NOTES ON AUSTRALIAN DIPTERA. XX.

By J. R. Malloch.
(*Communicated by I. M. Mackerras.*)

(Thirty-four Text-figures.)

[Read 31st July, 1929.]

This paper contains notes on Calyptrate Diptera only and is intended as a final contribution on the genus *Rutilia*.

Family **Muscidae.**

Subfamily Phaoniinae.

Helina howei Malloch.

A metallic dark green species, with grey dusted thorax, black legs, cross-veins of wings conspicuously infuscated, the apical portions of wings slightly so, the calyptrae white, and halteres fuscous.

A female specimen before me differs from the type in being much larger (7:5 mm.), but otherwise agrees in all respects with it. This specimen has the fore tibiae present and armed with two posterior bristles. The type specimen lacks the fore legs.

Locality.—Lord Howe Is.: Mt. Gower, 19.1.1922 (A. R. McCulloch). Australian Museum.

The type specimen belongs to the British Museum of Natural History.

Family **Calliphoridae.**

Subfamily Rhiniinae.

Chlororhinia viridis Townsend.

Three examples of this species in very much abraded condition are amongst the material submitted to me from the Australian Museum.

Locality.—Exeter, N.S.W., March, 1927 (A. H. Murray).

I have previously recorded this species from New South Wales and Queensland.

Metallea illingworthi Aldrich.

Three specimens of this species submitted by the Australian Museum from the following localities: Galston Gorge, Berowra, nr. Hawkesbury River, N.S.W., February, 1927 (T. G. Campbell); Norton's Basin, Nepean River, 17.10.1920 (A. Musgrave).

Family **Tachinidae.**

The descriptions and records presented herein are mainly of species recently received and the data presented in the discussions of same are intended to convey some of the more important and frequently overlooked characters of these to the printed page for the convenience of Australian students of these flies. I have made

no effort to obtain a large collection of the species, so have rather a paucity of genera available, none of them of remarkable characteristics, except possibly the *Rutilia* group, *Amenia*, or *Microtropeza*. Many of the species belong to genera which have a very wide distribution, and some of them of more limited dispersal belong to genera that occur in the Orient and the intervening islands of the Pacific and Indian Oceans.

It is impracticable at this time to publish a key to the genera recorded from Australia, as some of the species placed in certain genera very probably do not belong to these genera. Consequently a complete generic synopsis must await a fuller knowledge of the species involved.

Tribe **Phasiini**.

Genus HYALOMYIA Robineau-Desvoidy.

In a recent paper of this series I summarized my knowledge of the Australian species of this genus, describing four as new. Directly after sending the manuscript to Dr. Mackerras I received from him a shipment of flies which contained several new species of Tachinidae, dealt with in the following pages, including two belonging to *Hyalomyia*. One of the latter lacks the abdomen and, though it probably belongs to an undescribed species, I am leaving it aside pending receipt of better specimens; the other specimen is in good condition and is described below.

HYALOMYIA COSTALIS, n. sp.

Male.—Black. Face yellowish below and on sides, obscured by whitish dust, as are the other portions of head; antennae black; palpi testaceous; frontal hairs, those on facial ridges and vibrissal region, and the postocular ciliae, black, occipital and genal hairs white. Thorax black, densely pale grey dusted, mesonotum with four black vittae, the submedian pair appearing as a broad central stripe, except as seen from behind when the intervening space is quite evidently brownish-yellow dusted in front of suture, sublateral vittae narrow, interrupted at suture, narrowed behind and not attaining hind margin of mesonotum; scutellum entirely black, slightly shining. Abdomen shining black, with slight brown tinge basally, entirely yellowish dusted below, more greyish dusted on sides anteriorly, the colour of dust changing apically to yellow, fourth tergite densely yellow dusted, less so centrally and anteriorly in middle where it is shining, fifth tergite entirely densely yellow dusted. Legs black. Wings greyish hyaline, quite conspicuously brownish or fuscous along costa to apex of first vein, and with a faint pale brown cloud over the inner cross-vein. Calyptrae greyish, lower one with a large brownish basal cloud. Halteres brownish-yellow.

Frons linear above, orbits setulose on anterior third, with short fine hairs almost to anterior ocellus, and a few hairs laterad of the anterior setulae; ocellars undeveloped; antennae hardly more than half the length of face, third segment hardly longer than second; mouth margin slightly produced, almost on a level with lower margin of eye; parafacial above about as wide as third antennal segment and half as wide as height of cheek; palpi long and slender. Thorax with quite dense black hairs, one very poorly differentiated pair of dorsocentrals in front of suture, and one posterior marginal pair of strong and one anterior pair of weak dorsocentrals in front of scutellum, the posterior acrostichals well developed; sternopleurals 1 + 1; mesopleural hairs not flattened. Abdomen longer than thorax, and about one and a half times as long as wide, basal visible tergite

longest, the others, except fifth, subequal in length. Legs normal, trochanters and bases of fore and mid femora pale haired, hind femora entirely black haired. Inner cross-vein of wing more than one-third from apex of discal cell; bend of fourth vein evenly rounded.

Length, 7 mm.

Type, Woodford, N.S.W., 15.11.1925 (Nicholson).

This species will not find a place in my key already printed, as it is intermediate in length between the two segregates. It is related to *nigrisquama*, having the apical scutellar bristles at tip, but the head is different in shape from that of that species.

In a paper received by me after my catalogue of this family had been sent to the press I find a description by C. H. Curran of *Alophora aureiventris*, a new species from Queensland (*Bull. Ent. Res.*. 18, pt. 2, 1927, 165). If this species is referable to *Hyalomyia*, and I can see no reason why it should not be, it differs from any other known to me in the male sex by the colour of the wings, which are "blackish, with pale streaks in the costal cell, along the third and fifth veins, and in the apical cell, the veins more or less yellow basally". The dorsum of the thorax also appears to be distinctively marked, having "four rather broad, subshining black vittae, and with a large, transverse, golden pollinose presutural spot which is triangularly produced in the middle almost to the suture". The abdomen of the male is golden pollinose dorsally, with sometimes the apical segment and part of the preceding one darkened, and an obscure median vitta. The female has the wings hyaline, and the abdomen black, the second and third segments with broad, interrupted, yellowish pollinose basal fasciae, the fourth segment usually wholly yellowish pollinose, and the venter grey as in the male. This is as large a species as *costalis*, and evidently with much broader wings in the male.

Reared from the hemipteron *Dysdercus sidae*.

In the same paper there are two other Australian species of the family described, which were not included in my catalogue when originally submitted for publication; these were subsequently added.

HYALOMYIA sp.

The species which I mention above as being in too poor condition to describe is about the same length as *costalis*, but has the wings entirely fuscous, darker costally, and with a hyaline streak along the costal margin of third vein, the thorax with four dark vittae, the central pair ceasing about midway between suture and the hind margin. Lack of the abdomen prevents me from describing the species fully, but the above may suffice to identify it should anyone have perfect specimens.

Tribe **Ameniini**.

Genus AMENIA Robineau-Desvoidy.

I have previously presented a key to the known species of this genus in this series of papers, and now describe a new species which is quite different in general appearance from the others. No previously recognized species has the abdomen densely greyish-white dusted and with conspicuous black spots, all being brilliant metallic blue or green, with or without darker areas, and with conspicuous white dusted spots on thorax and abdomen. This distinction in coloration alone is sufficient to separate the new species from the others.

I append below records of two of the old species.

AMENIA PARVA Schiner.

Two specimens, Norton's Basin, Nepean R., 17.10.1920 (Musgrave), and French's Forest, N. Sydney, N.S.W., 12.3.1923 (T. G. Campbell). Australian Museum.

AMENIA LEONINA (Fabricius).

Two females, Gundamaian, Port Hacking, N.S.W., 12.3.1927 (T. G. Campbell), and Deep Creek, 20 miles from Kingscote, Kangaroo Is., S.A. (E. Troughton). Australian Museum.

AMENIA NIGROMACULATA, n. sp.

Male.—Head bright orange-yellow, occiput black except on sides below, ocellar triangle black, basal two antennal segments fuscous, proboscis and all cephalic hairs black, aristae fuscous at bases, yellow apically. Thorax black, slightly bluish at edges of the white dorsal spots, mesonotum with two white dusted submedian vittae, but the specimen is greasy where the pin is inserted so that they appear to be broken at posterior side of the suture which may not be the case in perfect specimens, and in addition to these vittae there are three spots on each side of same nature, the one on humeral region largest, mesopleura and sternopleura each with a similar spot; spiracular coverings black. Abdomen with the first visible tergite deep black, the others densely coated with greyish-white dust, through which a green tinge shows from the underlying surface, second tergite with five deep black marks, a spot in centre, a small one on each side of that at the lateral curve, and a small mark on each of the lateral edges, third tergite with two additional spots, each about as large as the central one, situated between the latter and the small one on lateral curve, fourth tergite with a large central black apical mark which is subtriangular in shape, its apex broad. Legs black, femora purplish. Wings clear, infuscated at bases. Calyptrae and halteres fuscous.

Frons at narrowest point a little wider than third antennal segment, the latter about as long as distance from its apex to mouth margin and not two-thirds as long as height of cheek. Thorax with 2 or 3 + 4 well developed dorsocentral bristles, and about three pairs of presutural acrostichals; sternopleurals 2 + 1; scutellum with eight marginal bristles. Abdomen broadly ovate, two strong bristles on each of the black dorsal spots on tergites 2 and 3, and one on the spot at lateral curve. Legs normal. Wings as in *parva*.

Length, 9 mm.

Type, Perth, W.A., 1.11.1924 (Nicholson).

Submitted by Dr. I. M. Mackerras, and to be returned to him.

Tribe **Microtropezini.**

Genus MICROTROPEZA Macquart.

Up to the present time only one species has been included in this genus, but before me now there are four, two of which can be readily distinguished from the genotype by the yellow colour of the abdomen, but the other is not so readily separated. In essential characters they all agree, possessing the features considered by me as of generic import in my previous treatment of the genus in part xvii of this series of papers, as well as the series of short hairs on the upper half of the occiput between the postocular ciliae and the eye, and an exceptionally short costal section between the apices of second and third

wing veins (Text-figs. 1, 2), the last two characters not already mentioned by me. The four known species may be distinguished by means of the following key.

Key to the Species.

1. Abdomen black to castaneous in colour, distinctly shining, with the anterior margins of visible tergites 2 to 4 densely grey dusted, most broadly on 4, and on 3 and 4 with a central extension of the grey dust and a similar extension along lateral edges, so that each has a large deep black spot on each side of dorsal exposure .. 2
   Abdomen entirely ochreous, with a more or less evident central dark vitta on the basal two or three tergites, but never with deep black dorsal paired spots 3
2. Mesopleura largely yellow-haired, but with some strong black hairs on centre of disc; no conspicuous black mark on the extreme lateral incurved margins of tergites; fore tarsus of female but slightly widened (Text-fig. 3*b*) ..... *sinuata* Donovan
   Mesopleura entirely yellow-haired, without any black hairs on centre of disc; a conspicuous black mark on each lateral incurved margin of each tergite except the second; fore tarsus of female much widened (Text-fig. 3*a*) .. *latimana*, n. sp.
3. Visible tergites 3 and 4 ochreous, when seen from behind with dense uniform ochreous dust; tarsi with at least the apical segment fuscous; sternopleurals two in number (1 + 1) ..... *ochriventris*, n. sp.
   All visible tergites when seen from behind with dense grey dusting and a pair of large glossy ochreous spots on dorsum; tarsi entirely yellow; sternopleurals three in number (2 + 1) ..... *flavitarsis*, n. sp.

MICROTROPEZA LATIMANA, n. sp.

Female.—This species agrees so closely with *sinuata* that it may readily pass for it unless carefully examined. In general habitus and coloration the two species are strikingly alike, but the lack of any black hairs on centre of mesopleura, the presence of large black spots on lateral edges of the tergites, and the broad fore tarsi of the female, should distinguish this species from the genotype. It is also noteworthy that the large black submedian spots on the dorsum of abdomen extend the entire length of the tergites forming a complete serrate vitta on each side, the tarsi in *sinuata* are fuscous, but slightly yellowish on base of first segment, while in *latimana* the basal segment is almost all yellow and the fifth is entirely so. In my previous note on the genotype I did not mention the disparity in size of the tarsal claws of the sexes which I now illustrate for this species. I assume that this same distinction exists between the sexes of the other species, as the claws and pulvilli are long in the male of *flavitarsis* while in the females of *ochriventris* both are short. The fore tarsi of the female of *ochriventris* are the same as in *sinuata*. Except for the characters listed above the present species is similar to *sinuata*.

Length, 14 mm.

Type, Queensland, no other data. Australian Museum.

MICROTROPEZA SINUATA (Donovan).

I have before me three examples of this species from the following localities: 2 females, King George's Sound, W.A., and 1 male, Gayndah, Queensland (Masters). Australian Museum.

MICROTROPEZA OCHRIVENTRIS, n. sp.

Female.—Ochreous, shining, aristae dark brown, head orange-yellow, face white dusted, cheeks and parafacials yellow dusted, mesonotum infuscated on disc and slightly bronzy or coppery when seen from the side and above, with rather conspicuous white dust which divides the dark portion into four broad vittae, the

sublateral pair divided at suture, and none of the vittae extending clearly to hind margin; centre of each pleural sclerite rather noticeably white dusted, the small knob-like protuberance on pleura in front of base of wing covered with white pile. Second visible abdominal tergite more or less darkened and with noticeable white dust centrally, when seen from behind with dense pale yellow dust on front half and with two dark ochreous subtriangular spots behind, the abdomen otherwise ochreous and densely yellow dusted, not shining when seen from behind. Legs yellow, apical segment of each tarsus fuscous. Wings greyish hyaline, not yellow on basal half as in *sinuata*. Calyptrae and halteres ochreous yellow. Occiput with stout orange hairs.

Structurally similar to *sinuata*; parafacials quite strongly haired; cheek about two-thirds as high as eye. Thorax not so strongly bristled as in *sinuata*; presutural acrostichals two pairs. Abdomen with bristles weaker than in *sinuata*, especially on sides of fourth visible tergite and on apices of sternites, the fourth tergite of female not so pronouncedly emarginate at apex as in that species. Legs and wings as in *sinuata*.

Length, 11-13 mm.

Type and two paratypes, Allyn Range, Barrington Tops, N.S.W., February, 1925, on *Leptospermum* (Sydney University Zool. Exped.).

Submitted by Dr. I. M. Mackerras, to whom the species will be returned.

MICROTROPEZA FLAVITARSIS, n. sp.

Male.—Similar in general coloration to the preceding species, differing as stated below. It must be noted that I have only a male of this species and females of the preceding one, and there may be sexual differences in the species which, under the circumstances, I note as of specific significance.

The frontal orbits are shining and undusted in *ochriventris*, but in *flavitarsis* they, as well as the face and cheeks, are greyish-white dusted. The mesonotum lacks the coppery lustre of the preceding species, and while in *ochriventris* the submedian dark vittae are evidently fused anteriorly in front of the suture when seen from the side and behind, in the present species these vittae are separated by a stripe of grey dust. As in *ochriventris* the first and second tergites are dark centrally, but here the second has a quite noticeable black central vitta and there are traces of a dark line on third, the large glossy, ochreous spots on the tergites are similar in form and size to the black spots on the abdomen of *sinuata*, and they do not extend to the extreme lateral edges of the tergites. Legs entirely yellow. Wings quite conspicuously yellow at bases as in *sinuata* and *latimana*. Calyptrae and halteres yellow.

Frons at vertex fully one-fifth of the head width, without forwardly directed supraorbitals; second segment of arista about three times as long as thick; third antennal segment subequal to second. Thorax with bristles as in *sinuata*; sternopleurals 2 + 1. Abdomen robust, second visible tergite with about eight closely placed bristles on central portion of apical margin, third tergite with a complete series at apex, fourth with rather numerous bristles laterally, the bristles of transverse series subapical centrally, the tergite emarginate at apex in middle; sternites 2 to 4 strongly bristled at apices. Legs as in *sinuata*, fore tarsal claws and pulvilli long. Wings normal.

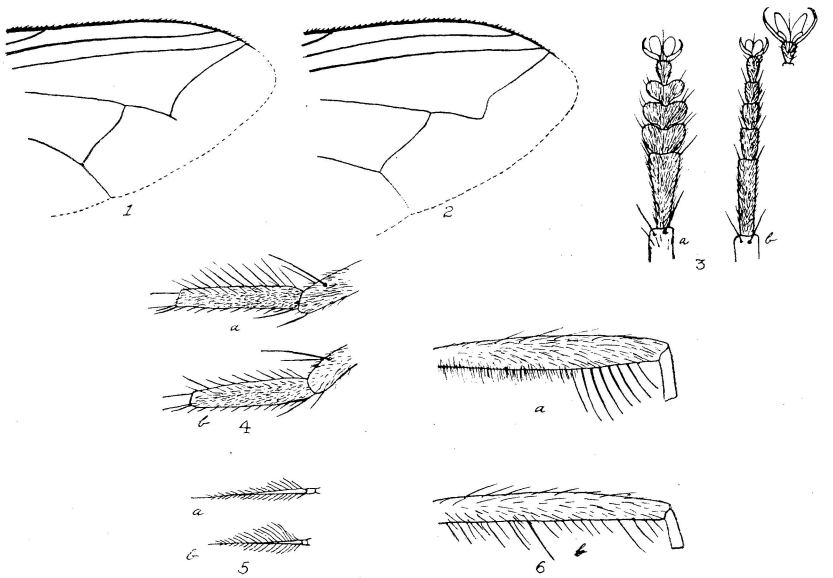
Length, 12·5 mm.

Type, Tasmania, no other data. Australian Museum.

Tribe **Cylindromyiini.**

Genus CYLINDROMYIA Meigen.

This genus is better known as *Ocyptera* Latreille, and under that generic name five Australian species have been associated, four of which I included in *Ocyptcropsis* Townsend in my recently published catalogue of the Australian Tachinidae. A careful scrutiny of the descriptions of these species indicates the probability of there being but one species represented by the names *flavifrons* Macquart and *bimacula* Walker, and *bicolor* Bigot is very similar. All three of these descriptions indicate species with the abdomen bicoloured, black and red,



Text-fig. 1.—*Microtropeza sinuata*, apex of wing.
Text-fig. 2.—*Microtropeza ochriventris*, apex of wing.
Text-fig. 3*a*.—*Microtropeza latimana*, fore tarsus of female from above.
Text-fig. 3*b*.—*Microtropeza sinuata*, fore tarsus of female from above, and apical segment of fore tarsus of male.
Text-fig. 4*a*.—*Prodiaphania georgei*, hind metatarsus of male from the side.
Text-fig. 4*b*.—*Prodiaphania testacea*, hind metatarsus of male from the side.
Text-fig. 5*a*.—*Prodiaphania georgei*, arista.
Text-fig. 5*b*.—*Prodiaphania testacea*, arista.
Text-fig. 6*a*.—*Prodiaphania testacea* ?, hind femur of male.
Text-fig. 6*b*.—*Prodiaphania testacea*, var. *claripennis*, hind femur of male.

the base and apex being black, and the central portion red with black dorsal spots. The fourth description, that of *tristis* Bigot, refers to an entirely black species which has white dusted bases to the abdominal tergites. Walker's species *diversa* does not belong to this genus in my opinion.

Both Walker and Macquart make particular mention of the yellow frons of the species they described, the latter author utilizing this character as the basis for his specific name, and despite the fact that the specimen now before me has the frontal orbits silvery instead of yellow, I consider it is the female of *flavifrons*.

It may be pertinent at this time to deal with the characters of the genus.

The name *Cylindromyia* was proposed by Meigen in 1803, *Ocyptera* by Latreille in 1805, the same species being the genotype in both cases. Meigen subsequently used Latreille's name for the genus in 1824, and with few exceptions this course was followed until 1910 when Coquillett adopted *Cylindromyia* and pointed out the synonymy. The most recent paper on the genus is that by Aldrich on the North American species and in this *Cylindromyia* is adopted and a full consideration of the synonymy presented (*Proc. U.S. Nat. Mus.*, art. 23, vol. 68, 1926, 1-27). The genus as accepted by Aldrich contains several generic concepts of Townsend, but he dealt with North American forms only and *Ocypteropsis* Townsend, being Australian, was not included. I now propose to sink this name also as a synonym of *Cylindromyia*.

I would define the genus as follows: Thorax chitinized on entire extent of its hind margin below base of abdomen and above hind coxae, presenting an almost vertical wall; pleural knob not outstanding, similar to that of typical Tachinidae; lower calypter long, rather narrow, and evenly rounded at apex, without an inner lobe, upper calypter short, almost a transverse strip; parafacials bare; facial ridges not setulose except for a short distance above vibrissae; palpi microscopic or totally lacking; proboscis slender, about as long as height of head, not geniculated except near base; prosternum and centre of propleura bare; fourth wing-vein connecting with third well before apex of latter, the tip of third curving forward towards costa and ending well before tip of wing.

The relationships of the genus have been the subject of various opinions, while the status of the group to which it belongs has been quite variously treated by different authors. In some cases the group has been accorded family rank, in others it has been reduced to a subfamily near Phasiinae, and in yet others treated merely as a tribe. Possibly this last definition is the proper one, but how many related genera there are at present known I am unable to state. *Cylindromyiella* Malloch, a Philippine genus, I would place in the tribe; it has the third wing-vein ending a little before apex of wing, the fourth ending as far behind apex and directly below apex of third, the first posterior cell open, and the venation like that of many Phaoniinae of the family Muscidae owing to the very slight forward curvature of the fourth vein. The proboscis is short and stout, and the palpi are large. Other genera that belong to the tribe are: *Penthiosoma* Townsend, a Philippine genus with venation similar to that of *Huttonobesseria* Curran, but the male has two forwardly directed bristles on each orbit; *Besseria* Robineau-Desvoidy, a European genus with closed first posterior cell of the wing as in *Cylindromyia*, but the third vein runs straight to the wing margin beyond its fusion with fourth instead of running obliquely forward into the costa, and the abdomen lacks strong dorsal bristles; *Oedamasoma* Townsend from North America is a synonym of *Besseria* in my opinion; *Euphania* Townsend is a European genus quite similar to *Penthiosoma*; *Ichneumonops* Townsend and *Polistiops* Townsend are rather bizarre forms which are doubtfully distinct from *Cylindromyia*. *Penthosia* van der Wulp and *Beskia* Brauer and Bergenstamm are closely related to *Xanthomelaena* van der Wulp and do not belong to the tribe as accepted by me.

