

ART. XI.—*Contributions to the Diptera Fauna of New Zealand: Part I.*

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THIS "contribution" is the first of a series, and comprises a description of seven new forms belonging to the family Stratiomyidae, together with a revision of the nine species included by Hutton in the genera *Beris* and *Exaireta*.<sup>\*</sup> Since commencing this paper several additional new forms have been collected and will be described in a future work on this family.

I have laid stress upon the structure of the wing-neuration, since there are marked differences even amongst species of the one genus; however, in certain cases some forms will no doubt have to be separated later on. Not only the wings, but antennae show distinct peculiarities.

The palpi of some species are peculiar. For example, in *Beris saltusans* n. sp. the 2nd palpal joint shows apparently 5 segments and the 1st joint 3, marked by lateral restrictions. Little has been done in the comparative study of the dipterous palpi, which are believed to vary from 1 to 5 joints. An investigation of these organs would doubtless be of considerable systematic value.

In referring to the tarsal joints I have adopted the following terminology for the 1st to 5th joints respectively, as suggested by Dr. Williston: pro-tarsus, epitarsus, mesotarsus, metatarsus, and onychotarsus.

The wing illustrations of the genus *Exaireta* were drawn to scale from photographs.

I am indebted to Mr. R. Speight, of the Canterbury Museum, for his kindness in allowing me access to the Hutton collection, and to Mr. G. Howes and Mr. G. V. Hudson for various specimens placed at my disposal.

## Family STRATIOMYIDAE.

## Genus EXAIRETA Schiner.

If the wings of the various species of this genus, referred to below, be examined, it will be noticed that the 1st submarginal cell varies considerably in form where the 3rd longitudinal vein arises from the 2nd. This feature is due to the position of the anterior cross-vein, and I have indicated in such cases that this cross-vein has either a common origin with the 3rd longitudinal from the 2nd or arises independently from the 3rd. The 3rd longitudinal vein is, according to the species, either strongly or slightly sinuated; accordingly the anterior branch, which may arise from the middle, before the middle, or beyond, is shorter or longer respectively. Again, the distance from the posterior wing-margin of the confluence of the 5th and 6th (anal) longitudinal veins, as compared with the length of the anterior cross-vein, is a feature I consider of importance.

It will be noticed from the illustrations that in the wing of *spiniger* (the type of this genus) the alula is well developed, while in the other species this part of the wing is absent. Also, the general outline of the wings and the position of the discal cell vary considerably.

Of the 4 posterior veins, characteristic of this genus, the 3rd varies considerably in length and may be rudimentary. On the right wing of

<sup>\*</sup> F. W. HUTTON, 1901, Synopsis of the *Diptera brachycera* of New Zealand, *Trans. N.Z. Inst.*, vol. 33, pp. 1-95

one male specimen of my new species *seolforalis* this 3rd posterior vein is totally absent, although present on the left wing. The right wing is shown in fig. 7. In all my other specimens of this form the 3rd posterior vein is present. When this vein is absent, as in the above case, one would probably be inclined to place the species in the genus *Beris*—that is to say, if only one specimen were available.

In most cases the antennae of the ♂ are considerably shorter than those of the ♀, and the eyes of the former are slightly closer than those of the latter.

This genus has a distribution throughout New Zealand, most of the species being found both in the North and the South Islands. Only one form, *spiniger*, is common to Australia and New Zealand, while *seolforalis* n. sp. ranges from sea-level to 3,000 ft. altitude.

In his work on the Brachycera,\* Hutton describes five species, of which his new form *alpina* I place in the genus *Berismyia* for reasons stated under that division. I also agree with Walker that *E. opposita* of Hutton belongs to the genus *Actina*.

The sexes may be distinguished mainly by the length of the antennae, proximity of the eyes, size of body, and form of the abdomen. In the ♂ the abdomen usually has parallel sides or sides restricted along the middle and is narrower than the thorax, while the ♀, although narrower at the base than the thorax, as a rule becomes wider beyond the middle.

Although both the genera *Exaireta* and *Actina* are very much alike in general appearance, they may be distinguished by the fact that the eyes of the former are bare and those of the latter pubescent, either densely or thinly so.

According to the venation of the wings, I have divided the species of this genus into two main groups—(1) those with the first submarginal cell obtuse, and (2) those with this cell acute. In the one species forming the first group the wing is not clouded or is only faintly coloured, while the anterior branch of the 3rd vein arises before the middle of this vein. The four species of the second group have the wings clouded and the anterior branch of the 3rd vein beyond the middle. This group is further divided into two subgroups by comparing the lengths of the anterior cross-vein and the vein between the discal and 5th posterior cells. To one of these subgroups three species belong, and are themselves distinguished mainly by their coloration.

TABLE OF SPECIES.

1	First submarginal cell proximally obtuse; wings not clouded, almost clear; 1st abdominal segment deep purple, remainder with dense silvery pubescence .. .. .	<i>seolforalis</i> n. sp.
	First submarginal cell proximally acute; wings clouded; abdomen without dense pubescence .. .. .	2
2	Vein between discal and 5th posterior cells shorter, never longer, than the anterior cross-vein .. .. .	3
	Vein between discal and 5th posterior cells distinctly longer than anterior cross-vein .. .. .	<i>spiniger</i> .
3	Wings tinged with yellow proximally and brown distally, or also with a distinct transverse cloud .. .. .	4
	Wings clouded with brown both proximally and distally, and with clear interspaces .. .. .	<i>hoheria</i> n. sp.
4	Wings with a distinct transverse median cloud, the distal half lighter brown; abdomen of a uniform purplish-bronze (♀) ..	<i>straznitskii</i> .
	Wings without transverse cloud; abdomen tawny, with purple apex	<i>apicalis</i> .

\* F. W. HUTTON, 1901, Synopsis of the *Diptera brachycera* of New Zealand, *Trans. N.Z. Inst.*, vol. 33, pp. 1-95.

*E. spiniger* Schiner.

*E. spiniger* Schiner, *Verh. Zool.-Bot. Ges. Wien*, vol. 17, p. 309 (1867); Hutton, *Trans. N.Z. Inst.*, vol. 33, p. 4 (1901). *Xylophagus spiniger* Wied., *Ausser-Europ. Zweif. Ins.*, 2, p. 618 (1830); Hutton, *Cat. Dipt. N.Z.*, p. 35; Hudson, *Man. N.Z. Entom.*, p. 56, pl. vi, fig. 5. *Beris servillei* Macq., *Dipt. Exot.*, 1, p. 176, pl. 21, fig. 1 (1838). *Diphysa spiniger* Macq., *l.c.*, p. 172.

Walker (*Cat. Dipt. B.M.*, p. 1152) considers *Beris albimacula* to be a probable variety of this species.

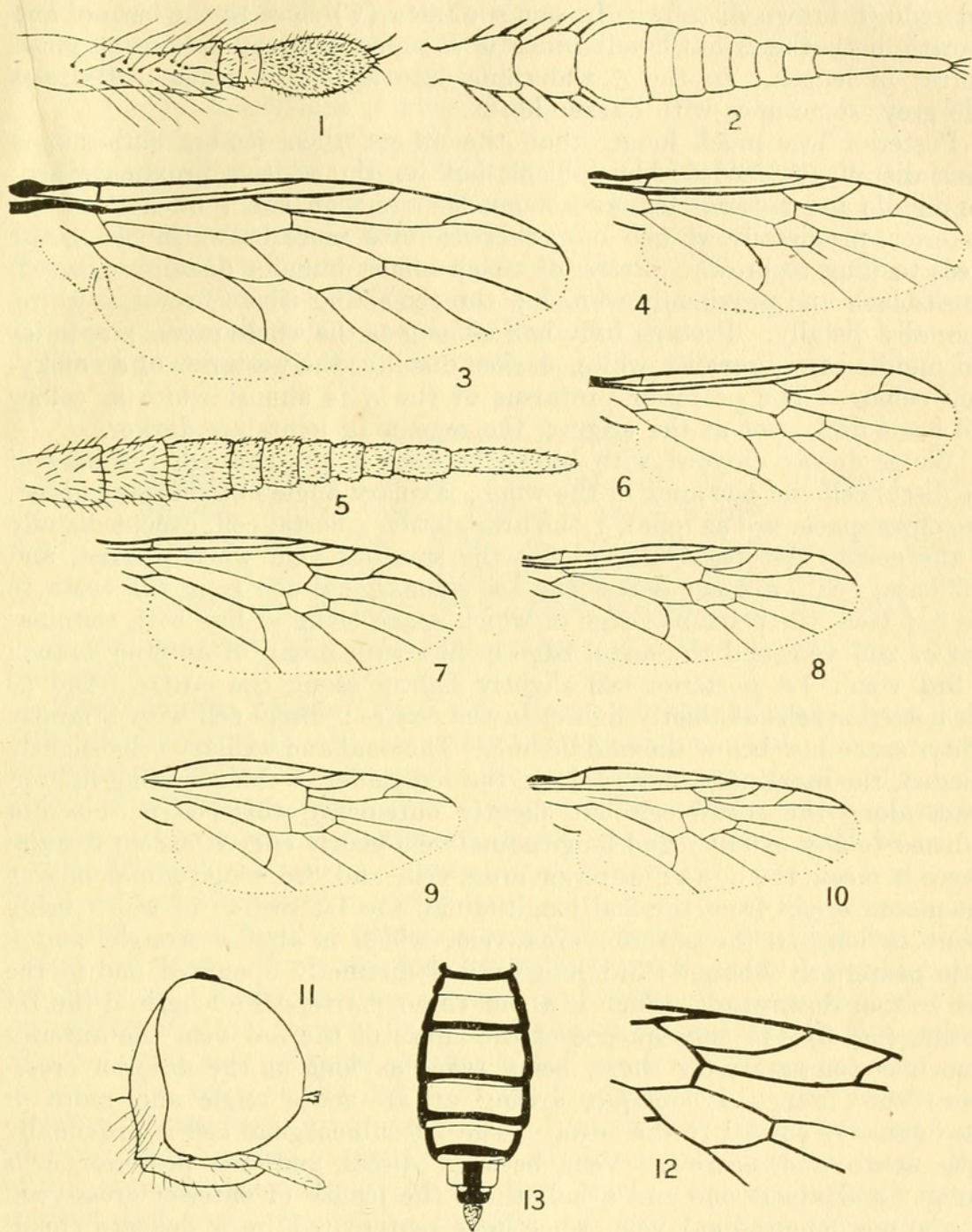
A large elongate blue-black fly, the legs with white bands. The head slightly broader than the thorax at the humeri; eyes bare, dichoptic, more so in the ♀, in profile occupying the whole side of head, facets of uniform size, no transverse depression. Front widening toward the antennae, dark shiny blue-black with short and scattered silvery reclinate hairs not affecting the ground-colour; a medio-longitudinal depression and two narrow longitudinal grooves, one on each side toward the orbits; immediately above the antennae and occupying the first third of the front is a dense silvery-white proclinate pile which in certain lights gives a dull-black reflection; there is a distinct transverse line separating the reclinate hairs of the front from the pile. Ocellar triangle circular and bare but surrounded by delicate and small hairs more distinct in the ♂; ocelli brownish-yellow. Occiput with dense silvery hairs, longer below.

