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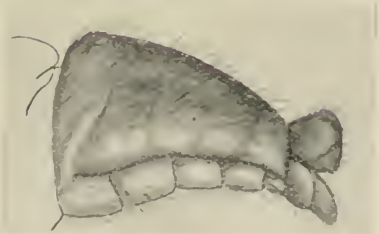

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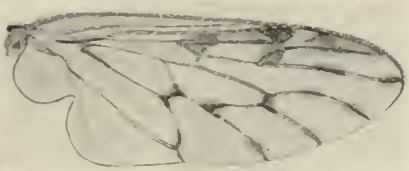

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AUSTRALIAN *RHYPHIDÆ AND LEPTIDÆ (DIPTERA).*

By G. H. Hardy.

Plate XXVII.

(Received 24th June, 1919. Read 1st September, 1919.)

Owing to the discovery that the well known *Rhyphus brevis*, Walker, is a synonym of Macquart's *R. dubius*, which was misplaced by the latter author with doubt in the genus *Chrysopilus* (*Leptidæ*), and as Walker's name is now generally used in literature, it is necessary that an early notification of this change of name be published.

This opportunity is taken to revise the *Rhyphidæ*, which family contains but one known species in Australia.

Fam. RHYPHIDÆ

This family may be described as follows:—Slender insects with filiform antennæ containing 16 joints, the two basal differentiated, the flagellum (3-16) tapering apically; with two basal and a discoidal cell complete, anal cell widely open, all veins simple, not forked; five posterior veins; macrotrichia (at least in the Australian species) on the membrane of the wing. Abdomen with 7 segments.

The following is rendered from Kertesz' key in Term. Fuz. xxv., page 4, 1902:—

Key to the Genera of Rhyphidæ.

1. Radial vein curved, marginal cell open on border. *Rhyphus.*

   Radial vein straight, closing marginal cell by meeting the subcosta at costa. 2.

2. Radial vein rising from cubital anterior to the transverse cross-vein, almost opposite the base of the discoidal cell. Eyes bare. *Olbiogaster.*

   Radial vein rising from the cubital at the transverse cross vein. Eyes hairy. *Lobiogaster.*

Genus *Rhyphus*, Latr., has a wide distribution, occurring in Europe, Africa, India, Java, Australia, New Zealand, and America (North and South); genus *Olbiogaster*, Ost-Sack., is only known from the Southern parts of North America; and genus *Lobiogaster*, Phil., occurs in Chili.

Genus Rhyphus, Latreille.

Latr. Hist. Nat. Crust. et Ins. xiv. 291., 1804.

Kertesz. Cat. Dipt. Vol. 1., pg. 304, 1902 (which see for synonymy).

Characters as described under the family; radial vein curved, eyes in ♀ separate, in ♂ contiguous, bare. Abdomen cylindrical, elongate tapering. Legs simple, slender, spines at most only indicated by strong hairs on the posterior tibiæ; anterior tibiæ with one, intermediate and posterior tibiæ with two apical spurs.

Rhyphus dubius, Macq.

Chrysopilus dubius, Macq., Dipt. Exot. suppl. 4, pg 104, tab. 9, fig. 18, 1850.

Rhyphus brevis, Walk., Ins. Saund. Dipt. i., pg. 449, 1856.

Macquart's so called *Chrysopilus dubius* is a *Rhyphid*. The description from a mutilated specimen and the figure of the wing show conspicuous evidence that this is the case, since the wing markings and the wide anal cell agree with those of the common Rhyphid known as *R. brevis*. The figure shows the cubital vein forked, but the description would lead one to suppose otherwise, as only one submarginal cell is mentioned; indeed, such discrepancies are not unusual in Macquart's work. The type specimen is from East Australia, and Walker's type is Tasmanian; a comparison of Sydney and Tasmanian specimens shows them to be identical.

Easily recognised by its brownish colour, wings much spotted and macrotrichia on the membrane of the wing as well as on the veins. Dr. Tillyard records these macrotrichia in P.L.S. N.S.W. xliii., pp. 627-641, text figures and plate, 1918.