I know of no other Australian genus of the group than *Cylindromyia*, but place *Huttonobesseria* Curran, erected for the reception of *Phania verecunda* Hutton from New Zealand in the same segregate. It has the first posterior cell of the wing open, ending almost in the wing tip, and the palpi well developed.

CYLINDROMYIA FLAVIFRONS (Macquart).

Female.—Black, head with dense white dust, interfrontalia fuscous, orbits silvery, antennae black, hairs on lower occiput white. Thorax with white dust, that on dorsum leaving two rather broad, and not very clearly defined black vittae, the lateral margins most densely dusted. Abdomen bright red, black on first tergite, apical two-thirds of fourth, and all of apical segments and the genitalia, a transverse mark on base of second tergite which extends narrowly backward in centre almost to middle of tergite, and an elongate spot on middle of third tergite; bases of tergites narrowly white dusted. Legs black. Wings greyish hyaline, yellow at bases. Calyptrae white. Halteres with fuscous knobs.

Frons at vertex about one-fourth of the head width, all verticals present, the outer pair shorter than the inner, ocellars and postocellars moderately long, equal; each orbit with two strong and one weak outer forwardly directed bristles; mouth margin slightly produced. Thorax as in *argentea* Coquillett; scutellars 6, apical pair short; sternopleurals 2. Abdomen with a pair of strong bristles at some distance from hind margin of tergites 2 to 4 inclusive, and a strong lateral bristle on those tergites and 5; genitalia tubular, slightly curved up at apex, with some short ventral bristles, and extending forward to level of base of fourth tergite. Legs normal; hind tibia with two anteroventral bristles. Angle of fourth wing vein with an appendage.

Male.—There are two males identified as this species in the collection of the United States National Museum, and apparently correctly so. Apart from the yellow-dusted frontal orbits and upper parafacials the thoracic dorsum shows four distinct black vittae which are not discernible in the female specimen described above.

I may be in error in associating these specimens as the sexes of one species, but their striking similarity leads me to do so despite the distinctions mentioned and their being from widely separated localities.

Length, 8 mm.

Localities: Female, Perth, W.A., November 15, 1924 (Nicholson); male, Sydney, N.S.W.

Tribe **Rutiliini.**

With the accession of more material I am enabled to present some more data on this tribe which may be of service to Australian students, though of course I am in no position to deal *in extenso* with the group.

It must be noted that the order in which the tribes appear in this paper is in no way to be accepted as indicative of their relationships.

Genus PRODIAPHANIA Townsend.

I have now in hand at least two species of this genus which are readily separable by structural characters. In my recently published catalogue of this family I included only one synonym of the genotype, *echinomides* Bigot, but Engel cites two others, *Rutilia analoga* Macquart, and *Senostoma variegata* Macquart. Without examining the type specimens of these two, it is impossible to verify this statement.

The new species may be distinguished from *testacea* as below:

A. Hind tibia without bristles on the posterodorsal surface except the one close to apex; hind tarsus of male with a series of bristles along the anterodorsal surface of basal segment which are longer than the diameter of that segment (Text-fig. 4*a*); arista short haired (Text-fig. 5*a*) ..... *georgei*, n. sp.

AA. Hind tibia with several quite prominent posterodorsal bristles on central portion; hind tarsus with shorter anterodorsal bristles on basal segment; arista longer haired (Text-fig. 5*b*) ..... *testacea* Macquart

PRODIAPHANIA GEORGEI, n. sp.

Male.—Similar in general coloration and structure to *testacea*, the scutellum largely testaceous, abdomen semipellucid brownish testaceous, with a broad dorsocentral black vitta, the dark sub-basal mark on the wing is pale brown, much paler than in typical *testacea* from the eastern section of Australia.

Structurally the species are similar, but the longer bristles on basal segment of hind tarsi, the lack of posterodorsal bristles on central portion of the hind tibia, and the shorter haired arista, sufficiently distinguish *georgei* from the genotype. The prosternum is bare laterad of the plate.

Length, 13-14 mm.

Type and one paratype, King George's Sound, W.A., no other data. Australian Museum.

PRODIAPHANIA TESTACEA (Macquart).

I am convinced that this species requires further elucidation, as I have before me two forms of the male which are distinguished by the armature of the hind femora, neither of which may be typical *testacea*. I give below a diagnosis of these forms and assign a new varietal name to one of them; the other may not be typical *testacea* either, as the females I accept as that form have the armature of the hind femur as in *georgei* and the variety *claripennis*.

A. Wing with a conspicuous dark brown mark close to base; hind femur with some long bristles on apical third on anteroventral surface, with fine hairs and no bristles on basal two-thirds (Text-fig. 6*a*) ..... *testacea* (Macquart)

AA. Wing without a dark mark close to base; hind femur as in *georgei*, with irregular bristles on the anteroventral surface, the longest near the middle, and again near apex (Text-fig. 6*b*) ..... var. *claripennis*, n.

var. TESTACEA (Macquart).

Females before me which I assign here, and which agree with available descriptions, have the anteroventral series of bristles on the hind femur as in *georgei*.

Localities.—Sunnybank, Qld., three, 13.12.1925 (A. Musgrave); Como, N.S.W., two, 14.11.1922 (T. G. Campbell). Australian Museum.

The male which was used as a basis for the figure of the femur (Text-fig. 6*a*) is from Moruya, N.S.W., 21.1.1905 (G. W. Compere), and is in the United States National Museum. The hind metatarsus has the anterodorsal bristles longer than is the case in *claripennis*, but not so long as in *georgei*. This may be a distinct species, as there are some long bristly hairs on each side of the prosternal plate on the membrane and there are no such hairs on any other specimen before me now.

var. CLARIPENNIS, new.

This may also be a new species, but further material is essential for a definite conclusion. It agrees with *testacea* in the hairing of the arista, but the wing has

no dark basal mark, the hind femur is armed as in *georgei*, and the hind metatarsus is much shorter bristled on anterodorsal surface (Text-fig. 6*b*).

Length, 11·5 mm.

Type, King George's Sound, W.A., no other data. Australian Museum.

I have seen a specimen from Eastern Australia in which the wings are unmarked, but think it is an aberrant specimen of *testacea*.

Genus RUTILIA Robineau-Desvoidy.

Below I append some notes on recently received examples of this genus. All of the material was received from the Australian Museum and is in excellent condition, providing a basis for a better determination of the specific characters than any in previous accessions.

I have carefully examined Walker's descriptions of species of this genus and in only one or two cases can I suggest their identity. I consider it almost certain that *chersipho*, described without locality record and not included in my catalogue, is *erichsoni*, *idessa* is probably *splendida*, and *uzita* appears to be *formosa*.

In addition to Walker's species there are three described by Thomson, a large number by Macquart, and some by Bigot, which have not yet been definitely identified.

Of Thompson's species I can confidently assign *albopicta* as a synonym of *leucosticta* Schiner. It was described from a specimen taken at Sydney, N.S.W., and the very full description of the markings, including the two white-dusted spots on the posterior portion of the mesonotum, with mention of the apical bristles on the central portion of the second abdominal tergite, leaves no doubt as to the identity of the specimen. There is some doubt as to the priority of the Schiner paper over that of Thomson, but the generally accepted practice is to give precedence to Schiner. The other two Thomson species are not so readily identified, but I feel certain that *pubicollis* is merely *formosa* Robineau-Desvoidy, while *spinipectus* is evidently near *viridinigra* Macquart.

Of the Macquart species two, *media* and *minor*, appear to me to be either synonyms of *Senostoma ruficornis* or species very close thereto. His *assimilis* does not belong to *Rutilia* and, having before me a specimen which I consider belongs to this species, I accept *Paramphibolia* Brauer and Bergenstamm as a valid genus, this species being the genotype. For a consideration of this genus see subsequent text matter. It is not possible definitely to identify all of Macquart's species from the descriptions, but possibly there are some types in the Bigot collection now in the possession of Mr. J. E. Collin which will help to place definitely those so represented. It is possible that *elegans* Macquart is merely *imperialis* Guérin. The specimens used in this paper will all be returned to the Australian Museum and comparison with them ought to make possible the identification of further accessions and, though in one or two cases the exact specific name may be slightly doubtful, they will afford a basis for subsequent work until accurate identifications based upon type examination are available.

The type specimens of Bigot's species are, I assume, all in the collection in Mr. Collin's possession and identification thereof should be readily made by comparison with recent material.

One remarkable feature of the genus is the much elongated penis of the males, shown in Text-figure 7. This character holds throughout the genus, and in *Formosia*, *Amphibolia*, and *Prodiaphania*. Lack of material for dissection prevents

me from dealing at greater length with this feature of the group, but possibly it will be found to be of value in tribal segregation, as it clearly distinguishes the genera above mentioned from *Microtropeza* Macquart, *Amenia* Robineau-Desvoidy, and *Stilbomyia* Macquart, in which the internal portions of the male hypopygium are shorter, more complicated, and partake more of the sarcophagid or calliphorid type. This distinction has already been mentioned by Engel in his paper on Rutiliinae, but he did not arrange the genera in sequence according to this criterion, nor did it influence him to examine the other structures of the abdomen more carefully in *Prodiaphania* and *Chrysopasta*. Had he done so his arrangement of the genera both in his key and text would have no doubt been materially different.

I have not been able to dissect all the species of *Rutilia* available to me, but a careful examination of these and of Engel's figures of the hypopygia of a number of species makes it appear possible to group those now retained in *Rutilia* upon the basis of the hypopygia, in similar manner to that adopted herein on the basis of the frontal armature of the females. The outer forceps of the *formosa* group (Group I) is much narrower and more tapered apically (Text-fig. 7) than in the *vivipara* group (Group II) (Text-fig. 8). There is no outstanding difference in the penis of the two groups judging by the two species I have dissected. The fifth abdominal sternite in all species known to me is very deeply cleft in the males and I have observed no outstanding structural peculiarities in any of the species examined.

I have made no effort to discover the internal structure of the female genitalia, but possibly these will develop specific or generic characters.

I have attempted to key the species of this genus available to me in my previous papers, using in my first attempt the presence or absence of hairs on the parafacials below the bases of the antennae as my first character, and in my second attempt, having found it difficult to apply that criterion to all the material then available, I resorted to the nature of the armature of the hind tibia (Text-fig. 9). Now, with a larger number of species, though both the above-mentioned characters are quite reliable, I find that in applying either or both the result is an incongruous grouping of the species involved. I therefore defer further attempts to key all the species, present below notes on those now on hand, with suggestions as to grouping, and key the *desvoidyi* group.

It appears probable that an intensive study of the genus will result in the segregation of certain groups, one (Group I) in which there are no forwardly directed supraorbitals on the female, and the other (Group II) in which these bristles are present, impressing me favourably as possible subgenera. This division is supported by another character in the females, the group without the anteriorly directed supraorbitals in the female always having an anterior sternopleural bristle in that sex,. while the other group lacks that bristle, except in Section 1 in which it occurs in both sexes. Unfortunately the males are not characterized in the same manner, both groups lacking the anterior sternopleural in that sex, except in Section 1 of Group II, so that a rearrangement of the species on the basis of these characters is not attempted at this time.

The subgenus *Senostoma* Macquart has the same characters as *vivipara*, both sexes having the anterior sternopleural present. The arista is distinctly short-haired instead of only pubescent, and the species are more slender and brighter coloured, metallic green, than is the case in *Rutilia, sens. str.*

We have, therefore, groups as below.

Group I.	Group II.	Group II.
formosa Rob. Des.	Sect. 1, *vivipara* Fab.	Subgenus *Senostoma* Mcq.
erichsoni Engel	*micans*, n. sp.	*ruficornis* Mcq.
leucosticta Schiner	*micropalpis*, n. sp.	*albovirida*, n. sp.
imperialis Guérin	Sect. 2, *regalis* Guérin	*hirticeps*, n. sp.
splendida Donovan	*inornata* Guérin	*flavipes* B. & B.
argentifera Bigot	*desvoidyi* Guérin	*nigriceps*, n. sp.
	viridinigra Macq.	
	pellucens Macquart	
	lepida Guérin	
	ethoda Walker	
	potina Walker	
	dubitata, n. sp.	

Group I. *Females without forwardly directed frontals.*

RUTILIA FORMOSA Robineau-Desvoidy.

In my previous papers on this genus I accepted as the above species specimens in which the general colour is a bright metallic emerald or blue-green, without conspicuous white-dusted marks on either the thoracic or abdominal dorsum, and the pleural hairs are preponderantly yellow. In my first paper (These PROCEEDINGS, 53, pt. 3, 1927, 348) I dealt with some variations from type, and suggested the possibility that some of the more distinct of these might prove to be distinct species. I have now before me a number of recently received examples from different localities, some of which present characters not noted by me previously. All agree in lacking the forwardly-directed outer bristles on the upper third of the frontal orbits in the female.

The typical form I accept as possessing a fringe of short closely placed bristles on the entire length of the anterodorsal surface of the hind tibia (Text-fig. 9*a*), with one outstanding longer bristle in the series beyond the middle, a quite conspicuous sub-basal dark mark on each wing, the sternopleural bristles 1 + 1, and no bristles on the presutural lateral area of thorax in the sublateral series, only the posthumerals being represented by one or two of the series.

Localities.—Como, N.S.W., 6.12.1913, and One Tree Hill, Q., 12.12.1925 (A. Musgrave). Australian Museum.

RUTILIA FORMOSA, var.

This variety agrees with the typical form in most particulars, but the hind tibia has the anterodorsal series of bristles as in Text-fig. 9*c*, there being no outstanding submedian bristles in the series.

Localities.—Female, and allotype, One Tree Hill, Q., 12.12.1925 (A. Musgrave), female, lagoon near Lee Farm, Plunkett, Q., 20.12.1925 (A. Musgrave and G. P. Whitley). Australian Museum. Three badly discoloured specimens from Lord Howe Island appear to belong here.

RUTILIA FORMOSA, var. SUBVITTATA, new.

This variety differs from the others in having the dorsum of the thorax more noticeably quadrivittate with black, the wings yellowish at bases and without a sub-basal dark mark, the sternopleurals 2 + 1, and the posterior sublateral bristle present but weak. The antennae are rufous yellow. In other respects like typical *formosa*, the hind tibiae similarly armed, but with three instead of one posterodorsal bristle, and the upper extremities of the frontal orbits are not at

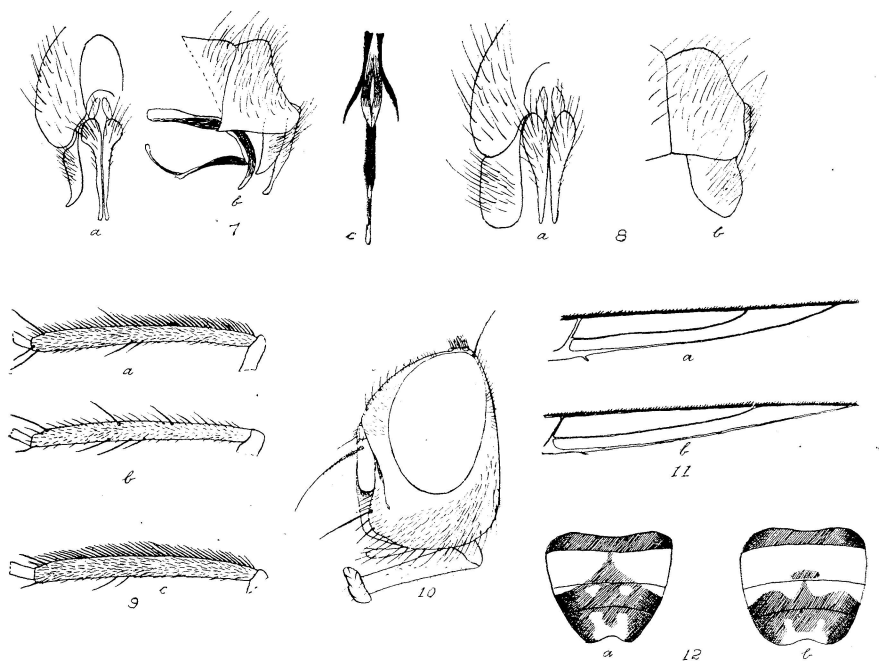
all metallic green in colour. It is possible that the number of sternopleurals varies in the species, but I have seen no other example in which they are more than two in number. Possibly a distinct species.

Locality.—Type, female, King George's Sound, W.A., no other data. Australian Museum.

RUTILIA LEUCOSTICTA Schiner.

Two males and a female before me agree in all essential characters with the type specimen sent to me by the Vienna Museum, and with others so identified by Engel.

Localities.—National Park, N.S.W., two (A. Musgrave), Blue Mts., N.S.W. (A. Musgrave).



Text-fig. 7.—*Rutilia splendida*, hypopygium of male. *a*, rear view; *b*, side view, *c*, penis from above.
Text-fig. 8.—*Rutilia pellucens*, hypopygium of male. *a*, rear view, one side; *b*, side view.
Text-fig. 9*a*.—*Rutilia erichsoni*, hind tibia of male.
Text-fig. 9*b*.—*Rutilia micans*, hind tibia of male.
Text-fig. 9*c*.—*Rutilia regalis*, hind tibia of male.
Text-fig. 10.—*Rutilia inornata*, head of male from the side.
Text-fig. 11*a*.—*Rutilia ruficornis*, auxiliary and first veins of wing.
Text-fig. 11*b*.—*Rutilia pellucens*, auxiliary and first veins of wing.
Text-fig. 12*a*, *b*.—*Formosia atribasis*, dorsal pattern of abdomen of male.

The last mentioned specimen is a male which is rather small for this species, 12 mm. in length, and lacks the fine hairs on the lower half of parafacials, close to the eyes. It agrees in other respects with a much larger specimen of the same sex, though the characteristic golden brown hairs on the bases of the femora are less numerous than is usual in this sex. This species agrees with *formosa* in lacking forwardly-directed supraorbital bristles in the females.

RUTILIA ERICHSONI Engel.

In addition to the characters made use of in my key for distinguishing this species from *splendida*, it appears worth noting that the dorsum of the thorax, when seen from directly above, has only two metallic blue vittae on a deep black ground in *erichsoni*, while in *splendida* the ground colour appears to be green, with four black vittae, owing to the greater development of the pale lateral areas and the presence of a pale central vitta. Also in *erichsoni* there are some golden-brown hairs on the anterior face of thorax on each side, which lie close against the centre of the propleura, and are difficult to detect unless the head stands free of the thorax; in *splendida* these hairs are black. Female without forwardly-directed supraorbitals in both species, the frons bright yellow to upper margin in *erichsoni*, the orbits greyish in *splendida*, becoming darker above, sometimes partly greenish at upper extremities. The lower calypter is white in *erichsoni*, brown in *splendida*.

Localities.—Male and female, King George's Sound, W.A.; female, Queensland, no other data. Australian Museum.

These specimens agree with the three in the type series belonging to the Vienna Museum now before me. It appears worth noting that the type bears two labels, one apparently in Erichson's writing with the name *Agria iniana* Er., the other *erichsoni* det. B. & B. The locality of this specimen is Swan River.

In both females of *erichsoni* the hind tibia has the armature as in typical *formosa*, while in the male it is as in the listed but unnamed variety of that species. In both sexes of *leucosticta* the hind tibia is armed as in *desvoidyi*, there being more than one outstanding anterodorsal bristle present.

RUTILIA SPLENDIDA Donovan.

This species belongs to the same group as those already dealt with above, having no forwardly-directed supraorbital bristles in the female. The hind tibia is armed on the anterodorsal side with either a quite regular series of bristles, or there is one slightly longer bristle in the series beyond the middle.

Localities.—Deep Creek, 20 miles from Kingscote, Kangaroo Is., S. Aust., six (E. Troughton); Como, N.S.W., one, 14.11.1922 (A. Musgrave); Megan, E. Dorrigo, N.S.W., one, 1.1.1923 (A. Musgrave), Ulong, E. Dorrigo, N.S.W., one, Feb.-Apr., 1923 (W. Heron). Australian Museum.

RUTILIA IMPERIALIS Guérin.

This species belongs to the same group as *splendida*, lacking the forwardly-directed supraorbitals in the female, and having the hind tibia with a regular series of anterodorsal bristles. It is closely related to that species, but may be readily distinguished from it by the characters listed in my key to the species of this genus already printed in this series of papers, the most striking of these being the dark coloured hairs on parafacials and cheeks. The abdomen, especially in the female, is frequently marked with a pair of small submedian green spots on tergites 2 and 3.

Locality.—One pair, Fern Tree Gully, Melbourne, V., February, 1928 (A. Musgrave). Australian Museum.

RUTILIA ARGENTIFERA Bigot.

This species is known to me only in the male sex, but I consider it belongs to the *formosa* group, there being but one sternopleural, and the hind tibia having one outstanding bristle in the series on the anterodorsal surface. The parafacials

and cheeks are yellow, with dense golden-yellow dust, and the former are yellow-haired to the lower level of eyes. The calyptrae are fuscous, with the connecting angles pure white.

Locality.—Cairns, N. Qld. U.S. National Museum.

Group II. *Females with one or two forwardly directed frontal bristles.*
Section 1. Sternopleurals 1 or 2 + 1 in both sexes.

