis*, Shelford, Trans. Ent. Soc. Lond. p. 238 (1906) (Assam).
9. *H. vittata*, Brunner von Wattenwyl, Nouv. Syst. des Blatt. p. 119, n. 4 (1865) (Cambodia).

Doubtful species :

10. *H. lessellata*, Rehn, Proc. U. S. Nat. Mus. Vol. 27, p. 545 (1904) (Siam).
11. *H. australis*, Tepper, Trans. Roy. Soc. S. Austral. Vol. 19, p. 153 (1895) (N. Queensland).

4. GENUS MALLOTOBLATTA, SAUSSURE & ZEHNTNER

Malloblatta. Saussure & Zehntner, in Grandidier, Hist. Nat. Madag. Orth. Vol. 1, p. 17, 41 (1895).

Characters. — Small slender insects with the head, pronotum and tegmina furnished with a scattered erect pubescence. Tegmina and wings in the male longer than the abdomen, wings with an intercalated apical triangle and simple or bifurcated ulnar vein; in the female the tegmina are not longer than the abdomen, the wings are abbreviated. Femora strongly spined. Supra-anal lamina in the male transverse or slightly produced, trigonal in the female.

Geographical distribution of species. — Madagascar, East Africa, India.

1. *M. pubescens*, Saussure & Zehntner, in Grandidier, Hist. Nat. Madag. Orth. p. 42, pl. 2, f. 19 (1895) (Madagascar).
2. *M. pilosella*, Saussure & Zehntner, in Grandidier, ibidem, p. 44, pl. 2, f. 20, 20a (1896) (Madagascar).
3. *M. brachyptera*, Adelung, Ann. Mus. Zool. St-Petersb. Vol. 8, p. 303, pl. 20, f. 13 (1904) (Abyssinia).
4. *M. Kraussi*, Adelung, ibidem, Vol. 9, f. 12 (1905) (Abyssinia).
5. *M. obscura*, Shelford, Trans. Ent. Soc. Lond. p. 234 (1906) (India, Madras).

5. GENUS ESCALA, SHELFORD

Escala. Shelford, Trans. Ent. Soc. Lond. p. 238 (1906).

Characters. — Allied to *Theganopteryx*, Br., but the sub-genital lamina of the male bearing an asymmetrical lobe which may be unarmed or armed with a series of hooks or replaced by a single stout hook; the right style sometimes absent, the left style acuminate. Supra-anal lamina produced, triangular, not projecting beyond the sub-genital lamina. Cerci elongate. Wings with median and ulnar veins simple, triangular apical field somewhat inconspicuous.

Geographical distribution of species. — India, Australia.

1. *E. circumducta*, Walker, Cat. Blatt. Brit. Mus. Suppl. p. 142 (1869) (Adelaide, S. Australia). —
Plate, Fig. 9.
circumducta, Shelford, Trans. Ent. Soc. Lond. p. 239, pl. 15, f. 4.
2. *E. longiuscula*, Walker, Cat. Blatt. Brit. Mus. Suppl. p. 143 (1869) (Adelaide, S. Australia).
longiuscula, Shelford, Trans. Ent. Soc. Lond. p. 239, pl. 15, f. 5.
3. *E. insignis*, Shelford, Trans. Ent. Soc. Lond. p. 240, pl. 15, f. 6 (1906) (Australia).
4. (?) *E. subcolorata*, Walker, Cat. Derm. Salt. Brit. Mus. Vol. 5, Suppl. Blatt. p. 32 (1871) (India, Bombay).

6. GENUS ANAPLECTA, BURMEISTER

Anaplecta. Burmeister, Handb. Ent. Vol. 2, p. 494 (1838).

Riatia. Walker, Cat. Blatt. Brit. Mus. p. 66 (1868).

Characters. — Antennæ setaceous; pronotum transversely elliptical. Tegmina generally with discoidal area traversed by longitudinal veins. Wings with ulnar vein simple or bifurcate, provided with a large triangular apical area which, in a state of repose, is folded longitudinally and then reflected over the rest of the wing, it is without veins. Legs as in *Ectobia*, Westwood. Supra-anal lamina slightly produced, triangular or trigonal. Sub-genital lamina of males without styles.

Geographical distribution of species. — Tropical Asia and Africa, Central and South America, Australia.