Yellowish brown. Eyes bare, black; ocellar tubercle black; flagellum of antennæ black. Thorax with three broad black stripes, the central stripe reaching neck. Abdomen more or less stained black. Thorax and scutellum have bristles, or hair-like bristles which are not always easy to differentiate. The following, according to their position and size, are undoubtedly bristles:—2 dorso-scutellar, 4 notoplural, 1 supra-alar, 2 interalar; dorso-central and acrostichal bristles indicated by conspicuous bristles posteriorly which become more hair-like anteriorly, and other anterior hair-like bristles can be traced on the thorax. Wings hyaline, slightly fuscous at base, fuscous spots at humeral and median cross veins, and distinctly irregular fuscous bands (very spot like) from costa;

one band through base of discoidal cell to the tip of the 5th posterior vein; a second from stigma through tip of discoidal to apex of 4th posterior; a third half way between this to the tip of the wing, reaching into the 3rd posterior cell; and finally the wing is bordered fuscous from the apex to the anal vein. The sexes are very similar, the eyes contiguous in ♂, and widely separate in ♀. In respect of the former the abdomen is much more slender and cylindrical.

Length ♂ 5-6 mm., ♀ 4-7 mm.

Hab. Tasmania, Hobart, September to November; New South Wales, Sydney, June; Western Australia, Perth.

The specimen utilised for the above description is in the Australian Museum, and was captured at Neutral Bay, Sydney, on the 7th June, 1917. (Collector.—A Musgrave.)

The species is abundant during part of the year, and will probably be found to have a wide distribution in Australia.

Fam. LEPTIDÆ.

The known Australian genera may be characterised as follows:—

Thorax, scutellum, and abdomen without bristles, the bristles of the legs if present are either thin or small. Abdomen either elongate and tapering, or conical. Anal cell closed, or at most narrowly open at border; cubital vein forked; 4 or 5 posterior veins, all reaching margin except in genus *Spaniopsis*, where the third posterior vein is stunted if present. Antennæ three jointed at least, the third joint bearing an appendage of apical joints in the form of an arista thickened and composed of more than one joint, thickened basally and unjointed, or hairlike. Tibiæ with or without apical spurs.

Metoponia rubriceps, Macq., belongs to the *Stratiomyiidæ*.

Chrysopilus dubius, Macq., belongs to, and is treated in, the *Rhyphidæ* above.

The following key will separate the known Australian Genera:—

Key to the Genera of Australian Leptidæ.

1	Five posterior cells	2.
	Four posterior cells	5.
2	Fourth posterior cell closed	*Clesthenia*.
	Fourth posterior cell open	3.

3. Antennæ with unjointed arista, eyes touching in ♂ widely separate in ♀. 4.

   Antennæ with arista jointed and thickened, eyes separate in both sexes. *Atherimorpha.*

4. Eyes bare, abdomen elongate, anterior tibiæ without spurs, intermediate with two, and posterior with one spur. *Chrysopilus.*

   Eyes pubescent, abdomen conical, short, anterior tibiæ with one, intermediate and posterior tibiæ with two spurs. *Dasyomma.*

5. Wings hyaline, indications of the third posterior vein usually present, fourth posterior vein rising from the discal cell about $\frac{1}{4}$ length from base. Blood-sucking. *Spaniopsis.*

   Wings spotted, 3rd posterior vein rising from $\frac{3}{4}$ length of discal cell, no trace of the fourth posterior vein present. Non blood-sucking. *Austroleptis.*

Genus Clesthenia, White.

White, P. & P. Roy. Soc. Tasm., pg. 45, text fig. 3 (wing) 1914.

This genus is characterised by:—Five posterior cells, fourth and anal cell closed: antennæ three jointed with a short thickened two jointed (apparently) terminal style: legs with all tibiæ two spurred; thorax arched, and abdomen conical. Eyes bare, separate in both sexes, short bristles on intermediate and posterior tibiæ.

Clesthenia aberrans, White.

(Pl XXVII., fig 1.)

White, P. & P. Roy. Soc. Tasm., pg. 46, text fig. 3, 1914.

Hab. Tasmania; Hobart, Mangalore, Mt. Wellington, Dunalley.

Type in the British Museum.

Genus Atherimorpha, White.

White, P. & P. Roy. Soc. Tasm., pg. 41, text fig. 1, 1914.

Five posterior cells open, anal cell narrowly open or closed; antennæ three jointed with a jointed thickened style, anterior tibiæ without spurs, intermediate and posterior tibiæ with two spurs, abdomen elongate tapering, eyes separate in both sexes, bare; tibiæ with conspicuous bristles.