RUTILIA VIVIPARA Fabricius.

A shining brownish-red species, with dorsum of thorax broadly infuscated, sometimes almost to scutellum, the dark part grey dusted, more or less aeneous or coppery and with four dark vittae, pleural hairs mostly yellow, those on mesopleura fuscous, abdomen with a dark dorsocentral vitta, whitish dusting on bases of tergites, and the apices of latter appearing dark owing to the presence of strong apical bristles, wings greyish hyaline, without a distinct sub-basal dark mark, legs tawny, hind tibia with the anterodorsal fringe short and irregular and one or two quite strong anterodorsal bristles, parafacials not haired below bases of antennae.

This species is very similar in appearance to *desvoidyi.* but has, besides the above characters, an arcuate series of four or more strong bristles on centre of apex of second visible tergite which are never present in that species, the sternopleurals usually 1 + 1 in both sexes, and three instead of four postalar bristles.

Localities.—Blue Mts., N.S.W.; Tasmania; King George's Sound, W.A.; Albany, W.A., 21.11.1921 (Troughton, Grant and Wright). Australian Museum.

RUTILIA MICROPALPIS, n. sp.

Female.—Head black, centre of face, lower parafacials, and anterior portions of cheeks testaceous, orbits, face, and occiput with white dust, almost silvery, cheeks greyish-white dusted; palpi testaceous; frons and anterior portions of cheeks black-haired, occiput centrally and posterior portions of cheeks pale haired. Thorax metallic green, mesonotum posteriorly, and the scutellum, conspicuously coppery or purplish coloured, mesonotum with white dust and the usual four blackish vittae, anterior lateral margins more conspicuously white-dusted than disc; mesopleura rather conspicuously white-dusted, and with a white-dusted mark above fore coxa; some pale hairs on stigmatal region, on posterior portions of pteropleura and sternopleura, and on hypopleura, the other hairs, including those on sides of the scutellum, dark. Abdomen coloured as thorax, the tergites becoming deeper coloured from near bases to apices, the apices purplish, bases white-dusted, the dark dorsocentral vitta deep green and narrow, incurved ventral portions of tergites green, white-dusted; some golden yellow hairs at base of venter. Legs black. Wings greyish hyaline, with the sub-basal dark mark present. Calyptrae brownish. Halteres dark.

Each orbit with one forwardly-directed upper bristle; hairs ceasing a little below level of bases of antennae. Thorax with about three pairs of quite well developed presutural acrostichals, only two or three bristles between the pre-scutellar dorsocentrals; postalars 4-5; anterior sternopleural strong; scutellum not evidently flattened, with about ten marginal bristles and a few weaker sub-marginals. Abdomen with a pair of central apical bristles on second visible tergite, a complete series on apex of third, and a discal series on fourth, the latter

tergite not noticeably concave at apex; tergites not strongly bristled below. Fore tibia normal; fore tarsus subequal to tibia; mid femur with some anterior median bristles; hind tibia with three anteroventral and three posterodorsal bristles, the anterodorsal series closely placed to beyond middle, terminating in a much stronger bristle; hind coxae with weak ventral bristles. Wings normal.

Length, 13-15 mm.

Type, Como, N.S.W., 7.11.1923 (A. Musgrave and T. G. Campbell); paratype, Gunnamatta Bay, Port Hacking, N.S.W., 13.2.1926 (A. Musgrave). Australian Museum.

A quite exceptional species owing to the small size of the palpi. The paratype specimen has a ventral median bristle on both hind tibiae which is absent in the type. The weakly bristled hind coxae in this and the next species readily separate the two species from *vivipara*, in which there are present the usual strong decumbent backwardly-directed bristles characteristic of the *regalis* section of the genus.

RUTILIA MICANS, n. sp.

Female.—This species looks superficially like a larger form of the preceding species, but the head is quite bright yellow, with yellow dust, much like those of most of the *formosa* group, with the interfrontalia brown, and the upper occiput green on each side, and with whitish dust; the frontal hairs are dark, those on cheeks and occiput yellow; apex of third antennal segment brown; palpi yellow. Thorax testaceous, mesonotum broadly metallic emerald-green, with coppery or purplish reflections, especially on hind portion, the whole whitish-dusted and with four dark vittae, the spaces between the median and lateral vittae quite conspicuously white-dusted in front of suture, lateral margins each with four quite noticeable whitish-dusted spots as in *splendida*, the pleura with two large and one smaller white-dusted spots; the pleural hairs almost all yellow, as are those on sides of scutellum. Abdomen metallic green, the dorsum almost entirely purple, with whitish dust, a dark dorsocentral line, and dark apices to tergites; many of the hairs on sides and venter basally golden-yellow. Legs fuscous, tibiae tawny yellow. Wings greyish hyaline, bases brownish-yellow. Calyptrae and halteres yellow.

This species differs from the preceding one in having the palpi much longer, the ocellars sometimes slightly evident, and the forwardly directed supraorbitals much weaker, sometimes lacking. The presutural acrostichals are weak or absent, and the postalars are three in number. Abdomen as in *micropalpis*, the bristles at apex of second visible tergite variable in number. Hind tibia with one or two anterodorsal bristles, and the fringe poorly developed (Text-fig. 9*b*), the ventral bristle absent.

Length, 16-18 mm.

Type and three paratypes, Kosciusko, N.S.W., 5,000 feet, March, 1889 (Helms). Australian Museum.

This species is rather variable in the absence or presence of the forwardly directed supraorbital bristles of the frons, but I consider it better placed in this group than in Group I.

Section 2. Sternopleurals 0 + 1 in both sexes.

Subsection a. Second visible tergite without apical central bristles.—The members of this section are very difficult to differentiate satisfactorily. Structural characters that can be depended upon to distinguish the species invariably are

almost impossible to find and, though many of them are readily distinguishable by colour characters alone, it is hard to put the distinctions into words. Consequently it is with much satisfaction I am able to state that all the species will be subsequently found in the collection of the Australian Museum, where they may be compared with fresh material by interested students. I fear that the hypopygia will afford few outstanding characters for specific determination in the group, but, with plenty of material in hand, some resident dipterist may be able to present a more satisfactory set of differentiating characters than I do at this time. As a contribution to the elucidation of the species of Group II, I present the following key.

Key to the Species.

1. Sternopleura with at least two bristles (1 + 1); second visible abdominal tergite with some strong bristles at apex centrally; hind tibia with two or more posterodorsal and always at least one outstanding anterodorsal bristle 2
   Sternopleura with only one bristle, the anterior one lacking in both sexes 4
2. Palpi not nearly as long as basal segment of fore tarsus, when directed along the proboscis not attaining apex of basal segment of same; hind tibia with a series of closely placed anterodorsal bristles to beyond middle and at apex of the series one much stronger bristle ..... *micropalpis,* n. sp.
   Palpi much longer than basal segment of fore tarsus and extending well beyond apex of basal segment of proboscis; hind tibia with an irregular anterodorsal series of short bristles and one or two longer bristles in the series; postalars three .. 3
3. Thoracic dorsum reddish-brown, disc broadly fuscous, with greyish dust and four dark vittae, the lateral margins and pleura without conspicuous spot-like markings of white dust; scutellum slightly coppery; legs brownish testaceous; hind coxae with long strong backwardly-directed macrochaetae .... *vivipara* Fabricius
   Thoracic dorsum conspicuously metallic emerald-green, overlaid with white dust, the disc with four black vittae anteriorly and between these presuturally with vittae of white dust, lateral margins with four spot-like markings of white dust and the pleura with two similarly coloured spots as in *splendida*; scutellum and posterior portion of mesonotum brilliant coppery or purplish; legs largely fuscous; hind coxae with only weak backwardly-curved bristles .. *micans,* n. sp.
4. Third antennal segment at least as long as distance from its apex to mouth margin; parafacials bare from a little below level of apex of second antennal segment to lower margin ..... *inornata* Macquart
   Third antennal segment very distinctly shorter than distance from its apex to the mouth margin 5
5. Thorax and abdomen quite brilliant metallic emerald-green to blue-green; mesopleura and sternopleura with black hairs 6
   Thorax black or brown, with a more or less evident blue or green tinge on dorsum; abdomen testaceous brown or fuscous, sometimes with coppery, green or purple reflections, or, if the thorax and abdomen are quite evidently metallic green, the hairs on mesopleura and sternopleura are not all black 7
6. Calyptrae fuscous, almost black; abdomen deep metallic green or blue-green, rarely coppery on bases of the tergites, the apices of these and a narrow central vitta black, the bases white-dusted; large species, averaging 20 mm. in length; parafacials haired to about apex of second antennal segment ..... *regalis* Guérin
   Calyptrae greyish or yellowish-white; abdomen subdiaphanous, bright emerald-green on entire dorsum and venter in male, the tergites whitish dusted basally, appearing like mother-of-pearl, the dark dorsocentral vitta and the apices diffuse but distinct, appearing narrow; the female duller in colour and with broader dark marks on dorsum of abdomen; parafacials haired almost to lowest level of eyes ..... *lepida* Guérin
7. Pleura entirely black-haired 8
   Pleura largely yellow-haired 10
8. Parafacials haired to lowest level of eyes, quite densely so in the male, more sparsely so in the female; abdomen in both sexes brownish testaceous, subdiaphanous in the male, and with a rather broad uniform black dorsocentral vitta in that

Localities.—Males, Katoomba, N.S.W., December, 1925, Como, N.S.W., 14.11.1922 (A. Musgrave, T. G. Campbell); French's Forest, Sydney, N.S.W., 7.11.1922 (T. G. Campbell); female, Pt. Stephens, N.S.W., 12.11.1919 (A. R. McCulloch). Australian Museum.

RUTILIA INORNATA Macquart.

I have already recorded this species, but had only females prior to receiving the consignment from the Australian Museum. The male has the eyes larger than usual in the genus, and the face from mouth margin upward is more nearly vertical than in any other species (Text-fig. 10). The third antennal segment is not as long in the male as in the female, but it is longer than in allied species.

Localities.—Hunter's Hill, Sydney, N.S.W., Dec., 1919 (A. Read); Como, N.S.W., 6.12.1913, and 14.11.1922 (A. Musgrave); Gordonvale, Qld., Nov., 1917 (Edmund Jarvis). Australian Museum.

RUTILIA REGALIS Guérin.

The largest species of the genus known to me, rarely less than 20 mm. in length. Distinguished from other large species in this group with forwardly-directed orbitals in the female by the bright metallic blue-green thorax and green abdomen, the former being whitish-dusted and with four linear black vittae anteriorly, the abdomen with coppery or golden lustre, a narrow blue-black dorso-central vitta, and similarly coloured apices to tergites; cheeks greenish posteriorly. All pleural hairs and the calyptrae fuscous. Scutellum concolorous with mesonotum, flattened, rather sharply triangular, and with about eighteen marginal bristles. Second abdominal tergite without apical central bristles. Sides of prosternum with stiff black hairs.

Localities.—Narrabeen, nr. Sydney, N.S.W., April, 1928 (Purcell); Sydney, N.S.W., various collectors, October, February; Croydon, nr. Sydney, N.S.W., February, 1928 (Miss W. Hall); Willoughby, N.S.W., January, 1920 (Cheel); Rockdale, N.S.W., December, 1927 (A. E. Baker). Australian Museum.

RUTILIA VIRIDINIGRA Macquart.

Since writing my previous paper on this genus, I have had an opportunity of examining an example of this species identified by Brauer and Bergenstamm. The identification is probably correct as these authors had many of the Macquart types and those of the older authors before them when they wrote their papers on the family. In any case I am inclined to accept their identification of this species.

I have seen no other specimen that agrees *in toto* with this one, though *ethoda* is rather closely similar to it.

RUTILIA DESVOIDYI Guérin.

I accept as this species one specimen so identified by Bigot now in the United States National Museum.

The coppery or purplish hue on the scutellum and posterior portion of the mesonotum is more pronounced than in *viridinigra*, the two narrow dark presutural vittae on the mesonotum are quite pronounced here and not so in the preceding species, and the first visible abdominal tergite is dark blue-green, very distinctly deeper in colour than the anterior portion of the second tergite, while in *viridinigra* it is not noticeably darker than it.

It is possible that there may be variations within the species that will dissipate the stated specific criteria, but fresh material from the same localities is a desideratum to enable one to decide this.

Locality.—New Holland.

Bigot had much material that passed through the hands of Macquart, but there is no means of determining if this specimen is one such.

RUTILIA ETHODA Walker.

Female.—Head black, brownish on face and cheeks, with quite dense whitish dusting, the cheeks slightly shining, and showing bluish-black through the dust posteriorly; antennae fuscous; palpi brown; occiput pale-haired centrally, the other cephalic hairs dark. Thorax black, mesonotum with a quite distinct blue-green tinge, most noticeable between and laterad of the black vittae, on centre of mesopleura, and sternopleura; mesonotum with whitish dust and four moderately broad and diffuse black vittae; scutellum brownish, with a purple lustre; pleural hairs black. Abdomen black, bases of the tergites metallic purple or violet coloured, obscured slightly by whitish dust, apices of tergites deep metallic blue, appearing almost black. Legs black. Wings greyish hyaline, with evident, but not conspicuous, black sub-basal mark. Calyptrae and halteres fuscous.

Head similar to that of *regalis*, but the parafacials are fine haired to almost the lowest level of the eyes, and the facial carina lacks the raised central line which is characteristic of that species. Thorax as in *regalis*, some hairs on the prosternum laterally. Second visible abdominal tergite with about eight bristles on the central portion of apical margin, third with a complete apical series, fourth with a very deep central and apical depression, the disc with a transverse series of long bristles beyond which there are dense long bristly hairs and laterally numerous strong bristles. Hind tibia with a regular series of anterodorsal bristles; hind femur normal, the bristles on apical half of anteroventral surface short and regular.

Length, 18 mm.

Locality.—King George's Sound, W.A., no other data. Australian Museum.

Apart from *vivipara* this is the only species of this section of the genus known to me in which the second visible tergite of the abdomen is conspicuously armed with strong bristles at apex centrally. This character, its much duller coloration, the distinction between the colour of the scutellum and mesonotum, the lack of green colour on the cheeks and of a raised central line on the facial carina, should readily distinguish the species from *regalis*, which it closely approaches in size. It may be that I am in error in identifying this as *ethoda*, but it agrees well with the description.

RUTILIA DUBITATA, n. sp.

Female.—Similar in general coloration to *vivipara* Fabricius. Brownish testaceous, slightly shining; head yellowish-white dusted; thorax with the dorsum largely infuscated, whitish-dusted, and with four blackish vittae; abdomen with a rather narrow but conspicuous black dorsocentral vitta, the apices of tergites, except that of third, indistinctly blackened, the bases of all white-dusted. Third antennal segment fuscous except base; frontal and parafacial hairs fuscous, genal hairs yellowish except on anterior portion where they are dark. Practically all the pleural hairs and many of those on mesonotum pale. Hairs on abdomen black,

some at extreme base of venter and on each side of basal half of fourth visible tergite above yellow. Legs concolorous with body, bases of femora slightly darkened, fore pair pale-haired behind. Wings greyish hyaline, sub-basal dark spot present. Calyptrae and halteres yellow.

Ocellar bristles indistinguishable, forwardly-directed supraorbitals small; face with the carina broad, with a central raised line; parafacials sparsely haired to level of apex of third antennal segment; palpi club-shaped. Prosternum bare; presutural acrostichals not developed; postalar bristles four; scutellar bristles about twelve in number. Abdomen without apical central bristles on second visible tergite, with a complete apical series on third; fourth tergite with a slight apical depression, the apical and lateral bristles sparse, median transverse series strong; no strong bristles on venter. Hind tibia with the anterodorsal fringe shorter than usual; hind coxal bristles not very strong. Wing normal.

Male.—Similar to the female, but the parafacials are bare below the level of apex of second antennal segment, the bases of femora are more evidently darkened, and the tarsi are brown; base of costa slightly explanate.

Length, 15-16 mm.

Type, female, Jindabyne, N.S.W., 3,000 feet, March, 1889 (Helms); allotype, Gordonvale, Queensland, April, 1917, ex scrub (Edmund Jarvis). Australian Museum.

The male may not belong to the same species as the female, but they agree so closely that I deem it proper to place them together pending receipt of more material.

Rutilia potina Walker.

Male and female.—A black species quite similar to *ethoda* Walker in general appearance, but smaller, and with much less evidence of metallic coloration, especially on the abdomen, without bristles on centre of apex of the second visible abdominal tergite, and with the parafacials less extensively haired, rarely to below the apex of second antennal segment. The head is entirely black, including the antennae and palpi, and the dusting is whitish-grey. The thorax has a variable degree of metallic suffusion on the dorsum, but is rarely noticeably blue in tone, while the scutellum is frequently more or less coppery or purple. The abdomen is usually entirely shining black, and the bases of second and third tergites are very narrowly white-dusted above, much more broadly dusted below. Legs black. Pleural hairs all black, mesopleura with disc rather conspicuously white-dusted; mesonotum with quite noticeable whitish dust in front of suture, and there with four black vittae. Calyptrae fuscous.

Length, 17-18 mm.

Localities.—Barrington Tops, N.S.W., 24.1.1927 (T. G. Campbell); Berowra, nr. Hawkesbury R., N.S.W., 11.12.1923 (T. G. Campbell); Como, N.S.W., various dates (A. Musgrave); Canley Vale, N.S.W., Dec., 1925 (C. Harris); Sydney, N.S.W., May, 1928 (W. J. Paul); National Park, N.S.W., 28.1.1928 (W. Bailey); Port Hacking, N.S.W., 7.4.1912 (A. Clark); Eden, N.S.W., January, 1928 (K. Richardson); French's Forest, N. Sydney, N.S.W., 7.11.1922 (A. Musgrave); Enfield, nr. Sydney, N.S.W., no other data. Australian Museum.

It must be noted that the identification of the species described by Walker has been arrived at without an examination of the type specimens and in this manner identifications are merely tentative and subject to confirmation.

The last species listed above appears to be the most common if one can judge from its occurrence in this collection. It somewhat resembles a Tabanid in habitus and might possibly be mistaken for one in the field.

Subgenus SENOSTOMA Macquart.

The arista in this subgenus is generally more distinctly haired than in *Rutilia*, both sexes have the sternopleurals 1 + 1 or 2 + 1, the hind coxae are not powerfully spined, the fourth visible tergite of the female is not concave or depressed at apex, as a rule the species are considerably smaller and much less robust than in *Rutilia*, and the inclination of apices of auxiliary and first wing-veins is different from that of the *vivipara* group (Text-figs. 11*a* and 11*b*). The lack of strong hind coxal bristles, and the presence of an anterior sternopleural bristle in the females, would appear to link the *formosa* group with the present one, and it is noteworthy that the new species *micans* described herein has most of the attributes of *Senostoma*. It will require intensive work to distinguish clearly the various segregates of the genus.

Key to the Species.

1. Parafacials quite densely yellow-haired; pleura and dorsum of thorax almost entirely yellow-haired; pleura green; legs entirely yellow ..... *hirticeps*, n. sp.
   Parafacials bare 2
2. Pleura testaceous yellow, pale-haired ..... *flavipes* Brauer and Bergenstamm
   Pleura green or almost black 3
3. Parafacials largely or entirely fuscous; ocellars in male differentiated as two rather long curved hairs; thorax metallic green with very slight pale dust, without white spots ..... *nigriceps*, n. sp.
   Parafacials entirely bright golden yellow 4
4. Thorax metallic green, without distinct white-dusted spots ..... *ruficornis* Macquart
   Thorax metallic green on dorsum, with eight white-dusted dorsal spots, four in front of and four behind suture, the submedian anterior pair faint; pleura black, with a large white-dusted spot on the mesopleura and another on the sternopleura .... *albovirida*, n. sp.

RUTILIA (SENOSTOMA) HIRTICEPS, n. sp.

Male.—Head testaceous yellow, vertex darker, upper half of occiput metallic green, frontal orbits pale grey-dusted, face and cheeks yellow-dusted, posterior raised portions of cheeks with metallic green sheen; antennae and palpi yellow, arista fuscous; parafacial and occipital hairs yellow, postocular ciliae and frontal hairs fuscous. Thorax metallic emerald-green to blue-green, scutellum testaceous, with a pronounced violet or purple lustre; nearly all of the pleural hairs and many of those of the mesonotum and scutellum yellow. Abdomen semipellucid testaceous yellow, with a quite broad dorsocentral vitta bright emerald-green, and the surface of the tergites with a pronounced green sheen, most evident when viewed from behind; hairs largely yellow below and on the sides. Legs fulvous yellow. Wings hyaline, yellow at bases. Calyptrae and halteres yellow.

Frons at vertex about one-tenth of the head width; inner verticals weak; ocellars undeveloped; parafacials haired on entire extent; facial carina broadly rounded; arista very short haired. Thorax with the dorsocentrals and presutural acrostichal bristles distinct but not strong; anterior sternopleural sometimes duplicated; postalars 3. Abdomen ovate, second tergite sometimes without the pair of apical central bristles. Hind tibia with a series of short closely-placed bristles and one much longer bristle on anterodorsal surface, and two or three posterodorsal bristles.

Length, 11-12 mm.

Type, Moonbar, 3,000-3,500 feet, Monaro, N.S.W., March, 1889 (Helms); paratype, Ulong, Dorrigo, N.S.W. (W. Heron). Australian Museum.

The paratype differs from the type in having the mesonotal hairs more largely dark, and the abdomen more pronouncedly metallic blue-green.

RUTILIA (SENOSTOMA) FLAVIPES Brauer and Bergenstamm.

A specimen of this species in rather greasy condition from the Austrian National Museum differs from *ruficornis* in having the pleura, including humeri and lateral margins of mesonotum, testaceous yellow, the venter, including incurved portions of the tergites, of same colour, the pleural hairs mostly yellow, only some on the upper portion of the mesopleura dark. Legs entirely yellow.