Face silvery-white due to tomentum, widening below, with a median fissure, the angles of the epistome bare, bluish-black, and slightly projecting; the silvery tomentum lengthens towards the epistome; facial orbits without hairs but with a dense silvery-white tomentum.

The mouth-parts retracted, of a brownish colour with a few scattered black hairs. The palpi, as far as I am able to discern, are 2-jointed, but Schiner says that they are apparently 3-jointed. The penultimate is elongate and restricted, while the ultimate is clavate; the former is bare but for long and scattered hairs arising from distinct pits, while the latter is clothed by dense and short hairs, among which may be seen innumerable minute pits more distinct in the ♀ palp (fig. 1). In the ♂ the 1st joint is about twice as long as the 2nd, brownish but tawny distally; the 2nd is tawny except for a brown band toward the base, and terminates in 4 distinct and stiff hairs which are apparently hollow. The 1st joint in the ♀ is not much longer than the 2nd, which is without a transverse band and completely tawny. In the ultimate joint of the ♂ palp the hairs are less distinct posterior to the transverse band, and the pits are here absent.

Antennae situated a little below the middle line of head, elongate, being about half the width of head in the ♂ and longer in the ♀, the whole fusiform (fig. 2); 1st and 2nd joints and first third of 3rd joint reddish-brown but with a darker reflection, the remainder of the 3rd joint dark brown; 1st and 2nd joints bristly, the latter about two-thirds the length of the former; 3rd joint bare, about three times the sum of the 1st and 2nd, composed of 8 segments, and terminating in a tuft of apical hairs; the ultimate segment is about one-third the length of the whole; the 1st segment is a little longer than the 2nd joint and broader than any other part of the antenna.

Thorax longer than broad, shiny bluish-black, with short and sparse golden tomentum on the dorsum which becomes longer and silvery on the pleurae; a tubercle before the articulation of the wing and a brown and shiny ridge along the dorso-pleural suture interrupted in the middle; the tomentum on the humeri is denser. Scutellum large, coloured and



- FIG. 1.—Palp of *E. spiniger*.  
 FIG. 2.—Antenna of *E. spiniger*.  
 FIG. 3.—Wing of *E. spiniger*.  
 FIG. 4.—Wing of *E. apicalis*.  
 FIG. 5.—Antenna of *E. straznitskii* (♀).  
 FIG. 6.—Wing of *E. straznitskii*.  
 FIG. 7.—Right wing of *E. seolforalis* n. sp.  
 FIG. 8.—Wing of *E. hoheria* n. sp.  
 FIG. 9.—Wing of *A. opposita*.  
 FIG. 10.—Wing of *A. simmondsii* n. sp.  
 FIG. 11.—Head profile of *B. alpina*.  
 FIG. 12.—Part of wing of *B. alpina*.  
 FIG. 13.—Abdomen of *B. alpina*.

clothed as the dorsum; 4 large and hairy spines, black toward the base and reddish-brown distally. In one specimen (♀) close to the base of and beneath both the 2 left-hand spines is a supernumerary spine not much shorter in length. In the ♂ the spines are lighter in colour. Halteres pale grey, sometimes with darker heads.

Posterior legs much longer than the others, their femora club-shaped being distally thickened, bluish-black but for the whitish proximal part; the middle and anterior femora not much more than half the length of the posterior, proximally whitish but otherwise of a more brownish black, the knees tending to brown. Posterior tibiae robust but not distally enlarged, bluish-black and proximally whitish; the remaining tibiae brownish-white, especially distally. Protarsi fully half as long as the whole tarsus; anterior and middle tarsi brownish-white, darker distally, the posterior of a smoky-grey colour. The posterior protarsus of the ♂ is almost white in colour and has a dark spot at the origin; the remaining joints are darker.

Wings deeply clouded with brown between a line through the base of the discal cell and the apex of the wing; axillary angle not sharply curved. The clear spaces are as follow: the articulation; costal cell, except distally at the costa; 1st basal cell, except the spurious vein when present, and 2nd basal cell; a space across the 1st submarginal cell from the costa to the 3rd vein, the proximal edge of which space being in line with termination of 2nd vein and the distal edge in line with origin of anterior branch of 3rd vein; 1st posterior cell slightly lighter along the centre; 2nd to 5th posterior cells distinctly lighter in the centre; discal cell with a faintly lighter space just below the middle line. The anal and axillary cells slightly clouded, the marginal cell very dark, the remainder of the colouring lighter. Costa along the costal cell but slightly outcurved, this cell is thus not widened to any extent; 2nd longitudinal vein gently curved except distally where it meets the costa; anterior cross-vein and 3rd longitudinal having a common origin from the 2nd longitudinal, the 1st section of which being about as long as the anterior cross-vein, which is almost straight and a little posteriorly oblique; 3rd longitudinal distinctly upcurved and in the last section downwards, which is about three-quarters the length of the 1st section (fig. 3); in consequence of the curve of the 3rd vein the anterior branch is comparatively short, being twice as long as the anterior cross-vein; this branch is oblique, arising at an acute angle and more or less distinctly curved to the costa. The 1st submarginal cell is proximally both acute and narrow. Vein between discal and 5th posterior cells straight and about one and a half times the length of anterior cross-vein. A spurious longitudinal vein, sometimes represented by a delicate cloud, along the middle of the 1st basal cell. Of the 4 posterior veins from the discal cell the 3rd reaches three-quarters of the distance to the posterior margin of the wing. The confluence of the 5th and 6th longitudinal veins about three times the length of the anterior cross-vein from the margin.

The abdomen is elongate, fusiform in the ♀, linear and restricted along the middle in the ♂; in the former as broad as thorax beyond the middle, but not broader or as broad as the thorax in the latter; the whole deep shiny-blue with a faint tinge of purple in certain lights. There is a short vestiture of silvery hairs, longer laterally, and so arranged on the posterior margin of each segment as to present a banded appearance. In the ♂ those bands are more or less brown. The abdomen is 7-segmented.

The ♀ genital organs are represented by a pair of 2-jointed tawny styles projecting slightly upwards and arising from the sides of a central dome-shaped tawny plate.

The ♂ genitalia consist above of a pair of short tawny claw-like hairy styles arising from a plate as in the ♀, and beneath this plate is a pair of stout claws being opposed to each other and each arising from a protuberance upon which they apparently articulate.

♂. Length, 7–12.5 mm.; wing, 6–10 mm.

♀. Length, 14 mm.; wing, 12 mm.

*Habitat.*—Throughout New Zealand, but more abundant in Auckland than elsewhere. It is by no means often found as far south as Otago, and is not as common in the South Island as in the North Island, except at Nelson, where the climate is exceptionally warm. The principal localities are Auckland, Napier, Wellington, and Nelson; and it is seen in the months of December, January, and February.

This species is common to Australia and New Zealand.

### *E. apicalis* Hutton.

*E. apicalis* Hutton, *Trans. N.Z. Inst.*, vol. 33, p. 4 (1901). *Beris apicalis* White, *Voy. "Erebus" and "Terror,"* pl. 7, fig. 17; Walker, *Cat. Dipt. B.M.*, p. 126. *Diphysa apicalis* Walker, *l.c.*, p. 1151 (1849); Hutton, *Cat. Dipt. N.Z.*, p. 34. *Exaireta analis* Nowicki, *Mem. Krak. Akad. Wissen.*, 2, p. 11 (1875).

A medium-sized fly with clouded wings and a tawny abdomen dark at the apex.

