

# ACALYPTERATE DIPTERA

OF

NEW ZEALAND

*by*

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# ACALYPTERATE DIPTERA OF NEW ZEALAND

## *Introduction*

Knowledge of New Zealand flies is far from complete, and will be so for many years. Species already known number about two thousand, and many more await discovery. Of the described species, many are known from one or few specimens, adequate information on distribution is lacking, and, as in other groups, the older descriptions are often so brief that the species cannot be recognised. However, enough is now known of the New Zealand Diptera fauna to give some indication of its peculiarities and affinities, and of its important gaps. New Zealand Diptera lacks any major text and the literature is scattered in New Zealand and overseas journals. Thus collection of literature is one of the major hurdles at the early stages of any research work on New Zealand flies. It now seems desirable to consolidate this information so that we may the better assess the extent of our knowledge and the most profitable avenues of future research.

This study is an attempt at such consolidation for one section of the New Zealand Diptera, the Acalypterae. These flies have received less attention than any other section of the New Zealand Diptera, for without doubt the tendency with many collectors has been to ignore specimens of this group. This is for two reasons: first, the majority of these flies are small and are often regarded as being difficult to handle and preserve; hence, most are discarded if captured, and many undoubtedly escape through normal net material. Secondly, identification of these flies has always been regarded as relatively difficult, especially at the family level.

All previously known species are re-described. For some of the more recently described species, original descriptions are adequate, but, for the sake of uniformity, these species are again described in this text. The majority of original descriptions, however, are basically descriptions of the colouration of the species, and, as such, have proved inadequate for recognition of the species.

Holotypes have been available for all but a few indigenous species. However, in three species, a search through all likely collections has failed to locate either holotypes or paratypes, and these must be regarded as lost. For twenty species, holotypes exist but have not been seen by the writer. Specimens have, however, been compared with holotypes by competent authorities in the institutions which house the types.

If this work serves no other purpose than to quicken interest in New Zealand Diptera, and in acalypterates in particular, its preparation will have been worthwhile. The major need is a many-fold increase in the number of specimens in collections, for it is only when collections from each major population within the range of each species are avail-

able that the taxonomist can hope to arrive at a final understanding of the group he is studying.

An examination of the locality records for most species in this text will make it apparent that the distribution of the majority of species is insufficiently known to determine the course of evolution of the group in New Zealand.

## HISTORICAL

The first two endemic New Zealand acalypterate Diptera were described by Walker (1849) from material lodged in the British Museum.

Schiner (1868) described material collected during the voyage of the *Novara* and recorded two Sapromyzidae from New Zealand. Because of the generally recognised doubt concerning the validity of the localities of the *Novara* material (e.g. Miller, 1950 p. 138), and because the two species concerned have not been captured in New Zealand since the voyage, the records must be considered doubtful and are omitted from this work.

Hutton (1881) described two acalypterates together with many other Diptera. One of his species was the well-known large sciomyzid previously described by Walker (1849) and now known as *Neolimnia sigma* (Walker). Later Hutton published a series of papers (Hutton, 1901, 1902a, b, 1904a) which are the foundation works for New Zealand acalypterates. Hutton (1904b) lists the total species known. By the end of 1904, 41 species had been described.

Mik (1881) added one species to the known fauna.

Lamb (1909) described an important collection of Diptera from the several subantarctic islands of New Zealand and added six species to the known acalypterate fauna.

Miller (1921) added one species.

Watt (1923, 1924) described many agromyzids and gave very full notes on immature stages, mines, host plants and habits of the species.

Malloch (1922) described two species and revised two genera.

Tonnoir and Malloch (1926a) began the most important series of papers yet published on New Zealand acalypterates. Together they, or Malloch by himself, described many species and added 115 species as endemic or introduced forms in the following series of papers: Tonnoir and Malloch (1926a, b, 1927, 1928); Malloch (1925, 1930a, b, c, d, 1931 a, b, 1933a, b, c, 1935).

During the period when Tonnoir and Malloch were publishing, only minor additions were made by other authors; Womersley (1937) made the most important contribution when he recorded seven species, three of them new, from Macquarie Island, an island normally regarded as belonging to the New Zealand subregion; Enderlein (1930) added one species; Hendel (1937) added another in an important paper discussing Diptera of the subantarctic islands; Cresson (1935) described a new ephydrid; Salmon (1937, 1939) described one ephydrid and one chloropid; Kelsey (1937) and Morrison (1938) gave notes on the biology of some agromyzids. †

Records of the occurrence of introduced species have been made by Broun (1905), Cottier (1933), Harrison (1952, 1953a), and Mugeridge (1933).

Apart from nomenclatural changes noted by Miller (1945) and Salmon (1950) no work was published on acalypterates, from 1940 to 1951.

Dumbleton (1953) gave notes on asteiid species.

Harrison (1952, 1953a, b, 1955) described and recorded several species from the mainland and the subantarctic islands.

Sabrosky (1955) described one further chloropid.

Miller (1950) published a complete catalogue of New Zealand Diptera which, at the same time as consolidating the records of New Zealand species, has been and will continue to be of invaluable assistance to dipterists. That catalogue lists 174 species of acalypterate Diptera. In this study, 233 species are considered, including 37 new species and 17 immigrant species, which are recorded from New Zealand for the first time.

### COLLECTION AND PRESERVATION

*Collection:* The majority of acalypterates are too small or inconspicuous to be specially hunted for and collections are best obtained by general sweeping with a net. With experience, the various families or genera or even species may be recognised in the net by their shape and particularly by their behaviour within the net, but it is usually advisable to retain all specimens until a preliminary sorting can take place.

The most satisfactory net for collecting acalypterates is of jappara, nylon, or some soft very finely meshed material. It should be pointed at its apex so that the small insects can be concentrated readily to a small space and transferred to a killing bottle with ease and without fear of damaging them.

Some families of acalypterates are only rarely taken in nets and can be more satisfactorily collected by means other than sweeping.

The Drosophilidae are rarely taken in the sweep net unless collecting is carried out in specialised habitats such as rubbish dumps, fruit stores, or similar localities. Traps are the most profitable means of obtaining these flies. Many traps and baits have been used, and the most successful types are those described by Demerec (1950). A type used successfully in Auckland for several years is a half-pint milk bottle with a plastic-gauze funnel. The trap is baited with yeasted banana, prepared by mincing ripe or over-ripe bananas, adding live yeast and allowing fermentation to take place. Such bait is best for use when about two to five days old.

It is often desirable to culture drosophilid flies in order to obtain immature stages and to have fresh material for dissection of those internal organs that are used as diagnostic characters.

Half-pint milk bottles or vials, 1 in. x 3 in., are convenient culture vessels and a suitable medium is:

Rolled oats	.. .. .	110 g.
Molasses	.. .. .	30 g.
Yeast (baker's)	.. .. .	15 g.
Agar agar	.. .. .	13.5 g.
Water	.. .. .	750 cc.
Moldex (a mould preventive)	.. .. .	0.5 g.



These ingredients are boiled for about five minutes and the medium poured while hot into the culture bottles. Gravid females are placed in cultures, which have a paper strip on which adults can rest. Satisfactory cultures can be obtained at room temperature, but, for experimental work, accurate temperature control is essential. Methods of breeding are described fully by Demerec (1950).

Adult flies of the Agromyzidae are frequently taken in the sweep net. However, valuable information concerning immature stages and host plants can be obtained by collecting mined plants and breeding adults from the mines.

*Preservation.* All acalypterate Diptera should be pinned, and all but the larger specimens should be double mounted either gummed on card points or impaled on stainless steel micro-pins. Single-mounted flies should be pinned through the lateral region of the mesonotum or dorsal pleura and never at the mid dorsal line, as this destroys the important acrostichal and dorsocentral bristles. Flies mounted on card should be stuck on the apex of the triangle in such a manner that the whole dorsal surface and at least one complete lateral surface are untouched and readily visible. Those mounted on micro-pins in double mounts should be pierced with the micro-pin from the ventral-lateral region of the thorax. With freshly killed specimens the micro-pin need not pass right through the body but with old specimens that have been relaxed for mounting it is advisable to do so in order to secure the specimen more firmly.

For taxonomic work, flies need not be set, but it is often an advantage to have legs unfolded and spread away from the body, for then examination of structures is easier.

Male genitalia can rarely be examined *in situ* and need to be dissected from the abdomen. For preparation of genitalia, the terminal abdominal segments are detached, boiled in 10 per cent caustic soda or caustic potash solution for five to ten minutes according to size and then washed thoroughly in water. Genital structures are then dissected out and mounted. Permanent mounts are best made in balsam, but semi-permanent mounts can be quickly prepared by mounting in glycerine jelly. It is essential that prepared genitalia be referable to the specimens from which they were obtained. This can be done by cataloguing specimens and microscope slides on which genitalia are mounted, or by mounting genitalia on celluloid squares and attaching them to the pin holding the specimen.

#### LOCATION OF TYPES AND SPECIMENS

Locations are given in abbreviated form in brackets as the last entry to the data given for the holotype or specimens examined and given as new records.

Two locations are given in some cases because many of Malloch and Tonnoir's and Malloch's types are at the time of writing in the United States National Museum prior to being distributed to the institution where the authors intended them to be finally deposited. The second abbreviation given indicates the final repository.