Locality.—New Holland, no other data.

RUTILIA (SENOSTOMA) NIGRICEPS, n.sp.

Male.—A smaller and darker species than any of the others before me. Frons black, face dark brown, parafacials fuscous above, cheeks and occiput fuscous, with a green tinge, frontal orbits and parafacials yellowish-grey-dusted, changeable; antennae fuscous, base of third segment reddish; aristae fuscous; palpi testaceous yellow; occipital and posterior genal hairs yellow, the other cephalic hairs black. Thorax dark metallic green, the pleura almost black, mesonotum slightly white-dusted, and with four black vittae, all hairs black. Abdomen brassy or golden green, with a broad diffuse dark green dorsocentral vitta, the tergites slightly pale-dusted; all hairs dark. Legs black. Wings greyish hyaline, darker basally. Calyptrae brown. Halteres brownish-yellow.

Structurally similar to *hirticeps*, but the ocellars are distinguishable, the parafacials are bare, the facial carina is flattened, the aristae are even shorter haired, and the species is smaller.

Length, 7-9 mm.

Type and three paratypes, Ulong, E. Dorrigo, N.S.W., no other data (W. Heron). Australian Museum.

RUTILIA (SENOSTOMA) RUFICORNIS Macquart.

This species is somewhat doubtfully identified by me as represented by a number of specimens of both sexes now before me. There is a close agreement between the males and Macquart's description, but, if my identification of *flavipes* is correct, I cannot understand why Engel accepted the two as synonymous. The colour of the legs is quite variable in the male, being sometimes fuscous with the tibiae slightly paler; at other times the tibiae are fulvous testaceous and much paler than the femora and tarsi; the female has the entire legs fulvous testaceous. In the male the abdomen is fulvous testaceous, with a black or dark green median vitta of variable extent and a very pronounced green sheen over the entire surface, most evident on the fourth visible tergite; the abdomen of the female is entirely metallic emerald-green, with a coppery tinge in some lights, and no dark central vitta.

Length, 11-14 mm.

Localities.—Como, N.S.W., French's Forest, N. Sydney, N.S.W., Oct.-Dec. (A. Musgrave, T. G. Campbell). Australian Museum.

RUTILIA (SENOSTOMA) ALBOVIRIDA, n. sp.

Female.—Head orange, with bright orange-yellow dusting on frontal orbits, face, cheeks, and lower half of occiput, upper half of postocular orbits silvery-dusted, vertex and upper extremities of frontal orbits fuscous, upper half of occiput metallic green, interfrontalia dark brown; apical half or more of third antennal segment and all of aristae fuscous; palpi yellow. Thorax bright metallic emerald-green, mesonotum with two faint blackish lines in front of suture and laterad of each of these a white-dusted vitta which is usually distinct only in front, a pair of large white-dusted spots on each lateral margin, one presutural, the other post-sutural, and a smaller spot on each side of disc near hind margin in line with the presutural vittae; pleura with two conspicuous white-dusted spots, one on the mesopleura the other on the sternopleura. Abdomen metallic green, with coppery and purplish reflections, disc of second and third visible tergites each with two small faint white-dusted submedian spots, those on second almost indistinguish-able, second with a conspicuous spot of same colour on each lateral curve and another on extreme lateral edge, third with the one on lateral curve quite incon-spicuous, the other large, fourth with all the spots present and more or less united. Wings hyaline, black near bases. Calyptrae and halteres fuscous.

Frons at vertex about one-fourth of the head width, each orbit with one or two forwardly-directed supraorbitals, a series of incurved inner marginals, and some short black lateral hairs; parafacials bare, about half as wide as eye in profile; cheek with yellow hairs; ocellars short but distinct; inner verticals rather long, outer pair undeveloped; third antennal segment not as long as distance from its apex to mouth margin; arista pubescent; vibrissae well differentiated. Thorax with dorsocentrals and acrostichals well developed, posterior sublateral lacking; prosternum entirely bare; all pleural hairs black; sternopleurals 1 + 1; postalars 3. Abdomen ovate, second tergite sometimes with a weak pair of central apical bristles, third with a complete apical series, fourth not concave at apex, with some discals and no strong apicals above. Hind tibia missing in both specimens before me. First posterior cell of wing narrower than usual at apex.

Length, 10-12 mm.

Type and paratype, Yeppoon, Q., October, 1924 (A. Musgrave). Australian Museum.

This species resembles a small specimen of *leucosticta*, but the latter lacks the forwardly-directed supraorbitals in the female, and the abdomen is differently marked.

Genus CHRYSOPASTA Brauer and Bergenstamm.

I have already dealt with this genus and now add some data bearing on the genotype.

CHRYSOPASTA ZABRINA (Walker).

I am confident that this name applies to the genotype, *versicolor* Brauer and Bergenstamm and, having priority over it, should supplant it.

Walker described his species as a *Rutilia* and gave as its locality Western Australia. His description is quite unmistakable, the peculiar white-dusted eye-orbits and the black spot-like vittae of the thorax being characteristic of this species only, as far as I am aware at this time. The female has two strong forwardly-directed supraorbitals on each orbit, the ocellars quite well developed, and two or three anterodorsal bristles on the hind tibia, while the male has neither

of the strong fronto-orbitals, and the strong anterodorsal bristles on the hind tibiae are more numerous and not so clearly differentiated from the other setulae.

I have seen no recent specimens of this species.

Genus Formosia Guérin.

In my preceding papers on this tribe I separated *Formosia* from *Rutilia* on the character of the postalar region, the former having the suprasquamal ridge bare and the postalar declivity more or less extensively haired centrally, while *Rutilia* has many hairs on the suprasquamal ridge and the postalar declivity bare on centre. Previous writers had separated the genera on the nature of the hairing of the artista, subplumose in *Formosia*, and pubescent or very short-haired in *Rutilia*. Accepting the first mentioned character as the criterion for distinguishing the genera, I have in my first paper on the genera, included in *Formosia* two of the species included in it by Engel and two others placed in *Rutilia* by that author. This difference in treatment is due to the above facts. Typically the genus has the arista with its longest hairs about half as long as the width of third antennal segment, but some of the species I place herein have the arista no longer haired than in typical species of *Rutilia*, the hairs being hardly distinguishable. However, I summarize the characters in the key to the species presented below, which will clarify the matter. There is some diversity in the extent of the hairing of the postalar declivity, some species, including the genotype and *flavipennis*, having the hairs present on almost the entire height of the central portion, while others have the hairs confined to the upper margin of the central portion just below the strong bristle.

Key to the Species.

1. Longest hairs on arista fully half as long as width of third antennal segment; frontal orbits and upper half or more of parafacials bright metallic emerald-green, without forwardly-directed fronto-orbitals in the female; wings not blackened at bases 2
   Longest hairs on arista not longer than its basal diameter; frontal orbits and parafacials not metallic green 3
2. Legs black; hairs on mesopleura fuscous ..... *mirabilis* Guérin
   Legs yellow; all the pleural hairs yellow ..... *flavipennis* Macquart
3. Thorax and abdomen with conspicuous spots or markings of white dust 4
   Thorax and abdomen without conspicuous markings of white dust, at most with inconspicuous greyish or whitish dusting on them 5
4. Species brilliant metallic blue or blue-green, mesonotum with two narrow presutural vittae and two large spots on each side white-dusted, one of the lateral spots presutural, the other postsutural; pleura with two white-dusted spots; second abdominal tergite with six, third and fourth each with four rounded spots of white dust; legs entirely black; head orange-yellow, yellow-dusted, with a green mark on each side of upper margin of occiput; pleural hairs all black; hairs on the postalar declivity present on only the upper margin at centre .. *frontosa*, n. sp.
   Species black, without conspicuous metallic coloration, mesonotum presuturally with four vittae and a small anterior central mark, and posteriorly with four spots, of dense white dust; pleura with two similar spots; abdomen densely whitish-grey-dusted, with black marks as follows: first tergite, a transverse mark on centre of second tergite near apex, a cordate central spot, and a much larger one on each lateral curve, on third tergite, all three of these present on fourth and connecting with the spots on third, and a spot on each extreme lateral margin of each tergite; legs fulvous yellow; head testaceous, densely grey-dusted, frons and upper occiput fuscous; pleural hairs yellow; hairs on the postalar declivity present on almost the entire height at centre ..... *speciosa* Erichson
5. Wings not noticeably blackened at bases; brownish testaceous species, dorsum of thorax metallic blue, rather dull, scutellum testaceous, with a purplish tinge;

mesopleura and sternopleura not more conspicuously dusted than other parts of pleura, all the pleural hairs and the calyptrae pale; legs fulvous testaceous; hairs on postalar declivity present only on the upper margin in centre; female with forwardly-directed supraorbital bristles ..... *confusa*, n. sp.

Wings deep black from extreme bases to the apices of basal cells; metallic blue or green species, with deep black markings on thorax and abdomen; mesopleura, and to a lesser extent the sternopleura, with conspicuous white-dusted markings; pleural hairs, calyptrae, and legs black; hairs on the postalar declivity present on almost the entire height at centre 6

6. Dorsum of thorax when seen from directly above uniformly metallic emerald-green, not noticeably white-dusted in front of suture, and with four black vittae, the submedian pair ceasing a little behind suture; large species, 17-19 mm. in length ..... *smaragdina*, n. sp.

Dorsum of thorax black, with a green tinge in female, and in that sex quite distinctly pale grey-dusted in front of suture, in male dull blackish-green, not so distinctly metallic as in *smaragdina*, in both sexes with four black vittae as in that species; smaller species, 14-15 mm. in length ..... *atribasis* Walker

FORMOSIA MIRABILIS Guérin; FORMOSIA FLAVIPENNIS Macquart.

I have nothing to add to what I have already reported upon these two species, except that I have seen two specimens labelled *flavipennis* by Engel that appear to me to belong to *mirabilis*, the legs being entirely black, and some of the hairs on the mesopleura dark. These are from New Pommern.

I consider that a careful examination of a long series of both sexes of these two forms is essential to a definite conclusion as to specific identities.

FORMOSIA MONETA Gerstaecker; FORMOSIA CALLIPYGUS Gerstaecker.

These two species are as yet unknown to me. The frontal orbits and parafacials are green as in the female in the foregoing species, and the third antennal segment is much longer than in some of the other species which follow in this paper, being about three-fourths as long as the basal segment of fore tarsus.

From Engel's descriptions I would infer that these species resemble *atribasis* Walker and *smaragdina* mihi rather closely, except for the green orbits and lower occiput and hind portions of the cheeks. The abdomen has evidently less extensive green markings on the dorsum, the third and fourth tergites having green dorsal spots of lesser extent, especially the third.

FORMOSIA SPECIOSA Erichson.

This species was included in *Amphibolia* in my catalogue of Australian Tachinidae, although my opinion is that it belongs to *Formosia*, and I had previously placed it in this genus.

I have before me a discoloured female submitted by the Australian Museum, the only other example available being from New South Wales. Engel has recorded it from Queensland. The Museum specimen is from Victoria.

The original specimens described by Erichson are not amongst the types sent me by the Vienna Museum.

FORMOSIA CONFUSA, n. sp.

Male and female.—Superficially this species closely resembles *Rutilia vivipara* Fabricius, but it lacks the hairs on the suprasquamal ridge and falls in the segregate of *Formosia* in which the hairs on the postalar declivity are confined to the upper margin, though its dull coloration makes it appear out of place here. Head testaceous yellow, interfrontalia reddish-brown, orbits, face, and cheeks greyish-yellow dusted; third antennal segment browned or blackened except at

base; palpi pale; occipital and genal hairs yellow; postocular ciliae and frontal hairs black. Thorax brownish testaceous, disc of mesonotum entirely infuscated, with a blue-green metallic tinge, slightly white-dusted, and with four interrupted black vittae, dorsal hairs pale on margins, black on disc; pleural hairs yellow, some on central upper portion of mesopleura black; scutellum semipellucid brownish testaceous, shining, with coppery or purple reflections. Abdomen brownish testaceous, distinctly shining, with coppery or purple lustre, bases of tergites slightly grey-dusted, dorsum with a dark dorsocentral vitta which is rather narrow and not very conspicuous, the apices of tergites appearing narrowly dark owing to the presence of black apical bristles; hairs mostly black, some pale hairs at apex and along venter. Legs brownish testaceous. Wings greyish hyaline, inconspicuously pale brown at bases. Calyptrae and halteres yellow.

Frons of male at vertex about one-ninth of the head width, that of female one-fifth of head width, orbits with an inner marginal series of fine incurved bristles and many lateral hairs, the female with one or two fine forwardly-directed outer supraorbitals on upper third of each orbit; parafacials bare below bases of antennae, third segment of latter hardly more than half as long as distance from its apex to mouth margin; arista pubescent; three or four bristles above vibrissa, the latter well differentiated. Thorax with the dorsocentral and acrostichal bristles distinct, no posterior sublateral bristle; sternopleurals 2 + 1; scutellum slightly flattened, subtriangular, with about twelve marginal bristles. Second abdominal tergite with six or more apical central bristles, third with a complete apical series, the central pair on each in front of the others, fourth with a transverse series of discal bristles and beyond these many weaker bristles and hairs; all tergites with strong apical bristles ventrally to lateral edges. Mid tibia in both sexes with a strong submedian ventral bristle; hind tibia with the anterodorsal fringe inconspicuous, short, one or two of the bristles beyond middle outstanding.

Length, 15-18 mm.

Type, male, allotype, and 2 paratypes, Deep Creek, 20 miles from Kingscote, Kangaroo Island, S. Aust. (E. Troughton); paratypes, three, Kosciusko, N.S.W., 3,000 feet, March, 1889 (Helms); Jindabyne, N.S.W., two, 3,000 feet, March, 1889 (Helms); Berowra, nr. Hawkesbury, N.S.W., one, 11.12.1923 (T. G. Campbell) [Australian Museum]; Katoomba, Blue Mts., N.S.W., two, 1912 (Dodd).

The last two specimens were identified as *desvoidyi* by Engel and recorded as that species by him in his paper on the group.

FORMOSIA FRONTOSA, n. sp.

Male.—Brilliant metallic blue, with conspicuous spots of white dust on thorax and abdomen. Head bright orange-yellow, orbits, parafacials, and cheeks densely yellow-dusted, ocellar spot fuscous, upper margin of occiput green laterally, occiput and cheeks with fulvous hairs, postocular ciliae and frontal hairs black; antennae and palpi orange-yellow, third segment of former and the aristae brownish. Thorax green on disc of mesonotum, and with the following conspicuous white-dusted markings: two narrow submedian vittae in front of suture, a large spot extending from middle of each humerus almost to suture, a similar lateral spot behind suture, a very small spot mesad of the posterior extremity of the humeral one, and two pleural spots, one on mesopleura and the other on sternopleura; all thoracic hairs, and the spiracular coverings black. Abdomen green centrally on dorsum, the apices of third and fourth tergites golden green, tergites with the following rather

large, changeable spots of white dust: six on second tergite, four on third, and four on fourth, the last sometimes all connected; all abdominal hairs black. Legs black. Wings hyaline, fuscous at bases. Calyptrae and halteres fuscous.

Frons at vertex as wide as parafacial and about twice as wide as length of third antennal segment; ocellar region rather densely haired, the ocellar bristles not differentiated, inner verticals moderately long, outer pair undeveloped, orbits with an inner marginal series of fine bristles and laterad of these erect black hairs, both ceasing at bases of antennae; parafacials bare, a few black setulose hairs above the vibrissa, the latter outstanding; arista pubescent; facial carina flat. Posterior sublateral bristle absent, dorsocentrals all present, only the posterior pair strong, the presutural acrostichals not very strong; anterior sternopleural bristle very fine and short; scutellum subtriangular, not much flattened on disc, with about ten marginal bristles. Abdomen convex, but little tapered to apex, first and second visible tergites without central apical bristles, third and fourth each with a complete apical series and some shorter bristles encroaching on disc from hind margin centrally; no transverse series of macrochaetae on incurved portions of tergites. Femora attenuated on apical halves or less, tibiae and tarsi slender, mid tibia without a ventral bristle; hind femur with long bristles on basal half of anteroventral and posteroventral surfaces, and short bristles on apical half of anteroventral surface; hind tibia with the anterodorsal fringe indistinguishable, and one short bristle near middle on that surface, one posterodorsal, and three long anteroventral bristles. Fourth wing-vein nearly straight beyond angle.

Length, 16-18 mm.

Type and paratype, Jindabyne, N.S.W., 3,000 feet, March, 1889 (Helms). Australian Museum.

I have before me a specimen from the Austrian National Museum in Vienna which appears to be the female of this species. It differs from the male in having the presutural vittae on mesonotum less distinct, broader, and a third faintly-dusted vitta between them. The abdomen is crushed, but I can, I believe, detect the white-dusted markings that distinguish the male, though the spots on fourth tergite are fused.

Locality.—New Holland.

This specimen bears the label "*frontosa* B. & B." and below another which indicates that it belongs to a new genus, though I am unable to decipher all of the writing. Brauer and Bergenstamm's name *frontosa* is a *nomen nudum*, but I utilize the name herein for the species, the validity of the name dating from this paper.

Formosia atribasis Walker.

The male has the pale portions of the abdomen bright metallic emerald-green, seen from above it is marked as in Text-figure 12*a*; the female has the green portions of abdomen duller and largely or entirely suffused with reddish or coppery colour and marked as Text-figure 12*b*. It should be noted that the central apical armature of the second visible abdominal tergite is always much weaker in the male than in the female, and that in the former it is frequently lacking.

Locality.—Gordonvale, N.Q., Nov., 1919 (E. Jarvis). Australian Museum.

I have seen this species from Cairns and Kuranda, Queensland. There is no doubt as to this being *smaragdifera* Bigot, but its identity as *atribasis* Walker is not so certain.

FORMOSIA SMARAGDINA, n. sp.

Male and female.—This species is larger than *atribasis* (18 : 15), and the material before me shows no sexual dimorphism in colour, the pale portions of the thorax and abdomen being bright emerald-green in both sexes, with the markings almost the same in both, resembling those of the female of the preceding species, though there is a forward extension of the dark apical mark on second tergite in the male. The species is similar to the preceding species except as stated in the foregoing key.

Length, 18-19 mm.

Type, female, Gordonvale, N.Q., Oct., 1917 (E. Jarvis), Australian Museum; allotype, Cairns, N.Q. (A. P. Dodd), and one female paratype, same locality and collector as type (U.S. Nat. Mus.).

It would appear rather remarkable if this species has escaped description until now, as it is such a striking form, but I can find no description that fits it.

Genus AMPHIBOLIA Macquart.

I cited the characters of this genus in my first paper on the tribe, and have nothing to add to that citation and the information contained in my key to the genera in a subsequent paper of this series.

AMPHIBOLIA VALENTINA Macquart.

The black markings of the abdomen are rather variable in both sexes, as is also the number of discal abdominal bristles. The female has a forwardly-directed upper frontal bristle, and in both sexes there is one outstanding bristle in the anterodorsal series of bristles on the hind tibia. Head of male as in Text-figure 13.

Localities.—One male, Lord Howe Island, 4.1.1922 (A. Musgrave); one female, same locality, no other data; one female, Tasmania, no other data; two females, King George's Sound, W.A., no other data. Australian Museum.

One female from Sydney, N.S.W. (Thorey, 1864) sent by the Austrian National Museum bears the label "*thoreyi*, det. B. & B.". This specimen was examined by Engel also.

Genus PARAMPHIBOLIA Brauer and Bergenstamm.

This genus possesses similar characters to *Rutilia*, falling in my key to the genera of this tribe in the section with setulose hairs on the suprasquamal ridge. It differs from *Rutilia* in having strong discal bristles on the second and third tergites of the abdomen, and from *Amphibolia* in having hairs on parafacials to lower level of the eyes. The separation from *Amphibolia* would appear to be rather weak if one considers that in *Rutilia* the character upon which the distinction is based is not utilized for the division of that genus, and that species with both bare and haired parafacials occur therein, but the genotype of *Paramphibolia* is radically different in general habitus from that of *Amphibolia*, the shape of the head is quite distinct (Text-fig. 14), and the hind tibia has a different armature.

For a more complete characterization of the genus see description of the species.

Genotype, *Rutilia assimilis* Macquart.

PARAMPHIBOLIA ASSIMILIS (Macquart).

Male.—Head reddish testaceous, frons, occiput, most of parafacials, third antennal segment except base, and the aristae, fuscous, frontal orbits, parafacials, upper part of face, occiput, and cheeks pale-grey-dusted; palpi yellow; hairs on parafacials, cheeks, and occiput yellow, postocular ciliae and frontal hairs fuscous. Thorax reddish testaceous, disc of mesonotum broadly fuscous, whitish-dusted, and with four dark vittae; pleura except mesopleura fuscous; scutellum reddish testaceous, shining; pleural hairs mainly yellow, some black hairs on centre of mesopleura; mesonotum brownish-haired on disc, pale-haired on sides. Abdomen reddish testaceous, shining, with a uniformly wide black dorsocentral vitta, and faint white dusting on bases of tergites when seen from behind, black-haired above, with some yellow hairs below. Legs black, central portion of tibiae reddish to a variable extent, sometimes entirely so, femora with yellow hairs and black bristles. Wings greyish hyaline, with very faint sub-basal brown mark. Calyptrae yellowish. Halteres yellow.