Head a little broader than the thorax at the humeri; eyes bare, dichoptic, more so in the ♀; a faint emargination above the antennae, very distinct in the ♂. In profile the eyes occupy the whole side of the head. Front shiny black with a tinge of blue and a patch of silvery tomentum just above the antennae, which are situated a little below the middle line of head; about three-quarters the width of the head in ♂ and fully one and a quarter times the head-width in ♀, being characteristically elongated. As a rule the antennae project in front of the head, but in one ♀ they are erect. First and 2nd joints bristly with a shorter pubescence, the 3rd with a dense vestiture of short and stiff pubescence obscuring the segmentation; this joint is linear and almost of equal width throughout. The 2nd joint and proximal portion of 3rd are tawny, the remainder dark brown. The apex of the 3rd joint is of unique form: the penultimate segment is truncated, from one corner of which some short and stiff hairs project; the opposite corner and the adjoining half of the anterior edge of this segment are occupied by the base of the ultimate segment, which is short and oval, terminating in some stiff hairs. Face with a silvery pubescence, darker in certain lights, and with a dark medio-longitudinal stripe. Mouth-parts tawny and withdrawn, the palpi apparently 2-jointed. Occiput shiny black with a silvery tomentum.

Dorsum dark violet-black, faintly purple in certain lights, and dusted with a golden tomentum; humeri tawny; in some cases the dorsum is more or less dark tawny, with a dark violet-black spot posterior to the humeri and extending as a narrow stripe to the transverse suture. Pleurae shiny violet-black, except the sternopleurae which are pitch-black. Scutellum either tawny or dark tawny, tomentose, and with 4 tawny spines. Halteres pale tawny.

Legs tawny, the anterior tarsi fuscous except the proximal portion of the protarsi which is tawny; posterior femora thickened. The anterior and middle protarsi are equal to the sum of the remaining tarsal joints,

but the posterior protarsus is only about one-half the sum of the remainder, its epitarsus being but a little shorter.

Wings (fig. 4) clouded with brown distally of the posterior angle of discal cell, across which from the costa and through the marginal cell the coloration is darker; proximally the wing is faintly yellow, with veins of a similar colour, but distally the veins are brown; a clear space in the marginal cell along the 2nd vein and a slightly clearer space in the 1st sub-marginal cell. The anterior branch of the 3rd vein may be either clouded or unclouded. Axillary angle distinctly rounded. Anterior cross-vein and 3rd vein having a common origin from the 2nd longitudinal, the 1st sub-marginal cell proximally acute. Anterior branch of 3rd vein arising almost at right angles and gently curved to the costa, and a little longer than the anterior cross-vein, which is anteriorly oblique and slightly curved. Third longitudinal vein angulated at the origin of the anterior branch, and the last section almost straight. Of the 4 posterior veins from the discal cell the 3rd is short, reaching only one-quarter of the distance to the posterior margin. Length of vein between discal and 5th posterior cells but little more than half the anterior cross-vein. The confluence of the 5th and 6th longitudinals about twice the length of the anterior cross-vein from the margin.

Abdomen linear in the ♂ but broadening beyond the middle in the ♀, where it is wider than the thorax. In the ♂ the abdomen may or may not be restricted along the middle of the sides. There are 7 visible segments; the 1st four and a triangular spot on the anterior margin of the 5th tawny, the remainder iridescent-violet; the 1st is slightly darker. Just before the posterior margin on the 2nd to 4th segments is a darker narrow band not extending to the sides.

The genital organs of both ♀ and ♂ are tawny.

♂. Length, 7 mm.; wing, 6 mm.

♀. Length, 8 mm.; wing, 7 mm.

*Habitat*.—Throughout New Zealand; not rare. Principal localities: Bay of Islands, Auckland, Wellington, Nelson, and Otago. To be found from October to February.

#### *E. straznitskii* Nowicki.

*E. straznitskii* Nowicki, *Mem. Krak. Akad. Wissen.*, 2, p. 14 (1875); Hutton, *Trans. N.Z. Inst.*, vol. 33, p. 4, and *Cat. Dipt. N.Z.*, p. 36.

A moderate-sized fly, purplish in colour, with tawny scutellum and legs and a transverse cloud on wing.

♀. Head broader than the thorax at the humeri; eyes bare and dichoptic, occupying almost the whole of the head in profile; a delicate restriction across the eye from just above the antennae, becoming faint toward the occiput; facets of uniform size. Front depressed, of a shiny blackish-blue colour, with a dense silvery pubescence just above the antennae, otherwise with minute scattered hairs; on the front above the antennae is a circular depression from which runs a central groove to the base of the antennae.

Antennae elongate, about one and a half times the width of head and situated a little below the middle line; dark brown, except the 2nd joint and the 1st segment of the 3rd which are brownish yellow; 1st joint about one and a half times the length of the 2nd, and with a vestiture of delicate black bristles; 2nd joint with stronger bristles; 3rd joint pubescent, densely so distally concealing the segmentation. When cleared and

examined under a high power 8 segments may be distinguished (fig. 5). Many sensory pits may be seen on these segments, especially toward the outside.

Face silvery tomentose except for a nude and black medio-longitudinal stripe; upon the tomentum, in certain lights, are a few black spots. Mouth-parts tawny, completely withdrawn except for the apices of the palpi. A few hairs around the oral aperture and longer posteriorly.

Thorax on the dorsum shiny and dark reddish-purple, dusted with a tawny tomentum; humeri tawny; pleurae shiny pitch-black with a faint purplish reflection and short silvery down at times indistinct. Scutellum and the 4 spines tawny. Halteres light yellow.

Legs tawny, posterior femora thickened; tarsi darker at the apex, especially those of the anterior and middle legs, almost the whole of the former velvet-brown. Length of tarsal joints as in preceding species.

Wings (fig. 6) with costa straight along the costal cell; anterior cross-vein and 3rd longitudinal not having a common origin from the 2nd vein but nearly so, the 1st submarginal cell being thus proximally acute. Anterior cross-vein curved a little and slightly anteriorly oblique but not short. The remainder of venation practically identical with that of *apicalis*. A dark-brown band across the wing covering the marginal and discal cells and becoming lighter toward the posterior margin; both sides of this band are irregular, and the apex of the marginal cell may be clear. Proximal of the band the wing is faintly tinged with yellow, darker in the costal cell, and the veins yellow; between the band and apex the wing is faintly brown, with brown veins.

Abdomen beyond the middle broader than the thorax, of a shiny-cupreous colour, with a distinct purplish tint, dusted with tawny, and bearing yellow hairs at the sides.

Genital organs represented by a pair of tawny and styli-form appendages.

♀. Length, 8 m.m.; wing, 7.5 mm.

Hutton gives the length, apparently of both sexes, as 8–11 mm., and wing 7–8 mm. I have not seen the male, and there are no specimens of the species in Hutton's collection.

*Habitat*.—Auckland (Hutton) and Southland, January (Philpott).

### *E. seolforalis* n. sp.

A fly of moderate size. Wings unclouded and more or less pellucid. Thorax of a brilliant green, and abdomen—except for the first deeply purple segment—covered by a dense silvery pubescence. The abdomen is characteristic.

Head broader than the thorax at the humeri; eyes bare, dichoptic, more so in ♀, occupying most of head in profile, orbits angulated above the antennae (more marked in ♂), facets of uniform size, no transverse depression in either sex but in the ♂ a narrow bronzy belt; in both sexes lower two-thirds of eye darker than the upper third. Front hairy, narrow, of about equal width throughout, shiny black with a faint bluish tinge and a patch of silvery tomentum just above the antennae, which are situated a little below the middle line of head and not quite as long as the width; 1st to 3rd joints dark brown with a thick pubescence; 1st and 2nd joints short, bristly, and of about equal length; 3rd elongate, club-shaped, and composed of 8 segments terminating in apical delicate hairs.

Face hairy, silvery-tomentose with darker longitudinal reflections. Proboscis hairy and tawny; palpi darker with delicate hairs, the penultimate joint elongate and narrow, tawny, and about as long or a little

longer than the ultimate, which is fusiform, and broader than the former, the first quarter tawny, the remainder dark brown caused by a dense pubescence amongst which are one or two delicate hairs. Occiput depressed, shiny black, with no reflections.

Thorax and scutellum brilliant bluish-green, the 4 scutellar spines short and tawny, those of the ♂ longer than in the ♀; dorsum thinly dusted with tawny, humeri slightly tawny. Halteres greyish-white, but darker at the head.

Legs very minutely clothed with stiff hairs, on the whole dark tawny, anterior tarsi fuscous; apex of middle protarsi and remaining 4 joints fuscous; posterior tarsi greyish in certain lights. Protarsi longer than sum of remaining joints, more so the anterior; posterior epitarsi slightly longer than those of the other legs; posterior femora thickened.

Wings (fig. 7), except for the tawny subcostal and marginal cells, unclouded, being either clear or slightly coloured; costal cell normal, not widened; anal angle but distinctly curved; anterior cross-vein and 3rd longitudinal not having a common origin from the 2nd vein, the cross-vein leaving the 3rd vein about half its length from the 2nd vein so that the 1st submarginal cell is more or less proximally truncated or obtuse; cross-vein not short, anteriorly oblique. Third vein not angulated but gently curved, the anterior branch arising at a slightly acute angle and bisinuated to the costa, the 1st sinuation the stronger; this branch is about twice the length of anterior cross-vein. Vein between the discal and 5th posterior cells not quite as long as the anterior cross-vein. Of the 4 veins from the discal cell the 3rd may be absent, rudimentary, or short (absent in the figure). The distance from the posterior margin of the confluence of the 5th and 6th longitudinals equal to the length of the anterior cross-vein.