1. *A. subrotundata*, Walker, Cat. Derm. Salt. Brit. Mus. Vol. 5, Suppl. Blatt. p. 26 (1871) (Bombay, India).

2. *A. fulva*, Brunner von Wattenwyl, Ann. Mus. Stor. Nat. Genova, Vol. 33, p. 12 (1893) (Burma).
3. *A. gyrinoides*, Walker, Cat. Blatt. Brit. Mus. p. 97, n. 64 (1868) (Ceylon).
4. *A. maculata*, Shelford, Trans. Ent. Soc. Lond. p. 240, pl. 15, f. 7 (1906) (Ceylon).
5. *A. zeylanica*, Shelford, ibidem, p. 241, pl. 15, f. 8 (1906) (Ceylon).
6. *A. Thwaitesi*, Shelford, ibidem, p. 241, pl. 15, f. 9 (1906) (Ceylon).
7. *A. malayensis*, Shelford, ibidem, p. 242, pl. 15, f. 10 (1906) (Malay Peninsula).
8. *A. obscura*, Shelford, ibidem, p. 242, pl. 15, f. 12 (1906) (Malay Peninsula).
9. *A. javanica*, Saussure, Ann. Mus. Stor. Nat. Genova, Vol. 35, p. 71 (1895) (Java).
10. *A. borneensis*, Shelford, Trans. Ent. Soc. Lond. p. 242, pl. 12, f. 11 (1906) (Borneo).
11. *A. cincta*, Gerstäcker, Mitt. Ver. Vorpomm. Vol. 14, p. 56 (1883) (Ogowé, W. Africa).
12. *A. dahomensis*, Shelford, Trans. Ent. Soc. Lond. p. 244, pl. 16, f. 2 (1906) (Dahomey, W. Africa).
13. *A. pulchra*, Shelford, ibidem, p. 244 (1906) (Fernando-Po).
14. *A. africana*, Saussure, Ann. Mus. Stor. Nat. Genova, Vol. 35, p. 70 (1895) (E. Soudan).
15. *A. mexicana*, Saussure, Rev. Zool. (2), Vol. 20, p. 97 (1868) (Mexico).
16. *A. nahua*, Saussure, ibidem, p. 354 (1868) (Mexico).
17. *A. tolteca*, Saussure, ibidem, p. 354 (1868) (Mexico).
18. *A. otomia*, Saussure, Mém. Soc. Sc. Phys. Nat. Genève, Vol. 20, p. 238, pl. 3, f. 18 (1869) (Mexico).
19. *A. azteca*, Saussure, Rev. Zool. (2), Vol. 20, p. 97 (1868) (Mexico).
20. *A. albomarginata*, Saussure & Zehntner, Biol. Centr. Amer. Orth. Vol. 1, p. 26, n. 12 (1893) (Mexico).
21. *A. parvipennis*, Saussure & Zehntner, ibidem, p. 26, n. 13 (1893) (Mexico).
22. *A. decipiens*, Saussure & Zehntner, ibidem, p. 27, n. 16, pl. 3, f. 5, pl. 6, f. 10, 11 (1893) (Mexico).
23. *A. flabellata*, Saussure & Zehntner, ibidem, p. 29, pl. 3, f. 1, pl. 4, f. 13, 14 (1893) (Mexico to Panama).
24. *A. fulgida*, Saussure, Rev. Zool. (2), Vol. 14, p. 163 (1862) (Mexico, Guatemala).
25. *A. fallax*, Saussure, ibidem, p. 163 (1862) (Mexico, Guatemala, Colombia).
26. *A. domestica*, Saussure & Zehntner, Biol. Centr. Amer. Orth. Vol. 1, p. 26, n. 14 (1893) (Guatemala).
27. *A. elliptica*, Saussure & Zehntner, ibidem, p. 27, n. 17, pl. 3, f. 2, pl. 4, f. 8 (1893) (Guatemala).
28. *A. Dohrniana*, Saussure & Zehntner, ibidem, p. 28, n. 18, pl. 3, f. 3, pl. 4, f. 15 (1893) (Guatemala).
29. *A. fansonii*, Saussure & Zehntner, ibidem, p. 29, n. 20, pl. 3, f. 4, pl. 4, f. 9 (1893) (Nicaragua).
30. *A. dorsalis*, Burmeister, Handb. Ent. Vol. 2, p. 494, n. 3 (1838) (Porto Rico).
31. *A. minutissima*, De Geer, Mém. Ins. Vol. 3, p. 542, n. 10, pl. 44, f. 13, 14 (1773) (Surinam).
31. *A. pallida*, Bolívar, An. Soc. Esp. Hist. Nat. Vol. 10, p. 463 (1881) (Ecuador).
33. *A. pavidata*, Shelford, Trans. Ent. Soc. Lond. p. 245, pl. 16, f. 3 (1906) (Ecuador).
34. *A. fusca*, Shelford, ibidem, p. 246, pl. 16, f. 4 (1906) (Ecuador).
35. *A. varipennis*, Shelford, ibidem, p. 246, pl. 16, f. 5, 6 (1906) (Ecuador). — **Plate, Fig. 5, 6, 6a.**
36. *A. peruviana*, Saussure & Zehntner, Biol. Centr. Amer. Orth. Vol. 1, p. 23, n. 2 (1893) (Peru).
37. *A. moxa*, Saussure & Zehntner, ibidem, p. 23, n. 5, pl. 4, f. 3, 4 (1893) (Peru).
38. *A. alaris*, Saussure & Zehntner, ibidem, p. 27, n. 15 (1893) (Peru).
39. *A. lateralis*, Burmeister, Handb. Ent. Vol. 2, p. 494, n. 2 (1838) (Colombia, Brazil).
40. *A. bivittata*, Brunner von Wattenwyl, Nouv. Syst. des Blatt. p. 63, n. 2 (1865) (Brazil).
41. *A. unicolor*, Burmeister, Handb. Ent. Vol. 2, p. 494, n. 4 (1838) (Colombia).
42. *A. replicata*, Saussure & Zehntner, Biol. Centr. Amer. Orth. Vol. 1, p. 25, n. 10, pl. 4, f. 12 (1893) (Brazil).
43. *A. grandipennis*, Saussure & Zehntner, ibidem, p. 25, n. 11, pl. 4, f. 5 (1893) (Brazil).
44. *A. Brunneri*, Shelford, Trans. Ent. Soc. Lond. p. 245, pl. 16, f. 1 (1906) (Brazil).
45. *A. pallicornis*, Walker, Cat. Blatt. Brit. Mus. p. 66 (1868) (Brazil). — **Plate, Fig. 4.**
46. *A. chrysoptera*, Shelford, Trans. Ent. Soc. Lond. p. 247, pl. 16, f. 7 (1906) (Brazil).
47. *A. platycephala*, Rehn, Proc. U. S. Nat. Mus. Vol. 27, p. 542 (1904) (Queensland).

