THE *DIPTERA-BRACHYCERA* OF TASMANIA.

Part I. Families *Leptidæ*, *Stratiomyidæ*, *Nemestrinidæ*, & *Cyrtidæ*.

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The present paper is intended to form the first part of a general revision of the Diptera-Brachycera of Tasmania. The families *Leptidæ*, *Stratiomyidæ*, *Nemestrinidæ*, and *Cyrtidæ* are dealt with; the *Tabanidæ*, which should properly be taken between the *Stratiomyidæ* and *Nemestrinidæ*, are held over for the present for the purpose of further study.

I wish to take this opportunity of acknowledging my indebtedness to Mr. W. W. Froggatt, Government Entomologist of New South Wales, Mr. G. H. Hardy of the Tasmanian Museum, Mr. A. M. Lea of the Adelaide Museum, Mr. F. M. Littler of Launceston, and, particularly, Mr. F. P. Spry, of the National Museum, Melbourne, who have been most kind in looking up references for me in works to which I had no access, or in supplying me with specimens for examination.

Most of the Tasmanian species of Diptera that have been named up to the present time, were described about the middle of last century by Macquart (*Diptères Exotiques*, 1838-55) and Walker (*List Diptera Brit. Mus.*, 1848-55; *Insecta Saundersiana*, *Diptera*, 1850; and *Trans. Ent. Soc. Lond.*, 1856-8). A few species were also described by Erichson (*Archiv f Naturgesch*, 1842). In later years a few species were described by Bigot ("Diptères nouveaux ou peu connus," *Ann. Soc. Ent. Fr.*, 1892); a single species of *Cordyluridæ*, by Osten-Sacken (*Ent. Monthly Mag.*, 1881), and a species of *Hippoboscidæ* by Wesché (*Ann. Mag. Nat. Hist.*, 1903). Finally some new species of *Asilidæ* were described by myself in these *Papers and Proceedings* for 1913. Various references to Tasmanian species previously described may also be found in various papers dealing more particularly with the Diptera of the mainland States, especially Skuse, "Diptera of Australia" (*Proc. Linn. Soc., N.S.W.*, 1888-90), which deals with the *Diptera-Nemocera*; Ricardo, "A Revision of the Asilidæ of Australia" (*Ann. Mag. Nat. Hist.*, 1912-13); and Von Kröber, "Thereviden des Indo-Australischen Region" (*Entomologische Mitteilungen*, 1912-13).

During the last fifty years, however, very little work has been done on the Tasmanian Diptera, indeed the dipterous fauna of Tasmania has never been studied as a whole, and not only are there now a large number of new species to describe, but it is also necessary to place many of the older species in different genera to those in which they were originally described.

The method of classification that I propose to adopt in this and any subsequent papers is the following:—

Suborder i.—**Nemocera.** (Families: *Tipulidæ, Psychodidæ, Discidæ, Culicidæ, Chironomidæ, Cecidomyidæ, Mycetophilidæ, Bibionidæ, Simulidæ, Blepharoceridæ, Orphnephilidæ, Ryphidæ.*)

Suborder ii.—**Brachycera.** (Families: *Leptidæ, Stratiomyidæ, Acanthomeridæ, Tabanidæ, Nemestrinidæ, Cyrtidæ, Bombylidæ, Therevidæ, Scenopinidæ, Mydaidæ, Apioceridæ, Asilidæ, Empidæ, Dolichopodidæ, Lonchopteridæ, Phoridæ.)*

Suborder iii. — **Athericera.** (Families: *Platypezidæ, Pipunculidæ, Syrphidæ, Conopidæ, Tachinidæ, Dexidæ, Sarcophagidæ, Æstridæ, Muscidæ, Anthomyidæ, Muscidæ-Acalypteræ.*)

Suborder iv.—**Pupipara.** (Families: *Hippoboscidæ, Streblidæ, Nycteribiidæ.*)

The two first Suborders form the **Orthorrhapha**, the last two the **Cyclorrhapha.**

DIPTERA-BRACHYCERA.

Of the Suborder Brachycera the following eleven families are represented in Tasmania:—*Leptidæ, Stratiomyidæ, Tabanidæ, Nemestrinidæ, Cyrtidæ, Bombylidæ, Therevidæ, Asilidæ, Empidæ, Dolichopodidæ,* and *Phoridæ.*

The Brachycera are well represented in Tasmania, although many of the species are not met with unless searched for carefully; the great majority are inhabitants of the bush. Taking the families seriatim, the *Leptidæ* are somewhat local, though usually common where they occur. The *Stratiomyidæ*, with the exception of two species, occur very sparingly, and are seldom met with. The *Tabanidæ* are numerously represented, but only a very few species can be described as common; they are inhabitants of the bush, with the exception of a single species which frequents sandhills on the coast. The *Nemestrinidæ* are represented by two species, one common, the other rare and local. The *Cyrtidæ* are of very infrequent occurrence, most of the species being known from only single specimens. The *Bombylidæ* are well represented

species of *Bombylius*, *Systœchus*, *Dischistus*, and *Geron* are not uncommon, whilst several species of *Anthrax* are abundant. The *Therevidæ* are probably the most characteristic Tasmanian family; a number of species occur, most of which seem to be confined to Tasmania; the genus most in evidence is *Anabarrhynchus*, which contains a number of closely allied species. The *Asilidæ* are also numerously represented; a number of the species are common to both Tasmania and the mainland of Australia, but the larger Australian forms are wanting; the two most characteristic genera are *Leptogaster* and *Neoitamus*, which, so far as the Australian region is concerned, seem to reach their maximum development in Tasmania. The *Empidæ* are represented by only a few genera, which, however, contain a number of species; the majority belong to the genera *Empis*, *Hilara*, and *Leptopeza*. The *Dolichopodidæ* seem to be represented by very few species; the genera *Psilopus* and *Diaphorus* are represented, but the other species will probably require the creation of new genera. A species of *Phoridæ* is common on windows.

With regard to the question of distribution, the only families for which it is at present possible to give exact figures are those dealt with in the present paper. These families are represented, in Tasmania, by 15 genera and 28 species. Of these 15 genera, 5 are of world-wide distribution, 5 are common both to the mainland of Australia and to Tasmania, and 5 are confined to Tasmania. Of the 28 species none occur beyond Australia; 7 are common both to the mainland and to Tasmania, and 21 are confined to Tasmania. These figures may of course be modified by further discoveries, but they seem sufficient to emphasize the distinctness of the Tasmanian fauna, even from that of the neighbouring portion of the mainland. I might mention that for my knowledge of the Victorian species, I depend largely on the fairly comprehensive collection in the Melbourne Museum, and that I have taken into account the undescribed as well as the described species.

Key to the Tasmanian Families of Brachycera.

1.	The three basal cells always long.	2
	The third basal (or anal) cell short or wanting.	7
2.	Thorax without bristles.	3
	Thorax with bristles.	5
3.	Third joint of antennæ always annulated; cubital fork well above the wing tip. **STRATIOMYIDÆ.**	
	Third joint of antennæ either not annulated, or, if annulated, then the cubital fork not above wing tip.	4

4. Abdomen broad; antennæ with third joint annulated. TABANIDÆ.

   Abdomen narrow, and antennæ rarely annulated. LEPTIDÆ.

   Veins of wing run parallel with the hind margin. NEMESTRINIDÆ.

   Head minute, abdomen inflated, squamæ very large. CYRTIDÆ.

5. Wings with only three or four posterior cells. BOMBYLIDÆ.

   Wings with five posterior cells. 6

6. Front excavated between the eyes, and attached to the thorax by a slender neck. ASILIDÆ. Front not excavated between the eyes, and set close against the thorax. THEREVIDÆ.

7. Antennæ with arista very long and thread-like; all basal cells very short. DOLICHOPODIDÆ.

   Antennæ without a very long and thread-like arista; first and second basal cells not very short. EMPIDÆ. Wings, with two strong anterior veins, reaching only half-way to the tip, and three or four faint veins running diagonally across the wing. PHORIDÆ.

Family I. LEPTIDÆ.

Bristleless flies of elongated shape, having the squamæ small, and the posterior tibiæ spurred.

Head semi-circular, usually very short, and flattened above; face short, the antennæ being placed near the mouth; the antennæ of various shapes, but only annulated in the small sub-families *Xylophagine* and *Cœnomyine*, the latter unrepresented in Australasia. Thorax normal in shape. Abdomen, with seven obvious segments beside the genitalia. Legs usually rather long, without any strong bristles; hind tibiæ always spurred, the front and middle tibiæ usually so. Wings with a normal venation; the discal cross-vein is placed near the base, or at least on the basal third, of the discal cell; fourth posterior cell usually wide open; stigma generally well defined.

This family, so far as is known at present, is represented in Tasmania by six species, four of which are now described for the first time.

The species seem to be somewhat local, but where they occur at all, they usually do so in considerable numbers. Their habits are very various. One species is blood-sucking; the others may be found settled on vegetation, on the stones

in mountain streams, and on windows. The different species occur from early spring to late autumn.

Table of the Tasmanian Genera of Leptidæ.

1. Antennæ with third joint annulated.
   METOPONIA, Macq.
   Antennæ with third joint not annulated. 2
2. Fourth posterior cell closed. CLESTHENTIA, Gen. nov.
   Fourth posterior cell not closed. 3
3. Antennæ with a long thread-like arista.
   CHRYSOPILUS, Macq.
   Antennæ with a thickened arista. 4
4. Discal cell with three issuing veinlets; the upper branch of postical vein arising from second basal cell.
   ATHERIMORPHA, Gen. nov.
   Discal cell with four issuing veinlets or traces of them, the 1st, 2nd, and 4th complete, the 3rd abortive, the 4th being the upper branch of the postical vein.
   SPANIOPSIS, Gen. nov.

