

INDIAN TRYPANEIDS (FRUIT-FLIES) IN THE COLLECTION OF THE INDIAN MUSEUM, CALCUTTA.

By PROF. M. BEZZI, *Turin, Italy.*

(Plates viii-x).

INTRODUCTION.

Through the kindness of Dr. Annandale of the Indian Museum, I have received for study a large collection of Indian acalyptate Muscids with variegated wings, most of which are Trypaneids, but a few belong to other families. In the present paper I will deal with the Trypaneids, and I will reserve the rest for another paper, which will embrace the Heleomyzids, Lauxaniids, Oortalids, Ephydriids and Drosophilids.

I will make the present paper the more extensive inasmuch as the Oriental and Australian Trypaneids are little known and in most cases are as yet in great confusion. This is perhaps due to the fact that the great monographer of the Trypaneids, Prof. Loew, was very little acquainted with Oriental forms; though a great portion of Palaearctic, Nearctic, Neotropical and even Ethiopian species were named and described by him¹, in the Oriental or Australian fauna he has not described even a single species! Most of the species are due to Mr. Walker, who, with his well-known inaccuracy, has mixed up the matter in a very disagreeable manner.

The family of the Trypaneids, however, is of very great economic importance, because it contains a great many harmful insects which are generally known as "Fruit-flies."

2. DISTINCTIONS OF THE FAMILY AND GENERAL CHARACTERS.

Among the so-called acalyptate Muscids, the family of the Trypaneids is a natural one and not difficult to recognize; as however in the Oriental fauna there are many related forms with a very similar wing-pattern, which may easily be confounded with them, I think it better to give here the essential characters of the family. These are:—

The frons bears a row of bristles in the anterior part of its lateral borders, the so-called lower fronto-orbital bristles. Post-vertical bristles parallel or divergent, never crossed. There are no distinct vibrissae.

2. The thorax with a characteristic chaetotaxy on both dorsal and lateral surfaces, consisting of strong bristles which only in a few cases are

¹ Prof. Loew has named 32% of the Palaearctic, 28% of the Ethiopian, and 21% of the Nearctic species.

reduced. This is called "complete chaetotaxy" and consists of two pairs of scapular, a pair of dorso-central, a pair of prae-scutellar, one humeral, two noto-pleural, one prae-sutural, three supra-alar, one or two mesopleural, one pteropleural and one sternopleural. Very characteristic are the four bristles (scapular) in front of the thorax.

3. The legs without praeapical bristle on the tibiae and with spurs only at the end of middle tibiae.
4. The abdomen with four segments in the male and with five in the female, the first segment being very long and composed of two segments soldered together. Abdomen of the female terminating in a corneous, three-jointed and pointed ovipositor, often very long and usually flattened.
5. The wings have a characteristic neuration and are usually marked with a distinct pattern, consisting chiefly of bands or reticulate patterns. The auxiliary vein becomes indistinct towards the end, where it is merged in the stigmal callosity; the first longitudinal vein is usually beset with spines, the third also in many cases; the basal cells are of large size; the anal cell likewise large, with its lower angle mostly drawn out into a point which in some cases is very long.

If attention is given to the assemblage of these characters, it is impossible to confound a Trypeneid with another acalyptrate Muscid with similarly patterned wings.

There are two closely related families¹, in both of which the females possess a similar corneous ovipositor, the Ortalidae and the Lonchaeidae; the first have also, as a rule, variegated wings and are therefore very often mistaken for Trypeneids. But the Ortalids have no lower fronto-orbital bristles, and the auxiliary vein is distinct as far as its end in the costal vein. Both these characters are also to be found in the Lonchaeids, which have also the basal cells of much smaller size. There are in addition some Agromyzids with a corneous ovipositor (*Liriomyza*), but these flies are sharply distinguished by the simple first vein, by the presence of vibrissae, and by the wings not being blunt.

The Oriental fauna is rich in Lauxaniids which show a wing-pattern very like that of *Tephritis* (*Sapromyza trypetoptera*, *pulchripennis*, etc., *Amphicyphus reticulatus*); but these forms are easily distinguished by the crossed post-vertical bristles, the very small basal cells and the want of the corneous ovipositor.

The Heleomyzidae, some of which have been mixed up by Walker, are readily distinguished by the spinose costa and by the strong bristles (*vibrissae*) at the edges of the mouth; the Heteroneuridae are distinguished in the same way and also, moreover, by the very approximate cross veins. The Sciomyzidae and Dryomyzidae are distinguished by the presence of a praeapical bristle on the tibiae. Finally the Ephydriidae and Drosophilidae have no distinct auxiliary vein, and the second basal cell is usually fused with the discoidal.

¹ Not speaking of the *Tachiniscidae*, which so far as is known are exclusively Neotropical.

For the distinction of the numerous genera and species of the Trypaneids, the following are the principal characters employed:—

Head.—The general form is important, as the head can be broad or narrow, widened below or not, with the face retreating inferiorly or not. The eyes can be rounded or narrowed; the epistome prominent or not; the cheeks broad or narrow; the occiput swollen inferiorly or not. The antennae are important chiefly on account of their form and of the length of the third joint; the arista can be bare, pubescent, pilose or plumose on both sides or only on the upper side.

The proboscis is short, but in some forms is elongated, with the flaps very much prolonged and directed hindwards, and therefore the proboscis appears to be geniculate.

Very important are the bristles, on account of their position, number and form. These are (fig. 1):—

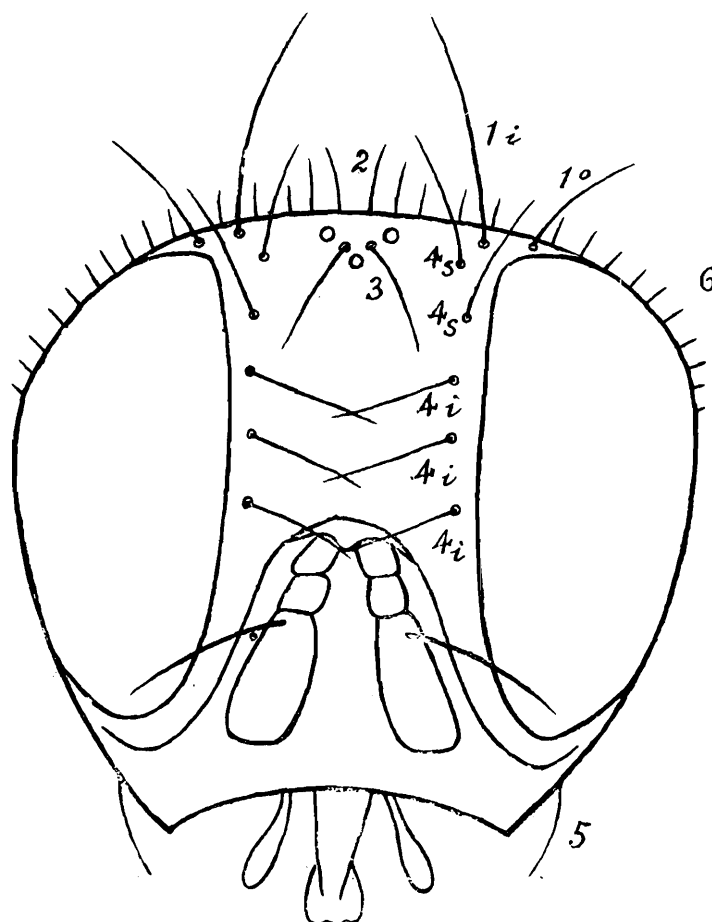


FIG. 1.—Front view of the head of a Trypaneid, showing typical chaetotaxy. For explanation of the numbers see text.

1. *Vertical bristles* (vt.): on the vertex, two pairs, the inner very long, the outer shorter.

2. *Postvertical bristles* (pvt.): on the vertex behind the ocellar spot, only a pair, short and weak, parallel or diverging, rarely wanting.

3. *Ocellar bristles* (oc.): a pair on the ocellar dot, strong, weak or absent.

4. *Fronto-orbital bristles* (or.): a row on each side of the front, variable in number and form. They are divided into superior (1 or 2 pairs bent backwards) and inferior or lower (1 to 4 pairs bent forwards or outwards).

5. *Genal bristle*: on the cheeks, more or less developed.

6. *Occipital row*: along the posterior orbits from vertex to chin, rarely wanting. It is formed either by black, thin, pointed bristles, or by whitish, thick, truncated bristles, and has great systematic value.

Thorax.—Very important is the number and position of the thoracic dorsal and pleural bristles. These are (fig. 2):—

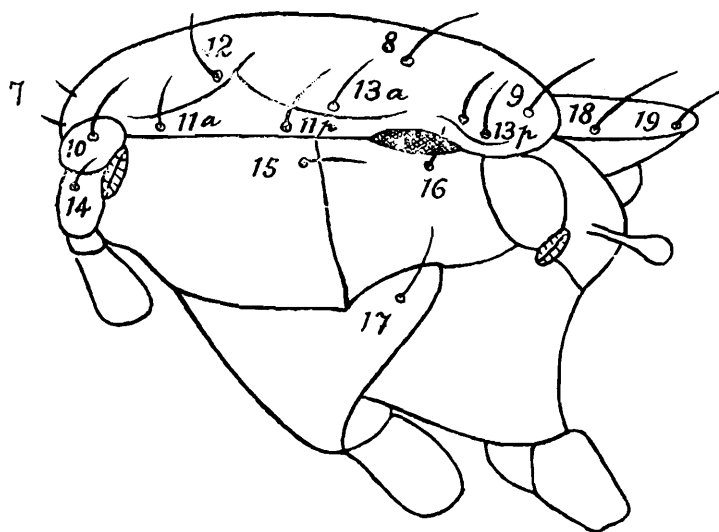


FIG. 2.—Side view of the thorax of a Trypaneid, showing typical chaetotaxy. For explanation of the numbers see text.

7. *Scapular bristles* (scp.): two pairs of small bristles on the fore border of thorax, sometimes less distinct but never wanting; a pair is median or acrostichal, and the other lateral or dorso-central.

8. *Dorso-central bristles* (dc.): a pair, or very rarely two pairs, in the dorso-central region between the transverse suture and the scutellum, sometimes wanting.

9. *Praescutellar bristles* (prsc.): a pair on the hind border in front of the scutellum, more or less approximate, very rarely wanting.

10. *Humeral bristle* (hm.): on the humeral callus, very rarely wanting.

11. *Notopleural bristles* (npl.) or *post-humeral* of Osten Sacken: two bristles inserted above the dorso-pleural suture in the notopleural depression; that behind the humeral callus is called anterior and that before the suture¹ is called posterior; they are always present.

12. *Praesutural bristle* (prst.): before the suture and above the praesutural depression, sometimes wanting.

¹ In my paper of 1909 (*Boll. d. Labor. d. Zool. gen. e agaria d. Portici*, III, p. 275, fig. 1) I have called this bristle *praesutural* (calling *posthumeral* the *praesutural*); but at present I think it better to follow the usual nomenclature.

13. *Supra-alar bristles* (sa.): three; the anterior, just behind the suture, is very rarely wanting, the posteriors, one above the root of the wing and one on the postalar callus are always present; these last are also called postalar bristles.

14. *Propleural bristle* (pp.) or prothoracic: near the prothoracic stigma, usually wanting.

15. *Mesopleural bristles* (mpl.): one or two on the posterior border of the mesopleura, sometimes accompanied with some bristly hairs.

16. *Pteropleural bristle* (pt.): one on the pteropleura, under the root of the wing, usually strong, but sometimes weak.

17. *Sternopleural bristle* (st.): on the sternopleura, below the sternopleural suture, very rarely wanting.

The pubescence of the thorax is moreover of some importance, being more or less distinct, black or yellow, and sometimes very strongly developed.

Scutellum.—The form is important, its surface being flattened or convex, sometimes swollen; in general shape it is triangular, semicircular or trilobate. It usually bears two pairs of bristles.

18. *Basal bristles*: a pair, usually stronger than the apical pair, divergent, very rarely wanting.

19. *Apical bristles*: a pair, usually weaker than the basal, parallel, converging or even crossed, often wanting.

There is also, rarely, an intermediate pair of bristles, between basal and apical.

Abdomen.—Narrow and elongate, or broad and short; narrowed at the base or even pedunculate; the first two segments fused together or distinct; with or without lateral and apical bristles. Male genitalia usually not prominent. Ovipositor with the basal joint flattened or tubular; short, long or very long.

Legs.—Short and robust, or long and slender; fore femora rarely thickened, with a row of bristles below, which is very rarely wanting; middle tibiae with one or two spurs; hind tibiae with or without a row of bristly hairs or even pectinate; some African species have pinnate legs.

Wings.—Narrow, broad or very dilated. Costal bristle wanting, more or less developed or even double. Stigma short, long or very long.

Very important characters are taken from the length, direction, form and position of the longitudinal and cross-veins, and from the form and length of the cells.

The longitudinal veins are distinguished as follows (fig. 3):—

1. *Costal vein* (Costa, C.): ending at the fourth vein, more or less thickened, ciliated over its whole length.

2. *Auxiliary vein* (Subcosta, Sc.) or mediastinal vein of Schiner: thin and more or less short, quite distinct, or very near the front vein and indistinct.

3. *First longitudinal vein* (Radius 1, R_1) or subcostal vein: usually bristly over its whole length, not reaching the small cross-vein, or reaching it or passing beyond it.

4. *Second longitudinal vein* (Radius 2+3, R_{2+3}) or radial vein: straight, bent

in the middle, or wavy, more or less distant from the first, rarely bearing a stump of vein.

5. *Third longitudinal vein* (Radius $4+5$, R_{4+5}) or cubital vein: bare or bristly over its whole length, at base alone, or to the small cross-vein; straight or bent; parallel or diverging from the fourth, rarely converging with this; more or less approximate to the second.

6. *Fourth longitudinal vein* (Media, M.) or discoidal vein: straight or curved after the hind cross-vein or very rarely curved forward at its tip.

7. *Fifth longitudinal vein* (Cubitus, Cu.) or postical vein: bare or very rarely bristly over its whole length, more or less diverging from the fourth.

8. *Sixth longitudinal vein* (Analis, An.) or anal vein: more or less long, reaching or not reaching the hind margin.

9. *Axillary vein* (Axillaris, Ax.): very indistinct.

10. *Humeral cross-vein*, or basal cross-vein: on fore border at the base, between costa and auxiliary vein, less important.

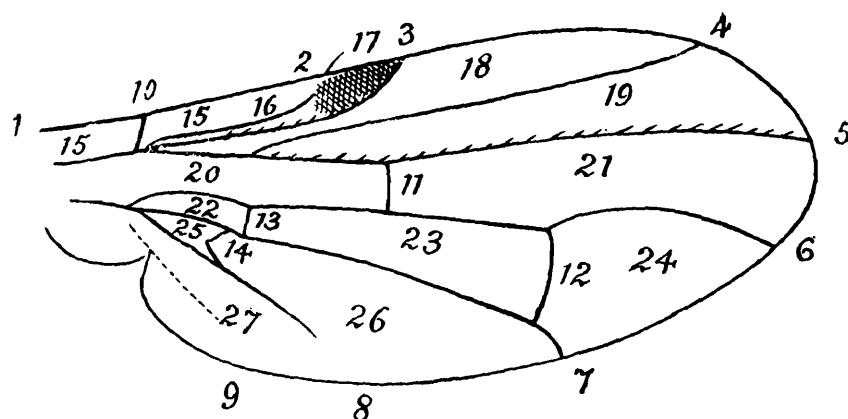


FIG. 3.—Wing of a Trypaneid, showing typical neuration. For explanation of the numbers see text.

11. *Small cross-vein*, or anterior, or median cross-vein: towards the middle, between third and fourth longitudinal veins, very important; placed before, on, or after the middle of the discal cell; long or short, oblique or perpendicular.

12. *Hind cross-vein*, or posterior cross-vein: on the posterior portion near the hind margin between fourth and fifth veins; long or short, oblique or perpendicular, parallel or not with the small cross-vein. Very important is the distance between the small and the hind cross-vein, in relation to the position of the small cross-vein; this distance can be measured by reference to the length of the hind cross-vein; or, following Rondani, by the relative length of the various portions into which the fourth vein is divided. These portions are: the first or basal, between the basal and the small cross-vein; the second or median, between the small and the hind cross-vein; the third or apical, between the hind cross-vein and the end.

13. *Basal cross-vein*, or anterior basal, or discoidal cross-vein: in the middle of the base, between fourth and fifth veins, less important.

14. *Anal cross-vein*, or posterior basal cross-vein: at the base below the preceding, between fifth and sixth veins, very important; straight, convex or con-

cave, or with a very characteristic deep median bend (*Ceratitis*-like); sometimes with the lower portion very prolonged.

15. *Costal cell*: at the base of fore border between costa and auxiliary vein, broad or narrow, short or long; in reality this cell is divided into two cells by the humeral cross-vein; these cells are called the first and the second costal cell; but is here always considered only the second.

16. *Subcostal cell*, or mediastinal cell: at fore border below the preceding between auxiliary and first longitudinal vein; less important, often very small and sometimes indistinct.

17. *Stigma* or pterostigma: the callosity at the end of the subcostal cell, where it is dilated; important in its form and colouration; short or long, often very much prolonged. At the base, where the auxiliary vein ends, it bears the so-called *costal bristle*.

18. *Marginal cell*, or subcostal cell of Schiner: in the distal portion of the fore border, between first and second longitudinal veins, narrow or broad, more or less elongated in the apical portion.

19. *Submarginal cell*, or cubital cell: below the preceding and between the second and third longitudinal veins, from the base to the tip of the wing; narrow or broad, more or less widened at the end.

20. *First basal cell*: in the middle, between the third and fourth longitudinal veins, from the base of the wing to the small cross-vein; more or less long; widened or not at the end.

21. *First posterior cell*: in continuation of the preceding, between the same veins, from the small cross-vein to the hind margin of the wing; with parallel sides or widened outwards, very rarely narrowed at the end.

22. *Second basal cell*: below the base of the first basal cell, between the fourth and fifth longitudinal veins from the bifurcation of these veins to the basal cross-vein; more or less broad, more or less widened at end, sometimes very much dilated.

23. *Discoidal cell*, or discal cell: in continuation of the preceding and between the same veins, from the basal to the hind cross-vein; more or less long and more or less widened at the end, very rarely narrowed at the end.

24. *Second posterior cell*: in continuation of the preceding and between the same veins, from the hind cross-vein to the hind margin of the wing; more or less widened.

25. *Anal cell*, or third basal cell: below the second basal cell, between the fifth and sixth longitudinal veins, from their bifurcation to the anal cross-vein; rarely obtuse at the end, usually with the inferior angle drawn out in a point which is narrow or broad. This cell is shorter than the second basal cell, or of equal length, or longer, and is sometimes very elongate, reaching almost to the hind margin of the wing.

26. *Third posterior cell*: in continuation of the preceding and between the same veins, from the anal cross-vein to the hind margin of the wing.

27. *Axillary cell*: at the base of the hind margin, between sixth vein and hind margin of the wing; this cell is partly fused with the preceding and with the axillary lobe.

The pattern of the wings is also important for the distinction of the species and even of the genera; but in this last case some caution is necessary. The colouring is usually due to a diffused tint in the wing-membrane itself, but in some cases, as in the genera *Schistopterum* and *Rhabdochaeta*, it is due to microscopic peculiarly-shaped and coloured hairs of the wing surface. The patterns may be reduced to two principal types, the banded type and the reticulate type; rarely these two types are to be found on the same wing, as in *Acrotaenia*.

The banded type is well-developed in the so-called "rivulets" of many species; an exaggeration of this type is shown by the species which have black wings, with hyaline indentations and spots, or with complete apical bands. The species which have entirely black wings, with scattered, rather distant, hyaline or subhyaline spots show passage to the following type.

The reticulated type is due to the presence of numerous approximate hyaline spots, which break up the black colouring of the wing into a net-like pattern; on account of the form and size of these spots the net can be more or less closed, and sometimes quite broken up into brown isolated streaks. Special cases of this type are the so-called "star-shaped pattern" and the "radiating pattern."

The colouring of the pattern varies from yellow or brown to black; in rare instances red spots are to be observed, as in *Schistopterum*.

3. METAMORPHOSIS AND BIONOMICS.

Very little is known of the early stages and bionomics of Indian Trypaneids; but I think it useful to give here a summarized account of those of the family in general.

The Trypaneids are flies which live only on vegetable substances, the adults running on leaves or feeding on flowers, the larvae living in various parts of vegetables. The metamorphoses of many species are well enough known, chiefly because some species are very serious pests, while some others can be easily obtained by rearing.

The adult flies are to be found on plants, chiefly on those in which they have been living in the first stages; most of the true Trypaneinae are to be seen on plants of the family Compositae. Other species visit flowers; and many of the Dacinae and of the Ceratitinae seek the sweet secretions and exudations of plants or of certain insects such as the Coccidae.

The flies are remarkable for their handsome aspect and specially for the patterned wings, which they hold spread and trembling. A great many species prefer shady and cool places, and are to be found on the under surface of broad leaves. Many species, which are easily observed in the larval stages, are extremely rare as adult flies, and these can be obtained only by breeding.

The females, with their corneous ovipositors, place the eggs in suitable parts of the vegetables and the very variable form and length of the ovipositor denotes that

the adaptations in this way are very numerous and different. The eggs are elongate, cylindrical, rounded at the two ends, whitish, and with a smooth and thin shell; in microscopical observation the micropyle at the cephalic end appears as a prominent tubercle.

The larvae in the last stage are whitish maggots, with a round and conical body, pointed in front and abruptly truncated behind. They are divided into a number of segments, which are not always easily distinguished, but are usually 14 in number, those of the cephalic end being very small. The body is smooth above; the under surface bears transverse rows of small black spines, directed backwards; the sides are usually adorned with little prominent ring-like keels. The anal end is somewhat impressed, contoured by a variable number of fleshy points or tubercles, some of which bear also chitinous spines.

At present no comparative study of Trypaneid maggots, with the object of discriminating the genera and species, has been made, but the larvae offer a great many structural variations, which can be very well employed for this distinction, variations which will also throw some light on the systematic affinities and classification of the genera of the family.

The most important features of the larvae are to be found in the antennae and palpi, in the mouth parts and in the spiracles.

The antennae are short, two-jointed prominences, usually placed in the middle of the anterior portion of the first segment; the form and length of the two joints are variable in the different species. The palpi are placed just below the antennae and in front of the mouth hooklets and are also variable in shape.

The mouth parts are very important and form the so-called "pharyngeal skeleton," which on account of its black colour and of the transparency of the teguments is easily seen. In the larva of the last stage the pharyngeal skeleton is formed by the two thick and strong hooks, prominent and retractile, which represent the mandibles; the internal portion is constituted by the two pharyngeal plates, the upper and the lower, on which are inserted the muscles for their movements. The hooks vary in shape and curvature, in length and thickness; and below the pointed end they bear sometimes a projecting tooth-like point (present for example in *Rhagoletis*, wanting in *Zonosema*). The plates are also very variable in form.

The larva in the last stage is amphipneustic, *viz.*, presents only anterior and posterior spiracles. The anterior spiracles are placed on the sides of the third segment; they are of very small size and crown-shaped; in microscopical examination they appear to terminate in a variable number of finger-shaped processes. The posterior spiracles are of greater size and are placed on the last segment over the anal opening, near the dorsal surface. They appear as two small yellowish or brownish approximated tubercles, more or less prominent, each of which bears at the end a plate with three respiratory areas.

The larvae of some species are provided with the faculty of jumping.

The larvae of the Trypaneids are rather various in their habits, and attack

different parts of vegetables ; lists of the host plants are given by Frauenfeld, 1856, and by Schiner, 1858. These habits can be reduced to four types:—

1. The Dacinae and most of the Ceratitinae live in the fruits of very different species of plants ; they prefer fleshy fruits and are known as fruit-maggots ; they dig into the pulp, going to the inner parts of the fruit and usually cause its fall.

2. Most of the Trypaneinae and Urophorinae live in the flower-heads of the Compositae, usually without producing galls.

3. Some species live in various parts of plants, such as stems, flower-stems, buds, etc. ; and those which mine in the leaves of various Compositae and Umbelliferae, such as certain species of *Acidia*, *Spilographa* and *Euleja*, are very remarkable.

4. Finally some species make galls on various parts of the plants : on flowers, stems and roots. Not less than 48 gall-making species belonging to nine different genera are known in Europe, viz. about 17 % of all the species known from this region.

The pupation of the larvae living in fruits takes place usually on the ground ; those living in leaves, in flowers or in galls pupate on those parts.

The puparia are of the usual barrel-shaped form ; they show the characters of the mature larva on the spiracles and are various in colouring and appearance. I have before me a certain number of puparia of Trypaneids, and the different features of these specimens show the great variety of characters which the first stages of these flies present. I will record here as an example the differences which are to be seen on summary and superficial examination. *Dacus oleae* has a whitish puparium, thin, smooth and almost opaque, with segmentation not prominent and with the posterior spiracles yellow and rather approximate. *Bactrocera tryoni-ferruginea* has a pale ferruginous puparium, with more approximated posterior spiracles, which are placed in the middle of a pale yellow area. The segments are more distinct and bear a row of very small spinules. The species *B. cucurbitae* has on the contrary a puparium very like that of *D. oleae* in colouring and appearance. *Anastrepha fraterculus* has a thin, pale yellow puparium, with more distinct segmentation ; the surface is smooth and with silky sheen, the posterior spiracles are brown and somewhat approximate. This and the preceding genus have a broad, transverse, wrinkled anal cicatrice, which in *Dacus oleae* is less developed and smaller. *Ceratitis capitata* has a thin and smooth yellow puparium which does not present a shining appearance. The posterior spiracles are dark yellow and approximate and the anal cicatrice is small and smooth. *Acidia lucida* and *Euleia heraclei* have, according to Mik, a dull yellow puparium, with very hard and thick skin and with well-marked segmentation. *Zonosema alternata* has a hard and thick, opaque, pale yellow puparium ; the surface is smooth but with well-marked segmentation ; the posterior spiracles are yellow and somewhat distant and the anal cicatrice is small. Another species of this genus (*Z. meigenii*) has, according to Mik, a dark ferruginous and thin puparium. *Rhagoletis cerasi* has a puparium very like that of *Zonosema alternata*. *Gonyglossum wiedemanni* has, according to Mik, a

dark ferruginous puparium, without prominent segmentation. *Carpomyia vesuviana* and *incompleta* have a hard and thick, opaque, pale yellow puparium; the segmentation is well marked, and the surface shows transverse wrinkles; the posterior spiracles are rather distant and the anal cicatrice is small and smooth. *Urophora cardui*, according to Mik, has a dark ferruginous, flat segmented puparium with little silky splendour. *Myiopites blotii* has a thin, smooth, yellow puparium without a shining surface and with less distinct segmentation; the posterior spiracles are very small and rather distant. *Euribia onotrophes*, according to Mik, has a thin, whitish, shining puparium, with marked ferruginous cross-wrinkles. *Carphotricha pupillata*, described by the same author, has a black violet-coloured puparium, with prominent segmentation and the surface strongly wrinkled, almost reticulate. *Ensina sonchi* has a very shining, thin, transparent, white puparium, with less distinct segmentation and rather distant yellow posterior spiracles. *Sphenella marginata* has an extraordinary thin, shining, brownish black puparium, which is very convex on the back, where the segmentation is indistinct, and concave on the ventral surface which is segmented and finely denticulate. The posterior spiracles are black and very closely approximated. The species of the genus *Oxya* show, according to Mik, thin, smooth, flat segmented, pale ferruginous puparia, and those of *Tephritis* thick, wrinkled, more strongly segmented puparia.

I will finally record that hymenopterous parasites of Trypaneids are known, belonging to the Braconidae and to the Chalcididae and some of these can be used as a natural method of coping with the flies. Among parasites of the genus *Dacus* (s. l.) are known some Braconids of the genus *Opias* and many Chalcidids of the genera *Eupelmus*, *Eurytoma*, *Ormyrus*, *Dinarmus* and *Eulophus*; among those of the genus *Ceratitis*, a species of *Syntomosphyrum*, found in India, and among parasites of the genus *Anastrepha* some species of the Braconid genus *Bioteres*, etc.

4. GEOGRAPHICAL DISTRIBUTION.

The family Trypaneidae is a large one; it includes about 875 known species and this number goes on increasing from year to year. Schiner in 1858 stated that the known species were only 296.

The family has a wide distribution over all the globe, from the Arctic to Tropical regions; the number of the species naturally increasing from the north to the south. From Lapponia 10 species are known, from England 64, from Austria about 100, and from Italy about 130.

From the Palaearctic region 290 species are known. From Africa and the adjacent islands 160 species are known, 60 of which belong to the Mediterranean fauna and also to the Palaearctic region. The truly Ethiopian species are about 100. From the Oriental region the species known are 140, and 50 from the Australian. The North American fauna includes 210 species, and from South America about 70 species have been recorded. There are also about 15 species whose habitat is unknown.

The Indian fauna is as yet little known. In the present paper 69 species are described; with the addition of those recorded by other authors as Indian and no

existing in the collection studied, the total number does not reach 100, which must, I think, be much less than one half of the species living in the country. As far as is known, the Trypetid fauna of the Himalayas is of special character, of more Palaearctic appearance. In Europe the Trypaneids go very high up on the mountains, following their nutritive plants, chiefly the Compositae; 13 species are even recorded from the so-called "nival fauna."

The true Dacinae are exclusively proper to tropical or subtropical countries, *Dacus oleae* being the only example of a species going a little more towards the north. They are almost exclusively confined to the old world. The Ceratitininae have their head-quarters mostly in warm countries, but are also well enough represented in temperate regions. Urophorinae and Trypaneininae, which contain most of the species living on the Compositae, are, like these plants, more proper to temperate regions and mountainous districts; the Urophorinae, so far as is known, exclusively inhabit the old world.

Most of the well-defined genera show a restricted area of habitation; and as the various faunae become better known there is a tendency to making the genera more restricted. The species of Trypaneidae with a wide area of distribution are very few and in most cases this distribution is not a natural one, but is due to man. So the very dangerous *Ceratitis capitata* is known from the warm countries of Europe, Africa, Asia, Australia and North and South America. Some species of *Dacus* (s. l.) also show a wide distribution, as *D. oleae* from the Mediterranean subregion and from South Africa, *D. cucurbitae* from India, Australia and some Pacific Islands. Other examples are *Carpomyia vesuviana* from South Europe and India; *Euribia fluorescentiae* from Europe and North America; *Oxyna bullans* from Europe and South America; *Tephritis angustipennis* from Europe and North America and *Trypanea stellata* from Europe and Australia. Characteristic genera of the Palaearctic region seem to be *Platyparea*, *Euphranta*, *Chaetostoma*, *Gonyglossum*, *Hemilea*, *Anomoea*, *Zonosema*, *Rhacochlaena*, *Myiopites*, *Urophora* and *Hyphenidium*.

True North American genera are *Straussia*, *Oedicarena*, *Epochra*, *Stenopa*, *Neaspilota*, *Peronyma*, *Icterica*, *Eurosta*. Characteristic of the Neotropical fauna are *Hexachaeta*, *Polionota*, *Cecidochares*, *Anastrepha*, *Toxotrypana*, *Blepharoneura*, *Eutreta*, *Strobelia*, *Rhachiptera*, *Acrotaenia*, *Plagiotoma*.

The Ethiopian Trypetids are not yet divided into smaller genera, but there are many characteristic forms which will serve in future for the erection of new genera. *Dacus* (s. str.) and *Leptoxys*, *Schistopterum*, *Rhochmopterum* and *Carpophthoromyia* are the only examples which can be given at present.

The Australian species are very little known; but this fauna also seems to have a number of forms which are related to the Oriental ones along with some others which are endemic; for the latter no special genera have been as yet erected. As special genera can only be recorded *Lenophila*, *Cardiocera* and *Phaeogramma*. It is remarkable that no species of Trypaneids are known from New Zealand, with the exception of those recently described by Brown, which are probably imported.

The Oriental Trypaneids are very numerous and include a great many handsome

and characteristic forms; no subdivision into smaller genera has yet been proposed, but in the following pages I have made an attempt to do this for the Indian species. The Dacinae are represented by very special forms, different from the African ones and I propose to separate them under the generic name of *Bactrocera*. Peculiar genera of the region are also *Meracanthomyia*, *Rioxa*, *Ptilona*, *Vidalia*, *Themara*, *Acanthoneura*, *Henicoptera*, *Rhabdochaeta* and *Myiopardalis*.

The peculiar character of the Oriental (and also of the Indian) fauna seems to be the great variety and richness of Ceratitinae and the very numerous forms with a plumose arista. This last character is also shown by many Ethiopian and Australian forms, while in Europe we have, on the contrary, only *Euphranta* with a short plumose arista. In North and South America there are no such forms, the arista being only pubescent or very shortly pilose.

Comparison between Oriental and Australian or Ethiopian faunas, like that which Loew has established between European and American faunas, is not at present possible.

5. CRITICAL REVIEW OF THE ORIENTAL AND AUSTRALIAN TRYPANEIDS HITHERTO DESCRIBED.

There are two catalogues of the Oriental Trypaneids, one by Bigot, the other by Van der Wulp. The first, published in the *Journal of the Asiatic Society of Bengal*, ii, 1892, p. 220—227, is very incomplete and confused; Bigot had no idea of the natural limits of the family or of the genera, as is shown by the MS. names in the Indian Museum collection.

Van der Wulp's Catalogue (the Hague, 1896, pp. 186—195) is very diligent and complete, but not critical, as he refers to the species of Walker and Doleschall as these were described, without any attempt to place them in correct genera. These species are the misfortune of the Oriental fauna, and it seems that the types are in some cases lost; but fortunately Walker has described only a few species from India. Van der Wulp also was little acquainted with Trypaneids, as he described an *Oxyna* as a *Leptomyza*, an *Acidia* as an *Euxesta*, and even the common North American Ortalid *Chaetopsis aenea* as an *Aciura*!

In the following review I have included the few known Australian species, because they have relation with the Oriental forms and no catalogue of them exists. The species marked with an asterisk (*) are Indian (including Ceylon), and those with two (**) are Australian.

1. *absolutus* (*Dacus*), Walker, 1861 (Proc. Linn. Soc., vi, 22, 13), from Ceram. Seems to be a *Bactrocera* allied to *ferruginea*. Type in London, British Museum.
2. ***acroleuca* (*Tephritis*), Schiner, 1868 (Diptera Novara Reise, 268, 112), from Sydney. Seems to be a *Tephritis*, with obtuse anal cell; but if the observation on p. 269 is exact, this species may belong to the new genus *Tephrella*. Type in Vienna, Imperial Museum.
3. *acroleucus* (*Dacus*), Wiedemann, 1830 (Auss. Zweifl., ii, 520, 11), habitat unknown. Is not a Dacine; the plumose arista clearly indicates one of the Ceratitinae from the Oriental region; but it is doubtful if this form is a Trypaneid or not. Type in Vienna, Imperial

- Museum. Prof. Hendel (Wien. Entom. Zeit., xxxi, 1912, p. 13) has stated that this species is an African one, belonging to the new genus *Conradtina*, Enderlein.
4. **acrostacta*, Wiedemann, 1824 (Anal. Entom., 54, 119, and Auss. Zweifl., 1830, ii. 501, 39), both as *Trypeta*, from East India. A very characteristic species, belonging to the new genus *Tephrostola*. Type in the Museum at Copenhagen.
 5. *addens* (*Dacus*), Walker, 1860 (Proc. Linn. Soc., iv, 149, 177) from Macassar. Is not a Trypaneid, as I have stated in Boll. Lab. Portici, iii, 301, (1909), but an Ortalid, and belongs with great probability to the genus *Stenopterina* as stated by Walker himself. Type in London, British Museum. Prof. Hendel places it in the new genus *Conicipithea*.
 6. ***aenea* (*Tephritis*), Macquart, 1847 (Mem. Soc. Lille, 109, [93], pl. vi, f. 8), from New Holland. Seems to be an Ortalid. Type in Verrall's (Bigot's) collection at Newmarket.
 7. *aeneus* (*Dacus*), Wiedemann, 1819 (Zool. Mag., iii, 29, 44, and Auss. Zweifl., ii, 513, 2), from Java. Is the well-known Ortalid *Stenopterina aenea*.
 8. ***aequalis* (*Dacus*), Coquillett, 1909 (Proc. Linn. Soc. N. S. W., xxxiii, 794) from N. S. Wales. The description appeared in March, 1909; Froggatt (Report 1909, 91, pl. iii, f. 11) figures the wing and gives a description; both authors say nothing about the chaetotaxy, but the species is probably a *Bactrocera*. Type in Washington, U. S. National Museum.
 9. ***albida* (*Trypeta*), Walker, 1853 (Ins. Saunders., iv, 384) from South Australia. Walker states that it is an *Acinia*, R. D. (= *Tephritis*); from the description it seems to be a Trypaneid of the group Trypaneinae but of impossible generic location. Type in London, British Museum.
 10. *alboguttata* (*Themara*), Doleschall, 1858-59 (Nat. Tijdschr. N. Indie, xvii, 124, 82) from Amboina. Seems to be a *Rioxa*. Type in Vienna, Imperial Museum.
 11. *alboscuteolata* (*Anomoea*), Van der Wulp, 1898 (Tijdschr. v. Entom., xli, 217, 4, pl. x, f. 15) from Sumatra. The pattern of the wings comes near that of *Anomoea*, but the position of the posterior cross-vein is very different; I place the species in *Acidia*. Type at Amsterdam? Prof. Meijere, Tijdschr. v. Entom., liv, p. 385, has described the puparium.
 12. *alcestis* (*Trypeta*), Osten-Sacken, 1882 (Berlin. Entom. Zeitschr., xxvi, 229, f. 10) from the Philippine Islands. Is a *Themara* or *Acanthoneura*, as stated by the author himself; the spelling *alkestis* is incorrect. Type in Heidelberg? According to Enderlein, Zool. Jahrb. Syst. Abt., 1911, p. 420, belongs to *Acanthoneura*.
 13. ***alvea* (*Trypeta*), Walker, 1849 (List Dipt. Brit. Museum, iv, 1027) from Australia. Is referred by Walker to the gen. *Noeeta*, R. D., = *Carphotricha*, Loew, and seems to be a true Trypaneine; but on account of its dilated wings, perhaps allied to the group of *stellata* etc., forming a genus related to *Eutreta*. Type in London, British Museum.
 14. *amoyensis* (*Dacus*), Bigot MS., Froggatt, 1909 (Report, 99) from Amoy. Is only a MS. name in Bigot's, now Verrall's collection at Newmarket.
 15. *ampla* (*Themara*), Doleschall, 1858-59 (Nat. Tijdschr. N. Indie, xvii, 154, 81) from Amboina. Doleschall has only quoted the name of this species, without description, referring to Walker's species of this name; but Osten-Sacken, who since Doleschall's death has come into possession of his original unpublished drawings, has stated (Ann. Mus. Civ. Genova, 1882, 19) that this species was a synonym of *Rioxa quadrifera*, Walker, and was therefore not the same as the following.
 16. *ampla* (*Themara*), Walker, 1856 (Proc. Linn. Soc., i, 33, 110, pl. i, f. 5) from Singapore. As Walker, l. c., p. 134, says, the present species is the female of *Achias maculipennis*, Westwood, 1848, which, as stated by Osten-Sacken in Ann. Mus. Civ. Genova, 1881, p. 461, is a Trypaneid allied to *Acanthoneura*, Macq.; on account of the widened head of the male, the gen. *Themara* can perhaps be retained as distinct. Type in London, British Museum.
 17. *amplipennis* (*Trypeta*), Walker, 1860 (Proc. Linn. Soc., iv, 159, 199) from Macassar and

- Philippine Islands. Van der Wulp places this species (Catal., p. 194) in the genus *Acinia*, Macq., which is the same as *Tephritis*; but Osten-Sacken (Berlin. Entom. Zeitschr., xxvi, p. 228) considers that it belongs to the group related to *Euresta*. Type in London, British Museum.
18. *amplissima*, Walker, was a misspelling for the preceding name, as pointed out by Osten-Sacken, Berlin. Entom. Zeitschr., xxvi, p. 228.
 19. *amurensis* (*Ptilona*), Portschinsky (Hor. Soc. Entom. Ross., xxvi, 214, pl. i, f. 12 and 12a) from Vladivostok. Seems to be a *Rioxa*. I have recorded here this Palaearctic species, because it shows that the genus *Rioxa* comes also into the limits of the Palaearctic fauna. Becker in the Kat. Pal. Dipt., iv, p. 95, has erroneously placed this species in the Ortalid genus *Ptilonota*, Loew.
 20. *antica* (*Xiria*), Walker, 1856 (Proc. Linn. Soc., i, 36, 111, pl. ii, f. 2) from Mt. Ophir. According to Westwood's figure, it appears to be a true Trypaneid; but Osten-Sacken and Van der Wulp state that it is an Ortalid. It seems however different from my new genus *Chaetellipsis*. Type in London, British Museum.
 21. **antiqua* (*Trypeta*), Walker, 1853 (Ins. Saunders., iv, 378) from East India. Is said to be an *Ensina*, and probably belongs to that genus or to *Trypanea*. Type in London?
 22. *approximans* (*Trypeta*), Walker, 1860 (Proc. Linn. Soc., iv, 160, 20) from Macassar. A species of *Acidia* or *Aciura* which shows the shining black thorax and characteristic pattern of the wings. Type in London, British Museum.
 23. *arcuosa* (*Henicoptera*), Walker, 1860 (Proc. Linn. Soc., iv, 156, 191) from Macassar. It seems to be well placed in this genus. Type in London, British Museum.
 24. *areolatus* (*Dacus*), Walker, 1861 (Proc. Linn. Soc., v, 295, 89) from Batjan. It is a true *Dacus* s. l., characterized by the four black spots on the face; the ovipositor is said to be cylindrical, which perhaps shows relation with the African genus *Leptoxys*. Type in London, British Museum.
 25. *argentea* (*Tephritis*), Fabricius, 1805 (Syst. Antl., 323, 32) from Amboina. Wiedemann (Auss. Zweifl., ii, 596, 5) has since stated that this species belongs to the gen. *Chlorops*, but Prof. Mik in 1887 (Verh. Zool. Bot. Ges. Wien, xxxvii, 180) has expressed the opinion that it is a *Lobioptera*; Prof. Giglio-Tos in 1895 (Ann. Soc. Ent. France, lxiv, 367) has founded the gen. *Milichiella* for it, and this genus is accepted by Becker, in his monograph of 1907, Ann. Mus. Nat. Hung., v, 536. Type in Museum at Kiel.
 26. *asiatica* (*Ceratitis*), Becker, 1907 (Ann. Mus. Zool. Acc. Imp. Sci. St. Petersburg., xii, 291, 64, pl. i, f. 10) from N. E. Tibet. This Palaearctic species is recorded here because it is a true *Ceratitis* s. str., which will perhaps be found in the Himalayas. Type in St. Petersburg, Museum of the Acad. of Science.
 27. **asteria* (*Tephritis*), Schiner, 1868 (Dipt. Novara Reise, 270, 118) from Madras. A true *Trypanea* (*Urellia*). Prof. Meijere (Tijdschr. v. Entom., 1908, pl. iv, f. 6) recording the species from Java, has given a figure of the wing.
 28. *atilia* (*Trypeta*), Walker, 1849 (List Dipt. Brit. Museum, iv, 1021) from China. Walker placed the species in the group *Urophora*; it is a widely-spread species belonging to the genus *Spheniscomyia* (*Spheniscus*, Becker, preoccupied), which was placed in *Acidia* by Osten-Sacken. I think that the species is spread over all Africa; it has been described under different names by Macquart, Bigot and myself; see the special part. Type in London, British Museum.
 29. ***basalis* (*Dacus*), Walker, 1849 (List Dipt. Brit. Mus., iv, 1072) from Port Essington, N. Australia. As stated by the author himself, this is an Ortalid of the gen. *Stenopterina*. Type in London, British Museum. According to Prof. Hendel is a *Scotinosoma*.
 30. *basalis* (*Trypeta*) Walker, 1859 (Proc. Linn. Soc., iii, 120, 144) from Aroe. Impossible to locate from description. Type in London.