Head in profile as Text-figure 14; frons at vertex about one-sixth of the head width, orbital hairs and postocular ciliae long, inner verticals long, outer pair undeveloped, ocellars undifferentiated; parafacials haired to lowest level of eyes; arista bare. Thorax with 3 or 4 + 4 pairs of dorsocentrals, 3 + 2 acrostichals, two pairs of posterior intra-alars, three postalars, sternopleurals 1 + 1, some pale hairs on sides of the prosternum, and about twelve scutellars. Abdomen ovate, second visible tergite with two or three pairs of discals, and an arcuate series of about twelve apicals, third with a pair of discals and a complete arcuate series of apicals beyond which in centre there are some weaker bristles, fourth tergite with a pair of discals anteriorly and from middle to apex rather densely bristled, tergites 2 to 4 with apical bristles below; hypopygium with the apical forceps very slender, contiguous to apices. Mid tibia with a submedian ventral bristle; hind femur with long bristles on basal half of anteroventral and postero-ventral surfaces, and some moderately long bristles near apices on anteroventral surface; two or three outstanding and a number of shorter bristles on anterodorsal surface of hind tibia.

Length, 13 mm.

Locality.—Mt. Wellington, Tasmania, 3,500 feet, 15.1.1928 (A. Musgrave). Australian Museum.

Genus CHAETOGASTRINA, nov.

This genus is very similar to *Paramphibolia*, agreeing with it in structure of the head and thorax, but there are no parafacial hairs below level of bases of antennae. From *Amphibolia* it differs in having the ocellar bristles well developed in the male, and in the armature of the hind tibia, as well as in the general shape of the head.

Genotype, the following species.

CHAETOGASTRINA STOLIDA, n. sp.

Male.—Black, hardly shining, with grey dust on head, thorax, and abdomen. Head densely whitish-grey-dusted except on interfrontalia; lunule and apex of second antennal segment testaceous; palpi testaceous, dark at bases; occipital hairs except postocular ciliae yellow, the other cephalic hairs black. Mesonotum when seen from behind whitish-grey-dusted and with five black vittae, the outer one on each side broadest and interrupted at suture, the others ceasing about

midway from suture to hind margin; prothoracic spiracle pale brown, metathoracic one fuscous; all hairs on thorax black. Second visible abdominal tergite pale-grey-dusted on anterior half when seen from behind, posterior half of tergites 3 and 4 brown dusted, slightly checkered; all abdominal hairs black. Legs black. Wings greyish hyaline, slightly darker at bases. Calyptrae fuscous, margins darker. Halteres brownish-yellow.

Eyes bare; frons at vertex fully one-sixth of the head width, inner verticals moderately long, outer pair undeveloped, ocellars of moderate length, curved forward and slightly divergent, orbits with a series of fine incurved inner marginal bristles and numerous long lateral hairs, the bristles running slightly outward below and extending but little below antennal insertions, the hairs ceasing at same level; facial carina evenly rounded, broader than third antennal segment above, narrowed below; head in profile as Text-figure 15. Thorax with 3 or 4 + 4 dorsocentrals, 2 + 2 acrostichals, 2 intra-alars, sternopleurals 1 or 2 + 1; scutellum with about twelve marginal bristles and about six weaker submarginals, the hairs covering entire sides of basal third. Abdomen with first visible tergite unarmed at apex, second and third each with a pair or more of discal bristles and the apical series curving forward centrally, becoming distinctly preapical in middle; bristles on fourth tergite numerous, strongest on disc; sternites quite numerously bristled, fifth without strong bristles. Hind femur with several long strong bristles on basal half of anteroventral and posteroventral surfaces and some shorter bristles on apical half of anteroventral; hind tibia with three or four long anterodorsal and posterodorsal bristles, and one anteroventral bristle; ventral bristle on mid tibia short. Base of third wing-vein finely bristled above and below.

Length, 15 mm.

Type, and three paratypes, Barrington Tops, N.S.W., 20.1.1927 (T. G. Campbell). Australian Museum.

The three foregoing genera fall in the same section of my generic key, distinguished from *Rutilia* by the presence of discal abdominal bristles, and may be separated as below.

Key to the Genera.

1. Parafacials haired to lowest level of eyes; hind tibia with about three outstanding bristles on anterodorsal and posterodorsal surfaces ..... *Paramphibolia* B. & B.
   Parafacials entirely bare from below level of bases of antennae 2
2. Ocellars entirely lacking in male, slightly developed in female; anterodorsal surface of hind tibia with an almost regular series of short bristles, and one outstanding bristle beyond middle, the posterodorsal surface normally with but one bristle beyond middle ..... *Amphibolia* Macquart
   Ocellars quite well developed in male; anterodorsal and posterodorsal surfaces of hind tibia with about three outstanding bristles on each ..... *Chaetogastrina*, n. gen.

I know of no record of *Paramphibolia assimilis* Macquart since its original description. It will thus be of considerable importance to Australian entomologists to have all the above three genera in the Australian Museum for purposes of comparison, as Macquart's types which are still in existence are all in Europe.

Genus CHAETOGASTER Macquart.

This genus appears to have its closest affinities with this tribe, possessing the same type of head, characterized by the broad regularly-rounded central vertical carina of the face, and the pubescent arista. The parafacials are bare below

bases of antennae, the cheek is almost as high as eye in the male; facial ridges bare; palpi long and slender. Prosternum bare, centre of propleura haired, some short hairs just below lower calypter, suprasquamal ridge bare; postalar declivity with a few hairs on upper central portion; metasternum more elevated than in *Rutilia* and quite evenly rounded, bare. Second, third, and fourth abdominal tergites with discal and apical bristles; sternites not strongly bristled at apices. Fore tibia with one or two weak bristles near base on anterodorsal surface. Wing as in *Rutilia*. Upper calypter short, rounded at apex.

In my key to the genera of Rutiliini already printed, this genus will run down to caption 5, section two. It fits best in the subgenus *Euamphibolia* Townsend, but differs from it in possessing two pairs of discal bristles on second and third abdominal tergites.

CHAETOGASTER VIOLACEA Macquart.

I have seen a series of specimens in the United States National Museum collection which agree well with Macquart's description, but the violet colour is not so pronounced as one might expect it to be from the name, in fact the insect is largely black, with a violet tinge on posterior half of mesonotum and particularly on the scutellum, while the abdomen is apparently rather reddish on sides, though this colour is obscured by the purplish tinge. The dorsum of thorax is whitish-dusted and has on the anterior portion five dark vittae, the abdomen when seen from behind is whitish-dusted on each side of the tergites of basal half. Legs black. Wings smoky, very noticeably yellow at bases and along costa to beyond middle. Calyptrae yellow. Halteres brown.

Length, 15-17 mm.

Locality.—Bega, N.S.W., 30.1.1903 (W. W. Froggatt).

Tribe **Dexiini.**

This group has generally been ranked as a family or subfamily, the distinguishing characters being the distinctly haired arista and the lack of the posterior sublateral bristle on thorax. I consider tribal rank all it is entitled to.

Genus MESEMBRIOMINTHO Townsend.

This genus has the face without a central vertical carina. The other characters are listed in the subjoined key to genera herein.

There are two specimens of the genotype, *compressa* Townsend, in the United States National Museum; these are all that I have seen.

Genus PROSENA St. Fargeau and Serville.

This genus is the only one as yet known to me from Australia in which the proboscis is exceptionally elongated and slender. The palpi are quite short and rather wide.

Curran has published a key to the Australian species known to him (*Ent. Mitt.*, 16, No. 5, 1927; see also Aldrich, *Id.*, 17, No. 2, 1928, 130).

Genus ZOSTEROMEIGENIA Townsend.

A monobasic genus of which I have seen only the type specimen of the genotype (*mima* Townsend), in the United States National Museum.

Despite the haired arista I have doubts as to the propriety of placing the genus in this tribe.

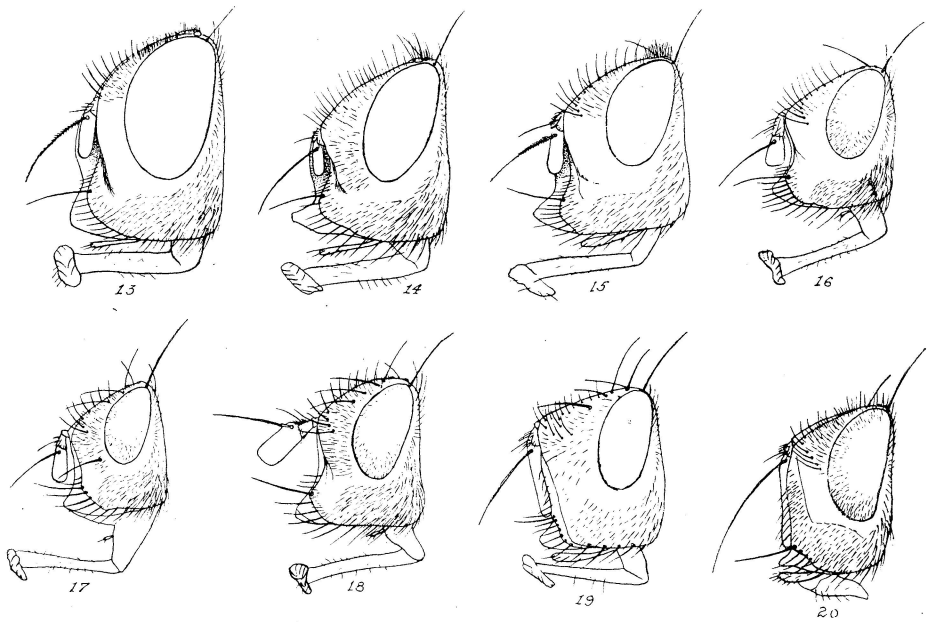
Genus DEXIA Meigen.

I have seen no species of this genus from Australia and none such may occur, despite the fact that there are several species placed in it by the older authors. In general all species agreeing in a general manner with the genotype were considered to belong here, but more recent workers have utilized characters for generic segregation which remove many of the old species to other genera.

The characters cited in the generic key were obtained from an examination of the genotype, *rustica* Fabricius, a European species.

Genus RHINOMYIOBIA Brauer and Bergenstamm.

The characters cited in the generic key were derived from an examination of *plumifera* Bezzi, a species occurring in Samoa and the Fiji Islands.



Text-fig. 13.—*Amphibolia valentina*, head of male from the side.
Text-fig. 14.—*Paramphibolia assimilis*, head of male from the side.
Text-fig. 15.—*Chaetogastrina stolida*, head of male from the side.
Text-fig. 16.—*Linnaemyia bicolor*, head of male from the side.
Text-fig. 17.—*Apalpus dorsalis*, head of male from the side.
Text-fig. 18.—*Chaetophthalmus brevigaster*, head of male from the side.
Text-fig. 19.—*Quadra ornata*, head of male from the side.
Text-fig. 20.—*Zebromyia obesa*, head of male from the side.

Tribe **Linnaemyiini.**

This tribe has frequently been referred to as Micropalpiini, but the genus *Micropalpis* was erected by Macquart by combining three of Robineau-Desvoidy's genera and, *Bonnettia* being the first included, *Micropalpis* has been placed as a synonym of it. *Linnaemyia* was the second and *Bonellia* the third of the included genera.

In a recent paper on the Diptera of the Belgian Congo (*Bull. Amer. Mus. Nat. Hist.*, 57, 1928, 398) Mr. C. H. Curran has listed the three above-mentioned genera and four others as synonyms of *Linnaemyia*, but at present we are not interested in other than Australian forms, all of which before me have been compared with the genotypes of *Bonnettia*, and *Linnaemyia*, i.e., *comta* Fallen, and *vulpina* Fallen, respectively.

In the present paper I deal with three genera which belong to the tribe, the definition of the latter being as below.

Second antennal segment distinctly shorter than third; hind coxae above bases of femora without hairs or bristles; lower calypter subtransverse on hind margin, without a distinct bulge upwards along inner margin; notopleurals 1 + 1. All the Australian genera have the palpi very small, the eyes distinctly haired, and the first posterior cell of the wing open and terminating a little before wing tip.

The tribe containing *Cuphocera* Macquart, *Peleteria* Robineau-Desvoidy, *Archytas* Jaennicke, *Echinomyia* Latreille, and some other genera, although having the head similarly formed, even in some cases with the minute palpi, have the second antennal segment usually distinctly elongated, almost always longer than third segment, and the hind coxae haired above bases of femora.

There are three species amongst my Australian material, each apparently referable to a distinct genus. They may be distinguished as in the following key.

Key to the Genera.

1. Parafacials bare; frons of male about one-sixth of the head width at vertex, without strong forwardly directed supraorbitals ..... *Linnaemyia* Rob.-Des.
   Parafacials haired 2
2. Parafacials without strong bristle; frons in both sexes about one-third of the head width at vertex, and with at least two strong forwardly-directed supraorbitals on each side ..... *Chaetophthalmus* Brauer and Bergenstamm
   Parafacials each with one strong bristle (Text-fig. 17) ..... *Apalpus*, n. gen.

N.B.—The genus *Palpina* Malloch, from the Federated Malay States, has the parafacials bare, but it lacks discal bristles on second and third abdominal tergites, has the sutures of the tergites indistinct centrally, and a long appendix at the preapical bend of the fourth wing-vein. It most closely resembles *Linnaemyia*.

Genus Linnaemyia Robineau-Desvoidy.

I am placing in this genus one of the Australian species now before me, but it does not agree absolutely with the characters of the genotype, though it possesses most of its characters.

Linnaemyia bicolor (Macquart).

It is possible that I am in error in identifying this specimen as belonging to Macquart's species, but it agrees very well with his description and, without an opportunity to examine the type specimen of *bicolor*, it is not possible to be certain of its identity. I briefly describe the specimen to insure its recognition by others.

Male.—Head orange-yellow, frontal orbits, upper portions of parafacials and face, and the raised portions of cheeks white-dusted, upper half of occiput greenish-black, white-dusted, almost all of third antennal segment and entire aristae black; lower occipital hairs pale, all other cephalic hairs black. Thorax and abdomen fulvous testaceous, shining, the former with almost entire dorsum metallic blue-green, with whitish dusting, the mesonotum with four dark vittae, apex of

scutellum with a small fulvous spot; abdomen with the centre of first and second visible tergites very broadly metallic blue-green, third tergite not so broadly so, the dorsum slightly whitish-dusted. Legs fulvous testaceous, tarsi darker from near bases to apices. Wings greyish hyaline, yellowish at bases. Calyptrae whitish-yellow. Halteres yellow. Head in profile as Text-fig. 16; frons at vertex about one-sixth of the head width, widened anteriorly, inner verticals long, cruciate, outer pair lacking, ocellars well developed, orbits sparsely haired, parafacials bare. Thorax with 3 + 4 dorsocentrals, 3 + 3 acrostichals, three intra-alars, prealar long, scutellars 8, sternopleurals 2 + 1. Abdomen with very long discals and apicals on tergites 2 to 4 inclusive. Costal thorn almost as long as inner cross-vein; bend of fourth vein with a short appendage; outer cross-vein bisinuate.

Length, 8 mm.

Locality.—Gundamaian, Port Hacking, N.S.W., 22.8.1925 (A. Musgrave). Australian Museum.

Genus Apalpus, nov.

This genus is readily distinguished from all others of the tribe known to me by the presence on each parafacial of a strong bristle (Text-fig. 17). Propleura bare on the central portion; discal bristles present on third and fourth visible tergites. In the group containing *Peleteria* Robineau-Desvoidy there are a number of genera which have similar strong bristles on the parafacials, but in all of these the hind coxae are haired above bases of the femora as mentioned in a preceding paragraph.

Genotype, the following species.

Apalpus dorsalis, n. sp.

Female.—Head testaceous yellow, whitish-yellow-dusted, upper half of occiput fuscous, and grey-dusted, on each side; third antennal segment largely brown apically; aristae dark brown; hairs on frons, parafacials, and cheeks dark, those on entire occiput yellow. Thorax fuscous, broadly testaceous yellow on upper half of pleura and more narrowly along margins of mesonotum, especially on hind margin, the black dorsal portion lightly whitish-dusted, and indistinctly vittate. Abdomen shining, testaceous yellow, disc broadly bluish-black, with slight whitish dust, most noticeable on the fourth tergite, the margins only narrowly yellow. Legs yellow, apical four tarsal segments of fore and mid tarsi fuscous, basal two yellow on the only one of the hind legs remaining on type, the apical three broken off. Wings hyaline. Calyptrae and halteres yellow.

Eyes rather long pale-haired; frons at vertex fully one-third of the head width, widened to anterior margin; inner verticals long, outer pair undeveloped; orbits well defined, with strong bristles and fine black hairs, inner series of bristles (8-9) abruptly turned outward near base of antenna and extending almost to eye, outer forwardly-directed orbitals two in number; postverticals and ocellars weak; interfrontalia parallel-sided, anteriorly narrower than either orbit; parafacials with fine hairs and one strong bristle (Text-fig. 17). Thorax with 3 + 3 dorsocentrals and acrostichals, 1 + 1 or 1 + 1 + 1 sternopleurals, and some hairs below the lower calypter; postscutellum well rounded. Abdomen broadly ovate, sutures between tergites weak centrally, second visible tergite with a pair of central apical bristles, third with a pair on disc and a complete apical series, fourth with the discal series stronger than the apical series. Fore tarsus with the

apical four segments widened, the fifth least so; mid tibia with a median ventral bristle; hind tibia with four or five irregular anterodorsal and posterodorsal bristles. Third wing-vein setulose at base above and below; bend of fourth vein angular, with a short appendage, distance from bend to outer cross-vein not one-third as great as distance from that vein to inner cross-vein.

Length, 7 mm.

Type, Eradu, near Geraldton, W.A., Sept. 8, 1926 (Nicholson).

Submitted by Dr. I. M. Mackerras, to whom the type will be returned.

Genus CHAETOPHTHALMUS Brauer and Bergenstamm.

This genus was erected for the reception of two Australian species, of which *brevigaster* Macquart was selected as genotype. It was distinguished from the other genera accepted as belonging to the tribe by its authors by the much more strongly haired parafacials, and the broader abdomen. I have not detected any hairs on the parafacials of any genotype examined by me that pertains to those sunk as synonyms of *Linnaemyia*, but there may be some such that are unknown to me. Meanwhile I accept the Australian group as a valid genus.

I have only two examples of the genus before me, evidently the sexes of one species, though there is a considerable difference in the colour markings of the specimens. It may be that my specific identification is wrong, but the generic determination is almost certainly correct.

It must be noted in connection with this genus that *Aprotheca* Macquart was unknown to Brauer and von Bergenstamm when they erected it, and also that in my catalogue of this family there are some species which were retained in *Micropalpus*, one of them suggested as a possible *Chaetophthalmus* by these authors, but all of them unknown to them except from descriptions.

CHAETOPHTHALMUS BREVIGASTER (Macquart).

Male.—Head yellow, with yellow dust, somewhat changeable on parafacials, occiput fuscous on each side of upper half; third antennal segment brown on almost the entire outer half; aristae black; occipital hairs yellow, the other cephalic hairs fuscous. Thorax testaceous yellow, mesonotum except margins fuscous, with a blue tinge, whitish-dusted, and with four dark vittae; scutellum testaceous, with a fuscous tinge showing through from below. Abdomen fulvous testaceous, with a blue-black vitta occupying central third of dorsum up to middle of fourth visible tergite, the dust yellow on pale portions, whitish on the dark vitta. Legs yellow testaceous, tarsi slightly darkened apically. Wings hyaline, yellowish at bases. Calyptrae and halteres yellow.

Frons at vertex about one-third of the head width, each orbit with two or three strong forwardly-directed bristles laterad of the inner marginals; ocellars rather short, widely divergent; inner verticals long, outer pair undeveloped; profile as in Text-figure 18. Thorax with 3 + 3 dorsocentrals and acrostichals. Discals usually present on all tergites except first visible. Bend of fourth vein with an appendage.

Female.—Differs from the male in lacking a conspicuous dorsocentral vitta on the abdomen and in having the yellow dust more dense, especially on centre of basal half of dorsum.

Length, 6-7 mm.

Localities.—Male, Cairns, N. Queensland; female, Allyn Range, Barrington Tops, Feb. 25, on *Leptospermum* (Sydney University Zool. Exped.).

I know of no such sexual difference in colour in any other species of the group, and my assignment of both to the same species may be an error.

Tribe **Tachinini.**

The species following have been placed herein in groups under the names of the best known genera in each group, though some of these groups are possibly entitled to tribal status.

Gonia Group.

I have already, in my previous paper in this series, dealt with two genera of this group, *Tritaxys* Macquart, and *Anamastax* Brauer and von Bergenstamm. I now add some more genera to the group, figuring the heads of the new genera in profile so that a clearer conception of the genera may be obtained than would be possible merely from a description. In two of these genera the eyes are conspicuously haired, and in one of these only is the third notopleural bristle developed.

Genus Quadra, nov.

Generic characters.—Eyes bare; head in profile as Text-figure 19; facial ridges elevated, but not noticeably more so at vibrissae than elsewhere, setulose to past midway to bases of antennae; first posterior cell closed a little before attaining the wing margin; visible abdominal tergites 2 to 4 with discal bristles.

The closed first posterior cell of wing is a very unusual, if not unique, character in this group.

Genotype, the following species.

Quadra ornata, n. sp.

Female.—Head bright orange-yellow, with golden yellow dust, occipital hairs yellow, postocular ciliae and other cephalic hairs black. Thorax fuscous, the humeri, lateral margins of mesonotum except in front of suture, the sutures of pleura, and all of scutellum, testaceous yellow, the scutellum shining, the other portions with dense yellow dust, mesonotum densely grey-dusted on disc, and with four black vittae, all interrupted at suture, the submedian pair narrow, extending less than midway from suture to hind margin, the sublaterals much broader, extending about three-fourths of the distance from suture to hind margin. Abdomen black, densely coated with whitish-grey dust, dorsal exposure of first tergite shining black, second and third tergites each with a large shining deep black mark on each side, which are narrowly separated centrally and extend over lateral curve, the pair on second tergite extending to anterior margin, fourth tergite unspotted. Legs orange-yellow, tarsi black except base of first segment. Wings hyaline, yellow at bases. Calyptrae whitish-yellow. Halteres yellow.