Atherimorpha vernalis, White

(Pl. XXVII., fig. 2).

White, P. & P. Roy. Soc. Tasm., pg. 42, text fig. 1, 1914.

Hab. Tasmania; Geeveston, Mt. Wellington, Hobart, Sandford, Bagdad, Cradle Mt. White states that a near ally occurs in New South Wales. Victoria; Ringwood 19th Oct., 1918, one ♂ specimen (C. E. Cole).

At Cradle Mt. a yellow brown variety was taken as well as the ordinary form.

Type in the British Museum.

Atherix pusilla, Macq.

Macquart, Dipt. Exot. suppl. 5, pg. 88, pl. 2, fig. 13, 1854.

The description and the figure of the wing of this species are nearest to *Chrysopilus aequalis*, Walker, but it is inconceivable that Macquart would place a species of the genus *Chrysopilus* into the genus *Atherix*. Possibly the species belongs to the genus *Atherimorpha*.

Macquart's description is short, and as follows:— "Length 2 lines. ♀. Black (denuded), with traces of "white pubescence. Legs black, tibiæ fawn. Wings grey; "stigma brown. Adelaide.

Genus CHRYSOPILUS, Macq.

Chrysopilus, Macq., Recueil Soc. Sci. Agric. Lille, pg. 403, 1826.

Kertesz, Cat. Dipt. Vol. 3. pg. 317, 1908 (which see for synonymy).

White, P. & P. Roy. Soc. Tasm., pg. 39, 1914.

Five posterior cells open, anal closed; antennæ three jointed with a hair-like terminal arista; anterior tibiæ without spurs, intermediate with two, posterior with one spur; abdomen slender; eyes contiguous in ♂, separate in ♀, without pubescence; tibiæ without bristles.

Chrysopilus aequalis, Walk.

(Plate XXVII., figs. 3, 4.)

Leptis aequalis, Walker, List. Dipt. B.M. i., pg. 216, 1848.
? Froggatt, Austr. Ins., pg. 296, 1907.

Chrysopilus aequalis, Kertesz, Cat. Dipt. iii., pg. 317, 1908.

Chrysopila rufipes, Macquart, Dipt. Exot., suppl. 4, pg. 103, pl. 9, fig. 17, 1849.

Chrysopilus rufipes, White, P. and P. Roy. Soc. Tasm., pg. 40, 1914.

Chrysopilus antipodes, Bigot, Soc. Zool. France, xii., pg. 105, 1887.

Chrysopilus tasmaniensis, White, P. and P. Roy. Soc. Tasm., pg. 40, 1914.

Specimens of *Chrysopilus* are represented in most of the collections examined by me, and they invariably belong to this variable species, two forms of which White separated on colour and habits in Tasmania.

An extreme form is common at Trevallyn, Launceston, which has an extra wide head, and the wings are suffused with black anteriorly from the base and reach to two thirds of the length of the costa. Mr. C. E. Cole took a specimen approaching this form at Eltham, Victoria.

Macquart's species from Tasmania was evidently correctly identified by White, and Bigot's species is probably identical. White's type of *C. tasmaniensis* only differs in the colour of the legs and probably this is the form described by Walker from Australia as *Leptis aequalis*.

A long series of specimens shows these forms merging into each other and therefore they cannot be considered distinct species.

Hab.—Tasmania: Mt. Wellington, Hobart, Bagdad Valley, Eaglehawk Neck, Mt. Maria, Launceston, Cradle Mt. It has a wide distribution throughout Tasmania and occurs from October to April.

Victoria: One specimen, Eltham, 26th October, 1918. (Collector.—C. E. Cole.)

New South Wales: One specimen from behind Sublime Point, Thirroul, 30th March, 1918. Also a number in the Macleay Museum.

The type of *C. tasmaniensis*, White, is in the British Museum.

Chrysopilus auratus, Fabr.

Atherix auratus, Fabr., Syst. Ant., pg. 73, 1805.

Chrysopilus auratus, Kertesz. Cat. Dipt. iii., pg. 318, 1908 (which see for further references).

Rhagio atrata, Meig., Klass. Ins. 302, 1805.

Chrysopila atrata, Macq., Dipt. Exot., suppl. 2., pg. 50, 1847; Walk., Ins. Saund. Dipt. i., pg. 164, 1852.