31. *basifascia* (*Trypeta*), Walker, 1860 (Proc. Linn. Soc., iv, 158, 195) from Macassar. Is without doubt a *Rioxa*. Type in London.
32. *basilaris* (*Trypeta*) Wiedemann, 1830 (Auss. Zweifl., ii, 510, 55) from Sumatra. Is an Ortalid of the genus *Rivellia* as stated by Loew (Monogr., iii, 44, 1873). Meijere, 1908 (Tijdschr. v. Entom., 123, 3) records it from Java and Coquillett, 1898 (Proc. U. S. Nat. Museum, xxi, 338) from Japan. Type at Kiel.
33. ***basilis*, Froggatt, 1909 (Report, p. 93) is a misprint for *basalis*, Walker, no. 29.
34. *biarcuatus* (*Dacus*), Walker, 1863 (Proc. Linn. Soc., viii, 122, 54) from New Guinea. Seems to be a *Dacus* s. l., characterized by the pattern of the wing; is perhaps allied with *Callistomyia pavonina* or *C. icarus*, but has elongated antennae and bare arista. Type in London.
35. ***bicolor* (*Urophora*), Macquart, 1855 (Mem. Soc. Sci. Lille, 144 [124] 17, pl. 7, f. 7) from Adelaide. A *Rioxa* showing the characteristic pattern of the wing of this genus. Froggatt (Austr. Ins., 1908, p. 308, and Report 1909, p. 114) records it as *Trypeta*. Type in Verrall's collection at Newmarket.
36. *bicolor* (*Dacus*), Walker, 1849 (List Dipt. British Mus., iv, 107), habitat unknown. Is said to be a *Stenopterina*; it may be an Ortalid from Oriental source. Type in London. According to Hendel is the same as no. 52.
37. *bilineatus* (*Dacus*), Walker, 1860 (Proc. Linn. Soc., iv, 150, 178) from Macassar. Not a *Dacus* at all, probably an Ortalid, showing a very characteristic pattern of body. Type in London.
38. *bimaculata* (*Rioxa*), Walker, 1860 (Proc. Linn. Soc., i, 164, 65) from Amboina. Walker has placed the species in this genus with a query; from the description it seems to be correctly placed. Type in London.
39. *bipars* (*Sophira*), Walker, 1861 (Proc. Linn. Soc., vi, 23, 14) from Ceram. Probably an Ortalid. Type in London.
40. *bischofi* (*Ptilona*), Kertész, 1901 (Termesz. Füzet., xxiv, 427, 25) from New Guinea. Prof. Meijere (Bijdr. Dierk., 1904, 111) states that it is a true *Ptilona*; but the presence of a pair of *dc.* bristles is a character which makes this location impossible. Type in Budapest, Hungar. Nation. Museum
41. *bistriga* (*Sophira*), Walker, 1860 (Proc. Linn. Soc., iv, 160, 201) from Celebes. In the same condition as no. 39.
42. **brahma* (*Tephritis*), Schiner, 1868 (Dipt. Novara Reise, 272, 121) from Madras. A true *Tephritis*. Type at Vienna, Imp. Museum.
43. *brevicornis* (*Ptilona*), Van der Wulp, 1880 (Tijdschr. v. Entom., xxiii, 185, 44, pl. 11, f. 7) from Java. Osten-Sacken, 1882, p. 226, records it also from the Philippine Islands. Is the type of the gen. *Ptilona* as restricted by Osten-Sacken and Meijere; eyes and head as in the new genus *Diarrhegma*, but no *prst.* bristle. Type at Amsterdam. Enderlein (Zool. Jahrbuch, xxxi, 420) places this species in *Acanthoneura*.
44. *brevivitta* (*Trypeta*), Walker, 1863 (Proc. Linn. Soc., viii, 124, 60) from New Guinea. A Trypetid with plumose arista. Type in London.
45. *brevivittata* (*Trypeta*), Van der Wulp, 1896 (Catal., p. 193); is a misprint or a correction for the preceding.
46. ***caerulea* (*Tephritis*), Macquart, 1843 (Mem. Soc. Lille, 340 [212] 10, pl. 18, f. 15) from Sydney Island, Polynesia. Seems to be an Ortalid, congeneric with *T. aenea*, Macq. and *rufitarsis*, Macq. Type in Verrall's collection at Newmarket.
47. **capitata* (*Trypeta*), Wiedemann, 1824 (Anal. Entom., 55, 124). Described originally from East India, but supposed to be from an African source; distributed over the world. Is the type of the gen. *Ceratitis* s. str. Type at Copenhagen.
48. *cassandra* (*Trypeta*), Osten-Sacken, 1882 (Berlin. Entom. Zeitsch., xxvi, 228, fig. 9) from the Philippine Islands. Seems to belong to my new genus *Anoplomus*. Type at Heidelberg?

49. **caudatus* (*Dacus*), Fabricius, 1805 (Syst. Antl., 276, 16), from Java. Types at Copenhagen and Kiel. A typical *Bactrocera*. *Dasyneura caudata* of Walker's List, 1873, from N. Bengal, appears to be surely this species.
50. *caudatus* (*Dacus*), Froggatt, 1909 (Report, p. 95), in Bigot's (Verrall's) collection is very different from the typical species, being smaller and differently coloured.
51. *caudatus* (*Dacus*), Wiedemann ♀ not ♂ 1830 (Auss. Zweifl., ii, 518, 8) from Java. As stated by Meijere (1908, p. 129), the female of Wiedemann's description is not of the typical species, but probably *maculipennis*, Dol. Type in Kiel.
52. *chlalybeiventris* (*Trypeta*), Wiedemann, 1830 (Auss. Zweifl., ii, 479, 5) from unknown locality. Appears to be an Ortalid. Type in Vienna. According to Prof. Hendel belongs to its new genus *Icteracantha*.
53. ***cluana* (*Trypeta*), Walker, 1849 (List Dipt. Brit. Museum, iv, 1019) from New Holland. Placed by Walker in *Urophora*, appears to be an Ortalid, congeneric with No. 46, etc. Type in London.
54. ***cometa* (*Trypeta*), Loew, 1840 (Stett. Entom. Zeit., i, 157), from Europe. Schiner (Verh. Zool. Bot. Ges. Wien, viii, 1858, p. 643) records this species from Australia.
55. *concinna* (*Sophira*), Walker, 1856 (Proc. Linn. Soc., i, 132, 150) from Borneo. Seems to be an Ortalid; type in London.
56. *concisa* (*Strumeta*), Walker, 1862 (Proc. Linn. Soc., vii, 227, 28) from Waigiou. Placed in *Dacus* by Wulp, Cat. p. 188, has nothing to do with this genus, but may be a Trypetid with singular venation. Type in London.
57. *concisus* (*Dacus*), Walker, 1861 (Proc. Linn. Soc., v, 252, 72) from N. Guinea. According to Osten-Sacken, who has seen the type in the British Museum (Ann. Mus. Civ. Genova, xvi, p. 487), it is a species of *Diplochorda*, family Micropezidae, of which *Elaphomyia brevicornis* ♀ Saunders, 1861, and *Dacus turgidus*, Walker, 1861, are synonyms.
58. *confinis* (*Rioxa*), Walker, 1856 (Proc. Linn. Soc., i, 132, 152) from Borneo. A true *Rioxa*; type in London.
59. *conformis* (*Bactrocera*), Doleschall, 1858-59 (Nat. Tijdschr. N. Indie, xvii, 122, 78) from Amboina. Wulp states (Cat., p. 186) that this is synonymous with *B. ferruginea*, F. *Dacus conformis* of Koningsberger, 1897, is also according to Meijere (1908, p. 137) a synonym of this same species. Type in Vienna, Imp. Museum.
60. *conformis* (*Strumeta*), Walker, 1857 (Proc. Linn. Soc., i, 34, 111, pl. 2, f. 4) from Singapore. Synonym of *Bactrocera umbrosa*, Fabr., as stated by Osten-Sacken, 1881, p. 72. Type in London.
61. *contingens* (*Oxyna*), Becker, 1907 (Mem. Acad. Sci. St. Petersburg, xii, 288, 58, pl. i, f. 5) from E. Tibet. A Palaearctic species, which may be found in the Himalayas. Type at St. Petersburg.
62. *contrahens* (*Dacus*), Walker, 1860 (Proc. Linn. Soc., iv, 151, 181) from Macassar. Seems to be an Ortalid allied to *Stenopterina* belonging to the genus *Pseudepicausta*, Hendel. Type in London.
63. **contraria* (*Trypeta*), Walker, 1853 (Ins. Saunders., iv, 385, pl. viii, f. 7) from East India. Walker places it in *Acinia* (= *Tephritis*); it appears to belong to the group *Rioxa*, but Westwood's figure shows a bare arista. Type in London.
64. ***crassipes* (*Trypeta*), Thomson, 1858 (Eugenia Resa, 583, 260) from Honolulu. Is a *Tephritis*, as stated by Grimshaw, Fauna Hawaii., iii, 45, 1 (1901). Type at Stockholm.
65. ***cratericola* (*Tephritis*), Grimshaw, 1901 (Fauna Hawaii., iii, 46, 3, pl. ii, f. 25) from Maui, Hawaii. Probably an *Oxyna*. Type ?
66. *cribrata* (*Urellia*), Becker, 1907 (Mem. Ac. Sci. St. Petersburg, xii, 287, 53, pl. i, f. 3) from Tibet. A true *Trypanea* of large size and peculiar wing pattern. Type at St. Petersburg.
67. **crux* (*Musca*), Fabricius, 1794 (Ent. Syst., iv, 358, 190) from East India. Placed in *Dacus*

by Fabricius (Syst. Antl., 277, 23) and in *Trypeta* by Wiedemann (Auss. Zweifl., ii, 488, 19). A very interesting species, on which the new genus *Staurella* is founded. Type at Kiel.

68. ***cucumis* (*Dacus*), French, 1907 (Journ. of Agric. Victoria, May, and Bull. 26, Dept. Agric. Victoria) from Queensland and New South Wales. Described as a variety of *tryoni*; Froggatt (Report, 1909, 80) thinks that it is a different species; and it is in fact a good species of *Bactrocera*, of which I have specimens in my collection.
69. **cucurbitae* (*Dacus*), Coquillett, 1899 (Ent. News, 129) from Hawaii. Recorded from India by Froggatt (Report, 1909, 81, pl. ii, f. 6-7). It is a true *Bactrocera*; type in Washington, U. S. National Museum.
70. *curvifer* (*Dacus*), Walker, 1862 (Proc. Linn. Soc., vii, 229, 34) from Waigiou. Seems to be a *Bactrocera*. Type in London.
71. ***curvipennis* (*Dacus*) Froggatt, 1909 (Report, 93, pl. iv, f. 15 and 16) from Fiji. A *Bactrocera*, with two scutellar bristles. Type in Sydney, Agric. Dept. collection.
72. **cylindrica* (*Trypeta*), Walker, 1853 (Ins. Saunders., iv, 380, pl. viii, f. 6) from East India. Doubtful if a Trypaneid or an Ortalid, allied with *Adrana*. Type in London.
73. *cylindricus* (*Dacus*), Van der Wulp, 1880 (Tijdschr. v. Entom., xxiii, 181, 43, pl. 11, f. 5) from Java. As stated by Osten-Sacken (1882, p. 211) this is synonymous with *Adrama determinata*, Walk.; this synonymy was subsequently accepted by Van der Wulp himself (Tijdschr. v. Entom., xxx, 176, 2, 1888).
74. *debeaufortii* (*Rioxa*), Meijere, 1906 (Dipt. Exped. N. Guinea, 94, 2, pl. i, f. 17) from N. Guinea. On account of the very different pattern of the wings, this species can hardly be a true *Rioxa*, notwithstanding the presence of the *prst.* and of the six scutellar bristles; it belongs perhaps to a new genus, but may be allied to *Xiria*, or to *Henicoptera*. Type at Amsterdam?
75. ***dentipes* (*Lenophila*), Guérin-Ménéville, 1843 (Rev. Zool., vi, 200, 5) from Port Jackson (Sydney). Froggatt (Rep., 1909, p. 106) records that the type is in Bigot's (Verrall's) collection at Newmarket. A particular genus, described by the author as a subgenus of *Ceratitis*.
76. *determinatus* (*Dacus*), Walker, 1856 (Proc. Linn. Soc., i, 133, 154) from Borneo. As stated by Osten-Sacken (1881, p. 279), this is an Ortalid of the genus *Adrama*. Type in London, seen by Osten-Sacken (1882, p. 210). But recently Prof. Hendel has stated (Wien. Entom. Zeit., xxxi, p. 12) that this genus belongs to the Trypaneids.
77. *detrudens* (*Dacus*), Walker, 1863 (Proc. Linn. Soc., viii, 135, 11) from Salwatty, N. Guinea. Seems to be an Ortalid, perhaps a *Pseudepicausta*, Hendel; type in London.
78. *devius* (*Dacus*), Walker, 1861 (Proc. Linn. Soc., v, 250, 67) from N. Guinea. Said to be allied to *divergens* and *addens*, and therefore perhaps an Ortalid, according to Hendel it is a *Antineura*. Type in London.
79. *diffusus* (*Dacus*), Walker, 1860 (Proc. Linn. Soc., iv, 153, 185) from Macassar. Seems to be a *Bactrocera* with banded face. Type in London.
80. *diluta* (*Oxyna*), Becker, 1907 (Mem. Acad. Sci. St. Petersburg, xii, 289, 60, pl. i, f. 7) from Turkestan. A true *Oxyna*; type at St. Petersburg.
81. *discipennis* (*Dacus*), Walker, 1861 (Proc. Linn. Soc., v, 294, 87) from Batjan. Said to be allied to *emittens*, seems to be a *Bactrocera*; type in London.
82. ***dispar* (*Cardiocera*), Macquart, 1847 (Mem. Soc. Sci. Lille, 108 [92], pl. ii, f. 3), from Tasmania. Seems to be an interesting genus of Trypaneids.
83. *distorta* (*Sophira*), Walker, 1857 (Trans. Ent. Soc. (2) iv, 230) from Celebes. Osten-Sacken, who has seen the type in the British Museum (1881, p. 481), placed this species among the Ortalids.
84. *divergens* (*Dacus*), Walker, 1860 (Proc. Linn. Soc., iv, 149, 176) from Macassar. Seems to be

an Ortalid of the *Stenopterina* group, according to Hendel it is a *Philocompus*; type in London.

85. *diversata* (*Trypeta*), Walker, 1863 (Proc. Linn. Soc., viii, 124, 59) from N. Guinea. Perhaps not a Trypaneid at all; fore tibiae bristly. Type in London.
86. **diversus* (*Dacus*), Coquillett, 1904 (Proc. Ent. Soc. Washington, vi, 139) from Ceylon and India. A true *Bactrocera*; type in Washington.
87. ***doclea* (*Trypeta*), Walker, 1849 (List. Dipt. Brit. Mus., iv, 1035) from N. Holland. Placed by its author in a group without name, between *Anomoia* and *Euleia*. Probably a Trypaneid; type in the British Museum.
88. *dorsigutta* (*Trypeta*), Walker, 1859 (Proc. Linn. Soc., iii, 119, 143) from the Aru Islands. Seems to be a Trypaneid near *Ceratitis*, with blackish streaks on the base of the wings. Type in London.
89. *dunlopi* (*Ptilona*), Van der Wulp, 1880 (Tijdschr. v. Entom., xxiii, 186, 45, pl. xi, f. 8 and 9) from Padang. Prof. Meijere placed this species in *Rioxa* (Bijdr. Dierk., p. 110); but it is very distinct on account of the reduced chaetotaxy, comparable with that of *Euphranta*. Type at Amsterdam.
90. *elimia* (*Trypeta*), Walker, 1849 (List Dipt. Brit. Mus., iv, 1033) from the Philippines. Placed by its author in *Anomoia*; Osten-Sacken has recognized it as a *Trypeta* s. l., and Van der Wulp in 1898 placed it erroneously in *Anomoia*; it belongs to *Acidia*. Type in the British Museum.
91. *emittens* (*Dacus*), Walker, 1860 (Proc. Linn. Soc., iv, 152, 184) from Celebes. Said to be allied to *ferrugineus* and *trivittatus*, seems to be a true *Bactrocera*. Type in London. Froggatt (Report, p. 96) has redescribed the species.
92. *erebus* (*Rioxa*), Rondani, 1875 (Ann. Mus. Civ. Genova, vii, 436) from Borneo. Seems to be a true *Rioxa*. Type at Genova, Museo Civico.
93. ***escheri* (*Oedaspis*), Bezzi, 1910 (Boll. Labor. Zool. Portici, v, 19, f. 9) from Sydney. Type in the author's collection.
94. *evanescens* (*Oxyna*), Becker, 1907 (Mem. Acad. Sci. St. Petersburg, xii, 189, 59, pl. i, f. 6) from N. E. Tibet and Turkestan. Type at St. Petersburg, Museum of the Academy of Science.
95. *exigens* (*Dacus*), Walker, 1860 (Proc. Linn. Soc., iv, 151, 180) from Celebes. Seems to be a *Stenopterina* belonging to the Ortalids in the genus *Pseudepicausta*, Hendel. Type in London.
96. *expandens* (*Dacus*), Walker, 1859 (Proc. Linn. Soc., iii, 114, 129) from the Aru Islands. A true *Bactrocera*, probably the same as *ferruginea*. Type in London.
97. *expertus* (*Dacus*), Walker, 1861 (Proc. Linn. Soc., vi, 14, 47) from Gilolo. Seems to be an Ortalid, perhaps a *Pseudepicausta*, Hendel; type in London.
98. ***facialis* (*Dacus*), Coquillett, 1910 (Entom. News, xxi, 12) from Tonga Island, Polynesia. Is said to be allied to *oleae*, but nothing is known about the chaetotaxy. Type at Washington, National Museum, N. 12737.
99. *faciestriata* (*Acinia*), Doleschall, 1857 (Nat. Tijdschr. Ned. Indie, xiv, 416, pl. x, f. 7) from Amboina. Is an Ortalid, synonymous with *Scholastes cinctus*, Guer., a widely distributed species extending from Sydney to the Philippines; the synonymy is established by Schiner; the type is at Vienna, Imp. Museum, seen by Osten-Sacken, 1881, p. 479.
100. *fasciata* (*Urophora*), Walker, 1856 (Proc. Linn. Soc., i, 134, 158) from Borneo. Has nothing to do with *Urophora*, but is a Ceratitine near *Zonogastra* or *Anoplomus*. Type in London.
101. *fasciatipennis* (*Bactrocera*), Doleschall, 1856 (Nat. Tijdschr. N. Indie, x, 412, 35, pl. iii, f. 1) from Java. Is synonymous with *Bactrocera umbrosa*, Fabr., as stated by Osten-Sacken, who has seen the type in Vienna.

102. ***fasciestriata* (*Lamprogaster*), Schiner, 1868 (Dipt. Novara Reise, 284, 160) from Stuart Islands. Is a correction of the name of No. 99 and the same as *Scholastes cinctus*.
103. *fascipennis* (*Dacus*), Wiedemann, 1819 (Zool. Mag., iii, 28, 42, and Auss. Zweifl., ii, 519, 9) from Java. Is synonymous with *Bactrocera umbrosa*, Fabr. Type in Vienna.
104. **fasciventris* (*Tephritis*), Macquart, 1843 (Mem. Soc. Sci. Lille., 382 [225] 4, pl. 31, f. 2) from East India. Belongs to the new genus *Gastrozona*. Type in Paris, Jardin de Plantes.
105. *fasciventris* (*Tephritis*) (*bis*), Macquart, 1847 (Mem. Soc. Sci. Lille, 225 [65], pl. 7, f. 7) from Java. Is the type of the new genus *Anoplomus*; I have called it by Bigot's manuscript name *flexuosus*. Type in Paris? It is very curious that Macquart (*l. c.*, 1851, p. 290) describes another *Tephritis fasciventris* (*ter*) from Brazil, which is synonymous with *Hexachaeta eximia*, Wied., see Loew, Monogr., iii, 216.
106. *fenestella* (*Oxyphora*), Coquillett, 1910 (Ent. News, xxi, 308) from Hongkong. Type in Washington, N. 12993, U. S. National Museum.
107. **ferruginea* (*Trypeta*), Walker, 1853 (Dipt. Saunders., 387) from East India. Unknown to me; type in London.
108. **ferrugineus* (*Musca*), Fabricius, 1794 (Ent. Syst., iv, 342, 127) transferred to *Dacus* in Syst. Antl., 274, 5, (1805) from India. Is the type of the genus *Bactrocera*. Type at Copenhagen.
109. *ferrugineus* (*Dacus*), Macquart, 1847 (Mem. Soc. Sci. Lille, 224 [64], pl. 7, f. 8 and 1851, 257 (284) 2, pl. 26, f. 8) from Java. Is different from the species of the same name recorded by Fabricius and Wiedemann, and seems to be synonymous with *Bactrocera caudata*, Fabr. on account of the infuscated hind cross-vein. Type of the description of 1867 in Paris (?), and of that of 1851 in Bigot's (Verrall's) collection at Newmarket, as stated by Froggatt, Report, 1909, p. 81.
110. *figuratus* (*Dacus*), Walker, 1856 (Proc. Linn. Soc., i, 133, 155) from Borneo. In my paper of 1909 I have considered this species as a *Dacus s. l.*, but now I think that this was incorrect. Type in London.
111. *flava* (*Henicoptera*), Macquart, 1847 (Mem. Soc. Sci. Lille, 223 [63] 1, pl. 7, f. 9) from Java. Is the type of the genus *Henicoptera*, one of the Ceratitinae but is without sternopleural bristle (as pointed out by Osten-Sacken) and therefore perhaps a Dacine. Type in Paris?
112. *formosipennis* (*Rioxa*), Walker, 1861 (Proc. Linn. Soc., v, 252, 73) from N. Guinea. Prof. Meijere has figured it in Dipt. N. Guinea, 93, 1, pl. i, f. 16. A true *Rioxa*, type of the genus. Type in British Museum.
113. **fossata* (*Tephritis*), Fabricius, 1805 (Syst. Antl., 320, 20) and Wiedemann, Auss. Zweifl., ii, 503, 41 (*Trypeta*), from Tranquebar. Placed by Van der Wulp in *Anomoea*, perhaps because Walker placed his *elimia* in this genus, but, notwithstanding the resemblance of the wing pattern, does not belong to it. Type at Copenhagen.
114. ***frauenfeldi* (*Dacus*), Schiner (Dipt. Novara Reise, 269, 95) from Stuart Islands. Froggatt, Report 1909, p. 96; type at Vienna. Probably a *Bactrocera*.
115. ***frenchi* (*Dacus*), Froggatt, 1909 (Report, 92, pl. i, f. 4) from N. Caledonia. French, Journ. of Agricult. Victoria, May 1907, fig. without name. In all probability a *Bactrocera* with banded wings of the *umbrosa* group.
116. **fulvidus* (*Dacus*), Froggatt, 1909 (Report, 99) from India. Is a MS. name in Bigot's collection.
117. *fulvitaris* (*Dacus*), Walker, 1860 (Proc. Linn. Soc., iv, 153, 186) from Macassar. Not a *Dacus*, and perhaps not a Trypaneid at all. Type in London.
118. *fulviventr* (*Dacus*), Froggatt, 1909 (Report, 99) from N. Guinea. A MS. name in Bigot's collection.
119. *furcifer* (*Dacus*), Walker, 1861 (Proc. Linn. Soc., vi, 14, 46) from Gilolo. Osten-Sacken,

- 1881, p. 461, says that it is a Trypaneid, but not a *Dacus*; on account of the plumose arista is perhaps a *Taeniostola* and according to Hendel a *Lagarosia*. Type in London.
120. ***fuscata (Acinia)*, Macquart, 1851 (Mem. Soc. Sci. Lille, 266 [137] 10, t. 27, f. 8) from Tasmania; perhaps a Trypaneid of the *stellata* group. Type in Paris.
121. **fuscipennis (Acanthoneura)*, Macquart, 1847 (Mem. Soc. Sci. Lille, 378 [221], pl. 30, f. 2) from Bengal. Type of the genus *Acanthoneura*; type in Paris.
122. **gamma (Meracanthomyia)*, Hendel, 1910 (Wien. Entom. Zeit., xxix, 107, pl. i, f. 13) from Ceylon. Type in Vienna, Imp. Museum.
123. ***glaucia (Trypeta)*, Thomson, 1858 (Dipt. Eugen. Resa, 581, 256) from Sydney. A typical *Trypanea (Urellia)*, with two scutellar bristles. Type in Stockholm.
124. **guttata (Ensina)*, Macquart, 1843 (Mem. Soc. Sci. Lille, 387 [230] 1, pl. 31, f. 10) from Coromandel. Is without any doubt synonymous with *Tephrostola acrostacta*, Wied. Why Macquart placed it in *Ensina* I cannot comprehend. Enderlein, Zool. Jahrbuch xxxi, 453, says that it belongs perhaps to the genus *Platensina*. Type in Paris.
125. ***gutipennis (Epicerella)*, Macquart, 1851 (Mem. Soc. Sci. Lille, 267 [193], 1, pl. 27, f. 9) from Tasmania. Loew (Monogr., iii, 23) thinks that it is a genus of Trypaneids, but Hendel in Genera Insectorum states that it is a Pyrgotine, perhaps synonymous with *Toxura*. Type in Paris.
126. *helomyzoides (Strumeta)*, Walker, 1867 (Proc. Linn. Soc., vii. 220, 84) from Mysol. Meijere (Dipt. N. Guinea, 96) after a comparison with the type in London made by Austen, says that it is a *Rioxa*; but I think that it should be placed in a special genus with No. 74.
127. ***heterura (Trypeta)*, Thomson, 1858 (Diptera Engenia Resa, 584, 262) from Sydney. Said to be allied to *marginalis*, Wied. from the Cape; but this is perhaps a *lapsus* for *marginata*, Fall., the species being evidently a *Sphenella*. Type in Stockholm.
128. *hirtipes (Themara)*, Rondani, 1875 (Ann. Mus. Civ. Genova, vii, 435) from Borneo. An *Acanthoneura*, which Rondani compares with *lata*, viz. *ampla*. Type in Genova, Museo Civico.
129. **histrionicus (Musca)*, Fabricius, 1794 (Ent. Syst., iv. 343, 128; placed in *Dacus* in 1805, Syst. Antl., 274, 5) from East India. Wiedemann, Auss. Zweifl., ii. 530, 1, states that it is a species of *Chyliza*. Type in Copenhagen.
130. *horsfieldi (Achias)*, Westwood, 1850 (Trans. Ent. Soc. London, v, 235, pl. 23, f. 9) from Java. Collection of W. W. Saunders. As stated by Osten-Sacken in 1881, this is the same as *Themara maculipennis*, Westw.
131. *icarus (Dacus)*, Osten-Sacken, 1882 (Berlin. Entom. Zeitschr., xxvi, 224, f. 8) from the Philippine Islands. Seems to belong to my new genus *Callistomyia*. Type in Heidelberg?
132. *imitans (Dacus)*, Walker, 1860 (Proc. Linn. Soc., iv, 150, 179) from Macassar. Is not a *Dacus*, and not a Trypaneid at all; according to Prof. Hendel it is a *Plagiostenopterina*. Type in London.
133. ***immaculata (Terellia)*, Macquart, 1855 (Mem. Soc. Sci. Lille, 125, [145] 2) from the Marquise Islands. A Trypaneid with hyaline wings; type in Verrall's collection at Newmarket.
134. *impleta (Trypeta)*, Walker, 1859 (Proc. Linn. Soc., iii, 120, 145) from the Aru Islands. A Trypaneid with plumose arista and reticulate wings. Type in London.
135. *inaptus (Dacus)*, Walker, 1860 (Proc. Linn. Soc., iv, 151, 182) from Macassar. Seems to be an Ortalid, allied to *Stenopterina*, according also to Prof. Hendel. Type in London.
136. **incisa (Trypeta)*, Wiedemann, 1824 (Anal. entom., 53, 117, and Auss. Zweifl., ii, 500, 37) from Bengal. Seems to be identical with *Rioxa modesta*, Fabr. Type in Vienna.
137. **incisus (Dacus)*, Walker, 1860 (Trans. Ent. Soc. London, v, 323) from Burma. A *Bactrocera*, near *ferruginea*. Type in London.
138. **indica (Sphenella)*, Schiner, 1868 (Dipt. Novara Reise, 267, 110) from Madras. A true *Sphenella*; type in Vienna.

139. *inscriptus* (*Dacus*), Walker, 1860 (Proc. Linn. Soc., v, 162, 61) from Ambonia. Said to be allied to *bilineatus*; seems to be an Ortalid. Type in London.
140. *instabilis* (*Dacus*), Walker, 1861 (Proc. Linn. Soc., v, 250, 68) from N. Guinea. Said to be closely allied to *divergens* and *addens*, and therefore perhaps a *Stenopterina*. Type in London.
141. **klugii* (*Dacus*), Wiedemann, 1824 (Anal. entom., 56, 125, and Auss. Zweifl., ii, 523, 15) from East India. Probably a *Bactrocera* with banded wings or a *Callistomyia*. Type at Copenhagen.
142. *lanceolata* (*Rioxa*), Walker, 1856 (Proc. Linn. Soc., i, 35, 114, pl. ii, f. 3) from Singapore. The typical species of the genus *Rioxa*, figured also by Van der Wulp, Tijdschr. v. entom., xli, 218, 5, pl. x, f. 16. Type in London. See also Meijere, Tijdschr., liv, 380, 1911, and Enderlein, Zool. Jahrbüch., xxxi, 447.
143. *lateralis* (*Ptilona*), Kertész, 1901 (Termesz. Füzet., xxiv, 428, 26, pl. xx, f. 17) from N. Guinea. Meijere places it in *Rioxa*; type at Budapest.
144. *lateralis* (*Dacus*), Walker, 1863 (Proc. Linn. Soc., viii, 123, 55) from N. Guinea. Not a *Dacus*, and perhaps not a Trypaneid. Type in London.
145. *lateralis* (*Trypeta*), Wiedemann, 1830 (Auss. Zweifl., ii, 479, 6) from unknown locality. A Trypaneid with *Acidia*-like pattern of wings. Type at Vienna.
146. *latifascia* (*Dacus*), Walker, 1859 (Proc. Linn. Soc., iii, 114, 131) from Aru Islands. An Ortalid belonging to *Xiria*, according to Prof. Hendel. Type in London.
147. *latiuscula* (*Noeeta*), Walker, 1856 (Proc. Linn. Soc., i, 133, 156) from Borneo. Seems to be a true *Carphotricha*. Type in London.
148. *lativentris* (*Dacus*), Walker, 1859 (Proc. Linn. Soc., iii, 115, 134) from Aru Islands. Seems to be an Ortalid; type in London.
149. *lativentris* (*Trypeta*), Walker, 1860 (Proc. Linn. Soc., iv, 158, 197) from Macassar. A Trypaneid with dilated wings, perhaps of the group of *stellata*, etc. Type in London.
150. **leontodontis*, Degeer; Macquart, 1847 (Mem. Soc. Sci. Lille, 225) records this European species from Australia.
151. *leucotelus* (*Xarnuta*), Walker, 1856 (Proc. Linn. Soc., i, 28, 95, pl. i, f. 4) from Singapore. Placed erroneously in the Helomyzids, was later recognized as a Trypaneid by Walker himself. A widely spread species. Westwood's figure shows no bristles on the frons. Type in London.
152. *limbipennis* (*Dacus*), Macquart, 1843 (Mem. Soc. Sci. Lille, 374 [217], pl. 29, f. 9) from Java. Seems to be a *Bactrocera* allied to *ferruginea*, if not the same. Type in Paris.
153. **limpidapex* (*Tephritis*), Grimshaw, 1901 (Fauna Hawaii., 46, 2, pl. ii, f. 24) from Hawaii. A true *Tephritis*.
154. *lituratus* (*Dacus*), Walker, 1861 (Proc. Linn. Soc., v, 251, 70) from Waigoe. Seems to be an Ortalid which, according to Hendel, is the same as *Cleitamia liturata*, O.-S.; type in London.
155. **longicornis* (*Bactrocera*), Guérin-Méneville, (1832) 1838 (Voyage de la 'Coquille,' 301) from Sydney. The species was named by Macquart, and is reported in Suites à Buffon, ii, 1835, 453, 1, pl. xix, f. 13. Is the typical species of *Bactrocera*, probably the same as *umbrosa*, F. Type at Paris?
156. *longicornis* (*Dacus*), Wiedemann, 1830 (Auss. Zweifl., ii, 524, 16) from Java. A species of *Dacus* s. l., of the special group which resembles *Conops* in the shape of the abdomen (Froggatt, Report 1909, p. 86). Type at Vienna. Redescribed by Prof. Meijere, Tijdschr. liv, 380, 1911.
157. **longirostris* (*Trypeta*), Thomson, 1858 (Dipt. Engenia Resa, 586, 266) from Foua. An *Oxyina* allied to *sororcula*, with two scutellar bristles. Type at Stockholm.
158. *longivitta* (*Dacus*), Walker, 1859 (Proc. Linn. Soc., iii, 115, 133) from Amboina. Perhaps

- an Ortalid of the *Stenopterina* group, belonging to *Plagiostenopterina*, Hendel. Type in London.
159. ***lugubris (Tephritis)*, Macquart, 1847 (Mem. Soc. Sci. Lille, 109 (93), pl. vi, f. 7) from N. Holland. Seems to be a *Rioxa*; type in Bigot's (Verrall's) collection at Newmarket.
160. *macilentus (Dacus)*, Wiedemann, 1830 (Auss. Zweifl., ii, 525, 18) from unknown locality. Not a *Dacus*, and perhaps an Ortalid; referred as *maculentus* by Froggatt, Report, 1909, p. 99. Type in Vienna. Belongs to *Rivellia* according to Prof. Hendel.
161. *maculiger (Bactrocera)*, Doleschall, 1858-59 (Nat. Tijdschr. N. Indie, xvii, 122, 79) from Amboina. A *Bactrocera*, synonymous with *zonata*, Saunders. Froggatt, Report 1909, p. 94, says that the type in the Imperial Museum, Vienna, bears a label by Loew on which is written: *zonatus = maculiger*.
162. *maculipennis (Bactrocera)*, Doleschall, 1856 (Nat. Tijdschr. N. Indie, x, 412, 36, pl. ii, f. 1) from Java. Placed by Van der Wulp in synonymy with *ferruginea*, Fabr., has been recently recognized as a good species by Meijere. Type in Vienna.
163. **maculipennis (Meracantha)*, Macquart, 1851 (Mem. Soc. Sci. Lille., 258 [285] 1, pl. 26, f. 9) from India. Loew and Osten-Sacken considered it as an Ortalid; but Hendel (Wien. Ent. Zeit., xxix, 1910, p. 109) has stated that it is the type-species of the Trypaneid genus *Meracanthomyia*, the generic name of Macquart being preoccupied in Coleoptera. Type in Verrall's collection.
164. *maculipennis (Achias)*, Westwood, 1848 (Cab. Orient. Entom., 38, pl. 18, f. 4) from Java. Is a *Themara*, as stated by Osten-Sacken, 1881, p. 461. The species is widely spread in the Oriental region. Type at Oxford. See also Meijere, Tijdschr., liv, p. 382, and Enderlein, Zool. Jahrbüch., xxxi, 415.
165. **malaica (Oxyphora)*, Schiner, 1868 (Dipt. Novara Reise, 274, 125) from Ceylon. Is said to be synonymous with *Xarnuta leucotelus*, Walk., as was suspected by Schiner himself. Type at Vienna.
166. **mangiferae (Dacus)*, Cotes, 1893 (Ind. Mus. Notes, iii, 17) from India. The species has been figured by Maxwell-Lefroy. Van der Wulp has considered it synonymous with *Bactrocera ferruginea*, Fabr. I have seen the type in the Indian Museum, and think that it is a variety of *ferruginea*, but suspect that the differences may be due merely to immaturity, being seen only in bred specimens.
167. *manto (Trypeta)*, Osten-Sacken, 1882 (Berlin. Entom. Zeitschr., xxvi, 231, f. 11) from the Philippine Islands. A Ceratitine with plumose arista. Type at Heidelberg. According to Enderlein (Zool. Jahrbüch., xxxi, 420) belongs perhaps to *Acanthoneura*.
168. *marginemaculata (Acinia)*, Macquart, 1851 (Mem. Soc. Sci. Lille, 265, (292) 8, pl. 27, f. 6) from Asia. Seems to be a Trypaneine of the *stellata* group. Type in Paris.
169. *melaleuca (Trypeta)*, Walker, 1862 (Proc. Linn. Soc., vii, 238, 40) from Ceram. Osten-Sacken, 1881, p. 259, says that this species is identical with *atilia* of the same author; but this last name has priority, and therefore is used by Van der Wulp in his Catalogue. A widely distributed species, which belongs to *Spheniscomyia*. Type in London.
170. *melanotus (Dacus)*, Coquillett, 1910 (Ent. News, xxi, 13) from Cook Island, Polynesia. Probably a species of *Bactrocera*, bred from oranges. Type at Washington, U. S. National Museum, no. 12739.
171. *meritoria (Helomyza)*, Walker, 1862 (Proc. Linn. Soc., vii, 218, 79) from Mysol. Czerny, who has seen the type in the British Museum, says that this species is not a Helomyzid, but a Trypaneid; from the wing-pattern it seems to be related to *Rioxa*.
172. **mixta (Trypeta)*, Walker, 1853 (Dipt. Saunders., iv, 385) from East India. Seems to be a *Tephritis*. Type in London.
173. **modestus (Dacus)*, Fabricius, 1805 (Syst. Antl., 278, 29) from Bengal; Wiedemann, Auss. Zweifl., ii, p. 493. 26. Van der Wulp in 1898 placed the species in *Ptilona*, but Meijere

- thinks that it is probably a *Rioxa*, as already suspected by Osten-Sacken. But the shape of the head is very different from that of *Rioxa*, and I think it better to make the species the type of a new genus, called *Diarrhagma*. Type at Copenhagen.
174. *multistriga* (*Trypeta*), Walker, 1859 (Proc. Linn. Soc., iii, 119, 142) from Aru Islands. Seems to be a form with plumose arista, allied to *Rioxa*. Type in London.
175. **musae* (*Trypeta*), Froggatt, 1899 (Agric. Gazette N. S. Wales, 501, pl. ii, f. 1-2, and Report 1909, p. 123, p. vii, f. 1-3) from Australia. Is a *Rioxa*. Type in Sydney, Dept. of Agriculture.
176. *mutilloides* (*Dacus*), Walker, 1859 (Proc. Linn. Soc., iii, 115, 132) from Aru Islands. Osten-Sacken, who has seen the type in London, says (1881, p. 461) that the present species is not a *Dacus* and not a Trypaneid at all; according to Hendel it belongs to *Pseudepicausta*.
177. **mutyca* (*Trypeta*), Walker, 1849 (List Dipt. Brit. Mus., iv, 1036) from East India. Placed in *Euleja* by Walker; it appears to be a *Rioxa* allied to *vaga*, Wied. Type in London.
178. *nebulosa* (*Urellia*), Becker, 1907 (Mem. Acad. Sci. St. Petersburg, xii, 286, 51, pl. i, f. 2) from E. Tibet. A true *Trypanea*; type at St. Petersburg.
179. *nebulosa* (*Dasyneura*), Walker, 1849 (List Dipt. Brit. Mus., iv, 1076) from unknown locality. Seems to be a true Oriental *Bactrocera*; type in London.
180. *nigra* (*Rioxa*), Meijere, 1906 (Dipt. N. Guinea Exped., 95, 3, pl. i, f. 18) from N. Guinea. Seems to be congeneric with *debeaufortii* and *helomyzoides*. Type at Amsterdam?
181. *nigricans* (*Trypeta*), Wiedemann, 1830 (Auss. Zweifl., ii, 509, 53) from unknown locality. Seems to be an *Acidia* or an *Aciura*. Type at Vienna.
182. *nigrifascia* (*Trypeta*), Walker, 1860 (Proc. Linn. Soc., iv, 158, 196) from Macassar. A Ceratitine with plumose arista and peculiar pattern of the thorax. Type in London.
183. *nigrilinea* (*Dacus*), Walker, 1861 (Proc. Linn. Soc., v, 251, 71) from N. Guinea. Not a *Dacus*, and probably not a Trypaneid at all. Type in London.
184. **nigripes* (*Urophora*), Macquart, 1851 (Mem. Soc. Sci. Lille, 260 (131), 11, pl. 26, f. 13) from Tasmania. An Oortalid, congeneric with *testacea*. Type at Paris.
185. *nigropunctulata* (*Themara*), Doleschall, 1858-59 (Nat. Tijdschr. N. Indie, xvii, 124, 83) from Amboina. Is a Sapromyzine, perhaps synonymous with *Sapromyza trypetoptera*, *picta* or *punctipennis*. Type at Vienna.
186. *nivistriga* (*Helomyza*), Walker, 1861 (Proc. Linn. Soc., v, 246, 57) from N. Guinea. Czerny in 1904, after examination of the type in the British Museum, has stated that this is not a Helomyzid, but a Trypaneid, and I think that it is probably a *Rioxa*.
187. *notabilis* (*Ptilona*), Van der Wulp, 1880 (Tijdschr. v. Entom., xxiii, 187, 46, pl. xi, f. 9-11) from Padang. Perhaps a *Rioxa*, according to Enderlein. Type at Amsterdam.
188. *nox* (*Rioxa*), Rondani, 1875 (Ann. Mus. Civ. Genova, vii, 437) from Borneo. A true *Rioxa*. Type in Genova.
189. *obliqua* (*Xiria*), Osten-Sacken, 1881 (Ann. Mus. Civ. Genova, xvi, 463, fig.) from Sumatra. This species has no lower fronto-orbital bristles, and therefore is perhaps allied to the new genus *Chaetellipsis*, but the shape of the face and pattern of the wings are very different. Westwood's figure of the type species shows lower fronto-orbital bristles. Type at Genova.
190. *obsoleta* (*Trypeta*), Wiedemann, 1824 (Anal. Entom., 53, 118, and Auss. Zweifl., ii, 499, 36) from Java. Seems a Trypaneid, with a peculiar wing-pattern, which however seems to be like that of the Lauxanid genus *Amphicyphus*. Type at Vienna.
191. *obtrudens* (*Dacus*), Walker, 1859 (Proc. Linn. Soc., iii, 116, 135) from Aroe. Osten-Sacken, who has seen the type in London, places it among the Oortalids of the *Stenopterina* group, and Prof. Hendel says that it belongs to *Pseudepicausta chalybea*, Dol.
192. *optatura* (*Helomyza*), Walker, 1863 (Proc. Linn. Soc., viii, 116, 40) from N. Guinea. Osten-Sacken in 1881 says that it is a Trypaneid allied to *quadrifera*, Walk., and Czerny

in 1904, after examining the type in London, says that it is the female of *Rioxa quadrifera*, Walker.