1. CHRYSOPILUS, Macq.

Dark coloured flies, decked in life with golden pile; antennæ with the arista thread-like; hind tibiæ with only one spur.

Head broader than the thorax; face scarcely descending beneath the eyes. Eyes joining in the male, but widely separated in the female. Antennæ with all joints small, the third bulbose, and terminated by a long thin arista. Thorax and abdomen covered with golden or pale yellow pile, which is very easily rubbed off. Legs long and slender, with the basal joint of the tarsi especially lengthened; anterior tibiæ without spurs, the middle tibiæ with two spurs, and the hind tibiæ with one spur. Wings broad, with the anal cell always closed.

This genus is of very wide distribution, a number of species having been described from Europe, Asia, and North and South America. In Tasmania two species occur; they may be distinguished as follows:—

1. Thorax black, unstriped; femora, light brown; pile in the male golden. Larger species.
   C. RUFIPES, Macq.

2. Thorax drab, striped; femora wholly black; pile in the male light yellow. Smaller species.
   C. TASMANIENSIS, Sp. nov.

Chrysopilus rufipes, Macq.

Thorax black, unstriped, with golden pile; abdomen black, with golden pile in the male, and very pale yellow pile in the female; femora light brown, the anterior pair blackish on basal half above.

Length. Male, 7-9 mm; Female, 9 mm.

Hab. Tasmania (generally distributed).

Male. Head, with the eyes joining, and occupying all the front except a lengthened triangular patch above, which is black; lower face grey. Palpi and antennæ black. Thorax velvety black, scutellum and abdomen dull olive-black, all decked in life with golden pile; abdomen with long whitish hairs along each side. Legs light brown, anterior femora blackish on basal half. Wings broad, with the veins and stigma light brown.

Female resembles the male, but the eyes are widely separated, the front brown, the abdomen produced into a long narrow ovipositor, and the pile, though golden on the thorax, is a pale whitish yellow on the abdomen.

In the male this species may be readily distinguished from *C. tasmaniensis*, next to be described, if examined below, there being a striking contrast between the very dark coxæ and the light brown femora, whereas in *C. tasmaniensis* the coxæ and femora below are uniformly dark. *C. rufipes* may also be distinguished by its larger size, and by the thorax being velvety black and unstriped, instead of drab and striped.

A slight variation in the neuration of the wings occurs in both sexes, the upper branch of the cubital fork sometimes possessing a small recurrent veinlet.

This species differs in its habits from most species of *Chrysopilus* in being by no means confined to the neighbourhood of water. It is an insect of the bush, where it may be found frequenting vegetation. I have met with it from December 8 to February 18

Chrysopilus tasmaniensis, Sp. nov.

Thorax drab, with a narrow black median stripe; abdomen banded with black and drab; femora black; pile in the male pale yellow.

Length. Male, 5-6 mm.

Hab. Hobart and Bagdad Valley.

Male. Head, with the eyes joining, and occupying almost all the front, the visible front being confined to the vertex. Lower face grey. Palpi and antennæ black. Thorax drab,

lighter in the centre, with a narrow black median stripe, and indistinct side stripes; a few black hairs on sides. Scutellum drab. Abdomen banded with black and drab; both thorax and abdomen covered with pale yellow pile; sides of abdomen with white hairs. Legs with femora black, tibiæ and tarsi brown, with joints and tips of tarsi darkened. Wings with a slight brownish tinge; stigma and veins brown.

Female unknown.

This species resembles *C. rufipes*, but may be distinguished from that species by its smaller size, by the femora being black instead of light brown, by the thorax being drab and striped, instead of black and unstriped, by the abdomen being banded instead of uniformly black, and by the pile in the male being pale yellow instead of golden.

This species may be found resting on the stones in the bed of mountain streams. I have met with it between November 30 and December 20, but no doubt it remains on the wing until a considerably later date.

2. ATHERIMORPHA, Gen. nov.

Robust flies; antennæ with a thickened arista; eyes separated in both sexes; front hairy; hind tibiæ with two spurs.

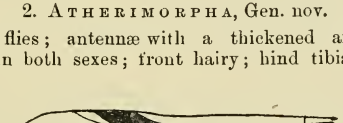

Fig. 1. Wing of *Atherimorpha vernalis*.

Head semicircular, about the same breadth as the thorax; front in the male densely, in the female slightly, hairy; face not descending below the eyes. Proboscis thick, protruding. Palpi almost as long as the proboscis, of equal breadth throughout, and bearing very long hairs. Eyes widely separated in both sexes. Antennæ situated very low, the three joints small and of almost equal breadth, the first being slightly the longest, and the second the shortest of the three, the third gradually drawn out terminally into a thick arista. Thorax arched and hairy. Abdomen robust, truncate in the male, pointed in the female. Legs long; femora with numerous small bristles; anterior tibiæ without spurs, middle and posterior tibiæ with two spurs. Wings with a distinct stigma, but no other markings; fourth posterior cell wide open; anal cell closed.

This genus seems to be most nearly allied to *Atherix*, with which it agrees in having the front hairy in the male, the posterior tibiæ with two spurs, and the closed anal cell. From *Atherix*, however, it may be at once distinguished by the antennæ, which have the third joint very small, and produced terminally into a conspicuously thickened arista, the joint and arista merging into one another without any distinct line of demarcation, instead of, as in *Atherix*, the third joint being large, kidney-shaped, with a long thin arista, which is apparently dorsal. It also differs from *Atherix* in having the eyes widely separated in the male, and in the wings being without markings. The antennæ bear some resemblance to those of the Siberian genus *Omphalophora*, but the arista is longer than in that genus, also in *Omphalophora* the hind tibiæ have only one spur.

ATHERIMORPHA VERNALIS, Sp. nov. (Fig. 1.)

A robust, densely hairy fly. Thorax grey, with three dark stripes; abdomen banded with black and grey; femora and tarsi black, tibiæ brownish.

Length. Male, 7 mm.; female, 7.5 mm.

Hab. Bagdad Valley.

Male. Face and front grey, the latter very long, flat, wide above, narrowing gradually to the antennæ, and densely hairy. Antennæ black, the three joints small and of almost equal breadth, the first being slightly the longest, and the second the shortest of the three; the arista conspicuously thickened, and nearly twice as long as the three joints together. Vertex with a distinct ocellar tubicle; back of head puffed out behind the eyes, and bearing long black hairs. Thorax grey, with three dark longitudinal stripes, scutellum grey, both densely covered with long black hairs. Abdomen banded with black and grey, the anterior portions of second to sixth segments, and the whole of the seventh, black, the remainder grey; the sides with long yellow and black hairs, the former predominating in the basal half, the latter in apical half. Legs slender; femora and tarsi black; tibiæ brownish, with short black bristles. Wings brownish, with a distinct dark brown stigma.

Female. The colouring resembles that of the male, but is somewhat lighter; the eyes are smaller, and more widely separated; pubescence of the front, thorax and abdomen less dense and shorter; abdomen long and pointed, and wings almost hyaline.

This species occurred commonly in the bush surrounding the Bagdad Valley during the Spring seasons of 1911 and

1912, but in 1913 I did not meet with a single specimen. I have found it on the wing from September 24 to November 9. The males appear some time before the females, and seem to be the commoner sex. The insects are somewhat sluggish in their habits; they may be found settled on bracken and clumps of grass. A nearly allied, undescribed, species occurs in New South Wales.

3. Spaniopsis, Gen. nov.

Blood-sucking flies, with a lengthened proboscis, and short broad abdomen; antennæ with the third joint large and produced into a thick subterminal arista; tibiæ without any distinct spurs; wings with the discal cell angulated below, and emitting four posterior veins; the first, second, and fourth reaching the wing margin, the third reduced to a mere stump and sometimes wanting; anal cell closed.

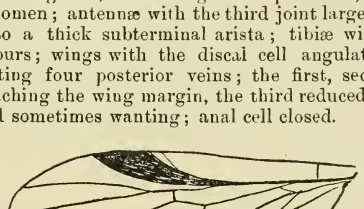

Fig. 2. Wing of *Spaniopsis tabaniformis.*

Head broader than the thorax; eyes in the female (the only sex known) very widely separated; proboscis stout, with large sucker flaps, slightly longer than the head, and twice the length of the palpi; antennæ with the first and second joints extremely small; the third large and produced into a thickened subterminal arista. Thorax with extremely short pubescence; scutellum without spines. Abdomen short and broad, resembling *Tabanus.* Legs bare; tibiæ without any distinct spurs. Wings with a conspicuous stigma; the cubital fork long and narrow; discal cell (usually) angulated below, and emitting four posterior veins; the first, second, and fourth (which is really the upper branch of the postical vein) reaching the wing margin, the third reduced to a mere stump, and occasionally wanting; anal cell closed.

This curious genus cannot be confounded with any other occurring in Tasmania. The four posterior veins arising from the discal cell would, at first sight, seem to show some affinity with the *Cœnomyinæ,** which is, I believe, the only subfamily of the *Leptidæ* in which this peculiarity has

* Some authorities make the *Cœnomyinæ* into a separate family, the *Cœnomyidæ.*

hitherto been known to occur: the *Cœnomyinæ*, however, have the third joint of the antennæ flagelliform and annulated, and the cubital fork of the wings large, bell-shaped, and embracing the wing tip. I consider that its real relationships are more correctly indicated by the shape of the antennæ, and the abortive third posterior vein, characters that are shared by *Spania*. The genus is probably a connecting link between the *Leptidæ* and the *Tabanidæ*.