7. GENUS ANAPLECTOIDEA, SHELFORD

Anaplectoidea. Shelford, Trans. Ent. Soc. Lond. p. 247 (1906).

Characters. — Allied to *Anaplecta*, Burmeister, but with the ulnar vein of the wings ramose; tegmina with the marginal field very broad, ulnar vein with six branches. Legs strongly spined.

Geographical distribution of species. — Celebes, Batchian and Sangir.

1. *A. nitida*, Shelford, Trans. Ent. Soc. Lond. p. 248, pl. 16, f. 8, 9 (1906) (Celebes and Batchian).
2. *A. Dohertyi*, Shelford, Ann. Mag. Nat. Hist. Lond. (7), Vol. 19, p. 25 (1907) (Sangir).

8. GENUS HOLOLAMPRA, SAUSSURE

Hololampira. Saussure, Mém. Blatt. Mex. p. 94 (1864).

Aphlebia. Brunner von Wattenwyl, Nouv. Syst. des Blatt. p. 66 (1865).

Characters. — Tegmina of horny texture, as long as the body or abbreviated, veins indistinct. Wings rudimentary or absent. Femora sparsely armed with spines. Supra-anal lamina short transverse in both sexes. Abdomen dilated in the female.

Geographical distribution of species. — Europe, Atlantic Islands, N. Africa, Asia minor, Turkestan, Madagascar, West-Indies.