193. *orientalis* (*Tephritis*), Meijere, 1908 (Tijdschr. v. Entom., 41, 130, 1, pl. 4, f. 5) from Semarang, Java. Type at Amsterdam?
194. **ornatipes* (*Dacus*), Froggatt, 1909 (Report, 99) from India. Is a MS. name of Bigot's in Bigot's (Verrall's) collection.
195. ***ornatissimus* (*Dacus*), Froggatt, 1909 (Report, 93, pl. iv, f. 13-14) from New Caledonia, bred from mandarins at Sydney. A true *Bactrocera* allied to *ferruginea*. Type at Sydney.
196. *ortaloides* (*Helomyza*), Walker, 1863 (Proc. Linn. Soc., viii, 116, 41) from N. Guinea. Said by the author to connect *Helomyza* with *Poticara*. Czerny, after examining the type in London, states that it is a Trypaneid.
197. **pardalina* (*Carpomyia*), Bigot, 1891 (Ind. Museum Notes, i, 51, pl. 5, f. 1) from India. In my paper of 1910 I have founded upon this species the new genus *Myiopardalis*. Type in the Indian Museum, Calcutta.
198. *paritii* (*Tephritis*), Doleschall, 1856 (Nat. Tijdschr. N. Indie, x, 412, 38, pl. 1, f. 2) from Amboina. Osten-Sacken states that it is synonymous with *Diarrhegma modestum*, Fabr. Type at Vienna. See also Enderlein, Zool. Jahrbüch., xxxi, 449.
199. **parvula* (*Euxesta*), Van der Wulp, 1897 (Termesz. Füzet., xx, 141, 20, pl. iii, f. 2) from Ceylon. Meijere in 1908 places this species in the Trypaneidae, and Hendel in 1909, after examining the type at Budapest, states that it is an *Acidia*. I think that it is synonymous with *Spheniscomyia quadrincisa*, Wied.
200. *pectoralis* (*Dacus*), Walker, 1859 (Proc. Linn. Soc., iii, 114, 130) from Aroe, etc. Seems to be a *Bactrocera* allied to *ferruginea*. Type in London.
201. ***pelia* (*Tephritis*), Schiner, 1868 (Dipt. Novara Reise, 271, 120) from Sydney. A true *Tephritis*. Type at Vienna.
202. *perplexus* (*Dacus*), Walker, 1861 (Proc. Linn. Soc., vi, 14, 48) from Gilolo. Perhaps a Pyrgotine Ortalid. Type in London.
203. **persicae* (*Rivellia*), Bigot, 1889 (Indian Mus. Notes, i, 192) from India. Placed in *Dacus* by me and by Froggatt. Seems to be the same as *Bactrocera zonata*, W. W. Saunders. Type in the Indian Museum.
204. *pictipennis* (*Henicoptera*), Walker, 1860 (Proc. Linn. Soc., iv, 155, 189) from Celebes. Osten-Sacken, who has seen the type in London, places it in synonymy with the Ortalid *Sophira distorta*, Walk.
205. **pictus* (*Dacus*), Froggatt, 1909 (Report, 99) from Ceylon. A MS. name in Bigot's collection.
206. *plagifera* (*Henicoptera*?), Walker, 1860 (Proc. Linn. Soc., iv, 156, 192) from Macassar. It is very doubtful whether the species is rightly referred to this genus, as already pointed out by Osten-Sacken, 1882, p. 233. Type in London.
207. *platypalpus* (*Atopognathus*), Bigot, 1881 (Ann. Soc. ent. France, [6] i, 24) from Ternate. Is a Micropezid, near *Phytalmia*. Type at Newmarket.
208. ***poenia* (*Trypeta*), Walker, 1849 (List Dipt. Brit. Mus., iv, 1025) from N. Holland. Placed in *Acinia* by the author, and recorded also by Froggatt (Austral. Ins., 308). Seems to be allied to *Tephritis*. Type in London.
209. *polyxena* (*Acanthoneura*), Osten-Sacken, 1882 (Ann. Mus. Civ. Genova, xvi, 462, fig.) from Java. Van der Wulp in Tijdschr. v. entom., xii, 221, 7, pl. x, f. 18 (1898), has redescribed and figured this species. Type in Genova.
210. *pompilioides* (*Dacus*), Walker, 1859 (Proc. Linn. Soc., iii, 116, 136) from Aroe. Seems to be an Ortalid, which according to Prof. Hendel belongs to *Pseudepicausta*; type in London.
211. ***pornia* (*Trypeta*), Walker, 1849 (List Dipt. Brit. Mus., iv, 1039) from N. Holland, Port

- Stephenson. Placed in *Euleja*, but has a plumose arista, perhaps a *Rioxa*. Type in London.
212. *proditrix* (*Henicoptera*), Osten-Sacken, 1882 (Berlin. entom. Zeitschr., 233), from the Philippines. Said to be very like *H. flava*. Type at Heidelberg? Enderlein (Zool. Jahrbüch., xxxi, 414) records the species from Sumatra.
213. ***psidii* (*Tephritis*, *Dacus*), Froggatt, 1899 (Agric. Gazette, N. S. W., 501, pl. ii, f. 1-3, and Report 1909, 86, pl. vii, f. 1-3), from New Caledonia and Fiji. A *Bactrocera* with two scutellar bristles. Type at Sydney.
214. *pubiseta* (*Dacus*), Walker, 1861 (Proc. Linn. Soc., v. 294, 86) from Mysol. Said to be allied to *divergens* and *addens*, and therefore perhaps an Ortalid allied to *Stenopterina*; according to Hendel belongs to *Antineura*. Type in London.
215. *pulchella* (*Rhabdochaeta*), Meijere, 1904 (Bijdr. Dierk., xvii, 109, pl. viii, f. 22-23) from Java. Said to be allied to *Schistopterum*, Becker; type at Amsterdam.
216. *pulla* (*Trypeta*), Wiedemann, 1830 (Auss. Zweifl., ii, 506, 47) from unknown locality. Allied to *Tephritis*. Type at Vienna.
217. *punctifera* (*Sophira*), Walker, 1861 (Proc. Linn. Soc., vi, 15, 49) from Gilolo. Osten-Sacken in 1881 placed this species among the synonyms of *Trypeta stellipennis*, Walk. Type in London.
218. *punctum* (*Urellia*), Becker, 1907 (Mem. Acad. Sci. St. Petersburg, xii, 285, 50, pl. i, f. 1) from Turkestan. A true *Trypanea*; type at St. Petersburg.
219. *quadrifera* (*Helomyza*), Walker, 1861 (Proc. Linn. Soc., v. 246, 58) from N. Guinea. Osten-Sacken, 1881, 459, has stated that this is a Trypaneid; Czerny in 1904, after examination of the type in London, placed it in *Ptilona*? as had already been done by Kertész, who has redescribed and figured the species. I think that the species is better placed in *Rioxa*, as has already been done by Meijere.
220. **quadrincisa* (*Trypeta*), Wiedemann, 1824 (Anal. entom., 55, 122 and Auss. Zweifl., ii, 508, 50) from East India. A widely spread species, with many synonyms, usually placed in *Acidia*, but nearer to *Spheniscomyia*. Type at Copenhagen.
221. *quinaria* (*Trypeta*), Coquillett, 1910 (Entom. News, xxi, 308) from Hongkong. Type at Washington, U. S. Nat. Museum, No. 12992.
222. *regularis* (*Ortalis*), Doleschall, 1858-59 (Nat. Tijdschr. N. Indie, xvii, 119, 75) from Amboina. Osten-Sacken, 1882, p. 227, places the species among the synonyms of *Trypeta elimia*, Walk. = *Acidia fossata*, F. Type at Vienna.
223. **reinhardi* (*Trypeta*), Wiedemann, 1824 (Anal. Entom., 54, 121, and Auss. Zweifl., ii, 507, 48) from East India. A species of the new genus *Tephrostola*. Type at Copenhagen.
224. *repleta* (*Strumeta*), Walker, 1861 (Proc. Linn. Soc., v. 296, 94) from Batjan. Placed in *Dacus* by Van der Wulp; has a plumose arista and seems to be a *Rioxa*. Type in London.
225. *reticulata* (*Ensina*), Doleschall, 1856 (Nat. Tijdschr. N. Indie, x, 412, 37, pl. xii, f. 2) from Java. A Lauxaniid, upon which Meijere has erected the new genus *Amphicyphus* (Tijdschr. v. entom., 1908, 148, pl. 4, f. 9-10). Type in Vienna. The species is also an Indian one.
226. *retorta* (*Trypeta*), Walker, 1861 (Proc. Linn. Soc., vi, 16, 33) from Gilolo. A Ceratitine with plumose arista. Type in London.
227. *ritsemae* (*Dacus*), Weyenberg, 1869 (Arch. neerl., iv, 360, pl. vi, f. 1-5) from Java. A true *Bactrocera*; type at Amsterdam?
228. *roborowskii* (*Hemilea*), Becker, 1907 (Mem. Acad. Sci. St. Petersburg, xii, 290, 61, pl. i, f. 6) from Turkestan. Type at St. Petersburg.
229. *roripennis* (*Trypeta*), Walker, 1859 (Proc. Linn. Soc., iii, 131. 15) from Key Island. A Trypaneid with plumose arista. Type in London.

230. *rudis* (*Trypeta*), Walker, 1856 (Proc. Linn. Soc., i, 133, 157) from Borneo. A Ceratitine. Type in London.
231. ***ruficeps* (*Urophora*), Macquart, 1851 (Mem. Soc. Sci. Lille, 461, [287] 12, pl. 26, f. 14) from Tasmania. Seems to be a *Sphenella*; type at Paris.
232. *rufipetia* (*Dacus*), Froggatt, 1909 (Report, 99) from unknown locality. A mere MS. name in Bigot's collection.
233. ***rufitarsis* (*Tephritis*), Macquart, 1847 (Mem. Soc. Sci. Lille, 110, [94], pl. vi, f. 9) from N. Holland. Seems to be an Ortalid of the *aenea* group No. 6. Type in Bigot's (Verrall's) collection.
234. *rufiventris* (*Henicoptera*), Walker, 1860 (Proc. Linn. Soc., v, 163. 64) from Amboina. Osten-Sacken has stated, 1881, p. 479, that this is a synonym of *Adrama selecta*. Type in London.
235. *sepedonoides* (*Dacus*), Walker, 1862 (Proc. Linn. Soc., vii, 228. 33) from Waigoe. In my paper of 1909 I have accepted this species as a *Dacus*, but at present its position seems to me to be very obscure; according to Prof. Hendel it is allied to *longicornis*, Weid. Type in London.
236. *sepsoides* (*Dacus*), Walker, 1860 (Proc. Linn. Soc., v, 163. 62) from Amboina. Probably an Ortalid of the genus *Stenopterina*; according to Hendel belongs to *Elassogaster*. Type in London.
237. *sexincisa* (*Trypeta*), Thomson, 1858 (Dipt. Eugenia Resa, 579. 252) from China. The same as *Spheniscomyia atilia*, Walk. Type at Stockholm. Thomson's spelling 6-incisa is incorrect.
238. *seamaculata* (*Ptilona*), Van der Wulp, 1880 (Tijdschr. v. entom., xxiii, 185, and Dipt. Sumatra, 51, pl. iii, f. 7-11) from Sumatra. In 1898 the species was correctly placed in *Rioxa*. Type at Amsterdam. Enderlein (Zool. Jahrbüch., xxxi, 447) has erected upon this the new genus *Ptilonina*.
239. *signatipes* (*Dacus*), Walker, 1860 (Proc. Linn. Soc., v, 163. 63) from Amboina. An Ortalid of the group *Stenopterina*; according to Hendel belongs to *Elassogaster*. Type in London.
240. *significies* (*Trypeta*), Walker, 1860 (Proc. Linn. Soc., v, 165. 67) from Amboina. Osten-Sacken, who has seen the type in London, states that it is a *Trypeta* s. l.; the arista is plumose and the colouring is very like that of some Ortalids.
241. *sinensis* (*Sphenella*), Schiner, 1868 (Diptera Novara Reise, 267. 109) from China. A true *Sphenella*. Type at Vienna.
242. *sinensis* (*Trypeta*), Thomson, 1858 (Dipt. Eugenia Resa, 585. 263) from S. China. Is evidently a *Sphenella* allied to the preceding, if not the same. Type at Stockholm.
243. *sinica* (*Trypeta*), Walker, 1857 (Trans. Ent. Soc. London, iv, 229) from China. Seems to be allied to *Rioxa*. Type in London.
244. *sordidus* (*Dacus*), Walker, 1861 (Proc. Linn. Soc., v, 251. 69) from Mysol. Not a *Dacus* at all, but probably an Ortalid belonging to the *Stenopterina* group. Type in London.
245. *soror* (*Acidia*), Schiner, 1868 (Dipt. Novara Reise, 264. 100) from Java. With plumose arista, seems to belong to the group *Rioxa*, and perhaps a *Taeniostola*. Type in Vienna.
246. *speculifer* (*Dacus*), Walker, 1863 (Proc. Linn. Soc., viii, 122. 53) from N. Guinea. The pattern of the wings is like that of *Callistomyia*. Type in London.
247. **squalidus* (*Dacus*), Walker, 1860 (Trans. Ent. Soc. London, v, 323) from Hindustan. Probably a *Bactrocera*. Type in London.
248. **stella* (*Trypeta*), Walker, 1849 (List Dipt. Brit. Mus., iv, 1030) from Bengal. Placed in the group *Noeta*, but seems to be more like a *Tephritis* than a *Carphotricha*. Type in London.
249. *stellata* (*Acinia*), Macquart, 1851 (Mem. Soc. Sci. Lille, 266 [293] 9, pl. 17, f. 7) from Manila. Osten-Sacken has seen the type in Bigot's (now Verrall's) collection, and says that it is a Trypaneid of the group related to *Eutreta*. Enderlein (Zool. Jahrbüch., xxxi, 433, f. 4) records the species from Sumatra, giving a figure of the wing and a complete synonymy.

250. *stellipennis* (*Trypeta*), Walker, 1860 (Proc. Linn. Soc., iv. 159. 198) from Macassar. Osten-Sacken says that this is allied to the preceding. Type in London.
251. **striata* (*Ceratitis*), Froggatt, 1909 (Report, III, pl. v, f. 17) from Ceylon. Belongs to the new genus *Stictaspis*. Type at Peradeniya?
252. *strigifer* (*Dacus*), Walker, 1861 (Proc. Linn. Soc., vi, 13. 46) from Gilolo. An Ortalid, perhaps of the group *Stenopterina*; according to Prof. Hendel it belongs to the genus *Antineura*. Type in London.
253. *strigifinis* (*Dacus*), Walker, 1861 (Proc. Linn. Soc., v, 295. 90) from Batjan. In my paper of 1909 I have considered this species as a *Dacus*, but at present this seems to me very doubtful. Type in London.
254. ***strigipennis* (*Tephritis*), Macquart, 1851 (Mem. Soc. Sci. Lille, 263 [289] 16, pl. 27, f. 2) from N. Holland. Seems to be a *Ceratitis*. Type in Paris.
255. *subocellifera* (*Trypeta*), Walker, 1859 (Proc. Linn. Soc., iii, 120. 146) from Aroe. Seems to be a Lauxaniid of the group of *Sapromyza trypetoptera*, on account of the colouring of the thorax. Type in London.
256. *succinatus* (*Dacus*), Wiedemann, 1830 (Auss. Zweifl., ii, 526. 20) from unknown locality. An Ortalid of the genus *Rivellia*, as stated by Loew (Monogr., iii, 12 and 44) who erroneously called the species *succinctus*. Type at Vienna.
257. *succinctus* (*Dacus*), Loew, 1873 (Monogr. N. Amer. Dipt., iii, 12) is a misprint for *succinatus*.
258. *tacia*, Van der Wulp, 1896 (Cat. Orient. Dipt., 192); is a misspelling for *tucia*, No. 269.
259. *taeniata* (*Urophora*), Macquart, 1843 (Mem. Soc. Sci. Lille, 379, [222] 3, pl. 30, f. 6) from Java. An Ortalid of the group *Platystominae*. Type in Paris.
260. *tau* (*Dasyneura*), Walker, 1849 (List Dipt. Brit. Mus., iv. 1074) from China. A true *Bactrocera*. Type in London.
261. *tenuis* (*Urophora*), Becker, 1907 (Mem. Acad. Sci. St. Petersburg, xii. 287. 54) from Turkestan. A Palaearctic species. Type at St. Petersburg.
262. *terminifer* (*Dacus*), Walker, 1860 (Proc. Linn. Soc., iv. 152. 183) from Macassar. A *Bactrocera* of the group of *ferruginea*. Type in London.
263. ***testacea* (*Urophora*), Macquart, 1851 (Mem. Soc. Sci. Lille, 260 [131] 10, pl. 26, f. 12) from Tasmania. Seems to be a Pyrgotine. Type at Paris.
264. *tortuosa* (*Henicoptera*), Walker, 1860 (Proc. Linn. Soc., iv. 155. 190) from Macassar. Osten-Sacken says that this species is closely related to *flava*. Type in London.
265. *transiens* (*Trypeta*), Walker, 1860 (Proc. Linn. Soc., v. 164. 66) from Amboina. Seems to be a Trypaneid. Type in London.
266. *trivittatus* (*Dacus*), Walker, 1849 (List Dipt. Brit. Mus., iv. 1072) from the Philippine Islands. Seems to be a *Stenopterina*; Van der Wulp in his Catalogue has the species twice over, once as *Stenopterina* and once as *Dacus*. Type in London.
267. ***tryoni* (*Tephritis*, *Dacus*), Froggatt, 1897 (Agric. Gazette N. S. W., 410, pl. 8, f. 1 and Report, 1909, 79, pl. i, f. 1, and pl. vi) from Australia. A true *Bactrocera*, with two scutellar bristles, the same as *ferruginea*. Type in Sydney.
268. *tubifera* (*Trypeta*), Walker, 1857 (Trans. Ent. Soc. London, iv, 230) from China. Seems to be a Ceratitinine. Type in London.
269. **tucia* (*Trypeta*), Walker, 1849 (List Dipt. Brit. Mus., iv, 1021) from Bengal. Placed by its author in *Urophora* but is really a *Spheniscomyia* synonymous with *quadrincisa*, Wied. Type in London.
270. *turgidus* (*Dacus*), Walker, 1863 (Proc. Linn. Soc., viii, 134. 10) from N. Guinea. Is a Micropezid of the genus *Diplochorda*, as stated by Osten-Sacken, who has seen the type in London.
271. *umbrosus* (*Dacus*), Fabricius, 1805 (Syst. Antl., 274. 7, and Wiedemann, Auss. Zweifl., ii

- 7) from Sumatra. A widely spread species, the type of the *Bactrocerae* with banded wings. Type at Copenhagen.
272. ***undecimguttata* (*Trypeta* 11-*guttata*), Thomson, 1858 (Dipt. Eugen. Resa, 581. 255) from Sydney. Seems to be a *Tephritis*. Type at Stockholm.
273. **vaga* (*Trypeta*), Wiedemann, 1830 (Auss. Zweifl., ii. 490. 21) from Bengal. A true *Kioxa*. Type at Vienna.
274. *variabilis* (*Ptilona*?), Kertész, 1901 (Termesz. Füzet., xxiv. 426, 24, pl. 20, f. 15) from N. Guinea. Meijere also refers this species to *Ptilona*, but the presence of *dc.* bristles makes this impossible. Type at Budapest.
275. *varialis* (*Dacus*), Walker, 1863 (Proc. Linn. Soc., viii. 123. 56) from N. Guinea. Probably an Ortalid, which belongs to *Elassogaster* according to Hendel. Type in London.
276. *variata* (*Urellia*), Becker, 1907 (Mem. Acad. Sci. St. Petersburg, xii. 286, 51, pl. i. f. 4) from Turkestan. A typical *Trypanea*. Type at St. Petersburg.
277. **varipennis* (*Leptomysa*), Van der Wulp, 1897 (Termesz. Füzet., xx. 143, 28, pl. iii, f. 3-4) from Ceylon. As stated by Czerny, who has seen the type at Budapest, the present species is an *Oxyna*, and I think it is the same as *sororcula*, Wied.
278. *venusta* (*Sophira*), Walker, 1856 (Proc. Linn. Soc., i. 35, 113, pl. ii, f. 1) from Singapore. Is an Ortalid. Type in London.
279. *vespoides* (*Bactrocera*?), Doleschall, 1858-59 (Nat. Tijdschr. N. Indie, xvii. 123. 80) from Amboina. In my paper of 1909, p. 292, I have placed this species in synonymy with *longicornis*, Wied. No. 156. Type at Vienna.
280. *violacea* (*Tephritis*), Gray, 1832 (Griffith, Anim. Kingd., ii. pl. 128, f. 1) from S. Asia. Is the handsome well-known Ortalid *Loxoneura decora*, Fabricius.
281. *violacea* (*Trypeta*), Wiedemann, 1830 (Auss. Zweifl., ii. 476, 1) from Java. Osten-Sacken (Ann. Mus. civ. Genova, xvi. 464) places this species in the genus *Xiria*, which is placed among the Ortalids; but Westwood's figure of the type of *Xiria* shows lower fronto-orbital bristles. Type in the Leyden Museum.
282. ***virgatus* (*Dacus*), Coquillett, 1910 (Entom. News, xxi. 13) from Tonga Island, Polynesia, bred from guavas. Nothing is said about chaetotaxy. Type at Washington, U. S. National Museum, No. 12738.
283. *vittata* (*Tephritis*), Macquart, 1851 (Mem. Soc. Sci. Lille, 263 [290] 15, pl. 27, f. 1) from Asia. Is a Ceratitine. Type in Paris.
284. ***vittipennis* (*Phaeogramma*), Grimshaw, 1901 (Fauna Hawaii., 48, 1, pl. ii, f. 26-27) from Hawaii. A very peculiar genus of Trypanininae.
285. **vittithorax* (*Urophora*), Macquart, 1851 (Mem. Soc. Sci. Lille, 259 [285] 9, pl. 26, f. 11) said to be from India. The locality must have been erroneously given, because, as stated by Loew (Monogr., iii. 227) the present species is synonymous with the Neotropical *Anastrepha serpentina*, Wied. Type in Bigot's (Verrall's) collection at Newmarket.
286. ***xanthodes* (*Tephritis*, *Dacus*), Brown, 1904 (Trans. N. Zeal. Instit., xxxvii. 327) from N. Zealand and Fiji. See also Froggatt, Report, 1909, 91, pl. i, f. 3. A *Bactrocera*, closely allied to *ferruginea*, Fabr. Type?
287. *ypsilon* (*Themara*), Rondani, 1875 (Ann. Mus. civ. Genova, vii. 435) from Borneo. As the second vein is straight, this species cannot belong here; it is perhaps a Ceratitine. Type at Genova, Museo Civico. According to Enderlein (Zool. Jahrbüch., xxxi. 422), who records the species from Sumatra, it belongs to *Acanthoneura*.
288. **zonata* (*Dasyneura*), W. W. Saunders, 1841 (Trans. Entom. Soc. London, iii. 61, pl. 5, f. 3) from Bengal; Walker, List Dipt. Brit. Mus., iv. 1075. The type of the genus *Dasyneura*, which is synonymous with *Bactrocera*. Type in London. See also Enderlein, Zool. Jahrbüch., xxxi. 408.

The present list was already written, when I received a paper by Mr. Froggatt (*Notes on Fruit-Flies (Trypetidae) with descriptions of new species*, 1911) and another by Dr. Enderlein (*Trypetiden-Studien*, 1911). I give below a list of the new species and genera of the Oriental and Australian regions described in these papers; minor citations will be inserted at convenient places in the text.

289. *appendiculata* (*Sophira*), Enderlein, 1911 (Zool. Jahrbüch., xxxi, 434, fig. M) from Sumatra.
A very interesting species. Type in Museum at Stettin, like the following.
290. *bataca* (*Acanthoneura*), Enderlein, 1911 (Zool. Jahrbüch., xxxi, 417, fig. B) from Sumatra. A good species near *fuscipennis*, Macq.
291. *bisetosa* (*Ensina*), Enderlein, 1911 (Zool. Jahrbüch., xxxi, 455, figs. Y and Z) from Formosa.
Seems to be *Oxyna sororcula*, Wied., a widely spread species.
292. *formosana* (*Acanthoneura*), Enderlein, 1911 (Zool. Jahrbüch., xxxi, 419, fig. C) from Formosa.
Seems to be a typical *Rioxa* in my opinion.
293. *formosana* (*Trypeta*), Enderlein, 1911 (Zool. Jahrbüch., xxxi, 427, fig. H) from Formosa.
Is the widely spread *Spheniscomyia sexmaculata*, Macq.
294. *gigantea* (*Henicoptera*), Enderlein, 1911 (Zool. Jahrbüch., xxxi, 413) from Sumatra. A very interesting species.
295. ***hirki* (*Dacus*), Froggatt, 1911 (Proc. Linn. Soc. N. S. Wales, xxxv, 871) from ? New Zealand. A true *Bactrocera*.
296. *latilimbata* (*Euphranta*), Enderlein, 1911 (Zool. Jahrbüch., xxxi, 438, fig. P) from Sumatra.
Very doubtful; the author says nothing about the *dc*, which in the genus *Euphranta* are wanting. Probably a *Rioxa*, as stated by Prof. Hendel, Wien. Entom. Zeit., xxxi, 15.
297. *lemniscata* (*Trypeta*), Enderlein, 1911 (Zool. Jahrbüch., xxxi, 426, fig. G) from Formosa. Is not a true *Trypeta*.
298. *limbata* (*Sophira*), Enderlein, 1911 (Zool. Jahrbüch., xxxi, 435, fig. N) from Sumatra. A very remarkable species.
299. ***loranthi* (*Ceratitis*), Froggatt, 1911 (Proc. Linn. Soc. N. S. Wales, xxxv, 863) from W. Australia. A very characteristic species, which perhaps belongs to *Carpophthoromyia*.
300. *montina* (*Acanthoneura*), Enderlein, 1911 (Zool. Jahrbüch., xxxi, 416) from Java. Seems to be a good species near *maculipennis*.
301. *nigra* (*Euphranta*), Enderlein, 1911 (Zool. Jahrbüch., xxxi, 439, fig. Q) from Sumatra. A very remarkable species, but probably not of this genus. Prof. Hendel says that it is a *Lagarosia*.
302. *normaliceps* (*Acanthoneura*), Enderlein, 1911 (Zool. Jahrbüch., xxxi, 420, fig. D) from Sumatra. Seems to be a *Rioxa*.
303. *ortalina* (*Dimeringophrys*), Enderlein, 1911 (Zool. Jahrbüch., xxxi, 452, fig. W) from Sumatra.
This new genus seems to be allied to my *Chaetellipsis* on account of the reduced chaetotaxy of the head.
304. ***passiflorae* (*Dacus*), Froggatt, 1911 (Proc. Linn. Soc. N. S. Wales, xxxv, 870) from Fiji and New Zealand. Seems to be a true *Bactrocera*, with unspotted wings.
305. ***pepisalae* (*Dacus*), Froggatt, 1911 (Proc. Linn. Soc. N. S. Wales, xxxv, 869) from the Solomon Islands. There is some doubt whether this species really belongs to the Dacinae.
306. *pulchralis* (*Colobostroter*), Enderlein, 1911 (Zool. Jahrbüch., xxxi, 445, fig. T) from Sumatra.
The position of this new genus among Trypaneids seems to be very doubtful.
307. *quadrifasciata* (*Spilograpta*), Enderlein, 1911 (Zool. Jahrbüch., xxxi, 436, fig. O) from Sumatra. The pattern of the wings is like that of the new genus *Taeniostola*, but the arista is only pubescent.
308. ***rarotongae* (*Dacus*), Froggatt, 1911 (Proc. Linn. Soc. N. S. Wales, xxxv, 872) from Coe Island. Seems to be the same as *D. melanotus*, Coq., No. 170 from the same locality.

- 309. *sauteri* (*Tephritis*), Enderlein, 1911 (Zool. Jahrbüch., xxxi, 456, fig. A) from Formosa. A true *Tephritis*.
- 310. *sumatrana* (*Rioxa*), Enderlein, 1911 (Zool. Jahrbüch., xxxi, 449, fig. U) from Sumatra. A true *Rioxa*, perhaps the same as my *quinquemaculata*.
- 311. *sumbana* (*Platensina*), Enderlein, 1911 (Zool. Jahrbüch., xxxi, 454, fig. X) from Sumba. Seems to be a species allied to *acrostacta*, Wied. It consequently follows that my new genus *Tephrostola* is the same as *Platensina*, the latter having priority. The genus however has nothing to do with *Ensina*.
- 312. *superflucta* (*Trypeta*), Enderlein, 1911 (Zool. Jahrbüch., xxxi, 428, fig. Z) from Formosa. Seems not to be a true *Trypeta*.
- 313. **tongensis* (*Dacus*), Froggatt, 1911 (Proc. Linn. Soc. N. S. Wales, xxxv, 870) from Tonga Island and New Zealand. Seems to be a *Bactrocera* with hyaline wings, different from the species described by Coquillett from the same locality.
- 314. ***zonatus* (*Dacus*), Froggatt, 1911 (Proc. Linn. Soc. N. S. Wales, xxxv, 868) from the Solomon Islands. Is evidently different from the Indian *zonatus*, Saund., being moreover twice as large; perhaps a *Bactrocera*.

In the meantime three other papers have appeared dealing with Trypaneids, one by Prof. J. C. H. de Meijere (*Studien über Südostasiatische Dipteren* vi, 1911), and two by Prof. Fr. Hendel (*Neue Muscidae Acalypteratae*, 1912 and *Genus Dacus* from *H. Sauter's Formosa-Ausbeute*, 1912). I have inserted in the text some citations, chiefly concerning Prof. Hendel's last paper, which has, as usual, a very great importance, and I will complete the above list in the following lines.

- 315. *albistrigatus* (*Dacus*), Meijere, 1911 (Tijdschr. v. Entom., liv, 377, 4, pl. 20, f. 33) from Java. A *Bactrocera* with banded wings. Type in Amsterdam.
- 316. *apicalis* (*Dacus*), Meijere, 1911 (Tijdschr. v. Entom., liv, 376, 3) from Java. A *Bactrocera*, near *ferruginea*. Type in Amsterdam.
- 317. **austeni* (*Adrama*), Hendel, 1912 (Wien. Entom. Zeit., xxxi, 12, 12) from Ceylon. Type in the British Museum.
- 318. *chrysotoxus* (*Dacus*), Hendel, 1912 (Suppl. Entom., i, 24, 8, pl. i, f. 5) from Key Islands. A true *Bactrocera*, near *caudata*. Type at Berlin, in the collection of Mr. B. Lichtwardt.
- 319. *ciliifer* (*Dacus*), Hendel, 1912 (Suppl. Entom., i, 15, 1, pl. i, f. 1) from Formosa. A true *Bactrocera*. Type in Berlin, collection of the Deutsch. Entom. Museum.
- 320. *conopsoides* (*Dacus*), Meijere, 1911 (Tijdschr. v. Entom., liv, 378, 5) from Java. A *Dacus* s. l., with stalked abdomen, belonging to the group *longicornis* (Wied.). Type in Amsterdam.
- 321. *cruciata* (*Psila*), Walker, 1863 (Proc. Linn. Soc., viii, 126, 63) from New Guinea. As recognized by Osten-Sacken (1881, p. 479) belongs to *Adrama selecta* no. 332. Type in London.
- 322. *dorsalis* (*Dacus*), Hendel, 1912 (Suppl. Entom., i, 18, 3, pl. i, f. 3) from Formosa. A true *Bactrocera* allied to *ferruginea*. Type in Berlin, Deutsch. Entom. Museum.
- 323. *hageni* (*Dacus*), Meijere, 1911 (Tijdschr. v. Entom., liv, 375, 2) from Sumatra. A *Bactrocera*, near *ferruginea*. Type in the Leiden Museum.
- 324. *imitans* (*Lagarosia*), Meijere, 1911 (Tijdschr. v. Entom., liv, 383, 2) from Java. Type in Amsterdam.
- 325. *lacteata* (*Lagarosia*), Van der Wulp, 1891 (Tijdschr. v. Entom., xxxiv, 211, pl. 12, f. 13) from Java. The typical species of the genus *Lagarosia* which was considered by its author to belong to the Ortalids. Prof. Meijere, and subsequently Prof. Hendel have shown that it is a true Trypaneid, belonging to the Ceratitinae with plumose arista. Type in Amsterdam.

326. *maculifrons* (*Acanthipeza*), Rondani, 1875 (Ann. Mus. Civ. Genova, vii, 438), from Borneo. The type of the genus *Acanthipeza*, but according to Osten-Sacken (1881, p. 479) it is synonymous with *Adrama determinata*. Type at Genova, Museo Civico.
327. *nubilus* (*Dacus*), Hendel, 1912 (Suppl. Entom., i, 16, 2, pl. i, f. 2) from Formosa. A true *Bactrocera*, described as a variety of *caudata*. Type in Berlin, Entom. Museum.
328. *obscuratus* (*Dacus*), Meijere, 1911 (Tijdschr. v. Entom., liv, 373, 1) from Java. A *Bactrocera*, described as a variety of *ferruginea*. Type in Amsterdam.
329. *parvipunctata* (*Rioxa*), Meijere, 1911 (Tijdschr. v. Entom., liv, 381) from Java. A true *Rioxa*, described as a variety of *sexmaculata*. Type in Amsterdam.
330. *parvulus* (*Dacus*), Hendel, 1912 (Suppl. Entom., i, 21, 5) from Formosa. A true *Bactrocera*, near *ferruginea*. Type in Berlin, Entom. Museum.
331. *scutellatus* (*Dacus*), Hendel, 1912 (Suppl. Entom., i, 20, 4, pl. i, f. 4), from Formosa. A true *Bactrocera*. Type in Berlin, Entom. Museum.
332. *selecta* (*Adrama*), Walker, 1859 (Proc. Linn. Soc., iii, 118, 139) from Aru Islands. The typical species of the genus *Adrama*, which is considered by Prof. Hendel to belong to the Trypaneids, near *Meracanthomyia*. Type in London.
333. *smieroides* (*Callantra*), Walker, 1860 (Proc. Linn. Soc., iv, 154, 187) from Macassar. Prof. Hendel (Suppl. Entom., i, 15) says that this species is very like a *Dacus* s. l., with stalked abdomen; it is therefore perhaps a Trypaneid, while the following genus *Aragara* belongs to the Ortalids. Type in London. *Smieroides* is evidently a misprint for *smicroides*.
334. *striatella* (*Lagarosia*) Van der Wulp, 1891 (Tijdschr. v. Entom., xxxiv, 213, pl. 12, f. 14) from Java. According to Prof. Meijere, 1911, p. 383, is evidently the female of *lacteata*, no. 325. Type in Amsterdam.

6. NOMENCLATURE AND CLASSIFICATION.

In my paper of 1910 (Boll. Labor. Zoolog. Portici, v, pp. 2-4) I have already discussed the nomenclature and the classification of the family; I will repeat here briefly the principal points, and give the characters of the sub-divisions.

For a long time the family name has been Tephritidae, which was used chiefly by French authors, and by Rondani as late as in 1870. But the genus *Trypeta*, Meigen, 1803, being of more early date than *Tephritis*, Latreille, 1804, the family name universally used until recent times has been Trypetidae. Quite recently, however, after the discovery that *Trypeta*, Meigen, 1803, is the same as *Euribia*, Meigen, 1800, Czerny has proposed (Verh. zool. bot. Ges., lix, 1909, p. 252) to call the family Euribiidae. I have already (1907) stated that the genus *Trypanea* (*Trupanea*) of Schrank, 1795, must be employed in place of *Urellia* (Robineau-Desvoidy) Loew, and therefore the family name must be drawn from this genus, and must be Trypaneidae, as used in the present paper. Guettard's *Trypanea*, 1756, cannot be taken into consideration, being prior to the year 1758.

The subdivision of the family Trypaneidae is very difficult, and up to the present has not been effected in a satisfactory manner. I have proposed to divide the family into two subfamilies, the Dacinae and the Trypaneinae, and the latter into three tribes.

1. *Subfamily Dacinae*.—Antennae elongate, as long as or longer than the face, usually bare, or very rarely shortly pilose. *Oc.* wanting; *pvt.* wanting or very small; occipital row wanting. *Hm.*, *prst.* and *dc.* wanting; anterior *sa.* and *prsc.* sometimes

wanting; *pt.* usually weak; *st.* wanting. Abdomen of the female with the last segment (5th or 6th) hidden. Front femora without bristles below, or very rarely bristly. Scutellum with two or four bristles; if the bristles are only two it is always the basal (not the apical) pair that is absent. Wings with the auxiliary vein very approximate to the first longitudinal vein, and often very little distinct; the first three longitudinal veins are usually very approximated, the others are distant, the small cross-vein is therefore very long and oblique. Second basal cell usually very much dilated, and short at the base; anal cell narrowed, its inferior angle usually drawn out into a very long point, much longer than the second basal cell. Pattern of the wings usually very simple and reduced to a fore border and some stripes; banded wings are very rare, and reticulated wings are never found.

The principal character of the subfamily is the reduced chaetotaxy of the head and of the thorax. The species are tropical or subtropical and live almost exclusively in the old world. The larvae live only in fruits of various kinds, and are never gall-makers.

Loew was not clear as to the limits of his group *Dacinae*, which is very different from the subfamily here defined; he has drawn the characters chiefly from the shape of the abdomen of the female. *Ceratitis* and allied forms have been often placed near *Dacus*, with which, however, they have nothing to do, as is shown by their very developed chaetotaxy.

The subfamily *Dacinae* is not at present rich in genera; besides the genus *Dacus* s. l., it probably comprises the very distinct American genus *Toxotrypana*,¹ and certainly the aberrant genus *Meracanthomyia*, Hendel, with its ally *Adrama*. *Hemicoptera* and *Cardiocera* are also perhaps to be placed here. *Meracanthomyia* has the reduced chaetotaxy and the antennae of the true Dacine; but the arista is shortly pilose, the femora are bristly below, the first three longitudinal veins of the wings are not approximated, the second basal cell is not dilated, and the inferior angle of the anal cell is not drawn out into a long point, being shorter than the second basal cell.

If we take the well-known *Dacus oleae*, Gmelin, as the type of the genus *Dacus*, we will find that the majority of the other *Dacinae* cannot be considered as congeneric with it. The genus *Dacus* s. str. is to be restricted to the forms which have no anterior *sa.* and no *prsc.*, a short and rounded abdomen with distinct segments and a flattened ovipositor. The African species allied to *longistylus*, Wied., which have the same chaetotaxy as the species *oleae*, but have a very elongate body, an abdomen with partly fused segments and a cylindrical unflattened ovipositor, belong to a distinct genus which will bear the name of *Leptoxyda*, Macquart. I do not know if all the African species belong only to these two groups, or if there are some other genera; but as far as I know, the African species are very distinct from the Oriental and Australian species principally by reason of their more reduced chaetotaxy.

The Oriental (and Australian) species have always a pair of *prsc.* and one anterior *sa.* bristle, and the scutellum bears very often four bristles. All the known

¹ Chiefly on account of its very reduced chaetotaxy; it would be the only Dacine of the new world.

Indian species belong to one single genus, which I have previously named *Chaetodacus*; but subsequently I recognized that it is better to distinguish them under the name *Bactrocera*, Guérin-Ménéville. If the species with banded wings (type *umbrosus*) are considered generically distinct from those with unbanded wings (type *ferrugineus*), for the latter the generic name *Dasyneura*, W. W. Saunders, must be used; but this name being preoccupied by Rondani in the Diptera, my name *Chaetodacus* will replace it. *Strumeta*, Walker, is synonymous with *Bactrocera*, or with the group of species with banded wings.

2. *Subfamily Trypaneinae*.—Antennae usually shorter than the face, with a bare, pilose or plumose arista. *Oc.* mostly present, strong or small, as also the *pvt.*; occipital row more or less developed, but never wanting. *Hm.* always present, but in a single case wanting; *prst.* rarely wanting; anterior *sa.* present; *prsc.* and usually one or rarely two pairs of *dc.* present; *st.* almost always present; *pt.* usually strong. Scutellum usually with two pairs of bristles, but sometimes with three pairs; if only one pair is present it is always the basal (not the apical) pair, that is to say, the apical pair only can be wanting. Anterior femora usually bristly below (bare in *Euphranta*). Abdomen of the female with the last segment distinct and the others never fused together; the ovipositor usually flattened (cylindrical in some *Anastrepha*, *Carpophthoromyia* and *Urophora*). Auxiliary vein distinct; the first three longitudinal veins not approximated; second basal cell not dilated; anal cell not narrowed, with the inferior angle drawn out in a point or not, shorter or longer than the second basal cell. Pattern of the wings varying from the banded to the reticulated type, rarely absent. The species are proper to tropical, temperate and even cold countries; the larvae live in fruits, or in various parts of vegetables, and are very often gall-makers.

This great subfamily includes most of the proposed genera of Trypaneids. No attempts have been made to subdivide it; and I think that Loew in his generic divisions has laid too much stress on the pattern of the wings, chiefly for practical purposes. Schiner has followed Loew with some little modification, and so have all subsequent writers. Rondani, in 1870, has given a more scientific arrangement, but he lays too much importance on the relative lengths of the various portions of the fourth longitudinal vein.

I think that the subdivision of the subfamily Trypaneinae into other groups of subfamily rank is not at present possible; but I am of opinion that three secondary groups or tribes can be distinguished by the following characters:—

1st Tribe: *Ceratitininae*. Occipital row formed by thin black bristles, which at the most are yellow only in the postvertical region; or the row is almost wanting, being only distinct in the superior portion. Arista often pilose or plumose. Thorax mostly clothed on the back with black pubescence. Wings with the third longitudinal vein usually bristly over its whole length, or at least towards the base; anal cell usually with its lower angle drawn out into a point, and therefore as long as, or longer than, the second basal cell (obtuse in *Gonyglossum*). Wing-pattern of the banded type. The species of this tribe are most abundant in tropical or subtropical

countries, but are not rare in temperate regions. The larvae often live in fruits, like those of the Dacinae; but some species mine into the leaves of umbelliferous plants or of Compositae; a few species are gall-makers, but none live in the flower-heads of the Compositae.

2nd Tribe: Myiopitinae. This tribe has the same characters as the preceding; but the anal cell is always obtuse, its lower angle is never drawn out in a point; the ovipositor is long and cylindrical; the wings are banded. The species are found exclusively in temperate countries, being wanting in the tropics; the larvae live only on plants of the family Compositae, and often make galls.

3rd Tribe: Trypaneinae. Occipital row usually formed of strong yellow bristles, which are usually obtuse at the end. Thoracic pubescence yellowish. Wings with the third longitudinal vein usually bare; anal cell never longer than the second basal cell (obtuse in some forms). Wing-pattern usually of the reticulate type, rarely banded and sometimes hyaline. Ovipositor flattened. Arista usually bare. The species occur in temperate countries and also in cold regions; the larvae live usually in the flower-heads of the Compositae, and sometimes make galls, even on the roots of plants of this family.

The known genera of Trypaneids are arranged as follows in my classification:—

Subfam. DACINAE.

Toxotrypana (<i>Mikimyia</i>).	? Henicoptera.
Dacus.	? Cardiocera.
Leptoxyda (<i>Leptoxys</i>).	Meracanthomyia (<i>Meracantha</i>).
Bactrocera (<i>Strumeta</i> , <i>Dasyneura</i> , <i>Chaetodacus</i>).	Adrama (<i>Acanthipeza</i>).

Subfam. TRYPANEINAE.

Tribe CERATITININAE.

Anastrepha (<i>Acrotoxa</i> , <i>Leptoxyda</i>).	Callantra.
Hexachaeta.	Platyparea.
Blepharoneura	Macrotrypeta.
Polymorphomyia.	Acidia (<i>Epidesmia</i> , <i>Myioleja</i>).
Xarnuta.	Ocneros (<i>Hemilea</i>).
Dimeringophrys.	Hypenidium.
(Xiria).	Rhacochlaena.
(Sophira).	Chaetostoma.
Colobostroter.	Stemonocera.
Acanthoneura (<i>Themara</i>).	Vidalia.
Rioxa (<i>Ptilonina</i>).	Straussia (<i>Strauzia</i>).
Ptilona.	Molynocoelia.
Conradtina.	Spilographa (<i>Forellia</i> , <i>Phorellia</i>).
Euphranta (<i>Mosina</i>).	Zonosema.
Lagarosia.	Rhagoletis.

Euleja (*Philophylla*).
 Carpomyia.
 Myiopardalis.
 Gonyglossum (*Orellia*).
 Oedaspis.
 Polionota.
 Cecidochares.
 Peronyma.

Ceratitis (*Petalophora*, *Halterophora*).
 Lenophila.
 Carpophthoromyia.
 Anomoea (*Phagocarpus*).
 Epochra.
 Spheniscomyia (*Spheniscus*).
 Aciura.
 Coelopacidia.

Tribe MYIOPITININAE.

Myiopites (*Stylia*).
 Asimoneura.

Urophora.

Tribe TRYPANEININAE.

Schistopterum.
 Rhochmopterum.
 Rhabdochaeta.
 Stenopa.
 Euribia (*Trypeta*, *Orellia*, *Cerajocera*,
Sitarea, *Terellia*).
 Phaeogramma.
 Plagiotoma.
 Neoaspilota (*Aspilota*).
 Acrotaenia.
 Baryphlegma.
 Platensina.
 Eutreta (*Icaria*).
 Strobelia.
 Rhachiptera.
 Percnoptera.
 Carphotricha (*Paracantha*, *Noeeta*,
Hoplochaeta).

Eurosta.
 Acidogona.
 Elaphromyia.
 Xenochaeta.
 Oedicarena.
 Oxyphora (*Xyphosia*).
 Icterica (*Westermannia*, Lioy pre-
 occ).¹
 Sphenella (*Sineura*, Lioy).
 Ensina.
 Oxyna.
 Acanthiophilus.
 Campiglossa.
 Euaresta.
 Tephritis (*Ditricha*, *Spathulina*,
Acinia).
 Trypanea (*Urellia*, *Actinoptera*, *Try-
 panaea*).

7. KEY FOR THE DETERMINATION OF THE GENERA.

In the following key the genera of Trypaneids present in the collection submitted for my study are distinguished. The abbreviations used in naming the bristles of the head and thorax, are those proposed in the second chapter and explained by the figures.

1 (4). *St.* wanting; no *hm.*, *prst.* and *dc.*; auxiliary vein faintly distinct; second basal cell dilated.