Eyes bare; frons at vertex one-third of the head width, interfrontalia parallel-sided, at middle half as wide as either orbit, each orbit with long hairs and bristles, the latter in two series along inner margin anteriorly, the inner series curving outward below, and opposite apex of second antennal segment reaching midway to eye, two strongly forwardly-directed supraorbitals on each side; parafacials haired to lower level of eyes; third antennal segment slender, about five times as long as second; arista about as long as third antennal segment, almost

the same diameter to well beyond middle, second segment about as long as thick; palpi long, clubbed. Thorax with 3 + 4 dorsocentrals, and 3 + 3 acrostichals, the prosternum setulose, 2 + 1 sternopleurals, no extra notopleural, and five bristles on the presutural lateral area. Abdomen broadly ovate, a complete series of preapical bristles on third visible tergite, none on fourth. Legs normal, fore pair missing in type, hind tibia with the anterodorsal bristles very uneven. Third wing-vein with two bristles at base above and below.

Length, 11·5 mm.

Type, King George's Sound, W.A., no other data. Australian Museum.

I can find no description amongst those of the older authors that agrees with this conspicuously marked species.

Genus ZEBROMYIA, nov.

This genus differs from the preceding one in having the eyes quite densely and noticeably haired, the first posterior cell of the wing open, no discal bristles on the second and third abdominal tergites, and apical bristles on first and second tergites, while there are only four bristles on the presutural lateral area of thorax, and the sternopleurals are 1 + 1.

Genotype, the following species.

ZEBROMYIA OBESA, n. sp.

Male.—Head reddish testaceous, with changeable white dusting, checkered on parafacials, frontal and postocular orbits; third antennal segment fuscous, paler at base; upper postocular orbits and ocellar region fuscous; occipital hairs whitish-yellow, postocular ciliae and other cephalic hairs black; palpi yellow. Thorax similar to the preceding species, but the pale parts more rufous, the disc of mesonotum not so dark, and the dark vittae nearly equal in width, more widely broken, and more punctiform behind suture. Abdomen with the dark marks on dorsum more transverse and not so dark in colour, almost castaneous, the fourth tergite with a pair of small blackish spots at apex. Legs entirely reddish testaceous. Wings yellow at bases. Calyptrae white. Halteres yellow.

Head in profile as Text-figure 20; frons at vertex about one-fourth of the head width, interfrontalia at middle about equal in width to either orbit, the latter with long hairs and bristles, the bristles descending well below level of apex of second antennal segment and nearly reaching eye; parafacials bare on lower two-thirds; facial ridges seen from the side almost as wide as parafacials, with four or five series of short black bristles, longest on section above vibrissae. Thorax with 3 + 4 dorsocentrals, 3 + 3 acrostichals, four bristles on presutural lateral area, the extra notopleural weak or lacking, and the sternopleurals 1 + 1. Abdomen broadly ovate, first and second visible tergites each with a pair of central apical bristles, third with a complete series on the black portions, fourth with long bristles on sides and apex and encroaching slightly on disc, sternal bristles not as long or strong as those on lateral edges of tergites. Fore tibia with bristles on basal three-fourths of anterodorsal surface; mid tibia with a ventral bristle; mid femur with about six strong bristles in two series at middle on anterior surface; anterodorsal series of bristles on hind tibia quite uneven, two or three of them outstanding. Third wing-vein with about three bristles at base above and below; first posterior cell open.

Length, 12-13 mm.

Type and one paratype, Tasmania, no other data. Australian Museum.

Genus Arrhenomyza, nov.

This genus belongs to the *Gonia* group, agreeing in all essential characters with my definition given in a preceding paper of this series, except in having the third notopleural bristle undeveloped. There are numerous long bristly hairs on the notopleural region in the male and, as it is not unusual for the female to have fewer and stronger hairs than the male, it is quite probable that in that sex the third notopleural may be distinct. The frons is exceptionally developed, extending well above upper level of eyes in profile (Text-fig. 21), and regularly convex when seen from in front; the orbits greatly exceed the interfrontalia in width and are entirely haired, connecting with the similarly haired parafacials; facial ridges bare; eye hairy; third antennal segment about twice as long as second; second aristal segment hardly longer than wide; proboscis hardly longer than head; palpi long, slightly club-shaped. Prosternum setulose; propleura bare in centre; metasternum haired. Abdomen with some bristles on second visible tergite which are apical laterally, and become preapical centrally, a similar series on third tergite which recede almost to middle of disc at centre, and no outstanding bristles on fourth tergite. Otherwise much as the other genera, but with only one bristle at base of third wing-vein, on upper side.

Genotype, the following species.

Arrhenomyza conspicua, n. sp.

Male.—Head orange-yellow, ocellar spot and a broad streak on lower portion of upper half of occiput black; occiput white-haired, postocular ciliae and other cephalic hairs black. Thorax deep black, with the following conspicuous white-dusted marks: a slender vitta along each series of dorsocentrals, connected at suture by a similar transverse line which is widened laterally and centrally, a spot on each humerus, and three smaller spots on lateral margins behind that, one before and one behind suture, and the other just in front of scutellum, and a spot on each pleural sclerite; scutellum translucent yellow, narrowly dark at base; spiracles yellow; all hairs black. First abdominal tergite black, second, third, and fourth, densely greyish-white-dusted, second with five black marks, a central spot, a large sublateral sub-triangular mark, and a large lateral spot, third with only three black marks, the sublaterals missing; fourth without black marks; hypopygium and sternites black, the lateral tergal spots glossy, the others less evidently shining. Legs orange-yellow. Wings hyaline, orange-yellow at bases. Calyptrae white. Halteres yellow.

Eyes haired; postocular ciliae long and fine; frons at vertex one-third of the head width, inner verticals not very strong, outer pair hardly distinguishable, ocellars weaker than postverticals, suberect and slightly divergent; interfrontalia at centre not one-third as wide as either orbit. Thorax with 3 + 4 dorsocentrals, 3 + 2 acrostichals, three posterior intra-alars, four bristles on the presutural lateral area, and some hairs on central upper portion of postalar declivity. Third and fourth visible abdominal tergites each with a dense patch of stiff short black hairs occupying almost all of the black patches on the lateral incurved portions. Hind tibia with the anterodorsal fringe of bristles longer than usual in this group, and with one outstanding anterodorsal bristle, the other bristles as in *Gonia*.

Length, 10 mm.

Type, Eradu, near Geraldton, W.A., 8.9.1926 (Nicholson).

It would appear worth noting that in this genus and *Quadra* we find a recurrence of the conspicuous black and white markings characteristic of the genus *Amphibolia*, of *Microtropeza ruficornis* Macquart, and *Amenia maculiventris* mihi, a type of coloration in that degree of prominence unknown to me in this family from any other region. The very striking white markings of such genera as *Rutilia* are also characteristic of this faunal region. No such features are found in the South American fauna, but there the number of genera in Calyptratae in which the abdomen is black with red, yellow, or golden apex is quite noteworthy, as are the two features mentioned above, but the occurrence is not restricted to that continent, though much more common there than in other regions. Another feature of the Australian tachinid fauna is the number of metallic blue or green species, and also the percentage of the family in which the eyes are very distinctly haired.

Genus FROGGATTIMYIA Townsend.

This genus and the next are distinguished from all the other genera included in Tachinini in this paper by the presence of erect hairs on the central portion of the propleura. There are very few Tachinini, and in fact very few genera of the family outside of the Ameniini, Rutiliini, and Dexiini, that have this character. Although especially noteworthy, it is remarkable that in the African representatives of the genus *Cylindromyia* Meigen there are species with, and without, the propleural hairs, one with hairs being now before me. In the Australian and North American species known to me the hairs are lacking.

Froggattimyia belongs near *Tritaxys* Macquart. In the genotype (*hirta* Townsend) the type specimen has the propleura yellow-haired in centre, the parafacials entirely haired, facial ridges bare, eyes bare, notopleurals 1 + 1, prosternum setulose, the abdomen without strong discal bristles, second segment of the arista not elongated, first posterior cell open, third antennal segment extending four-fifths of the distance to mouth margin and about four times as long as second segment.

I have seen only the type specimen in the United States National Museum.

Genus PROTOMEIGENIA Townsend.

This genus is very similar to the preceding one, but the antennae are a little shorter, the facial carina is the same (see key), but the parafacials are haired only down to about their middle.

The type specimen of the genotype (*aurea* Townsend) has the hairs on centre of the propleura black, but along with it there is a second specimen in which the hairs are pale yellow.

For localities of these species see my catalogue of the family.

Genus GONIA Meigen.

I have seen no Australian representative of this genus.

CHLOROTACHINA Group.

This group, as accepted herein, contains metallic coloured species which have the eyes haired, the palpi well developed, aristae bare or almost so, strong discal bristles on the second to fourth visible abdominal tergites, the parafacials bare, and the lower calypter widened behind, without a bulge upward along inner margin.

In *Chlorotachina* the face is not carinate, but in *Macrochloria* there is a very distinct vertical carina on the upper half of face. *Chlorodexia* Townsend is a synonym.

Genus CHLOROTACHINA Townsend (1915).

This genus was erected for the reception of a metallic green species with somewhat the appearance of a small slender *Rutilia*. The face, however, lacks the central carina, the eyes are hairy, the centre of the propleura is bare, the upper calypter is short and rounded at apex, and the fore tibia has an almost complete series of anterodorsal bristles. The hind tibia has an irregular anterodorsal series of bristles, two or three of them being much longer than the others, the prosternum is haired, and there are no hairs below the lower calypter, on the suprasquamal ridge, or on the centre of postalar declivity. Angle of fourth vein without a conspicuous appendage.

Genotype, *Chrysosoma flaviceps* Macquart.

The species at present known to me may be distinguished as in the key below.

Key to the Species.

1. Frontal orbits, entire face, and cheeks, bright golden-yellow-dusted; entire antennae bright orange-yellow; humeral angles when seen from behind with a conspicuous spot of dense white dust clearly differentiated from the adjoining mesonotal region; abdomen without any dusting 2

   Frontal orbits and a spot on parafacials densely white-dusted; face and cheeks brownish, changeably dusted; third antennal segment brown at apex; dorsum of thorax more densely and evenly dusted than in the preceding species, the dust on humeral angles when seen from behind not more conspicuous than that on adjoining mesonotal region; abdomen metallic green, with whitish-dusting, similar in appearance to that of *Lucilia sericata* Meigen .... *froggatti* Townsend

2. Thorax and abdomen metallic blue-green; fore tibia with the anterodorsal series of bristles complete ..... *flaviceps* (Macquart)

   Thorax black, with quite evident blue shade; abdomen glossy black, with purplish or bronzy tinge on sides basally; fore tibia with the anterodorsal series of bristles confined to basal third ..... *nigrocaerulea*, n. sp.

CHLOROTACHINA FLAVICEPS (Macquart).

A metallic blue-green species. Frons black, orbits, entire face, and cheeks golden yellow; antennae and palpi orange-yellow. Thorax noticeably white dusted on dorsum anterior to the suture, the humeri when seen from behind with a large white spot; the mesonotum with four dark vittae anteriorly. Abdomen without dusting. Legs black. Calyptrae white. Halteres fuscous.

Male.—Frons at vertex about one-fifth of the head width; parafacials bare below bases of antennae; epistome projecting; one or two bristles above vibrissae; aristae bare; palpi of moderate length. Thorax with 3 + 4 dorsocentrals, 4 + 3 acrostichals, and the sternopleurals 2 + 1. Visible tergites 2 to 4 with discal bristles, second with a pair of apical central bristles, third with a complete apical series, fourth with two such series.

Length, 10-11 mm.

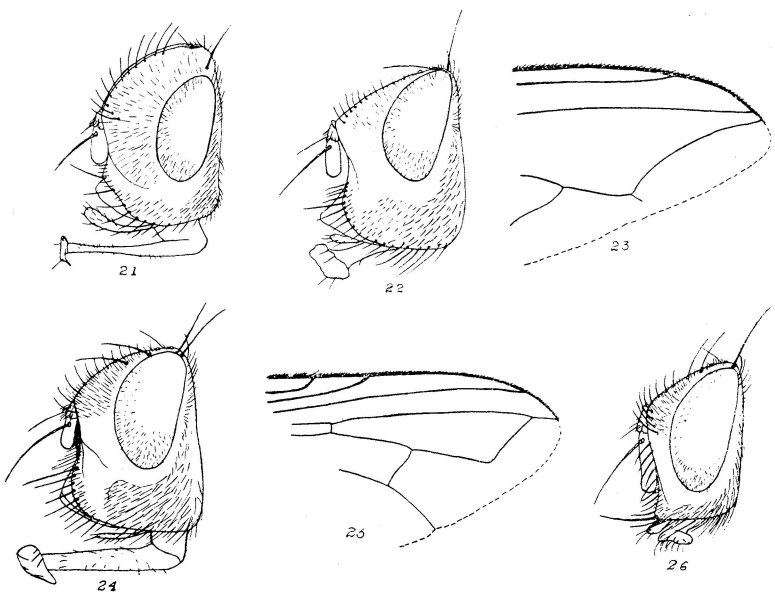
Locality.—Cairns, N.Q. (A. P. Dodd). Labelled "ex bark".

CHLOROTACHINA NIGROCAERULEA, n. sp.

This may be merely a variety of *flaviceps*, from which it differs essentially in being largely glossy black, the thorax with a bluish cast, and the abdomen with a

purplish tinge on sides basally. The legs are black, the wings greyish hyaline. calyptrae white, and halteres fuscous.

Frons at vertex one-sixth of the head width in male, interfrontalia widened from back to front, orbits strongly bristled along entire inner margins anterior to ocelli, finely haired laterad of the bristles; ocellars rather long; inner verticals long, incurved, outer pair not developed; postocular ciliae long above; profile as in Text-fig. 22; parafacials bare. Thorax with 3 + 4 dorsocentrals, 4 + 4 acrostichals, five bristles on the presutural lateral area; the sternopleurals 2 + 1; and no hairs just below the lower calypter. Second and third visible abdominal



Text-fig. 21.—*Arrhenomyza conspicua*, head of male from the side.
Text-fig. 22.—*Chlorotachina nigrocaerulea*, head of male from the side.
Text-fig. 23.—*Chlorotachina nigrocaerulea*, apex of wing.
Text-fig. 24.—*Macrochloria calliphorosoma*, head of female in profile.
Text-fig. 25.—*Phorocerosoma setiventris*, apex of wing.
Text-fig. 26.—*Phorocerosoma setiventris*, head in profile.

tergites with two or three pairs of long discal bristles, third with a complete apical series, fourth with long bristles on disc and apex, sternites and lateral margins of tergites without strong bristles, but rather abundantly haired. Fore tibia with four or five short bristles on basal half of anterodorsal surface; mid femur with one median anterior bristle; mid tibia with a ventral bristle; hind tibia with 5 to 8 unequal anterodorsal bristles. Base of third wing-vein with about eight short fine closely placed setulae above and below; wings slightly pointed, apical venation as Text-fig. 23.

Length, 13 mm.

Type, King George's Sound, W.A., no other data. Australian Museum.

CHLOROTACHINA FROGGATTI Townsend.

Male.—Differs from the genotype in having the head much darker coloured, the frons largely fuscous, face dark brown above, raised portion of cheek metallic green, and third antennal segment brown at apex. The thorax and abdomen are metallic emerald-green, with white dusting.

Structurally the species are very similar, but the fourth visible abdominal tergite is less copiously bristled, and there is a noticeable appendage at angle of the fourth wing-vein.

Length, 10 mm.

Locality.—Blue Mts., N.S.W., 9.2.1915 (A. Musgrave). Australian Museum.

I have carefully compared this specimen with the type specimen and find that they agree in all particulars, thus *Chlorodexia* is synonymous with *Chlorotachina*, this being the genotype of the former.

Genus MACROCHLORIA, nov.

This genus is closely related to the foregoing one, but it differs radically in the structure of the head as can be seen by comparing the Text-figures 22 and 24 herein. The genotype has a very noticeable superficial resemblance to some of the large species of the genus *Calliphora*, hence the specific name. In addition to the distinction in head structure, the posterior sublateral bristle is lacking, and there are some hairs below the lower calypter.

Genotype, the following species.

MACROCHLORIA CALLIPHOROSOMA, n. sp.

Male and female.—Head reddish testaceous; frons fuscous, interfrontalia of female brown, orbits yellowish-grey-dusted, changeable; face yellow-dusted; occiput fuscous except below, with whitish dust; antennae reddish-yellow, third segment blackened apically; aristae fuscous; palpi reddish-yellow; genal hairs dark in front, pale behind. Thorax fuscous, with distinct blue tinge, dorsum whitish-dusted, with four narrow dark vittae which do not reach posterior margin. Abdomen metallic blue-green, dorsum without evident dusting, except on fourth tergite, where there is quite conspicuous white dust when seen from behind, venter white-dusted. Legs variable in colour, sometimes dark brown with fuscous femora, sometimes entirely fuscous. Wings greyish hyaline, yellowish at bases; basal scales rufous yellow. Calyptrae yellowish. Halteres yellow. Pleural and abdominal hairs dark.

Frons of male at vertex about one-tenth of the head width, vertical bristles hardly differentiated, ocellars lacking, orbits bulging up slightly in front, rather densely long-haired, the inner series strongest; frons of female at vertex about one-fourth of the head width, widened anteriorly, all four verticals strong, post-verticals lacking, ocellars very short and fine, orbits wide, exceeding interfrontalia except in front, with two strong forwardly-directed supra-orbitals, the inner series of moderate strength, and the surface short-haired to below bases of antennae; profile as Text-fig. 24. Thorax with 3 + 4 dorsocentrals, 3 + 3 acrostichals, three posterior intra-alars, three bristles on anterior lateral area, the posterior sublateral lacking, sternopleurals 1 or 2 + 1, prosternal plate with a few microscopic hairs, and about twelve marginal scutellars. Abdomen ovate, second and third tergites each with one or more pairs of discals, second with two or more apical bristles in centre, third with a complete apical series, fourth with long bristles on most

of dorsum. Fore tibia with the anterodorsal setulae very short, lacking in male; hind tibia with about three outstanding anterodorsal and posterodorsal bristles. Bend of fourth vein with short appendage.

Length, 12-14 mm.

Type, male, Barrington Tops, N.S.W., 20.1.1927 (T. G. Campbell); allotype, one male and one female paratype, Kosciusko, N.S.W., March, 1889 (Helms). Australian Museum.

The facial carina in this genus is quite pronounced, being rounded above to near the level of apices of antennae where it becomes obsolete, there being no evidence of it on the lower half of the face.

Phorocera Group.

The genera included in this group all have the facial ridges strongly bristled to well above the middle, the eyes more or less distinctly haired, third antennal segment longer than the second and extending well below middle of face, frontal bristles descending to below level of base of third antennal segment, parafacials bare below lower frontal bristle, ocellar bristles present, palpi well developed, prosternal plate haired or bristled, notopleurals 1 + 1, centre of propleura bare, posterior sublateral bristle present, hind coxae bare above bases of femora, fifth wing-vein distinctly shorter beyond than before outer cross-vein, first wing-vein bare, third with some setulae at bases above and below, lower calypter broad, not bulging up along inner margin.

The largest and most widely distributed genus is *Phorocera* Robineau-Desvoidy, which according to the most recent treatment contains several subgenera. Amongst my material from Australia there are two species which I consider are entitled to generic separation from any other of the group, and I describe them herein.

Genus Phorocerosoma, nov.

This genus is most closely related to *Madremyia* Townsend and *Murdockiana* Townsend, two monobasic North American genera in which the first posterior cell of the wing is closed at the margin and usually short petiolate. In both of these genera the outer cross-vein is situated more than twice as far from the inner one as from the bend of fourth vein, and the abdomen has discal bristles on the second and third visible tergites. There are no discal bristles on the second and third visible tergites in the new genus and the venation of the apical portion of wing is as Text-fig. 25. For other characters see description of genotype.

Genotype, the following species.

Phorocerosoma setiventris, n. sp.

Male.—Black, slightly shining. Interfrontalia dark brown, remainder of head densely white-dusted, almost silvery; antennae black, apex of second segment testaceous yellow; palpi testaceous yellow; hairs on lower occiput pale, other cephalic hairs black. Thorax quite densely pale-grey-dusted, mesonotum with four linear black vittae, sublateral pair interrupted at suture, all four ceasing between suture and hind margin; scutellum evenly grey-dusted. Abdomen densely grey-dusted, with a sub-triangular dark brown mark on centre of apical margin of each tergite and dots of same colour at bases of the hairs and bristles, ventral incurved portions of tergites almost all black, and distinctly shining. Legs black. Wings hyaline, yellowish at bases. Calyptrae white. Halteres dull yellow.

Head in profile as Text-fig. 26; frons at vertex more than one-fourth of the head width, orbits fully as wide as interfrontalia; ocellars short and fine; second segment of arista not longer than thick; eyes with very short sparse hairs. Thorax with 3 + 4 dorsocentrals and 3 + 3 acrostichals, 3 posterior intra-alars, the prealar long, sternopleurals 1 + 1 + 1, apical scutellars short and erect; prosternum with a few long bristly hairs. Abdomen with tergites 2 to 4 subequal, 2 with a pair of apical median bristles, 3 and 4 each with an apical series, the incurved lateral portions of 3 and 4 with quite dense decumbent short black hairs, but not with patches as in certain related species. Legs normal, the anterodorsal bristles on fore tibia very short, mid tibia with a ventral bristle, hind tibia with some outstanding anterodorsal bristles.

Length, 7 mm.

Type, National Park, Macpherson Range, Q., 18.12.1926 (A. Musgrave). Australian Museum.

There is no rearing record on this specimen, but as all the related genera are parasitic upon larvae of Lepidoptera, and to a lesser extent upon saw-fly and beetle larvae, it presumably has similar habits.