1. *H. marginata*, Schreber, Naturf. Vol. 15, p. 88, pl. 3, f. 16 (1781) (S. Europe).
2. *H. maculata*, Schreber, ibidem, p. 89, pl. 3, f. 17, 18 (1781) (Germany, Austria).
3. *H. punctata*, Charpentier, Hor. Ent. p. 77 (1825) (S. Europe).
4. *H. sardeca*, Serville, Hist. Ins. Orth. p. 112 (1839) (Sardinia, Algeria).
5. *H. pallida*, Brunner von Wattenwyl, Prodr. Eur. Orth. p. 42, n. 5 (1882) (Greece, Asia minor).
6. *H. trivittata*, Serville, Hist. Ins. Orth. p. 106 (1839) (Sardinia, Algeria, Spain).
7. *H. brevipennis*, Fischer, Orth. Europ. p. 102, pl. 7, f. 12 (1853) (Tyrol, Carniola, Istria, Servia).
8. *H. graeca*, Brunner von Wattenwyl, Prodr. Eur. Orth. p. 43, n. 8 (1882) (Greece, Asia minor).
9. *H. virgulata*, Bolivar, Ann. Soc. Ent. Belg. Vol. 21, p. 67 (1878) (Portugal).
10. *H. carpetana*, Bolivar, An. Soc. Esp. Hist. Nat. Vol. 2, p. 214, pl. 9, f. 1 (1873) (Spain). —

Plate, Fig. 10.

11. *H. subaptera*, Rambur, Faune Andal. Vol. 2, p. 14 (1838) (Spain, Corsica, Dalmatia, Sicily).
12. *H. polita*, Krauss, Verh. Zool.-Bot. Ges. Wien, Vol. 38, p. 569, pl. 15, f. 2, 2a (1888) (West Caucasus).
13. *H. adusta*, Fischer, Orth. Eur. p. 355 (1846) (Crimea).
14. *H. Retowskii*, Krauss, Verh. Zool.-Bot. Ges. Wien, Vol. 38, p. 570, pl. 15, f. 3, 3a (1888) (Crimea).
15. *H. infumata*, Brunner von Wattenwyl, Nouv. Syst. des Blatt. p. 68 (1865) (Madeira).
16. *H. bivittata*, Brullé, in Webb & Berthelot, Hist. Canar. Ins. p. 75, pl. 5, f. 1 (1844) (Canaries).
17. *H. algerica*, Bolivar, An. Soc. Esp. Hist. Nat. Vol. 10, p. 499 (1881) (Oran, Tangiers).
18. *H. moghrebica*, Bolivar, ibidem, Vol. 16, p. 89, pl. 4, f. 1 (1887) (Morocco).
19. *H. larrinae*, Bolivar, ibidem, Vol. 10, p. 500 (1881) (Algeria, Tunis, Crimea).
20. *H. faneri*, Bolivar, ibidem, p. 83 (1894) (Tangiers).
21. *H. Cazurroi*, Bolivar, Le Naturaliste, Vol. 3, p. 116 (1885) (Morocco).
22. *H. Ceconii*, Griffini, Bol. Mus. Zool. Torino, Vol. 10 (193), p. 1 (1895) (Candia).
23. *H. Chavesi*, Bolivar, Act. Soc. Esp. Hist. Nat. p. 72 (1898) (Azores).
24. *H. batika*, Bolivar, C. R. Soc. Ent. Belg. Vol. 28, p. 105 (1884) (Spain).
25. *H. tartara*, Saussure, in Fedtschenko, Reise in Turkestan, Orth. p. 7, pl. 1, f. 4 (1874) (Turkestan).
26. *H. madecassa*, Saussure, Mém. Soc. Sc. Phys. Nat. Genève, Vol. 20, p. 238, pl. 3, f. 19, 19a (1869) (Madagascar).
27. *H. minuta*, Shelford, Ann. Mag. Nat. Hist. Lond. (7), Vol. 19, p. 25 (1907) (Madagascar).
28. *H. inusitata*, Rehn, Bull. Amer. Mus. Nat. Hist. Vol. 22, p. 113 (1906) (Bahamas).