2 (3). Anterior *sa.* and *prsc.* wanting; ovipositor cylindrical

Leptoxyda, Macq.

3 (2). Anterior *sa.* and *prsc.* always present; ovipositor flattened

Bactrocera, Guer.-Men.

¹ *Westermannia*, Lioy, 1863, has the same type species as *Icterica*, Loew, 1873, and has therefore priority, but is preoccupied.

- | | | | | | |
|--|--|----|----|----|------------------------------|
| | <i>a</i> (<i>b</i>) Wings not banded | .. | .. | .. | <i>Chaetodacus</i> , n. gen. |
| | <i>b</i> (<i>a</i>) Wings banded | .. | .. | .. | <i>Bactrocera</i> , G.-M. |
- 4 (1). Sternopleural bristle always present;¹ *hm.*, *prst.* and *dc.* very rarely wanting; auxiliary vein well distinct; second basal cell of usual size.
- 5 (48). Occiput with the usual row of black bristles, or with bristles only on the upper side; if rarely the occipital bristles are yellow, they are thin and pointed; thorax usually with dark dorsal pubescence; arista mostly plumose or pubescent; proboscis not elongated; third longitudinal vein usually bristly throughout its whole length.
- 6 (37). Third longitudinal vein bristly throughout its whole length, or at least from the base to the small cross vein.
- 7 (8). No *hm.*; middle tibiae with 2 apical spurs; *dc.* and *prsc.* present; no *oc.*; *or.* 2. 2; occiput strongly swollen below; arista plumose; body black, marked with white; wings with brown rivulet-pattern *Anoplomus*, n. gen.
- 8 (7). *Hm.* always present.
- 9 (12). Frons flattened, thinly pilose, longer than the face; antennae inserted below the middle of the eyes; no *oc.*; arista plumose only on the upper side; wings without entire cross-bands.²
- 10 (11). No lower *or.*; colouring of body yellow; wings with yellowish markings toward the fore border .. *Chaetellipsis*, n. gen.
- 11 (10). Lower *or.* present; colouring of body tawny and shining black; wings with brown fore border *Poecillis*, n. gen.
- 12 (9). Frons not flattened, as long as, or longer than the face, not thinly pilose and bare towards the middle; antennae inserted on or above the middle of the eyes; arista usually plumose on both sides.
- 13 (16). Second longitudinal vein wavy.
- 14 (15). Second longitudinal vein straight at base and wavy at end; head very broad; body short, of brown colouring; wings brownish-black with hyaline spots and indentations; costa ciliated, and 1st, 3rd and 5th veins bristly .. *Acanthoneura*, Macq.
- 15 (14). Second vein wavy at base and straight at end; head not dilated; body elongate, of light yellow colouring, with black dots on thorax and scutellum; wings hyaline, with three yellow longitudinal bands; costa not ciliated and fifth vein bare *Xanthorrhachis*, n. gen.
- 16 (13). Second vein straight throughout its whole length.
- 17 (18). *Prst.* and *dc.* wanting; no *oc.*; *or.* 1. 1.; scutellum with four bristles; third antennal joint rounded at the tip; arista plumose; body brown and dark yellow; wings with hyaline indentations and spots .. *Ptilona*, Wulp.
- 18 (17). *Prst.* and *dc.* always present.
- 19 (22). Scutellum flattened, with six strong bristles, rarely the middle

¹ Wanting in *Henicoptera*, according to Osten-Sacken, and therefore this genus belongs probably to the Dacinae.

² *Ceratitis* s. str. shows a similar shape of head, but the arista is only shortly pubescent on the upper side.

- pair smaller than the others; no *oc.* or very weak; arista plumose; body dark yellow or brownish, with black bands on the abdomen; wings with hyaline spots and indentations.
- 20 (21). Eyes very narrow; face convex *Diarrhegma*, n. gen.
- 21 (20). Eyes of usual size, rounded; face concave *Rioxa*, Walker.
- 22 (19). Scutellum with four bristles only.
- 23 (24). A distinct *pp.*; four posterior femora spinulose beneath; middle tibiae with two spurs; abdomen narrowed at the base, almost pedunculate; no *oc.*; arista shortly plumose; body tawny, with yellow and black markings; wings with cross bands and broad apical spot *Callistomyia*, n. gen.
- 24 (23). No distinct *pp.*; femora not spinulose beneath; abdomen not pedunculate; middle tibiae with a single spur.
- 25 (32). Arista long plumose.
- 26 (27). *Oc.* very little developed, weak and short; third antennal joint rounded at the tip; small cross vein placed after the middle of the discal cell; body brown or yellowish, with black markings; wings with brown or yellowish rivulet-pattern, without basal black streaks *Gastrozona*, n. gen.
- 27 (26). *Oc.* very strongly developed, strong and long.
- 28 (29). Third antennal joint rounded at the tip; body yellowish ferruginous, with black longitudinal stripes on thorax and black cross-bands on abdomen; wings with four brownish cross-bands, the externals fused together at fore border *Taeniostola*, n. gen.
- 29 (28). Third antennal joint pointed at end.
- 30 (31). Small cross-vein placed on or before the middle of the discal cell; scutellum swollen, with shining black spots; wing-pattern as in *Ceratitis*, with basal black streaks; body short, yellow *Stictaspis*, n. gen.
- 31 (30). Small cross vein after the middle; scutellum not swollen, yellow with black markings; body elongate, black; wings with hyaline spots and indentations, without basal black streaks, but with triangular black spots in the hyaline indentations of the hind margin *Phaeospila*, n. gen.
- 32 (25). Arista shortly plumose or merely pubescent.
- 33 (34). Small cross-vein a little before the middle of the discal cell; hind cross-vein very oblique; frons flattened, in the male with peculiar bristles; arista pubescent only on the upper side; body black-spotted; wings with yellowish bands and black streaks towards the base .. *Ceratitis*, Mac Leay.
- 34 (33). Small cross-vein more or less after the middle; hind cross-vein not oblique; arista shortly pilose or pubescent on both sides; wings without basal black streaks.
- 35 (36). Face retreating inferiorly: frons of the male with horn-like processes or with very incrassated and rigid bristles *Vidalia*, R. D.
- 36 (35). Face not retreating; frons of the male without such bristles *Acidia*, R. D.
- 37 (6). Third longitudinal vein wholly bare, or with few bristles at the base only.
- 38 (39). Scutellum with two bristles only; *oc.* strong; arista pubescent; small cross-vein after the middle of the discal cell; body black; wings with hyaline spots and indentations .. *Aciura*, R. D.

- 39 (38). Scutellum with four bristles.
- 40 (41). *Prst.* wanting; *oc.* small; only a pair of superior *or.*; arista shortly plumose; body narrow, elongate; no distinct costal bristle; small cross-vein before or on the middle of the discal cell; colouring pale cinereous or black, wings banded .. *Staurella*, n. gen.
- 41 (40). Thoracic chaetotaxy complete; two superior *or.*
- 42 (45). Small cross-vein before the middle of the discal cell; anal cell short; arista pubescent; body yellow, with shining black spots on thorax and scutellum; wings with yellowish cross-bands.
- 43 (44). A pair of strong *oc.*; second longitudinal vein with a stump; cheeks very broad .. *Myiopardalis*, Bezzi.
- 44 (43). *Oc.* entirely wanting; second vein without stump; cheeks rather narrow .. *Carpomyia*, A. Costa.
- 45 (42). Small cross-vein on or after the middle; body black or yellowish, not spotted; wings with blackish bands or spots.
- 46 (47). No costal bristle; body elongate, yellow; wings with cross-bands dissolved into spots .. *Zonosema*, Loew.
- 47 (46). Costal bristle present; body short, shining black; wings with black cross-bands, united together .. *Spheniscomyia*, n. nom.
- 48 (5). Occipital row formed by strong yellow bristles, which usually are obtuse at the end; thorax with pale pubescence; arista usually bare, or at most shortly pilose; proboscis often elongate and geniculate; third longitudinal vein usually bare.
- 49 (50). Third longitudinal vein bent at end against the fourth, the first posterior cell being therefore narrowed at the end; body yellow, with black dots on the thorax; wings with yellow fore border *Craspedoxantha*, n. gen.
- 50 (49). Third longitudinal vein parallel or divergent with the fourth, the first posterior cell not narrowed.
- 51 (54). Proboscis prolonged and bicubitate.
- 52 (53). Wings with a middle cross-band; scutellum with four bristles; cross-veins conspicuously approximated .. *Sphenella*, R. D.
- 53 (52). Wings reticulate; scutellum sometimes with only two bristles, or the apical very small; cross-veins less approximated .. *Oxyna*, R. D.
- 54 (51). Proboscis short, the labella not or little elongated; if the labella are elongated, they are rather thick, and the proboscis therefore does not appear bicubitate.
- 55 (56). Body slender, elongate; wings very narrow and long, with parallel sides; anal cell obtuse; wing-pattern consisting of very numerous and small subhyaline dots *Paralleloptera*, n. gen.
- 56 (55). Body shorter and more robust; wings of usual shape; anal cell with the lower angle acuminate.
- 57 (60). Wings with hyaline indentations and spots, as in *Aciura*.
- 58 (59). Scutellum with four bristles; costal bristle well developed, often double .. *Tephrostola*, n. gen.
- 59 (58). Scutellum with two bristles only; costal bristle less developed .. *Tephrella*, n. gen.
- 60 (57). Wings reticulate or with a star-shaped pattern at the distal extremity.

- 61 (62). Wing-pattern not radiating at the margin; scutellum usually with four equally strong bristles. .. *Tephritis*, Latr.
- 62 (61). Wing-pattern radiating.
- 63 (64). The whole surface of the wings with a unicolorous reticulation; scutellum with four bristles *Campiglossa*, Rond.
- 64 (63). Only the distal extremity of the wings with a star-shaped pattern; scutellum usually with two bristles only .. *Trypanea*, Schrank.

8. DESCRIPTION OF THE SPECIES.

Family TRYPANEIDAE.

I. Subfamily DACINAE.

1. *Leptoxyda*, Macquart.

Macquart, Hist. Nat. des Ins. Dipt., ii, 452. 2, (1835).

As stated above I include in this genus the species of *Dacus* s. l. which have neither *prsc.* nor anterior *sa.* bristle; these differ from *Dacus* s. str. in having an elongated body and a cylindrical borer in the female. The type of the genus is *L. testacea*, Macquart, l. c., which seems to be the same as *Dacus longistylus* of Wiedemann, 1830, or at least a closely allied species. Macquart in 1843 has emended his own name to *Leptoxys*, which is perhaps orthographically better; but at the same time he has employed it in a different sense, including some Neotropical species which are now placed in *Anastrepha*; and as I find in Scudder's "Universal index", p. 173, that this name is preoccupied by Rafinesque in the Mollusca, I prefer to use here the original spelling. The genus, as at present known, is exclusively Ethiopian, some species being, however, represented in Egypt.

1. *Leptoxyda* sp. near *longistyla*, Wiedemann.

(Pl. viii, fig. 1.)

There are in the collection three females from Karachi (*Cumming*), 30-vii-89, $\frac{58.97}{15} - \frac{58.99}{15}$, which undoubtedly belong to this genus, and are very closely allied to *longistylus*, differing only in having the yellow marks less distinct, and the ovipositor a little shorter. Unfortunately they are too much damaged for description. This is probably an imported African species.

2. *Bactrocera*, Guérin-Ménéville.

Guérin-Ménéville, Voyage de la Coquille, Zool. Entom., xxvii livr., pl. 6, Paris, 1832 (the description appeared only in Livr. xxviii, 1838).

Dasyneura, W. W. Saunders, Trans. Entom. Soc. London, iii, 60 (1841), not of Rondani, 1840.

Strumeta, Walker, Journ. Proc. Linn. Soc. London, i, 33 (1856).

I adopt this name for the Oriental (and Australian) species of *Dacus* s. l. which have a pair of *prsc.* and an anterior *sa.*; practically this genus will contain all the true species of *Dacus* as yet known from the Orient. As the type of the genus I take *Musca ferruginea* of Fabricius, 1794, and also *Dacus umbrosus*, Fabricius, 1805, with which *Bactrocera longicornis* of Guérin is perhaps synonymous. Some species of this

genus have four bristles on the scutellum, and some others have complete cross-bands on the wings: these two characters are never present in the Ethiopian or in the Palaearctic species.

In the collection before me are no Indian species with complete cross-bands on the wings; there is however a male of *D. umbrosus*, Fabricius, from Batavia, determined by Prof. Meijere. This species will probably be found in future in India, and is easily distinguished from any other by its banded wings.

I have already stated, that if the species with banded wings are considered as generically distinct from the others, the name *Bactrocera* (type *umbrosus*, F.) will remain theirs; and for the species with unbanded wings will be used my new name *Chaetodacus* (type *ferrugineus*, Fabr.).

The species of *Dacus* which have been hitherto recorded from India and Ceylon are the following:—*ferrugineus*, Fabricius, 1794 (as *Musca*); *klugii*, Wiedemann, 1830; *zonatus*, W. W. Saunders, 1841 (as *Dasyneura*); *incisus*, Walker, 1860; *squalidus*, Walker, 1860; *persicae*, Bigot, 1890 (as *Rivellia*); *mangiferae*, Cotes, 1893; *cucurbitae*, Coquillett, 1899, and *diversus*, Coquillett, 1904. Of these, *persicae* is the same as *zonatus*, and *squalidus* probably the same as *mangiferae*, both being therefore only a variety of *ferrugineus*; of the remaining seven species *klugii* and *incisus* are not represented in the collection, which however includes four more species, two of them new. *Klugii* is very different from the other species in the pattern of the wings, even from those of the group *umbrosus*; perhaps it may not be a Dacine at all, but a Trypaneine near the new genus *Callistomyia*.

The Indian species in the collection can be distinguished as follows:—

- | | | |
|----------|--|---|
| 1 (10). | Scutellum bearing only two bristles, the basal pair being wanting. | |
| 2 (3). | Face of the female with a black cross band, that of the male unmarked; third abdominal segment of the male without the lateral row of bristles at hind margin. | <i>diversa</i> , Coq. |
| 3 (2). | Face in both sexes marked with two black spots; third abdominal segment of male ciliated. | |
| 4 (5). | Hind cross-vein broadly margined with brown; <i>vt.</i> black | <i>cucurbitae</i> , Coq. |
| 5 (4). | Hind cross-vein not bordered with brown; <i>vt.</i> yellow. | |
| 6 (9). | Wings with the brown costal border complete; species of larger size (5-8 mm.) | |
| 7 (8). | Abdomen short and broad; brown and yellow markings of the thorax well developed | <i>ferruginea</i> , Fabr. |
| 8 (7). | Abdomen narrow and elongated; markings of thorax | <i>ferruginea</i> var. <i>mangiferae</i> , Cotes. |
| 9 (6). | An isolated brown spot at the tip of wings | <i>zonata</i> , Saund. |
| 10 (1). | Scutellum with four bristles. | |
| 11 (12). | Face in both sexes with a black cross band | <i>maculipennis</i> , Dol. |
| 12 (11). | Face in both sexes marked with | |
| 13 (16). | Body narrow and elongated, scutellum and ovipositor entirely | <i>caudata</i> , Fabr. |
| 14 (15). | Thorax on the back with discal | |
| | entirely pale yellow; | |
| | ciliated | |

- 15 (14). Thorax without black markings; all the femora beneath with a shining black stripe; third abdominal segment of male not ciliated *garciniae*, n. sp.
 16 (13). Body short and broad, of prevalent black colour; scutellum with the distal half black, ovipositor black .. *scutellaris*, n. sp.

2. *Bactrocera diversa*, Coquillett.

(Pl. viii, figs. 2-3).

Coquillett, Proc. Ent. Soc. Washington, vi, 139 [*Dacus*] (1904); Bezzi, Boll. Labor. Zool. Portici, iii, 294 and 300 [*Dacus*] (1909); Froggatt, Report on parasitic and injurious Ins., 1907-1908, 83 [*Dacus*] (1909).

A small rounded species, with conspicuous bright yellow markings on the thorax, distinguished from any Indian species by its very different colouration in both sexes and by the third abdominal segment of the male not being ciliated.

To the good description of Mr. Coquillett, quoted by Mr. Froggatt in his Report, I have nothing to add. The transverse black facial band of the female is double, while in *maculipennis*, Dol., it is simple; the male show sometimes a rudiment of this band just on the oral margin. Vertical bristles black. The yellow streak in the centre of the mesonotum is sometimes wanting in the female. The unique female in the collection has the abdomen quite black, with only the posterior margin of the first segment very narrowly yellow.

The description of *incisus*, Walker, appears to be in some points not unlike this species.

A female from Madhapur, Bengal, 13-x-09 ($\frac{6.049}{1.6}$) and a male from Katihar, Purneah district, N. Bengal, 30-xii-09 ($\frac{6.058}{1.6}$) (*Paiva*); two males and a female from Calcutta, July and September ($\frac{5.925}{1.5}$, $\frac{5.926}{1.5}$, $\frac{5.929}{1.5}$).

Coquillett described his species from Colombo, Ceylon, and Bangalore, India; Froggatt records it from Pusa.

3. *Bactrocera zonata*, W. W. Saunders.

(Pl. viii, fig. 4).

W. W. Saunders, Trans. Entom. Soc. London, iii, 61, pl. 5, f. 3 [*Dasyneura*] (1841); Walker, List Dipt. British Mus., iv, 1075 [*Dasyneura*] (1849); Bezzi, Boll. Labor. Zool. Portici, iii, 293 and 299 [*Dacus*] (1909); Enderlein, Zoolog. Jahrbüch., xxxi, 408 [*Dacus*] (1911).—*maculigera*, Doleschall, Nat. Tijds. Ned. Indie, xvii, 122, 79 (1858-59); Froggatt, Report on par. and injur. Ins., 1907-1908, 82, pl. ii [*Dacus*] (1909); Bezzi, Boll. Labor. Zool. Portici, iii, 294 and 300 [*Dacus*] (1909).—*pe* Mus. Notes, i, 192 [*Rivellia*] (1889); Cotes, l. c., 195 [*Rivellia*] (1889); M Ins. Pests, 170, f. 193 [*Rivellia*] (1906); Bezzi, Boll. Labor. Zool. Portici, iii, 294 and 300 [*Dacus*] (1909); Froggatt, Report on par. and injur. Ins., 1907-1908, 82, pl. ii

A small species spotted and with an i

There is no yellow in both sexes. The t get confused togethe

, but lighter coloured, with the face tip of the wings.

e mesonotum. Legs wholly yellow tendency, chiefly in the female, to the preceding. Vertical bristles

yellow. Third abdominal segment of the male with a row of bristles. Wings without anal stripe, but in the male a grey round spot at the tip of the anal cell.

The synonymy with *persicae* seems to me very certain; that with *maculigera* appears to be proved by Loew's label in the Museum at Vienna, of which Mr. Froggatt speaks in his Report.

There are several specimens in the collection caught on board ship, ten miles off Masulipatam, Madras coast, 4—5th June 1908, by C. Paiva ($\frac{5770}{15} - \frac{5772}{15}$). This is a very good example of the transport of fruit flies by shipment. Another specimen is from Paresnath, West Bengal, 4300 ft., 9-iv-1909 (*Annandale*) ($\frac{9581}{15}$), and another from Pusa, June 1908 ($\frac{8232}{15}$). The species is already recorded from several places in India, Doleschall has it from Amboina and Enderlein from Sumatra.

4. *Bactrocera ferruginea*, Fabricius.

(Pl. viii, fig. 5).

Fabricius, Ent. Syst., iv. 342. 127 [*Musca*] (1794) and Syst. Antliat., 274. 5 [*Dacus*] (1805); Wiedemann, Auss. Zweifl. Ins., ii, 515. 5 [*Dacus*] (1830); Wulp, Compt. rend. Soc. entom. Belg., 1884, 296. 14 [*Dacus*] (1884) and Cat. describ. Dipt. S. Asia, 186 [*Dacus*] (1896); Meijere, Tijdschr. v. Entom., li, 126 [*Dacus*] (1908); Bezzi, Boll. Labor. Zool. Portici, iii, 293 and 299 [*Dacus*] (1909); Froggatt, Report on par. and injur. Ins., 1907-1908, 81, pl. ii, fig. 8 [*Dacus*] (1909).—*conformis*, Doleschall, Nat. Tijdschr. v. Ned. Indie, xvii, 122. 78 (1858-59); Koningsberger, Med. uit s'Lands Planten., xx, 24 [*Dacus*] (1897).

A middle-sized species, varying in colouring from ferruginous to dark brown with distinct yellow markings on the thorax and with hyaline wings filled with brown only on the fore border and at the anal cell.

This species is very variable in size and colouring, as already stated by Mr. Froggatt. The male shows the row of bristles on the third abdominal segment, and the anal stripe of the wing dilated at the tip. Frontal spots distinct; vertical bristles yellow; posterior bristles of the thorax darkened, often almost black. In dark specimens the yellow streaks of the thorax and the yellow scutellum are very striking.

This is a widely spread species, since we find records from India, Ceylon, Java and Amboina, but it is very doubtful if the species has ever been exactly recognized. The *ferrugineus* of Macquart is a different species, and the *maculipennis* of Doleschall has been erroneously placed here by Van der Wulp.

In the collection are many specimens from Calcutta, all caught in May, and one fed on rotten mangoes. Other examples are from Bangalore, S. India; Mergui; Sikhim; Tenasserim, Lower Burma; Sylhet; Shillong; Kurseong, 5,000 ft., E. Himalayas (*N. Annandale*); Rajmahal, Bengal, 6-vii-09; Katihar, Purneah district, N. Bengal, 15-v-10; Peradeniya, Ceylon, 16-iv. There is also a specimen from Batavia, determined by Prof. Meijere.

To judge from a specimen from Peradeniya, Ceylon, labelled by Mr. Froggatt himself, *Dacus tryoni* is synonymous with the present species; the specimens bred from fruits which I have received from Gospad district, N. S. Wales, through the kindness of Mr. Froggatt, approach the following variety:—

Var. *mangiferae*, Cotes.

(Pl. viii, fig. 6).

Cotes, Ind. Mus. Notes, iii, 17, fig. [*Dacus*] (1893); Maxwell-Lefroy, Indian Ins. Pests, 170, figs. 191-92 [*Dacus*] (1906) and Mem. Dept. Agric. India, i, 227. 129, fig. 71 [*Dacus*] (1907) both as *ferrugineus*, F.

This variety very much resembles the lighter coloured specimens of *ferrugineus*, from which it is distinguished by the paler colouring and by the shape of the abdomen, which is pointed at the end and distinctly narrower than the thorax. The dark brown spots of the frons are often indistinct. Thorax always pale ferruginous, the yellow markings therefore less distinct; thoracic bristles yellow. Wings with an indistinct narrow greyish margin on the fore border, often quite hyaline with only a small grey spot at the tip of the third vein; anal stripe also less distinct, but the dark spot at the end of the anal cell in the male is present.

In my paper of 1909 I have, with Mr. Froggatt, not distinguished this variety. *D. xanthodes*, Brown, as described and figured by Froggatt, seems to be a closely allied form; it was bred in New Zealand from larvae infesting fruits brought from Fiji.

It is very probable that this variety is based only on bred specimens, its colouring and the peculiar shape of the abdomen depending only on immaturity. There are many specimens in the collection. Two males from Calcutta ($\frac{25.90}{13}$, $\frac{25.96}{13}$), bred from mangoes, are co-types of Cotes. One female from Calcutta ($\frac{25.92}{13}$), determined by Bigot as *ferrugineus*, is said to have been compared with specimens of this species in the British Museum. Other specimens come from Hughli, Bengal (*J. C. Chakrabutty*).

5. *Bactrocera cucurbitae*, Coquillett.

(Pl. viii, fig. 7).

Coquillett, Ent. News, May, 1899, 129 [*Dacus*] (1899); Grimshaw, Fauna Hawaii. Dipt., 45, 4 [*Dacus*] (1901); Van Dine, Hawaii. Forest. and Agricult., iii, 127 [*Dacus*] (1906); Maxwell-Lefroy, Mem. Dept. Agric. India, i, 228. 130 [*Dacus*] (1907); Bezzi, Boll. Labor. Zool. Portici, iii, 291 and 300 [*Dacus*] (1909); Froggatt, Report on paras. and injur. Ins., 1907-1908, 84, pl. ii, figs. 6 and 7 [*Dacus*] (1909).

A proportionally large species, which can be easily recognized from all other known Indian species by the posterior cross-vein of the wings being widely bordered with brown.

Vertical, thoracic and scutellar bristles black. Third abdominal segment of the male with a row of black bristles; anal stripe dilated at the tip, but less abruptly than in the preceding species.

This species was originally described from Hawaii, but subsequently it has been found widely distributed over India and Ceylon, and this is its original home. In the collection are many specimens from Calcutta, caught in April, May, June and September; others from Durjhana, Nepal Terai; Ranchi; Jhansi, N. W. India, 850 ft. (*Brunetti*); Katihar, Purneah district, N. Bengal; Kumdhik, Nepal Terai, in March; Bhogaon, Purneah district, N. Bengal, in October; Allahabad, United Provinces, in August; Nepalganj, Nepal Frontier, 22-xi-11; Siripur, Saran, N.

Bengal, 26-ix-10; Adra, Manbhum district, 12-x-09; Bombay, in gourds, 12-x-03; Peradeniya, Ceylon, 10-i.

6. *Bactrocera caudata*, Fabricius.

(Pl. viii, fig. 8.)

Fabricius, Syst. Antl., 276 16, [*Dacus*] (1805); Wiedemann p. p., Auss. Zweifl., ii, 518. 8 [*Dacus*] (1830); Walker, List Dipt. Brit. Mus., iv, 1073 [*Dasyneura*] (1849); Meijere, Tijdschr. v. Entom., li, 179. 5 [*Dacus*] (1908); Bezzi, Boll. Labor. Zool. Portici, iii, 294 and 300 [*Dacus*] (1909); Enderlein, Zoolog. Jahrbüch., xxxi, 409 [*Dacus*] (1911); Hendel, Suppl. Entom., i, 16, 2, pl. i, f. 2 [*Dacus*] (1912).

A large species very much like the preceding, but at once distinguished by the four bristles of the scutellum and by the posterior cross-vein being only a little darkened in the lower portion.

The black markings on the mesonotum are much more marked than in the preceding, but rather variable. Male characters as in the preceding.

The specimen from Bigot's (Verrall's) collection described by Mr. Froggatt in his Report, p. 95, seems to belong to another species. On the other hand the *ferrugineus* described by Macquart (Dipt. exot. Suppl. 3, 224, (64) pl. vii. f. 8 and Suppl. 4, 257 (284) 2, pl. xxvi. f. 8 [*Dacus*] 1847 and 1851) seems to belong here.

This species was originally described from Java, but Walker has recorded it from North Bengal, and Enderlein and Hendel have it from Formosa. In the collection are examples from Shillong, Assam; Tenasserim, Lower Burma; Calcutta; Dehra Dun, United Provinces; Kurseong, 5000 ft., E. Himalayas; Sikhim; Katmandu; Bhowali, Kumaon, 5700 ft., 26-vi-10 (*A. D. Imms*). A specimen from Sadiya, Assam, bears a label in Bigot's handwriting: *D. nigrolineatus* ♂ n. sp., but this species has never been published. Another specimen from Sylhet (*Major Hall*) and some specimens from Peradeniya, Ceylon, Jan. 1910.

7. *Bactrocera garciniae*, n. sp. ♂, ♀

(Pl. viii, fig. 9).

Very closely allied to the preceding, but distinct in having an entirely ferruginous thorax, a black shining band on the femora below, and the third segment of the abdomen of the male not ciliated. Length 8-9 mm.

Head entirely yellow, whitish pollinose near the eyes; a brown spot on the frons above the antennae; two large subquadrate shining black spots on the face, their inner lower corner reaching the epistome; a brown subtriangular spot on the cheeks below the eye; a small black ocellar dot; antennae very long, the third joint a little darkened at the end; arista yellow at the base; palpi and proboscis yellow; all the bristles black, the *or.* 1. 2, inserted on less distinct brown dots.

Thorax ferruginous, opaque in the middle, without black lateral markings on the back, the post-sutural yellow lateral stripe not being striking, because its brown inner border is less distinct; humeri broadly yellow; a broad mesopleural shining yellow stripe, reaching the yellow upper border of the sternopleura; the mesopleura before this stripe and the sternopleura below are blackish; a large yellow double

hypopleural spot. Scutellum like the thorax, with four bristles, the basal pair weaker. All the bristles are black. Metanotum with two brown spots on the sides. Halteres pale yellow.

Abdomen narrow and elongated, clothed with white rather long pubescence; that of the male without lateral bristles on the third segment. It is, like the thorax, entirely ferruginous; the first segment is yellowish at the base and the second at the apex; third segment with a basal black cross band, broadly interrupted in the middle; a longitudinal black stripe runs from the middle of the third segment to the end of the abdomen. Belly yellow, with black quadrate spots in the middle of the segments. Ovipositor very short, reddish.

Legs entirely yellow, all the femora below with a shining broad black stripe, that of the hind femora being smaller and apical; hind tibiae darkened; first two segments of the tarsi whitish.

Wings as in *caudatus*, but the brown costal border less widened at the end, and the anal stripe in the male not broadened at the tip.

Some specimens from Peradeniya, Ceylon (*Green*), obtained through the kindness of Prof. Petri of Rome, bred from *Garcinia* fruits, viii-09: types ♂ and ♀ in the Indian Museum.

8. *Bactrocera scutellaris*, n. sp. ♂, ♀.

(Pl. viii, fig. 10).

A medium-sized species, easily distinguished from any other by its predominating black colouring, by the scutellum being largely black at the tip and bearing four bristles, and by the black ovipositor of the female. Length 6-8 mm.

Head yellow, the face and the occiput shining; the frons opaque but shining on the vertex and narrowly near the orbits; facial spots triangular, with the inner corners a little approaching together in the middle of the face; a brown spot in the middle of each cheek quite near the lower corner of the eyes; frons marked with a brown spot in front of its centre and with three pairs of lateral brown dots; vertex with a transverse black band including the ocelli; occiput wholly black, with a narrow complete yellow circle around the eyes; antennae yellow, the third joint darkened at the tip; arista yellow at the base; palpi yellow, quite bare, with some hairs on the underside only; proboscis yellow mottled with brown, with some pale hairs; frons with short hairs, cheek and lower portion of the occiput with rather longer hairs; all the bristles are black, 1 genal, 1 fronto-orbital, 3 lower fronto-orbital, of which the 2 apical pairs are approximated together, and 2 vertical; a tuft of yellowish short bristles at the middle of occiput on the callus over the insertion of the neck.

Thorax and abdomen densely punctate, covered with a short pale pubescence. Thorax quite black, both on the sides and below; the following markings yellow: three very small longitudinal streaks on the back behind the suture (a shorter one in the centre, the others on the sides above the wings), the humeral callosities, a fascia on the mesopleura extending from the transverse suture of the back to the upper part of the sternopleura, a large spot on each side of the metanotum includ-

ing the hypopleura. Scutellum yellow, punctate like the thorax, with the apical half black. Pleura bare, shining, with longer white hairs on the propleura, pteropleura and lower portion of the sternopleura. All the bristles are black: 2 *scp.*, 2 *npl.*, 3 *sa.*, 1 *prsc.*, 1 *mpl.*, 1 *pt.*; scutellum with four bristles, the basal pair on the yellow, the apical on the black part. Halteres yellow; squamae very small, pale haired.

Abdomen oval, as broad as the thorax, black, with the hind border of the first segment¹ very narrowly and that of the second more broadly yellow; hind border of the 5th segment also narrowly yellow; the pale pubescence on the sides of the first two segments is longer; third segment of the male with a row of black bristles on the sides of the hind border; venter yellowish, with a longitudinal median black band. Male genitalia not prominent, dark yellow; the circular pregenital ventral plate shining black; ovipositor depressed, slightly longer than the fourth and fifth abdominal segments taken together, shining black, the apical segment yellow.

Legs brownish black, the basal half of all the femora and the first joint of all the tarsi light yellow; fore coxae, and four anterior tibiae somewhat yellowish, the middle tibiae in the male often wholly yellow (there are some pale hairs), those of the upper side of the femora a little longer.

Wings hyaline; costa narrowly bordered with brown from apex of the auxiliary vein to the tip of the wing, distinctly widened in the apical portion; anal cell filled with brown, in the male more broadly, the brown widened at the tip; the apical lower corner of the discoidal cell is somewhat filled with greyish.

Of the described species, *D. incisus* of Walker seems to be not unlike this species, but differs in the colouring of the legs, etc.

This new species seems not to be rare in India; there are in the collection four males and six females from Shillong, Assam ($\frac{5.9.0.7}{1.5} - \frac{5.9.1.0}{1.5}$); from Siliguri, N. Bengal, in July ($\frac{5.9.3.1}{1.5}$); from Kurseong, 5000 ft., E. Himalayas, ix-09; and from Bhowali, Kumaon, 5700 ft., 15-vi-10 (*A. D. Imms*).

9. *Bactrocera maculipennis*, Doleschall.

(Pl. viii, fig. 11).

Doleschall, Nat. Tijdschr. v. Ned. Ind., x, 412, 36, pl. ii, f. 1 (1856); Meijere, Tijdschr. v. Entom., li, 127. 2 [*Dacus*] (1908); Bezzi, Boll. Labor. Zool. Portici, iii, 293 and 299 [*Dacus*] (1909).

A medium-sized species, very like *diversa*, but at once distinguished by its greater size and the four bristles on the scutellum.

The facial band is simple. All the bristles are black. The first joint of all the tarsi is whitish. Third abdominal segment of the male ciliated.

The *caudatus* of Wiedemann belongs partly here.

This species is known from Java. In the collection is a female from Kurseong, 5000 ft., E. Himalayas, 9-vii-08, ($\frac{5.9.8.2}{1.5}$), and another from Calcutta, August, 1909. A male from Java is determined by Prof. Meijere.

¹ In the numeration of the abdominal segments I have not followed Loew, since the segment that he numbered the first is here always considered as formed by two, the first and the second; our third segment is the second of Loew, etc.

2. Subfamily TRYPANEINAE.

1. Section *Ceratitininae*.3. *Anoplomus*, n. gen.

Easily distinguished from any other genus of the subfamily by the absence of the humeral bristle and by the swollen occiput.

Head higher than broad; face in the middle swollen but flattened, with narrow antennal furrows reaching the epistome; occiput with very strongly developed lateral swellings; cheeks rather broad; eyes very narrow; antennae not reaching the epistome, inserted over the middle of the eyes, the third joint a little pointed at the tip; arista plumose, the rays being longer at the upper than at the under side; *or.* 2. 2¹; *pvt.* weak; *vt.* 2, inner pair very long, the outer weak; no *oc.*; no occipital row of bristles; vibrissal edges not bristly; genal bristle weak.

Thoracic chaetotaxy complete, only the *hm.* wanting; *dc.* in the middle between the transverse suture and the basis of the scutellum; a single *mpl.*; *pt.* proportionally strong. Scutellum rounded, a little swollen, black-spotted, with four bristles, the apical pair strong and divergent.

Sixth abdominal segment of the female distinct; ovipositor about as long as the abdomen, flat-cylindrical; fifth segment of the male with a row of strong bristles on the hind border. Fore femora with a row of bristles beneath; posterior femora not spinulose beneath; middle tibiae with two apical spurs.

The pattern of the wings is of the rivulet type, with some blackish streaks at the base; costal bristle distinct; third vein bristly throughout its length, but the bristles small and scarce; second and fourth veins straight; small cross-vein a little behind the middle of the discal cell; posterior cross-vein almost perpendicular; second basal cell not enlarged; anal cell with the posterior angle drawn out into a short point, not longer than the second basal cell.

Type: *Anoplomus flexuosus*.

The genus *Oedemachilus*, Bigot, from Madagascar, as figured in Ann. Soc. Entom. France, (3) vii, pl. 13, f. 4 (1859), shows a singular resemblance to the present genus in the shape of the head, and it seems also that the *hm.* is wanting; but it has no lower fronto-orbital bristles and the neurulation is that of an Ortalid.²

10. *Anoplomus flexuosus*, nom. nov.

(Pl. viii, fig. 12).

Tephritis fasciventris, Macquart, Dipt. Exot. Suppl. 3, 225 (65), pl. 7, f. 7 (1847), not of Macquart, 1843.

A very handsome, large fly of a black colour, with white patches on the pleurae and two whitish broad transverse bands on the abdomen. Length of the male 6-8 mm., of the female 10-11 mm. (with the ovipositor).

¹ The first number indicates the upper fronto-orbital pairs, the second the lower fronto-orbital pairs.

² Through the kindness of the late Mr. Verrall, who has compared the type in Bigot's collection, I am now able to state that *Oedemachilus* is a true Ortalid, without humeral bristle.

Head white, the frontal band tawny; the upper part of the occiput from the vertex to the neck is black; a large brown spot on the cheeks under the eyes; antennae yellow; palpi whitish, darkened at the base, with some short black bristles; proboscis brownish; all the bristles are black; frons with a few short dark hairs, the swollen part of the occiput with longer white hairs; some very short black bristles on the upper posterior margin of the eyes.

Thorax wholly black, shining, with a short yellowish pubescence on the back; the following markings white: the humeral callosities, the whole mesopleura, the fore half of the pteropleura (all these three spots being united to form a very large oblique patch), a large spot on each side of the metanotum including the hypopleura. Scutellum white, shining, with a very narrow black band at the base and three black spots on the hind margin, one apical between the insertion of the two apical bristles, the others lateral beginning just beneath the insertion of each basal bristle. All the white parts are wax-like and shining. All the bristles are black; there are some white hairs on the propleura, on the white part of the pteropleura, and in the lower portion of the sternopleura. Halteres and squamae white, with white cilia.

Abdomen black, the first segment sometimes yellowish; the white bands are broad and equal, occupying the whole of the second and of the fourth segments; the dorsal surface is short-haired; at the base the hairs are somewhat longer and are black on the black parts and white on the white parts. Genitalia of the male black, a little prominent; the black bristles of the fifth segment are long and strong, 5-7 in number. The ovipositor is shining black, not depressed, with very short black hairs; I cannot perceive any trace of bristles on the fifth or on the sixth segment of the female abdomen.

Legs yellow, the coxae also; the four posterior femora darkened at the end, the intermediate almost wholly black; fore femora sometimes also darkened above, the bristles of the underside 5-6 in number; the hind femora at the end show some black bristles.

Wings whitish-hyaline, with the following brown markings: (i) A spot a little beneath the base, beginning at the fore border and showing some small streaks on the basal cells; the anal cell hyaline, its upper fold chitinated black, as in *Ceratitis*; the stigma brown in the basal portion, yellowish white in the apical. (ii) A broad, oblique cross-band which extends from beyond the apex of the first vein to the posterior margin beyond the apex of the sixth vein, reaching along the small cross-vein and at the costa united with a broad stripe that extends along the costa to midway between the apices of the third and fourth veins, filling the costal margin to the third vein; in this band near the costa are 4-5 brown dots. (iii) A large border on the posterior cross-vein, which begins on the fourth vein and reaches the posterior margin, where it is widened. (iv) An oblique streak beginning at the third vein just in the middle between the small cross-vein and the tip, and reaching the posterior margin a little beyond the tip of the fourth vein. This streak is sometimes united across the fourth vein with the band on the posterior cross-vein, forming a V-shaped rivulet.

The description of *fasciventris*, Macquart, 1847 (not 1843), from Java, agrees

well enough with the present species; but as this name is preoccupied by Macquart himself, I have adopted the appropriate MS. name of Bigot.

The collection includes four specimens, ♂ and ♀, from Sikkim ($47\frac{8}{2}8 - 47\frac{9}{2}1$), bearing a label with the name *Tephritis flexuosa*, n. sp. in Bigot's handwriting. A much smaller male ($45\frac{7}{2}2$) 6 mm. in length, from Paresnath, W. Bengal, 4000-4400 ft., 13-iv-09 (*N. Annandale*). There are also cotypes in Bigot's (Verrall's) collection. An additional female from Karmatar, Bengal, 23-x-09 (*C. Paiva*).

4. *Stictaspis*, n. gen.

Distinguished by its strong chaetotaxy, plumose arista, pointed third antennal joint and black-spotted thorax and scutellum.

Head as in the preceding, but the occipital swelling much less developed and the face distinctly concave; third antennal joint pubescent, very sharply pointed at the end; arista very deeply plumose; *or.* 2. 3; *prt.* strong; *vt.* 2, the inner very strong and long; a pair of very strong and long *oc.*; occipital row of black bristles well developed; genal bristle very strong; vibrissal edges with some short bristles. Palpi with stout black bristles.

Thoracic chaetotaxy complete; *dc.* nearer to the transverse suture than to the scutellum; 2 *mpl.*; *pt.* strong and long. Scutellum swollen, rounded, black spotted, with four bristles, the apicals parallel.

Abdomen with six distinct segments, the last segments bristly; ovipositor flattened, more or less long; male genitalia not prominent. Femora not spinulose beneath, the anteriors with a row of bristles beneath; middle tibiae with a single spur; middle and hind tibiae with a row of bristles on the outside.

Pattern of the wings as in *Ceratitis*; costal bristle well developed; third vein bristly throughout its length; small cross-vein before the middle or in the middle of the discal cell; posterior cross-vein a little oblique; second basal cell a little enlarged; anal cell with the posterior angle drawn out into a long point, longer than the second basal cell.

Type: *Stictaspis ceratitina*, n. sp.

It is very probable that some African species of *Ceratitis* with plumose arista belong here.

The species in the collection can be distinguished as follows:—

- | | | |
|--------|---|------------------------------------|
| 1 (4). | Small cross vein before the middle of the discal cell; yellow costal border of the wings complete; dorsum of the thorax with shining black spots on the sides; abdomen without blackish transverse bands. | |
| 2 (3). | Thorax without median black stripe before the transverse suture; scutellum with 3 black spots | <i>ceratitina</i> , n. sp. |
| 3 (2). | Thorax with a longitudinal black stripe; scutellum with a single great black spot | <i>striata</i> , Froggatt. |
| 4 (1). | Small cross-vein on the middle of the discal cell; yellow costal border interrupted between the first and the second cross-band; lateral black spots of the thorax wanting; abdomen blackish banded | <i>separata</i> , n. sp. |

11. *Stictaspis ceratitina*, n. sp. ♀

(Pl. viii, fig. 13).

A yellow species with black spots on the thorax and scutellum and with yellow banded wings. Length 8 mm., with the ovipositor.

Head yellow, opaque, shining only near the vertex; frons with a darker yellow spot above the antennae; all the bristles black, the occiput with yellow hairs below; some black hairs on the lower portion of the posterior orbits, above the genal bristle. Antennae reddish yellow, the two basal joints short, with short black bristles; third joint about three times as long as the two first taken together; palpi light yellow, with black bristles; proboscis yellow with pale hairs. The third pair of the lower *ov.* smaller than the others; frons bearing in the middle some short black hairs.

Thorax shining yellow, with yellowish pubescence on the dorsum; the *scp.* are yellow and weak, all the other bristles black and strong. On the anterior portion of the dorsum are to be seen two whitish median longitudinal stripes, which become obsolete after the transverse suture; a quadrate black spot in front of the scutellum, margined with white on the sides and behind, the lateral margins reaching the *dc.* The four lateral black spots are on the humeri, in the notopleural region, behind the suture, and on the postalar calli, this last being prolonged forward in a small streak. Above the humeri are two black dots, the larger supra-humeral in position, and the smaller in the dorso-central region. The lateral spots are partially margined with whitish streaks. Pleura yellow, shining, with some pale hairs; the superior portion of the mesopleura whitish, with a small longitudinal black streak just in front of the superior *mpl.*; metanotum yellow, black beneath the scutellum, with a white spot on the sides. Scutellum shining yellow, with three black spots, the middle one the larger and rectangular in shape, the laterals rounded. Halteres and squamulae whitish with pale hairs.

Abdomen narrowed at the base, yellow, black haired, the 2nd, 4th and 5th segments with whitish transverse bands; 2nd segment at the base with some erect black hairs; 3rd to 6th with black bristles on the sides, on the 5th and 6th a complete row at the hind margin. Ovipositor yellow, darkened at the end, shining, about as long as the abdomen. Venter whitish.

Legs entirely pale yellow, with black pubescence; row of the front femora with 6-7 bristles; coxae with some black bristles; row of bristles on the hind tibiae well developed.