Spaniopsis tabaniformis, Sp. nov. (Fig. 2.)

A fly resembling a small Tabanus. Thorax varying from yellow brown to blackish, with three dark longitudinal stripes, the middle one short, the outer extending the entire length of the thorax; abdomen with first segment pale grey or brown, remaining segments black, with pale hind margins; legs yellow, with the tarsi darkened; wings with a conspicuous stigma.

Length. Female, 5 mm.

Hab. Freycinet's Peninsula.

Female. Face light grey; front brown, with very short, stiff, black pubescence, and a small pale grey patch above the antennæ on either side. Proboscis dark brown. Palpi yellow, with the extreme tips darkened. Antennæ black; the first two joints very small, cup-shaped, and of almost equal length, the third broadened, twice the length of the first and second together, and produced into a short thick arista, which is distictly subterminal, and is about the same length as the three joints of the antennæ together. Thorax brown, with three dark longitudinal stripes, the middle one short; the outer ones extending the whole length of the thorax, the whole covered with very short and sparse black pubescence; scutellum brown, slightly darker than the thorax. Abdomen about the same length as the thorax and scutellum; first segment pale brown or grey, remaining segments black, with hind margins light brown or grey; ovipositor ending in two small outspread lamellæ. Legs pale yellow, with short pubescence, but without bristles, and tibiæ without any distinct spurs. Wings with the curious venation described under the generic characters, hyaline, with veins and stigma black.

This species is subject to some variation. The colouring of the front and thorax varies from yellow brown to black, the sides of the thorax from light grey to black, and the lighter parts of the abdomen from grey to brown; in the wings the discal cell is more angulated below in some specimens than in others, and the angulation is occasionally

marked by a minute veinlet inside the cell; the third posterior vein consists of a short stump in some specimens, whilst in others it is altogether wanting.

This interesting species was discovered by Mr. G. H. Hardy, who has been good enough to send me thirteen specimens for examination; these are all females. Mr. Hardy writes me concerning its habits as follows: "It occurs locally in swarms, like mosquitos, which, when flying around one, it is easily mistaken for. I came across but one patch of it, but over a very large area, as I walked through about two miles of it. I could observe no peculiarity that would give a clue to type of locality, as it occurred about scrub, amongst grass-trees, over rocky areas, and always in swarms, above 200 feet to 1,000 feet above sea level." Mr. Hardy further states that he received a bite from one of the insects, and that an intelligent boy informed him that the species was common at Wedge Bay and "nipped."

The insects were met with on April 12; it would therefore appear to be an autumn species.

4. Clesthentia, Gen. nov.

Small black flies having the thorax greatly arched. Antennæ with the first two joints extremely small, the third large, and provided with a short style; wings with both the fourth posterior and anal cells closed.

Fig. 3. Wing of *Clesthentia aberrans.*

Head set low down in front of the greatly arched thorax, and about the same breadth as the thorax. Eyes separated in both sexes. Antennæ with the first and second joints extremely small, the third about three times as broad as the second, and three times as long as the first and second together, and provided with a short style, which is barely half the length of the third joint. Thorax greatly arched; sides and scutellum with a few hairs. Abdomen tapering, almost bare. Legs rather short, all tibiæ with, apparently, two spurs; but those on the anterior and middle legs are very minute and difficult to distinguish; tibiæ with also a few small bristles. Wings small; radial vein straight, and extending well beyond the stigma; cubital fork narrow,

reaching the margin just above the wing tip; discal cell and discal cross-vein as in *Leptis*; fourth posterior and anal cells completely closed.

This genus can be distinguished from nearly all other genera of *Leptidæ* by the closed fourth posterior cell. This character alone is sufficient to separate it from the other Tasmanian genera; it is also the only known Tasmanian genus in which the antennæ are terminated by a short style.

Only one species is known.

Clesthentia aberrans, Sp. nov. (Fig. 3.)

Head, thorax, and abdomen black and shining; legs yellow, with femora blackish; wings brownish, with a distinct stigma.

Length. Male, 4.5 mm.; Female, 5 mm.

Hab. Mangalore.

Male. Face descending, but little below the antennæ. Eyes bare, separated. Antennæ black. Front black, shining, of equal breadth throughout; back of head with a little short pubescence. Thorax and scutellum black, shining, with a little short pubescence on dorsum, and a few yellow hairs on sides. Abdomen black, shining, almost bare, but with a little pubescence on sides, white on the first and second, and black on the remaining segments. Legs yellow; femora more or less suffused with black, and tarsi darkened, but colouring of the legs subject to some variation; tibiæ with a few small whitish bristles. Wings brownish, with stigma dark brown; the fourth posterior and anal cells closed slightly above the wing margin.

Female resembles the male in all respects.

This species occurs commonly on the windows of my house at Mangalore, between September 20 and December 15. I have not met with it elsewhere.

5. Metoponia, Macq.

This genus was created by Macquart for a Tasmanian species that is unknown to me. It was placed by him in the *Xylophagidæ* (now included in the *Leptidæ*). It is described as resembling *Beris*; palpi short; front of female very large; antennæ inserted towards the base of head; first segment a little elongated, third the length of first, with eight annulations; eyes small; ocelli at vertex; scutellum unarmed.

Metoponia rubriceps, Macq.

The species is described as having the head red, the thorax dull black, abdomen shining black, and the legs black.

Length (Female) 3 lines.

This species should be easy to recognise from the annulated antennæ, a character that separates it from all the other known Tasmanian *Leptidæ*. It would appear from Macquart's description, to be correctly placed, and if so is the only known Tasmanian representative of the subfamily *Xylophaginæ*.

Family II. STRATIOMYIDÆ.

Small to medium-sized bristleless flies, frequently with metallic colouring.

Head short, as broad as the thorax. Eyes of the male usually contiguous, those of the female separated. Antennæ with the third joint annulated, and provided with an apical style or arista. Thorax occasionally produced into a spine on either side, and with the scutellum either unarmed, or produced into two or more marginal spines. Legs altogether without bristles. Wings with a characteristic venation, the costal, mediastinal, subcostal, radial, and cubital veins distinct, and much crowded together on the fore part of the wing. The remaining veins faint and sometimes incomplete. The præfurca (common stem of the radial and cubital veins) commences opposite the base of the discal cell; cubital vein, including the cubital fork, when present, ends well before the wing tip; discal cell usually pentagonal; anal cell always closed.

The flies belonging to this family have the reputation of being flower-lovers, but the only Tasmanian species that I have found frequenting flowers are those belonging to the genus *Odontomyia*, a genus of world-wide distribution. Some species frequent the neighbourhood of water, others may be found settled on vegetation, and on windows.

Most of the Tasmanian species are decidedly rare, the only ones of common occurrence being *Odontomyia amyris* and *Actina incisuralis*.

Table of the Tasmanian Subfamilies and Genera of Stratiomyidæ.

1. Abdomen with seven visible segments. Subfam. **Berinæ.**
   Four posterior veins; eyes hairy, separated in both sexes.
   ACTINA, Meig.
   Abdomen with five or six visible segments. 2
2. Three posterior veins, all arising from the discal cell.
   Subfam. **Pachygastrinæ.**
   Scutellum produced in the form of a spine.
   LONCHEGASTER, Gen. nov.
   Four posterior veins. 3

3. The four posterior cells arise from the discal cell; colouring metallic. Subfam. **Antissinæ.**

   Scutellum armed. LECOGASTER, Gen. nov.

   Scutellum unarmed or with rudimentary spines. ANTISSELLA, Gen. nov.

   The fourth posterior vein is separated from the discal cell, and arises from the second basal cell. 4

4. Antennæ with a short terminal style. Subfam. **Stratiomyinæ.**

   Basal joint of antennæ never more than twice the length of the second. ODONTOMYIA, Meig.

   Antennæ with a long arista. Subfam. **Sarginæ.**

   Scutellum armed; black species. ACANTHASARGUS, Gen. nov.

Subfamily **Berinæ.**

BERIS, Latr.

Seven species were chronicled by Macquart under the genus *Beris*. Since that time the genus has been split up, and I think it unlikely that any of Macquart's species belong to Beris in its restricted sense. Some difference of opinion seems to exist as to the limits of these newer genera, but I think that entomologists are fairly agreed as to the following distinctions:—

1. Three posterior veins, all arising from the discal cell. 2
2. Eyes hairy, touching in the male. BERIS.

   Four posterior veins, or vestiges of them, all arising from the discal cell. 3
3. Eyes hairy, separated in both sexes. ACTINA.

   Eyes bare, separated in both sexes. NEOEXAIRETA.

The seven species described by Macquart are the following:

Beris servillei.
,, *incisuralis.*
,, *filipalpis.*
,, *parvidentata.*
,, *quinquecella.*
,, *nitidithorax.*
,, *fusciventris.*

Of these species *B. servillei* belongs to the genus *Neoexaireta* (*N. spinigera*). It may be distinguished at once by its banded wings. It is a common species in Victoria and

New South Wales, but is not at present known in Tasmania, although it may possibly occur. *B. filipalpis*, I believe to have been merely described from a male of the previously described *B. incisuralis*. This species, on account of its possessing four posterior veins, hairy eyes, separated in the male, and thickened hind tibiæ, I place in the genus *Actina*, together with a new species. *B. parvidentata* I have placed in a new genus *Antissella*. The three remaining species, *B. quinquecella*, *B. nitidithorax*, and *B. fusciventris*, are unknown to me, and they must, therefore, remain for the present as of doubtful position. *B. quinquecella* is described as violet, with green reflections; length 3 lines. *B. nitidithorax* as having the thorax brilliant green, with violet blue reflections; abdomen dull black, with last two segments and margins blue; length 3 lines. *B. fusciventris* is described as having the thorax brilliant green, with violet reflections, scutellum violet, abdomen brownish black, with incisions bluish black; length 3 lines.