The abbreviations used are as follows:

Ak. Mus.	Auckland Museum, Auckland
B.M.	British Museum (Natural History), London
Cant. Mus.	Canterbury Museum, Christchurch
Cawt. Inst.	Cawthron Institute, Nelson
D.E.I.	Deutsches Entomologisches Museum, Berlin
Dom. Mus.	Dominion Museum, Wellington
O.U.	Otago University, Dunedin
P.D.D.	Plant Diseases Division, Auckland
S.A.M.	South Australian Museum, Adelaide, Australia
S.P.H.T.M.	School of Public Health and Tropical Medicine, University of Sydney, Sydney, Australia
U.S.N.M.	United States National Museum, Washington, D.C., U.S.A.

## *Systematics*

### KEY TO SUBORDERS, SERIES, AND SECTIONS OF THE ORDER DIPTERA

- 1 Antennae usually of 6 or more segments. Palpi long, of 4 to 6 segments. Anal cell open and rarely narrowed towards wing margin .....Suborder **NEMATOCERA**  
 Antennae with less than 6 segments and bearing a terminal or basal arista. Palpi never of more than 2 segments, usually 1, and sometimes absent. Anal cell closed or distinctly narrowed towards wing margin ..... 2
  - 2 Frontal lunule and ptilinal suture absent  
     Suborder **BRACHYCERA-ORTHORRHAPHA**  
     and Suborder **BRACHYCERA-CYCLORRHAPHA**, Series **ASCHIZA**\*  
 Frontal lunule and ptilinal suture present  
     Suborder **BRACHYCERA-CYCLORRHAPHA**,  
     Series **SCHIZOPHORA** 3
  - 3 Leathery or horny flies. Parasitic on warm-blooded animals. Wings often reduced or absent. Legs and claws modified for clinging to hair and skin of hosts. Head closely joined to thorax and falling into an excavation in dorsal thorax ..... Section **PUPIPARA**  
 Normal flies ..... 4
  - 4 Second antennal segment with a longitudinal seam or cleft on outer dorsal surface and extending whole length of segment. Transverse suture of mesonotum complete or evident almost to centre of mesonotum. Squamae usually large and concealing halteres. Posterior calli of mesonotum present and distinguished by a depression extending from posterior of wing base to base of scutellum .....Section **CALYPTERAE**  
 Second antennal segment without well developed dorsal seam or cleft. Transverse suture of mesonotum not evident centrally. Squamae usually vestigial and not concealing halteres. Posterior calli of mesonotum not differentiated .....Section **ACALYPTERAE**
- \*The method of emergence from larval and pupal skins separates Brachycera-Orthorrhapha from Brachycera-Cyclorrhapha, but the grouping indicated here is used because of its great convenience for separating adults.

### Section **ACALYPTERAE**

Usually small flies, 2–5 mm. long but ranging from 1.5 to about 16 mm. Wing length usually the same as body length. Arista arising near base of dorsal surface of 3rd segment of antenna, occasionally from a preapical position or absent; composed of 2 small basal segments and a long 3rd apical; bare, faintly or strongly pubescent, plumose or pectinate. Antenna of 3 segments; usually decumbent, sometimes porrect; 3rd segment shorter, equal or several times length of 2nd segment, reniform, circular, spherical, or elongate rod shaped, usually covered with dense short pile; 2nd segment usually with 1 or more strong dorsal hairs or bristles, distinct row of hairs about apical margin, those at ventral region stronger than lateral ones and other hairs on rest of dorsal and lateral surfaces; basal segment usually minute and less than length of 2nd segment, bare or with dorsal apical hairs, only occasionally stronger than hairs on 2nd segment. Ptilinal suture

usually distinct, extending down face and separating the parafacial plates; frontal lunule small but distinct and in some families large and extending nearly half distance from antennae to vertex. Frontal orbits distinct, particularly so when strong fronto-orbital bristles are present; ocellar triangle usually differentiated, large and distinct in some families; ocellar area often distinctly raised above level of front; 3 ocelli present, only occasionally absent; front at vertex, wide, usually half or more of width of head; vertex sharply ridged or gently curved onto occiput; front usually same width in both sexes, sides parallel or converging anteriorly. Ocellars present or absent, erect or proclinate, cruciate or divergent; postverticals either present, or absent, and cruciate, convergent, parallel, or divergent; 2 pairs of verticals usually present, inner pair convergent, outer pair divergent and posterior to inner pair; fronto-orbitals present or absent, proclinate, reclinate, directed mesad or outwardly over eyes; frontals present in some families and usually convergent; hairs usually present between and posterior to ocelli, on frontal orbits and on front anterior to ocellar triangle; occasionally strong hairs or bristles posterior to vertex in addition to the normal postvertical pair. Face narrow or wide with parallel or divergent sides, vertical in profile or strongly produced and convex or deeply concave; usually evenly chitinised but occasionally with membranous area in centre; usually bare but sometimes thickly covered with hairs and bristles. Cheeks ranging from linear to about equal to vertical diameter of eye; composed of the extension ventrally and posteriorly of the parafacials which form the gena or plate bordering the eye and the bucca or ventral portion of the cheek; the occiput may be produced anteriorly between these two plates and so reduce the bucca; the central region of the face extends posteriorly beneath the bucca forming the oral margin and may be visible laterally, ventral to the bucca; vibrissal angle present or absent and sometimes distinctly prominent. Vibrissa present or absent; 2nd oral sometimes differentiated from other cheek hairs and bristles; hairs strong or weak or absent on all cheek except dorsal gena; bristles at lower posterior angle of cheek present or absent. Occiput convex to deeply concave. Postocular hairs in distinct rows on dorsal and lateral margin of occiput. Eyes bare or haired. Proboscis usually not specially modified; sometimes elongate and geniculate; palpi present, rarely absent or modified. Clypeus hidden or strongly produced anterior to epistoma.

Mesonotum usually strongly convex; transverse suture incomplete; humerus normally prominent; posterior callus not differentiated. Scutellum normally semicircular but occasionally very short, much wider than long or produced and large and about half length of mesonotum; dorsal surface flat or convex; postscutellum rarely prominent. Propodeum normally separated from prosternum by a weakly chitinised membrane. Acrostichal hairs present or absent and arranged in longitudinal rows from 2 to about 20 rows between the dorsocentrals posterior to transverse suture; acrostichal bristles present or absent, if present, the prescutellar pair usually present, anterior bristles occur less frequently; 0 to 4 postsutural and 0 to 3 presutural dorsocentrals; apical scutellars cruciate, convergent, parallel, or divergent; lateral scutellars usually present and near base of scutellum; scutellum haired or bare on dorsal surface and occasionally some hairs ventral to apex;

0 to 3 humerals; 0 to 1 presutural; 1 to 3 notopleurals; 1 to 2 supraalar; 0 to 1 interalar; 0 to 2 postalar; 0 to 1 mesopleural with occasionally extra short bristles; 0 to 3 sternopleurals; 0 to 1 propleural bristle, or hairs on propleuron present or absent; pteropleuron usually bare; hypopleuron usually bare; mesopleuron, sternopleuron and prosternum haired or bare.

Legs rarely extensively modified. Tibiae with or without preapical and apical spines. Empodia always linear.

Wings normal, reduced, or absent; with normal 5 longitudinal veins and an anal vein. Costa ending at apex of 3rd or 4th veins; costa broken or weakened or not weakened near humeral cross vein and at apex of subcostal vein; spines of costa several times diameter or less than diameter of costa, small black costal spines usually extending to between apices of 2nd and 3rd veins; subcosta entire, and free from 1st vein and ending in costa distinctly separate from apex of 1st vein, or fused with 1st vein at apex, or vestigial, or only traceable to costa as a faint fold in membrane, or strong basally and right angled near apex and almost unpigmented on this apical portion; 1st vein always short and ending in costa in basal half of wing; 2nd vein short in Asteiidae but long in other families; 3rd and 4th veins ending near wing apex; 5th vein either reaching wing margin or fading out before wing margin; anal vein absent, reduced to small stump vein, reaching wing margin or fading out before wing margin; axillary vein usually absent or represented by fold in membrane; anterior and posterior cross veins present or absent; cross vein separating discal and 2nd basal cell present or absent or partly present; additional cross veins sometimes between longitudinal veins; stump veins sometimes arising from longitudinal veins. Membrane clear, cloudy, or pigmented on small or large areas.

Halteres present, rarely modified.

Abdomen of 6 large visible tergites and 5 sternites in males and 6 to 8 visible segments in females. External male genitalia consisting of a genital arch formed of the 9th tergite, a pair of anal plates formed from the 10th tergite, and claspers associated with the genital arch and formed from the 9th segment. Penis short or very long and coiled; parameres minute or large. Female ovipositor simple, bordered by 2 ovipositor plates or modified into a telescopic structure enclosed in a sheath.

Acalypterate flies can be readily recognised and separated from other Diptera by the three-segmented antenna bearing an arista and having the 2nd segment without a dorsal seam; the presence of lunule and distinct ptilinal suture; the reduced squamae; the absence of the transverse suture in the middle of the mesonotum; and the usually sparse bristling of head and thorax. The antennal structure, suture, and squamae are the best characters to use for separation from the calypterates, and the presence of a lunule and ptilinal suture is the surest way of separating from the Aschiza and Brachycera-Orthorrhapha.