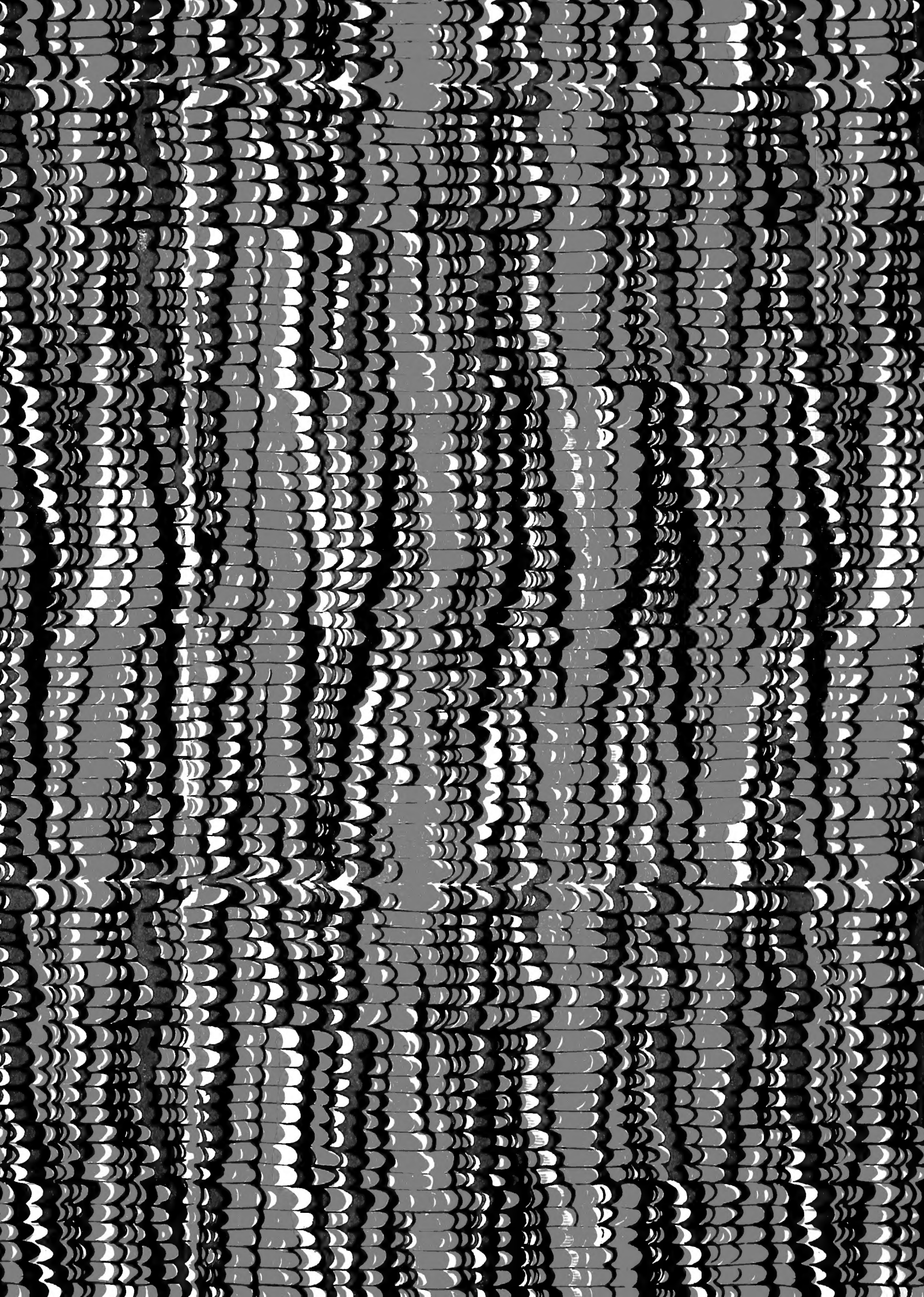
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difficilis, Sauss. (g. <i>Theganopteryx</i>)	8			pallida, Brunn. v. W. (g. <i>Hololampra</i>)	11
Dohertyi, Shelf. (g. <i>Anaplectoidea</i>)	11			Panzeri, Steph. (g. <i>Ectobia</i>)	7
Dohrniana, Sauss. & Zehnt. (g. <i>Anaplecta</i>)	10			parvipennis, Sauss. & Zehnt. (g. <i>Anaplecta</i>)	10
domestica, Sauss. & Zehnt. (g. <i>Anaplecta</i>)	10				
dorsalis, Burm. (g. <i>Anaplecta</i>)	10				