Abdomen with 7 segments, of uniform width in the ♂ and not as broad as the thorax; in the ♀ broader than the thorax and but little narrower at the base. First segment of a deep shiny purple, the remainder clothed with a dense silky and silvery pubescence which in certain lights shows a darker band on the posterior margin of each segment, due to a slight depression. There are longer silvery hairs at the sides. At times the silvery vestiture may be thinner, showing the ground-colour of the segments (except the 1st) to be tawny. This last feature was noticed in a male.\* The 8th segment, when visible, is bare and of a deep purple, the genital organs tawny.

♂. Length, 9.5 mm.; wing, 7.5 mm.

♀. Length, 10 mm.; wing, 8.25 mm.

*Habitat*.—Wellington (Howes); Mount Arthur Tableland, taken in hot sunshine, January, 1889 (Hudson); Kaitoke, November, 1910 (Hudson); Arthur's Pass, 3,000 ft., December, 1914 (Hudson).

This species, on account of abdomen, is unique. Although I have not yet met with specimens, it is apparently a common species.

#### *E. hoheria* n. sp.

A medium-sized slender and dark-coloured fly, with tawny bands on legs and clouded wings with clear spaces.

♀. Head broader than thorax at humeri; eyes bare, dichoptic more so toward the vertex, occupying most of head in profile, no transverse depression, facets of uniform size lower two-thirds darker than upper third; front shiny black with short hairs and a patch of white, slightly yellow,

\* Since writing the above I have found this species in large numbers in the bush on the banks of the Manawatu River during December. It abounded in the open glades in sunshine. Most of these specimens had the pubescence of the abdomen very thin.

pubescence above antennae and extending over the face, which has a black medio-longitudinal stripe and longer hairs than on the front. Mouth-parts tawny, proboscis light in colour; palpi completely tawny, the penultimate joint narrow and slightly restricted along middle of sides, bearing long and delicate hairs and about one and a half times the length of the ultimate which is clavate, bare on proximal half but with dense stiff and short hairs and numerous pits on distal half, terminating in at least 1 terminal and 1 subterminal stiff hair.

Antennae dark brown, situated about the middle line and not as long as width of head; 1st joint about twice the length of 2nd, and both bristly; 3rd joint with 8 segments, the first of which is the largest; terminal segment a little longer than the 1st and notched at apex, on one side of which is a tuft of hairs; the whole joint has a dense and stiff pubescence.

Occiput depressed, shiny black with a yellowish-grey tomentum.

Dorsum of thorax greenish-black with violet reflections and dusted with a yellowish-grey tomentum; pleurae coppery with a violet reflection, excepting the sterno-pleurae which are black; scutellum bluish-green but narrowly margined with tawny at the apex, the 4 tawny spines small or indistinct.

Halteres pale yellow with dark-brown heads.

Legs banded with tawny and fuscous, the latter separated by the former, which lies in the middle; posterior femora (which are enlarged) and their tibiae distinctly banded, the middle femora faintly banded being mostly tawny, the anterior tawny; middle and anterior tibiae tawny but for proximal fuscous bands; posterior protarsi and epitarsi light brown, the remainder dark; middle protarsi light brown with a dark distal spot, the remainder dark brown; practically all joints of anterior tarsi dark brown. In form the tarsi resemble the preceding species.

Wings (fig. 8) clouded, axillary angle strongly curved; costal cell widened; 1st submarginal cell proximally acute, the anterior cross-vein and 3rd longitudinal vein having a common origin from the 2nd vein. Third vein strongly sinuated, the anterior branch arising acutely beyond the centre, sinuated slightly, and nearly twice as long as anterior cross-vein, which is slightly anteriorly oblique. Third posterior vein reaching about half-way to the posterior margin. Vein between the discal and 5th posterior cells a little more than half the anterior cross-vein. Distance from the margin of the confluence of the 5th and 6th veins about twice the length of the anterior cross-vein. Veins brown; submarginal cell clouded with dark brown; costal cell clear; 1st submarginal cell clear except proximally and along the branch of 3rd vein; 2nd submarginal cell brown; 1st posterior-cell brown, except for a narrow elongate space near the middle; 2nd posterior cell brown except for a space toward the margin; 3rd and 4th posterior cells brown except for a large and square space on distal half into which runs the 3rd posterior vein; 5th posterior cell clear proximally the brown cloud being triangular in form; axillary lobe distinct, with a slightly clear space proximally along the 6th vein; anal cell clear but for a small cloud along the 6th vein near the confluence of the 5th; 1st and 2nd basal cells clouded on proximal half and clear distally; discal cell clouded.

Abdomen with 7 segments, narrower than the thorax at the base but becoming wider at the middle, tapering to a point and terminating in the bifid tawny and styliiform appendage. The whole almost blackish-bronze, the 3 apical segments lighter; 1st segment faintly tawny in the middle; 2nd almost all tawny but for sides and posterior margin; the 3rd with a broad tawny spot toward the anterior margin. Ventrally the

colour is bright yellow margined with black-bronze, except the 2 apical segments which are coloured below as above.

The ♂ is smaller than ♀. Thorax black-bluish-green; scutellum bright bluish-green, the spines short and tawny. Wings with no clear spot in 2nd posterior cell; space in the 3rd and 4th posterior cells smaller; 3rd posterior vein in one specimen not reaching this space but in another entering it—that is, the 3rd posterior vein of former specimen not reaching half-way to the margin and not more than half-way in the wing of the latter.

Abdomen long and linear, slightly restricted along the middle sides and not quite as broad as thorax; 1st segment without a tawny spot; spot of 2nd smaller than that of ♀ and with a faintly darker central stripe; the 3rd segment with a clear tawny spot on the anterior margin, and the 4th with a similar but smaller spot.

The ♀ and smaller ♂ were bred by Mr. Philpott from pupae found under the bark of a dead ribbonwood-tree at Wallacetown, while a larger ♂ was captured by him on a tree-trunk at night on the West Plains.

Another ♂ captured by him in Otago measures only 7 mm., and wing 5 mm. The tawny spots of the abdomen are here indistinct, only to be faintly seen in certain lights, and the wings are not so deeply clouded with brown; in this case the 3rd posterior vein barely reaches half-way to the margin.

♂. Length, 8–9 mm.; wing, 6.25–6.75 mm.

♀. Length, 8 mm.; wing, 7 mm.

*Habitat*.—West Plains (Otago), February; Wallacetown, October.

#### Genus *ACTINA* Meigen.

This genus, as has been said, differs from *Exaireta* in the eyes being pubescent, but on reviewing the wings we find further differences. In *Actina* the costal cell is distinctly widened by a curve of the costa: this is characteristic of six other new forms obtained after the following were described, but which will form part of a future “contribution.” The costal cell is not widened in *Exaireta*. Again, the 3rd longitudinal vein is not so strongly sinuated in *Actina* as in *Exaireta*.

The two species mentioned below may be distinguished by the following table:—

- |   |                          |
|---|--------------------------|
| (a.) First submarginal cell proximally obtuse; abdomen tawny, with blackish-brown bands widening laterally ..         | <i>opposita</i> .        |
| (b.) First submarginal cell proximally acute; abdomen brownish-black, 3rd to 5th segments with anterior tawny band .. | <i>simmondsii</i> n. sp. |

#### A. *opposita* Walker.

*Exaireta opposita* Hutton, *Trans. N.Z. Inst.*, vol. 33, p. 5 (1901).

*Actina opposita* Walker, *Cat. Dipt. B.M.*, pt. 5, Supp., p. 13 (1854); Hutton, *Cat. Dipt. N.Z.*, p. 35.

♂. A medium-sized fly with brilliant green thorax and tawny, banded abdomen.

Eyes with delicate scattered and yellow hairs, cupreous with no transverse markings, closely approximated below middle line of front and occupying side of head in profile. Ocellar triangle Prussian blue, more or less prominent, situated well in front of the posterior eye-corners—that is, as if upon the front—the eye-corners at the vertex being well behind the triangle, which bears some long hairs, apparently not arranged in series; posterior to the triangle the vertex is rounded, carrying long hairs, and of a brilliant greenish-blue, this colour extending across the occiput to the foramen as an

elongate triangle; occiput rounded, violet-black, and hairy especially below where they are silvery; front blue-black with delicate brown hairs, narrow especially toward the antennae, above which it suddenly widens to form a triangular area of silvery ash-grey pubescence, along which is a narrow and darker medio-longitudinal stripe.

Antennae about half the width of head or a little more, and situated at the middle line; 1st and 2nd joints bristly, the latter about three-quarters the length of the former, both yellow, but the 1st, owing to the denser bristles, darker than the 2nd; 3rd joint composed of 8 segments, densely pubescent and with 2 terminal hairs, the penultimate segment also having some longer hairs apically; all the 1st and undersides of 2nd and 3rd segments yellow, the remainder fuscous. The dorsal edge of this joint is straight, the ventral approaching the dorsal toward the apex.

Face strongly widening below, hairy, the hairs longer and denser below, shiny blue-black with a greyish pubescence at epistome; facial orbits densely greyish-pubescent; oral margin violet-black and densely hairy, slightly produced downwards posteriorly; proboscis and palpi pale yellow, the latter small and indistinct.