This species is European, and the Australian records are evidently incorrect. Neither Macquart nor Walker gave any definite descriptions, and it is impossible to determine what species they actually had before them.

Genus Dasyomma, Macq.

Macq., Dipt. Exot. 2. i., pg. 31, 1840.

Five posterior cells open, anal cell narrowly open; antennæ three jointed with a terminal unjointed arista which is slightly thickened basally; tibiæ without bristles, anterior with one, intermediate and posterior with two apical spurs; abdomen conical; eyes pubescent, contiguous in the ♂, widely separated in the ♀.

Hitherto this genus was only known from Chili. Macquart separated it from *Leptis* by the pubescent eyes. This record of Australian allies to the Chilian species is of special interest, parallel to that of genus *Pelecorhynchus* (*Tabanidæ*).

Key to Genus Dasyomma.

1. Wings spotted, eyes thickly pubescent. *maculipennis.*
   Wings suffused with black, not spotted, eyes scantily pubescent. 2.
2. Antennæ reddish, abdomen entirely black. *dissimilis.*
   Antennæ black, abdomen brown, with apex of segments black. *dissimilis var.*

Dasyomma maculipennis, sp. nov.

Eyes thickly pubescent; wings suffused with brown, with dark spots.

♂. Shining black, face with tracings of greyish or brownish grey tomentum, eyes contiguous, thickly pubescent; antennæ with black hair on the two basal segments, beard yellowish grey, with a little black anteriorly nearest antennæ. Thorax with two grey tomentose median stripes and obscurely grey laterally, but these markings may be entirely obsolete; hairs yellowish mixed with a little weak black hair, similar hairs on scutellum and abdomen. Femora black, anterior and median with longish white hairs below; tibiæ reddish black, apically stained black; tarsi reddish, all joints apically black; wings dark, very brownish basally and along costa to tip of the radial vein, dark spots at the apex of the two basal and discoidal cells and also at base of the cubital fork.

♀. Similar but lighter in the thorax; head yellowish brown with the thickly pubescent eyes widely separated; third joint of antennæ, ocellar tubercle, and a moderately large frontal tubercle black; legs yellowish, all apices of joints stained black.

Varieties:—The above descriptions are taken from the ♂ holotype and ♀ allotype; the paratypes vary to a considerable degree in colour and markings; any part may be more brownish than black, and in the ♀ the abdomen is sometimes brown with apical margins of segments black, and the thorax may appear brown with three black stripes, the centre being sometimes obscure, or the lateral ones interrupted.

Length, 5-6 mm.

Holotype and allotype in the Australian Museum.

Hab. Tasmania:—Cradle Mt., 9 ♂, 2 ♀, 11th to 21st Jan., 1917; Launceston, 2 ♀; 28th Oct., 1916, and 7th Jan., 1917.

Dasyomma dissimilis, sp. nov.

(Pl. XXVII., figs. 5, 6.)

Very similar to *D. maculipennis*, but easily distinguished by the apparently bare eyes, which, however, are found to be scantily pubescent when seen under a low power microscope; the wings without spots, suffused with brown.

♂. Thorax and abdomen shining black, head covered with brownish grey tomentum, the first two joints of the antennæ reddish, palpi brownish black with black hairs; proboscis and third joint of antennæ black; hairs on thorax, scutellum and abdomen black; femora shining black or brown, tibiæ and tarsi brownish with black apices, the legs are, however, variable in colour.

Length, 6 mm.

♂ var. This variety, which may possibly represent a distinct species, has the abdomen brown, with apices of segments black; the legs much darker, and the antennæ entirely black; the general appearance of the insect is distinct, but there seem to be no characters other than colour and size between it and the typical form.

Length, 5 mm.

♀. Evidently belongs to the above variety, and is similar in colouration to the brownish form of *D. maculipennis*. The frontal and ocellar spots are united, the thorax stripes are obscured with blackish, and nearly all hairs black. It also differs by having only scanty pubescence on the eyes.

Brown; ocelli, frontal tubercle, third joint of antennæ, three obscure stripes on thorax, apices of joints of legs, apical borders of abdominal segments, hair of

thorax, abdomen, antennæ, palpi, a little on other parts of head and legs, black.

Length, 5 mm.

Holotype, allotype, and the holotype var. in the Australian Museum.