6. Actina, Meig.

Slender flies with a metallic thorax, six spined scutellum, discal cell with four issuing veinlets, and eyes separated in both sexes.

Head larger in the male than in the female, short, and not produced. Eyes separated in both sexes, somewhat narrowly in the male, but widely in the female; in the male densely hairy; but in the female with only very short pubescence. Antennæ set close together, the first and second joints short, the third long and annulated, and more than twice the length of the first two joints together. Thorax densely hairy in the male, but almost bare in the female; scutellum with six spines. Abdomen flattened, with seven visible segments, parallel sided in the male, but somewhat ovate in the female. Legs with the hind tibiæ thickened, especially in the male; first joint of the posterior tarsi lengthened in both sexes, and dilated in the male. Wings with a conspicuous stigma; cubital vein forked; discal cell with four issuing veinlets; anal cell closed at a considerable distance from the wing margin.

This genus can be distinguished in both sexes from *Beris* by the presence of four, instead of three, posterior veins. The males can also be distinguished at once from those of *Neoexaireta* (or *Chorisops)* by the densely hairy eyes, but in the females the pubescence is short, and not always easy to make out. So far as the Australian species are concerned, however, there is no difficulty, the sole species of *Neoexaireta* being distinguished at once by the parti-coloured wings.

The Tasmanian species are distinguished as follows:—

A. incisuralis, Macq.	*A. costata*, Sp. nov.
Medium-sized species.	Very small species.
Scutellar spines long, yellow, with the base metallic green.	Scutellar spines short, and altogether metallic green.
Abdomen in female orange-brown, with black incisions.	Abdomen in female altogether blackish brown.
Costa of wings straight.	Costa of wings sinuated.
Femora partly black.	Femora yellow.
Thorax in female bronze green.	Thorax in female emerald green.

Actina incisuralis, Macq.

Syn. *Beris incisuralis*, Macq.

Syn. *Beris filipalpis*, Macq.

Thorax emerald green (male), or bronze green (female); abdomen brown (male), or orange-brown (female), with incisions black; scutellar spines yellow, with the base dark metallic green; hind femora black (male), or orange with apical third or half black (female).

Length. Male, 7 mm.; female, 6 mm.

Hab. Tasmania, Victoria, New South Wales.

Male. Face, front, palpi, and antennæ black, the face more or less covered with white pubescence. Eyes separated, densely hairy. Thorax and scutellum metallic emerald or bluish green; scutellum with six long marginal spines, which are yellow, except at the extreme base, where they agree in colour with the scutellum. Abdomen brown, darker at base and apex, and with junctions of segments broadly black. Legs with the first and second pairs yellow, with exception of the tarsi and basal two-thirds of femora, which are black; hind pair black, with the base of the tibiæ and tarsi dull brown or yellow. Wings with a large black stigma; discal cell emits four veinlets, the first, second, and fourth complete, the third only extending two-thirds the distance to the wing margin.

Female differs considerably in appearance from the male. The head is smaller, the face covered with white pubescence, the eyes more widely separated, and bearing only a little, very short and inconspicuous pubescence. The pubescence of the thorax and scutellum is short, and the colour rather a bronze than an emerald green. Abdomen is less parallel-sided, approaching an ovate shape, and the colour is lighter and brighter. Legs are more orange; first and second pairs have the femora scarcely darkened, hinder pair have the

femora with the basal half or two thirds orange. Wings as in the male.

This species varies somewhat in the colouring of the abdomen and legs, some specimens being considerably darker than others; there is also some variation in the colouring of the wings, which have usually a pale brownish tinge, but are occasionally blackish; also the third veinlet from the discal cell varies considerably in length. In Mr. F. M. Littler's collection, there are two females from Mt. Arthur, which differ considerably from the type; they are unusually small and have the thorax emerald instead of bronze green; they have somewhat the appearance of belonging to a distinct species, but I consider them to be merely a variety (possibly a mountain one) of *A. incisuralis*.

This species, though not always to be met with, is distinctly common at times. I have found it in Spring (October 12 to beginning of November) and Autumn (March 29 to May 1). Mr. Littler has also met with it at Launceston, from February 20 to March 21.

It may usually be found settled on low vegetation, and also occurs not uncommonly on windows. The female seems to be much more common than the male.

Actina costata, Sp. nov.

A small species having the thorax, scutellum, and scutellar spines dark metallic green, abdomen blackish brown, and legs yellow.

Length. Female, 4.5 mm.

Hab. Bagdad.

Female. Face covered with white pubescence; front blackish æneous; antennæ with first and second joints brown, third black. Eyes somewhat broadly separated, bearing short pubescence. Thorax and scutellum brilliant metallic green, with short pubescence; scutellum with six short metallic green spines. Abdomen dark blackish brown. Legs yellow, with the knees of posterior pair and apical tarsal joints darkened. Wings tinged with brown, except for a perfectly hyaline spot between the pale brown stigma and the cubital fork; space within the cubital fork distinctly brown; discal cell emitting four posterior veins, the third extending barely half-way to the wing margin; cubital vein distinctly curved, with the fork large; costal margin of wing sinuated.

The distinctions between this and the previous species have already been referred to.

This species is scarce. I have only come across a single specimen, which I swept from grass growing in a small tarn in the hills at Bagdad, on January 25, 1913.

Subfamily **Antissinæ.**

7. Antissella, Gen. nov.

Bright metallic flies. Antennæ nearly twice the length of head; eyes joining and hairy in the male, widely separated and practically bare in the female; scutellum unarmed or with rudimentary spines; wings with costal margin inflated in the male.

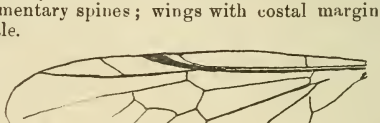

Fig. 4. Wing of *Antissella parvidentata* ♀.

Head broader than long. Antennæ situated about the middle of the head in profile, and nearly twice the length of the head; first and second joints of almost equal length, and somewhat cup-shaped, third joint annulated, rather longer than the first two joints together, and provided with a blunt style. Eyes joining and hairy in the male, widely separated and almost bare in the female. Thorax broadening behind; scutellum unarmed or with rudimentary spines, whose position is merely indicated by a serration of the margin of the scutellum. Abdomen somewhat ovate, considerably broader and a little longer than the thorax. Legs simple. Wings with the mediastinal and subcostal veins apparently coalescent, the radial very indistinct, the cubital with a long fork, the lower branch being slightly longer than the stem, and more than twice the length of the upper branch; discal cell with four issuing veinlets, the first, second, and fourth reaching the wing margin, the third only half way to the wing margin.

This genus is proposed for a specie that occurs both in Victoria and Tasmania. It seems to come near to *Antissa*, created by Walker for a West Australian species, but *Antissa*, according to Walker's description, has the antennæ much shorter than, instead of nearly twice the length of, the head.

Antissella parvidentata, Macq. (Fig. 4).

Syn. *Beris parvidentata*, Macq.

Thorax in male greenish gold, in female emerald green; abdomen in male deep violet, in female ruddy bronze, with red, blue, and green reflections; legs yellow; wings with costal margin inflated in the male, veins light yellow brown.

Length. Male and female, 7.5 mm.

Hab. Launceston, Mangalore.

Male. Face below the antennæ covered with white pubescence; front greenish gold; eyes hairy, joined directly above the antennæ. Antennæ dark brown, the style blunt and directed inwards. Thorax and scutellum greenish gold; punctate, and covered with brownish hairs; scutellum with rudimentary spines. Abdomen deep violet, minutely punctate, with scanty white pubescence. Legs light yellow brown, with the tarsi darkened Wings with front margin inflated from base of wing to end of first posterior cell, hyaline; veins yellow brown with an indistinct stigma.

Female differs considerably in appearance from the male, so much so as to be easily mistaken for a distinct species. The eyes are widely separated, with only a little extremely short pubescence, which can only be distinguished with difficulty. Antennæ with the first and second joints light brown, third joint and style blackish. Thorax and scutellum emerald green, the pubescence very short. Abdomen ruddy bronze, with red, blue, and green reflections, according to the point of view. Wings faintly tinged with brown; the costal margin straight.

This species can be easily recognised by its bright metallic colouring. The male is much rarer than the female, and, as is the case with most of the Tasmanian genera of *Stratiomyidæ*, it is the female that is usually met with. My description of the male is taken from a Victorian specimen, kindly lent me by Mr. F. P. Spry.

Judging from Macquart's description and figure, I think that there is little doubt that it was a female of this species that he described under the name of *Beris parvidentata.*

In Tasmania this species is of somewhat uncommon occurrence, although it is probably widely distributed. My dates extend from February 12 to March 8.

8. Lecogaster, Gen. nov.

Metallic flies with a short but extremely broad abdomen and four-spined scutellum. In the male the costal margin of wings is greatly inflated, and the eyes are densely hairy.

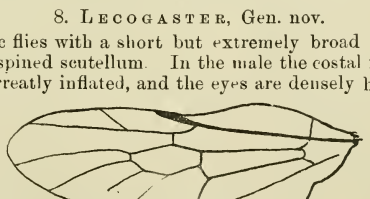

Fig. 5. Wing of *Lecogaster cærulea* ♂.