Dorsum of thorax and scutellum brilliant bluish-green, with a vestiture of minute and delicate hairs, each hair arising from a minute depression, giving, on the whole, a delicate punctured appearance. The scutellum is, if anything, bluer than the dorsum, the 4 strong spines being yellow but darker at the base. Humeral and post-alar calli dark tawny, the former with distinct yellow hairs. In certain lights the dorsum may be bronzy-green, violet-blue, or golden. Pleurae with silvery hairs, coloured as the dorsum but the reflections more pronounced.

Anterior and middle femora and tibiae pale yellow; posterior femora thickened, darker than the others and fuscous at the apex; posterior tibiae thickened but not strongly so, darker than the others, slightly fuscous at the knees but strongly fuscous on apical quarter. Anterior tarsi fuscous, the middle pale yellow but darker apically, the posterior thickened, darker than the middle and slightly fuscous toward the apex. All the protarsi longer than the following joint.

Wings yellowish, the veins yellow, the marginal cell clouded with yellow; costal cell strongly widened; auxiliary vein sinuated at apex; 1st submarginal cell proximally obtuse; the 3rd vein apparently arising from anterior cross-vein; 1st section of 3rd vein about half the length of the anterior cross-vein, which is perpendicular; 3rd vein slightly sinuated, the anterior branch fully twice as long as anterior cross-vein, arising almost at right angles and bisinuated to the costa (fig. 9); 3rd posterior vein not reaching half-way to margin of wing; vein between the discal and 5th posterior cells a little longer than anterior cross-vein; distance from the margin of the confluence of the 5th and 6th veins nearly three times the length of anterior cross-vein. Anal angle strongly curved.

Halteres pale yellow.

Abdomen with 7 segments, of equal width throughout, almost as wide as thorax, with a vestiture of dense pale-yellow hairs along the sides and short hairs on dorsal surface; 1st segment blackish-brown but for a central tawny part extending on to the posterior margin and not separated from the colour of following segment; 2nd to 4th segments tawny, each with a narrow posterior blackish-brown band widening laterally to form a triangular spot on the sides at the posterior corners. Although along the middle this band is separated from the posterior margin by a narrow and tawny fusiform area, it extends on to the margin at the sides; 5th and 6th segments

with the blackish-brown band not produced as a triangle at the sides, and in the latter not extending completely across the segment; 7th segment small, the brown band occupying almost the whole surface, only a slight tawny area on each side. The genital organs are tawny and withdrawn.

In the ♀ the abdomen is oval, broader than the thorax, and dark tawny with dark-brown bands as in the ♂. The legs are also dark tawny but without fuscous markings, while the thorax is not so brilliant in colour.

♂. Length, 8 mm.; wing, 6.5 mm.

♀. Length, 8 mm.; wing, 6.5 mm.

*Habitat*.—Wellington, December (Howes), November (Hudson); Auckland (Bolton and Broun); Otago (Hutton).

#### *A. simmondsii* n. sp.\*

♂. A medium-sized fly with green thorax and dark-brown abdomen with tawny markings.

Eyes holoptic just below middle of front, distinctly pubescent; front bluish-green with silvery reflections toward the ocellar triangle, which is prominent and bears long and erect stiff hairs.

Antennae dark-brown almost black, situated a little below middle line but not as long as the width of head; 1st and 2nd joints bristly, the latter about a third as long as the former, which is comparatively elongate; 3rd joint about twice the sum of the 1st and 2nd, composed of 8 segments, and clavate in form; ultimate segment almost a third as long as the whole joint.

Face with long brownish-grey hairs, darker in certain lights, and an indistinct and darker medio-longitudinal stripe. Proboscis and palpi tawny. Occiput flat, black with a silvery tomentum.

Dorsum, pleurae, and scutellum bright bluish-green, with a vestiture of erect and tawny scattered hair; the 4 scutellar spines tawny and short, indistinct on account of vestiture. Halteres pale tawny.

Legs tawny, tarsi fuscous more so apically; the posterior pair lost on my only specimen.

Wings very faintly tinged with brown, the veins brown; marginal cell clouded with brown but lighter apically; 1st submarginal cell proximally acute; costal cell enlarged; 3rd vein almost straight, the anterior branch about three times length of anterior cross-vein which is slightly anteriorly oblique; 3rd posterior vein reaching more than half-way to the margin; vein between the discal and 5th posterior cells longer than but not twice as long as anterior cross-vein. Distance from the margin of the confluence of the 5th and 6th veins about four times length of anterior cross-vein. Anal angle strongly rounded.

Abdomen brownish-black, not quite as broad as thorax, rectilinear and of a uniform width throughout, in profile swollen at the apex, consisting of 7 visible segments, the apical bearing an extruded and down-turned tawny appendage; 3rd to 5th segments margined anteriorly by a tawny band broader at the sides, except on the 3rd, where the band is uniformly thin throughout; apical segment tawny; ventral side dull tawny bordered by brownish-black; apical segments coloured ventrally as dorsally. The whole covered by long tawny hairs longer at the sides and shortening apically.

♂. Length, 8 mm.; wing, 6.5 mm.

*Habitat*.—Runanga, January (Howes); Titahi Bay, December (Simmonds).

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\*I have taken the liberty to name this species after Mr. Simmonds, of Auckland, who collected the first specimens at Titahi Bay.

## Genus BERISMYIA Giglio-Tos.

I have placed the following species, *Exaireta alpina* of Hutton, in this genus on account of the position of the antennae below the middle line of head and the presence of only three posterior veins in the wing. I have no specimens of this species at my disposal beyond Hutton's type species, which is a female.

*B. alpina.*

*Exaireta alpina* Hutton, *Trans N.Z. Inst.*, vol. 33, p. 5 (1901).

♀. A moderately large fly with bluish-green thorax and the abdomen dark tawny, the sides of which and the posterior margin of each segment dark green; legs tawny and wings yellowish. At first sight this species resembles in colour the female of *A. opposita*, but its much larger size and margined abdomen, as well as the position of the antennae and number of posterior veins, at once place it as a distinct species.

Eyes dichoptic, bare, occupying side of head in profile, a faint depression a little above the antennae. Ocellar triangle and front blue-black and shiny, the former more or less prominent and the latter with a patch of silvery-grey tomentum above the antennae, which are elongate, being longer than width of head, and situated below the middle line (fig. 11); black in colour but for base and underside of 1st segment of the 3rd joint, which is dark tawny; 1st and 2nd joints bristly, the latter half as long as the former; 3rd joint composed of 8 segments, densely pubescent, and terminating in several short and delicate hairs.

Face shorter than front and strongly receding, covered by a silvery-white tomentum (black in certain lights), along which is a dark medio-longitudinal and narrow stripe. Proboscis pale tawny; palpi large and projecting in front of proboscis; penultimate joint elongate and narrow, longer than the ultimate, and pale tawny with delicate hairs; ultimate joint fusiform, about two-thirds length of preceding, tawny at base and on inner side, otherwise black. Occiput shiny black, more or less rounded, with some scattered silvery tomentum above but hairy below, and produced backward at the oral margin.

Thorax brilliant bluish-green, especially the pleurae, the sterno-pleurae a darker green; the dorsum with a scattered greyish tomentum, the pleurae with silvery hairs. Humeral and post-alar calli dark tawny, the latter golden in certain lights. Scutellum brilliant bluish-green margined with tawny, the 4 spines short and dark tawny.

Wings tinged with yellow, deeper at the base and in costal and marginal cells; veins yellow; costal cell broadened slightly; 1st submarginal cell proximally obtuse, the 1st section of 3rd vein not quite as long as anterior cross-vein, which is slightly oblique anteriorly (fig. 12); 3rd vein slightly sinuated, the anterior branch arising at right angles from the middle and strongly bent to the costa; only 3 posterior veins, there being no sign of a 4th; vein between discal and 4th posterior cells not quite twice length of anterior cross-vein. Distance from the margin of the confluence of the 5th and 6th veins not twice the length of anterior cross-vein. Anal angle strongly rounded. Halteres yellow.

Legs tawny, the femora and tibiae stout, the posterior femora thickened; anterior tarsi fuscous, especially the protarsi.

Abdomen with 7 visible segments about as wide as thorax, oval or almost rectangular excluding the 6th and 7th segments (fig. 13). The whole tawny, but segments 1 to 5 bordered along the sides by deep shiny-green, which is continued across the middle of the 1st segment; the 2nd to 5th

segments with a transverse dark-green band near the posterior margin; the 6th segment has a broad fuscous stripe in the middle, while the 7th and terminal appendage are more or less totally fuscous. The ventral side is yellow.

What I have called the 6th and 7th abdominal segments are probably a portion of the extruded ovipositor, since they differ not only in colour but are abruptly smaller than the 5th. However, at present I am unable to place this species in any of the genera which have 5 visible segments as their character.

♀. Length, 10 mm.; wing, 9 mm.

*Habitat*.—Mount Arthur, 3,600 ft. (Hudson).

#### Genus BERIS Latreille.

Captain Hutton (*l.c.*, pp. 5–7) described four species of this genus, three of which were new forms; of the fourth—*B. substituta* Walk.—neither Hutton nor I have representatives, though I am inclined to think that the female of *violacea* Hutton may be a *substituta*.