#### KEY TO FAMILIES OF ACALYPTERAE IN NEW ZEALAND

- |   |  |   |
|---|--|---|
| 1 | Subcosta curved forward at nearly a right angle and weakened beyond bend ..... | 2 |
|   | Subcosta not sharply angled and weakened .....                                 | 3 |

2	Postverticals convergent	TRYPETIDAE (p. 179)	
	Postverticals divergent or absent	PSILIDAE (p. 174)	
3	Basal segment of hind tarsus short and incrassate	SPHAEROCERIDAE (p. 252)	
	Basal segment of hind tarsus normal		4
4	Arista absent	CRYPTOCHAETIDAE (p. 328)	
	Arista present		5
5	Wings with anal lobe and alula reduced or absent, cross veins very close together and close to base of wing	OPOMYZIDAE (p. 213)	
	Wings normal, anal lobe and alula usually well developed; if lobe and alula reduced, cross veins well separated		6
6	Subcosta complete and ending in costa and widely separated from apex of 1st vein		7
	Subcosta vestigial or complete but fused to 1st vein for most of its length or fused with 1st vein at apex		13
7	Palpi vestigial	SEPSIDAE (p. 169)	
	Palpi normal		8
8	Postverticals convergent		9
	Postverticals parallel or divergent		11
9	Mesonotum and scutellum flattened, legs and abdomen conspicuously bristly; anal vein reaching wing margin faintly; apical tarsal segments triangular and enlarged	COELOPIDAE (p. 93)	
	Mesonotum and scutellum not flattened; legs and abdomen not bristly; anal vein incomplete and never reaching wing margin; apical tarsal segments not enlarged		10
10	Vibrissa absent	SAPROMYZIDAE (p. 10)	
	Vibrissa present	HELOMYZIDAE (part) (p. 110)	
11	Prosternum and propleuron fused as one continuous heavily chitinised plate	HELCOMYZIDAE (p. 90)	
	Prosternum and propleuron distinctly separated by membrane		12
12	Tibiae without preapical dorsal bristles	OTITIDAE (p. 175)	
	All or some tibiae with preapical dorsal bristles	SCIOMYZIDAE (p. 36)	
13	Vibrissa absent or very weak		14
	Strong vibrissa present		16
14	Postverticals divergent		15
	Postverticals convergent	CHLOROPIDAE (p. 336)	
15	Glossy flies; 2nd basal and discal cells separated by a cross vein	PALLOPTERIDAE (p. 198)	
	Not glossy flies; 2nd basal and discal cells united	EPHYDRIDAE (p. 215)	
16	Anterior fronto-orbitals convergent		17
	No convergent fronto-orbitals		18
17	Postverticals divergent	AGROMYZIDAE (p. 305)	
	Postverticals convergent or parallel	MILICHIIDAE (p. 329)	
18	Second vein very short and ending very close to 1st vein	ASTEIIDAE (p. 279)	
	Second vein not short and ending close to 1st vein		19
19	Subcosta very short and vestigial, not continued to costa	DROSOPHILIDAE (p. 283)	
	Subcosta not vestigial, fused with 1st vein at apex or on most of its length		20
20	Postverticals divergent and weak; shining black species	PIOPHILIDAE (p. 171)	
	Postverticals convergent or absent; not shining black species		21
21	Dull grey species; face often strongly concave; clypeus prominent	CANACEIDAE (p. 249)	
	Not dull grey species; face vertical or retreating, not concave; clypeus never distinctly prominent	HELOMYZIDAE (part) (p. 110)	

## Family SAPROMYZIDAE

Two fronto-orbital bristles; postverticals convergent\*. Vibrissa absent. At least two dorsocentrals; mesopleural and sternopleurals present. Tibiae usually with distinct preapical dorsal bristles. Subcostal vein distinct from first vein on all its length; costa extends to fourth vein; anal vein incomplete, never reaching wing margin; second basal and anal cells short.

Sapromyzidae can be recognised by the convergent postverticals, absence of vibrissa, incomplete anal vein, and complete and free subcostal vein.

### *Genera Occurring in New Zealand:*

*Poecilohetaerella* Tonnoir and Malloch

*Poecilohetaerus* Hendel

*Sapromyza* Fallén

*Trypaneoides* Tonnoir and Malloch

All four genera fit well into the recognised synopsis of the family and there is no great divergence from Northern Hemisphere forms. The genera above, except *Poecilohetaerella*, are found in other countries indicating that isolation affords no barrier for the movement and establishment of these flies.

New Zealand sapromyzids show, more than any other family in the acalypterate group of Diptera, affinities to flies of the Australian region. There is no similarity at all with the South American sapromyzid fauna. *Poecilohetaerus* occurs in New Zealand and Australia. *Trypaneoides* is found in New Zealand, Australia, Pacific islands, and the East Indies. *Sapromyza* is world wide in distribution. *Poecilohetaerella* is the only endemic genus and is the strongest genus in New Zealand. *Sapromyza*, *Trypaneoides* and possibly *Poecilohetaerus* are probably more recent additions to the fauna than is *Poecilohetaerella* and although speciation in these genera has probably occurred in New Zealand, the New Zealand fauna can be regarded as a peripheral one of the Australasian region. This interpretation indicates that flies of this family have strong powers of dispersal.

### KEY TO GENERA OF SAPROMYZIDAE IN NEW ZEALAND

- 1 Two strong mesopleurals; 4 acrostichal bristles .... *TRYPANEOIDES* (p. 10)  
One strong mesopleural; prescutellar acrostichals only ..... 2
- 2 Anterior fronto-orbitals convergent ..... 3  
Anterior fronto-orbitals directed backwards ..... *SAPROMYZA* (p. 15)
- 3 Arista white in part, face glossy and convex .. *POEILOHETAERELLA* (p. 24)  
Arista dark brown; face flat and not shining .... *POEILOHETAERUS* (p. 34)

### Genus *TRYPANEOIDES* Tonnoir and Malloch

*Trypaneoides* Tonnoir and Malloch, 1926. Rec. Cant. [N.Z.]  
Mus. 3 : 20.

Arista pubescent. Anterior fronto-orbital bristle directed backwards. One presutural and 3 postsutural acrostichal and dorsocentral bristles; 2 mesopleural bristles, 1 posterior and the other near middle of sclerite; 2 strong sternopleurals. Short stout costal spines extending to and ending abruptly at or just beyond apex of 3rd vein.

Type Species: *Trypaneoides guttata* Tonnoir and Malloch

\* *Huttonina* (Fam. Sciomyzidae) often has slightly convergent postverticals but has no mesopleural.

Readily distinguished by the two mesopleurals, four acrostichals and the costal spines reaching the apex of third vein. The type species is endemic to New Zealand and the genus was originally monobasic.

*Species Occurring in New Zealand:*

- Trypaneoides costata* sp.n.  
*T. guttata* Tonnoir and Malloch  
*T. tenuipennis* Malloch

The three New Zealand species are closely related to each other. The wing pattern varies in intensity and in position within a species to the extent that the placing, distribution and numbers of the smaller brown areas and the light areas within the large shaded areas cannot be used to separate species; only major differences in wing colouration are of specific value. The shading of the wing falls into three major areas; a basal area with most shading anteriorly about the apices of subcosta and first vein and with a small unshaded area near apex of costal cell; a middle area consisting of four prominent separate or partly fused spots on the marginal cell, heavy shading posterior to these spots as far as the posterior margin of wing, the strongest shading being about the cross veins; an apical area in the marginal, submarginal, and first and second posterior cells, with the apex of the first posterior cell clear.

The costal index is useful in separating New Zealand species, and, from an examination of descriptions of those species occurring outside the New Zealand region, it would appear that the fourth vein index may be useful in separating groups of species. The New Zealand species have a fourth vein index greater than 2.0 while such species as *T. confusa* (Solomon Is.), *T. hyalipuncta* and *T. octopunctata* (Buru) have a fourth vein index less than 2.0.

Although the type species of *Trypaneoides* is a New Zealand species, New Zealand lies on the periphery of the distribution range of the genus. The three known New Zealand species all belong to the group of species typified by *T. guttata* and it is likely that their evolution has taken place in this country. *T. guttata* and *T. costata* are most common in lowland forest areas while the only record of *tenuipennis* indicates that it is an alpine or subalpine species.

KEY TO SPECIES OF TRYPANOIDES IN NEW ZEALAND

- |   |   |                    |
|---|---|--------------------|
| 1 | All acrostichals equally strong .....   | 2                  |
|   | Presutural and anterior postsutural acrostichals much weaker than<br>posterior two bristles ..... | <i>tenuipennis</i> |
| 2 | Costal index not greater than 2.5 .....   | <i>costata</i>     |
|   | Costal index greater than 2.5 .....   | <i>guttata</i>     |

***Trypaneoides tenuipennis* Malloch. Fig. 3.**

*Trypaneoides tenuipennis* Malloch, 1930. Rec. Cant. [N.Z.]  
Mus. 3 : 244.

A grey species with extensive brown spotting particularly on abdomen, and extensive brown shading on wings. Body length about 3.0 mm., wing length about 3.0 mm.