Pages.		Pages.		Pages.
7	parvula, Walk. (<i>g. Theganopteryx</i>)	11	Retowskii, Krauss (<i>g. Hololampra</i>)	8
10	pavida, Shelf. (<i>g. Anaplecta</i>)	9	Riatia (genus), Walk.	7
7	perspicillaris, Herbst. (<i>g. Ectobia</i>)	11	sardea, Serv. (<i>g. Hololampra</i>)	10
10	peruviana, Sauss. & Zehnt. (<i>g. Anaplecta</i>)	8	Saussurei, nom. nov. (<i>g. Theganopteryx</i>)	10
8	pilosella, Sauss. (<i>g. Theganopteryx</i>)	7	senegalensis, Sauss. (<i>g. Theganopteryx</i>)	8
9	pilosella, Sauss. & Zehnt. (<i>g. Mallo-</i> <i>toblatta</i>)	8	soror, Brunn. v. W. (<i>g. Hemithyrso-</i> <i>cera</i>)	7
11	polita, Krauss. (<i>g. Hololampra</i>)	8	subcinctum, Walk. (<i>g. Hemithyrso-</i> <i>cera</i>)	11
10	platycephala, Rehn. (<i>g. Anaplecta</i>)	9	subcolorata, Walk. (<i>g. Escala</i>)	10
9	pubescens, Sauss. & Zehnt. (<i>g. Mal-</i> <i>loblatta</i>)	11	subaptera, Ramb. (<i>g. Hololampra</i>)	8
10	pulchra, Shelf. (<i>g. Anaplecta</i>)	7	sublucida, Tepp. (<i>g. Ectobia</i>)	11
11	punctata, Charp. (<i>g. Hololampra</i>)	9	subrotundata, Walk. (<i>g. Anaplecta</i>)	8
8	punctata, Sauss. (<i>g. Theganopteryx</i>)	8	suspecta, Bol. (<i>g. Hemithyrso-</i> <i>cera</i>)	7
8	punctulata, Sauss. & Zehnt. (<i>g. The-</i> <i>ganopteryx</i>)	11	tartara, Sauss. (<i>g. Hololampra</i>)	10
10	replicata, Sauss. & Zehnt. (<i>g. Ana-</i> <i>plecta</i>)	8	tasmanica, Branes. (<i>g. Ectobia</i>)	8
			tessellata, Rehn (<i>g. Hemithyrso-</i> <i>cera</i>)	7
			Theganopteryx (genus), Brunn. v. W.	10
			Thwaitesi, Shelf. (<i>g. Anaplecta</i>)	8
			tolteca, Sauss. (<i>g. Anaplecta</i>)	11
			tricolor, Sauss. & Zehnt. (<i>g. Thega-</i> <i>nopteryx</i>)	7
			tridentina, Targ. (<i>g. Ectobia</i>)	8
			trivittata, Serv. (<i>g. Hololampra</i>)	7
			unicolor, Burm. (<i>g. Anaplecta</i>)	10
			varipennis, Shelf. (<i>g. Anaplecta</i>)	8
			vinula, Stål (<i>g. Theganopteryx</i>)	11
			virgulata, Bol. (<i>g. Hololampra</i>)	8
			vittata, Brunn. v. W. (<i>g. Hemithyrso-</i> <i>cera</i>)	7
			vittiventris, Costa (<i>g. Ectobia</i>)	10
			zeylanica, Shelf. (<i>g. Anaplecta</i>)	8

EXPLANATION OF THE PLATE

- Fig. 1. *Theganopteryx aethiopica*, Saussure.
— 2. *Hemithyrso-cera lateralis*, Serville.
— 3. Abdomen of *Ectobia lapponica*, Linnæus, ♂, dorsal view.
— 4. *Anaplecta pallicornis*, Walker.
— 5. — *varipennis*, Shelford.
— 6. $\left. \begin{array}{l} a. \\ b. \end{array} \right\}$ Wings of *Anaplecta varipennis*, Shelford.
— 7. *Ectobia perspicillaris*, Herbst.
— 8. $\left. \begin{array}{l} a. \\ b. \end{array} \right\}$ Tegmen of *Ectobia lapponica*, Linnæus.
Wing » » »
— 9. End of abdomen of *Escala circumducta*, Walker, ♂, dorsal view.
— 10. *Hololampra carpetana*, Bolivar.



(1) *Blattidae*

Oncopteryx

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