Hab. Tasmania:—Cradle Mt., holotype 16th Jan., 1917; holotype var. and allotype 16th Jan., 1917; paratype, 16th Jan., 1917; paratype var. 21st Jan., 1917. Mt. Wellington, paratype, 6th Jan., 1916. In all 6 specimens.

Genus Spaniopsis, White.

White, P. & P., Roy. Soc. Tasm., pg. 43, text fig. 2, 1914.
Ferguson, J. & P., Roy. Soc. N.S.W., vol. 49, pg. 233, plate 26, 1915.

Antennæ with the first and second joints small, the third large, terminally produced into a thickened jointed appendage. Wings with only four posterior cells, the third posterior vein being reduced to a stump which is occasionally absent; the fourth posterior branches from about one quarter the length of the discoidal cell; the lower branch of the cubital fork ends at the tip of the wing; anal cell closed before the border of the wing; eyes bare, in the female separate (♂ unknown); abdomen conical; tibiæ without bristles, the anterior and posterior without spurs, the intermediate with two spurs.

The female has blood-sucking habits.

Dr. Ferguson has given a key to the identification of the species founded on colour which is very reliable and easy for use. The following key is founded on structure.—

Key to Genus Spaniopsis.

1. Terminal appendage of antennæ twice the length of the three basal joints. *longicornis.*
   Terminal appendage of antennæ about as long as the three basal joints. 2.
2. The third joint of antennæ swelling away from its terminal appendage towards the base much more dorsally than ventrally. 3.
   The third joint of antennæ swelling from its terminal appendage more or less uniformly above and below. 4.
3. Terminal appendage of antennæ a little longer than the length of the three basal joints. *marginipennis.*
   Terminal appendage of antennæ a little shorter than the length of the three basal joints. *clelandi.*

4. A small species from N.S.W., 3 mm. long. *vexans.*
A larger species 5 mm. long from Tasmania. *tabaniformis.*

Spaniopsis tabaniformis, White.

White, P. & P. Roy. Soc. Tasm., pg. 44, text fig. 2, 1914.
Ferguson, J. & P. Roy. Soc. N.S.W., xlix., pg. 238, Pl. 26, fig. 11, 1915.

Hab. Tasmania. The only specimen taken, since the original 13 from Freycinet's Peninsula in 1914, was captured by Mr. C. Cole at Wedge Bay, during Easter, 1917.

Spaniopsis vexans, Ferg.

Ferguson, J. & P. Roy. Soc. N.S.W. xlix., pg. 238, pl. 26, figs. 6 and 10, 1915.

Hab. New South Wales:—Heathcote, June, 1917, and Thirroul (Sublime Point), 30th March, 1918. 2 specimens.

Spaniopsis clelandi, Ferg.

Ferguson, J. & P. Roy. Soc. N.S.W., xlix., pg. 240, pl. 26, figs. 5 and 9, 1915.

Hab. New South Wales:—2 specimens, Thirroul (Sublime Point), 30th and 31st March, 1918.

Spaniopsis marginipennis, Ferg.

Ferguson, J. & P. Roy. Soc. N.S.W., xlix., pg. 239, pl. 26, figs. 2, 4, and 8, 1915.

Hab. New South Wales:—Heathcote, June, 1917, about 40 specimens, very common at the bottom of a gully; Hornsby, June, 1917.

Spaniopsis longicornis, Ferg.

Ferguson, J. & P. Roy. Soc. N.S.W., xlix., pg. 242, pl. 26, figs 1, 3, and 7, 1915.

Hab. New South Wales:—Heathcote, June, 1917, 3 specimens.

Genus Austroleptis, gen. nov.

Antennæ 7 jointed, composed of two more or less equal basal joints, both about as wide as long, third swollen and much compressed, and a terminal complex of four closely fitting but distinct joints, which under a coddington lens often looks like only three. The venation is somewhat

similar to *Spaniopsis* in appearance, but entirely different structurally; there are only four posterior cells, the third posterior vein (coincident with the fourth) branches from beyond half the length of the discal cell; the lower branch of the cubital fork runs to or above the tip of the wing; anal cell closed by the true fifth (apparent fourth) posterior vein a little before the border of the wing; the transverse vein situated about one third the length of the discal cell. The wings much marked with spots. Tibiæ without conspicuous bristles, at most with a few weak ones on the anterior legs; intermediate and hind tibiæ with two apical spurs, which can only be seen with difficulty under a lens; abdomen conical; eyes bare, contiguous in the ♂, separate in ♀.