Head broader than long. Eyes in the male densely hairy, widely separated at vertex, but nearly joined at base of

antennæ. Antennæ situated about middle of the head in profile, about the same length as the head; the first joint slightly longer than the second, the third a little longer than the first two together. (The antennæ resemble those of *Lasiopa*). Thorax lengthening behind; scutellum with four spines, the two terminal spines being the longest. Abdomen short, but extremely broad. Legs simple. Wings with the costal margin (in the male) greatly inflated; the mediastinal and subcostal veins apparently coalesce; cubital with a very long fork, the lower branch longer than the stem, and twice the length of the upper branch; discal cell with four issuing veinlets, the first, second, and fourth reaching the wing margin, the third only half way to the margin; all veins distinct.

This genus may be recognised at once by the extremely broad abdomen in conjunction with the metallic colouring. It seems to come near to Macquart's genus *Anacanthella*, but *Anacanthella* has the scutellum unarmed, and eyes of the male with only short pubescence. From *Antissella* it is distinguished by the much broader abdomen, and spined scutellum, and, in the male, by the differently placed eyes and more inflated wings.

Lecogaster cærulea, Sp. nov. (Fig. 5).

A bright metallic blue fly, with a very broad abdomen and four-spined scutellum.

Length. Male, 8 mm.

Breadth of abdomen. Male, 4.5 mm.

Hab. Bagdad.

Male. Head broader than long; face densely hairy; front shining bronze, with a small tubercle at vertex. Eyes densely hairy, widely separated above, but gradually approaching until at the antennæ they are but narrowly separated, below which they again recede. Antennæ black, the second joint somewhat cup-shaped and shorter than the first, the third slightly longer than the first and second together, annulated, gradually tapering, and ending bluntly without any distinct stigma. Thorax and scutellum metallic blue, covered with long black hairs; scutellum with four marginal spines. Abdomen as broad as long, metallic blue, with short white pubescence. Legs black, rather stout. Wings hyaline, with a narrow pale brown stigma; veins brown and distinct.

Female unknown.

This interesting species occurs both in Victoria and Tasmania, but seems to be generally rare. In Tasmania I have only met with a single specimen; it occurred in the bush at Bagdad on November 17, 1912. The only other specimen

that I know of is one in the collection of the Melbourne Museum.

Subfamily **Stratiomyinæ.**

9. Odontomyia, Meig.

(*Exochostoma*, Macq. *Opseogymnus*, O-Costa.

Psellidotus, Rond. *Eulalia*, Kert.)

All the known Australian species of the subfamily *Stratiomyinæ* belong to the genus *Odontomyia*, although some of these were originally described as species of *Stratiomys*. They are fair-sized, robust species, black and green, or black and yellow in colour, and never metallic. The abdomen of the male is broad, parallel-sided, and almost rectangular, that of the female ovate.

Face conspicuously pubescent. Eyes either bare or hairy, practically touching in the male, but widely separated in the female. Antennæ with the the two basal joints almost equally long, or, at the utmost, the basal joint twice as long as the second (in this respect differing from *Stratiomys*, which has the basal joint three or four times as long as the second); third joint elongate, with from four to six annulations, of which the last two may form a terminal style. Thorax broad; scutellum with two subapical spines. Abdomen with five obvious segments in the male, and six or seven in the female. Legs simple. Wings with the anterior veins much crowded; cubital vein usually forked, but occasionally simple; one or two of the veinlets from the discal cell frequently abortive, and, as a rule, none reach the wing margin.

Of this genus six species have so far been recorded from Tasmania, but one of these, *O. rufifacies*, I am unable to distinguish. An additional species is now added, which is apparently the *O. lateremaculata* of Macquart, described by him from "New Holland."

Table of the Tasmanian Species of Odontomyia.

1. Abdomen violet black. Scutellata, Macq.
   Abdomen black, with yellow or green side margins. 2
2. Scutellum fulvous. Carinata, Macq.
   Scutellum (except the tip) black. 3
3. Abdomen with broad green border; large species. Amyris, Walk.
   Abdomen with narrow green border; very small species. Marginella, Macq.
   Abdomen black, with yellow or green side-spots. 4

4. Abdomen with three pairs of small, widely separated side spots; antennæ with a long thin style.
CARINIFACIES, Macq.

Abdomen with three pairs of side-spots, the first and second pairs large and (usually) confluent; antennæ with a very short thick style. LATEREMACULATA, Macq.

O rufifacies Macq I am unable to distinguish by Macquart's description from his *O. stylata*. *O. stylata* Macq. and *O. amyris* Walk. appear to be identical. The species *O. scutellata* Macq. and *O. carinata* Macq., given in the above table, I am not personally acquainted with, so for the characters given I depend on Macquart's descriptions

ODONTOMYIA AMYRIS Walk.

SYN. *Odontomyia stylata* Macq.

A large robust fly; abdomen black with green or yellow side margins; thorax in life brilliant green, but in dried specimens black.

Length. Male, 9-11 mm.; female, 10-10.5 mm.

Hab. Tasmania, Victoria, New South Wales.

Male. Face fulvous, covered with silvery pubescence. Antennæ with the two basal joints of almost equal length, reddish, tipped with black; third joint thickened, considerably longer than the first two joints together, distinctly annulated, and provided with a pointed style, black above and reddish beneath, style black. Thorax brilliant green in living, but black in dried specimens, with abundant, long, yellowish pubescence on the sides; scutellum black, outer margin yellow, with two yellow spines and long pubescence. Abdomen broad and flattened, black, with side-margins broadly green or greenish yellow, the whole covered with short silvery pubescence. Legs yellowish or light yellow-brown, with posterior tarsi darkened Wings with anterior veins and stigma brown; posterior veins indistinct; only one complete veinlet (the middle one) issues from the discal cell, the first and third being abortive.

Female differs considerably in appearance from the male, the eyes being widely separated, and the abdomen more oval and less rectangular in outline. Lower part of front is fulvous, the upper two-thirds shining black; thorax with shorter pubescence; abdomen almost bare, the side margins, which are narrower than in the male, clear green or yellow.

There is a specimen of this species in the Melbourne Museum personally named by Walker, so that there is no doubt as to its correct identification. Judging from Macquart's description his *O. stylata* is identical.

This is the commonest species of the Tasmanian *Stratiomyidæ*, though somewhat local in its occurrence. The males may be found dancing in the air and darting to and fro at a short distance above marshy ground; in such a situation I have found them common during the latter part of October. The females are more sluggish in their habits; they may be found settled on low herbage, and I have also taken a specimen on box bloom. In the late summer odd specimens of both sexes may be found far from water, either on long grass or, occasionally, on fennel bloom.

Odontomyia marginella Macq.

Face, front, and thorax black; abdomen black, with a narrow green border; femora black, tibiæ yellow, with a black ring.

Length. 5 mm.

Hab. Huon.

This species resembles *O. amyris*, but is distinguished by its small size, and narrow green abdominal border.

There is a specimen of this species in the collection of the Department of Agriculture, Hobart.

Odontomyia carinifacies Macq.

Abdomen black, with three pairs of small, yellow, widely separated marginal spots; antennæ with a long thin style.

Length. Female, 8 mm.

Hab. Mangalore (also in Victoria.)

Female. Face black, with a narrow fulvous margin, which separates the black of the face from the eyes, and is continued in a narrow fulvous band above the antennæ, being separated from the antennæ by a black patch, which is a continuation of the black of the face; face with pale yellow pubescence; front above the fulvous band shining black, with pale yellow pubescence; vertex almost bare. Antennæ blackish, tinged a little with red above, and distinctly reddish beneath; first joint twice as long as the second, third a little longer than the first two together, thickened, and provided with a pointed style, which is about one quarter the length of the third joint. Thorax black, with short, scanty, yellow pubescence; scutellum with the base black and margin broadly yellow; spines yellow with tips black. Abdomen distinctly marginate, black, with a pair of triangular, yellow, marginal spots at the lower margins of the second and third segments, a pair of smaller lengthened spots on the lower margin of the fourth segment, and a yellow outer margin to the fifth segment. Legs black, with the knees and basal portions of tibiæ and first joints of tarsi yellow brown.

Wings with base, upper and middle basal cells and anterior veins brown; posterior veins indistinct; from the discal cell the middle veinlet reaches the wing margin indistinctly; the first and third veinlets are abortive.

This species bears a considerable resemblance to *O. lateremaculata*, but may be distinguished by the antennæ, which bear a long thin pointed style, instead of a short blunt one, by the much smaller and widely separated abdominal spots, and in the female, by the face being black with a fulvous border instead of altogether fulvous.

Of this species I have only come across a single specimen, it occurred on fennel bloom at Mangalore, on February 27, 1912; it was very active, flying about from one part to another of the bloom-heads, and only keeping at one spot for a few seconds at a time.

Odontomyia lateremaculata Macq.

Abdomen black, with three pairs of green or yellow marginal spots, the first and second pairs large, and usually confluent; antennæ with a short blunt style; face in male black, in female fulvous.

Length. Male, 12 mm.; female, 9 mm.

Hab. Bagdad Valley, Wedge Bay, Lefroy.