Genus Hillia, nov.

This genus has somewhat the same characters as the preceding one, but the first posterior cell of wing is closed nearer to the wing margin, the costal division between apices of auxiliary and first veins is much shorter (Text-fig. 27), the third vein is setulose on upper side to, or beyond, the inner cross-vein, the short erect apical pair of scutellar bristles is lacking, the frontal bristles do not descend below level of apex of the second antennal segment, and the posterior sublateral bristle of thorax is undeveloped. Like the preceding genus it has the hairs on the eyes very minute and sparse, appearing absent except under a high magnification (× 34).

Genotype, the following species.

Hillia polita, n. sp.

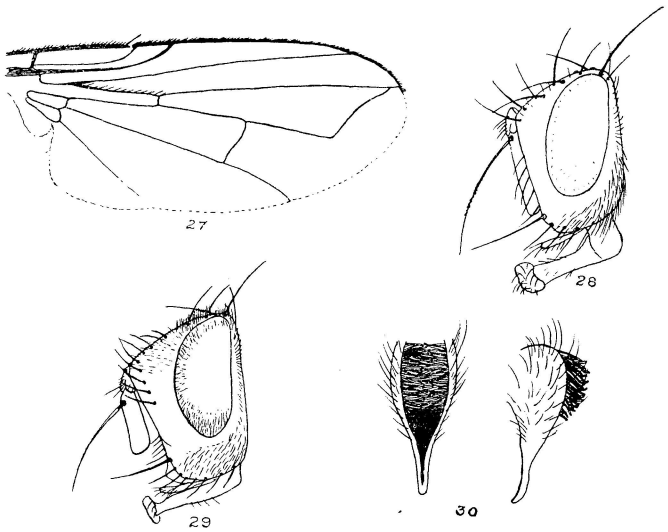
Female.—Black. Head with dense silvery dust on frontal orbits, parafacials, cheeks, and postocular orbits, upper portion of occiput slightly shining submarginally; antennae black; palpi testaceous yellow; lower occipital hairs pale. Thorax with quite dense whitish dust; mesonotum with two broad shining black vittae; scutellum black, contrasting with the grey-dusted postscutellum. Abdomen glossy black. Legs black. Wings greyish hyaline, yellowish at bases. Calyptrae white. Halteres fuscous.

Head in profile as Text-fig. 28; postverticals and outer verticals short, inner verticals long; ocellars moderately long; few orbital hairs present; third antennal segment extending almost to mouth margin, three times as long as second; arista microscopically pubescent, second segment not longer than thick. Thorax with 2 + 3 dorsocentrals, 3 + 3 acrostichals, prealar very short, sternopleurals 1 + 1, and a small bristle almost below the anterior one; scutellum with six marginal bristles, the median pair short; prosternum damaged in type. Abdomen with the tergites 2 to 4 subequal, second and third with a pair of strong median apical bristles, fourth with much shorter and weaker subapical and apical bristles. Anterodorsal surface of fore tibia with an almost complete series of rather

irregular anterodorsal bristles; hind tibia with the anterodorsal bristles irregular. Costal thorn longer than inner cross-vein.

Length, 4·5 mm.

Type, Darwin, N. Aust. (G. F. Hill).



Text-fig. 27.—*Hillia polita*, wing.
Text-fig. 28.—*Hillia polita*, head of female in profile.
Text-fig. 29.—*Thrycolyga sorbillans*, head of male in profile.
Text-fig. 30.—*Thrycolyga sorbillans*, hypopygial forceps from behind and the side.

Genus Phorocera Robineau-Desvoidy.

I have been unable to identify any Australian species of this genus satisfactorily. The few I have seen are quite normal in characteristics, but the species from New Zealand now before me differ from the typical Phorocerae in having the frons much broader, and with but one strong backwardly-curved upper orbital in the male. The males of typical species have two backwardly-curved bristles on the upper third of each orbit. The present is not an appropriate time to deal with the status of the New Zealand group.

There is a great number of Tachinidae involved in the division of the family to which *Phorocera* belongs, and much difficulty and uncertainty attend their generic elucidation. The principal generic concepts are *Phorocera*, *Zenillia* Robineau-Desvoidy (= *Exorista* auct.), *Exorista* Meigen (= *Tachina* auct.), *Frontina* Meigen and *Sturmia* Robineau-Desvoidy. The principal characters for the separation of these genera are the extent of bristling of the facial ridges, and the degree of hairiness of the eyes, both rather unsatisfactory for group distinction, because of the fact that it is not the absence or presence of either that is the criterion, but the degree of representation, thus making possible the occurrence of a large number of species which are hard to place in any group.

Frontina is very similar to *Phorocera*, the only character separating it therefrom being the indistinctly haired eyes. *Sturmia* is very similar to *Zenillia*, both

lacking strong bristles on the facial ridges except on their lower third or less, but the eyes in *Sturmia* are very indistincly haired, while those of *Zenillia* are quite conspicuously haired. The hind tibiae are stated to be pennate in both sexes in *Sturmia* while in *Zenillia* they are not so, or at least not so in the female, but this character does not hold in *Sturmia*, and in any case I consider it of much less than generic value. *Exorista* is about intermediate between the two groups, having the facial ridges setulose to, or slightly above, middle, and the eyes indistinctly haired. *Masicera* Macquart is close to *Sturmia*. For further discussion of the latter see subsequent page in this paper.

Genus Frontina Meigen.

I have seen one Australian species which apparently belongs to this genus, but am unable to determine what is the specific name for it if it has been described.

The genus is difficult to distinguish from *Phorocera*, the only character of any importance for that purpose being the indistinctly haired eyes. I have examined the genotype, *laeta* Meigen, and find, in addition to the generally cited characters, the following: prosternum setulose, no infrasquamal hairs, posterior sublateral bristle present, discals on second and third visible abdominal tergites of abdomen, hind tibia with an irregular fringe on anterodorsal surface.

Frontinella Townsend is similar, but has no discal bristles on second and third visible tergites of abdomen.

Exorista Group.

Genus Exorista Meigen.

This genus has generally been called *Tachina* by authors, but the latter name is now applied to the group more generally known as *Echinomyia* Latreille.

I have seen at least one Australian species which I cannot determine specifically at this time.

Genus Sturmia Robineau-Desvoidy.

I have seen a few species from Australia that would fall in this genus as generally accepted, but I am unable definitely to identify most of them specifically at this time. One species I discuss below.

Sturmia elzneri (Townsend).

This species was originally described as the genotype of *Ugimeigenia* by Townsend, but I can see no reason why it should be separated from *Sturmia, sens. lat.* It agrees in practically all the essential generic characters with the species generally accepted as belonging to this genus, except in the lack of ocellar bristles, which character in itself is not sufficient to justify generic separation, in my opinion.

A very strikingly coloured species. Black, the head and thorax covered with dense yellow, almost golden, dust; interfrontalia and antennae black; palpi yellow; dorsum of thorax with four deep black vittae, the pairs quite close together, the outer one of each extending farther posteriorly than the inner, but not attaining the posterior margin; scutellum black on the basal half; pleura more greyish-dusted below and behind. Abdomen black, slightly shining, bases of tergites densely and rather broadly white-dusted. Legs black, fore femora densely yellowish-

grey-dusted on posterior side. Wings greyish hyaline. Calyptrae yellowish-white. Halteres yellow.

Female.—Outer verticals undeveloped, ocellars indistinguishable from the long hairs, each orbit with two strong outer forwardly-directed bristles, orbitals descending to below level of apex of second antennal segment; third antennal segment about four times as long as second; palpi long; arista subnude, second segment not elongated. Prosternum setulose; dorsocentrals and acrostichals 3 + 4, posterior sublateral present, sternopleurals 2 + 1. Abdomen without discals or central apicals on tergites 1 and 2, 3 and 4 each with apicals. Hind tibia with one strong bristle in the regular anterodorsal fringe. Wing normal.

Length, 12 mm.

Locality.—Cairns, N.Q., ex scrub (A. P. Dodd). Originally described from Banks Island. Specimen compared with type.

It would appear to be worth noting that *Sturmia sericariae* Cornalia, the very widely distributed silk-worm parasite, agrees in practically all characters with the present one, lacking only the outstanding anterodorsal bristle on the hind tibia and having the third antennal segment rather shorter. It was placed in another genus and if that were valid it would carry with it *elzneri*, but Bezzi places *sericariae* in *Sturmia*. The latter species may be found to occur in Australia.

Genus Zenillia Robineau-Desvoidy.

This genus, generally called *Exorista* by authors, is very similar to *Thrycolyga* Rondani, the only character for their separation being that cited in my key, which is not by any means a satisfactory one, in my opinion, for distinguishing genera. However, the matter may rest pending a survey of the Australian forms. I have seen some unidentified species of *Zenillia* from Australia.

Genus Thrycolyga Rondani.

This generic name has been emended to *Tricholyga*, but the above is the original spelling.

I have before me one species of this genus from Australia and summarize the generic characters therefrom.

Eyes distinctly haired; frons of male with two strong backwardly-directed upper orbitals on each side, lower orbitals incurved and descending to middle of the parafacials; profile of head as in Text-figure 29; ocellars proclinate and slightly divergent, rather long; inner verticals long, outer pair undeveloped. Prosternum haired, centre of propleura and upper metapleura bare, notopleurals 1 + 1; lower calypter large, subtransverse at apex, raised along inner side near margin. First wing-vein bare, third setulose at base above and below, ending well before apex of wing; first posterior cell open. Hind tibia with a short anterodorsal fringe and one outstanding median bristle in the series.

Thrycolyga sorbillans (Wiedemann).

A black species, with dense whitish-grey dust, the thorax with four black vittae, and the abdomen with broad black apices to tergites. Wings clear. Legs black. Calyptrae white. Halteres brown.

A striking peculiarity of the species, and one distinguishing it from others of the genus, is the presence of dense, somewhat flattened pale yellow hairs on the hind sides of the basal portions of the superior hypopygial forceps of the male (Text-fig. 30).

Length, 10-12 mm.

Locality.—Cairns, N.Q., ex *Doleschalia australis* (A. P. Dodd).

The species is very widely distributed as a parasite of Lepidoptera, occurring throughout Europe, the Orient, and in Africa. It has also been introduced into the United States of America.

Synonyms of the genus are *Podotachina* Brauer and Bergenstamm, and *Neoscotia* Townsend, the latter having this species as its genotype.

Genus WINTHEMIA Robineau-Desvoidy.

I have seen no species of this genus from Australia, but have no doubt that there are some such.

In the common North American species *quadripustulata* Fabricius, the eyes are conspicuously haired, the male has no strong upper reclinate orbitals, the hind tibia is evenly fringed in the male and in the female there is one outstanding bristle in the series, the posterior sublateral bristle is present, and there are no discal bristles on the second and third visible tergites of abdomen.

The next two genera I have not assigned to any particular group.

Genus DEMOTICUS Macquart.

I have seen no species of this genus from Australia, the characters cited in the key to genera being derived from the genotype, *plebeius* Fallen, a European species. Curran is the only author recording the genus from Australia.

A summary of the generic characters is as follows: Eyes bare, facial ridges with a few hairs just above vibrissae, parafacials bare; prosternum bare; third antennal segment extending nearly to mouth margin, slightly widened at apex and about three times as long as second; arista bare; posterior sublateral bristle lacking; first posterior cell of wing open; discal bristles on second and third visible tergites of abdomen; hind tibia with an irregular series of anterodorsal bristles; orbits with forwardly-directed outer bristles in both sexes; second segment of arista elongated in male (two and a half times its own length), not elongated in the female.

Genus SEMISUTURIA Malloch.

I have already dealt with this genus in this series of papers, reference to the paper being given in my catalogue of the family.

The present opportunity is taken to give a figure of the head of the female of the Australian species to show the characters of the genus (Text-fig. 31).

I have seen no further material belonging to the genus since writing my previous paper.

EUTHERA Group.

Some authors would consider this genus entitled to tribal rank, but I am not inclined to consider it so, though it has some rather striking characters which distinguish it from other Tachinidae.

Genus EUTHERA Loew.

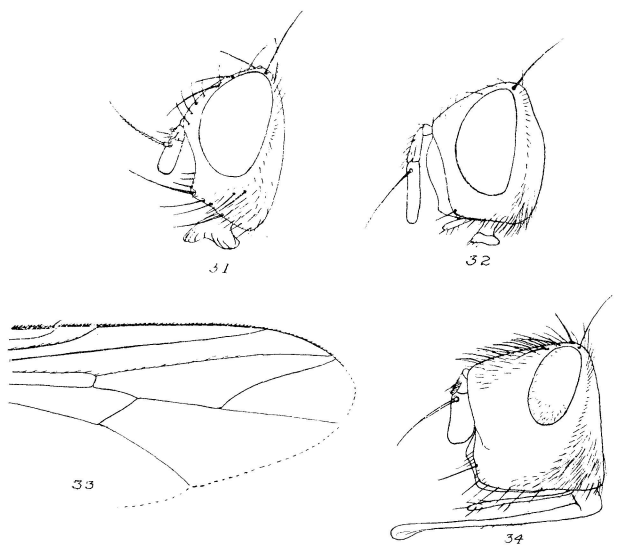
In some manner I failed to include this genus in my original manuscript of the catalogue of **Tachinidae.**

Bezzi dealt with all the species of the genus in 1925 (These PROCEEDINGS, 50, pt. 3, p. 275), and accepted three subgenera, one of them being erected in his paper. It is possible that these segregates may yet be accorded full generic status.

The single Australian species, *skusei* Bezzi, was placed in the subgenus *Macreuthera*, which subgenus agrees more nearly with typical *Euthera*, all the species of which are from the New World, than it does with the subgenus *Eutheropsis* Townsend, the species of which occur in Africa, Europe and Asia. *Eutheropsis* has the parafacials haired, the other two subgenera have them bare.

I have not seen the Australian species which, like all the others, has the wings very conspicuously marked with black. The species was described from a single female specimen collected at Eidsvold, Queensland, and ought to be in the collection of the Department of Public Health in Sydney, if it was ever returned by Dr. Bezzi.

I figure the head of *Euthera tentatrix* Loew, the genotype of *Euthera, sens. str.*, an American species (Text-fig. 32).



Text-fig. 31.—*Semisuturia australis*, head of female in profile.
Text-fig. 32.—*Euthera tentatrix*, head of female in profile.
Text-fig. 33.—*Hyleorus furcatus*, apex of wing.
Text-fig. 34.—*Peremptor vittata*, head of male in profile.

VORIA Group.

This group is readily distinguishable from the others by the position of the outer cross-vein of the wing, which is at or before a point midway from inner cross-vein to bend of fourth vein, and the consequent lengthening of the ultimate section of fifth vein, which is at least half as long as the penultimate section, and frequently about as long as it. There are certain other groups in which this feature is present, but none of them is represented in available Australian material. Two closely related genera are amongst the material I have before me from New Zealand.

Genus HYLEORUS Aldrich.

This genus has the eyes haired, facial ridges with bristles to above the middle, arista not as long as third antennal segment, its second segment about three times as long as thick, each orbit of the female with three strong forwardly-directed bristles, parafacials bare, all abdominal tergites from second visible to fourth with at least two strong discal bristles; first and third wing-veins setulose, the latter with hairs almost to apex; venation of apical half of wing as Text-figure 33.

Length, 5·8 mm.

I have examined the genotype and only species in the United States National Museum.

Tribe **Palpostomini.**

I have not received any recent material in this tribe so am unable to extend my notes upon it.

Tribe **Actiini.**

Genus ACTIA Robineau-Desvoidy.

I have just discovered an example of a species of this genus which appears to be new and is not included in my previous paper referred to herein.

ACTIA DARWINI, n. sp.

Male.—Head testaceous yellow, upper occiput fuscous on each side, densely grey-dusted, vertex, ocellar triangle, and frontal orbits dark, densely pale-grey-dusted, interfrontalia with pale dust when seen from certain angles, when seen from above and behind sharply differentiated in colour from the orbits; face and cheeks whitish-dusted; third antennal segment almost entirely yellowish-brown; palpi testaceous yellow. Thorax fuscous, densely grey-dusted, mesonotum not vittate; margin of scutellum slightly yellowish. Abdomen shining testaceous yellow, with a black dorsocentral vitta, black apices to third and fourth tergites, and a narrow fascia of white dust on each tergite. Legs testaceous yellow, apices of mid and hind femora, the hind tibiae, and mid and hind tarsi, more or less evidently browned. Wings hyaline. Calyptrae white. Halteres yellow.

Frons at vertex one-third of the head width, either orbit at middle as wide as interfontalia at same point, bristled as usual, lowest bristle above level of apex of second antennal segment, one or two fine hairs below it; parafacial visible in profile; third antennal segment simple, about three times as long as second, extending almost to mouth margin; second aristal segment about three times as long as thick, third tapered on apical half, subnude; palpi slightly club-shaped; apical section of proboscis as long as third antennal segment. Thorax with three pairs of postsutural dorsocentral bristles, lower stigmatal bristle represented by a short hair, lower sternopleural very short, no hair on anterior upper angle of hypopleura. Abdomen ovate, second visible tergite with a pair of median apical bristles, third and fourth each with six apical bristles. Mid tibia with an anterodorsal bristle near middle. Venation similar to that of *eucosmae* Bezzi, but the fourth vein is evident though weak from beyond the preapical bend to apex, first vein setulose on entire length above and at apex below, third vein setulose to a little beyond level of outer cross-vein above and with one setula at base below, fifth vein setulose along basal half of discal cell; inner cross-vein at middle of discal cell; ultimate section of fifth vein subequal to penultimate section.

Length, 3 mm.

Type, Darwin, N.Aust., 11.10.1916 (G. F. Hill).

This is the only Australian species I have seen which has the first, third, and fifth veins setulose above. There are a number of similarly armed species in the Orient, but none of them agrees with this one in all particulars.

Miscellaneous Genera.

The notes under this heading refer to genera not included in the generic key.

Genus ZITA Curran.

It is impossible for me to place this genus in my key owing to lack of mention of certain characters in the original description. It falls in the section with hairs on centre of propleura, and the pubescent arista would place it in the vicinity of *Rutilia*, though its being compared with *Arctophyto* Townsend indicates that it is not at all related to that genus. From all of the *Rutilia* group it is distinguished by the weak facial carina which is present only on the upper portion of face, but without information as to whether the face is deeply excavated and the suprasquamal ridge setulose it is impossible to place it in the key.

ZITA AUREOPYGA Curran.

This, the only species of the genus, should be readily distinguished by the densely golden-yellow-dusted head, yellow antennae, blackish palpi, black thorax with grey dust, four dark vittae, and two silvery pleural spots, the black abdomen with paired silvery spots on tergites 2 and 3, and golden dusted fourth tergite and hypopygium.

Length, 12 mm.

Locality.—Herberton, Q.

Type in Deutsches Entomologische Institut, Berlin-Dahlem.

Genus DODDIANA Curran.

This genus is compared with *Hyalurgus* Brauer and Bergenstamm by its describer. It has the prosternal plate and centre of the propleura bare, second and third antennal segments of almost equal length, the arista pubescent, second segment short, palpi long, posterior sublateral bristle absent, first posterior cell of wing open, first vein bare, outer cross-vein nearer to bend of fourth than to inner cross-vein.

DODDIANA PALLENS Curran.

This is the only species of the genus so far described.

Locality and location of type as in the preceding species.

Genus PALIA Curran.

Belongs to the *Phorocera* group, but has no ocellar bristles, and the two upper orbitals in the male are reclinate.

Monobasic, genotype, *Palia aureocauda* Curran.

Locality.—Kuranda, Q.

Genus PALIANA Curran.

Belongs to the *Phorocera* group, lacks the ocellars as *Palia*, but has only one upper reclinate bristle on each orbit. Not the same as the New Zealand group.

Two species. Genotype, *Paliana basalis* Curran.

Locality.—Kuranda, Q.

Genus AMPLIPILA Curran.

Compared with *Winthemia* Robineau-Desvoidy by its describer, and stated to differ in lacking ocellar and posterior sublateral bristles, as well as in having shorter antennae and vibrissae above mouth margin. Genotype, *A. versicolor* Curran.

Locality.—Herberton, Q.

Synoptic treatment of the Genera.

In presenting the subjoined partial key to the genera of Australian Tachinidae, I realize that there are some drawbacks to my doing so, one of the most serious of which is its incompleteness, there being only fifty-three genera included. This number may appear very inadequate, as compared with the total of eighty-eight in my recent catalogue, which in itself is incomplete, but there is considerable uncertainty regarding the status of many of the species referred to such genera as *Masicera*, *Tachina*, *Exorista*, etc., that I am undecided upon the propriety of including these genera in the key. There are also many genera which are unknown to me, including ten of those erected by Townsend for the reception of species described by the older authors, six erected by Brauer and Bergenstamm, fourteen of Macquart's genera, and six recently erected by Curran; these, with three synonyms, account for most of the missing genera.

I have, in the following key, discarded some of the characters generally used in generic synopses of the family, as I have in my own work found it practically impossible to decide which category certain species should be assigned to when one finds a division thus: "First posterior cell ending at or close to the extreme wing tip" as against "First posterior cell ending some distance before extreme wing tip" or "Vibrissae on a level with oral margin" as against "Vibrissae distinctly above oral margin". I do not consider that such divisions can be used by anyone because of their variability and the gradual merging from one to the other, nor do I believe that they indicate relationships. Colour I consider valueless in generic distinctions, though there are cases where colour and structure are invariably coordinated. In most keys one finds sections divided upon the criteria "Eyes hairy" and "Eyes bare". But working, as I do, with a uniform magnification of thirty-four, it is confusing to find that genera which are definitely located in the groups with bare eyes really have hairs on the eyes, short it is true, but nevertheless hairs. I have thus in my key stated more clearly than is customary just what is intended by "haired" and "bare" eyes.