Wings hyaline, with the fore border and three cross bands yellowish. The base is broadly hyaline, with brownish dots on the basal cross-veins and some black streaks; of the latter, two in the first basal cell, the outer curved beneath the prefurca, two in the second basal cell, the outer oblique, and one in the anal cell on the chitinised fold. The yellow border along the costa begins at the stigma and extends a little beyond the end of the third longitudinal vein, including some brown and hyaline spots. The first cross band begins at the costal border below the stigma,

between the small cross-vein and the prefurca, and extends perpendicularly to the hind margin at the end of the 6th vein; the second begins after the end of the first vein and extends upon the posterior cross-vein to the hind margin at the end of the 5th vein; these two cross bands are yellow above and brownish below. The third cross band is smaller and more oblique, wholly brownish, and reaches the hind margin a little beyond the end of the 4th vein. The anal cross-vein is strongly curved as in *Ceratitis*.

A single female from Paresnath, W Bengal, 4400 ft., 11-iv-09 (*N. Annandale*) ($\frac{9.5}{1} \frac{8.5}{3}$).

12. *Stictaspis striata*, Froggatt.

(Pl. viii, fig. 14).

Froggatt, Rep. on paras. and injur. ins., 1907-08, III, pl. v, f. 17 [*Ceratitis*] (1909).

Very like the preceding, but smaller and with a different pattern on the thorax and scutellum.

Frontal spot darker than in the preceding. The thorax shows above the humeri a single large quadrate black spot; the median stripe is connected with the quadrate spot in front of the scutellum. The scutellum is wholly black, the basal border and two round subapical dots yellow; metanotum entirely black, with a median yellow spot and the lateral whitish spots as in the preceding, but with a brown dot beneath the 5th abdominal segment; in the male with six black bristles; the whitish transverse bands less distinct. The row of bristles on the anterior femora numbering 5 or 6; hind tibiae with shorter bristles.

Pattern of the wing exactly as in the preceding, but the smaller apical cross band is often not united with the costal border.

I have seen a ♂ cotype from Peradenyia, Ceylon, August, 1903 ($\frac{8.2}{1} \frac{8.5}{5}$), and three additional females from the same locality, 8-viii-10 ($\frac{6.0}{1} \frac{8.2}{6}$).

13. *Stictaspis separata*, n. sp. ♀.

(Pl. viii, fig. 15).

Very distinct from the other species by the position of the small cross-vein and by the pattern of the thorax and wings. Length 6 mm., including the ovipositor.

There is only a single damaged specimen, from which it is not possible to draw up a complete description, but in spite of this I have named the species because it is too characteristic to be overlooked.

Head as in the preceding, the frontal spot above the antennae brownish. Thorax with a quadrate spot in front of the scutellum and two small black streaks after the transverse suture outside the *dc.*; the four lateral black spots of the preceding species are wholly wanting. Pleura opaque cinereous. Scutellum with three black spots as in *ceratitina*; metanotum yellow, with whitish spots on the sides. Halteres yellow.

Abdomen yellow; the 3rd, 4th and 5th segments with a small blackish transverse band on the fore border, interrupted in the middle. Ovipositor reddish yellow, short trapezoidal, hardly at all longer than broad, not longer than the three last

abdominal segments. Legs entirely yellow; bristle-row of the front femora with 4 or 5 bristles, hind tibiae with well-developed row of bristles.

Wings with the basal streaks as in the preceding species; the yellow cross-bands are similarly disposed, but the first is wholly separated from the second, owing to the fact that the hyaline space between the two first bands extends to the costa.

A female from Kohima, Assam ($\frac{1}{1}\frac{2}{2}$).

5. *Gastrozona*, n. gen.

Like the preceding, but easily distinguished by the weaker *oc.*, the unpointed third antennal joint and by the different pattern of the wings, which have also no distinct costal bristle.

Head as high as broad or higher than broad, the eyes being round or narrowed; face concave; third antennal joint rounded at the tip; arista plumose, with more or less long hairs; the chaetotaxy exactly the same as in the preceding, but the vibrissal edges without bristles and the *oc.* much weaker than the *or.* or the *vt.* Palpi without stout bristles. Thoracic and scutellar chaetotaxy also the same; *scp.* black; scutellum more flattened. Abdomen with the last segments bristly; ovipositor flattened and short. Legs as in the preceding. Wings also, but the pattern very different and not unlike that of the Neotropical genus *Anastrepha*; the base without black streaks; small cross-vein after the middle of the discal cell; anal cross-vein non-*Ceratitis*-like; the inferior angle of the anal cell drawn out in a very narrow point, longer than the second basal cell.

Type: *Tephritis fasciventris*, Macquart.

This genus seems to be allied to the recently created African genus *Carpophthoromyia*, Austen (Bull. entom. Research, i. 71, 1910), but is distinguished by the flattened non-tubular ovipositor, the less developed costal bristle, the different shape of the anal cross-vein, the want of black streaks on the base of the wings and by the thorax having longitudinal in place of transverse bands.

The Indian species before me can be distinguished as follows:—

- 1 (4). Eyes not narrowed; thorax ferruginous with or without black longitudinal stripes; scutellum pale yellow.
- 2 (3). Thorax with two longitudinal black stripes; scutellum with an apical black spot; abdomen with a single black cross-band .. *fasciventris*, Macq.
- 3 (2). Thorax without such stripes; scutellum entirely whitish yellow; abdomen with two or three transverse black bands .. *montana*, n. sp.
- 4 (1). Eyes narrowed; thorax black with ferruginous longitudinal stripes; scutellum shining black, with yellow spots on the sides .. *melanista*, n. sp.

14. *Gastrozona fasciventris*, Macquart.

(Pl. viii, fig. 16.)

Macquart, Dipt. exot., iii. 382 (225) 4, pl. 31, f. 2 [*Tephritis*] (1843); *fasciventris* in the index, p. 459 (302).

A yellow ferruginous species with two longitudinal black bands on the thorax and a transverse black band on the third abdominal segment.

The head is as high as broad, and the eyes are rounded; frons reddish yellow, a little darkened above the antennae; arista shortly plumose.

The two black bands of the thorax are distant, complete, narrowly interrupted at the transverse suture, beginning after the external *sc.* and ending before the scutellum at the level of the internal posterior *sa.*; a black triangular spot in front of the scutellum, between the *prsc.*; humeri, sides and posterior portion of the dorsum whitish yellow, as also the mesopleura; pteropleura blackish; metanotum black, with a whitish lateral spot; hypopleura white. Scutellum whitish yellow with an apical black spot. All the bristles black. Halteres yellow.

Abdomen ferruginous, with pale pubescence; the transverse band on the hind border of the third segment is narrowly interrupted in the middle; venter black; male genitalia not prominent. Legs wholly yellow; coxae with some bristles; front femoral row of bristles numbering 7 or 8, middle tibiae with 4-5 bristles in the middle on the outside, hind tibiae with a complete row.

Pattern of the wings brownish yellow, disposed as in Macquart's figure, but the last cross-band not reaching the fore border and not connected with the band on the posterior cross-vein.

The species was originally described from East India. A single specimen from Sylhet, Assam, 26-iv-05 (*E. A. Hall*).

15. *Gastrozona montana*, n. sp. ♂, ♀

(Pl. viii, fig. 17.)

Very like the preceding but distinguished by the entirely yellow scutellum and somewhat different pattern of the thorax, abdomen and wings. Length 7 mm.

Head yellow, with a black geminate spot on the occiput and a small black ocellar dot; all the bristles black, some yellowish hairs on the lower portion of the occiput; eyes not narrowed; cheeks rather broad; antennae a little shorter than the face, the third joint attenuated at the tip but not pointed, with a short plumose arista; proboscis and palpi yellow.

Thorax ferruginous on the back, with very short yellowish pubescence and black bristles; 2 *npl.*; *scp.* long and strong, black; the female has a black notopleural stripe, which in the male is reduced to a less distinct spot on the posterior *ntpl.*; in front of the scutellum the female has a broad shining black cross-band, which in the male is broken into three spots. Pleura with the usual broad whitish stripe, from the humeri through the mesopleura to the sternopleura; this stripe is margined with brown above and below; sternopleura ferruginous, with the upper border black; metanotum black, with two lateral spots, which are fused with the hypopleural spot, forming a broad white yellowish patch. Scutellum entirely of a pale yellow colour, with four strong bristles. Squamulae and halteres dark ferruginous in the female, pale yellow in the male. All the black markings of the thorax are less distinct in the male.

Abdomen ferruginous at the base, greyish at the end, with long pale pubescence and black bristles; the first transverse black band is broad and entire, in the female filling the whole of the second segment and a narrow fore border of the third; the

second band is narrower and placed on the fore border of the fourth segment; the 5th segment is also black, forming a third narrow band in front of the ovipositor; the latter is as long as the four last segments, swollen, shining ferruginous with a black end. In the male the first band covers only the hind margin of the second segment, and the third band is not present. The third and fourth segments have a rather whitish colouring. Male genitalia prominent, shining black, with projecting yellow organs. Legs of the male entirely yellow; hind femora of the female darkened at the end.

Wing-pattern like that of the preceding species; stigma entirely brown, with a small yellowish dot on the apical corner; the first brown band from the stigma runs hindwards between the first and fourth veins to the root of the wing; second band and anterior arcuate border as in the preceding; the apical brown streak is united to the fore border through the middle of the last portion of the third vein; the band on the hind cross-vein is isolated and much widened at the hind margin.

A male and a female from Kurseong, 5000 ft., E. Himalayas, 8—20-ix-09 (*Annan-dale* and *Lynch*).

16. ***Gastrozona melanista***, n. sp. ♀

(Pl. viii, fig. 18.)

A black species with white patches on the thorax and scutellum, and a very similar but blacker pattern on the wings. Length 7 mm., including the ovipositor.

The shape of the head is different from that of the preceding species, and like that of *Stictaspis*, the eyes being narrowed; the colour is reddish yellow, the face in the middle and the lower occipital orbits pale cinereous; antennae yellow, the arista darker and deeply plumose; palpi light yellow, pale-haired, with 2–3 short black bristly hairs; proboscis yellow, pale-haired; the *oc.* a little stronger than in the preceding, but always much weaker than the *vt.* or the superior *or.*

Thorax shining black on the dorsum, with pale pubescence; on the middle two broad parallel ferruginous stripes which extend to the *dc.*; humeri, notopleural region and two large lateral spots before the scutellum whitish. Pleura black, shining, a large white patch filling the mesopleura and the anterior part of the pteropleura and forming with the humeral and notopleural patches a single very striking oblique band. Pubescence of the pleura rather long, whitish, on the lower portion of sternopleura thicker. Metanotum black, with the usual white lateral spots; hypopleura white. Scutellum shining black, with two lateral whitish yellow spots, in the middle of which are inserted the basal bristles. Halteres pale yellow.

Abdomen with pale and black pubescence and black bristles on the sides of the last segments; the first two segments ferruginous, the second with a small yellow hind border; the third wholly black; 4th, 5th and 6th black, with a broader yellow hind border; 5th and 6th with a complete row of bristles on the hind border. Venter ferruginous. Ovipositor black, shining, black haired, as long as the last three abdominal segments.

Legs yellow, the four posterior femora with the apical half black; the front

femora covered with black bristles on the outside, the inferior row with 6-7 long bristles; middle tibiae with 4-5 bristles, hind tibiae with a complete row.

Wings hyaline, with blackish bands. The first band begins at the stigma, which is wholly blackish, and extends obliquely to the first basal cell, the second basal cell and the anal cell being hyaline. The second band is parallel to the first, from which it is separated by an entire hyaline band; it begins at the costa some distance after the stigma and going upon the small cross-vein extends to the 6th vein, not reaching the hind margin; from the superior end of this band the border of the wing is filled with blackish, forming an arcuate band which extends to the tip, ending a little before the end of the 4th vein. In the hyaline triangular space limited by these bands are two blackish streaks not united together, one on the posterior cross-vein, the other on the middle of the last portion of the 4th vein, both reaching the hind margin, the last one united with the fore costal border.

A single female caught at light on board-ship 5 miles off Calicut, Malabar coast, 6-v-08 (*C. Paiva*) ($\frac{57\frac{3}{5}}{1\frac{3}{5}}$).

This species seems to be allied to *Tephritis vittata*, Macquart, Suppl. 4, 263, 15, pl. 27, f. 1 (1851), from Asia, which perhaps also belongs to the genus *Gastrozona*; the present species is, however, different in the colouration of the legs, abdomen and ovipositor; the pattern of the wing is very similar.

G. melanista, on account of the different shape of the head, is perhaps not congeneric with the two preceding species, but the colouration of the wings and the white patch on the pleura show a real affinity with them.

6. *Diarrhegma*, n. gen.

Easily distinguished by the six bristles on the scutellum, the shape of the head and the pattern of the wings.

Shape of the head as in *Anoplomus*, the occipital swellings much less developed and the cheeks smaller; eyes narrowed; antennae inserted above the middle of the eyes, the third joint short, rounded at the tip; arista plumose, with longer hairs above; palpi not bristly; face in the middle swollen, but flattened; the antennal furrows reaching the epistome; no distinct *oc.*; *or.* 2. 2.; *vt.* 2.; *put.* weak and parallel; genal bristle weak; a row of occipital black bristles.

Thoracic chaetotaxy complete; the *dc.* in the middle between transverse suture and scutellum; 2 *mpl.*; *pt.* stout. Scutellum of great size, triangular, with six bristles, the apical parallel.

Abdomen narrowed at the base, with six distinct segments, the last bristly; ovipositor flattened, a little shorter than the last three abdominal segments together; male genitalia not prominent. Front femora with a row of bristles beneath; middle tibiae with two apical spurs; hind tibiae with a row of hairs on the outside.

Wings black, with hyaline indentations and spots; the longitudinal veins straight; small cross-vein a little beyond the middle of the discal cell; posterior cross-vein perpendicular; second basal cell a little enlarged; inferior angle of the anal cell drawn

out into a point as long as the second basal cell; third vein bristly throughout its length; costal bristle well developed.

Type: *Dacus modestus*, Fabricius, 1805.

This genus is very similar to the Neotropical genus *Hexachaeta*, Loew, from which it differs in the want of the *oc.*, in the presence of only two lower *or.*, in the face being not concave and in the plumose arista.

17. *Diarrhagma modestum*, Fabricius.

(Pl. viii, fig. 19.)

Fabricius, Syst. Antl., 278, 29 [*Dacus*] (1805); Wiedemann, Auss. Zweifl., ii. 493, 26 [*Trypeta*] (1830); Osten-Sacken, Berlin. entom. Zeitschr., xxvi. 227 [*Trypeta*] (1882); Wulp, Tijdschr. v. entom., xli. 219, 6, pl. 10, f. 17 [*Ptilona*] (1898); Meijere, Bijdr. tot de Dierk., xvii. 111 [*Rioxa*] (1904); Enderlein, Zoolog. Jahrbüch., xxxi, 449 [*Rioxa*] (1911);—*incisum*, Wiedemann, Anal., 53, 117 [*Trypeta*] (1824) and Auss. Zweifl., ii. 500, 37 [*Trypeta*] (1830);—*paritii*, Doleschall, Tijdschr. ned. Ind., x. 412, 38, pl. 1, f. 2 [*Tephritis*] (1856); Enderlein, Zoolog. Jahrbüch.; xxxi, 449 [*Rioxa*] (1911).

A yellow middle-sized species, with brown spots on the thorax and black transverse bands on the abdomen.

Or. yellow; the inner *vt.* yellow, the outer black; *put.* dark yellow or black; genal bristle black, and above this some other (3-4) weaker black bristles. Thoracic and scutellar bristles yellow, sometimes darkened or blackish at the base, but the scapulars black. Row of the front femora with 7-9 black bristles; hairs of the hind tibiae pale yellow. The stigma shows sometimes the trace of a yellowish spot, chiefly in immature specimens.

The species has been placed in *Rioxa* by Prof. Meijere on account of its chaetotaxy and the pattern of the wing; but it differs from the true species of that genus in the shape of the head, which resembles that of the preceding genera. The whitish patch on the mesopleura shows also affinity with the preceding.

The species was originally described from Bengal, and Doleschall has it from Amboina; it seems to be not uncommon in India as the collection comprises many specimens from Calcutta, February, May and July, some of these bred from decayed wood. Some specimens are labelled *Trypeta incisa*, Wied., in Bigot's handwriting. Many additional specimens from Khargpur, Bengal, 17—30-vi-11 (*R. Hodgart*).

7. *Ptilona*, Wulp.

This genus, as here restricted, is easily known from any other by the reduced chaetotaxy of the head and thorax.

Shape of the head approaching to that of the preceding, the head being distinctly higher than broad, but the eyes not so narrowed as in the preceding. No *oc.*; *vt.* 2, weak, the inner also very short; *put.* parallel; *or.* 1. 1, the second pair only of the superior *or.* being present in the middle of the front; genal bristle rather stout; vibrissal edges with short bristles; a row of black occipital bristles; antennae inserted at the middle of the eyes, very short, the third joint being about as long as the

second; arista plumose, on the upper side with longer hairs; face flat, the epistome not prominent.

Thoracic chaetotaxy reduced; no *prst.* and no *dc.*, the *prsc.* more separated than in the other genera; 2 *mpl.*; *pt.* much weaker than in the preceding genera. Scutellum as flat as the dorsum of thorax, with four bristles.

Abdomen flat, narrowed at the base, with six distinct segments, the last bristly on the sides; male genitalia not prominent; ovipositor flattened, a little longer than the two last abdominal segments. Front femora with a row of bristles beneath; middle tibiae with a single spur; hind tibiae with a row of hairs on the outside.

Wings proportionally long and narrow, blackish with hyaline indentations and spots; a distinct costal bristle; veins straight, the 3rd and 4th parallel; the small cross-vein beyond the middle of the discal cell; hind cross-vein short and perpendicular; anal cell drawn out into a point, as long as the second basal cell, the point broad.

Type: *Ptilona brevicornis*, Wulp.

This genus was originally erected by Van der Wulp (Tijdschr. v. Entom., xxiii, 183, 1880), for some different species, of which the first is to be considered as the type; subsequently the genus has been restricted by Osten-Sacken and Prof. Meijere, the other species being referred to *Rioxa*. Through the kindness of Prof. Meijere, who has examined the type of *Pt. brevicornis* at Amsterdam, I can say that the *dc.* are not present, an important circumstance which has been overlooked by other authors even by Enderlein (Zool. Jahrbüch., xxxi, 415).

18. *Ptilona nigriventris*, n. sp. ♂, ♀

(Pl. viii, fig. 20.)

Very like *brevicornis*, but distinguished by having the hyaline indentation of the third posterior cell divided into two spots, and the abdomen wholly black, except at the base. Length 6-7 mm.

The present species differs from Wulp's description, besides the wing-pattern, in having the lower *or.* curved forward not behind as in Wulp's figure; the head is less narrowed. The frons is a little concave, at the vertex whitish yellow and shining; on the sides it has a shining small stripe, which ends anteriorly in a tubercle on which is inserted the single superior *or.*; all the bristles are black; occiput below with black hairs. Palpi with black bristles.

All the bristles of the thorax and the *sc.* also black; the pubescence on the dorsum and pleura black; inferior part of mesopleura and pteropleura and superior part of sternopleura black. Squamulae with dark hairs.

Abdomen black, with the two first segments dark yellow; the hairs black; ovipositor black. Bristles and hairs on the legs all black.

A consideration of the wide distribution of *brevicornis*, which ranges from Java to the Philippine Islands, may perhaps be taken as evidence that *P. nigriventris* is only an Indian form of that species; but the distinctions seem to me sufficient. In

the collection are three specimens from Assam, labelled by Bigot: *Trypeta nigricauda*, n. sp., and one from Sylhet, June.

There is in the collection another specimen of this genus, from the Lushai Hills (*Macleod*), which is without the abdomen, and seems to be the true *brevicornis* (Pl. viii, fig. 21). The pleura is wholly yellow, without black markings; the wing-pattern is as shown in Wulp's figure, the hyaline spot of the third posterior cell being entire. The head and the eyes are not so narrowed as in Wulp's figure, but about as broad as in the following genus.

8. *Rioxa*, Walker.

A group comprising numerous species which have in common the wing-pattern, the shape of the head, the complete chaetotaxy of the thorax and the six bristles of the scutellum.

Head broader than high; eyes round; face concave, the epistome more or less but distinctly prominent; *oc.* very minute, sometimes wholly wanting; *or.* usually 2. 1, seldom 2. 2.; *vt.* 2, the inner strongly developed; antennae inserted on the middle of the eyes, short, the third joint rounded at the tip, not more than double the length of the second; arista variable, in some species plumose on both sides, in others pectinate on the upper side only; genal bristle well developed; a row of rather long occipital black bristles; palpi bristly.

Thoracic chaetotaxy complete; 2 *mpl.*; *pt.* weak. Scutellum flat, with six bristles, the intermediate pair being sometimes smaller. Abdomen elongate, sometimes narrowed, bristly on the sides and at the end; ovipositor flattened, of moderate size. Legs in some species short and stout, in others long and slender; front femora with a row of bristles beneath; middle tibiae with a single rather long spur; hind tibiae with a complete row of hairs.

Wings broad or narrow, blackish or brown with hyaline spots and indentations; costal bristle present or wanting; veins straight, the third bristly throughout its length; first vein often very elongate, ending in the middle between the auxiliary and the second vein, but sometimes abbreviated, ending before the small cross-vein; small cross-vein beyond the middle of the discal cell; posterior cross-vein perpendicular; inferior angle of the anal cell drawn out into a long point, longer than the second basal cell, the point broad at the base and sharp at the tip.

Type.—The type species of Walker was *R. lanceolata*, a slender form with pectinate arista; the stouter species of the group of *vaga* with plumose arista are perhaps not congeneric, as also those of the *stellata* group with *Tephritis*-like wing-pattern.

The species in the collection are to be distinguished as follows:—

- 1 (12). All the frontal bristles black; arista usually plumose.
- 2 (11). Stigma broadly hyaline at the base, the wings therefore with two hyaline indentations on the fore border; arista with many hairs on the under side.
- 3 (8). Scutellum with six bristles of about equal size; stouter species, with broad wings and a distinct costal bristle; legs stout, short; sides of thorax wholly yellow.

- 4 (7). Wings in the middle with three round hyaline dots, disposed in a triangle around the small cross-vein.
- 5 (6). The three discal dots are rather large; abdomen with yellow spots *vaga*, Wied.
- 6 (5). The three discal dots very minute; abdomen without such spots *mutyca*, Walk.
- 7 (4). The discal dots wholly wanting .. *vidua*, n. sp.
- 8 (3). The intermediate bristles of the scutellum much weaker than the others; slender species, with narrower wings and no costal bristle; legs slender and long; thorax with blackish stripes on the sides.
- 9 (10). The second costal hyaline indentation of the wings not united with the second indentation of the hind margin; abdomen with black transverse bands *dunlopi*, Wulp
- 10 (9). The second indentation united with that of the hind margin to form a complete hyaline cross-band in the middle of the wings; abdomen without transverse black bands *solula*, n. sp.
- 11 (2). Stigma wholly black, the wings with a single indentation on the fore border; arista with only a few minute hairs on the under side; two lower *or.*; no costal bristle; intermediate scutellar bristle weak (musae, Frogg.)
- 12 (1). Superior *or.*, inner *vt.* and *put.* yellow; arista usually pectinate; stigma black; no costal bristle; intermediate bristle of the scutellum weak.
- 13 (14). First longitudinal vein ending in the middle between the auxiliary and the second vein; wings without hyaline dots in the middle; stigma wholly black *quinquemaculata*, n. sp.
- 14 (13). First vein very short; wings with many hyaline discal dots; stigma with a hyaline dot *stellata*, Macq.

19. *Rioxa vaga*, Wiedemann.

(Pl. viii, fig. 22.)

Wiedemann, Auss. Zweifl., ii. 490, 21 [*Trypeta*] (1830).

A yellow species of proportionally large size, with three large hyaline dots disposed as a triangle in the middle of the wings.

The single damaged specimen in the collection is without a head. All the bristles black, the six scutellar of about equal size. Front femora with a row of 3 or 4 bristles beneath. First longitudinal vein elongated, but reaching the costa before the middle between the auxiliary and the second vein.

A male specimen from Tenasserim, Lower Burma (*W Doherty*) $\frac{5880}{15}$. Wiedemann records it from Bengal.

20. *Rioxa mutyca*, Walker.

(Pl. viii, fig. 23.)

Walker, List Dipt. Brit. Mus., iv, 1036 [*Trypeta*, *Euleia*] (1849).

Very like the preceding, but distinguished by the pattern of the wings and abdomen.

Head wholly yellow; *oc.* very small, but distinct; only a pair of lower *or.*;

bristles of the occipital row rather long; after the genal bristle are some other black smaller bristles. Thoracic and scutellar bristles black; pleura with dark and long pubescence. Abdomen shining, the pattern as described by Walker, the last segment of the male wholly black, with a small central yellow dot, and with long bristles on the sides and hind margin. Legs as in the preceding, wholly yellow. Wings with the same pattern, the three discal dots in the same position but much smaller; there are also two hyaline streaks at the tips of the submarginal and of the first posterior cell, which are wholly wanting in the preceding. The first vein has the same length, ending after the small cross-vein.

A single male from Sadiya, Assam ($\frac{51.66}{8}$) determined by Bigot as *Trypeta mutyca*, Walker. Walker records the species from East India.

21. *Rioxa vidua*, n. sp. ♀

(Pl. viii, fig. 24.)

Very like the two preceding species, but without the discal hyaline dots. Length $8\frac{1}{2}$ mm.

Head wholly yellow, opaque, a little shining about the vertex; antennae dark yellow; arista deeply plumose; proboscis and palpi yellow, pale-haired, the last with some black bristle-like hairs; *oc.* very small; *or.* stout, 2. 1.; *vt.* 2, the inner very long; *pv.* parallel, strong; all the bristles black, those of the occipital row rather long; after the genal bristle some smaller black bristles.

Thorax wholly yellow, shining, with short yellow pubescence on the dorsum, and longer and darker pubescence on the pleura; all the bristles black. Scutellum like the thorax, its six bristles of equal size; metanotum blackish. Halteres yellow, squamulae pale-haired.

Abdomen damaged; it seems to be black, with the two basal segments yellow; venter yellow; black bristles on the sides. Legs wholly yellow; coxae with some black bristles; front femora with a row of 5-6 bristles beneath and some black hairs on the outside; hairs of the row on the hind tibiae dark yellow. Wings as in *vaga*, but the discal dots wanting, or only the outer a little distinct; the anal cell is prolonged into a point longer and smaller than that of the two preceding species.

A single female from Sikhim (*de Niceville*) $\frac{58.79}{15}$.

22. *Rioxa dunlopi*, Wulp.

(Pl. ix, fig. 25.)

Wulp, Tijdschr. v. entom., xxiii, 186, 45, pl. 11, f. 8 and 9 [*Phlona*] (1880); Meijere, Bijdr. tot de Dierk., xvii, 110 [*Rioxa*] (1904); Enderlein, Zoolog. Jahrbüch., xxxi, 448 (1911).

A yellow middle-sized species with only two hyaline discal spots and very hairy front legs in the male.

Head broader than in the preceding; the inferior orbits with an argenteous stripe which is wanting in the three preceding species; *or.* 2. 1; all the bristles black; arista a little more shortly plumose. Thoracic and scutellar bristles black; the intermediate scutellar bristle much weaker than the others. Abdomen shining.

Legs longer and more slender than in the preceding ; front femora of the male with a great many black bristles beneath ; front tibiae beneath thickly pilose ; front tibiae of the female with 5 or 6 bristles beneath and the tibiae bare ; hairs of the row of the hind tibiae black.

The sides of the thorax in this species are not wholly yellow, but above the humerus is to be seen a small longitudinal brown streak and another broader one beneath it.

The species is known from Java. In the collection are some specimens from Sylhet, Assam (*Major Hall*) June and July, and one from Khargpur, Bengal, 17—30-vi-11 (*R. Hodgart*).

23. *Rioxa soluta*, n. sp. ♂

(Pl. ix, fig 26.) .

A small-sized, narrow elongate, slender species, with a hyaline complete cross-band in the middle of the wings. Length $5\frac{1}{2}$ mm.

A damaged specimen, without head. Thorax shining yellow, with a broad black stripe in the notopleural region ; a small black stripe, parallel with the preceding, on the superior margin of the mesopleura ; all the bristles black, scutellum shining yellow, short, triangular, the intermediate pair of bristles very small. Metanotum shining black ; halteres yellow.

Abdomen very narrow and elongate, dark shining yellow, with yellow pubescence and black bristles on the sides ; the last segment black at the tip ; genitalia prominent, shining black with yellow base. Legs shining yellow, very long and slender ; front femora with 4-5 long and slender dark yellowish bristles ; front tibiae bare ; hairs of the hind tibiae yellow.

Wings elongate, the first vein ending at one-third the distance between the auxiliary and second vein ; pattern like that of the preceding, but very well characterized by the complete hyaline middle cross-band, which is restricted in the middle just after the small cross-vein ; of the two discal spots of *dunlopi* the outer only is present, and after this another which is elongate. Before the basal hyaline portion of the stigma are three black spots, and the costal border therefore shows four black spots before the end of the first vein. The point of the anal cell is much shorter than in all the preceding species.

The general facies, the pattern of the wings, the weakness of the legs and the brown streaks on the sides of the thorax show affinity with *dunlopi*.

A single male from Tenasserim, Lower Burma (*W Doherty*) $\frac{5.8}{1.5}$.

The collection includes a cotype of *Trypeta musae*, Froggatt, from N. S. Wales ; this is a true *Rioxa*, and I have placed the species in the above table because its discovery in India is not impossible. *R. musae* differs from all the above species in having two lower *or.* ; the arista is pectinate, but on the underside are to be seen some very small hairs. Pattern of the wings very like that of *dunlopi*, but the stigma wholly black ; a triangular indentation at the tip of the wings, in the first posterior cell. Anal cell broad, the point broad and a little shorter than the second

basal cell. First vein ending opposite the small cross-vein. Thorax wholly yellow, without black lateral streaks.

24. *Rioxa quinquemaculata*, n. sp. ♀

(Pl. ix, fig. 27.)

In this small-sized, narrow elongate, slender species, the black wings are devoid of hyaline discal spots and show only five marginal indentations. Length 7 mm., with the ovipositor.

This species is very like *sexmaculata*, Wulp, but easily distinguished by the unstriped pleura, the absence of bristles on the legs, and the wings with only five marginal hyaline indentations. Both these species seem to be congeneric with the type species *lanceolata* of Walker.

Head reddish yellow, very broad and low; antennae darkened, the third joint quadrangular; arista pectinate, with distant and long hairs on the upper side only; eyes round; cheeks narrow; two black lower *or.*; of the superior *or.* the superior is yellow and the inferior black; no *oc.*; *put.* yellow; two *vt.*, the outer black, the inner wanting; genal bristle black, and after this some other black bristles; the bristles of the occipital row are well developed, black.

Thorax damaged; it seems to be dark reddish yellow, the pleura cinereous and not striped; all the bristles black; intermediate bristle of the scutellum weak. Halteres darkened.

Abdomen narrow elongate, shining black, with a broad ferruginous median longitudinal band; the 6th segment wholly black like the ovipositor, which is as long as the four last segments together; some short bristles on the sides of the last three segments; pubescence blackish. Legs wholly yellow, short but not very slender; front femora with 3-4 bristles beneath; middle legs without bristles.

Wings as in *sexmaculata*; but the first hyaline marginal spot on the stigma wholly wanting; the four other spots are in the same position; the 5th is not at the end of the 6th vein, but in the middle between the ends of the 5th and 6th vein. First vein ending in the middle between the auxiliary and the second vein; the point of the anal cell very broad and short, but a little longer than the second basal cell; no distinct costal bristle.

A single specimen from Tenasserim, Lower Burma (*W. Doherty*) $\frac{58\frac{1}{5}}{15}$.

This species seems to be closely allied to the recently described *R. sumatrana*, Enderlein, Zoolog. Jahrbüch., xxxi, 449, f. U (1911).

25. *Rioxa* ? *stellata*, Macquart.

(Pl. ix, fig. 28.)

Macquart, Dipt. exot., Suppl. 4, 266, (137) 9, pl. 27, f. 7 [*Acinia*] (1851); Osten-Sacken, Berlin. Entom. Zeitschr., xxvi, 227 [*Trypeta*] (1882); Enderlein, Zoolog. Jahrbüch., xxxi, 433, f. 4 [*Acinia*] (1911).

Very distinct from all the other species by reason of the *Tephritis*-like pattern of the wings.

A damaged specimen is in the collection which seems to belong to this species or to a very closely allied form. It shows six scutellar bristles, the intermediate being a little smaller; the wings are not as broad as in the Trypaneinae of the *Eutreta* group with which it has no affinity, the occipital row of black bristles being very distinct. The arista seems to be, as in the preceding, scarcely pectinate only on the upper side; only a lower *or.*, black; the two superior *or.*, the *pvt.* and the inner *vt.* are yellow.

Thoracic and scutellar bristles dark yellowish. Abdomen yellow, with four longitudinal rows of black spots; ovipositor reddish yellow, as long as the three last segments together.

Wings very like Macquart's figure; a hyaline dot on the stigma; the hyaline spot at the tip of the wings, between the ends of 3rd and 4th veins, is the largest of all. The discal dots are as follows: three in the same line in the submarginal cell, one on the tip of the first basal cell, two at the base of the first posterior cell, five in two lines in the discal cell and one in the third posterior cell. First vein not elongated, ending before the small cross-vein; anal cell as in the preceding. Costal bristle distinct.

I think that *stellipennis*, Walker, is a true Trypaneine with bare arista, broad wings and an occipital row of stout yellow bristles.

A single ♀ from Tenasserim, Lower Burma (*W. Doherty*) $\frac{5.84}{1.5} \frac{7}{1}$.

9. *Acanthoneura*, Macquart.

Macquart, Dipt. exot., iii. 377 (220) 7 (1843).

Very distinct from the other Oriental genera by reason of the wavy second vein, the bristly 1st, 3rd and 5th veins, and the broad head of the male.

Head very broad, in the male much more so than in the female; face concave, the epistome a little prominent; eyes round; antennae inserted on the middle of the eyes, short but almost reaching the epistome, the third joint rounded at the tip, with plumose arista; *or.* 2, (?); *oc.* very small; *pvt.* parallel; genal bristle strong; bristles of the occipital row black and weak.

Thoracic chaetotaxy complete; *mpl.* 2; *pt.* weak; scutellum with four bristles. Abdomen bristly at the tip; ovipositor short, flattened; male genitalia not prominent. Front femora with a row of bristles beneath; middle tibiae with a single spur; hind tibiae with a row of short bristles on the outside.

Wings proportionally short and broad, brownish black with hyaline and luteous spots and indentations. First vein ending opposite the small cross-vein; second vein wavy; third and fourth a little sinuous, diverging near the extremity; small cross-vein much after the middle of the discal cell; posterior cross-vein long and perpendicular; anal cell drawn out into a triangular point, which is as long as the second basal cell. The costal vein is not so bristly as in Macquart's figure; first vein with long bristles; 3rd and 5th veins bristly throughout their length, but the bristles rather short; on the inferior side of the wings the 2nd, 3rd and 4th veins are bristly

throughout their length, the first bearing only some bristles at the tip; the posterior cross-vein also bristly on the underside.

It is very probable that the genus *Themara* of Walker is the same as the present, as already suggested by Osten-Sacken (Ann. Mus. civ. Genova, xvi, 461, 1881). From the Neotropical genus *Blepharoneura*, Loew, it differs in the waviness of the second vein, in the pattern of the wings being not reticulate, in the scutellum bearing only four bristles and in the sexual dimorphism of the head. The European *Platyparea poeciloptera*, Schrank, shows some relation to this group.

26. *Acanthoneura*? *fuscipennis*, Macquart.

(Pl. ix, fig. 29.)

Macquart, Dipt. exot., iii. 378 (221), pl. 30, f. 2 (1843); Enderlein, Zool. Jahrbüch., xxxi, 417 (1911).

A middle-sized species, with luteous indentations on the wings, the last one of the fore margin being whitish-hyaline like the single discal dot.

I am very doubtful if the present species is the same as that of Macquart, both figure and description being rather different; but I think that in this case Macquart's inaccuracy has been very great. The pattern of the wings of my species is exactly the same as in Walker's *Themara ampla* (Proc. Linn. Soc., i, pl. i, f. 5, 1856), and I should take this species as a synonym if Osten-Sacken had not said that it is the same as *Achias horsfieldi*, Westwood, in which the figure of the head is very different from my male specimen. As shown, however, by Prof. Meijere (Tijdschr. v. Entom., liv, 382) and by Dr. Enderlein (*l. c.*, 415) the width of the head is very variable.

Frons opaque, the vertex and the stripes on which are inserted the *or.* being shining. All the bristles black. Abdomen shining black, the first four segments of the male with the hind border yellow, in the female the first three only. The bristles on the posterior cross-vein are very distinct; the tip of the wing is devoid of spots; the narrow triangular indentation at the tip of the first vein and the round dot in the first posterior cell are whitish hyaline, the other indentations being luteous hyaline.

Two damaged specimens from Sadiya, Assam, one ($\frac{51.64}{8}$) labelled by Bigot as *Trypeta lineata* ♀, n. sp., the other ($\frac{51.62}{8}$) labelled by the same author as *Eurosta picta* ♂, n. sp.; Macquart records the species from Bengal.

Themara ampla was taken at Singapore.

10. *Phaeospila*, n. gen.

This genus is easily distinguished from the allied *Rioxa* by its black body, strong *oc.*, pointed third antennal joint and by the very peculiar pattern of the hind border of the wings.

Head as broad as high, with narrow cheeks; eyes round; face concave, the epistome a little prominent; antennae inserted on the middle of the eyes, the third joint more than three times the second in length, very sharply pointed at the tip; arista densely but shortly plumose; palpi bristly; bristles of the head long but rather weak, all black; *or.* 2. 3; *oc.* very long, longer than the superior *or.*; *vt.* 2, the inner

very long; *pvt.* parallel, short; the bristles of the occipital row not long, but well developed; genal bristle rather developed.

Thoracic chaetotaxy complete, all the bristles black but not very strong; 2 *mpl.*; *pt.* very long; scutellum light yellow, with four bristles, very broad at the base. Abdomen narrow-elongate, bristly on the sides and at the end; ovipositor longer than the last three abdominal segments. Legs rather long but not weak; front femora with a row of bristles beneath; middle tibiae with a single spur; bristle-row of the hind tibiae very short.

Wings proportionally long, with very small or indistinct costal bristle; first vein not elongate, ending before the small cross-vein; second vein straight; third vein a little curved, bristly over its whole length; small cross-vein after the middle of the discal cell; posterior cross-vein short, perpendicular; anal cell drawn out into a long point, longer than the second basal cell. Pattern of the wings like the type of hyaline indentations and spots; the hyaline indentations of the hind margin bearing a brown triangular spot in the middle.

Type: *Phaeospila varipes*, n. sp.

This genus has a rather isolated position, the pattern of the wing being, however, not unlike that of *Rioxa*; in some respects the type species is not unlike the European *Platyparea discoidea*.

27. *Phaeospila varipes*, n. sp. ♀

(Pl. ix, fig. 30.)

Very distinct by reason of the black body with yellow scutellum, by the legs being variegated with black and by the black spots in the hyaline indentations of the hind border of the wings. Length 6-7 mm., including the ovipositor.

Head yellow, opaque, cinereous; frons darkened above the antennae and with an ocellar black dot; antennae dark yellow, with short black hairs on the basal joints; palpi and proboscis yellow, pale-haired, the palpi with some black bristles; some short black bristles on the vibrissal edges; hairs of the lower portion of the occiput long and pale; the third lower *or.* shorter than the other.

Thorax black, shining, with pale pubescence; the humeri and a small streak near the external tips of the transverse suture dark yellow; in the middle of the dorsum are two longitudinal cinereous stripes; metanotum black; the anterior margin of the hypopleura yellowish. Scutellum flat, broad, triangular, wholly yellow; bristles very long, the apical parallel, the basal divergent. Squamulae white; halteres yellowish.

Abdomen wholly black, rather shining, with pale pubescence; the bristles are black; ovipositor black, the apical segments yellow; venter yellowish at the base. Legs yellow, the coxae also; the apical half portion of the four posterior femora black and the four posterior tibiae darkened at the base; femora with black hairs, row of bristles on the front femora numbering 6 to 7.

Wings blackish brown, with the following hyaline markings on the fore border: the costal cell, an indentation below the base of the stigma, two approximate indentations beyond the stigma, reaching the third vein; on the hind border: three

very large triangular indentations, one in the second posterior cell and two in the third posterior cell, the first of these reaching the middle of the discal cell, the second incomplete along the 6th vein; the first and the second of these indentations show in the middle an obscure spot, which reaches the hind margin. The posterior cross-vein is margined with luteous. There are three hyaline spots in the middle; two small dots in the basal part of the first posterior cell, at equal distances upon the superior end of the posterior cross-vein, and an elongated oblique streak before the end of the submarginal cell. On the second basal cell and on the base of the anal cell there are also two hyaline dots. The stigma is black, with the base small, hyaline.

One female from Darjiling, 6000 ft., 21-ix-08 (*Brunetti*), and another from the same locality, 9-viii-09, 7000 ft. (*Paiva*); the species seems, therefore, to be confined to the E. Himalayas.

11. *Taeniostola*, n. gen.

Characterized by its complete and strongly developed chaetotaxy, very strong *oc.*, rounded third antennal joint, yellow black banded body and banded wings.

Head and eyes as in the preceding; third antennal joint rounded at the tip; arista with scanty but long plumosity; palpi bristly; bristles black, strongly developed; *oc.* very strong, and longer than the superior *or.*; *or.* 2. 2 or 2. 1; *vt.* 2, the inner very long; *pvt.* small and parallel; occipital row with long bristles; genal bristle strong; vibrissal edges with short bristles.

Thoracic chaetotaxy complete, the bristles black, also the *sc.*; two *mpl.*; *pt.* very strong. Scutellum flat, rounded, with four or two bristles, the apical parallel. Abdomen elongate, little narrowed at the base, bristly on the sides and at the tip; male genitalia not prominent; ovipositor short, flattened, the basal segment bearing in the type species some long bristles at the tip. Legs short, with the usual bristles; a single spur on the middle tibiae.

Wings proportionally short and broad, with well-developed costal bristle; first vein short; second straight; third a little curved, beset throughout its length with long bristles; small cross-vein a little beyond the middle of the discal cell; posterior cross-vein long and perpendicular; anal cell drawn out into a narrow point, a little longer than the second basal cell. The pattern consists of complete blackish cross-bands, which are partially confluent.

Type: *Taeniostola vittigera*, n. sp.

This genus has also no close allies, and differs in the pattern of the wings from the *Rioxa* group.

28. *Taeniostola vittigera*, n. sp. ♂, ♀.

(Pl. ix, fig. 31.)

A middle-sized yellow species with black longitudinal bands on the thorax and black transverse bands on the abdomen, very distinct from any other by reason of its ovipositor being bristly at the tip. Length $6\frac{1}{2}$ – $7\frac{1}{2}$ mm., with the ovipositor.

Head yellow, ferruginous, opaque; in the middle of the frons a fuscous longitudinal stripe which is connected with the black ocellar dot; antennae dark yellow,

with some black hairs at the base ; arista yellow ; palpi and proboscis yellow ; all the bristles black, the occiput below without hairs, but with some black bristles ; two lower *or*.

Thorax yellow, rather shining, with short pale pubescence on the dorsum and longer darker hairs on the pleura ; there are five complete equidistant longitudinal black stripes, the median a little enlarged posteriorly and prolonged on to the scutellum, the two lateral are outside the *dc.* and on the notopleural suture ; all the bristles strong and black as are also the four scutellar ; metanotum black, shining, yellow on the sides. Scutellum yellow, with the median black stripe not reaching the tip ; it bears on the upper side some blackish hairs. Halteres yellow ; squamulae lurid with a dark border and a pale fringe.

Abdomen shining yellow, with black pubescence and black bristles ; in the female the 2nd to 5th joints bear a broad black band on the fore border, the band of the 5th being broader than the others and emarginate in the middle posteriorly ; the 6th segment is black, yellow in the middle ; in the male the 2nd to 4th segments show an equally narrow and complete black band. The 5th is black, with a broad longitudinal yellow band ; genitalia black. Venter yellow, with a black band before the tip. Ovipositor shining black, the apical segments yellow ; it is as long as the three last abdominal segments together. The tip of the first segment bears four long black bristles.

Legs wholly yellow, rather short and strong, with black hairs and bristles ; front femora of the male with 8-9 bristles beneath and between these with thick black pilosity ; front femora of the female almost bare, with 5-6 bristles.