FEMALE

HEAD: Arista brown apically, light brown basally; rays of pubescence not as wide as diameter of basal segment. Antenna yellowish-brown; 3rd segment brown except for base; 2nd segment with 1 dorsal and several ventral apical bristles and hairs on outer apical margin and on inner surface; basal segment with few short



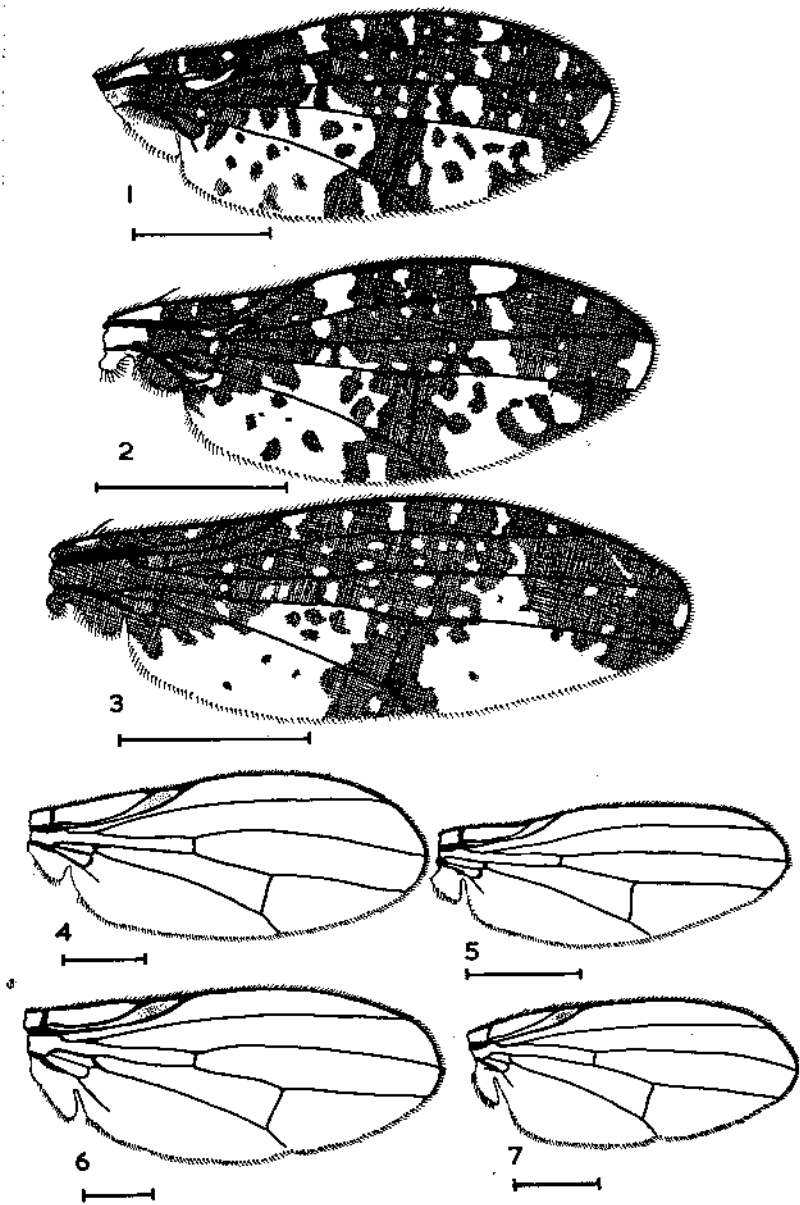


Fig. 1. Wing of *Trypaeoides guttata*  
 " 2. " " *T. costata*  
 " 3. " " *T. tenuipennis*  
 " 4. " " *Sapromyza simillima*  
 " 5. " " *S. persimillima*  
 " 6. " " *S. dichromata*  
 " 7. " " *S. neozelandica*  
 Scale: 1.0 mm.

black apical hairs. Front brownish-grey, light anteriorly, grey orbits and central stripe from ocelli anteriorly, and brown spot at base of each bristle. Two strong reclinate fronto-orbitals, anterior shorter than posterior; ocellars strong; verticals strong, outer one shorter; postverticals the smallest of frontal bristles and cruciate. Face grey dusted, with several brown areas, a dark brown spot opposite antennal insertion on parafacials, and a brown spot ventrally. Cheeks grey with brown spots, the anterior spot the most prominent. Cheeks haired except on gena; 2 bristles at lower posterior corner. Occiput grey. Eyes haired. Vertical diameter of eye about 3 times width of cheek in same axis. Proboscis brown; palpi narrow, light brown with distinct black hairs.

**THORAX:** Grey; mesonotum with brown spots at base of each bristle and strong hair, a pair of narrow brown stripes anteriorly, each one lateral to acrostichal row and not reaching anterior acrostichal bristle, and irregular brown areas about notopleural area; scutellum without brown spots; pleura with irregular brown areas. Anterior of the three postsutural acrostichals weak; basal scutellars convergent and just shorter than convergent apicals; scutellum bare; 1 humeral; 1 presutural; 2 notopleurals; 1 supraalar; 2 postalars; mesopleuron with 1 posterior, posteriorly directed bristle, 1 central, ventrally directed bristle, and a few short hairs; 2 sternopleurals, anterior shorter; propleuron with a small ventral hair; prosternum bare.

Legs light brown; femora with a brown prebasal and preapical band. Fore femur with bristles on postero-dorsal surface, a few small posterior bristles and strong bristles on postero-ventral surface; fore tibia with strong preapical and small apical; mid tibia with preapical and apical; hind femur with preapical antero-dorsal and 1 bristle at apical quarter of antero-ventral surface; hind tibia with preapical only.

Wings (Fig. 3) heavily shaded with brown. Wing indices: costal about 3.4; 4th vein about 2.5; 4c about 1.0; 5x about 0.5.

Halteres dark greyish-brown apex, and pale yellow stalk.

**ABDOMEN:** Grey with many irregular brown areas; tergites with bristles on posterior margin arising from a circular grey area.

**Holotype:** MT. COOK: -xii.1924, ♀, (*A. Philpott*), (Cant.Mus.).

**Material Examined:** Holotype.

**Distribution:** Mt. Cook (December).

**Remarks:** The weak anterior acrostichals readily separate this species from *T. guttata* and *T. costata*.

### **Trypaneoides costata** sp.n. Fig. 2

A grey and chocolate-brown species, heavily dusted; wings pictured. Body length about 2.75 mm., wing length about 2.75 mm.

#### FEMALE

**HEAD:** Arista dark brown; rays of pubescence less than diameter of basal segment. Antenna yellowish-brown; 3rd segment brown at middle; 2nd segment with 1 dorsal and about 2 strong ventral apical hairs. Front dark brown posteriorly, merging to yellowish-brown anteriorly; ocellar triangle dark brown not sharply defined; brown spot at base of fronto-orbitals. Anterior fronto-orbital about three-fifths posterior fronto-orbital; ocellars and inner verticals strong; a few minute hairs at middle of front. Face light greyish-yellow, brown spots near ventral margin and 1 median and 1 ventral spot on parafacials. Cheeks light grey merging to brown posteriorly. Hairs along cheek margin strongest posteriorly. Occiput dark brown. Eyes with few hairs. Vertical diameter of eye about 3.5 times width of cheek in same axis. Proboscis yellowish-brown; palpi with dark brown apical spot and a strong apical bristle.

**THORAX:** Heavily grey dusted; mesonotum with extensive brown areas; scutellum with brown spots at base of bristles and on disc; pleura mostly brown. All four acrostichals strong; all four dorsocentrals strong, anterior the weakest; parallel basal scutellars longer than apicals; scutellum bare; 1 small humeral; 1 strong presutural; 2 notopleurals; 1 strong supraalar; 2 strong postalars; 1 propleural; prosternum bare.

Legs yellowish-brown; coxae greyish-brown; femora with basal and preapical brown band; tibiae with brown shading at about basal third. Fore femur with bristles on postero-dorsal and postero-ventral surfaces; fore tibia with strong preapical and weak apical; mid femur with weak preapical bristle on antero-dorsal surface; mid tibia with strong preapical; hind femur with 1 median bristle and 1 at apical quarter of antero-ventral surface; hind tibia with preapical.

Wings (Fig. 2): Extensive brown shading. Costa with strong basal spine; 5th vein reaching wing margin; anal vein short. Wing indices: costal about 2.5; 4th vein about 2.7; 4c about 1.2; 5x about 0.5.

Halteres blackish-brown apex, grey base.

ABDOMEN: Heavily grey dusted, with many brown spots.

*Holotype*: LITTLE BARRIER ISLAND: 26.xi.1954, ♀, (R. A. Harrison), (P.D.D.).

*Material Examined*: Holotype.

*Remarks*: Separated from *T. guttata* and *T. tenuipennis* by having a smaller costal index. The acrostichals are equally strong and this character also separates it from *T. tenuipennis* which has small anterior acrostichals.

### **Trypaeoides guttata** Tonnoir and Malloch. Figs. 1, 10

*Trypaeoides guttata* Tonnoir and Malloch, 1926. Rec. Cant.  
[N.Z.] Mus. 3 : 20.

A light grey species with brown spots on head, thorax and abdomen, at base of hairs and bristles. Wings pictured. Body length about 3.0-3.5 mm., wing length about 3.0-3.5 mm.