Male. Face somewhat produced, with a rounded outline, black for some distance below the antennæ, then fulvous, and covered with yellow pubescence. Eyes bare, joined from vertex to antennæ. Antennæ black, the third joint slightly tinged with red beneath; first joint a little longer than the second, third considerably longer than the first and second together, and provided with a very short blunt style, which is only about one-tenth the length of the third joint. Thorax black, with thick fulvous pubescence at sides, scutellum with base narrowly black, margin broadly yellow; scutellar spines yellow, with the extreme tips black. Abdomen black, the second and third segments each bearing a pair of large green side-spots, which are partially confluent, the fourth with a pair of small green posterior side-spots, and fifth with green posterior side margins. Legs with femora black, pale yellow at the base; tibiæ black, with a pale yellow band around centre, also with knees of the anterior and middle pairs yellow; tarsi black, with the first joint two-thirds yellowish. Wings hyaline, the anterior veins brownish; the middle vein from the discal cell reaches the wing margin, the first and third are abortive.

Female bears a considerable resemblance to the male, but the face is fulvous, being only black for a small patch at base of the antennæ. Eyes widely separated. Front directly above

the antennæ fulvous, the fulvous colour becoming narrower on each side until it reaches the eyes; upper two-thirds of front shining black, with a little yellowish pubescence. Thorax with the pubescence much shorter than in the male. Legs lighter than in the male, yellow brown, the upper sides of femora and apical half of tibiæ black, and tarsi darkened. Wings distinctly brownish.

This species in general appearance resembles *O. carinifacies*, but may be readily distinguished by the antennæ bearing an extremely short blunt style, instead of a long pointed one, by the large, partly confluent abdominal spots, by the more projecting face, by the larger size, and, in the female, by the fulvous instead of black face.

The male from which the above description is taken was captured by Mr. G. H. Hardy, at Wedge Bay, on January 2, 1914. The female was swept by me from grass, near a small creek, at Mangalore, on December 26, 1912. The only other specimen that I am acquainted with is a male taken by Mr. F. M. Littler, at Lefroy; this differs from the southern Tasmanian forms in having the abdominal spots separated, and in their colour being yellow instead of green.

ODONTOMYIA SCUTELLATA, Macq.

This species is described by Macquart as having the thorax black, scutellum yellow with long spines, rising obliquely, which are black, with the base yellow; abdomen black with violet reflections; legs black.

Length. Female, 5 lines.

This species is unknown to me. It should be easily recognised by the wholly black abdomen.

ODONTOMYIA CARINATA, Macq.

This species is described by Macquart as having the thorax black, scutellum fulvous, abdomen green (male) or red (female) with a broad black centre band. Face fulvous, projecting. Length 5 lines.

Macquart's specimens had the third joint of antennæ wanting. Walker gives as the distinguishing feature of this species the fulvous scutellum.

This species seems to me to be insufficiently characterised, especially as it was described from mutilated specimens, and it may be necessary to delete it.

Subfamily Sarginæ.

This subfamily has not hitherto been recorded from the Australian Region; it is, however, represented by three species, two of these occurring in Victoria and one in Tasmania, and it is not unlikely that other species still remain to

be discovered. The Australian species have the scutellum armed, in this respect differing from all the Palæarctic and from most of the American species.

10. Acanthasargus, Gen. nov.

Black flies with a two-spined scutellum; antennæ with a long subterminal arista; abdomen flattened, increasing gradually in breadth from the base to the penultimate segment.

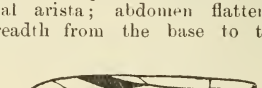

Fig. 6. Wing of *Acanthasargus palustris*.

Head wider than the front part of the thorax, excavated behind, and attached to the prothorax by a slender neck. Face considerably produced. Eyes bare. Antennæ placed rather below the middle of the head, short and thick, the third joint annulated and provided with a long subterminal arista. Thorax long; the scutellum armed with two slender spines, which rise obliquely from the scutellum at an angle of about 45 degrees. Abdomen with base much narrower than the thorax, but gradually widening until the last segment, where it again contracts, the greatest width being slightly greater than the greatest width of the thorax. Wings with the costal vein barely extended beyond the tip of the cubital; cubital vein forked; præfurca (common stem of the radial and cubital veins) has the discal cross-vein close to its base; both the discal and the lower cross-veins are very short; the three veins from the discal cell, as well as the upper branch of the postical vein, are incomplete, and do not nearly reach the wing margin; anal cell closed at some distance from the wing margin.

This genus resembles *Raphiocera* (South and Central America and New Caledonia) in having an armed scutellum and forked cubital vein, but the shape of the abdomen and uniform black colouration at once distinguish it. It is represented by one Tasmanian and one or two Victorian species, none of which have so far been described; all seem to be of considerable rarity.

Acanthasargus palustris, Sp. nov. (Fig. 6.)

Thorax and abdomen black; scutellum with two black spines; legs yellow.

Length. Female, 5.5 mm.

Hab. Mangalore.

Female. Face black; front with a median ridge, black and shining except for a narrow salmon-coloured patch directly above the antennæ; the head where it forms a narrow ridge behind the eyes is also salmon-coloured. Antennæ black, the first joint very short, the second a little longer than the first, the third hardly as long as the first and second together, annulated, and provided with a long subterminal arista, which is distinctly longer than the three joints of the antennæ together. Eyes bare and widely separated. Thorax and scutellum black, with a little very short white pubescence; scutellum with two black spines, which rise diagonally at an angle of about 45 degrees. Abdomen black with long, but scanty, pubescence along the sides. Legs yellow, with all the tarsi darkened. Wings with the anterior veins and stigma brown; posterior veins pale and indistinct; of the three veinlets issuing from the discal cell the middle one is the most distinct.

This species is only known from a single specimen. It occurred by a small marsh at Mangalore, on November 12, 1911. An allied undescribed Victorian species, represented in the Melbourne Museum by a single specimen, may be distinguished by its having the scutellar spines yellow.

Subfamily **Pachygastrinæ.**

11. Lonchegaster, Gen. nov.

Small black flies with a short, ovate abdomen; scutellum produced backwards in the form of a spine.

This genus resembles *Pachygaster*, but is distinguished by the curious form of the scutellum, which rises from the thorax at an angle of about 45 degrees, and is produced into a thin central spine, the spine being about the same length as the rest of the scutellum.

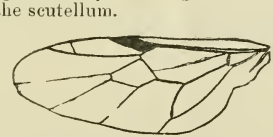

Fig. 7. Wing of *Lonchegaster armata.*

Head flattened beneath. Eyes touching in the male, but widely separated in the female. Antennæ with the two first joints small, the third round and enlarged, with a long subterminal arista. Thorax long; scutellum as described above. Abdomen short, broad, and ovate. Legs simple. Wings with the cubital vein curving upwards, and forked

well before the wing-tip; discal cell giving rise to three posterior veins, which are faint but complete; anal cell closed bluntly at some distance from the margin.

This genus, so far as the form of scutellum is concerned, bears a certain resemblance to the Mexican genus *Cynipimorpha*, but in the latter genus the scutellum ends merely in a short blunt process, instead of, as in *Lonchegaster*, being produced into a long thin spine.

This genus, containing a single species, is, so far as is known at present, the only representative of the *Pachygastrinæ* occurring in Australia.

LONCHEGASTER ARMATA, Sp. nov. (Fig. 7.)

Thorax and abdomen black; legs pale yellow.

Length. Male and female, 3 mm.

Hab. Mangalore.

Male. Head broader than long and flattened beneath; front black, shining. Eyes large, bare, meeting on the front. Antennæ orange. Thorax dull black, with very short yellowish pubescence, which does not extend to the scutellum; scutellum produced backwards in the form of a narrow spine. Abdomen blue black, in contrast with the dull black of the thorax, and like the thorax covered with a minute punctuation. Legs pale yellow, the femora indistinctly banded with brown, and the anterior tibiæ and tarsi darkened. Wings hyaline, anterior veins light brown, posterior veins pale; subcostal vein conspicuously darkened as it approaches the costa; stigma pale yellow brown; cubital vein curved upwards, with a small fork, which is situated well before the wing tip. Halteres white.

Female resembles the male, but the eyes are widely separated, and veins of the wing slightly more distinct.

Of this species I have met with four specimens, all of which occurred on the windows of my house at Mangalore, during the summer of 1911-1912, the dates extending from December 15 to February 27.

Family III. NEMESTRINIDÆ.

A family distinguished from all others by its peculiar venation, the veins curving up and running parallel with the hind margin of the wing.

Head broad and short, set close against the thorax. Proboscis frequently much produced. Eyes either bare or hairy, usually widely separated in both sexes, but sometimes touching or closely approximated in the male, in which case the eyes in the female are not very widely separated. Antennæ small, widely separated at the base, third joint,

usually, bearing a jointed arista. Thorax longer than broad, with dense pubescence but no bristles. Abdomen either very short and broad or fairly long and conical. Legs slender and absolutely without bristles. Wings with a peculiar venation, the veins towards the tip running parallel, and ending in the wing margin, whilst the basal part of the cubital vein appears to be carried in the form of a diagonal vein across the anterior portion of the wing

This family has its headquarters in South America and the mainland of Australia. In Tasmania two genera, *Exeretoneura* and *Tricophthalma*, occur. The former genus, which is confined to Tasmania, and contains only a single species, is extremely aberrant; it may be recognised by the annulated antennæ, short proboscis, and spotted wings with a very peculiar venation (see Fig. 8). *Tricophthalma* has a normal venation (Fig. 9) and the proboscis is considerably lengthened; of this genus four Tasmanian species have been described, but these seem to be all varieties of the same species. There are, therefore, so far as is known at present, only two species of the *Nemestrinidæ* occurring in Tasmania.

12. Exeretoneura, Macq.

This is an extremely interesting genus, owing to the fact that it has no near allies in any part of the world. It differs very much both as regards the antennæ and venation from all other genera of the *Nemestrinidæ*. The annulated antennæ and spurred tibiæ seem to indicate affinities with the *Tabanidæ*, but the form of the ovipositor in the female agrees with that of the normal *Nemestrinidæ*. The venation of the wings alone is sufficient to distinguish it from every other dipterous genus.