Wings hyaline, the stigma black with small luteous tip. There are four complete cross-bands, the two first separated, the other two united together on the fore border. On the base from the humeral cross-vein to the base of the anal cell is a small band, sometimes wanting. The first band begins at the stigma, where it is broader, and ends at the tip of the apal cell. The second begins a little beyond the tip of the first vein, reaches along the small cross-vein and ends on the hind border at the end of the 6th vein. The 3rd and 4th bands begin together before the tip of the 2nd vein, and diverge extending to the hind margin, the third along the posterior cross-vein and the 4th ending after the tip of the 4th vein ; these two bands are dilated on the costal border and form a Λ -shaped band. The tip of the wings at the end of the 3rd vein is filled with brown. The hyaline space between the branches of the Λ -shaped band is variable, extending to the 3rd or only to the 4th vein. The apical spot is sometimes united with the base of the Λ -shaped band at the end of the second vein. The veins are luteous in the hyaline spaces, and fuscous in the brownish cross-bands.

Some specimens from Assam, Sylhet and Lungleh, April and July.

29. *Taeniostola gracilis*, n. sp. ♀

(Pl. ix, fig. 32.)

A smaller, slender species, distinguished from the preceding by the presence

of only 1 lower *or.* and only 2 scutellar bristles, and by the different pattern of the abdomen, wings and scutellum. Length 5 mm., with the ovipositor.

Head light yellow, the frons dark yellow in the middle, but without distinct fuscous median stripe; on the occiput, below and outside the *vt.*, is a black spot on each side, which is wholly wanting in the preceding species. Antennae light yellow, the third joint broader and shorter, with the upper apical angle a little sharpened; arista black.

Thorax as in the preceding, the pleura much less hairy; the median black stripe is much smaller and abbreviated, not prolonged on the scutellum; the latter wholly yellow, with a black dot at the tip; metanotum as in the preceding, but the hypopleura also black. The 2 scutellar bristles are very long. Halteres and squamulae yellow.

Abdomen very narrow and elongate, not distinctly narrowed at the base; pubescence and bristles black. It is yellow, with a black cross band on the base of the second segment, and black spots on the sides of the others. Ovipositor shining black, as long as the 2 last abdominal segments together, without the apical bristles of the preceding. Venter yellow.

Legs wholly yellow, a little more slender than in the preceding.

Wings with the 1st and the 2nd band exactly as in the preceding; the 3rd band is united with the black of the tip forming a great single black patch, which includes a hyaline band before the posterior cross-vein from the 3rd to the 5th vein. The 2nd band is also united with the third at the hind margin of the wings.

This species is undoubtedly congeneric with the preceding, notwithstanding the different chaetotaxy on the head and scutellum, and the want of the bristles at the tip of the basal joint of the ovipositor.

A single female from the base of the Dawna Hills, L. Burma (*N. Annandale*), 4-iii-08 ($\frac{5.764}{15}$).

12. *Staurella*, n. gen.

Distinguished from the other genera by the want of the *prst.*; from *Ptilona* it differs in having the *dc.* and 2 lower *or.*, a bare 3rd vein and a different pattern of the wings.

Head broader than high; eyes round; face concave and epistome prominent; antennae inserted on the middle of the eyes, reaching the epistome, the 3rd joint 3 times the length of the 2nd, rounded at the tip; arista shortly but densely plumose. *Or.* 1. 2, or 1. 3; *oc.* very small, almost indistinct or wanting; *vt.* 2, strong; *pvt.* weak; the bristles of the occipital row very weak and short; genal bristle strong; vibrissal edges without distinct bristles; palpi bristly.

Thorax elongate, with complete chaetotaxy, but the *prst.* wholly wanting; the bristles are not strong; 1 or 2 *mpl.*; *pt.* well developed. Scutellum triangular, flattened, bearing 4 bristles. Abdomen narrow and elongate, bristly at the tip; male genitalia strongly developed, prominent, with a pendulous middle organ; ovipositor flat, very narrow, not bristly at the tip, as long as the last 3 abdominal segments together.

Legs proportionally short and stout; femora not serrulated beneath, those of the

1st pair with a row of bristles below ; a single spur on the middle tibiae ; bristles of the hind tibiae rather long.

Wings elongate, hyaline with brown cross-bands, which are partially united together. No costal bristle ; all the veins straight ; the first not elongate ; the third wholly bare or with very few bristles at the base ; small cross-vein before or on the middle of the discal cell ; posterior cross-vein long, perpendicular ; anal cell drawn out into a short and broad point, which is shorter than the second basal cell.

Type : *Musca crux*, Fabricius, 1794.

The present genus seems to have also an isolated position, on account of its reduced chaetotaxy, strongly developed male genitalia and wing-pattern. In the elongated and narrow body of *Cordylura* or *Psila*-like shape, it shows affinity with the European genus *Euphranta*, Loew ; but in this genus the chaetotaxy is even more reduced, the *dc.* also being absent as in *Ptilona*. The third vein in *Euphranta* has some bristles at the base only ; in the present genus, the first two species have an entirely bare third vein ; the third species (*nigripeda*) shows some bristles at the base and one or two also after the small cross-vein ; but these are present in one wing only, and therefore it seems to be subject to variation or caduceus.

The species in the collection can be distinguished as follows :—

- 1 (4). Predominant colouring greyish yellow ; legs entirely pale yellow ; *or.* 1. 2 ; bands of the wings partly united.
- 2 (3). Wing-pattern paler and variegated, with a cross-shaped double band at the tip *crux*, Fabr.
- 3 (2). Wing-pattern darker and not variegated, the apical cross being broken in two separate bands *dissoluta*, n. sp.
- 4 (1). Predominant colouring black ; legs almost entirely black ; *or.* 1. 3 ; wing bands isolated, those of the middle divided into two streaks *nigripeda*, n. sp.

30. *Staurella crux*, Fabricius.

(Pl. ix, fig. 33.)

Fabricius, Entom. Syst., iv, 358, 190 [*Musca*] (1794) and Syst. Antl., 277, 23 [*Dacus*] (1805) ; Wiedemann, Auss. Zweifl., ii, 488, 19 [*Trypeta*] (1830).

A narrow elongate, middle-sized, greyish species, very distinct by reason of the variegated cross band at the tip of the wings.

Head greyish yellow, occiput, vertex and face shining ; frons opaque, with few dark hairs in the middle ; ocellar black dot very small ; a small black streak on each side below the vibrissal edges ; the bristles are black ; the 2 lower *or.* are long and of equal size ; the single superior *or.* is not inserted upon a tubercle as is the case in *Ptilona* ; occiput with long pale hairs below ; palpi with some black bristles ; arista with longer hairs on the upper side.

All the bristles of the thorax are black, the *sc.* also ; dorsum with short yellow pubescence, which is longer on the pleura ; pleura shining, darkened, reddish brown ; the dorsum opaque, whitish-tomentose ; metanotum dark reddish brown, very shining in the middle. Scutellum light yellow. Squamulae whitish ; halteres yellow.

Abdomen with black pubescence and black bristles; venter yellowish; 5th segment black with yellow tip in both sexes, 6th in the female wholly yellow. Ovipositor yellowish, black at the base on each side. Genitalia of the male round, prominent, reddish brown, shining, pale-haired; the pendulous middle organ is light yellow with a pale fringe; on the middle of the venter are two prominent approximate yellow lamellae, provided with black bristles. The dark portions of the legs are reddish brown; front femora in both sexes with only 3-4 bristles beneath.

Wing-pattern as described by Wiedemann; the brownish cross-bands are interrupted by clearer streaks, that of the middle band is between the 4th and 5th veins, and those of the apical band between 2nd and 3rd and 3rd and 4th, this last the broader. The stigma is brownish, with the extreme superior apical angle pale; the posterior cross-vein is margined interiorly with fuscous and exteriorly with cinereous.

Some specimens of both sexes from Calcutta, April 3rd, 1903.

31. *Staurella dissoluta*, n. sp. ♂ ♀

(Pl. ix, fig. 34.)

Very like the preceding, but easily distinguished by the darker and unvariegated pattern of the wings and by the crossed apical band being divided into two. Length 7-8 mm., with the ovipositor.

The body is a little more robust than in the preceding and the abdomen is more darkened; the male genitalia are exactly of the same shape but the lower lamellae are blackish. The principal difference is shown by the pattern of the wings, which is much darker and not variegated by lighter portions; the small band on the humeral cross-vein is a little broader; the Λ -shaped middle band has the same appearance, the greater branch being narrowly interrupted just above the fifth vein. At the tip are two cross-bands, one on the posterior cross-vein, extending from the hind margin to the third vein; the other is broader, beginning at the fore border before the tip of the second vein and ending at the hind border after the end of the fourth vein; on the fore border a little beyond the stigma, is a brown spot, which reaches below the second vein, and sometimes the third. The border of the posterior cross-vein is only blackish, without lighter margin.

A single pair from Maldhan, Naini Tal dist., U. P., 12-iv-08 ($\frac{5832}{15}$, $\frac{5840}{15}$).

32. *Staurella nigripeda*, n. sp. ♀

(Pl. ix, fig. 35.)

Easily distinguished from the two preceding species by the black colouring of the body and legs, and by the different pattern of the wings. Length 7 mm., with the ovipositor.

Occiput shining black, with a yellow spot on the sides and a ferruginous spot at the vertex; frons in the middle blackish, yellowish on the sides and in front of the antennae; face dark, with grey pollen; cheeks yellowish. All the bristles are black, the superior *or.* are not inserted upon a prominent tubercle; *or.* entirely wanting

Antennae yellow, the third joint grey pollinose ; arista black, long, shortly pilose ; proboscis and palpi dark yellow.

Thorax shining black, with very short pale pubescence and dark grey pollinose ; on the back are to be seen three less distinct narrow longitudinal grey stripes ; the humeri are yellowish ; the bristles are black ; there is a single *mpl.* Pleura shining black, without pollen, narrowly reddish along the sutures ; sternopleura below with short white pubescence. Metanotum shining black, unspotted. Scutellum of smaller size, triangular, reddish-yellow, with a broad basal black spot and greyish pollen ; the four bristles are strong and long, the median pair crossed at the apex. Halteres and squamulae pale yellow.

Abdomen narrow and elongated, shining black, with a broad longitudinal middle yellow stripe, which is quite distinct on the two first segments, and after them becomes greyish and less distinct, being also interrupted at the base of the segments. The bristles are black ; venter dark yellow. Ovipositor flattened, densely but very shortly pilose, as long as the three last segments, narrow and truncate at the end and shining black. Legs black, with grey pollen ; coxae and trochanters yellow and also the knees narrowly ; tibiae at the end and the first tarsal joint dark yellow, chiefly those of the front legs.

Wings without costal bristle ; veins black, only the costa at base and the subcosta yellow ; stigma black, narrowly yellow at the base. The pattern consists of four blackish bands. The first is near the base, short and narrow, extending from the bifurcation of the second vein to the apex of the anal cell. The second band reaches from the stigma over the small cross-vein to the hind margin, where it terminates in the middle of the third posterior cell ; it is broadly interrupted at the third vein, the first portion forming an isolated streak after the stigma, the second being much broader. The third band begins beyond the stigma, and passing over the hind cross-vein, reaches the hind margin at the apex of the fifth vein ; it is also interrupted at the third vein, the second portion being much broader than the first. The fourth band is much broader than the others, filling out all the apex ; it contains two hyaline spots, one at the distal corner of the marginal cell, the other semilunar just at the tip, between the ends of the third and fourth veins.

A single specimen from Kurseong, 5000 ft., E. Himalayas, ix-09.

13. *Callistomyia*, n. gen.

Easily distinguished from any other genus by the presence of a small but distinct *pp.*, and by the four posterior femora being serrulate beneath, and also by the peculiar pattern of the wings.

Head as broad as high, the frons and the face much narrower than in all the preceding genera ; eyes round, with the anterior facets enlarged ; occiput not swollen ; cheeks very narrow ; face concave, the epistome a little prominent ; antennae inserted at the middle of the eyes, not reaching the epistome ; third joint $2\frac{1}{2}$ times the length of the second, rounded at the tip ; arista shortly plumose ; palpi not bristly ; no *oc.* ; *or.* 2, 3, the superior weaker than the lower ; *pv.* very small ; *vt.* 2, the outer

very small; black bristles of the occipital row well-developed; genal bristle weak; vibrissal edges bare.

Thorax robust, with complete chaetotaxy and moreover with a black *pp.*, which is as strong as the *scp.*, and is wanting in all the other genera; *dc.* very close to the scutellum; two *mpl.*; *pt.* strongly developed. Scutellum triangular, flat, with four bristles. Abdomen broad and rounded, very convex, narrowed at the base and almost pedunculate, with short lateral and apical bristles; ovipositor short truncate, shorter than the two last abdominal segments together; male genitalia not prominent. Legs short and stout; front femora with a row of bristles beneath; the four posterior femora with a row of short spinules below on each side; middle tibiae with two spurs; hind tibiae ciliated.

Wings long, without costal bristle; they are hyaline with a middle arcuated brown cross-band and a large round apical spot of the same colour. All the veins straight; the first ending a little after the small cross-vein; third bristly; third and fourth parallel; the small cross-vein before the middle of the discal cell; the posterior cross-vein short and perpendicular; second basal cell a little enlarged and hyaline; anal cell drawn out into a middle-sized point, which is as long as the second basal cell.

Type: the following species.

This genus is very distinct from any other and has no near allies; it shows some resemblance to *Dacus* in general appearance and colouration as it does in the shape of the second basal cell; but has nothing to do with that genus. It is possible that *Dacus klugii* of Wiedemann belongs here; the *Dacus icarus* of Osten Sacken seems to me undoubtedly a species of this genus, and some of Walker's species also.

33. *Callistomyia pavonina*, n. sp. ♂ ♀

(Pl. ix, fig. 36.)

A handsome fly of proportionally great size, very distinct by its peacock-like pattern of the wings. Length 8—9 mm., with the ovipositor.

Head yellow, opaque, shining on the occiput, at the vertex and on the lower portion of the face; frons with two opaque dark spots, one, the greater, before the ocellar black dot and the other which is smaller above the antennae; a brown shining spot in the lower portion of the face at the middle of the epistome; basal joints of antennae dark reddish, with some black hairs; third joint light yellow; arista dark. All the bristles black; occiput below with a few short pale hairs and two or three black stronger hairs above the genal bristle; the first superior *or.* very weak and short. Palpi and proboscis yellow, dark reddish above; margin of eyes narrowly white.

Thorax tawny reddish, opaque, with yellow pubescence, the pleurae almost bare; three narrow black longitudinal stripes on the dorsum, the laterals sometimes abbreviated; a short black streak in the notopleural region and above this a yellow spot. Pleura reddish, darkened on the mesopleura and with an arcuate yellow band, which is formed by a horizontal streak on the superior margin of the mesopleura connected with a vertical streak on the anterior margin of the pteropleura; hypopleura yellow,

black beneath ; metanotum black, reddish yellow on the sides ; sternopleura with a blackish spot beneath. Scutellum yellow, narrowly reddish at the base. All the bristles black, not very strong ; propleura with long pale hairs. Squamulae white ; halteres reddish yellow.

Abdomen reddish, with pale pubescence and black short bristles ; the 2nd to 5th segments in the female and 2nd to 4th in the male show at the base a narrow complete transverse black band ; the lateral margins also narrowly black ; venter reddish ; ovipositor reddish, almost bare ; male genitalia black ; in the male the black cross-band of the 4th segment is often abbreviated on the sides.

Legs yellow, the apical half of femora and the tibiae darkened, reddish ; bristles and hairs black ; front femora in the male with many, in the female with few weak bristles beneath ; the serrulation of the four posterior femora begins after the middle.

Wings hyaline, with the following markings : a yellow irregular band at the base from the stigma to the anal cell, interrupted by the hyaline second basal cell ; along the anal cell this band is prolonged in a dark point upon the 6th vein. The stigma is wholly yellow. In the middle of the wings is a narrow brown cross-band, which begins on the fore border a little after the stigma and extends in the form of an arch over the small cross-vein to the hind margin ; this band is prolonged along the costa on the fore border to the end of the 2nd vein. At the apex of the wings is a large, rounded, brown area which extends from the tip to the posterior cross vein and from the 3rd to the 5th vein, filling up the apical portion of the discal cell, two-thirds of the first posterior cell and almost the whole of the 2nd posterior cell, the inferior external angle alone excepted.

Several specimens of both sexes from Gopkuda Island, Lake Chilka, Orissa, August 7—15th, '07 ; some others from Calcutta in June, labelled by Bigot *Dacus pavoninus* ; a male from Rajmahal, Bengal, July 6th, 1909 (*N. Annandale*). Some additional specimens from Gangapur Pattia and Bindukhera, Naini Tal distr., base of W Himalayas, 3—4-iv-1910.

I have given to the species the appropriate MS. name of Mr. Bigot.

14. *Chaetellipsis*, n. gen.

Easily distinguished from any other by the absence of the *or.* and the thickly pilose frons.

Head broader than high ; eyes oval, a little compressed, with the anterior facets enlarged ; antennae inserted below the middle of the eyes, the frons therefore longer than the face ; face flat, the epistome not prominent ; frons broad, flat, thickly pilose in its whole expanse. Antennae very short, the 3rd joint scarcely double the 2nd, rounded ; arista long, pectinate on the upper side only ; no *oc.* and no *or.* ; *vt.* 2, the inner three times as long as the outer ; *pvt.* weak, parallel ; bristles of the occipital row weak, yellow ; genal bristle almost indistinct ; palpi without black bristles.

Thoracic chaetotaxy complete, the bristles strong ; *dc.* a little before the middle between the transverse suture and the scutellum ; 2 *mpl.* ; *pt.* strong ; scutellum flat, triangular, with 4 bristles. Abdomen short, round, convex and narrowed at the

base, with strong bristles on the sides and at the tip; male genitalia a little prominent. Legs short and stout; middle tibiae with a single spur; claws of the male very short, the last tarsal joint a little dilated.

Wings long, with a small costal bristle; auxiliary vein indistinct at the end; first vein short; 2nd straight; 3rd bristly throughout its length, curved beneath near the tip; small cross-vein after the middle of the discal cell; posterior cross-vein perpendicular; anal cell drawn out into a broad point, as long as the 2nd basal cell. Pattern consisting of a broad yellow band along the fore border and of some streaks in the posterior half.

Type: the following species.

This genus is an aberrant one in the absence of the *or.*, but it shows all the other characters of a true Trypaneid. It is very probable that some Oriental species, placed by the authors in the Ortalids, belong here, as some *Xiria*, etc. The Neotropic genus *Xanthacrona*, Wulp, has a very similar shape of the head; but this genus is a true Ortalid, as stated by Prof. Hendel in his recent paper on the "Pterocallina." More affinity is perhaps presented with the Oriental genus *Lagarosia*, which however is unknown to me. The genus *Chaetellipsis* shows a remarkable likeness with *Ceratitis* s. str., and notwithstanding the yellow bristles of the occipital row is a true Ceratitine.

34. *Chaetellipsis paradoxa*, n. sp. ♂

(Pl. ix, fig. 37.)

A middle-sized yellow species, easily distinguished by the broad yellow band on the fore border of the wings. Length 6 mm.

Head yellow, with cinereous tomentum and a brown cross-band on the occiput above the neck; a small black ocellar dot; the frons shows a small darker yellow longitudinal stripe in the middle and is covered with pale hairs; antennae light yellow, with some pale hairs at the base; arista yellow; all the bristles yellow, except the *vt.* which are black; palpi and proboscis yellow.

Thorax yellow, shining, opaque in the middle of the dorsum, with short yellow pubescence, which on the pleura is longer and darker; all the bristles black, only the median pair of *scp.* being yellow. The post-alar calli and a transverse band in front of the scutellum black; the humeri and a band on the upper portion of the mesopleura extending to the anterior part of the pteropleura are whitish yellow; hypopleura white; metanotum shining black, with a yellow longitudinal stripe in the middle and a white lateral spot which is connected with that on the hypopleura. Scutellum whitish yellow. Squamulae and halteres yellowish.

Abdomen shining yellow, with pale pubescence and black bristles; 3rd segment with a black round spot on the sides; 4th with a complete black transverse band at the base; 5th with a triangular lateral black spot on each side; genitalia black; venter yellow cinereous, with some blackish spots on the sides.

Legs wholly yellow; bristles black, yellow on the fore coxae; front femora with a row of 2—3 bristles beneath and yellow hairs on the upper side; hairs of the hind tibial row black.

Wings with yellow veins ; the small costal bristle is black ; the yellow band at the fore border extends from the base of the wings to the tip of the 3rd vein, where it is connected with a brown spot which reaches the middle of the costa between the tips of the 3rd and 4th veins ; this band is cut obliquely below and covers the base of the anal cell, the whole of the 2nd and of the 1st basal cells and the bases of the discoidal and of the 1st posterior cells. Beyond the stigma there is a hyaline spot on the costa, and two other smaller ones at the end of the 2nd vein and before the end of the 3rd. The stigma is yellow, with a brown spot at the tip. Upon the posterior cross-vein is a yellowish brown band which extends from the hind border to the middle of the first posterior cell ; another smaller oblique brown band begins at the costal band in the middle of the last portion of the 3rd vein and extends to the hind border, reaching it after the end of 4th vein. On the middle of the third posterior cell is an uncertain yellow longitudinal band, which extends anteriorly to the middle of the discal cell.

A single male caught by Dr. Annandale at Paresnath, W Bengal, 4400 ft., April 11th, 1909.

15. *Poecillis*, n. gen.

Very like the preceding, but distinguished by the complete chaetotaxy of the head and the different pattern of the body.

Head, antennae and frons exactly the same as in the preceding ; no *oc.* ; *or.* 2. 4-5 ; the first superior very small ; the other bristles as in the preceding, but those of the occipital row black ; genal bristle strong, black. Thoracic and scutellar chaetotaxy as in the preceding ; the abdomen also ; ovipositor flat, as long as the 3 last abdominal segments together. Legs and wings as in the preceding genus, but the pattern of the wings blackish, not yellow.

Type : the following species.

Notwithstanding the very different chaetotaxy of the head and the different pattern of the body, it is very probable that this genus represents the female sex of *Chaetellipsis*, and if this extraordinary sexual dimorphism should be proved, the genus will retain this last name. *Lagarosia*, Wulp, is perhaps allied.

35. *Poecillis judicanda*, n. sp. ♀

(Pl. ix, fig. 38).

A black species with yellow and whitish markings, and with blackish pattern of the wings. Length 7 mm., with the ovipositor.

Head as in the preceding, but the pubescence of the frons dark and all the bristles black ; antennae darker. Thorax shining black, with two broad reddish stripes in the middle, which at the suture are so dilated as to reach the sides ; the whitish yellow lateral stripe from the humeri to the hypopleura is very striking and below this is a broad brown stripe ; sternopleura yellow beneath ; scutellum whitish yellow ; metanotum without the median yellow stripe. Squamulae and halteres whitish yellow. Abdomen black, the 2 basal segments yellow ; hind borders of 4th-6th segments with a broad yellow band, which does not reach the sides. Ovipositor black,

shining, black pilose; venter yellow. Legs with the 4 posterior femora blackish at the tip.

Wings with the same pattern as in the preceding, but the veins are fuscous and the broad band on the fore border is blackish; the costal cell is light; the 3 hyaline spots at the costa are in the same position. The 2 bands of the hind border are brownish; that on the hind cross-vein is often evanescent and there is no trace of the longitudinal band in the middle of the third posterior cell.

Two specimens caught by Dr. Annandale at the same place as the preceding: Paresnath, W. Bengal, 4300 ft., 9th and 11th April 1909 ($\frac{9565}{15}$, $\frac{9568}{15}$).

If it is proved that this species is the female of *Chaetellipsis paradoxa*, we have here the most remarkable case of sexual dimorphism as yet known in the family.

16. *Ceratitis*, MacLeay.

MacLeay, Zoolog. Journ., iv, 475 (1829).

Petalophora, Macquart, Hist. Nat. des ins. Dipt., ii, 454, 5 (1835).

Halterophora, Rondani, Dipt. ital. Prodr., iv, 10 (1861).

As restricted here, this genus is easily known by the pubescent arista on the upper side only, the oblique position of the hind cross-vein, and the very peculiar pattern of the wings.

Head as broad as high; face very broad beneath, flat, the epistome not prominent; cheeks rather broad; antennae inserted on the middle of the eyes, short, the third joint double the length of the second, rounded at the tip; arista long, shortly pubescent on the upper side only; *oc.* long and robust; *or.* 2. 2; *vt.* 2; *pvt.* parallel, yellow; occipital row with black bristles; genal bristle indistinct; palpi shortly bristled.

Thoracic chaetotaxy complete; *dc.* nearer to the suture than to the scutellum; 1 *mpl.*; *pt.* strong; mesopleura with long and stout hairs. Scutellum swollen, with 4 bristles and stout hairs on the middle. Abdomen broad and short, bristly on the sides and at the end; male genitalia prominent; ovipositor flat, short. Legs short and robust; front femora of the male much more bristly than those of the female; middle tibiae with a single spur; bristles of the row of the hind tibiae rather long.

Wings very broad and short, with yellow and brown cross bands and black streaks on the base; costal bristle short, but distinct; 1st vein short; 2nd straight; 3rd straight, bristly throughout its length; last portion of the 4th vein curved; small cross-vein on the middle of the discal cell; hind cross-vein oblique, the inferior angle of the discal cell therefore acute; second basal cell a little dilated; anal cell drawn out into a point as long as the 2nd basal cell; anal cross-vein very deeply curved in the middle.

Type: *Trypeta capitata*, Wiedemann, 1824.

As here restricted, the genus will comprise only a few species; the spatulated appendages of the front of the male are not present in all the species. The African species with feathered legs in the male seems to belong to a peculiar genus.

I think that the name *Ceratitis* is not preoccupied in zoology by *Ceratites*, and I

use it notwithstanding the reasons advanced by Mr. R. von Ihering in *Entomologista brasileiro*, ii, 212 (1909).

36. *Ceratitis capitata*, Wiedemann.

Wiedemann, Anal. entom., 55, 124 [*Trypeta*] (1824). For a complete bibliography of this species see Bezzi, Boll. Labor Zool. Portici, iii, 276 (1909) and Froggatt, Report 1907-1908, 100 (1909).

Easily distinguished by the peculiar colouration of the body and wings, and by the spatulate appendages of the frons of the male.

In the collection of the Indian Museum there are only 2 specimens from Australia presented by Mr. Froggatt; but this cosmopolitan species is recorded here because it was first described from East India, and is known as a fruit-pest in this country.

The species is well known; I will add to the description that the frons is pilose in the middle; the thoracic and scutellar bristles are black, except the *scp.* which are yellow; the stout hairs on the mesopleura are black in the male and yellow in the female and the hairs on the upper side of the front femora are also black in the male, yellow in the female.

17. *Phagocarpus*, Rondani.

Rondani, Bull. Soc. entom. ital., iii, 171, xix (1871).

Anomoia, Walker, Entom. Magaz., iii, 80 (1836), not of Chevrolat, Coleoptera, 1834.

Distinct by reason of the long and very oblique hind cross-vein and by the peculiar wing-pattern; from *Ceratitis* it is distinguished by the arista being pubescent on both sides, by the different shape of the discal cell and by the absence of the black streaks at the base of the wings.

Head as high as broad, not produced below; cheeks narrow; eyes rounded; occiput not swollen superiorly; face flattened, epistome not at all prominent; antennae inserted towards the middle of the eyes, a little shorter than the face, the third joint rounded at the end, the arista shortly pubescent on both sides; palpi with short bristles; proboscis short. Chaetotaxy complete; *oc.* short and weak; *pvt.* strong and parallel; *or.* 2. 3; genal bristle strong; bristles of the occipital row well-developed and black; frons thinly pilose toward the middle.

Thorax with black pubescence and complete chaetotaxy; *sc.* well-developed and black; *dc.* near the scutellum; 2 *mpl.*; *pt.* weak. Scutellum with four bristles, the apical parallel. Abdomen narrowed at base, bristly at end. Legs short and robust; front femora with a row of bristles below; middle tibiae with a single spur; hind tibiae not ciliated.

Wings of usual shape and with short costal bristle; first longitudinal vein short, ending before the small cross-vein; stigma very short; second vein ending in the middle between the ends of the first and third veins, or a little after; third and fourth veins parallel with one another; third bristly at the base only; small cross-vein placed on the middle of the discal cell, but apparently before the middle, because the hind cross-vein is very long and oblique, on the upper end very close to the small cross-vein and on the lower end very near the hind margin of the wing; the discal cell is therefore short

above and long below, its inferior external angle being very pointed ; anal cell drawn out into a long point, as long as the second basal cell. Wing-pattern consisting of a yellowish or blackish large basal spot extending to the small cross-vein, and of two divergent narrow black streaks on the apical half.

Type : *Musca purmundus*, Harris, 1776.

Walker's name, which was corrected to *Anomoea* by Loew, being preoccupied in the Coleoptera, must be changed to that given by Rondani, the latter accordingly is used here.

37. *Phagocarpus immsi*, n. sp. ♂

(Pl. x, fig. 72).

A dark yellow species, with the basal spot of the wings broadly yellow. Length of the body 6 mm., of the wings $5\frac{1}{2}$ mm.

Head entirely yellow, covered with white pollen on the face ; all the bristles black ; a few pale hairs on the occiput below ; antennae dark yellow, the third joint very shortly pubescent ; palpi pale yellow, proboscis darker.

Thorax on the back dark reddish, covered with dark grey pollen and black pubescence, on the pleura and humeri pale reddish and shining ; all the bristles are black. Scutellum flattened, pale reddish, shining, with very long marginal bristles. Squamulae brownish, halteres dark yellow. Abdomen dark reddish, shining, with black pubescence, second and third segment blackish, the first three segments with a broad greyish border on the hind margin ; belly yellowish, the middle segments partly blackened ; genitalia yellow, small, not prominent. Legs entirely yellow, with black hairs and bristles ; femora rather thickened.

Wing veins yellow, darkened only on the blackish portions of the pattern ; they are hyaline, with a peculiar pattern ; stigma entirely black. There is a broad basal patch which leaves the costal cell free, except for a yellowish spot on the humeral cross-vein, and ends below on the fifth vein, filling out the whole of the anal cell ; this large patch is yellow, but outwardly ends in an arcuate black band, which begins below the stigma, reaches the small cross-vein and ends on the fifth vein, which is prolonged in a narrow greyish streak to the hind margin of the wing at the end of the sixth-vein ; there is a small hyaline spot in the first basal cell, below the stigma. From the black band, just over the small cross-vein, extends a narrow black streak which reaches the fore margin, and forms a triangular hyaline indentation beyond the stigma, with the vertex on the third vein. The two apical diverging blackish streaks are as follows : one, the shorter, on the hind cross-vein, reaching the hind margin ; the other, longer and arcuate, begins at the base of the first posterior cell and follows the end of the second vein, and from here along the costa to the apex of the wings, ending a little after the end of the third vein. These two streaks are not fused together at the base and are never united with the black band.

A single male, collected near Bhowali, Kumaon, 5700 ft., June 22, 1910, by Dr. A. D. Imms, in whose honour the pretty species is named.

This species is a true *Phagocarpus* resembling *purmundus* in venation and pattern

of the wings. It differs from this last species, which is the only one known, in being of greater size and yellower colouring; the basal wing-pattern is also more yellow and more broadened; the second longitudinal vein is distinctly shorter. *Fossata*, Fabr., which was placed in this genus by Van der Wulp, has no connection with these forms and will be found in *Acidia*.

18. *Myiopardalis*, Bezzi.

Bezzi, Boll. Labor. Zool. Portici, v, 8 (1910).

Easily distinguished by the bare third vein, the short proboscis, the strong ocellar bristles, the stump on the second vein and the very short point of the anal cell; very characteristic also is the colour of the thorax, yellow with black spots.

Head distinctly higher than broad, the face elongated below and the cheeks very broad; occiput a little swollen below; eyes rounded, not distinctly narrowed; frons convex, prominent; face flat, without carina and with the epistome not prominent; proboscis short and not geniculate; palpi without bristles; antennae inserted above the middle of the eyes, very short, the third joint $1\frac{1}{2}$ times as long as the second, a little pointed at the tip; arista shortly pubescent on both sides.

Chaetotaxy of head and thorax complete; *oc.* long and robust; *or.* 2. 3; *vt.* 2; *pvt.* weak and long; bristles of the occipital row almost indistinct, dark yellowish; genal bristle not distinct; *scp.* very weak; *dc.* near the suture; 2 *mpl*; *pt.* strong. Scutellum flat, black-spotted, with 4 bristles. Abdomen broad, convex, bristly at end; male genitalia prominent, with a perpendicular middle organ below; ovipositor short, not flattened, swollen, with the apical joint very small. Legs short and stout; middle tibiae with a single spur.

Wings narrow, with yellow cross-bands and without basal black streaks; costal bristle distinct; first longitudinal vein short; all the veins straight, the 3rd and 4th parallel; second vein with a stump; third vein bare; small cross-vein before the middle of the discal cell; posterior cross-vein perpendicular; inferior angle of the anal cell drawn out into a very short point, shorter than the second basal cell.

Type: *Carpomyia pardalina*, Bigot, 1891.

This species was originally placed in the genus *Carpomyia*, but in my paper of 1910 I have shown that it demands the erection of a new genus.

38. *Myiopardalis pardalina*, Bigot.

(Pl. ix, fig. 39).

Bigot, Indian Museum Notes, i, 77, pl. 5 f. 1 [*Carpomyia*] (1891); Cleghorn, l. c., ii, 24 [*id.*] (1893); Maxwell-Lefroy, Indian Insect Pests, 171, f. 194 [*id.*] (1906), Mem. Dept. Agriculture, i, 129, f. 72 [*id.*] (1907) and Indian Insect Life, 230 [*id.*] (1909); Froggatt, Report, 112 [*id.*] (1909); Bezzi, Boll. Labor. Zool. Portici, v, 9, 2, fig. i, 3, 4 (1910).

A yellow middle-sized species, with 4 yellow bands on the wings and black spots on the thorax and scutellum.

To the description of Mr. Bigot, reported also by Mr. Froggatt, I have to add:—

Head wholly yellow, the frons a little darkened above the antennae; the bristles

black, but the *pv.* yellow; genal bristle yellow, indistinct; on the lower portion of the occiput some yellow hairs; palpi and proboscis yellow, clothed with pale hairs.

Thorax clothed with yellow pubescence, which on the pleura is longer; bristles black, except the *st.* and the very weak *scp.* which are yellow. The black spots on the sides are disposed as follows: one small, opaque, on the humeri above the *hm.*; one larger, before the suture between *npl.* and *prst.*, shining above, opaque beneath; one still larger after the anterior *sa.*, extending to the *dc.*, shining above and opaque below, sometimes divided into two spots; and a fourth, shining and small, on the postalar calli. There is also a large rounded black spot just in front of the scutellum. The scutellar spots are opaque, two on the sides at the base, one rounded in the middle before the tip, and one on the underside below the tip. Pleura wholly yellow, metanotum with a black streak above. Halteres and squamulae whitish yellow.

Abdomen wholly yellow, unspotted, the last segments shining; the 2nd to 4th segments show a cinereous cross-band along the hind margin. Genitalia reddish yellow, shining; ovipositor shining yellow. The pubescence of the abdomen is yellow, the bristles are black. Front femora in both sexes with very few bristles. Wing veins yellow; the stump of the second vein is narrowly bordered with a dark yellow shade.

This species is recorded only from India; the bionomics are well known, and the larvae and puparium have been figured many times. The larva breeds in cultivated melons, to which it is very injurious; it is known as the Baluchistan Melon-fly.

In the collection before me are 5 specimens, all co-types of Bigot and labelled Baluchistan (*J. Cleghorn*) $\frac{2325}{13} - \frac{2330}{3}$.

19. *Carpomyia*, A. Costa.

A Costa, *Annal. scient.*, i, 87 (1854); Rondani, *Bull. soc. entom. ital.*, i, 164 (1869).

This genus is very near the preceding and shows a similar pattern of body and wings; but is distinguished from it and from any other of the group by the absence of the ocellar bristles.

Head less high, the face being not so produced below and the cheeks being narrower; eyes a little narrowed; frons less prominent. The chaetotaxy and other characters are the same as in the preceding; antennae more elongate, the third joint not attenuated; arista with shorter pubescence. On the wings the stump of the second vein is wanting and the small cross-vein is placed towards the middle of the discal cell; the yellow cross-bands are sometimes much reduced.

Type: *C. vesuviana*, A. Costa, 1854.

There is great confusion about this genus. It was evidently named in MS. by Rondani; but the first notice is found in the rare paper of Prof. Achille Costa, *Frammenti di entomologia napoletana*, printed in Naples in 1854. Schiner has named it *Orellia*, and has mixed up some species belonging to other genera; moreover Rondani has stated that *Orellia flavicans*, Rob. Desv., is the same as *Trypeta falcata*, Scopoli. The division proposed by Rondani in 1869 was accepted by Loew in 1873 (*Monogr.* iii, 260) as follows: *Oedaspis* with the species *dichotoma*, *fissa* and *multifasciata*, *Goni-glossum* with *wiedemanni* and *Carpomyia* with *vesuviana* (*bucchichii*) and *schineri*.

I take here the genus as proposed in 1869 ; but the name was proposed in 1856 with the type *arctii*, Degeer (= *Trypeta*) ; in 1870 *signata*, Meigen (= *Rhagoletis*) was proposed as the type. For further information see my paper of 1910.

39. *Carpomyia vesuviana*, A. Costa.

(Pl. ix, fig. 40).

A. Costa, Annal. scient., i, 87, 10 (1854) ; Rondani, Bull. soc. entom. ital., i, 164 (1869) and ii, 23, 1 (1870) ; Roder, Ent. Nachr., xvii, 210 [*Orellia*] (1891) ; Becker, Kat. pal. Dipt., iv, 116 [*id.*] (1905) ; Bezzi, Boll. Labor. Zool. Portici., v, 10, 4, f. 5, 6 (1910).—*Bucchichi*, Frauenfeld, Verh. Zool. bot. Ges., xvii, 500, pl. xii, f. 23 [*Orellia*] (1867) and xviii. 154, 5 [*id.*] (1868) ; Kaltenbach, Pflanzenf., 776, 1 [*id.*] (1874).

A yellow black-spotted species, with four yellow cross bands on the wings, very like *M. pardalina*, but besides the generic characters, distinguished by the two apical black spots of the scutellum ; see the figures and descriptions of the above cited authors. The *or.* are yellowish and the *vt.* yellow ; occipital row well-developed, yellow. The thoracic bristles are yellowish at the end, the scutellar ones almost entirely yellow. The two scutellar black spots are separated by a narrow yellow line.

The species is only known from South Italy and Dalmatia ; the larva lives in the fruits of *Zizyphus*, as observed long ago by A. Costa, but the metamorphosis has not yet been properly described.

In the collection there is a single specimen from Calcutta ($\frac{3287}{15}$) bearing the label : “ *Carpomyia* sp., fly injurious to Plum in Calcutta ; reared in Museum, 4-ii-92,” and another label which says : “ by ‘ plums ’ the fruits of *Zizyphus jujuba* must be meant, N. A., 1908.”

20. *Zonosema*, Loew.

Loew, Monogr. Trypet., 43, viii (1862).

Distinguished by the yellow body, which is without any black spot, by the pointed third antennal joint and the bare third longitudinal vein of the wings.

Head formed as in the preceding genus, but with the epistome a little more prominent ; third antennal joint twice as long as the second, oval-shaped, a little pointed at the tip ; arista shortly pubescent. *Oc.* strong ; *or.* 2. 3 ; *vt.* 2 ; *pvt.* parallel ; bristles of the occipital row well-developed, black. Thoracic chaetotaxy complete ; *mpl.* 1 ; scutellum with 4 bristles. Middle tibiae with 2 spurs.

Wings narrow and elongate, with the veins all straight ; no distinct costal bristle ; first vein short ; third vein bare, parallel with the fourth ; small cross-vein placed after the middle of the discal cell ; posterior cross-vein perpendicular ; second basal cell narrow ; inferior angle of the anal cell drawn out into a broad point, which is longer than the second basal cell.

Type : *Tephritis alternata*, Fallen, 1820.

I have drawn the above characters from the following Indian species, which differs in some points from the European typical ones ; but owing to the general appearance it is better placed here than elsewhere. The single specimen is moreover badly preserved,

40. *Zonosema dubium*, n. sp. ♂

(Pl. ix, fig. 41).

A yellow middle-sized species, with narrow elongate brown-spotted wings. Length 5.5 mm.

Head yellow, the frons darkened above the antennae and with a small black ocellar dot; face below on the cheeks whitish-cinereous; antennae, palpi and proboscis yellow. All the bristles on the head and thorax are black. Thorax wholly yellow, opaque (?) on the back, shining on the pleura. Scutellum yellow, metanotum black. Abdomen wholly yellow, shining. Legs yellow. Wings hyaline, with yellowish veins and the following marks: a broad black spot on the anal cross-vein, which is the most striking of all; a brown streak at the fore border after the small cross-vein, running from the border to the third vein; a broad brown spot before the tip of the second vein, which does not reach below the third vein; a broad border at the tip of the wing, beginning at the middle between the 2nd and 3rd veins and extending to the tip of the 4th; the two cross-veins are bordered with brown, the border of the hind vein being continued above into a small streak reaching the third vein; the stigma is pale yellow and below this, in the base of the submarginal cell, in the base of the first basal cell and in the base of the discal cell, are to be seen yellow shades.

A single male specimen from Naini Tal, May or June 1893, Lucknow Mus., $\frac{5.989}{15}$.

21. *Vidalia*, Robineau-Desvoidy.

Robineau-Desvoidy, Essai sur les Myodaires, 719, xii (1830).

Distinguished by the very short antennae, by the retreating face, by the small cross-vein placed after the middle of the discal cell, and in the male sex by the broad and deep excavated frons, bearing horn-like processes and rigid and incrassated *or*.

Head as high as broad, the eyes a little narrowed; antennae very short, not reaching the middle of the face, third joint only a little longer than the second, rounded at the end, with a very short pilose arista; face flat, distinctly retreating inferiorly; cheeks more or less broad; frons of the male broad, deeply excavated towards the middle, with lateral edges elevated, often forming horn-like processes, bearing the very incrassated and rigid orbital bristles, which are truncated at the end; *oc.* very small or indistinct; *or.* variable in number, being partly very incrassate, rigid and erect; 2 *vt.*; *pvt.* short and convergent; occipital row black; genal bristle strong.

Thoracic chaetotaxy complete; 2 *mpl.*; *pt.* strong. Scutellum flattened, triangular, with four bristles, the apical not crossed. Abdomen broad, narrowed at the base, bristly at the tip. Legs short and robust; middle tibiae with a single spur; the row of the hind tibiae well developed.

Wings with a small indistinct costal bristle; first longitudinal vein short; second straight; third and fourth parallel, the third bristly; small cross-vein placed after the middle of the discal cell; posterior cross-vein perpendicular; lower angle of the anal cell drawn out into a small point, as long as the second basal cell, which is rather

broad at the tip. Wings with extended brown pattern with hyaline indentations and spots, or with isolated black spots.

Type : *V impressifrons*, R.-D., 1830.

The genus is placed here, notwithstanding the resemblance of one species to *Rioxa*, in respect of the very characteristic armature of the frons in the male, which is very like that to be observed in the European *Stemonocera cornuta*, Scop., and in the North American *Straussia longipennis*, Wied.; both these genera are evidently related to *Spilographa*.

The two species are to be distinguished as follows :—

- 1 (2). Superior edges of the frons elevated in the shape of two flattened horns ;
 or. 2. 1, the two superiors being incrassated and rigid ; abdomen black
 at the end ; wing-pattern of the *Rioxa* type. *ceratophora*, n. sp.
- 2 (1). Inferior edges of the frons elevated ; *or.* 2. 4, the last three inferior
 being incrassated and rigid ; abdomen entirely yellow ; wing-pattern of
 the *Spilographa* type *triceratops*, n. sp.

41. *Vidalia ceratophora*, n. sp. ♂

(Pl. ix, fig. 42).

Easily distinguished from the type species of the genus, as described by Desvoidy, by the base of the abdomen and the femora being wholly yellow. Length 5 mm.