#### MALE AND FEMALE

HEAD (Fig. 10): Arista brown, basal third yellowish-brown; rays of pubescence less than diameter of basal segment of arista. Antenna light yellowish-brown; 2nd segment with 1 strong apical dorsal, 2 or 3 similar strong ventral bristles and apical margin with small black hairs; basal segment with few minute black hairs. Front dusted greyish-brown posteriorly, yellowish-brown anteriorly. Anterior fronto-orbitals about two-thirds posterior; postverticals about two-thirds ocellars. Face heavily grey dusted, yellowish-brown; 4 brown spots on face and 3 on parafacials. Cheeks grey dusted; large brown spot posteriorly. Small hairs along cheek margin and no strong bristles at lower posterior corner. Occiput grey dusted. Eyes haired. Vertical diameter of eye about 4.5 times width of cheek in same axis. Proboscis yellowish-brown; palpi with 1 apical bristle and 1 or 2 at apical quarter and other smaller black hairs on apical half.

THORAX: Greyish-brown; brown spot at base of each mesonotal bristle and several on pleura. Basal scutellars equal to apicals; 1 humeral; 2 notopleurals; 1 presutural; 1 strong supraalar; 2 strong postalar; 1 propleural; prosternum bare.

Legs yellowish-brown; all femora with sub-apical and sub-basal brown annuli, lighter in fore femur; all tibia with faint brown sub-basal annulus very faint in fore tibia. Fore femur with strong bristles on postero-ventral and postero-dorsal surfaces; strong preapicals on all tibiae; strong apicals on mid tibia, weak on others.

Wings (Fig. 1) light grey with dark brown spots; veins brown. Third vein at apex forms acute angle with costa. Wing indices: costal about 3.0; 4th vein 2.25; 4c about 1.0; 5x about 0.4.

Halteres blackish-brown apex, light brown base.

ABDOMEN: Grey; irregular brown spots and areas; brown areas not necessarily at base of each hair or bristle.

*Holotype*: CASS: -.ii.1925, ♂, (*A. Tonnoir*), (Cant.Mus.).

*Material Examined*: Holotype, 3 ♀.

*New Records*: AUCKLAND: 20.x.1929, 1 ♀, (*A. Philpott*), (Ak.Mus.). WAITAKERE RANGES: Titirangi, ex light trap, 20.xii.1952, 1 ♀, (*C. R. Thomas*), (P.D.D.). CAMPBELLS HILL: -.xii.1912, 1 ♀, (*G. V. Hudson*). (Dom.Mus.).

**Distribution:** Auckland, Waitakere Ranges, Nelson, Cobb Valley, Pelorus Bay, Cass. (October, December, February).

**Remarks:** Separated by the higher costal index from *T. costata* and by the strong anterior acrostichals from *T. tenuipennis*.

### Genus SAPROMYZA Fallén

*Sapromyza* Fallén, 1810. "Sp. Ent. Nov. Dipt." p. 18.

Two fronto-orbitals, both directed backwards. Prescutellars present; 3 post-sutural dorsocentrals; 1 mesopleural bristle and some mesopleural hairs; 1 propleural; interalar absent. No short spines on fore femur. Preapicals on all tibiae; usually weak on hind tibia. Short costal spines ending before apex of 3rd vein.

Type Species: *Sapromyza flava* (Fabricius)

Closest to *Homoneura* Wulp, a widespread genus which does not occur in New Zealand. The chief distinguishing characters of the genus are the two backwardly directed fronto-orbitals, the single mesopleural bristle and the short costal spines ending before the apex of the third vein.

**Distribution:** World wide.

**Species Occurring in New Zealand:**

*Sapromyza arenaria* Tonnoir and Malloch

*S. dichromata* Walker

*S. neozelandica* Tonnoir and Malloch

*S. persimillima* sp.n.

*S. simillima* Tonnoir and Malloch

*S. dichromata* and *S. simillima* are closely related but apart from these two species the New Zealand members of the genus cannot be segregated into groups of species. This would point to the occurrence of immigrations of different populations originating from widely separated species. Such populations, since their arrival in New Zealand, have evolved to become true species. Because of the close similarity of *dichromata* and *simillima*, however, it is probable that the separation of these species from each other or their evolution from a common ancestral species has occurred in New Zealand.

#### KEY TO SPECIES OF SAPROMYZA IN NEW ZEALAND

- 1 Vertical diameter of eye about twice width of cheek in same axis ..... **arenaria**  
Vertical diameter of eye four or more times width of cheek in same axis ..... 2
- 2 Body with distinct chocolate-brown vittae and spots ..... **neozelandica**  
Body without chocolate-brown vittae and spots ..... 3
- 3 Small species; body length not over 4.0 mm. Genital arch of males enlarged and extending anteriorly to 2nd or 3rd sternite ..... **persimillima**  
Large species; body length greater than 5.0 mm. Genital arch of males small and not produced anteriorly beyond about 5th sternite ..... 4
- 4 Abdomen dull greyish-brown or blackish-brown with distinct dusting; male and female external genitalia brown or light brown .... **simillima**  
Abdomen including male and female external genitalia glossy black or blackish-brown ..... **dichromata**

### **Sapromyza arenaria** Tonnoir and Malloch. Fig. 16

*Sapromyza arenaria* Tonnoir and Malloch, 1926. Rec. Cant.

[N.Z.] Mus. 3 : 23.

A light greyish-brown species with clear wings. Body length about 4.0 mm., wing length about 4.0 mm.

## FEMALE

**HEAD** (Fig. 16): Arista dark brown, light brown basally; rays of pubescence much less than diameter of basal segments. Antenna light brown; 3rd segment light reddish-brown; 2nd segment with 1 dorsal bristle, hairs around apical margin, ventral hairs bristle-like; basal segment with a few short dorsal apical hairs. Front yellowish-brown, grey dusted on orbits and about ocellar area. Anterior fronto-orbital about three-quarters length posterior; verticals strong, inner bristle the stronger; ocellars fine and long; postverticals cruciate; black hairs on all front anterior to anterior orbitals. Face yellowish-white, a small dark brown spot at ventral region of antennal fossa. Cheeks light yellowish-brown. Hairs on cheek margin and posterior third of cheek. Occiput light greyish-brown. Eyes with few fine hairs. Vertical diameter of eye about twice width of cheek in same axis. Proboscis brown; palpi light brown with distinct black bristles on its whole length.

**THORAX:** Light greyish-brown, pleura yellowish-brown with much grey dusting, mesonotum with small, dark brown spot at base of most hairs and bristles. Prescutellars just over half length of posterior dorsocentral; the posterior dorsocentral bristle strongest; convergent basal scutellars about three-quarters length of divergent apicals; scutellum bare; 1 strong humeral; 1 strong presutural; 2 notopleurals, posterior one weaker; 1 supraalar; 2 postalars; 2 sternopleurals, anterior weaker; 1 strong propleural; prosternum with a small central hair.

Legs light yellowish-brown with grey dusting; apex of anterior surface of fore femur and apex of fore tibia brown; apical segments of all tarsi brown to dark brown. Fore femur with strong bristles on postero-dorsal, posterior, and apical half of postero-ventral surfaces; fore tibia with small apical; mid femur with small bristles on apical half of anterior surface and around apical margin; mid tibia with strong preapical and several apicals; hind femur with 1 strong preapical bristle on antero-dorsal surface; hind tibia with strong preapical.

Wings clear; veins light yellow. Costa with a pair of strong bristles near base; short black costal spines extending half way between apices of 2nd and 3rd veins. Wing indices: costal about 3.9; 4th vein about 1.6; 4c about 0.7; 5x about 0.4.

Halteres pale yellow.

**ABDOMEN:** Light brown with light dusting of grey. Tergites with distinct brown spot at base of each hair and bristle, strong bristles near postero-lateral region of each tergite. Genitalia with a cluster of distinct short black spines.

*Holotype:* CHRISTCHURCH: 29.xi.1924, ♀, (*A. Tonnoir*), (Cant. Mus.).

*Material Examined:* Holotype and 1 paratype.

*Distribution:* Christchurch. (November.)

*Remarks:* Readily separated from all other species in the genus occurring in New Zealand by the relatively wide cheek.

## *Sapromyza neozelandica* Tonnoir and Malloch. Figs. 7, 15

*Sapromyza neozelandica* Tonnoir and Malloch, 1926. Rec.

Cant. [N.Z.] Mus. 3 : 22.

A yellowish-brown species with chocolate-brown vittae and markings on head, thorax and abdomen. Body length about 4.0 mm., wing length about 4.0 mm.

## MALE AND FEMALE

**HEAD:** Arista dark brown; pubescent, rays less than width of basal segment. Antenna light brown; 2nd segment with strong dorsal bristle, 1 strong ventral apical and other enlarged hairs adjacent to it, and black hairs mainly on apical margin; basal segment with few apical hairs longer than normal hairs of 2nd segment. Front yellowish-grey, heavily dusted, with longitudinal chocolate-brown vittae, 1 broad vitta from anterior median region diverging slightly outwards to skirt lateral ocellus and ending immediately anterior to postvertical, the other vitta narrow, commencing from the anterior portion of the former vitta, sweeping round lateral to anterior orbital, including posterior orbital and ending at inner vertical. Anterior orbital about two-thirds posterior orbital; ocellars weakest of all frontal bristles; a few minute hairs on front, more particularly anteriorly. Face yellowish-grey dusted; chocolate-brown U-shaped mark between the dark brown

ptilinal sutures. Carina not prominent. Cheeks yellowish-brown with grey dusting more pronounced posteriorly. Small hairs in row along cheek; stronger hairs posteriorly and on occiput; 2 strong bristles at lower posterior corner. Occiput greyish-brown. Eyes bare. Vertical diameter of eye about 4 times width of cheek in same axis. Proboscis light brown; palpi dark brown.