To those already recorded I add four other new species, bringing the total to eight; but, since some possess features markedly different from those characteristic of this genus, it may be found necessary later on to place them in other genera. A noteworthy example is *cuprea* of Hutton; in this form the 1st and 2nd posterior veins arise from a common pedicle from the apex of the discal cell, which is thus apically acute, the 1st and 3rd posterior cells being here contiguous. Curiously enough, this is the only species of the eight which has holoptic eyes in the male, a feature peculiar to *Beris*. However, all but two of the following forms have the eyes more or less characteristically hairy, but the flagellum of the antennae, which should have 8 segments, has only 7 in all the species but one—*caliginosa* n. sp.—while at least the 1st and 2nd segments of the flagellum in *saltusans* n. sp. are distinctly hairy. Moreover, in these two forms, the 1st, 3rd (except anterior branch), 5th, and 6th longitudinal veins are distinctly bristly.

The anterior cross-vein arises from the 3rd longitudinal, but in none of the following do both have a common origin from the 2nd, though the 1st section of the 3rd vein varies in position and length.

According to the following table the species fall into two chief divisions, according as to whether the eyes be hairy or bare; in the former the legs are banded, but in the latter of a uniform colour.

TABLE OF SPECIES.

1	{ Eyes hairy and legs banded* .. .. .	2
	{ Eyes bare and legs not banded .. .. .	6
	{ Eyes distinctly hairy; 1st, 3rd (except anterior branch), 5th, and	
2	{ 6th longitudinal veins bristly .. .. .	3
	{ Eyes minutely or indistinctly hairy; veins not bristly .. .. .	4
3	{ Flagellum minutely pubescent .. .. .	<i>caliginosa</i> n. sp.
	{ Flagellum hairy on first two segments at least .. .. .	<i>saltusans</i> n. sp.
4	{ First section of 3rd vein longer than, or equal to, anterior cross-vein	5
	{ First section of 3rd vein shorter than anterior cross-vein .. .. .	<i>micans</i> .
5	{ Wings clear but for a transverse band; thorax brilliant bluish-green	<i>lacuans</i> n. sp.
	{ Wings clouded but clearer at apex; thorax dull-bronzy .. .. .	<i>violacea</i> .
6	{ First and 2nd posterior veins arising from a common pedicle .. .. .	<i>cuprea</i>
	{ First and 2nd posterior veins normal .. .. .	<i>refugians</i> n. sp.

\* *Substituta* is not included in this table, but it falls into the first division owing to colour of legs; as has been said, it may equal *violacea*. The legs of *micans* are not as distinctly banded as the other species of this division.

**B. substituta** Walker.

*B. substituta* Walker, *Cat. Dipt. B.M.*, Supp., 5, p. 12 (1854); Hutton, *ib.*, p. 6. *Actina substituta* Hutton, *Cat. Dipt. N.Z.*, p. 34.

“Dull green or aeneous green. Antennae black. Palpi testaceous. Scutellum with 4 tawny spines. Abdomen purplish-cupreous. Legs tawny, femora and tibiae with brown bands. Wings greyish, the stigma and veins black.

“This species has 3 externo-medial veins, and the 1st branch of the cubital vein is very short, proceeds almost directly to the border, and thus forms an unusually large angle with the second branch.

“Length, 2 lines; wings,  $3\frac{3}{4}$  lines.

“Auckland (Colonel Bolton).”—Walker, *l.c.*

**B. violacea** Hutton.

*B. violacea* Hutton, *Trans. N.Z. Inst.*, vol. 33, p. 6 (1901).

♀. Eyes broadly dichoptic with minute and scattered hairs; front broad, shiny blackish-brown with short scattered greyish hairs, and, above the antennae, a patch of greyish pubescence dead-black in certain lights and notched on the posterior margin. Antennae below middle line of head, long but not as long as width of head; 1st joint shiny black, the 2nd light brown, and both bristly (fig. 14); flagellum linear, covered by a dense stiff and black pubescence giving a tawny reflection in certain lights, composed of 7 almost equal segments except the ultimate which is about twice the length of the penultimate, both of which having terminal hairs. Face broad, shiny black with a few scattered silvery hairs; proboscis tawny and thinly hairy, palpi (fig. 15) 2-jointed, both of about equal length and projecting beyond the proboscis; 1st joint blackish and hairy, the 2nd brown with a darker apex, fusiform, minutely pubescent, and terminating in 3 bristle-like hairs. Occiput shiny black and depressed, hairy below.

Dorsum of thorax dull-bronzy with dull-greenish reflections and a finely punctured appearance; pleurae shiny blue-black and slightly hairy. Scutellum coloured as dorsum, with 4 light-brown but not large spines.

Wings clouded with greyish-brown but clear toward the apex; veins brown; stigma dark brown; base of the wing and anterior part of the costal cell clearer. First section of 2nd longitudinal vein about twice as long as anterior cross-vein, the 2nd section but slightly bent into the 1st submarginal cell; 1st section of 3rd vein a little longer than anterior cross-vein, which is perpendicular; 3rd vein curved upward to the bifurcation and thence sinuated downwards to the costa, the anterior branch arising almost at right angles and but very slightly bent to the costa (fig. 16); basal cells closed behind by an oblique transverse vein, the vein separating those cells represented by a furrow and clear line along which the membrane easily splits; confluence of the 5th and 6th longitudinal veins distant from the margin about three times the length of anterior cross-vein. Halteres with greyish-white heads and darker stalks.

Legs banded with dark and light brown, the proximal portions of each joint being of the latter colour, less distinct on the middle and anterior legs and more especially the latter, the tibiae of which have also a light-brown marking in the middle; posterior tibiae dark brown. The protarsi barely one-half as long as the whole joint, mostly light brown but for the apex, the remaining tarsal segments dark brown except for a light-brown band (sometimes indistinct) at the origin of each, but the anterior and middle tarsi vary from light to dark according to the light.

Abdomen broader than the thorax at the widest part, apically truncated, and shiny Prussian blue; the genital appendages paired, tawny, 2-jointed, and hairy.

♂. Antennae a little longer than those of the ♀ owing to the elongation of the flagellar segments; 2nd joint more or less black. Apex of palpi darker than ♀ and the hair beneath the eyes longer. Wings and legs also darker in colour. Thorax dull black and slightly shiny.

♂ and ♀. Length, 5 mm.; wing, 4 mm.

*Habitat*.—Abundant in swarms about bushes and flowers in the sunlight. Christchurch and Otago (Hutton): Christchurch, December; Manawatu, November and December (Miller): Wellington (Atkinson).

### *B. cuprea* Hutton.

*B. cuprea*, Hutton, *l.c.*, p. 6.

♀. Eyes bare, broadly dichoptic; front brilliant shiny black; antennae not slender, situated below middle line, barely half length of head-width and comparatively shorter than those of *violacea*; 2nd joint black and bristly; flagellum blackish-brown—except for the first segment, which is tawny and broader than the others—composed of 7 segments of about equal length\* covered by a dense stiff pubescence and terminating in 3 apical hairs; the ultimate segment, though short, is about twice the length of the penultimate, which bears longer hairs on the anterior margin. Occiput depressed.

Thorax humped and rounded above, brilliant bronze sometimes with a deep bluish-green sheen; scutellum coloured as dorsum, the 4 spines brownish-yellow but not large.

Legs tawny, not banded; onychotarsi black, protarsi about half the length of whole joint; posterior femora not thickened.

Wings faintly tinged with yellow, the stigma and veins yellow; anterior branch of 3rd vein arising at right angles and slightly curved to the costa (fig 17), the 1st section of the 3rd vein shorter than anterior cross-vein; discal cell apically acute; 3 posterior veins, but the 1st and 2nd arise from a common pedicle, the 1st and 3rd posterior cells being thus contiguous at apex of the discal cell; 3rd posterior vein distinctly separated from the 2nd basal cell; 5th and 4th vein evanescent toward their origin, the latter somewhat indistinct. Halteres tawny.

Abdomen ovate, broader than the thorax at the widest part, shiny blackish-brown. From the apical segment project a pair of short, 2-jointed appendages, the 1st joint tawny and longer than the 2nd, which is black, ovate, and terminates in long hairs.

♂. "Eyes contiguous; abdomen narrow and linear; the 2nd posterior cell petiolate" (Hutton).