Head wholly yellow, with a small black ocellar dot ; antennae yellow, with some black hairs at the base ; proboscis and palpi yellow, these last with some black bristles ; the middle of the frons is opaque, but the vertical horns are shining ; all the bristles are black, the single lower *or.* is placed at the base of the horns and curved forwards ; on the sides of the frons are some small hairs disposed in a single row ; the two incrassated superior *or.* are placed at the tip of the horn and very close together, the first being shorter and curved forwards, the second straight and longer. The 2 *vt.* are situated at the interior base of the horn.

Thorax wholly yellow, rather shining ; it seems to be a little cinereous on the middle of the back ; a small yellowish white streak is to be seen along the notopleural suture ; pleura and metanotum yellow, shining, unspotted ; all the bristles are black, only the middle pair of *scp.* being yellowish. Scutellum light yellow, shining. Squamulae and halteres yellowish. Abdomen shining, with black bristles ; the three first segments are reddish-yellow, the last two black ; the pubescence is pale on the reddish portion and black on the black. Belly reddish, black at tip ; genitalia prominent, of reddish colour. Legs wholly yellow ; front femora with 5–6 black bristles beneath ; hairs of the hind tibiae black.

Wings brownish black, with the base narrowly hyaline. Costal cell hyaline, with a brown spot on the humeral cross-vein ; stigma wholly black. At the fore border are two hyaline indentations, close together, one just after the stigma, extending to the third vein, the other reaching the middle of the first posterior cell just after the small cross-vein. At the hind border are two triangular hyaline indentations, one in the base of the second posterior cell and one after this in the apex of the third

posterior cell extending to the apex of the discal cell ; the posterior cross-vein is therefore margined with brown. The hind half of the third posterior cell and the whole of the fourth are hyaline ; the base of the discal cell is filled with yellow ; the basal and anal cells are wholly brown. The single hyaline dot in the middle is a very small one before the middle of the first posterior cell.

A single male specimen from Siliguri, N. Bengal, 18—20-vii-07 ($\frac{28\frac{2}{5}}{15\frac{2}{5}}$).

42. *Vidalia triceratops*, n. sp. ♂

(Pl. ix, fig. 43).

An entirely yellow species, distinguished from the preceding by the different wing-pattern and by the lower and not the superior *or.* being incrassate. Length 5 mm.

Head wholly yellow, with brown geminate spot on the occiput ; frons very broad, pale yellow, the lateral elevated edges black ; face whitish ; antennae and arista pale yellow, this last shortly pubescent ; palpi and proboscis yellow ; epistome prominent as a narrow hem ; face long and distinctly retreating inferiorly ; cheeks broad. The frons has the lateral edges on the anterior portion very prominent but not horn-like. The three last pair of lower *or.* are very incrassate, black and rigid, as long as the height of the head and truncated at the tip ; there is also another lower *or.* not incrassated, and two pairs of small superior.

Thorax and scutellum entirely ferruginous, shining, the pleura paler, the yellowish lateral stripes less distinct ; all the bristles are black. Halteres and squamulae dark yellow. Abdomen entirely shining ferruginous, the last segment black on the sides below ; genitalia with a thick prominent point below. Legs entirely yellow ; front femora rather incrassate.

Wings hyaline, narrower and more elongate than in the preceding, with indistinct costal bristle ; veins black, only the costa at the base and the subcosta yellow ; stigma wholly black. The black markings are as follows : a broad patch just below the stigma and in contact with it and giving off two branches, one backwards to the apex of the second basal cell, which is hyaline, and one forwards to the small cross-vein, ending at the fourth vein ; the discal cell shows a yellowish shade just below its end. Anal cell at apex with a small brown spot. A narrow perpendicular streak just after the stigma, reaching the third vein. A broad band on the hind cross-vein, beginning towards the middle of the first posterior cell, and becoming broader towards the hind margin. A broad apical patch, which begins at the last third of the distance between the first and second veins, runs perpendicularly to the third vein, and from here goes obliquely to the hind margin, which it reaches after the end of the fourth vein.

A single specimen from Darjiling, 7000 ft., 27-v-10, caught by Mr. Brunetti.

Spilographa armifrons, Portschinsky, Hor. Soc. Entom. Ross., xxvi, 221 (1891), from Siberia, seems to be a species of the present genus allied to *ceratophora*, on account of the pattern of the wings.

22. *Xanthorrachis*, n. gen.

Not unlike the European *Acidia*, but very distinct by reason of the black dots on the thorax and scutellum, by the wavy second longitudinal vein and by the three yellow rays of the wings.

Head as high as broad, the eyes a little narrowed; face a little concave; antennae placed on the middle of the eyes, the third joint $2\frac{1}{2}$ times as long as the second, rounded at the tip; arista plumose, the hairs scarce and scattered, those on the upper side a little longer; palpi with bristles; no *oc.*; *or.* 2, 3, the superiors very thick; *vt.* 2; *pvt.* weak; occipital row yellow; genal bristle strong.

Thorax with complete chaetotaxy; *pt.* weak. Scutellum rounded, convex, with 4 bristles. Abdomen elongated, bristly on the sides and at the end; ovipositor flattened, as long as the abdomen. Legs robust, middle tibiae with a single spur.

Wings long, with a distinct costal bristle; first longitudinal vein short; second wavy at the base, straight at the end; third bristly, its last portion very much curved forwards towards the middle; small cross-vein placed on the middle of the discal cell; posterior cross-vein a little oblique; second basal cell twice as broad as the first; inferior angle of the anal cell drawn out into a narrow point, longer than the second basal cell. Pattern of the wings very peculiar, consisting of three longitudinal yellow rays, diverging from the base.

Type: the following new species.

This genus is a very peculiar one, but seems to be related to the European yellow species of *Acidia*. The American genus *Plagiotoma* has nothing to do with the present genus, notwithstanding the rather similar pattern of the wing. Allied to the present genus seems to be the African species which Loew has described as *Trypeta jucunda* in 1861; and I have in my collection an undescribed species from Central Africa, which is allied with that here described, but not congeneric. The genus *Chelyophora*, Rondani, placed in the Ortalids by Wulp, is perhaps allied, but has a very different pattern of wing.

43. *Xanthorrhachis annandalei*, n. sp. ♀

(Pl. ix, fig. 43).

A yellow handsome species of great size, with 6 black dots on the thorax and scutellum, yellow bristles and 3 yellow rays on the wings. Length 7 mm., without the ovipositor which measures 4 mm.

Head wholly yellow, shining; antennae yellow, the third joint darkened at the tip; arista yellow; proboscis and palpi yellow, these last with short yellow bristles; a small black ocellar dot; all the bristles yellow; on the lower portion of the occiput some yellow hairs; the second superior *or.* is very thick and inserted on a small tubercle.

Thorax shining, wholly yellow, with all the bristles yellow; a black dot on the post-alar calli; metanotum yellow; scutellum light yellow, with four black dots, on which are inserted the 4 yellow bristles. Squamulae and halteres yellow. Abdomen wholly yellow, with yellow pubescence, but black bristles; ovipositor reddish yellow, shining. Legs wholly yellow and with yellow bristles, those of the front femora being 6-7 in number; the tibial spurs black.

Wings hyaline, with yellow veins. The three yellow rays are disposed as follows: the first extends along the costa, filling out the costal, marginal and submarginal cells; this ray is united at the base with the second, from which it is separated by a

hyaline streak near the base of the marginal and submarginal cells. The second ray extends along the fourth vein to the tip of the wings, filling up the small cross-vein. The third ray is separated at the base from the other two by the hyaline second basal cell and extends to the hind margin along the fifth vein, filling up the whole of the anal cell. The stigma is yellow. The costal ray shows 4 black dots along the costa, the first after the end of the first vein, the second and third, one before and one after the end of the second vein, the fourth at the tip of the third vein; between the three last spots are placed two hyaline streaks along the costa. The tips of the other two rays are also spotted with brown but the apical spot of the third ray is placed just at the end of the fifth vein, while that of the second is placed beneath, and therefore leaves the end of the fourth vein free.

A single female specimen from the Dawna Hills, L. Burma, 2—3000 ft., 2—3-iii-08 (^{5.76.9}), collected by Dr. Annandale; I take pleasure in naming this handsome and distinct species in honour of the Superintendent of the Indian Museum.

23. *Acidia*, Robineau-Desvoidy.

Rob.-Desv., *Essai sur les Myodaires*, 720, xiv (1830).

The species of this genus show a short pilose arista, a head not widened below, a scutellum with four bristles, a bristly third vein and the small cross-vein placed after the middle of the discal cell.

Head a little broader than high, not widened beneath, with the mouth-opening small; eyes very large and rounded; face flat, the epistome not prominent; frons not or little prominent; antennae inserted on the middle of the eyes, much shorter than the face, the third joint being about twice as long as the second, rounded at the tip, distinctly pubescent or bare; arista shortly pilose or pubescent; cheeks narrow or broad; *oc.* developed, but not strong; *or.* 2. 3, rarely 1. 3; *vt.* strong, curved backwards; *pvt.* parallel; genal bristle well-developed; bristles of the occipital row black; palpi very broad, spatulate, almost bare; proboscis short.

Thoracic chaetotaxy complete; *scp.* well-developed, black; 2 *mpl.*; *pt.* strong; 4 scutellar bristles, the apicals shorter than the basals or of equal size, parallel or a little diverging. Abdomen narrow, elongate, bristly on the sides and at the end; ovipositor short and broad, flattened, triangular. Front femora with a row of 5—6 bristles below; middle tibiae with a spur; hind tibiae with a row of short hairs.

Wings broad and short, or narrow and elongate, with a small but distinct costal bristle; first vein short, ending much before the small cross-vein, but sometimes very long; 2nd, 3rd and 4th veins almost straight, wide apart from each other and slightly diverging outwards in the broad winged species, in the narrow winged species parallel; small cross-vein placed beyond the middle of the discal cell, often in the apical third or fourth, long and oblique or short and perpendicular; posterior cross-vein long or short, parallel with the small, very close to the hind margin; third vein bristly from the base to the small cross-vein or a little beyond it; inferior angle of the anal cell drawn out into a long and very narrow point, which is equal in length to the second basal cell.

Type : *Tephritis cognata*, Wiedemann, 1817.

This genus is rather heterogenous ; the species are yellow or black, with very different patterns of the wings ; the length of the first vein, the approximation of the cross-veins and the shape of the wings are also very different in the different species. The typical species *cognata* and *lucida* have a yellow body, less approximate cross-veins, narrow wings with the rivulet pattern.

The three yellow Indian species here described are different in the wing-pattern, which is sometimes like that of *Rioxa*. The species of this group are not satisfactorily distinguished from those of *Spilographa*, the only valuable distinction being the position of the small cross-vein, which in the last genus is placed before the middle or on the middle of the discal cell.

The other Indian species have a black body and are allied to the European *caesio* ; they have broad wings with more approximate cross-veins and with a pattern consisting of a black basal portion with hyaline indentations and of apical black bands.

Most of the remaining species, of which none are present in the collection, I refer to the genus *Philophylla*, Rondani, 1870 (= *Euleja*, Walker, 1836, preocc.), which is very well distinguished by its bare arista, by the shape of the head being broader below with the occiput swollen beneath and the mouth-opening very broad, by the narrow eyes and by the narrow and elongate wings.

I recognize as belonging to this genus the European *heraclei*, *centaureae*, *separata*, the North American *fratria* and the South African *excellens*. This last species was previously placed in *Hemilea*, which genus is also only a section of *Acidia*, and the name of which must be *Ocneros*, O.G. Costa, 1844, as stated by Rondani.

The species are characterised as follows :—

- 1 (2). Wings dimidiate, the fore half black, the hind half hyaline *praestans*, n. sp.
- 2 (1). Wings not dimidiate.
- 3 (8). Colouring of the body yellow or ferruginous; arista pubescent; wings long and narrow, with the middle longitudinal veins parallel and of a *Rioxa*-like pattern; species of larger size (5—7 mm.).
- 4 (5). Only a superior *or.*; cheeks very narrow; cross-veins less approximate, the distance being greater than the length of the hind cross-vein; wings with three black bands *himalayensis*, n. sp.
- 5 (4). Two superior *or.*, as usual; cross-veins more approximate, the distance being shorter than or equal to the length of the hind cross-vein; wings with *Rioxa*-like pattern.
- 6 (7). First vein short, ending much before the small cross-vein, the stigma of usual shape; cheeks rather narrow; metanotum and abdomen entirely yellow; third joint of the antennæ of male black; apical black patch of the wing united to the rest of the pattern, and without hyaline spot *rioxaeformis*, n. sp.
- 7 (6). First vein very long, passing the small cross-vein, the stigma twice as long as in the preceding; cheeks very broad; metanotum with two large black spots and the abdomen black at the end; antennæ of the male yellow; apical black patch isolated and including a hyaline spot *apicalis*, n. sp.
- 8 (3). Colouring of body black; arista shortly pilose: wings short and broad,

with the middle veins diverging and *caesio*-like pattern; species of smaller size (4-5 mm.).

- 9 (12). Front femora yellow; halteres black; scutellum black, reddish only at the hind margin and beneath; wings short and broad, with the cross-veins approached, and the basal half black, the apical hyaline with black bands.
- 10 (11). The 4 posterior femora black; an isolated oblique black band between 3rd and 4th veins in the apical portion of the wings *fossata*, Fabr.
- 11 (10). All the femora wholly yellow; wings without such a cross-band in the hyaline portion *alboscuteolata*, Wulp.
- 12 (9). Front femora black; halteres yellow; scutellum entirely red; wings more elongate, the cross-veins less approximate, entirely black, with the base and some indentations hyaline .. *erythraspis*, n. sp.

44. *Acidia (Ocneros) praestans*, n. sp. ♀

(Pl. x, fig. 51).

Very like *Acidia (Ocneros, Hemilea) dimidiata*, but easily distinguished by being twice as large, by having the abdomen more reddish basally and by a straighter and more sharply defined lower margin of the black fore band of the wings. Length of the body $6\frac{1}{2}$ mm., of the wing 7 mm.

Head yellow, face and cheeks whitish; frons darker yellow, and brownish above the antennae; all the bristles black; *oc.* weak and short; *or.* 2. 3; antennae dark yellow, rather short, the third joint rounded at the end, but a little pointed forwards; arista shortly pubescent; palpi pale yellow, with black bristles; proboscis dark yellow; cheeks narrow.

Thorax dark reddish, shining, clothed with black pubescence; humeri and notopleural streak pale yellow; pleurae paler reddish; all the bristles black. Scutellum flattened, pale reddish. Squamulae pale, halteres dark yellow with blackened knob. Abdomen shining black, with black hairs and bristles; the base of the first segment, and the sides of this and of the other segments broadly reddish, but the last segment is entirely black. Ovipositor short, shorter than the two last abdominal segments together, flat, rounded, shining black. Belly reddish, black at the end. Legs entirely yellow; hind tibiae ciliated with short hairs.

Wings black, with the hind border hyaline from the base to the second posterior cell; the limit is sharply defined, and always forward of the fourth vein; anal cell almost entirely hyaline; stigma rather long, entirely black; after the stigma, at the fore margin along the costa, are to be seen two hyaline very narrow streaks. Second longitudinal vein very long; third and fourth parallel; cross-veins perpendicular, the smaller approached to the hinder; third vein bristly to the small cross-vein.

A single female specimen, near Bhowali, Kumaon, 5700 ft., June 13, 1910, collected on herbage by Dr. A. D. Imms.

This species is very near *dimidiata*, which is the type of the genus *Hemilea* of Prof. Loew; but as the species was originally described by Prof. O. G. Costa in a new genus *Ocneros* (with *Musca pulchella*, Rossi), the last name must be employed in place

of the first. I think, however, that Rondani (Bull. Soc. Entom. Ital., iii, p. 180) is right in leaving the species in the genus *Acidia*, from which it differs only in the wing-pattern.

45. *Acidia himalayensis*, n. sp. ♀

(Pl. ix, fig. 45).

A dark ferruginous species, with pale yellow notopleural stripe and scutellum, only a pair of superior *or.*, and hyaline wings with three black bands. Length of the body 5 mm., of the wing $5\frac{1}{2}$ mm.

Head entirely yellow, without occipital spot; frons rather narrow, shining on the sides, without white reflections; face with whitish pollen; antennae yellow, the third joint twice as long as the second; arista yellow, with very short pubescence; cheeks very narrow, with pale hairs below and a black genal bristle; all the bristles black, those of the occipital row thin and short; the single superior orbital is inserted upon a small tubercle; *oc.* very small, less distinct; *pvt.* dark yellowish at end; palpi and proboscis yellow.

Thorax shining ferruginous, with very short pale pubescence and grey pollen; all the bristles black; two equally strong *mpl.*, with some dark hairs near; the pale yellow notopleural stripe is rather distinct. Scutellum pale yellow, flattened, with the apical pair of bristles strong and crossed at the end. Metanotum shining ferruginous, unspotted. Halteres and squamulae dark yellow. Abdomen entirely shining ferruginous, with dark pubescence and black bristles; ovipositor shining black, very short, broader than long, shorter than the last two segments together. Legs entirely yellow, with black bristles and black hairs on the hind tibiae.

Wings not so long or so narrow as in the following two species; costal bristle small; veins black, yellow at the base; third vein bristly to the small cross-vein, lightly bent in the middle of the last portion and behind parallel with the fourth, which is straight after the hind cross-vein; first vein short, ending much before the small cross-vein; stigma short, entirely black; distance of the cross-vein a little greater than the length of the hind cross-vein, but the small cross-vein always placed after the middle of the discal cell. The first brownish-black band is V-shaped, one branch beginning at the stigma, the other going over the small cross-vein; this last is smaller, and is united with the other at the third vein, forming a single broad band which reaches the hind margin in a point before the apex of the third posterior cell. The second band is narrow and straight, beginning at the fore margin before the end of the second vein and running over the hind cross-vein to the hind margin, which it reaches at the end of the fourth vein. This band is united at the fore border with the third band, which forms a broad apical patch, passing a little beyond the end of the fourth vein.

Four specimens from Kurseong, 5000 ft., E. Himalayan, 10—26-ix-09 (*Lynch*).

I am doubtful if the present species can represent the other sex of *Vidalia tricera-tops* from Darjiling; the wing-pattern is very different, but the North American *Straussia longipennis*, Wied., has also striking differences in the pattern of the wing in

both sexes, showing in some varieties that of the *Rioxa*-type. But it seems that this is not possible for the face does not retreat inferiorly, the antennae are longer, the arista less pubescent and the thorax has pale yellow markings.

46. *Acidia rioxaeformis*, n. sp. ♂ ♀

(Pl. ix, fig. 46).

A yellow species with unspotted metanotum, black third antennal joint of male and black wings with hyaline indentations and spots. Length of the body $5\frac{1}{2}$ —7 mm., of wing 6— $7\frac{1}{2}$ mm.

Head entirely yellow; frons dark ferruginous, opaque, with strong white reflections; face with whitish pollen; cheeks also, a little broader than in the preceding, with some short black bristles; occiput a little swollen inferiorly; proboscis ferruginous, palpi dark yellow, with some bristly hairs; antennae dark ferruginous, the third joint $1\frac{1}{2}$ times as long as the second, very darkened or quite black in the male; arista black, shortly pubescent; all the bristles black; *oc.* rather long but weak; occipital row well-developed.

Thorax as in the preceding but of paler colouring, and with the lateral pale stripe not distinct; scutellum of the same colour as the thorax; metanotum unspotted; there is a very small black spot below the postalar calli, at the root of the wings, but it is not easily seen more especially in some positions of the wings. Halteres yellow. Abdomen entirely yellow as in the preceding; male genitalia partly black; ovipositor shining black, not so short as in the preceding, as long as broad. Legs entirely pale yellow.

Wings as in the preceding but distinctly narrower and longer; the first vein longer, reaching the small cross-vein, the stigma therefore a little longer than in the preceding; cross-veins more approximate, the distance being smaller than the length of the hind cross-vein; stigma entirely black. Costal cell hyaline, with blackened humeral cross-vein and a brown spot in the middle; the basal cells are filled with black, the anal cell is hyaline with a black apex. Just after the stigma are two hyaline triangular indentations, the first, which is the larger, passing forwards of the second vein, the second, the smaller, not passing this vein. Hind margin with two very large hyaline indentations; one in the second posterior cell reaching the middle of the first posterior cell; the other smaller in the apex of the third posterior cell and of the discal cell, ending on the fourth vein; the hind cross-vein is therefore bordered with a narrow black streak, dividing the two indentations. Third posterior and axillar cells entirely hyaline; base of the discal cell with a rounded hyaline indentation. There is a round hyaline discal spot towards the apex of first basal cell, before the small cross-vein, which sometimes is very small and indistinct. The black streak dividing the triangular indentations of the fore border is sometimes incomplete, the two spots being fused into a single spot, bearing an isolated black streak in the middle.

Four ♂ and 2 ♀ from Simla, 7000 ft., 20-vii-11, caught by Dr. Annandale in low-growing herbage.

47. *Acidia apicalis*, n. sp. ♂

(Pl. ix, fig. 47).

A yellow species closely allied to the preceding, but distinct by reason of the very broad cheeks, the black-spotted metanotum, the very long stigma and different pattern of the wings. Length of the body 7 mm., of the wing 9 mm.

Head as in the preceding, but the cheeks very broad, and the occiput swollen inferiorly; the black bristles of the cheeks are also wanting, only the genal bristle of dark yellowish colour being present; antennae of the male dark ferruginous.

Thorax as in the preceding; a single *mpl.*; two small black spots on the fore border, near the *scp.*; metanotum with two very large shining black spots; hypopleura with a small basal black border. Scutellum pale yellow toward the hind border. Abdomen with the last segment shining black, ferruginous toward the middle and on the sides. Legs entirely pale yellow.

Wings very long, the fourth vein a little bent after the hind cross-vein; cross-veins very approximate, the distance being smaller than the length of the hind cross-vein; first vein very long, passing the small cross-vein, the stigma therefore twice as long as in the preceding, entirely black. Costal cell hyaline, with less distinct spots. Just below the stigma and in contact with it is a broad black patch, reaching backwards to the apex of the second basal cell, which is hyaline, and sending forwards a shortened band over the small cross-vein, which ends towards the middle of the discal cell with a yellowish indistinct spot below. A large apical patch beginning before the end of the second vein and extending forwards to the end of the 4th vein, including a hyaline subapical spot over the end of the 4th vein, and a basal indentation on the base of the last portion of the 4th vein; hind cross-vein with a narrow, isolated brown border; there is also a brown isolated streak on the fore border after the stigma. By uniting along the third vein the apical black spot with the basal one, the pattern of this species becomes very like that of the preceding.

A single specimen from Darjiling, 7000 ft., 23-v-10, caught by Mr. Brunetti.

48. *Acidia fossata*, Fabricius.

(Pl. ix, fig. 48).

Fabricius, Syst. Antl., 320, 20 [*Tephritis*] (1805); Wiedemann, Auss. Zweifl., ii, 503, 41 [*Trypeta*] (1830); Wulp, Cat. describ. Dipt. S. Asia, 192 [*id.*] (1896), Tijdschr. v. entom., xli, 216, 3, pl. x, fig. 14 [*Anomoia*] (1898) and l. c., xlii, 54 and 57 [*id.*] (1899).—*Elimia*, Walker, List Dipt. Brit. Mus., iv, 1033 [*Anomoia*] (1849); Osten-Sacken, Berlin. entom. Zeitschr., xxvi, 227 [*Trypeta*] (1882).—*regularis*, Doleschall, Nat. Tijdschr. Ned. Ind., xvii, 119, 75 [*Ortalis*] (1859).—*fossata*, Bigot, Journ. Asiat. Soc. Bengal, lxi, 224 [*Trypeta*] (1892).

A black, well-known species with yellow head and appendages, easily distinguished by the apical isolated black band of the wings.

Scutellum dark reddish at the hind margin and below; thorax narrowly reddish at the humeri; all the bristles of body and legs black; halteres black; front coxae yellow.

The wing-pattern is not correctly figured by Wulp. The brown band along the

sixth vein is separated from the black central part by an entirely hyaline streak, which is situated in the posterior part of the third posterior cell; and along the fore border, from the end of the second vein to the apex of the wing, there is a narrow black border which is omitted in Wulp's figure.

The species has a wide distribution in the Oriental Region, being known from Tranquebar, Amboina, Java and the Philippine Islands. In the collection are many specimens from Assam, labelled *Urophora rufipes*, n. sp., Bigot, MS.; but Bigot has not published the species. A specimen from Tenasserim, Lower Burma (*W Doherty*) ($\frac{5.9.2.1}{1.5}$); 4 specimens from Kulattupuzha, W. base of W. Ghats, Travancore, 19-xi-08, 2 from Shasthancottah, 12 miles N.-N.-E. of Quilon, Travancore, 8-xi-08, and 2 from Sukna, 5000 ft., E. Himalayas, 1-vii-08, all caught by Dr. Annandale.

49. *Acidia alboscuteolata*, Wulp.

(Pl. x, fig. 49).

Wulp, Tijdschr. v. Entom., xli, 217, 4, pl. x, fig. 15 [*Anomoea*] (1898) and xlii, 51 [*id.*] (1899).

Very like the preceding, but distinguished by the yellow front femora and by the absence of the apical isolated black streak on the wings.

Head wholly yellow, the bristles long and black; antennae, palpi and proboscis yellow and shaped as in the preceding, but the palpi are a little more hairy. Thorax black, with light cinereous pollen; humeri broadly yellow; pleura shining black, a little brown and reddish along the sutures; all the bristles black. Scutellum black, reddish at the hind margin and beneath, as in the preceding. I do not understand why Wulp has, by the specific name he uses, called the scutellum white. Apical bristles longer than in the preceding. Halteres black. Abdomen shining black, with very long apical bristles; ovipositor much shorter, with the apical segment yellow. Legs wholly yellow, only the coxae being blackish. Wing-pattern as figured by Wulp, but the hyaline streak of the third posterior cell reaches the hind margin; the short black streak after the stigma is connected with the black central portion just over the small cross-vein as in *fossata*; the apical border along the wing margin is also as in *fossata*, and is also shown here in the figure.

Wulp has placed this and the preceding species in the genus *Anomoea*, but I think erroneously, having regard to the very different position of the hind cross-vein; there is only a resemblance in the wing-pattern.

The species was originally described from Sumatra. In the collection is a female only, not well preserved, from Tenasserim, Lower Burma (*W Doherty*) ($\frac{5.8.4.2}{1.5}$).

50. *Acidia erythraspis*, n. sp. ♀

(Pl. x, fig. 50).

Very distinct from the two preceding species by reason of its more elongate wings, the black pattern of which is much more extended, by the entirely red scutellum and the darker legs. Length of the body 5 mm., of the wing 6 mm.

Head entirely yellow, of the same shape as in the two preceding, but the frons a little prominent and the cheeks more broad; antennae the same, the arista shortly pilose; palpi little developed; proboscis of usual shape; bristles long, black.

Thorax black, with scarce grey pollen, more shining on the pleura; humeri reddish, and the pleural sutures also; all the bristles are long and black; the *scp.* black, but weak. Scutellum triangular, flattened, entirely of a red colour; it bears 4 bristles, the apical pair not much weaker than the basal. Squamulae whitish; halteres yellow. Abdomen entirely black and shining; lateral and apical bristles well-developed, black; ovipositor as long as in *fossata*. Legs black, the fore coxae also blackish; fore tibiae entirely yellow, the others towards the end; tarsi wholly yellow.

Wings more elongate and narrow, the first 4 longitudinal veins being therefore not so apart from each other, the 3rd and 4th being parallel outwards; cross-veins more remote, the small cross-vein being much beyond the middle of the discal cell, but separated from the hind cross-vein by a distance equal to the length of the latter. Base, alula and axillar lobe hyaline; costal cell hyaline to the stigma, which is wholly black. The rest of the wing is black, with the following hyaline indentations: two are placed towards the middle of the fore margin, and are of triangular shape, with the vertex on the third vein and the base on the costa, which is of a yellow colour at this point; the first begins just after the stigma, the second is very close to it and a little narrower; the brown streak dividing these two indentations is placed symmetrically above the small cross-vein. Two other large and narrow approximate indentations are at the hind margin, just after the tip of the wing. The first is curved as an arch, being parallel to the wing border; it begins very narrowly in the middle of the submarginal cell towards its apex and runs, becoming always more broad, to the hind margin, which it reaches at the end of the 4th vein; the second is parallel to the first, but a little smaller and shorter, beginning at the third vein and ending at the hind border in the fore half of the second posterior cell. There is a fifth hyaline streak in the posterior part of the third posterior cell, which separates, as in the preceding two species, the brown streak along the sixth vein from the black central part of the wing. There is also a hyaline vertical discal streak running towards the end of the discal cell, just below the small cross-vein; but this seems to be variable, being wanting in one specimen.

Two female specimens; one typical from Kurseong, 5000 ft., E. Himalayas, 8-vii-08 ($\frac{5.9}{1.5}$); the other, badly preserved, from the same locality ($\frac{5.7}{1.2}$), but of an older collection; this is without the hyaline discal streak, but otherwise similar.

24. *Spheniscomyia*, nom. nov.

Spheniscus, Becker, Mitteil. Zoolog. Mus. Berlin, iv, 138 [*Sphaeniscus*] (1908).

Easily distinguished by the bare third vein, the well-developed costal bristle, the approximate cross-veins, by only 2 pairs of lower *or.*, by the black colour of the body and by the pattern of wing, which is very like that of some species of *Urophora*. Characteristic also is the absence of bristles on the abdomen.

Becker has characterised the genus well and considers it allied to *Acidia*, but distinguished by its bare third vein and different head. He calls it erroneously *Sphaeniscus*, which must be amended to *Spheniscus*; but in this form the name is twice preoccupied in zoology, by Brisson, 1760, in birds and by Kirby, 1817, in Coleoptera. I have therefore proposed the new name given above.

Head broader than high; face a little concave, narrower than the frons, which is broad at the vertex and becomes more narrow toward the base of the antennae; eyes large, almost rounded; frons a little prominent, the epistome not prominent at all; cheeks narrow; antennae placed a little below the middle of the eyes, the third joint pubescent, rounded at the tip, twice as long as the second; arista bare or with only microscopic pubescence; *oc.* strong; *or.* 2. 2; *vt.* very long; *pvt.* parallel; genal bristle strong; occipital row well-developed, black. Proboscis short; palpi not large, bristly.

Thorax short and convex, entirely black and with complete chaetotaxy; 1 mpl.; *pt.* strong. Scutellum rounded, convex, with 4 bristles, the apical pair only a little weaker than the basal, converging at the apex. Abdomen short, rounded, convex, distinctly narrowed at the base, without any lateral or apical bristles; ovipositor long and broad, flattened. Legs short; front femora below with a row of 4—5 bristles; middle tibiae with a single spur.

Wings of usual shape, with distinct costal bristle; first vein short, ending far in front of the small cross-vein; second straight; 3rd and 4th a little curved; small cross-vein placed toward the apical fourth of the discal cell, perpendicular, its distance from the hind cross-vein equal to its length; posterior cross-vein long and perpendicular; third vein bare; inferior angle of anal cell short and broad, shorter than the second basal cell. Pattern of the wings very characteristic, black, with deep hyaline indentations at fore and hind border, or, to put it in another way, hyaline, with 4 black bands united together at the fore border or in the middle.

Type: *Trypeta quadrincisa*, Wiedemann, 1824.

It seems that only two species of this genus are known; but they have a very wide distribution in South Europe, Africa and Asia, as may be gathered from the numerous synonyms here reported.

The two Indian species can be distinguished as follows:—

- | | | | | | |
|--------|---|----|----|----|----------------------------|
| 1 (2). | Hind tibiae black with yellow ends; wings with only three hyaline indentations at the hind margin | .. | .. | .. | <i>quadrincisa</i> , Wied. |
| 2 (1). | Hind tibiae entirely yellow; wings with four hyaline indentations at the hind margin | .. | .. | .. | <i>sexmaculata</i> , Macq. |

51. *Spheniscomyia quadrincisa*, Wiedemann.

(Pl. x, fig. 52).

Wiedemann, Anal. entom., 55, 122 [*Trypeta*] (1824) and Auss. Zweifl., ii. 508, 50 [*id.*] (1830); Schiner, Dipt. Novara Reise, 264, 99 [*Acidia*] (1868); Osten-Sacken, Annal. Mus. civ. Genova, xvi. 459 [*id.*] (1881); Wulp, Cat. describ. Dipt. S. Asia, 189 [*id.*] (1896).—*brevicauda*, Becker, Mitteil. Zool. Mus. Berlin, iv, 138, 401, pl. iii, fig. 42 [*Sphaeniscus*] (1908).—*filiola*, Loew, Zeitschr. f. ges. Naturwiss., xxxiv, 12, 1 [*Acitura*] (1869).—*Tucia*, Walker, List Dipt. Brit. Mus., iv, 1021 [*Trypeta*] (1849).—*Tacia* Wulp,

Cat. describ. Dipt. S. Asia, 192 [*id.*] (1896).—*parvula*, Wulp, Termesz. Füzet., xx, 141, 20, pl. iii, fig 2 [*Euxesta*] (1897); Meijere, Tijdschr. v. Entom., 41, 126 [*id.*] (1908); Hendel, Ann. Mus. nat. hung., vii, 172, 12 [*Acidia*] (1909).

A short black species, with yellow head and appendages, with black wings, the base and four indentations being hyaline.

All the bristles are black. Squamulae whitish, halteres light yellow. The hind tibiae seem to be variable in colour, as Loew and Becker describe them as entirely yellow: There is also in some specimens a slight trace of the smaller hyaline indentation of the hind margin of the wings, characteristic of the following species.

If the above synonymy is right, as I think, the species is known from Spain, from Teneriffe, from India and Ceylon and from Java and the Nicobar Islands. The collection includes three female specimens from Balugaon, Puri Dist., Orissa, 14-xii-08 (*J. Caunter*) ($\frac{8814}{15} = \frac{8816}{15}$), and one caught at light by Mr. Gravely in Diamond Harbour—Calcutta train, 4-xii-10.

52. *Spheniscomyia sexmaculata*, Macquart.

(Pl. x, fig. 53).

Macquart, Mem. Soc. Lille, 1842, 379, 2, pl. 30, fig. 5 [*Urophora*] (1843).—*atilia*, Walker, List Dipt. Brit. Mus., iv, 1021 [*Trypeta*] (1849); Wulp, Cat. describ. Dipt. S. Asia, 189 [*Acidia*] (1896).—*melaleuca*, Walker, Proc. Linn. Soc., vii, 238, 40 [*Trypeta*] (1864); Osten-Sacken, Annal. Mus. civ. Genova, xvi, 459 [*Acidia*] (1888) and Berlin. entom. Zeitschr., xxvi, 227 [*id.*] (1882).—*sanctae-mariae*, Bigot, Bull. Soc. ent. France (3) vii, 548, pl. 13, fig. 3 [*Ortalis*] (1859); Hendel, Ann. Mus. Nat. hung., vii, 172, 12 [*Acidia*] (1909).—*melania*, Bezzi, Denkschr. med.-naturwiss. Ges. Jena, xiii, 193, 34, fig. 3 [*Acidia*] (1908).—*sexincisa*, Thomson, Dipt. Eugen. Resa, 579, 252 [*Trypeta*] (1868).—*formosana*, Enderlein, Zoolog. Jahrbüch., xxxi, 427, fig. H [*id.*] (1911).

Very like the preceding, but distinct in having four (not three) hyaline indentations at the hind margin of the wings.

The hyaline indentation characteristic of this species is shorter than the others, beginning only at the fifth vein, while the others begin at the fourth or at the third (the apical). The hind tibiae seems to be also variable, from wholly yellow to yellow with blackened base.

I think that the above synonymy is doubtless correct; *atilia*, *melaleuca* and *sexincisa* are quite certain; the description of *sexmaculata*, Macquart, also agrees well, only the figure shows the indentations of the fore border much smaller. Of *sanctae-mariae*, Bigot says that the antennae are black, but in the coloured figure they are yellow; the figure shows a hyaline spot at the fore border before the stigma, which is absent in my specimens, which have only a thin hyaline streak at this point. My *melania* is also the same species, only the antennae are described as darker.

The species is therefore known from South Africa, from Madagascar and Bourbon I., from China and from Celebes, Ceram, the Philippines and Formosa.

In the collection are many specimens from Calcutta collected in the months January, April and November, one from Rajshai, E. Bengal, 1—6-ii-07, by Dr. Annandale; one from Naini Tal, Kumaon, 6000 ft., 5-vi-09. There are also four specimens

collected at Batavia, 27-vi—9-viii-06 by Mr. Brunetti ; an additional specimen is from Sibü, Sarawak, 2-vii-10, coll. Beebe.

25. *Aciura*, Robineau-Desvoidy.

Rob.-Desv., Essai sur les Myodaires, 773, xiii (1830).

Allied to the preceding, but distinguished from it and from the others by the presence of only the basal pair of scutellar bristles, the apical being entirely wanting ; the pubescence of the thorax is black.

Head broader than high ; eyes large, rounded ; face a little concave ; frons and epistome not prominent ; antennae inserted toward the middle of the eyes, the third joint rounded, the arista pubescent or almost bare ; cheeks narrow ; frons not much narrowed forwards ; proboscis short, palpi bristly ; *oc.* strong ; *or.* 2. 3 or 1. 3 ; genal bristle strong. The occipital row seems to be variable, a feature which shows in my opinion that the genus is still composed of heterogeneous elements ; in the typical species the bristles are black and thin ; in some American species (*insecta*, *phoenicura*)¹ are all yellow and thin ; in one of the Indian species here described, those on the vertex (4) are yellow, short and stout, the others are black.

Thoracic chaetotaxy complete ; *pt.* strong and only 1 strong *mpl.* Scutellum convex, bearing only the basal pair of bristles. Abdomen narrowed at the base, convex, with or without small apical and lateral bristles ; ovipositor variable, short and broad, flattened, or long and narrow, less flattened, or very long, longer than the abdomen. Front femora bristly below ; middle tibiae with a single spur.

Wings elongate, with the costal bristle more or less developed ; first vein very short ; 4th curved in the middle of the last portion, 3rd bare ; the cross-veins perpendicular and approximate, the small one is placed in the apical third or fourth of the discal cell ; inferior angle of the anal cell more or less drawn out into a point, which is always short. Pattern of the wing somewhat variable, but the wings usually black, with hyaline indentations and hyaline discal spots ; in the middle of the fore border, after the stigma, there are usually two hyaline triangular indentations, while in *Spheniscomyia* only one is present.

Type : *Musca coryli*, Rossi, 1790.

The species of this genus are not common. Of the Palaearctic species only *coryli*, *rotundiventris* and *tibialis* are typical ; *alacris*, *caloptera* and *winnertzi* shows a different wing-pattern ; *filiola* is described as having 4 scutellar bristles, and belongs to *Spheniscomyia*, as stated above.

The two Indian species before me are distinguished as follows :—

- | | |
|--|-------------------------------|
| 1. (2). <i>Pvt.</i> and superior occipital bristles black ; frons bearing in the | |
| middle very few pale hairs ; ovipositor narrow, as long as the | |
| abdomen .. | .. <i>monochaeta</i> , n. sp. |

¹ These two species, having yellow pubescence on thorax, are perhaps better placed in the new genus *Tephrella*.

2. (1). *Pvt.* and the two superior occipital bristles pale yellowish; frons in the middle clothed with short and thick whitish hairs; ovipositor broader, shorter than the abdomen *xanthotricha*, n. sp.

53. *Aciura monochaeta*, n. sp. ♀

(Pl. x, fig. 54).

A black species with yellow head, antennae, tibiae and tarsi, only a pair of superior *or.*, very long ovipositor, and wings black, the base being also black, the axillar lobe hyaline with 6 indentations and 2 discal spots whitish-hyaline. Length of the body 4 mm., of the ovipositor 3 mm.

Head yellow, with some grey pollen; all the bristles black, including those of the occipital row which are scarce and weak; *pvt.* very weak; only a pair of superior *or.*; frons in the middle with a few pale thick hairs; antennae yellow, the third joint being twice as long as the second; arista pubescent, the hairs being longer than in the European species.

Thorax shining black, with scarce greyish pollen; humeri and pleura entirely black; scutellum also wholly black, rather developed, triangular; all the bristles are black. Squamulae dark; halteres light yellow. Abdomen coloured like the thorax, elongate, narrowed at the base, convex in the middle, without bristles; ovipositor as long as the abdomen, or longer if the apical joint is included, convex, narrow, with short black pubescence and small yellow apical style. Legs with black coxae and femora, the tarsi darkened towards the tip; hind tibiae with the two basal thirds black; front femora bearing only 2 bristles beneath at the apex.

Wings blackened to the extreme base, only the alula and the axillar lobe being hyaline. There are the following 6 indentations. One very small in the base of the costal cell, after the humeral cross-vein, extending below to the third vein. The second and third are placed toward the middle of the fore border, just after the stigma, and are close together; they are of triangular shape, the first has the vertex on the third vein, the second is smaller and shorter and does not touch the third vein; the costa is yellow in correspondence with the bases of these triangles, and the vertex of the second triangle is over the small cross-vein. The three other indentations are at the hind margin, and equidistant from each other; the first is in the base of the second posterior cell, with the apex before the superior end of the hind cross-vein; the second is in the apex of the third posterior cell with the apex on the fifth vein; the third is in the base of the same cell with the apex on the same vein, and is therefore longer. The two hyaline rounded spots are: one in the middle of the base of the first posterior cell, a little beyond the posterior cross-vein; the second towards the end of the discal cell, just below the small cross-vein. All these spots and indentations are of a white colour; the axillar lobe is greyish hyaline, except in the middle where it is white. Costal bristle very minute; stigma black, with its superior external angle yellow; small cross-vein close to the hind cross-vein, being at a distance from it which is a little greater than its own length.

A single female from Calcutta, 5-i-08 (52½2).

54. *Aciura xanthotricha*, n. sp. ♀

(Pl. x, fig. 55).

Very like the preceding, but smaller and distinguished by the pale yellow *pvt.* and superior occipital bristles; and by the shorter ovipositor. Length of the body 3 mm., of the ovipositor 2 mm.

This species is identical with the preceding in all the particulars of colour and pattern of the wings. The *pvt.* are not longer than the other 4 pale yellowish superior occipital bristles; these 6 yellow bristles are similar in colour and thickness to those which are characteristic of the section *Trypaneininae*, and are also obtuse at the end; the other bristles of the occipital row are black and thin. Arista with only microscopic pubescence. The pale yellowish pile of the frons are more developed and numerous, recalling those which are so developed in the American *insecta*, where they also cover the thorax, which in the present species shows no trace of such hairs. The ovipositor is distinctly shorter, broader and more flattened. Wing-pattern identical; the only difference which I can see is in the first indentations in the costal cell, which in one specimen is much smaller but distinct, while in the other is entirely wanting.

Two female specimens, both not well preserved, the type from Dhikata, Gharwal Dist., W. Himalayas, U. P., 9-v-09 ($1\frac{1}{2}\frac{8}{6}$); the other from Tenasserim, Lower Burma (*W. Doherty*) ($1\frac{8}{1}\frac{4}{5}$).

Very striking is the difference in the postvertical and occipital bristles in these two species, which are almost identical in other particulars.

3. Section *Trypaneininae*.26. *Tephrella*, n. gen.

Very like *Aciura* and bearing also only the basal pair of bristles on the scutellum, but differing in the bristles of the occipital row being entirely pale yellowish and in the thorax being clothed with pale pubescence.

Head broader than high; frons and epistome not prominent; face a little concave, with a light longitudinal keel in the middle; cheeks rather broad; eyes rounded; antennae inserted a little over the middle of the eyes, the third joint $1\frac{1}{2}$ times as long as the second, rounded at the tip, pubescent, not reaching the epistome, with bare arista; proboscis short; palpi bristly; *oc.* well developed; *or.* 2. 3; genal bristle well developed; bristles of the occipital row well developed and entirely pale yellowish.

Thorax with yellow pubescence and complete chaetotaxy; *pt.* strong; 1 *mpl.* Scutellum with only the basal pair of bristles. Abdomen with the bristles less developed; ovipositor flattened, long and narrow. Front femora with a row of bristles beneath; middle tibiae with a single spur; hind tibiae almost bare.

Wings narrow and elongate, with distinct costal bristle; first vein short; 2nd, 3rd and 4th straight, the third bare and parallel with the 4th; cross-veins perpendicular, close together; the small one placed after the middle of the discal cell; inferior angle of the anal cell broad and pointed, but not drawn out into a point and shorter than

the second basal cell. Wing-pattern as in typical *Aciura*, with hyaline indentations (two at the fore border) and discal spots.

Type : the following new species.