Type of the genus.—*A. rhyphoides*, sp. nov. . . . . Tasmania.

Austrolaptis rhyphoides, sp. nov.

(Pl. XXVII., figs 7, 8, 9.)

♂. Black; head with scanty hairs, palpi with black hairs, eyes smooth, ocelli on a raised tubercle, with black hairs, back of head with few black hairs and thin bristles; thorax with long black hairs, and with scanty traces of brownish grey tomentum, scutellum with long black hairs; base and apex of femora, tibiæ, and base of tarsi yellowish; abdomen with base of segments black, apically yellowish brown; long bristly black lateral hairs; underside similar; wings hyaline, basal half more or less yellowish, a black spot on fork of radial and subcostal veins, another at stigma, reaching the base of the cubital fork, a small spot at apex of lower branch of cubital vein; two spots along the first posterior vein situated at middle and sub-apex, two spots on second and third posterior veins situated at base and sub-apex; a spot at discal cross vein, and another on the fifth posterior vein where it runs into the anal vein. There are other, but indefinite, indications of black on the wings.

♀ Yellowish brown; head brown, proboscis black, apex of antennæ black, front blackish centrally extending to two black spots near eyes; thorax with three median and two lateral black stripes, central stripe faint; tip of scutellum black; black hair on thorax and scutellum, shorter than in ♂. Legs yellowish, femora darker, tips of tarsi black, all hairs black; abdomen similar to ♂, but more brown. Wings as in ♂.

Length, ♂ 3½-5 mm.; ♀ 5-6 mm.

Holotype and allotype in the Australian Museum.

Hab. Mt. Wellington, Tasmania. Holotype (♂), allotype (♀), 2nd December, 1916. 13 ♂ paratypes, from 25th November to 4th December. 1 ♀ paratype, 31st December, 1917; also a long series in Mr. Clive Cole's collection.

This species occurs near "The Springs" (2,000ft.), where the ♂ can be taken on fallen logs, the ♀ (rare) can be taken by sweeping. The fly appears in quantities for about a fortnight, after which it becomes excessively rare; ♀ ♀ are rare at all times.

Austroleptis multimaculata, sp. nov.

(Pl. XXVII., fig. 10.)

♂. Differs from *A. rhyphoides* chiefly in the spots of the wings, the entirely black abdomen, darker legs, and finally the hairs on face, thorax, and abdomen are lighter.

Wings. Costal cell with one spot at basal cross vein, one at half length, and the apical quarter is suffused black; apical half of marginal cell suffused black; spots in submarginal at base, middle and three quarters length; second submarginal cell spots at base, quarter, middle, and three quarters; 1st posterior with spot at base; followed by six others; 2nd, 3rd, and 4th posterior cells have two spots each; auxiliary cell with three spots; discal cell with two spots; there are indications of other spots more or less present. The veins between the 2nd and 3rd posterior and discal cells, between discal and basal cells, between fourth posterior, 2nd basal, and anal cells, suffused black.

Length, 3½ mm.

Holotype in the Australian Museum.

Hab. Tasmania:—Cradle Mt., 1 specimen, ♂, 22nd Jan., 1917.

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ILLUSTRATIONS.

Fig. 1. Antennæ of *Clesthenia aberrans*, White. ♂.

Fig. 2. Antennæ of *Atherimorpha vernalis*, White. ♂.

Fig. 3. Antennæ of *Chrysopilus æqualis*, Walker, ♂.

Fig. 4. Abdomen of *Chrysopilus æqualis*, Walker, ♂.

Fig. 5. Abdomen of *Dasyomma dissimilis*, sp. nov. ♂ (the two lower plates at apex of abdomen are exaggerated in the figure).

Fig. 6. Antennæ of *Dasyomma dissimilis*, sp. nov. ♀.

Fig. 7. Wing of *Austroleptis rhyphoides*, sp. nov. ♂ (from a micro-slide prepared by Dr. Tillyard).

Fig. 8. Antennæ of *Austroleptis rhyphoides*, sp. nov. ♂ (as seen *in situ*).

Fig. 9. Antennæ of *Austroleptis rhyphoides*, sp. nov. ♂ (from a micro-slide prepared by Dr. Tillyard).

Fig. 10. Wing of *Austroleptis maculipennis*, sp. nov. ♂ (from the holotype).