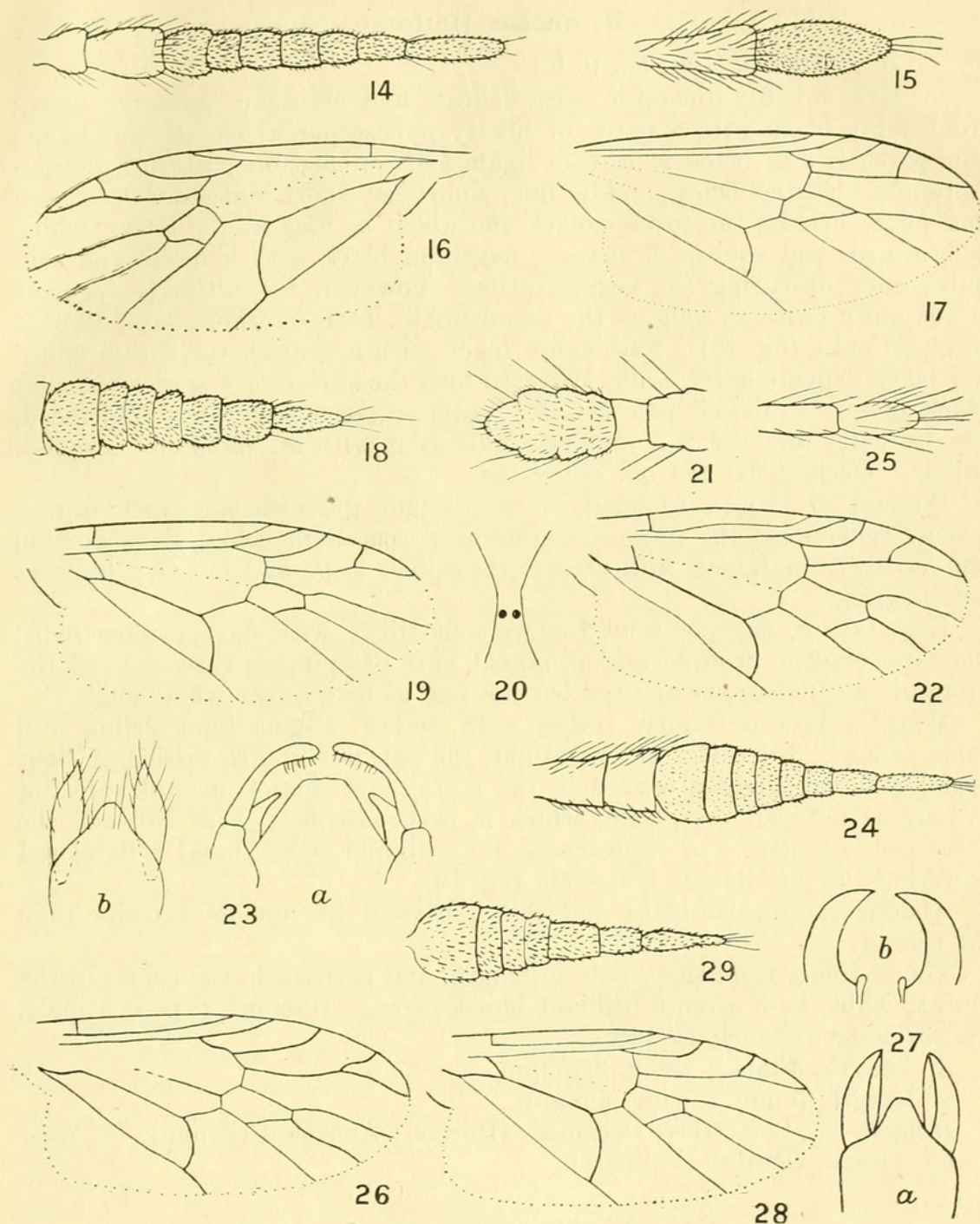
There is now no male specimen in Hutton's collection, and as I have no representatives of this species beyond Hutton's female type above described a fuller description is at present impossible.

♀. Length, 4 mm.; wing, 3 mm.

*Habitat*.—Auckland and Maketu (Broun).

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\* As Hutton's type, described above, is attached to a card, the first antennal joint, face, and proboscis are not visible; and, since the wings are incumbent, the venation cannot be accurately determined without damaging the specimen.

FIG. 14.—Antenna of *B. violacea*.FIG. 15.—Palp of *B. violacea*.FIG. 16.—Wing of *B. violacea*.FIG. 17.—Wing of *B. cuprea*.FIG. 18.—Flagellum of *B. micans*.FIG. 19.—Wing of *B. micans*.FIG. 20.—Showing eye-margins of *B. saltusans* n. sp.FIG. 21.—Palp of *B. saltusans* n. sp.FIG. 22.—Wing of *B. saltusans* n. sp.FIG. 23.—Genitalia of *B. saltusans* n. sp.FIG. 24.—Antenna of *B. caliginosa* n. sp.FIG. 25.—Palp of *B. caliginosa* n. sp.FIG. 26.—Wing of *B. caliginosa* n. sp.FIG. 27.—Genital appendages of *B. caliginosa* n. sp.FIG. 28.—Wing of *B. lacuans* n. sp.FIG. 29.—Flagellum of *B. refugians* n. sp.

**B. micans** Hutton.

*B. micans* Hutton, *ib.*, p. 6.

♀. Eyes broadly dichoptic, with delicate and indistinct scattered hairs; front shiny black with a patch of silvery pubescence above the antennae; this patch is dull black in certain lights and notched on posterior margin. Antennae situated below middle line, somewhat short and stout; 1st and 2nd joints bristly, the former black and about as long as the latter, which is brownish and square in shape; flagellum black with a dense and stiff pubescence obscuring the segmentation—however, the ultimate segment is not quite twice as long as the penultimate, both of which have distinct terminal hairs (fig. 18). Face shiny black with a greyish tomentum and a few black delicate hairs, while scattered over the surface are several circular black spots. Proboscis pale tawny; palpi testaceous or tawny, 2-jointed, the 1st hairy and the 2nd minutely pubescent with an indistinct terminal bristle. Occiput flat but not depressed.

Dorsum of thorax rounded, of a brilliant greenish-blue with darker bronzy reflections, the humeri testaceous; scutellum coloured as dorsum but narrowly margined with tawny, the spines large and tawny; halteres pale tawny.

Legs tawny, the posterior femora and tibiae with darker reflections; the tarsi (except protarsi and proximal part of epitarsi) fuscous; all the protarsi longer than the epitarsi but not half as long as the whole joint.

Wings yellow or faintly tinged with yellow, stigma light yellow and veins yellow; 3rd vein almost straight, the anterior branch arising at right angles and but slightly curved to the costa; 1st section of 3rd vein not as long as anterior cross-vein, which is perpendicular; vein between the basal cells obsolete and represented by a limpid line; basal cells closed posteriorly by an oblique cross-vein (fig. 19).

Abdomen brownish-black and shiny, beyond the middle broader than the thorax.

The ♂ differs from the ♀ only in length, and perhaps in the colour of the thorax, which is of a more brilliant bluish-green. Hutton's type is a male, the antennae of which are lost.

♂. Length, 4 mm.; wing, 3.75 mm.

♀. Length, 5 mm.; wing, 4.5 mm.

*Habitat*.—♂, Colac Bay, December (Howes); Auckland (Broun). ♀, West Plains, Otago, October (Philpott).

**B. saltusans** n. sp.

♂. Black. Head black; eyes distinctly hairy, dichoptic, the margins angulated just above the antennae (fig. 20); front slightly narrowing toward the antennae, shiny black, and distinctly hairy. Antennae blackish-brown, situated below middle line and, if anything, a little longer than half the width of head; 1st joint elongated, the 2nd about two-thirds as long as the 1st, and both bristly on the upper side; all but the first 2 segments of flagellum missing; 1st segment nearly as long as 2nd antennal joint but broader, the 2nd segment shorter, and both distinctly hairy. Face dull black with distinct brownish hairs except beneath the antennae where it is bare and shiny black; oral margin shiny bluish-black; proboscis brownish; palpi 2-jointed and blackish-brown, and both presenting a peculiar segmented appearance; 1st joint bristly, the sides notched (fig. 21), from which notches arise long bristle-like hairs; 2nd joint more or less clavate, apparently

divided into 5 segments from the anterior corners of which (except of the 1st) arise bristle-like hairs; the 1st of these segments is bare and brown in colour, the remainder having a vestiture of dense light-brown pile, the apical terminating in a pair of indistinct and short brown bristles. Posterior orbits broad, black, and hairy; occiput shiny black and flat.

Dorsum and scutellum shiny black with a covering of greyish hairs; scutellar spines black, short, and indistinct; pleurae brownish and slightly hairy; halteres brownish.

Wings shorter and blunter than preceding species, clouded with brown, but darker anteriorly than posteriorly with clear intercellular spaces; stigma darker brown but a clear space separating the pigment from the 2nd vein; veins brown; all the veins on posterior half excepting the 5th longitudinal weaker than those on anterior half; subcostal cell more or less clear except for a cloud along auxiliary vein as far as bend at apex; a clear space at the anterior apical corner of 1st basal cell, the colour also being separated from the 1st vein; in the 2nd basal cell is a more or less clear space apically, while these two basal cells are separated by a clear line, the vein being here obsolete; clearer spaces at apex of anal cell, in discal cell, in the posterior cells (that of the 1st posterior cell being in the form of a median line), and in the 1st submarginal cell at the costa. Costa curved outwards along costal cell, which is thus somewhat widened; auxiliary vein sinuated, 1st section of 3rd vein about twice as long as anterior cross-vein; 3rd vein slightly down-curved along posterior branch; the anterior branch arising at right angles and strongly curved to the costa (fig. 22); apex of discal cell slightly beyond the line of end of 2nd longitudinal vein; the 1st, 3rd (except anterior branch), 5th, and 6th longitudinal veins distinctly bristly.

Legs hairy, slightly stouter than in preceding species; femora and tibiae dark brown, their tarsi brown except proximal portions of protarsi and epitarsi which are greyish-brown; protarsi not quite half as long as the whole joint; posterior femora, tibiae, and protarsi perceptibly thickened; middle and anterior legs more hairy than the posterior, and the lighter portions of the tarsi of these legs somewhat darker than the posterior.

Abdomen ovate, composed of 7 segments, broader than the thorax, apically truncated, and brown in colour. Genitalia (fig. 23) more or less withdrawn; composed of an outer pair of 2-jointed, hairy, claw-like styles (*a*), while toward the base of each on the inner side is a small pointed and bare chitinous structure; between these outer claws is a pair of shorter, flat, and pointed hairy structures arising from a dome-shaped piece (*b*). The genitalia were damaged when mounting, so that a fuller account cannot be given.

♂. Length, 4 mm.; wing, 4 mm.

*Habitat*.—Wallacetown, October. Captured in the bush by Mr. A. Philpott.