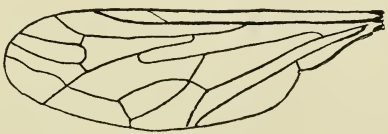

Fig. 8. Wing of *Exeretoneura maculipennis*.

Head as broad as the thorax. Eyes bare, widely separated in both sexes. Proboscis short, and barely protruding from the oral aperture. Antennæ with the first joint about three times the length of the second, the third as long as the first and second together, swollen and annulated. Thorax with soft pubescence. Abdomen flattened, nearly parallel-sided, and, in the female, produced into a long segmented ovipositor,

which does not seem to reach its full development until the insects have been for some time on the wing. Legs: all tibiæ bear two spurs, but one of those on the anterior pair is very short. Wings with the three basal cells considerably lengthened; the diagonal vein situated towards the tip of the wing; the mediastinal and subcostal veins reach the costa considerably before the wing tip, which is occupied by only four short veins; fourth posterior cell closed, produced downwards, and joined by a short veinlet to the wing margin.

This genus contains only a single species, which is confined to Tasmania.

EXERETONEURA MACULIPENNIS Macq. (Fig. 8).

Thorax grey with three dark longitudinal stripes; abdomen black, with hind margins of 2nd, 3rd, and 4th segments white or yellow; legs olive; wings hyaline, mottled with dark brown across the centre, and towards the tips.

Length. Male, 13.5-14 mm.; female (excluding ovipositor) 12.5-14 mm., (including ovipositor) 15-17 mm.

Hab. Bagdad Valley.

Male Proboscis barely projecting from the oral aperture, which is extremely large, occupying the greater part of the face; sides of face covered with thick yellowish-white pubescence, and, directly adjoining the eyes, with long black hairs. Front extremely broad, with a pronounced ocellar protuberance, dark grey, paler at sides and directly above the antennæ, the whole covered with black hairs, which are especially dense at the vertex. Eyes bare, very widely separated. Antennæ as noted in the generic characters, the first joint grey, second reddish, third black. Thorax grey, with three black, longitudinal, central stripes, the middle one short and narrow, the side ones broad and reaching to the scutellum; sides of thorax white, the whole covered with black hairs and a little yellow or white pubescence; scutellum grey with the tip red, or grey generally suffused with red, the whole bearing long black hairs. Abdomen distinctly flattened, velvety-black, with hind margins of second, third, and fourth segments bearing pale yellow pubescence, so that the abdomen appears to be black with incisions of segments yellow; dorsum and sides of abdomen with a little inconspicuous yellow pubescence. Legs olive, with short dense pubescence, all tibiæ with two terminal spurs, but on the anterior tibiæ one of the spurs is very short. Wings hyaline, mottled with dark brown across centre and towards the tips.

Female bears a very close resemblance to the male, but the front is lighter in colour, and both front and thorax less hairy.

This interesting species occurs near the tops of the higher hills on both sides of the Bagdad Valley. It probably also occurs in similar situations in other parts of the island, although it is unrepresented in any of the collections that I have seen. In its habits and appearance when on the wing it bears more resemblance to a *Tabanus* than to a species of the *Nemestrinidæ*. I have been personally deceived in this way, not discovering its identity until after it was captured. In its habits it is sluggish; it may be found either flying at a short distance above the ground or else settled on rocks or low vegetation. It seems to occur very sparingly. To give an idea of its relative rarity, I might mention that during three years' collecting I have come across seven specimens, three of these being males, and four females. It seems only to remain on the wing for a short time, as I have only met with it between January 26 and March 2 inclusive. Females captured towards the end of the season seem to have the ovipositor much longer than those taken earlier.

13. Tricophthalma, Walk.

This is the genus to which most of the Australian Nemestrinidæ belong. It is characterised by having the eyes densely hairy in both sexes; proboscis elongated; antennæ with a long, jointed arista; abdomen conical or short and broad, and, in the female, produced into a long ovipositor, The venation of the wings is similar to that of *Hermoneura*, from which genus, however, *Tricophthalma* can be at once distinguished by the elongated proboscis.

This genus seems to be represented in Tasmania by only a single species.

Tricophthalma novæ-hollandiæ, Macq. (Fig. 9).

Syn. *Hirmoneura novæ-hollandiæ*, Macq.
„ *H. nigriventris*, Macq.
„ *H. punctata*, Macq.
„ *Tricophthalma quadricolor*, Walk.

Very variable in the male, both as regards size and colour, so much so in fact that extreme examples appear to belong to quite distinct species. Thorax black or brown, with two pale, more or less distinct, longitudinal stripes; abdomen in the male varying from bright orange to dull drab, in the female always drab, and in both sexes with a row of variable, dark centre spots; legs yellow; wings hyaline, suffused with brown along the costal margin.

Length. Male, 8-15 mm.; female (excluding ovipositor) 10.5-12.5 mm., (including ovipositor) 14.5-16 mm.

Hab. Generally distributed in Tasmania and also occurring on the mainland of Australia.

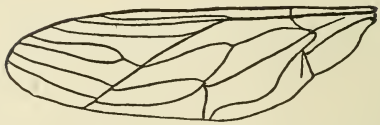

Fig. 9. Wing of *Tricophthalma novæ-hollandiæ*.

Male. Face produced, dull orange, with usually a more or less distinct black patch between the antennæ, and bearing beneath the proboscis a beard of thick white or pale yellow hairs. Front receding, grey, triangular in shape, with a median ridge between the eyes. Proboscis black, about the same length as the thorax. Palpi projecting forwards, orange, the tip black with a pencil of black hairs. Antennæ widely separated, the three joints short, the first a little longer than broad, the second broader than long, the third conical and terminated in a three or four jointed arista, the first two joints of which being short and thickened, the third long and slender, and as long as the first two joints together, with a very fine needle like termination, which has the appearance of being a separate joint; first joint of antennæ orange, second and third joints and arista black. Vertex occupied by an ocellar tubercle bearing long black hairs. Eyes densely hairy, converging directly below the ocellar tubercle, where they almost touch, after which they gradually diverge until at the antennæ they are widely separated. Thorax brown, with traces of three short pale stripes in front, the whole covered with dense brown pubescence. Abdomen differing in colour and markings in almost every specimen; it may be almost entirely orange, but more usually the sides only are orange, being separated by a middle, drab-coloured stripe; the drab colour, however, may be so extensive that the orange colour is reduced to lateral spots, whilst in other specimens the whole dorsum is drab, the orange colour being altogether wanting; in all cases there is a median row of dark brown diamond-shaped spots, which vary greatly in size; the whole is covered with dense drab or pale yellow pubescence. The undersurface of both thorax and abdomen is covered with white pubescence. Legs yellow, clothed with short, soft yellow pubescence, but without any sign of bristles or spurs; tarsi darkened. Wings hyaline with the costal margin broadly suffused with brown.

Female resembles the male, but is always drab in colour; the eyes are distinctly, though not very widely, separated, and the abdomen is produced into a long ovipositor.

So far as I can understand Macquart's descriptions of *Hirmoneura nigriventris* and *H. punctata*, these both refer to varieties of the present species. Walker's *Tricophthalma quadricolor* is also undoubtedly the same. The larger males seem to be usually more or less orange in colour, the smaller males generally drab, but connecting forms can be found between them. At first I considered that these represented distinct species, but after three years' careful observation of the insects in their natural haunts, I have come to the conclusion that all the varying forms belong to only one species. The female seems to vary little in appearance.

The males of this species hover in the air, and dart rapidly to and fro, in exactly the same way as the males of many *Syrphidæ*. The shrill humming sound made by the vibration of their wings is very characteristic, and the insects may usually be heard before they are seen. The females may be found hovering in front of the blossoms of the flowering box, or else settled on the foliage of young wattle trees.

This species is confined to the bush; it is widely distributed, and though probably somewhat local, yet seems to be common where it occurs. It may be found on the wing from the latter part of December to the middle of February.

Family IV. CYRTIDÆ.

Bristleless flies of medium size, easily distinguished by their extremely small head, inflated body, and very large squamæ.

Head very small, almost wholly occupied by the eyes, which may be either bare or hairy, and which usually touch in both sexes. Proboscis either long or rudimentary. Antennæ of widely differing forms and variously placed in the different genera. Thorax very gibbous, the prothoracic lobes sometimes enormously developed; scutellum large. Abdomen inflated and balloon-shaped, and more or less pellucid. Legs simple, without any sign of bristles, although the middle and posterior tibiæ may be spurred. Wings with a venation that varies very much in the different genera, sometimes complicated and showing a connexion with the Nemestrinidæ, at others simple, with many of the veins obsolete.

The larvæ of the *Cyrtidæ* are parasitic on spiders.

This family has not hitherto been recorded from Tasmania; it is however fairly represented, although all the species are of very uncommon occurrence. Five species, belonging to two genera are known at present, and it is probable that other species remain to be discovered.

The Tasmanian genera are distinguished as follows:

1. Costa of wing with a hump and a small tooth-like projection near end of subcostal vein; discal cell present. PTERODONTIA, Gray.

2. Costa of wing simple; discal cell absent, and venation very much reduced. ONCODES, Latr.

14. PTERODONTIA, Gray.

Head very small and set so low as to be partially below the greatly arched thorax. Antennæ of various forms, usually ending in three hair-like rays, but in the Tasmanian species terminated by a short thick arista. Thorax greatly arched. Abdomen large and inflated. Legs simple. Wings with the costal margin produced into a hump and a small tooth-like projection, which, in different species are situated at varying distances from the wing tip.