The present genus is one of those which link the two tribes Ceratitininae and Trypaneininae ; it is very probable that many species described as *Aciura*, such as the Neotropical *insecta* and *phoenicura*, belong here.

55. *Tephrella decipiens*, n. sp. ♀

(Pl. x, fig. 56).

A black species with yellow head, thorax densely covered with grey pollen and shining abdomen ; the wings are black with hyaline base, 6 hyaline indentations (2 at fore and 4 at hind border) and 3 discal spots. Length 5 mm., with the ovipositor, which is $1\frac{1}{2}$ mm. long.

Head yellow, the cheeks remarkably silvery white and shining ; antennae, palpi and proboscis yellow, all the bristles dark yellowish, those of the occipital row whitish ; occiput black with grey pollen.

Thorax black, but on the back covered by dense yellowish pollen, which on the pleurae is lighter and grey, the pleura being also more black and a little shining ; the bristles are of a dark yellowish colour, like those of the head ; the yellowish hairs are rather long and directed backwards. Scutellum coloured like the thorax, the two bristles very long and black at the base. Squamulae dark, halteres yellow. Abdomen shining black with short pale pubescence ; ovipositor as long as the last four segments, black-haired. Coxae dark, the 4 posterior femora black ; the front femora yellow, but black on the upper side ; tibiae and tarsi yellow ; front femora with 3 very long bristles beneath.

Wings broadly hyaline at the base to the stigma and to the basal cross-veins ; there is a black spot on the costa at the upper end of the humeral cross-vein ; the veins are yellow in this hyaline portion ; the stigma black, with a small yellowish spot at the basal lower angle. The six hyaline indentations are disposed as follows : two approached together in the middle of the fore border, just after the stigma ; they are of equal size and of triangular shape, with the broad rounded vertex on the third vein ; the brown streak dividing these two indentations is placed before the small cross-vein and becomes paler towards the costa, the separation at the base being therefore not very sharp ; the costa is yellow in correspondence with the bases of these hyaline triangles, and the second vein also is yellow in the hyaline space and black in the black streak. The other four indentations are placed at the hind margin ; 2 are in the second posterior cell, one on the base, large and triangular, with the vertex towards the superior end of the hind cross-vein, the other on the middle, much smaller and in the shape of a rounded spot. The other 2 are placed in the third posterior cell, approached together, of almost equal size, with the vertex on the fifth vein. The three discal rounded spots are : one in the first posterior cell, a little beyond the hind cross-vein ; and two in the discal cell, one, the larger, towards the base below the stigma, the other, which is smaller, below the small cross-vein. Anal cell hyaline, with dark-

ened lower angle, and an intensely black spot on the upper angle. The hyaline portions are of a whitish colour, but those on the hind margin are more greyish; axillar lobe grey.

Two female specimens, the type from Darjiling, 7000 ft., 27-v-10, caught by Mr. Brunetti ($\frac{60}{1} \frac{74}{6}$); the other from Kurseong, 5000 ft., E. Himalayas, 8-vii-08 ($\frac{59}{1} \frac{79}{5}$).

27. *Tephrostola*, n. gen.

Distinguished from the preceding by the 4 scutellar bristles and from *Acidia* by the bare third vein, the pale hairs of the thorax and the whitish bristles of the occipital row.

Head as in the preceding; antennae very short, reaching the middle of the face, the third joint rounded, a little longer than the second, with a pubescent arista; cheeks narrow; *oc.* strong; *or.* 2. 3; the genal bristles and those of the occipital row are strong.

Thoracic chaetotaxy complete, as in the preceding, the pale hairs of the thorax well-developed; scutellum with four bristles, those of the apical pair shorter and crossed. Abdomen without bristles or with less developed apical bristles in the male; ovipositor flattened, long, triangular. Legs with a row of bristles on the front femora, a single spur on the middle tibiae and the hind tibiae almost bare.

Wings broad and short, with well developed and often double costal bristle; wing veins directed as in the preceding, but the cross-veins more or less approached, the small one being always placed after the middle of the discal cell; third vein bare. Pattern of the wing like that of *Aciura*.

Type: *Trypeta acrostacta*, Wiedemann, 1824.

It is very probable that some species of *Acidia* and *Aciura* belong here, having pale pubescence on the thorax and whitish occipital bristles, as my African species *caeca*, *cyclopica* and *tephronota*. It is also probable that the present genus is the same as *Platensina*, Enderlein, 1911.

In the collection are 2 species of this genus, which may be distinguished as follows:—

- | | | |
|---|---|--------------------------------|
| 1 | (2). Thorax yellow at the sides; halteres and legs yellow; wings with a hyaline spot at the tip between the ends of the 3rd and 4th longitudinal veins; cross-veins less approximate. | .. <i>acrostacta</i> , Wied. |
| 2 | (1). Thorax black on the sides; halteres and femora black; wings without apical spot and with the cross-veins more approximate. | <i>reinhardi</i> , Wied. |

56. *Tephrostola acrostacta*, Wiedemann.

(Pl. x, fig. 57).

Wiedemann, Anal. entom., 54, 119 [*Trypeta*] (1824) and Auss. Zweifl., ii. 501, 39 [*id.*] (1830) — *guttata*, Macquart, Mem. Soc. Lille, 1842, 387, 1. pl. 31, f. 10 [*Ensina*] (1843).

A black species, the thorax with dense grey pollen and with yellow sides, very distinct by reason of the colouration of the cheeks in the male and the apical spot of the wings in both sexes.

Antennae, proboscis and palpi yellow ; the female has the face and the cheeks entirely yellow like the rest ; the male has the face and cheeks of a velvety black colour, with a broad cinereous cross-band on the inferior portion of the face and an argenteous spot on the cheeks below the inferior corner of the eye ; the third antennal joint in the male is moreover infuscated at the end.

The bristles of the head and thorax are dark yellowish, those of the occipital row are very thick and whitish. Pleurae of the male with cinereous pollen, those of the female lighter yellow. Abdomen shining black, narrowly reddish at the base in both sexes. Coxae yellow ; hind femora of the male a little infuscated.

Wing-pattern as described by Wiedemann ; there are often supernumerary hyaline spots in the third posterior cell and at the end of the marginal and submarginal cells. The spots are of a whitish colour ; the axillar lobe is blackish, with a marginal whitish spot in the middle. The present species has also wings entirely black to the extreme base ; the stigma is black, unspotted. There are two very strong costal bristles.

Wiedemann describes the species from India, where it seems to be very common ; the collection includes many specimens from Puri, Orissa, 4—7-xii-08 (*J. Caunter*) ; Moulmein, L. Burma, ii—iii-08 (*N. Annandale*) ; Calcutta, iii—v ; Ranchi (*Irvine*) ; Khoodna, E. Bengal, 10-viii-07 ; and from Sikkim, *Knyvett* coll. Macquart records the species from Coromandel.

57. *Tephrostola reinhardi*, Wiedemann.

Wiedemann, *Anal. entom.*, 54, 121 [*Trypeta*] (1824) and *Auss. Zweifl.*, ii, 507, 48 [*id.*] (1830).

Distinguished from the preceding by the black colour of the thorax, halteres and femora, and by the different pattern of the wing, which has no hyaline discal spots, but only the base, axillar lobe and 5 indentations hyaline.

Head yellow, with dark yellowish bristles and conspicuous whitish occipital row ; frons narrower than in the preceding. Cinereous pollen of the thorax light, pleurae shining, a little reddish along the sutures and at the humeri. Squamulae and halteres blackish. Abdomen shining black, not reddish at the base. Wing with distinct but simple costal bristle ; small cross-vein at a distance from the hind cross-vein equal to its own length. Pattern as described by Wiedemann ; the two hyaline triangular indentations of the fore border are very large ; axillar lobe hyaline ; base hyaline, but with a conspicuous black border along the costa in the costal cell ; stigma short, black.

A single specimen from Calcutta, without date of capture ($\frac{2839}{11}$).

28. *Paralleloptera*, n. gen.

Very distinct from all the other genera by reason of its slender body and legs and by the wings being narrow and elongate, with parallel margins, obtuse at the tip, without prolonged anal cell and with very peculiar pattern.

Head as broad as high, frons becoming narrower in front and face also narrowed ; eyes rounded ; epistome and frons not prominent ; cheeks narrow ; antennae very

short, inserted a little below the middle of the eyes, the third joint rounded at the tip, with short pubescent arista. *Oc.* strong ; *or.* 2. 3 ; occipital row very strong, whitish ; *put.* divergent ; genal bristle well developed ; proboscis short, palpi bristly.

Thorax with pale pubescence and complete chaetotaxy ; *mpl.* 2 ; *pt.* strong. Scutellum with four bristles, the middle pair short and crossed. Abdomen very slender and elongate ; ovipositor flattened, short, triangular. Legs long and slender, the first tarsal joint elongate ; middle tibiae with a single spur ; hind tibiae almost bare.

Wings of a very characteristic shape, being long and narrow, with entirely parallel sides and obtuse apex ; costal bristle small, but distinct ; first vein long ; stigma very long ; 2nd, 3rd and 4th veins straight and parallel ; third vein bare ; cross-veins perpendicular, the smaller placed after the middle of the discal cell, but not very close to the hind cross-vein ; anal cell small, with the inferior angle not prolonged. The wings are wholly darkened, with a narrow hyaline hind border and very numerous small subhyaline dots.

Type : the following new species.

This genus shows a striking resemblance to the American genus *Pterocalla*, both in wing shape and pattern. The African *Trypeta ulula*, Loew, certainly belongs here, and Loew placed it lately in *Pterocalla* (the head was wanting in his specimen) ; but Hendel in the " *Genera Insectorum* " has stated that it is a true Trypaneid. It seems very probable that Walker's *Trypeta adatha* is the same species.

58. *Paralleloptera pterocallaeformis*, n. sp. ♀

(Pl. x, fig. 58).

Very near *P. ulula*, Loew, but distinguished by having four black spots in the last two segments of the abdomen and more hyaline spots in the second posterior cell. Length of the body 5 mm., of wing 5 mm.

Head yellow ; the occiput black with grey pollen ; antennae, palpi and proboscis yellow ; the bristles dark yellowish, those of the occipital row pale whitish.

Thorax black, covered with cinereous pollen, with the humeri and the pleura yellow ; on the back there is a pale pubescence. The bristles are dark yellow, those on the pleura of much paler colour. Scutellum like the thorax. Halteres yellowish. Abdomen very elongate and narrow, entirely pale yellow, little shining, with pale pubescence and without bristles ; the two last segments bear each in the middle a pair of black rounded spots. Ovipositor reddish, shining, with short hairs, as long as the three last abdominal segments. Legs slender and long, entirely pale yellow, with pale pubescence.

Wings with yellow costa and black veins. They are entirely brownish black, only the axillar lobe and the hind half of the third posterior cell being cinereous-hyaline in the shape of a streak extending from the base of the wings to the end of the 5th vein stigma long, dark, with two hyaline dots. In the costal and marginal cells along costa the spots are larger and hyaline ; the others have numerous smaller yellowish colour, disposed in regular rows, one in the marginal, two in the submarginal, two in the first posterior and first basal, and two in the discal cells ; second

cell with 4 subhyaline spots placed along the hind margin of the wing. The grey hind portion of the wing shows two rows of larger and more hyaline spots.

A single female specimen from Dharampur, 5000 ft., Simla Hills, 14-v-08 (*N. Annandale*) ($\frac{5.8 \frac{2}{5}}{1.5}$), and another from Bhowali, Kumaon, 5700 ft., June 1910 (*A. D. Imms*).

29 *Craspedoxantha*, n. gen.

Easily distinguished from the preceding genera by its entirely yellow body, black spotted thorax and hyaline wings with yellow longitudinal rays.

Head as high as broad; frons and epistome a little prominent; face concave, very short, the narrow cheeks appearing therefore to be produced below; mouth opening very broad; proboscis short, palpi bristly; antennae inserted toward the middle of the eyes, rather long, reaching the epistome, the third joint rounded at tip, pubescent, $1\frac{1}{2}$ times as long as the second, which is rather elongate; arista with microscopic pubescence. *Oc.* strong; *or.* 1. 3, accompanied by a row of short hairs on the eye margin; *pvt.* parallel; bristles of the occipital row all yellow, but neither long nor thick, pointed; genal bristle strong.

Thorax with yellow pubescence and complete chaetotaxy; scutellum with 4 bristles, those of the apical pair touching at the end. Abdomen contracted towards the base, with short but abundant lateral bristles; ovipositor flattened, broad, short. Legs short and robust; front femora with a row of very strong bristles; middle tibiae with a single spur; hind tibiae with a very developed row of short equidistant bristles.

Wings long and narrow, with a short but distinct costal bristle. Stigma long; first vein long, reaching the small cross-vein; 2nd long, straight; third bare, strongly curved below towards the end, the first posterior cell being therefore narrowed at the end; 4th almost straight; small cross-vein placed after the middle of the discal cell, perpendicular, not much approached to the hind cross-vein, which is oblique; inferior angle of the anal cell drawn out into a narrow and long point, longer than the second basal cell. Wing-pattern consisting of yellow longitudinal rays, one of which is placed along the fore border.

Type: the following new species.

This genus seems to be allied to *Xanthorrhachis* in the group *Acidia*, but is placed here on account of the pale pubescence of the thorax. In the pattern of the wings it approaches the American genus *Xanthacrona*, which belongs to the Pterocallinae in the family Ortalidae. The resemblance between this and the preceding genus and the American *Pterocallinae*, which show perhaps natural affinity, is very notable. The *Trypeta marginalis* of Wiedemann, from Cape of Good Hope, in all probability belongs here.

59. *Craspedoxantha octopunctata*, n. sp. ♀

(Pl. x, fig. 59).

Handsome yellow species, with 8 black dots on the thorax, a broad yellow band along the whole fore margin of the wing and a yellow ray along the 5th vein, including the ovipositor, which measures $1\frac{1}{2}$ mm.

Head wholly yellow, the occiput opaque and covered with grey pollen, the face and frons shining, especially the last, which is highly polished; all the bristles are yellow, those of the occipital row short and thin. Antennae, palpi, and proboscis yellow.

Thorax wholly yellow, with pale pubescence and yellow bristles; on the back it is dark ferruginous, a broad notopleural band is light yellow, the pleura are also paler. The black dots are: 'two pairs in the middle after the suture, shining, bearing the *prsc.* and the *dc.*; two on each side in the notopleural depression, larger and velvety-opaque, one below the *prst.*, the other before the first *sa.*; besides there is another black spot below the post-alar callus and one smaller at the root of the wings. Scutellum like the thorax, but without black spots; halteres and squamulae yellowish. Abdomen entirely reddish yellow, with pale pubescence and numerous but short yellow bristles on the sides. Ovipositor shining reddish, as long as the three last abdominal segments. Legs wholly yellow; front femora below with 5-6 very long and strong bristles; hind tibial row very developed, the bristles being black, and disposed like a comb.

Wings wholly hyaline, with yellow veins; the stigma long, entirely yellow, of the same colour as the costal band. Costal band extending in almost equal width from the base to the tip of the wing; it reaches below the third vein, but just after the small cross-vein leaves a narrow hyaline streak in the middle of the submarginal cell. The colour of this costal border is light yellow, but it includes some dark spots, one lighter in the costal cell and two darker towards the end of the marginal cell; the arcuate tip, from the end of the second to the end of the third vein, is, moreover, blackened. The yellow posterior ray begins in the anal cell and runs along the fifth vein, being much broader below than above; at the apex it rejoins the hind margin of the wing; its colour is paler yellow than the fore border.

A single female specimen from the Dawna Hills, 2000—3000 ft., I., Burma, 2-iii-08 (*N. Annandale*).

30. *Sphenella*, Robineau-Desvoidy.

Rob.-Desv., *Essai sur les Myodaires*, 773, xiv (1830)

Distinguished by the prominent epistome, the long and geniculate proboscis, the 4 bristles of the scutellum and the banded wings with very approximate cross-veins.

Head broader than high; the frons rather long and depressed, broad, prominent; face short and very concave, the epistome strongly prominent and cut off; antennae inserted below the middle of the eyes, reaching the epistome, the third joint a little shorter than twice the second, a little pointed at the upper corner; arista bare; proboscis long, geniculate; palpi not bristly. *Oc.* strong; *or.* 1. 2; *pvt.* divergent; bristles of the occipital row strong, whitish; genal bristle less developed.

Thorax with paler pubescence and complete chaetotaxy, but the *scp.* less distinct; only a strong *mpl.* Scutellum with four bristles of almost equal size, the apical pair crossed, at least at the end. Abdomen with apical bristles; ovipositor short and flattened. Legs short and strong; front femora with a less developed row of bristles beneath; middle tibiae with a single spur; hind tibiae with some short hairs ♂

Wings narrow and elongate with small costal bristle; first vein short

the small cross-vein ; 2nd, 3rd and 4th veins almost straight, 3rd and 4th parallel, 3rd bare ; cross-veins very approximate, the small cross-vein being separated from the hind cross-vein by a distance less than its own length ; inferior angle of the anal cell drawn out into a short and broad point, as long as the second basal cell. Pattern of the wings very characteristic, with a complete cross-band in the middle.

Type : *Tephritis marginata*, Fallen, 1820.

With this genus begins a series of genera which are often difficult to distinguish ; I have followed here the usual division, based sometimes only upon the characters of the pattern of the wings.

60. *Sphenella indica*, Schiner.

(Pl. x, fig. 60).

Schiner, Dipt. Novara Reise, 267, 110 (1868).

Very near the European *marginata*, but distinguished by the unspotted stigma and the darker pattern of the wings.

Thoracic and scutellar bristles black ; beneath the black *npl.* there are two weaker yellow bristles. Abdomen with rich yellow pubescence ; the apical bristles black. Squamulae whitish, halteres yellowish. Legs entirely yellow. Costal cell black, with two yellowish hyaline spots at the two ends ; stigma entirely black ; a conspicuous yellowish hyaline spot just after the stigma, but the median band besides this shows only 2 or 3 small yellowish dots ; in Schiner's description these dots are more numerous. There is a brown spot in the middle of the 5th vein, and another which is paler on the 6th vein.

Schiner describes the species from Madras ; in the collection is a single specimen without head from Puri, Orissa, 20—21-1-08 ($\frac{5.8}{1} \frac{2.5}{5}$).

31. *Oxyna*, Robineau-Desvoidy.

Rob.-Desv., Essai sur les Myodaires, 755, iii (1830).

Very near the preceding, but distinct by reason of the cross-veins being not so approximate and the pattern of the wings reticulate not banded (and in the species here described by the absence of the apical scutellar bristles).

Head broader than high, long and depressed ; face short and concave, the epistome prominent ; antennae as in the preceding ; proboscis long and geniculate, often very long and slender ; palpi with some bristles at end. *Oc.* well developed ; *or.* 1. 2 (in the species here described) ; occipital row well developed.

Thorax with pale pubescence and complete chaetotaxy ; scutellar bristles 4 or 2, the apical bristles being sometimes very small. Abdomen slender, with short bristles and short flattened ovipositor. Legs as in the preceding, but slender.

Wings narrow and elongate, with small costal bristle ; first vein not reaching the small cross-vein ; cross-vein less approximate, the distance of the small cross-vein from the hind cross-vein always greater than the length of the same vein. Pattern of the wings reticulate, sometimes very little developed.

Tephritis absinthii, Fabricius, 1805.

Of the two species here described, the first shows more resemblance to the genus *Ensina*, in which it and the allied species are often placed. But at present I prefer to leave it in *Oxyna*, the genus *Ensina* being restricted to the single species *sonchi*, which is distinguished by the very depressed head, hyaline wings with the first vein reaching the small cross-vein and the body partly yellow.

The two species are very easy to distinguish :—

- | | | | |
|--------|--|---------|--------------------------|
| 1 (2). | Proboscis very long and slender, the terminal portion being as long as the basal ; abdomen grey with black spots ; wings with less marked pattern and rather diffuse reticulation. | .. | <i>sororcula</i> , Wied. |
| 2 (1). | Proboscis shorter and thicker, the terminal portion shorter than the basal ; abdomen shining black ; wings with intensive pattern | | <i>parca</i> , n. sp. |

61. *Oxyna sororcula*, Wiedemann.

(Pl. x, fig. 61).

Wiedemann, Auss. Zweifl., ii, 509, 52 [*Trypeta*] (1830) ; Becker, Mitteil. Zool. Museum Berlin, iv, 144, 420 (1908).—*vacillans*, Wollaston, Ann. Mag. N. Hist. (3) i, 115 [*Ensina*] (1858) ; Bezzi, Bull. Soc. entom. ital., xxxix, 159, 217 [*id.*] (1908).—*variipennis*, Wulp, Termesz. Füzet., xx, 143, 28, pl. iii, f. 3-4 [*Leptomysa*] (1897) ; Czerny, Wien. entom. Zeit., xxi, 256 (1902) and xxv, 254, fig. 1-2 (1906).

This species is very like the European *elongatula*, but is distinguished by the unspotted stigma and the more diffuse reticulation of the wings. Thorax, scutellum and abdomen entirely grey, the abdominal black spots more or less distinct. Bristles black ; ovipositor shining black. The wing-pattern more or less dark, often very light.

This species seems to have a wide distribution in warm countries ; Wiedemann described it originally from Teneriffe, where Becker found it very common ; Wollaston records the species from Madeira and I have seen numerous specimens from Erythraea, East Africa ; the species is also found in Egypt. Van der Wulp describes his *variipennis* from Ceylon, and I think that the synonymy is right, because Czerny compares the species with *elongatula*. The Central American species *picciola*, Bigot (= *aurifera*, Thoms. and *humilis*, Loew), which is placed in *Ensina* by American writers, is an allied form ; but it seems to be distinct in having always a pair of very small but distinct apical bristles on the scutellum, which in the present species are only found exceptionally.

The collection includes numerous specimens from Rajshai, E. Bengal, 1-6-ii-07 (N. Annandale) ; Puri, Orissa, 18-19-i-08 (N. Annandale) ; Calcutta, ii-08 (*id.*) ; Paresnath, W. Bengal, 4000-4400 ft., May, 1909 (J. T. Jenkins) ; Kufri, Simla Hills, 8000 ft., 11-v-09 (N. Annandale) ; Karmater, Bengal, 23-x-09 (C. A. Paiva).

62. *Oxyna parca*, n. sp. ♂ ♀

(Pl. x, fig. 62).

A small dark species, with grey thorax, shining black abdomen and black wings with about 17 hyaline spots. Length $2\frac{1}{4}$ — $2\frac{1}{2}$ mm.

Head yellow ; occiput black with grey pollen ; a whitish border along the eyes ;

antennae, palpi and proboscis yellow ; arista shortly pubescent ; *or.* 1. 2 ; bristles black ; occipital row well developed, whitish.

Thorax with densely grey pollination, the pleura yellowish ; pale pubescence well-developed ; bristles black, some yellow on the pleura ; scutellum like the thorax, with only the basal pair of bristles. Squamulae white, halteres yellowish. Abdomen shining black, with black bristles ; ovipositor black, and more shining than the abdomen. Legs with the coxae entirely yellow.

Wings black, with hyaline base and entirely black stigma. There are the following hyaline spots along the fore border : one before the stigma, with another smaller one just below ; a row of three in the marginal cell, that of the middle being of larger size and having another spot below, from which it is divided only by the second vein. Two spots are at the tip, one, larger, between the ends of the 3rd and 4th veins, and one smaller just above the end of the 3rd vein. At the hind margin : two in the second posterior cell, the second being larger and three in the third posterior cell, the third being of larger size. The discal spots are : one in the first basal and one in the first posterior cell, at equal distance from the small cross-vein ; two in the discal cell, one greater in contact with that of the first basal cell and one smaller on the lower external angle, in contact with the first of the three spots of the third posterior cell.

A single pair from Calcutta, 2-ix-07 and 9-x-07 ($\frac{5759}{15}$, $\frac{5747}{15}$).

This species belongs to a small well-characterized group, distinguished by the black abdomen, black wings with only a few hyaline spots and the apical scutellar bristles wanting. Of these species, *tristis*, Loew, has more spots at the tip of the wing and therefore the black pattern is here radiate ; *semitra*, Loew, has a hyaline spot in the first posterior cell after the small cross-vein ; *parce-guttata*, Becker, is very like the present species, but shows two hyaline discal spots in the first posterior cell ; *margaritifera*, Bezzi, has a spotted stigma and more numerous hyaline spots. The first and third of these species are Mediterranean, the second and fourth Ethiopian.

The collection includes, in addition, a single specimen, without head, of a species from Theog, Simla Hills, 8000 ft., 13-v-09 (*N. Annandale*), which seems to be allied to the European *tessellata*.

32. *Campiglossa*, Rondani.

Rondani, Bull. Soc. entom. ital., ii, 121 (1870).

Distinguished by the robust cinereous black-spotted body, by the short but geniculate proboscis, its apical portion being thick and membranous, and by the radiating pattern of the wings.

Head broader than high, frons and epistome prominent ; cheeks rather broad ; border of the mouth fringed with short and thick whitish hairs ; eyes rather narrowed ; frons broad, with the lunula greatly developed ; antennae placed below the middle of the eyes, with the third joint a little pointed and almost bare arista ; *oc.* strong ; *or.* 2. 2 ; occipital row very strong ; occiput below with many whitish thick bristly hairs ; genal bristle less distinct ; palpi bristly ; proboscis thick, with the terminal portion cubitate but short and thick.

Thorax with pale pubescence and complete chaetotaxy ; scutellum with 4 bristles. Abdomen bristly ; ovipositor short, flattened. Legs robust, the front femora with a row of bristles developed beneath ; middle tibiae with a single spur ; hind tibiae not pectinate.

Wings broad, with small costal bristle ; first vein reaching the small cross-vein ; 2nd, 3rd and 4th veins straight, 3rd bare and parallel with the 4th ; small cross-vein after the middle of the discal cell, but not much approached ; lower angle of the anal cell drawn out into a short and broad point, shorter than the second basal cell.

Type : *Tephritis irrorata*, Fallen, 1814.

If the other species of *Tephritis* with a radiating wing-pattern can be conveniently placed here, Rondani's name *Campiglossa*, 1870, must be used in place of *Euaresta*, Loew, 1873.

63. *Campiglossa cribellata*, n. sp. ♂

(Pl. x, fig. 63).

A handsome robust species very near *irrorata*, but distinguished by the black orbital bristles, and separated from *grandinata*, Rondani, by the radiated pattern of the tip of the wing. Length $4\frac{1}{2}$ mm.

Entirely cinereous, whitish on the head, frons with a geminate ferruginous spot above the lunula ; antennae dark yellow, palpi paler, proboscis darkened ; *oc.*, *or.* and *vt.* black, but the superior *or.* and the other vertical and occipital bristles whitish, those of the row very strong ; very conspicuous are the whitish bristly hairs of the inferior portion of the head.

Thorax entirely grey, with well developed yellow pubescence and black bristles ; black round spots are on the insertion of the *prsc.*, *dc.* and *prst.* ; and on the insertion of the *sa.* are smaller and less distinct. Pleura with long yellow hairs and a row of whitish bristles on the hind border of the mesopleura ; below the humeral bristle and before the prothoracic stigma are dense tufts of bristly whitish hairs. Scutellum like the thorax, with 4 bristles, the basal pair being stronger and inserted upon a pair of black spots like those of the back. Squamulae whitish, halteres dark yellow. Abdomen wholly grey, with strong pale yellowish pubescence and short yellow bristles on the sides ; first segment unspotted, the others with a pair of round black spots in the middle and one on each side less distinct. Legs yellow, the femora cinereous, the front femora with black bristles.

Wings black, with the base whitish hyaline ; stigma with two hyaline round spots, the second being of larger size. Pattern as in *irrorata*, but more closed and the hyaline spots more numerous ; the portion after the fifth vein and the axillar lobe are also black with numerous hyaline spots. The whole pattern is blacker than in *irrorata* ; the rays of the fore border are shorter, but equal in number ; the second posterior cell shows the 3 marginal spots and 5 discal spots, all of smaller size, two not being greater as in *irrorata*.

A single specimen from Kurseong, E. Himalayas, 4700—5000 ft., 23-vi-10 (*N. Annandale*) ($\frac{8\frac{1}{2}}{1}\frac{5}{6}2$).

33. *Tephritis*, Latreille.

Latreille, Hist. Nat. d. Crust. et Ins., xiv, 389 (1804).

In this genus are placed the species with a short non-geniculate proboscis, with a bare third vein and with the pattern of the wing not radiating; the scutellum has usually 4 bristles.

Eyes rounded; cheeks narrow, epistome but little prominent; proboscis short, with the flaps not prolonged; antennae placed at the middle of the eyes, the third joint not pointed, the arista bare, pubescent or shortly plumose; *oc.* strong; *or.* 2. 3 or 1. 2; occipital row very well developed; genal bristle less developed.

Thorax with grey pollen, yellow pubescence and complete chaetotaxy. Scutellum not swollen, with 4, rarely 2, bristles. Abdomen with bristles; ovipositor short. Legs usually robust; front femora with a well-developed row of bristles beneath; middle tibiae with 1 spur; hind tibiae usually bare, but sometimes pectinate.

Wings usually long and narrow, but in some species short and very broad; costal bristle distinct; first vein not reaching the small cross-vein; 2nd, 3rd and 4th straight and parallel, but the 2nd diverging in the broad-winged species; third bare; cross-veins parallel and perpendicular, the small one placed in the last third of the discal cell; lower angle of the anal cell drawn out into a short and broad point, as long as or shorter than the second basal cell. Wing pattern reticulate, not radiating; rarely broken into dark spots; exceptionally the wings are black with hyaline spots.

Type: *Musca leontodontis*, DeGeer, 1776.

In the collection are the following species, which are all described as new, on account of the difficulty of recognizing the species from the older descriptions.

- 1 (2). Wings very much dilated, almost as long as broad, entirely black, with very few hyaline or subhyaline spots *euryptera*, n. sp.
- 2 (1). Wings not dilated, much longer than broad, with more numerous hyaline spots.
- 3 (4). Scutellum with 2 bristles only; arista with rather long pubescence; *or.* 2. 3 *zodiacalis*, n. sp.
- 4 (3). Scutellum with 4 bristles, the apicals being sometimes smaller; arista bare or with very short pubescence.
- 5 (6). *Or.* 2. 3; hind tibiae shortly pectinate; thoracic bristles yellow; abdomen yellow, with black cross-bands *zonogastra*, n. sp.
- 6 (5). *Or.* 1. 2; hind tibiae almost bare; thoracic bristles black; abdomen grey, with or without black spots.
- 7 (8). Stigma with a broad hyaline spot; thorax without dark longitudinal stripes; abdomen not spotted; reticulation of the wing distinct *lyncea*, n. sp.
- 8 (7). Stigma unspotted; thorax striped and abdomen spotted; reticulation of the wing partly broken into spots *spiloptera*, n. sp.

64. *Tephritis euryptera*, n. sp. ♀

(Pl. x, fig. 64).

A species very easily distinguished from the others by its very dilated black wings, which have only a few marginal hyaline spots and very few discal subhyaline dots. Length of the body 7 mm., of the wing 6 mm., width of the wing 5 mm.

Head wanting. Thorax with dense grey pollination, on the pleura dark ferruginous; pubescence long and yellow; bristles dark ferruginous. Scutellum with 4 bristles, apical pair strong. Squamulae dark brown; halteres black. Abdomen narrow and elongate, shining black, with light dark greyish pollen and dark pubescence; bristles less developed; ovipositor flattened, as long as the two last segments. Legs slender, entirely reddish yellow; hind tibiae bare.

Wings entirely black, only the extreme base and the axillar lobe being a little paler; costal bristle very strong and long, accompanied by another smaller one; veins black; marginal and discal cell very broad, and therefore second and fifth veins very divergent from the third and fourth, which are parallel; third entirely bare; stigma black, short, with a small yellowish spot on the upper basal corner. The hyaline marginal spots are disposed as follows: three in the costal cell, one before and two after the humeral cross-vein; a large triangular indentation just after the stigma, surpassing the second but not reaching the third vein, with a small isolated black spot at the costa; a small spot before the end of the second vein, and another in the middle between the ends of the second and third veins; one, the largest of all, at the tip, between the ends of the third and fourth veins; two of smaller size, placed at equal distances, in the second posterior cell; and two very small in the third posterior cell, near the anal vein. The discal spots are not whitish-hyaline, but brownish yellow and therefore less distinct; there are two in the submarginal, one in the first basal, two in the first posterior and two in the discal cell; there is also a hyaline very small dot below the fifth vein, towards its middle.

A single specimen, without head, from Tenasserim, L. Burma (*W. Doherty*).

The arista of this species is probably shortly plumose, as in the following. The species seems to be allied to *amplipennis*, Walker, which, with some others, belongs to a group that recalls the American genus *Eutreta*. But Osten-Sacken says that the species of this group have a bristly third vein and six scutellar bristles, characters which do not belong to the species here described, which perhaps shows affinity with the group *Rioxa*.

65. *Tephritis zodiacalis*, n. sp. ♀

(Pl. x, fig. 65).

Allied to the preceding, but smaller and with undilated wings, which have more numerous hyaline spots. Length of body $4\frac{1}{2}$ mm., of the wing 4 mm.; width of the wing $2\frac{1}{2}$ mm.

Frons yellowish and face whitish; antennae yellow, with the third joint rounded and a short plumose arista; palpi and proboscis yellow; bristles black, *or.* 2. 3; *pvt.*, exterior *vt.* and those of the occipital row whitish and strong. Thorax grey, with short yellow pubescence and black bristles. Scutellum with only the basal pair of bristles. Squamulae and halteres yellowish. Abdomen as in the preceding, but at the base in the middle of the first segment with a short yellowish longitudinal stripe. Legs as in the preceding, entirely yellow.

Wings less broad, but the direction of the veins as in the preceding; they are

black, but the stigma shows a large yellowish basal spot. Costal cell as in *euryptera*; the large hyaline indentation after the stigma is divided into two rectangular spots by a perpendicular median black streak; and in contact with these are two other hyaline spots between the second and third veins; the other hyaline marginal spots are as in *euryptera*, but the third posterior cell has one more below the hind cross-vein; and the axillar lobe shows also two spots, which are wanting in the preceding. The discal spots are in number and position the same as in the preceding, but are larger and whitish-hyaline; there is a spot in the upper corner of the second posterior cell; the third posterior cell has also three hyaline discal spots, two of which are connected with the two basal marginal spots; before the anal cell is also a small hyaline spot.

A single specimen from Calcutta, 21-xi-07.

66. *Tephritis zonogastra*, n. sp. ♂

(Pl. x, fig. 66).

Distinguished by the yellow bristles of the head and body, by the colouring of the abdomen and by the pectinated hind tibiae. Length 4 mm.

Head yellow, with yellow appendages and bristles; third antennal joint short, with bare arista; *or.* 2. 3; occipital row well developed, whitish.

Thorax with dense grey pollination, with the humeri yellowish; pubescence short; all the bristles yellow. Scutellum grey, with yellow hind border, and 4 yellow bristles. Squamulae whitish, halteres pale yellow. Abdomen entirely reddish yellow, grey on the belly; pubescence yellow; bristles well developed, yellowish; each segment bears at the base a broad black band, only that of the last segment being narrowly interrupted in the middle. Legs short and robust, entirely yellow, with yellow bristles, those of the front femora very abundant; hind tibiae with a distinct comb of yellow bristles.

Wings of usual shape and neuration; veins black, yellowish towards the base. They are black, the base being hyaline from the stigma to the anal cell; costal cell with a small brown spot; stigma black, with a small basal yellow dot. Fore margin with two hyaline indentations; one just after the stigma, of larger size and triangular shape, with the vertex on the third vein and including in the middle a black spot extending from the costa to the second vein; the second, triangular but of smaller size, is just after the end of the second vein. An apical semilunar spot between the ends of 3rd and 4th veins. At the hind margin are two groups of hyaline spots; one in the second posterior cell, composed of three parallel stripes partly fused together. The second is in the third posterior cell, composed of 6 spots, 3 at the hind margin and 3 in the middle; besides there is a small spot before the anal cell. Axillar lobe grey, with 4 spots. The discal spots are: 1 in the first basal, 2 in the first posterior, all of smaller size; and 2 in the discal cell, the median very large, the exterior smaller, all rounded. The hyaline spots are whitish, those toward the hind border more grey.

A single specimen from Puri, Orissa, 4—7-xii-08 (*J. Caunter*).

67. *Tephritis lyncea*, n. sp. ♂ ♀

(Pl. x, fig. 67).

An entirely grey species, without dark margins on the thorax and abdomen, with reticulate wings and black stigma, bearing a large round hyaline spot. Length 3—3½ mm.

Head grey, with reddish frons and whitish face; a small whitish border along the eyes. Bristles black; *or.* 1. 2; *pv.*, exterior *vt.* and those of the hind row whitish; antennae reddish, the third joint obtuse, with bare arista; palpi and proboscis yellow, the last very short.

Thorax with dense pollen, yellowish on the back and grey on the pleura; pubescence long, of pale yellow colour; bristles black, inserted on less distinct black dots. Scutellum like the thorax, reddish at the apex, with 4 black bristles, the apical pair being smaller and not crossed. Squamulae and halteres yellowish. Abdomen entirely grey, with long yellow pubescence and few black bristles at end; last segment of the male as long as the two preceding together, the genitalia grey; ovipositor flattened, black shining, as long as the three last segments together. Legs yellow, the hind femora with the last half blackish grey; other femora a little grey; front femora with the bristles less developed; hind tibiae not pectinate.

Wings long and narrow, with small costal bristle; they are broadly hyaline from the base to the stigma, and here the veins are yellowish; stigma black, with a large hyaline round spot in the middle. The reticulation of the wings is formed by large hyaline spots; there are two larger black patches, one below the stigma, the other at the end of the first vein; between these, the marginal cell shows three large quadrate spots of equal size, and below these three others in the submarginal cell. Apex of submarginal and of first posterior cells, the whole second posterior and apex of the third posterior cells with many hyaline spots; discal cell almost hyaline, with some spots at apex. Axillar lobe hyaline.

One male and two female specimens from Darjiling, E. Himalayas (*Lynch*).

This and the following species are very distinct from the preceding by the *or.* bristles being only 1. 2.

68. *Tephritis spiloptera*, n. sp. ♂

(Pl. x, fig. 68).

Closely allied to the preceding, but distinguished by the striped thorax, spotted abdomen and different pattern of the wings. Length 3 mm.

Head as in the preceding, with the same colouring and bristles; a reddish spot over the middle of the epistome. Thorax with three distinct longitudinal blackish stripes on the middle, the two exterior corresponding to the *dc.* row; a notopleural stripe is less distinct; besides the bristles of the thorax and the two basal bristles of the scutellum are inserted on distinct black dots. Abdomen with two longitudinal rows of median black spots, the lateral being less distinct; the hind margin of the segments, moreover, narrowly yellowish, and the last segment broadly reddish at the

hind margin ; genitalia reddish. The abdominal bristles are black, rather developed. Legs entirely yellow, the hind femora only with a less distinct grey spot below in the middle.

Wing-reticulation broken into spots ; stigma black, without spots but with yellowish base ; the brown streaks form two cross bands, one less distinct below the stigma, and one more distinct praeapical, from the end of the second vein to the middle of the second posterior cell ; this band shows some hyaline spots. Third posterior cell in the middle with only three small brown spots.

Two male specimens from Calcutta, 5-ii-08 and 28-x-07.

This species seems to be allied to *orientalis*, Meijere, from Java.

34. *Trypanea*, Schrank.

Schrank, Briefe Donaumoor, 147 (1795).

Urellia, Robineau-Desvoidy, Essai sur les Myod., 774, xv (1830).

Distinguished by the slender body, by the scutellum bearing usually only two bristles and by the pattern of the wing being star-shaped and limited to the apex.

All the characters of the preceding genus are present, but the third joint of the antennae ends in a point on its external lower angle ; arista bare ; *or.* 2. 3 or 1. 3 ; proboscis usually short and not geniculate. Scutellum usually with only a pair of bristles. Wings as in *Tephritis*, but the black pattern limited to the apex and star-shaped, the remaining surface immaculate, or with very few spots ; at any rate the wings are not reticulate.

Type: *Musca stellata*, Fuessly, 1775.

As I have shown in *Wien. entom. Zeit.*, xxxvi, 54 (1907) the name *Trypanea* must be used for the present genus in place of *Urellia*, used by most authors ; the genera *Ditricha* and *Actinoptera* of Rondani are also synonymous. The collection contains the following species :—

- | | | |
|--------|--|---------------------------|
| 1 (2). | Epistome very prominent ; <i>or.</i> 2. 3 ; proboscis rather long with the flaps a little prolonged ; inferior angle of the anal cell not prolonged ; a complete cross-band through the middle of the fifth vein | <i>aucta</i> , n. sp. |
| 2 (1). | Epistome less prominent ; <i>or.</i> 1. 3 ; proboscis short ; inferior angle of the anal cell prolonged into a short but distinct point ; no complete cross-band on the fifth vein. | |
| 3 (4). | Apical ray of the star not reaching the hind margin ; scutellum and abdomen usually entirely grey ; face and antennae yellow in both sexes | <i>amoena</i> , Frauenf. |
| 4 (3). | Apical ray reaching the hind margin ; scutellum and abdomen partly yellow ; antennae and face of the male black | <i>asteria</i> , Schiner. |

69. *Trypanea aucta*, n. sp. ♀

(Pl. x, fig. 69).

Of usual shape and pattern, but distinguished by the very prominent epistome, elongate proboscis, obtuse anal cell and complete cross-band through the middle of the fifth vein. Length 4 mm.

Face whitish yellow, frons reddish, a whitish border along the eyes; antennae yellow, the third joint with a distinct anterior point, arista with microscopic pubescence; epistome very prominent, cut off; palpi pale yellow; proboscis yellow, thick, long, with short but geniculate terminal flaps. The bristles of the head are dark yellow, those of the hind border whitish; 2 superior *or*.

Thorax with dense grey pollination, with pale pubescence and dark yellow bristles. Scutellum with 2 bristles. Squamulae pale, halteres yellowish. Abdomen entirely grey yellowish, unspotted, with well-developed pubescence and few yellow bristles; ovipositor flattened, black, shining, as long as the two last segments. Legs entirely yellow; front femora very hairy above.

Wings hyaline, with pale veins, which are darkened in the black portion; stigma pale yellow, with a black anterior basal spot. The star-shaped apical spot gives off 5 rays to the hind margin, the first 4 reaching the hind border, the fifth ending at the fifth vein; the fourth runs along the posterior cross-vein. Fore border with the usual basal anterior triangular hyaline indentation and the rounded spot at the end of the second vein; apical border very narrow, less distinct. Small cross-vein narrowly margined with fuscous, isolated. From the stigma a pale band runs obliquely forwards, which at the fourth vein becomes broader, and passing across the middle of the fifth vein reaches the hind border at the end of the sixth vein, where it is widened. Inferior angle of the anal cell cut off, not drawn out into a distinct point.

A single female specimen from Puri, Orissa, 18—19-1-08, caught by Dr. Annandale.

70. *Trypanea amoena*, Frauenfeld.

(Pl. x, fig. 70).

Frauenfeld, Sitzgsber. Akad. Wiss. Wien, xxii, 542, f. 2 [*Trypeta*] (1856); for the rest see Becker, Kat. pal. Dipt., iv, 141 (1905).

A grey species distinguished by the face and antennae of the male being yellow and the apical ray of the star not reaching the hind border.

Some specimens of this European species, from Calcutta, v—x, and Paresnath, W. Bengal, 4000—4400 ft., May '09, and Lahore, Punjab, 8-v-08 (*N. Annandale*). The species is known from Central and Southern Europe, North Africa and Madeira and other species of this genus show a wide distribution.

71. *Trypanea asteria*, Schiner.

(Pl. x, fig. 71).

Schiner, Dipt. Nov. Reise, 270, 118 [*Tephritis*] (1868); Meijere, Tijdschr. v. Entom., li, 132, 2, pl. 4, f. 6 [*id.*] (1908).

Closely allied to the preceding, but distinguished by the apical ray being complete, by the yellower scutellum and abdomen, and by the black antennae and face in the male.

To the description of Schiner is to be added: third joint of the antennae of the male black; face in the same sex entirely of a velvety black colour, only a narrow band on the epistome being yellow. As it seems very strange that Schiner could have

overlooked such a striking character as this feature of the male, it is probable that the present species is different ; the figure given by Prof. Meijere is also rather different.

Schiner records the species from Madras, and Meijere from Java. The collection includes specimens from Paresnath, W. Bengal, 4000—4400 ft., iv-09 (*N. Annandale*), and May '09 (*J. T. Jenkins*).