The chief characters which separate *saltusans* from the preceding species are the angulated eye-margin, hairy flagellum, and hairy legs, the 4 bristly veins, and the position of the apex of the discal cell beyond the end of the 2nd longitudinal vein. Doubtless it will have to be placed in another genus.

#### *B. caliginosa* n. sp.

♂. Eyes distinctly hairy, not broadly dichoptic; front shiny black and distinctly hairy; antennae blackish-brown, about the length of the width of one eye and situated on the middle line; 1st joint not much longer

than the 2nd, both bristly above and below (fig. 24); flagellum clavate, distinctly 8-segmented, minutely pubescent, and terminating in short hairs; face with a dense and brownish tomentum, covered with long black hairs except on the lower part, there being only a few very short ones at the epistome; proboscis and palpi tawny, the latter projecting beyond the former; 1st palpal joint longer than the 2nd (fig. 25), both bearing long and stiff bristle-like hairs; posterior orbits not broad, of about equal width throughout, and with long black hairs below; there are distinct postorbital bristle-like hairs; occiput black, depressed, and hairy.

Dorsum of thorax violet-black, slightly shiny with short and delicate greyish hairs; pleurae black, shiny, and hairy; scutellum bare, shiny violet, the 4 spines distinct and brown; halteres pale brown.

Legs stouter than usual, indistinctly banded with brown and dark brown, the latter colour on the distal half of each joint; posterior femora club-shaped, their tibiae slightly thickened, and tarsi light brown except apex of the slightly thickened protarsi, epitarsi, and the whole of the remaining joints, which are dark brown; the tarsi of the other legs are also darker distally, but their protarsi are not so light in colour as the posterior; all the protarsi are barely half the length of the whole joint.

Wings faintly tinged with brown; veins brown, the auxiliary vein paler; the stigma brown but the pigment separated from the 1st longitudinal vein; 1st section of 2nd longitudinal vein—that is, the part between the origin and the origin of the 3rd vein—sinuated and about twice the length of the anterior cross-vein; 1st section of 3rd vein shorter a little than the anterior cross-vein, which is more or less anteriorly oblique; 3rd vein distinctly sinuated, the anterior branch forming an acute angle and strongly sinuated; apex of discal cell behind the line of end of second vein; vein separating the two basal cells obsolete only along proximal half; 1st, 3rd (except anterior branch), 5th, and 6th longitudinal veins bristly (fig. 26).

Abdomen brown (except the 1st segment, which is black) and darker at the sides, with 7 segments, about as wide as the thorax, not apically truncated but more or less pointed, and terminating in the tawny genital organs (fig. 27, *a* and *b*). The apical segment, slightly down-turned and projecting backward, is a pair of short hairy boat-shaped appendages separated by a cone-shaped structure (*a*), beneath which is a pair of strong inner claws (*b*), and outside these long claw-like bristles.

♂. Length, 6 mm.; wing, 5 mm.

*Habitat*.—Dunedin, November (Howes).

### *B. lacuans* n. sp.

♂ (?). Eyes minutely hairy and dichoptic; front shiny bluish-black, with a few delicate hairs and a patch of silvery tomentum just above the antennae; this tomentum is darker in certain lights and notched along posterior margin; antennae situated about the middle line of head or perhaps a little below, not elongate, not as long as width of an eye, blackish-brown, the base of the flagellum dark testaceous; 1st and 2nd joints short, of about equal length, and bristly; flagellum with a dense pubescence, 7-segmented, the 1st broad, the ultimate about twice as long as the penultimate and terminating in a tuft of hairs. Face black, thinly hairy and with a delicate greyish tomentum; proboscis pale yellow; palpi tawny, pubescent, and 2-jointed, projecting beyond the proboscis; 1st joint hairy, lighter in colour than the 2nd, which is fusiform and terminates in a pair of

black stiff hairs. The arrangement of the vestiture of both palpal joints gives an indistinct segmented appearance; in the 2nd joint there appears to be 7 such segments, the 1st distinct and forming a neck. Occiput depressed and indistinctly hairy; posterior orbits much narrowed above but slightly widened below, with long hairs at lower end and beneath the eyes; posterior orbital hairs present, short and bristle-like—a character of all the species described in this genus.

Dorsum brilliant bluish-green, the humeri and post-alar calli tawny; pleurae shiny blackish-brown with a tuft of greyish hairs below the humeri; scutellum brilliant bluish-green margined with tawny, the 4 spines large and tawny.

Anterior and middle legs tawny with darker markings on femora and tibiae, metatarsi and onychotarsi fuscous, protarsi about half as long as the whole joint. The posterior legs, halteres, and abdomen lost.

Wings clear but for the dark-brown stigma and a broad transverse median brown cloud; veins dark brown; auxiliary vein not sinuated (fig. 28); 1st section of 3rd vein, if anything, a little longer than the anterior cross-vein; anterior branch of 3rd vein arising at right angles and slightly curved forward to the costa, the posterior branch almost straight; anterior cross-vein nearly perpendicular. Apex of discal cell posterior to line of end of 2nd longitudinal, which runs almost straight from the 1st vein before turning up to the costa; vein between the basal cells obsolete and represented by a clear line and furrow; an oblique vein closing the basal cells behind.

Length of wing, 5 mm.

This type, though incomplete, is quite distinct from the other species.

*Habitat*.—Wallacetown, January (Philpott).

#### *B. refugians* n. sp.

♀. Eyes bare, moderately dichoptic; front narrow and greyish-yellow, due to a dense tomentum; ocellar triangle blackish-brown; antennae situated about middle line of head, blackish-brown with a testaceous band in the middle, in length about half the width of head; 1st and 2nd joints bristly, the former slightly elongated, the latter shorter and basin-shaped; flagellum (fig. 29) pubescent, clavate, and composed of 7 segments, the first 4 testaceous and semi-diaphanous, the remainder blackish-brown; the ultimate segment terminates in distinct hairs.

Face with a silvery tomentum darker in certain lights, a few scattered yellow hairs and a dark spot beneath the antennae; there are also a few longer yellow hairs beneath the eyes; proboscis and palpi a delicate pale yellow, the former with yellow hairs; palpi not reaching in front of proboscis, 2-jointed; the 1st densely pubescent with longer yellow hairs and a slightly darker reflection, the 2nd about as long as the 1st, minutely pubescent, fusiform, and ending in a distinct blackish-brown bristle; oral margin shiny blackish-brown with an anterior tubercle. Posterior orbits pubescent, narrowed toward the vertex, and with a tuft of long hairs below; posterior orbital hairs distinct; occiput depressed at the vertex, but slightly convex below, and of a greenish-yellow colour.

Thorax comparatively small considering the abdomen, shiny and bare but for a minute and scattered tomentum on the dorsum; humeri pale green with a dark mark beneath; dorsum tawny with darker reflections, the margins of the transverse suture and the anterior margin between the

humeri blackish-brown ; in certain lights may be seen 2 lighter longitudinal stripes anterior to the transverse suture, while posterior to it are 2 black stripes, the edges of the dorsum also being here margined with black ; those 4 stripes posterior to the suture do not extend to the scutellar suture ; pleurae pale yellowish-green with brownish markings on the pteropleurae and mesopleurae ; the lower half of the pteropleurae and sternopleurae dark brown ; metapleurae hairy ; scutellum apple-green with a darker brownish base, the spines short and pale yellow ; halteres dark tawny.

Legs tawny but paler than the coxae ; tarsi fuscous from the apex of the epitarsi to the onychotarsi (inclusive) ; in certain lights the posterior protarsi with a darker mark at the apex ; posterior tibiae with a darker tawny colour above ; posterior femora slightly thickened ; the protarsi of all legs a little more than half the length of the whole joint.

Wings very faintly tinted with yellow ; stigma pale yellow ; veins brownish-yellow ; auxiliary vein not sinuated ; 1st section of 2nd vein about three times the length of the anterior cross-vein and almost parallel to the costa ; 1st section of 3rd vein shorter than anterior cross-vein, the 2nd section slightly sinuated to the bifurcation, the anterior branch arising at a slightly acute angle and distinctly curved forward to the costa, the posterior branch curved downward and forming an obtuse angle with the 2nd section ; apex of discal cell distinctly posterior to apex of 2nd vein ; anterior cross-vein anteriorly oblique ; vein separating the basal cells present ; both basal cells closed toward the base, the 2nd of those cells being considerably narrower than the 1st.

Abdomen covered with delicate minute and bristle-like hairs, fusiform, about twice as long as the thorax and distinctly broader, composed of 7 segments, the apex upturned and bearing the 2 styli-form appendages ; the whole tawny but semi-diaphanous on basal half, while at the base is a blackish spot ; each segment except the 1st and 6th margined posteriorly with blackish-brown, which on the 2nd, 3rd, and 4th segments extends to and along the lateral margins in the form of a triangular spot ; in the middle, at the anterior margin of the 4th segment is a circular black spot ; on the 5th the black margin hardly extends to the posterior corners, on the 6th it is confined more or less to the centre of the posterior margin, while on the apical segment it forms a broader and wider marking. The 1st joint of the styli-form appendages is tawny, hairy, and equal in length to the 2nd, which is elongate, fusiform, and tawny on proximal half but black distally, carrying long hairs. The apical segment of the abdomen is hairy.

♀. Length, 6 mm. ; wing, 5.75 mm.

*Habitat*.—Dunedin, in the bush, January (Miller) ; Ranfurly, February (Howes).



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