This genus may be easily recognised by the shape of the wings, the curious costal hump, with an adjacent small tooth-like projection, distinguishing it from all other genera.

Pterodontia is a genus of very wide distribution, although the number of known species is limited. It has not hitherto been recorded from Tasmania, although three species, *P. macquartii*, *Westw.*, *P. flavipes*, *Macq.*, and *P. mellii*, *Erichs*, have been described from the mainland of Australia. Of these species, however, *P. macquartii* and *P. flavipes* are identical, whilst Westwood was of opinion (Trans. Ent. Soc. Lond. 1848) that *P. mellii* was merely a variety of the same species. The name *flavipes* of Macquart, as Mr. F. P. Spry has been good enough to point out to me, was preoccupied by an American species described in "Griffith's Animal Kingdom," and Westwood accordingly proposed the name *macquartii* in its place. This, therefore, reduces the Australian representatives of the genus to the single species *P. macquartii*, to which a new Tasmanian species, *P. variegata*, is now added.

PTERODONTIA VARIEGATA, Sp. nov. (Fig. 10.)

Head and thorax black; scutellum yellow; abdomen with first segment black, remaining segments yellow, with a broad black dorsal stripe; legs with anterior pair entirely yellow, middle and posterior pairs with femora black and tibiæ brown.

Length. Male, 7.5 mm.

Hab. Lefroy.

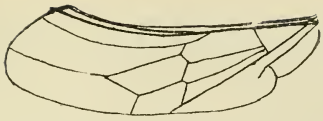

Fig. 10. Wing of *Pterodontia variegata*.

Male. Head small, consisting almost entirely of the eyes, which are contiguous. Eyes densely hairy. Antennæ set low down beneath the head, apparently consisting of two very small joints, terminated by a thickened arista. Thorax greatly arched, almost vertical in front, and covered with dense pubescence: this pubescence, and also that on the eyes, appears in some lights to be dark brown, in others tawny. Scutellum yellow. Abdomen inflated, about as broad as long, the first segment black, remaining segments clear yellow, with a black dorsal stripe, which is contracted in the middle and expanded on the margin of each segment. Legs with anterior femora and tibiæ yellow, middle and posterior femora black, middle and posterior tibiæ brown; anterior and middle tarsi yellow, posterior tarsi brown. Wings with the costal hump and small tooth-like projection situated close to the wing tip; discal cell with only two issuing veins; veins of wing yellow; squamæ fringed with brown.

The only other known Australian species of Pterodontia, *P. macquartii*, is described as being black, with the scutellum and sides of abdomen red; legs yellow; anterior femora black. The colouring of the legs will therefore at once distinguish *P. variegata*, which has the anterior femora yellow, the middle and posterior femora black, and middle and posterior tibiæ brown.

This species is only known from a single specimen, which was taken by Mr. F. M. Littler, at Lefroy, in the month of January; it occurred on sandy heath land, and was captured whilst in flight.

15. Oncodes, Labr.

(*Ogcodes*, Latr. *Henops*, Meig.).

Head of the male larger than that of the female. Antennæ situated on the extreme lower part of the head, apparently two-jointed, the second with a thin apical style or arista. Thorax very gibbous; scutellum large. Abdomen much inflated. Legs short and simple, without any sign of bristles, and the tibiæ not spurred. Wings short in the male, but larger and longer in the female. Venation much

reduced; the wing tip clear of all venation; radial vein absent; cubital vein sloping downwards, unforked, and not reaching the wing margin; discal vein indicated by two or three more or less distinct veinlets that approach the margin; postical vein fairly distinct; anal vein indistinct. Squamæ very large.

This genus is of very wide distribution. It has not hitherto been recorded from Tasmania, although two species are known from the mainland of Australia—*O. basalis* Walk. from New South Wales and *O. doddi* Wandolleck from Queensland.

The four Tasmanian species are all of very infrequent occurrence, and it is probable that other species remain to be discovered.

Table of the Tasmanian Species of Oncodes.

1. Veins of wing dark and prominently marked. 2

2. Abdomen black with hind margins of segments white; legs black. NIGRINERVIS, Sp. nov.
   Veins of wing faint. 3

3. Abdomen black and yellow; legs partly or altogether yellow. FLAVESCENS, Sp. nov.
   Abdomen black; femora black; tibiæ light brown. ATER, Sp. nov.
   Abdomen red-brown; femora and tibiæ light brown; very small species. PYGMÆUS, Sp. nov.

ONCODES FLAVESCENS, Sp. nov. (Fig. 11.)

A very variable black and yellow species, with either the abdomen or legs extensively yellow; thorax black; wings hyaline with the veins faintly marked.

Length. Male, 5.5-8 mm.

Hab. Launceston, Bridport, Mangalore.

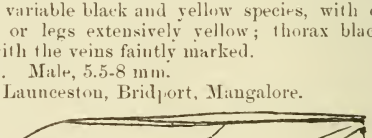

Fig. 11. Wing of *Oncodes flavescens.*

Male. Head consisting chiefly of the eyes. Antennæ very small, the arista black and yellow, thickened at the apex. Thorax and scutellum black and shining, with abundant, long, brownish pubescence. Abdomen black and yellow; first segment black with a pale hind margin; second

anteriorly widely, and posteriorly narrowly, black, remainder of segment brownish yellow; third segment yellow, with anterior third centrally black; fourth segment dark brownish yellow, with obscure blackish markings diverging from the centre of the anterior margin; fifth segment black; the first to the fourth segments have narrow whitish hind margins. Legs with femora yellow brown, knees black; tibiæ black, becoming yellowish towards the tarsi; tarsi black. Wings hyaline, costa yellowish; veins yellow brown, faintly marked. Squamæ with blackish margins.

This species seems subject to great variation, both as regards size and colouration. The specimen from Mangalore, from which the above description is taken, measures 8 mm., but two specimens sent me by Mr. F. M. Littler, which apparently belong to the same species, measure only 5.5 and 6 mm. respectively. The former of these, which was taken at Launceston, has the legs entirely yellow, and the yellow markings of the abdomen less extensive than in the specimen described. The other specimen, which is from Bridport, and which may possibly represent a distinct species, has the abdomen entirely brownish black, with pale hind margins; legs yellow with the knees black.

O. flavescens may be distinguished from the other Tasmanian species of *Oncodes* by its extensive yellow colouring. An allied, possibly identical species occurs in Victoria. *O. doddi* Wandolleck from Queensland, which is somewhat similarly coloured, is a much smaller species with brown thorax and brownish wings.

The only specimen of this species that I have personally met with occurred at Mangalore on January 6, 1912; it was flying rapidly to and fro over the surface of a road.

Oncodes nigrinervis, Sp. nov.

Thorax black; abdomen black with hind margins of segments white; femora and tibiæ black; wings brown with the veins strongly marked.

Length. Male, 6.5 mm.

Hab. Hobart.

Male. Head consisting chiefly of the eyes. Face white. Antennæ black, very small. Thorax and scutellum black, covered with brownish pubescence. Abdomen black, the hind margins of all segments, except the first, narrowly white. Legs with the femora, tibiæ, and tarsi black, the knees white; all covered with very short white pubescence. Wings light brown with the costal margin dark brown, veins dark brown, strongly marked and prominent.

This species is easily distinguished by the black legs and

wings with dark, strongly marked veins. Only a single specimen is known; it was taken by Mr. G. H. Hardy, at Hobart, on November 10, 1913.

ONCODES ATER, Sp. nov.

Thorax black; abdomen black with hind margins of segments indistinctly brown; femora black; tibiæ light yellow-brown; wings hyaline with the veins faintly marked.

Length. Male, 6 mm.

Hab. Bridport.

Male. Head consisting chiefly of the eyes. Face black. Antennæ black with the arista brown. Thorax and scutellum black, covered with brownish pubescence. Abdomen black, with hind margins of segments narrowly and indistinctly brown, the whole bearing short brown pubescence. Legs with the femora deep shining black, the tibiæ and tarsi light yellow-brown, the colouring of the femora and tibiæ being strongly contrasted, although the black of the femora encroaches slightly on the tibiæ at the knees. Wings hyaline, with the veins, except along the costal margin, faintly marked. Squamæ with blackened margins.

This species may be distinguished from *O. flavescens* by its black instead of black and yellow colouration, from *O. nigrinervis* by its hyaline, faintly marked wings, and its yellow-brown tibiæ and tarsi.

The only specimen known of *O. ater* was taken by Mr. F. M. Littler, at Bridport, on October 30, 1913; it occurred flying close to the ground round the bases of low shrubs.

ONCODES PYGMÆUS, Sp. nov.

A very small species. Thorax black; abdomen red-brown; femora and tibiæ uniform light brown; wings light brown.

Length. Female, 3.75 mm.

Hab. Launceston.

Female. Head consisting chiefly of the eyes. Antennæ black with the arista brown. Thorax and scutellum shining black, covered with brown pubescence. Abdomen red-brown, with short brown pubescence. Legs with the femora, tibiæ, and tarsi a uniform light brown. Wings tinted with brown, veins brown. Squamæ with blackened margins.

This species may be distinguished from the other three Tasmanian species by its small size, also from *O. flavescens* by the abdomen and legs having no trace of yellow, from *O. nigrinerris* and *O. ater* by the abdomen being red-brown instead of black, and by the femora being light brown instead of black.

The only specimen of this species at present known was taken by Mr. F. M. Littler, at Launceston.

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