**THORAX:** Yellowish-brown; broad chocolate-brown vitta between dorsocentrals extending onto disc of scutellum, this vitta with narrow whitish-grey median longitudinal stripe anteriorly; brown vitta along notopleural suture, dorsal mesopleuron, and surrounding wing base. Prescutellars just over half posterior dorso-central; basal scutellars about equal to apicals; 1 humeral; 1 presutural; 2 notopleurals; one supraalar; 2 postalar, both strong; 1 sternopleural with occasionally a small anterior bristle; prosternum with 1 or 2 small hairs.

Legs yellowish-brown except for brown or dark brown areas as follows: fore coxa except on dorsal margin, fore trochanter, apical third or half and a basal anterior spot on fore femur, apical quarter and a band at basal third of fore tibia, apical segments of fore tarsus; mid and hind legs shaded similarly to fore legs except mid femur with more pronounced darkening on apical ventral region. Fore femur with strong postero-dorsal bristles on apical two-thirds, 2 weak posterior bristles at about apical third and strong postero-ventrals on apical half; fore tibia with weak apical; mid femur with short strong anterior bristles on apical half and 1 or 2 posterior apicals; mid tibia with strong apical; hind femur with 2 weak antero-dorsal preapical bristles; hind tibia with a much reduced apical.

Wings (Fig. 7) shaded very light brown with slightly darker area at apex of subcostal cell; veins light yellowish-brown. Short stout costal spines extending about half way between apices of 2nd and 3rd veins; 5th vein reaching wing margin. Wing indices: costal about 3.4; 4th vein about 1.8; 4c about 0.8; 5x about 0.6.

Halteres light brown.

**ABDOMEN:** Grey; brownish-grey on basal segments; tergites with 4 large brown areas and smaller brown areas at bases of bristles and some hairs; pleurites brownish-grey.

External male genitalia (Fig. 15): Genital arch dark brown; anal plate light brown; clasper dark brown.

**Holotype:** NELSON: Aniseed Valley, 1.xii.1923, ♀, (*A. Tonnoir*), (Cawt. Inst.)

**Material Examined:** Holotype, 1 ♂ paratype, 27 ♂, 51 ♀, 1 ex.

**New Records:** MOKO HINAU ISLANDS: Fanal Island, 23.viii.1955, 1 ♀, (*R. A. Harrison*), (P.D.D.). LITTLE BARRIER ISLAND: 4-12.iii.1929, 1 ♂, (*W. R. B. Oliver*), (Dom. Mus.); 26-28.xi.1954, 1 ♂, 6 ♀, (*R. A. Harrison*): Thumb and Summit track, swept off fern, 23.xi.1954, 1 ♀, (*R. A. Harrison*): -i.1955, 1 ♂, (*M. Parkin*), (P.D.D.). AUCKLAND: Mt. Eden, 24.xii.1949, 2 ♂; on nectarine foliage, 7.xii.1948, 1 ♂, 1 ♀ (*in cop.*); 8.xii.1948, 1 ♂, 4 ♀, (*R. A. Harrison*): Avondale, 5.xii.1948, 1 ♀, (*R. A. Harrison*): Purewa, in bush, 21.iii.1942, 1 ♀, (*D. McKenzie*): Remuera, swept off lawn, 4.i.1953, 1 ♂, (*K. P. Lamb*): 24.i.1949, 1 ♂, 1 ♀, (*in cop.*), (*D. Spiller*), (P.D.D.): 18.x.1929, 1 ♀, (*A. Philpott*), (Ak. Mus.): no date, 1 ex., (Cawt. Inst.). WAITAKERE RANGES: Titirangi, ex light trap, 28.xi.1952, 1 ♀, 4.i.1953, 1 ♀; 30.i.1953, 1 ♀; 11.ii.1953, 1 ♂; 22.xii.1952, 1 ♂; 15.i.1953, 2 ♂; 18.ii.1953, 1 ♂, 1 ♀; 17.i.1953, 1 ♂; 25.i.1953, 1 ♂; 16.i.1953, 1 ♂; 10.xii.1953, 1 ♂; 13.xii.1953, 1 ♀; 20.xii.1952, 1 ♀; 19.ii.1952, 1 ♀; 10.xi.1955, 2 ♀, (*C. R. Thomas*): ex flowers *Astelia*, 2.ii.1944, 1 ♂, (*M. Carter*): Dreamlands, in house, 27.xii.1950, 1 ♂, 1 ♀, (*K. P. Lamb*): 12.ii.1950, 1 ♀, (*M. Knight*): Nihotupu, 2.i.1950, 1 ♀, (*R. A. Harrison*), (P.D.D.). MAYOR ISLAND: 28.xi.1948, 1 ♂, 1 ♀, (*S. A. Rumsey*), (P.D.D.). WHAKATANE: on *Coriaria*, 7.iii.1947, 1 ♀, (*W. Cottier*), (P.D.D.). Te Wairoa: 11.xi.1919, 2 ♂, (*J. Muggeridge*),

(B.M.). RIMUTAKA RANGES: 27.ii.1928, 1 ♀, (A. Castle), (Dom. Mus.). WAINUIOMATA: 30.xi.1923, 1 ♀, (H.H.), (Dom. Mus.). KAPITI ISLAND: 6.i.1928, 1 ♂, (Anon.), (Dom. Mus.). WELLINGTON: 16.i.1924, 1 ♀, (M.K.M.); Karori, -i.1940, 1 ♀, (G. V. Hudson); Hataitai, 6.i.1943, 3 ♀, (J. Ardley), (Dom. Mus.). TARAKOHE: 10.i.1943, 1 ♀, (E. E. Walker), (Cawl. Inst.). KUMARA: 28.iii.1929, 1 ♀; 3.xi.1929, 1 ♀; no date, 2 ♂, 2 ♀, (J. W. Campbell), (U.S. Mus.). NO DATA: 1 ♂, 8 ♀, (Ak. Mus.).

*Distribution:* Moko Hinau Islands, Little Barrier Island, Auckland, Waitakere Ranges, Whakatane, Mayor Island, Te Wairoa, Rimutaka Ranges, Wainuiomata, Wellington, Nelson, Tarakohe, Kumara. (August, October to March).

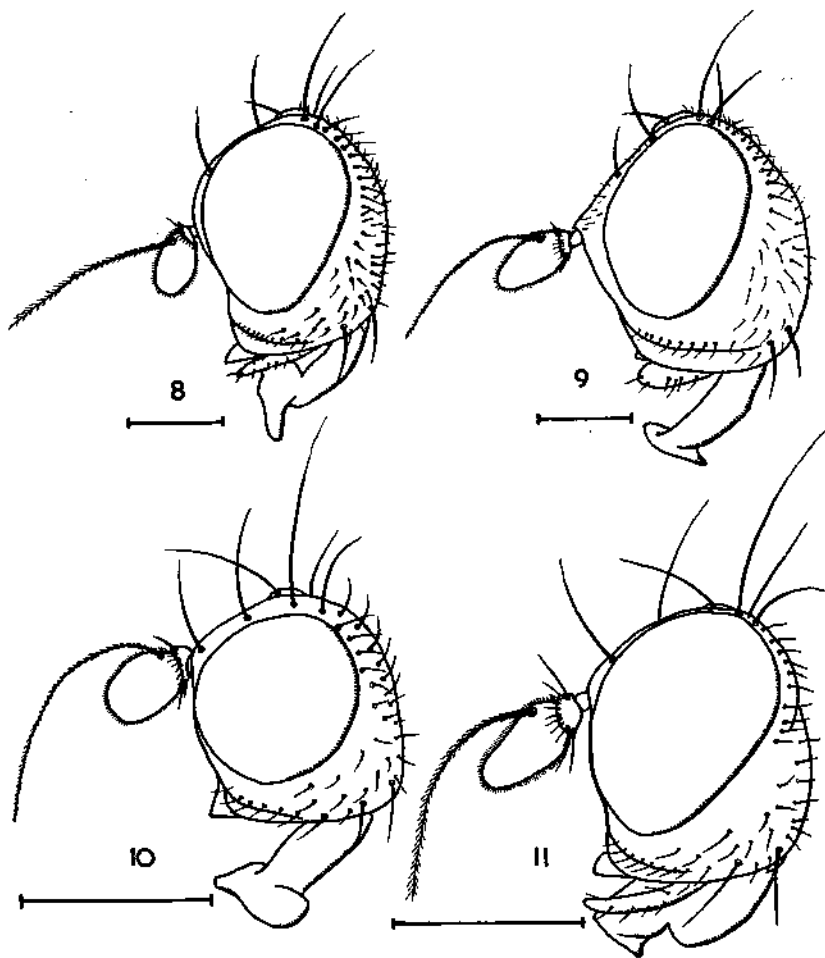


Fig. 8. Head of *Sapromyza dichromata*  
 " 9. " " *S. similima*  
 " 10. " " *Trypanooides guttata*  
 " 11. " " *Poecilohetaerus punctatifacies*  
 Scale: 0.5 mm.