In presenting these data I include also a number of figures which, though diagrammatic, may suffice as guides to the identification of the included genera. This precaution is taken because there must be many genera unknown to me that will run down more or less satisfactorily to certain of those included in the key, and still be readily distinguished from those on the basis of characters not mentioned in this paper. I frequently include in my captions characters that are not strictly diagnostic, but do so for the purpose of distinguishing the genera, not from those they are compared with in the key, but from others, unknown to me, which may conceivably run down to the same captions on the basis of the primary distinguishing character utilized therein, and yet differ in such subsidiary uncontrasted characters as are cited.

The genera preceded by an asterisk (*) are those as yet unrepresented in the material I have seen from Australia, though recorded by one or more of the older authors, except in the case of a few New Zealand genera, and possibly occurring

there. All such genera are included on the basis of genotype examination. Quite a number of the genera are not in material that is returnable to Australia, some belonging to the United States National Museum, so that all will not be available at this time to Australian students in my identified series which I hope to transmit to the Australian Museum very shortly.

Most of the genotypes examined are in the collection of the United States National Museum and were made available to the author by the curator, Dr. J. M. Aldrich.

I take this opportunity to deal with a quite remarkable new genus which occurs in New Zealand. It is not probable that it occurs also in Australia, but this is the first time an extensive key to the genera from this general region has appeared and it offers an opportunity to present comparative data which may prove of value.

Key to the Genera.

1. Propleura haired in centre* 2
   Propleura bare in centre 13
2. Postscutellum not prominently projecting, subtransverse, and slightly emarginate centrally at apex, with the heavily chitinized portion not carried far forward above; arista long plumose; all the abdominal sternites quite broadly exposed and armed with strong apical spines; hind coxae with hairs above bases of femora (Ameniini) 3
   Postscutellum prominently projecting, evenly, or sometimes rather sharply, rounded at apex, the chitin extending well over the dorsal exposure towards base; arista bare, pubescent, or short haired, if with distinct hairs the intermediate abdominal sternites are almost entirely concealed, and not strongly spinose; hind coxae bare above bases of femora except in *Microtropeza* Macquart 5
3. Face not carinate ..... *Paramenia* Brauer and Bergenstamm
   Face with a prominent central vertical carina 4
4. Frons in both sexes about one-third of head width, and with strong forwardly-directed supraorbital bristles; third antennal segment about as long as height of cheeks ..... *Stilbomyia* Macquart
   Frons of male much narrower than that of female and without forwardly-directed supraorbitals; third antennal segment much shorter than height of cheek ..... *Amenia* Robineau-Desvoidy
5. Supraspiracular (metapleural) convexity with long erect hairs; abdominal sternites rather broadly exposed and strongly spinose apically; face not carinate; arista bare; third antennal segment not much longer than second; apices of second and third wing-veins more closely approximated than usual (Text-figs. 1 and 2) (Microtropezini) ..... *Microtropeza* Macquart
   Supraspiracular convexity without distinct hairs; abdominal sternites usually concealed, if exposed they are not strongly spinose apically 6
6. Face not deeply sunken, with a very prominent central vertical carina which is on at least a part of its extent more or less broadly rounded and projecting beyond parafacials in profile (Ruteliini) 7
   Face deeply sunken, with a low linear central vertical carina which is not visible in profile (Tachinini, pt.) 12
7. Suprasquamal ridge with setulose hairs 8
   Suprasquamal ridge without hairs 10
8. Second and third visible tergites of abdomen with strong discal bristles ..... †*Paramphibolia* Brauer and Bergenstamm, *Amphibolia* Macquart, *Chaetogastrina*. n. gen.
   Second and third visible tergites of abdomen without strong discal bristles 9

* Some extralimital species of *Cylindromyia* have the propleura haired in centre, but these all have the hind margin of thorax above the coxae and below base of abdomen heavily chitinized, high, and vertical, which is never the case in any of the genera included in Caption 1 in this key.

† See prior treatment of these genera in this paper.

9. Facial carina narrowly rounded above, abruptly decreasing in height above middle of face, almost sharp below; parafacials with rather long coarse hairs to below lowest level of eyes; forwardly-directed supraorbitals of female exceptionally strong for this tribe ..... *Chrysopasta* Brauer and Bergenstamm.
Facial carina broadly rounded, sometimes more or less sulcate centrally, flat below; parafacials haired or bare; forwardly-directed supraorbitals present or absent; strong only in the subgenus *Senostoma* ..... *Rutilia* Robineau-Desvoidy
10. Palpi very small, not, or very little, longer than diameter of apical section of proboscis; upper calypter almost as long as the lower one ..... *Prodiaphania* Townsend
Palpi long, much longer than diameter of apical section of proboscis; upper calypter much shorter than lower one 11
11. Second and third visible tergites of abdomen without discal bristles ..... *Formosia* Guérin
Second and third visible tergites of abdomen with discal bristles ..... *Chaetogaster* Macquart
12. Parafacials haired on their entire extent ..... *Froggattimyia* Townsend
Parafacials haired down to about middle, bare below .... *Protomeigenia* Townsend
13. Abdominal tergites without strong dorsal bristles; ovipositor of female with a strong backwardly-directed spike-like or scoop-like process; frons of female without forwardly directed supraorbitals (Phaniini) 14
Abdomen with well developed macrochaetae at least at apices of tergites 3 and 4 15
14. Antennae as long as face; abdomen prominently convex above, sutures subobsolete, apparently immovable ..... **Gymnosoma* Meigen
Antennae about half as long as face; abdomen flattened above, sutures normal .... *Hyalomyia* Robineau-Desvoidy
15. Thoracic region above hind coxae and below base of abdomen entirely chitinized, slightly rounded, quite high and vertical (Cylindromyiini) ..... *Cylindromyia* Meigen
Thoracic region above hind coxae and below base of abdomen membranous (soft) centrally, usually rather low 16
16. Outer cross-vein of the wing not nearer to bend of fourth vein than to inner cross-vein 17
Outer cross-vein of wing very distinctly nearer to bend of fourth vein than to inner cross-vein 22
17. First vein bristled above, third setulose or bristled above and below at base 17*a*
First vein bare above, third setulose at base above and below 18
17*a*. Facial ridges bristled to above middle; parafacials bare below; ultimate section of fifth vein almost as long as penultimate, the venation apically as in Text-fig. 33, the bend of fourth vein with a continuation of that vein to, or almost to margin of wing ..... *Hyleorus* Aldrich
Facial ridges with one or two short bristly hairs above the vibrissae; parafacials with a complete series of strong downwardly-curved strong bristles; ultimate section of fifth vein about four-fifths as long as penultimate section in male, the bend of fourth vein with a short thick appendiculate vein which does not nearly reach the margin of wing (New Zealand) ..... **Calcageria* Curran
18. Scutellum with a number of long erect bristles on disc; distance from apex of second vein to apex of third not less than that from apex of latter to tip of wing, the first posterior cell of wing open; third antennal segment very little longer than second; prosternum bare (New Zealand) ..... **Calcager* Hutton
Scutellum without long erect discal bristles, if any long bristles are present they are decumbent and directed apically; distance from apex of second vein to apex of third very much greater than distance from apex of third to wing tip, if not very much greater the first posterior cell is closed and short petiolate 18*a*
18*a*. Lower calypter narrow, evenly rounded at apex, and well separated from the scutellum along its inner margin (Palpostomini) 19
Lower calypter broadened apically, apical margin broadly rounded or subtransverse, the inner margin adhering quite closely to the scutellum on most of its extent 20
19. First posterior cell of wing closed and with a more or less pronounced petiole .... *Palpostoma* Robineau-Desvoidy
First posterior cell of wing open ..... *Eustacomyia* Malloch

20. First posterior cell of wing open, sometimes the fourth vein evanescent or lacking beyond the preapical curve; facial ridges setulose on not more than their lower third (Actiini) ..... *Actia* Robineau-Desvoidy
First posterior cell of wing closed and with a more or less developed petiole; facial ridges with quite strong bristles on lower two-thirds or more (Tachinini) .. 21
21. Third wing-vein setulose less than midway from its base to inner cross-vein .... *Phorocerosoma*, n. gen.
Third wing-vein setulose from its base to, or beyond, inner cross-vein .. *Hillia*, n. gen.
22. Proboscis very slender, the apical portion at least three times as long as head; arista plumose; face with a complete, flattened, central vertical carina; abdomen without discal bristles on second and third visible tergites; parafacials and prosternum bare (Dexiini) ..... *Prosena* St. Fargeau and Serville
Proboscis normal, not, or but little, longer than head, if about twice as long the arista is almost bare 23
23. Palpi rudimentary or extremely short, not, or very little, longer than diameter of apical portion of proboscis (Linnaemyiini) 24
Palpi long, usually much longer than diameter of apical portion of proboscis, if subequal to it the proboscis is short and stout (Tachinini) 26
24. Parafacials bare ..... *Linnaemyia* Robineau-Desvoidy
Parafacials haired 24
25. Parafacial without a strong bristle ... *Chaetophthalmus* Brauer and Bergenstamm
Parafacial with a strong bristle near lower margin of eye ..... *Apalpus*, n. gen.
26. Face with a central vertical carina which frequently projects beyond parafacial in profile 27
Face without a well developed central vertical carina 29
27. Arista plumose; antennae short, about half the length of face; facial carina sharp; parafacials bare; prosternum bare; discal bristles on second and third visible tergites of abdomen; eyes bare; about one and a half times as high as cheek; posterior sublateral bristle lacking (Dexiini) ..... **Dexia* Meigen
Arista bare or almost so; other characters not as above in combination 28
28. Eye narrower than parafacial and not, or very little, higher than cheek; face with a deep cavity for the reception of the antennae when retracted, the foveae divided by a linear vertical carina which becomes higher and much wider below, filling the space between facial carina and sometimes visible from the side just above vibrissae as shown in Text-fig. 34; proboscis more slender than usual and its apical section longer than head; first posterior cell of wing open; eyes distinctly haired (New Zealand) ..... **Peremptor* Hutton
Eye wider than parafacial and higher than cheek; other characters not as above in combination 28*a*
28*a*. Facial carina broad, rounded, highest point at middle of face, antennae extending to, or a little below, mouth margin; first posterior cell of wing closed at some distance from margin of wing, the petiole quite long; eyes bare; discal abdominal bristles weak or undeveloped ..... *Euthera* Loew.
Facial carina almost nose-like, confined to upper half of face; first posterior cell of wing open; eyes distinctly haired; second and third visible tergites of abdomen each with more than one pair of strong discal bristles .... *Macrochloria*, n. gen.
29. No evident divisions between the tergites of abdomen on most of the dorsum, centrally apparently immovable; arista with very short hairs; parafacials narrow, bare; eyes very sparsely short haired ..... *Semisuturia* Malloch
Divisions between the abdominal tergites distinct, all capable of movement 30
30. Parafacials without fine hairs below middle, rarely with any below level of apex of second antennal segment; sometimes the strong frontal bristles descending beyond that point 31
Parafacials with fine hairs below middle, usually to lowest level of eyes 40
31. Lower calypter with quite long hairs on almost the entire upper surface; first posterior cell of wing open; discal bristles lacking on second and third visible tergites ..... **Nemoraea* Robineau-Desvoidy
Lower calypter without evident hairs except along margins, none on the disc ... 32
32. Arista long haired, the longest hairs at least as long as width of third antennal segment; first posterior cell narrowly open, ending rather close to wing tip .. 32*a*
Arista bare, pubescent, or very short haired, the longest hairs never appreciably longer than its basal diameter; legs stouter and shorter, the hind tibia with more numerous and longer bristles 33

32*a*. Slender species, with much the same habitus as *Cylindromyia* Meigen, the second and third visible tergites of abdomen each with a pair of long discal bristles; legs slender, and rather long, the hind tibia with one anteroventral, two anterodorsal, and two posterodorsal bristles, all short ... *Mesembriomintho* Townsend

Stouter species, without discal bristles on the second and third visible tergites of abdomen; legs not so slender nor long, the hind tibia with equally short bristles, but not arranged as above ..... *Rhinomyiobia* Brauer and Bergenstamm

33. Facial ridges broadly visible almost up to bases of the antennae when the head is viewed from the side, almost as wide as the parafacials, and furnished with about four irregular series of short stiff black hairs on more than three-fourths of their extent; frontal bristles extending to below level of apex of second antennal segment, ending close to eye (Text-fig. 20) ..... *Zebromyia*, n. gen.

Facial ridges much narrower and less extensively visible in profile, with one, rarely two series of hairs or bristles 34

34. Eyes densely and distinctly haired, the hairs visible with a weak magnification (× 10) 35

Eyes with very short sparse hairs, appearing bare except under a strong magnification (× 34); frontal orbits in male each with two strong backwardly-directed bristles on upper third 37

35. Facial ridges in profile narrowly visible on a variable portion of their extent, and with a series of quite strong bristles to well above middle; frontal orbit in male with two strong backwardly-directed bristles on upper third .... *Phorocera* Robineau-Desvoidy

Facial ridges in profile visible for only a short distance above vibrissae and with setulose hairs on bristles on less than their lower half 36

36. Frontal bristles extending in a single strong series along middle of parafacial sometimes to about midway to vibrissa; male with two strong backwardly-curved bristles on upper third of each frontal orbit; black species 36*a*

Frontal bristles usually confined to the inner margin of orbits, not descending below level of apex of second antennal segment; no strong backwardly-directed bristles on upper third of orbits in male; metallic blue or green species .... *Chlorotachina* Townsend

36*a*. Bend of fourth vein without trace of an appendiculate vein .... *Zenillia* Robineau-Desvoidy

Bend of fourth vein with a distinct appendiculate vein ..... *Thrycolyga* Rondani

37. Arista with quite evident hairs, the longest almost as long as its basal diameter; slender species; fourth visible abdominal tergite in male with a dense clump of black bristly hairs on each side below which are quite long apically and project slightly behind (Dexiini) ..... *Zosteromeigenia* Townsend

Arista bare or almost so; more robust species; male without the above-described anal tufts, though in some cases with patches of short erect hairs on same portions of third and fourth visible tergites 38

38. Facial ridges bristled to, or slightly above, middle, the bristles becoming weaker and shorter as they ascend; hind tibia without a regular series of bristles on anterodorsal surface ..... *Exorista* Meigen

Facial ridges bristled on almost their entire extent ..... *Frontina* Meigen

Facial ridges bristled on less than their lower third 39

39. Prosternum bare; forwardly directed frontal bristles present and the frons about equally wide in both sexes; posterior sublateral bristle lacking; hind tibia without a regular anterodorsal fringe of bristles ..... **Demoticus* Macquart

Prosternum setulose or haired; forwardly-directed orbitals present only in the female, the frons in that sex much wider than in the male; posterior sublateral bristle present; hind tibia with a regular fringe of bristles on anterodorsal surface, sometimes one of the bristles longer than the others .... *Sturmia* Robineau-Desvoidy

40. First posterior cell of wing closed before attaining margin, and with a very short petiole; eyes almost bare; abdomen with discal bristles on second and third visible tergites ..... *Quadra*, n. gen.

First posterior cell of wing open; abdomen without discal bristles on second and third visible tergites, the apical series anterior to the hind margin in *Arrhenomyza* and simulating discals, especially at centre 41

41. Frons almost uniformly protuberant above and in front; its height above eyes at ocelli about equal to the length of third antennal segment (Text-fig. 21); para-

facials with quite strong, long, black hairs; eyes densely haired; hind tibia with a fringe of exceptionally long bristles on the entire length of anterodorsal surface ..... *Arrhenomyza*, n. gen.

Frons hardly projecting above eyes posteriorly in profile 42

42. Stem vein of wing (Radius) with strong setulose hairs on posterior side of its basal section as in Rhiniinae (Fam. Calliphoridae); eyes long haired; parafacials haired to almost the lowest level of eyes; intermediate sternites of abdomen with long black apical spines ..... **Protohystricia*, n. gen.

Stem vein of wing without any setulose hairs on posterior side of its basal section 42*a*

42*a*. Eyes quite densely long haired (× 10); second segment of arista not longer than thick; parafacials quite copiously haired on their entire extent ..... *Winthemia* Robineau-Desvoidy

Eyes microscopically haired or bare (× 34); other characters not as above in combination 43

43. Second segment of arista hardly as long as thick; parafacials sparsely setulose to below middle; eyes practically bare ..... *Anamastax* Brauer and Bergenstamm

Second segment of arista more than four times as long as thick; parafacials setulose to lowest level of eyes 44

44. At least the lower third of facial ridges with very short black setulae; parafacials with about the inner fourth (nearest the facial ridges) bare, the remainder with rather short hairs; eyes with microscopic hairs (× 34) .. *Tritaxys* Macquart

Not more than the lower fifth of the facial ridges with setulae; parafacials with some quite strong and moderately long bristles extending along a portion of the inner margin, which are well differentiated from the fine short hairs laterad of them ..... **Gonia* Meigen

Notes on some New Zealand Genera.

I have a number of New Zealand genera which were sent to me about ten years ago by Mr. Morris M. Watt, but I do not purpose dealing with all of them at this time, as it may be possible to find an opportunity to prepare a separate publication dealing with them at some future time. The new genus *Protohystricia* is unique, so far as I am aware, in possessing setulose hairs on the posterior side of the basal section of the stem vein of the wing on its upper surface, as in the calliphorid subfamily Rhiniini and in some Muscidae. The other genera dealt with are so similar to some which occur in other faunal regions that I suspect they may yet be found in Australia, and they are included in the key for comparative purposes.

Genus PROTOHYSTRICIA, nov.

Generic characters.—Eyes rather conspicuously haired, frons of male about half as wide as that of female, the orbits without strong backwardly-directed upper bristles in male, and with two strong forwardly-directed supraorbitals in female, outer verticals undeveloped in neither sex, ocellars of moderate length; parafacials haired; bristles descending a little below bases of antennae; face concave in profile, much as in *Winthemia*; third antennal segment about twice as long as second; arista almost bare, second segment not longer than thick; epistome projecting beyond anterior level of frons; palpi long; facial ridges setulose on lower fourth. Prosternum and centre of propleura bare; posterior sublateral bristle lacking, acrostichals and dorsocentrals strong; postalars two; pteropleural bristle strong; sternopleurals 3; scutellum with very strong bristles on apical half. Abdomen stout, with strong discals and apicals on all tergites except first, apices of at least the intermediate sternites with very strong bristles. First posterior cell open, fourth vein much curved beyond angle, base of third vein above and below

and the posterior upper side of basal section of stem vein setulose. Lower calypter bare, wide at apex, lying close against scutellum.

Genotype, *Hystricia pachyprocta* Nowicki.

PROTOHYSTRICIA PACHYPROCTA (Nowicki).

Specimens from Dunedin, 20.11.1916, Paradise, 1.1.1920, and Bold Peak, 24.12.1913 (Watt).

The genus *Hystricia* has the lower calypter haired above as in *Nemoraea* Meigen, and neither it nor any related form has the setulose hairs on the base of stem vein.

Genus CALCAGER Hutton.

This genus was originally erected for the reception of four New Zealand species, but in 1927 Curran published a statement that in his opinion there were three genera involved in Hutton's concept, designated *apertum* Hutton as the genotype, and removed *turbidum* Hutton to the new genus *Plagiomyia.*

Calcager, as now restricted, is very similar to *Cyrtophloeba* Rondani, a genus occurring in Europe, North and South America. It differs from the latter in having a series of long setulose hairs on the parafacials instead of long strong bristles, and in having the outer cross-vein of the wing nearer to the inner cross-vein than to the bend of fourth, instead of nearer to the bend.

I have seen *Calcager apertum* Hutton from Ruapehu, New Zealand, 7.1.1922 (Fenwick).

Genus CALCAGERIA Curran.

This genus was erected in 1927 for a new species from New Zealand, *incidens* Curran. It is closely similar to *Opsophagus* Aldrich, erected for the reception of two Peruvian species in 1926 (*Trans. Amer. Ent. Soc.*, 52, p. 15). I have a specimen of *incidens* before me, have compared it with the genotype of *Opsophagus*, and find that the only differences between the two lie in the arrangement of the frontal and parafacial bristles. In the American genus the strong parafacials connect with the outer, or supraorbital, forwardly-directed series, while in the New Zealand genus they connect with the inner marginal series. This difference may be of no significance, as there is generally some variation in the bristling in related forms. The only other feature worth noting is that the outer cross-vein is closer to the inner in the New Zealand than in the American species.

I would consider the genera synonymous. Both belong near *Voria* Robineau-Desvoidy. The known genera with retracted outer cross-vein of the wing have been dealt with by Aldrich in the paper referred to above.

Genus PEREMPTOR Hutton.

This genus was erected by Hutton for the reception of two New Zealand species. The description given is fairly good, but the genus is in no way related to *miltogramma* Meigen, with which it is compared, that genus belonging to the Metopiinae, a subfamily of Calliphoridae. It does bear a resemblance to *Procissio* Hutton, the only character given for its separation therefrom being the lack of discal bristles on the second and third visible tergites of the abdomen.

I have but one species before me, *vittata* Curran, described in 1927 in a paper already referred to herein.

PEREMPTOR VITTATA Curran.

This species is the only one with the abdomen reddish-yellow. The black dorsocentral vitta on abdomen is tapered slightly apically, the legs are yellow, apices of tarsi darkened. Head in profile as Text-figure 34.

Localities.—Ruapehu, Routeburn, Milford I., and Eglinton V. The initial in the last listed locality may mean Valley.

It should be noted that *Hystricia lupina* Swederus will run down very well to the present genus in my key, but the space between the vibrissae is three or more times as great as the width of the third antennal segment in that species, while in the present one it is less than the width of the third segment. I believe that it will be necessary to erect a new genus for the reception of *lupina*. It is remarkable in the possession of bicoloured strong bristles on the abdomen—black at bases and golden yellow at apices.