**Remarks:** Mainly a North Island species, with the distribution extending to the northern part of the South Island. Separated from other species in the genus that occur in New Zealand by the presence of the distinctive vittae and marking on the body.

**Sapromyza persimillima** sp.n. Figs. 5, 14

A yellowish-brown fly without distinctive marking. Body length 3.5-4.0 mm., wing length 4.0 mm.

MALE AND FEMALE

**HEAD:** Arista blackish-brown, light basally; minutely pubescent, rays much less than width of basal segments. Antenna yellowish-brown; 3rd segment light brown except basally; 2nd segment with 1 small dorsal bristle and ventral hairs; basal segment with some dorsal hairs and brown spot laterally. Front yellowish-brown; ocellar area dark brown. Anterior fronto-orbital directed backwards and very slightly convergent, the dorsal orbital divergent; anterior orbital about three-quarters posterior; anterior half of front with many minute black hairs. Face whitish-yellow, almost flat; parafacials at either side of the base of antennae brown. Cheeks light greyish-brown. Long strong black hairs along cheek margin to lower posterior corner. Occiput yellowish-brown. Eyes with fine hairs. Vertical diameter of eye about 5 times width of cheek in same axis. Proboscis yellowish-brown to brown; palpi light brown.

**THORAX:** Yellowish-brown to light brown; mesonotum with pair of faint brown median vittae anteriorly. Basal scutellars convergent and just shorter than divergent apicals; 1 strong humeral; 1 strong presutural; 2 notopleurals; 1 strong supraalar; 2 postalar; 2 sternopleurals on one side; prosternum with few minute hairs.

Legs whitish-yellow. Fore femur with strong bristles on postero-dorsal, postero-ventral and basal half of posterior surfaces; fore tibia with weak apical; mid femur with small anterior bristles on apical quarter, anterior ventral surface produced to heel-like structure at apex, 2 posterior apical bristles; mid tibia with strong apical; hind femur with few fine apical bristles; hind tibia with weak apical.

Wings (Fig. 5) clear, no indication of shading or spotting in costal cell; veins light brown. Short stout costal spines about two-fifths distance between apices of 2nd and 3rd veins; 5th vein just traceable to wing margin. Wing indices: costal about 5.0; 4th vein about 1.6; 4c about 0.5; 5x about 0.7.

**ABDOMEN:** Light brown with narrow black apical margin on each tergite.

External male genitalia (Fig. 14) enlarged and rests along sternites as far forward as 2nd or 3rd sternites; genital arch the chief structure, elongate, narrow dorsally, wide at middle and tapering to a distinct point, a few bristles on surface; anal plates very small, situated ventrally to narrow dorsal region of arch, a series of distinct bristles on and near median margin; a pair of heavily chitinised ventral appendages near ventral tip of arch.

**Holotype:** WAITAKERE RANGES: Titirangi, ex light trap, 18.ii.1953, ♂, (C. R. Thomas), (P.D.D.).

**Paratypes:** WAITAKERE RANGES: Titirangi, ex light trap, 17.i.1953, 1 ♀; 12.ii.1953, 1 ♂; 18.ii.1953, 5 ♂, 4 ♀; 19.ii.1953, 1 ♀; 14.vi.1953, 1 ♂, 2 ♀; 28.ix.1955, 2 ♂, (C. R. Thomas), (6 ♂, 6 ♀, P.D.D., 1 ♂, Ak. Mus., 1 ♀, Dom. Mus., 1 ♂, 1 ♀, Cawt. Inst., 1 ♂, Cant. Mus.). AUCKLAND: Browns Bay, 16.vii.1949, 1 ♀; 17.vii.1949, 1 ♀, (R. A. Harrison), (P.D.D.).

**Material Examined:** Holotype, 9 ♂ and 10 ♀ paratypes.

**Remarks:** *S. persimillima* is superficially most like *S. simillima* and *S. dichromata* and is separated from these two species by its relatively small size, and the enormous development of the genital arch.



**Sapromyza simillima** Tonnoir and Malloch. Figs. 4, 9, 13

*Sapromyza simillima* Tonnoir and Malloch, 1926. Rec. Cant.  
[N.Z.] Mus. 3 : 22.

A yellowish-brown species with darker brown but not highly glossy abdomen. Body length about 5.0-6.0 mm., wing length about 5.0-6.0 mm.

MALE AND FEMALE

**HEAD** (Fig. 9): Arista dark brown, lighter brown basally, pubescent, rays not as long as width of basal segment. Antenna yellowish-brown, 3rd segment paddle shaped, longer than wide; 2nd segment with short fine dorsal apical bristle, black hairs particularly about apical margin, and a short ventral apical bristle; basal segment with short black hairs. Front yellowish or light brown, ocellar area brown. Anterior fronto-orbital about three-fifths length of posterior orbital and further away from eye; ocellars weak; verticals strong; fine black hairs on orbits anterior to posterior orbital and on anterior region of front. Face light brown. Cheeks yellowish-brown. Fine black hairs along lower margin of cheek and 2 bristles at lower posterior corner. Occiput yellowish-brown, hairs strong and black. Eyes with few short fine hairs over surface. Vertical diameter of eye about 5 times width of cheek in same axis. Proboscis light brown; palpi narrow and yellowish-brown with short black hairs.

**THORAX**: Generally yellowish-brown, mesonotum often light brown. Prescutellars about equal to anterior dorsocentrals, the two posterior dorsocentrals stronger; apical and basal scutellars about equal in size; scutellum bare; strong humeral; strong presutural; 2 notopleurals; 1 supraalar; 2 strong postalar; 1 strong posterior sternopleural and in most cases a weak anterior sternopleural (holotype has this latter bristle missing on left side); prosternum with few fine hairs.

Legs yellowish-brown; apices of tibiae a shade darker brown. Fore femur with bristles on postero-dorsal surface and apical half of postero-ventral surface; fore tibiae with weak apical; mid femur with a few bristles on apical third of anterior surface and 1 apical posterior; mid tibia with strong apical; hind femur with 1 antero-dorsal preapical and 2 small dorsal apicals; hind tibia with weak apical.

**Wings** (Fig. 4) light yellowish-brown. Short stout costal spines extending about two-fifths distance between apices of 2nd and 3rd veins; 5th vein reaching wing margin; no bristles on costa at apex of subcosta or elsewhere. Wing indices: costal 2.9-3.6, (mean 3.3); 4th vein about 1.7; 4c about 0.7; 5x about 0.6.

Halteres light brown.

**ABDOMEN**: Greyish-brown; light brown basal segments, dusted with grey and not glossy.

Male genitalia (Fig. 13): Genital arch light brown, about 15 bristles on either side in approximately 2 rows, parallel and close to posterior margin; anal plate small and triangular with bristles over most of surface; clasper almost square, bristles shorter than those an arch of anal plate over surface. Penis large but narrower than claspers.

**Holotype**. CHRISTCHURCH: 18.ii.1922, ♂, (*A. Tonnoir*), (Cawt. Inst.).

**Material Examined**: Holotype, 22 ♂, 33 ♀.

**New Records**: KAITIARA: -ii.1917, 2 ♂, (*Anon.*), (Dom. Mus.).  
LITTLE BARRIER ISLAND: Thumb and Summit track, 23.xi.1954, 3 ♀, (*R. A. Harrison*), (P.D.D.). WAITAKERE RANGES: Nihotupu, -viii.1923, 1 ♀, (*Anon.*): 2.i.1950, 1 ♂, (*R. A. Harrison*): Titirangi, ex light trap, 10.xii.1952, 1 ♂; 19.xii.1953, 1 ♀; 22.xii.1952, 2 ♂, (*C. R. Thomas*), (P.D.D.). NATIONAL PARK: 3,710 ft., on window of Chateau, 1.i.1954, 1 ♀; near Chateau, 24.xii.1953, 1 ♀, (*R. W. Taylor*), (P.D.D.). OHAKUNE: 30.xi.1919, 1 ♀; -iii.1920, 1 ♀, (*T. Harris*), (U.S.N.M.). TAUPO DISTRICT: Tauhara Mt., 24.ii.1939, 1 ♂, 1 ♀, (*J. T. Salmon*), (Dom. Mus.). WAIKAREMOANA: 12.xii.1946, 1 ♂, 5 ♀,

(*R. R. Forster*), (Dom. Mus.). TE WAIROA: 11.xi.1919, 1 ♂, 1 ♀, (*J. Muggeridge*), (B.M.). MT. EGMONT: Dawson Falls, 10.xii.1946, 1 ♂, 1 ♀, (*A. Castle*), (Dom. Mus.); 3,100 ft., 17.i.1955, 1 ♂ (*G. Ramsay*), (P.D.D.). KAITOKE: 12.xii.1897, 1 ♂, (*G. V. Hudson*), (Dom. Mus.). KAPITI ISLAND: Summit, 10.xii.1919, 1 ♂, (*Anon.*), (Dom. Mus.). WELLINGTON: Silverstream, 19.xi.1916, 1 ♀, (*Anon.*); Wiltons Bush, 2.i.1941, 1 ♂, (*G. V. Hudson*), (Dom. Mus.); Eastbourne, 29.xi.1947, 1 ♂, 2 ♀, (*G. Ramsay*), (P.D.D.). NELSON: Anisced Valley, swept off native bush, 24.ii.1949, 1 ♀, (*A. W. Parrott*); Upper Maitai, 29.i.1945, 2 ♂, (*B. B. Given*); Tinline Valley, swept off native bush, 17.x.1951, 1 ♀, (*A. W. Parrott*), (Cawt. Inst.). KIWI: Bush, 30.i.1925, 1 ♂, (*Anon.*), (U.S.N.M.). DUN MT.: Track, 7.i.1950, 1 ♀, (*J. G. Dawber*), (Cawt. Inst.). KUMARA: no date, 1 ♀, (*J. W.*

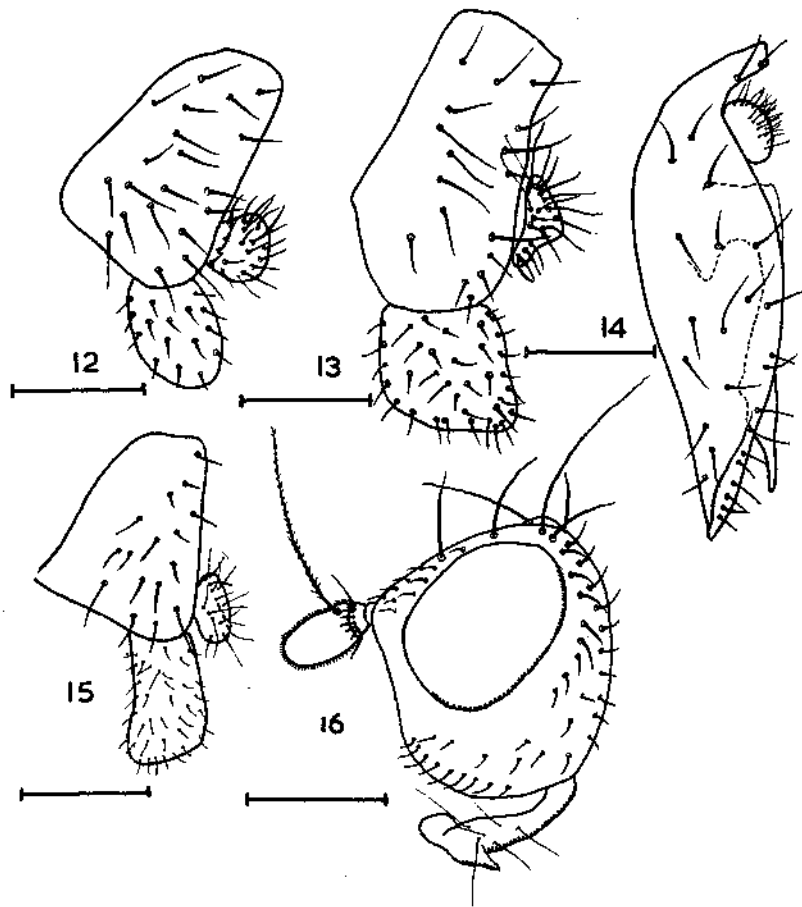


Fig. 12. External male genitalia of *Sapromyza dichromata*  
 " 13. " " " " *S. simillima*  
 " 14. " " " " *S. persimillima*  
 " 15. " " " " *S. neozelandica*  
 " 16. Head of *S. arenaria*

Scale: Figs. 12-15, 0.25 mm.; Fig. 16, 0.5 mm.

*Campbell*), (U.S.N.M.). MT. COOK: near Hermitage, 25.i.1945, 1 ♂, 1 ♀, (*G. V. Hudson*), (Dom. Mus.). BLACKBALL: -iii.1920, 1 ♀ (*Anon.*), (U.S.N.M.). OTIRA: 10.i.1920, 1 ♀, (*J. W. Campbell*), (U.S.N.M.). WAITATI: 21.i.1920, 1 ♂, (*Anon.*), (Ak. Mus.). DUNEDIN: Opoho, 8.i.1925, 1 ♀, (*Anon.*), (Ak. Mus.). MAKARORA: 1,000 to 2,000 ft., -xii.1924, 1 ♀, (*Fenwick*), (Dom. Mus.). QUEENSTOWN: 16.xii.1919, 1 ♂, (*Anon.*), (U.S.N.M.). CASWELL SOUND: Stillwater R., 26.iii.1949, 1 ♀, (*J.C.L.*), (Dom. Mus.). NO DATA: 1.iii.1919, 1 ♀: 20.xi.1919, 1 ♂: -ii.1920, 1 ♀: 1 ♀, (*Anon.*), (U.S.N.M.).

*Distribution:* Kaitaia, Little Barrier Island, Waitakere Ranges, National Park, Taupo, Waikaremoana, Te Wairoa, Mt. Egmont, Kapiti Island, Kaitoke, Wellington, Nelson, Dun Mt., Moana, Christchurch, Akaroa, Mt. Cook, Waitati, Dunedin, Makarora, Caswell Sound. (August, October to March).

*Remarks:* Most closely related to *S. dichromata* and separated from it by having a non-glossy abdomen and brown external genitalia in both sexes. The males have a distinct, square shaped clasper and this character is often visible *in situ* in pinned specimens. It is a sure means of separating males of the two species. The costal index is generally lower in *simillima* than in *dichromata* but it is not an infallible means of separating the two species. *S. simillima* usually has a small anterior sternopleural in addition to the one strong posterior bristle, whereas *S. dichromata* usually lacks this small bristle. In some species of *simillima* this bristle may be absent on one or both sides while, very occasionally, *dichromata* has a minute anterior sternopleural. The colouration of the abdomen offers the most straightforward means of separating the two species and in cases of doubt about this character the males can be separated by examining the claspers.

*S. simillima* occurs throughout New Zealand. The only variations observed between local populations is the intensity of the colouration of the abdomen. This may vary from greyish-brown to blackish-brown with grey dusting.

### **Sapromyza dichromata** Walker. Figs. 6, 8, 12

*Sapromyza dichromata* Walker, 1849. List Dipt. Brit. Mus. 4: 988. Hutton, 1881. Cat. Dipt. N.Z. p. 66. Hutton, 1901, Trans. N.Z. Inst. 33: 87. Tonnoir and Malloch, 1926. Rec. Cant. [N.Z.] Mus. 3: 21.

A yellowish-brown species with dark brown abdomen. Body length about 5.0-7.0 mm., wing length about 5.0-7.0 mm.

#### MALE AND FEMALE

**HEAD** (Fig. 8): Arista dark brown, rays of pubescence about as wide as basal segment. Antenna yellowish or light reddish-brown; 2nd segment with 1 small dorsal bristle, hairs around apical margin, longer ventrally; basal segment with black hairs. Front light brown or brown, parallel sides. Anterior fronto-orbital about three-quarters length of posterior; ocellars minute; anterior region of front with small fine hairs. Face brown or light brown. Carina absent. Minute hairs in row ventrally on parafacials. Cheeks light brown. Two bristles at lower posterior angle of cheek. Occiput light brown. Eyes bare. Vertical diameter of eye about 7 times width of cheek in same axis. Proboscis light brown; palpi yellowish-brown.

THORAX: Yellowish-brown. One humeral; 1 presutural; 2 notopleurals; 1 supra-alar; 2 postalar; 1 posterior sternopleural and a few fine hairs, more ventrally; prosternum bare.

Legs yellowish-brown. Fore coxa with 2 anterior and other smaller apical bristles; fore femur with postero-dorsal and postero-ventral bristles on apical half; fore tibia with weak apical, mid femur with anterior bristles on apical half strongest towards apex and 1 or 2 posterior apicals; hind femur with 1 preapical antero-dorsal.

Wings (Fig. 6) shaded light yellowish-brown; stigma darker brown, veins light brown. Short black spines of costa ending half way between apices of 2nd and 3rd veins. Costa much weaker between 3rd and 4th veins; 5th vein just traceable to wing margin. Wing indices: costal 3.3-4.1, (mean 3.7); 4th vein about 1.5; 4c about 0.6; 5x about 0.6.

Halteres light brown.

ABDOMEN: Blackish-brown, light on anterior segment. Tergites with strong bristles on lateral portions of posterior margins. Female genital plates brown.

Genitalia (Fig. 12): Genital arch brown to dark brown, about two bristles on either side; anal plate light brown, small and with many long bristles; clasper broadly spear shaped and with relatively shorter bristles; penis large and as broad as claspers.

*Lectotype*: AUCKLAND: ♂, (*A. Sinclair*), (B.M.). Designated, labelled, and here published as the lectotype from the syntype series of 2 ♂.

*Material Examined*: Lectotype, 15 ♂, 31 ♀, 1 ex. (Three specimens were identified by Dr F. I. van Emden, Commonwealth Institute of Entomology, London).

*New Records*: HEN ISLAND: 18-20.x.1925, 1 ♀, (*H.H.*), (Dom. Mus.). LITTLE BARRIER ISLAND: Thumb and Summit track, 23.xi.1954, 2 ♂, 1 ♀: Kauri Gully and tracks, 23.xi.1954, 1 ♀: Waipawa Stream bed, 1 ♂, (*R. A. Harrison*): -.vi.1955, 1 ♀, (*M. Parkin*), (P.D.D.). WAITAKERE RANGES: Oratia, Kauri Rd., 11.i.1953, 1 ♀: Nihotupu, 21.i.1950, 7 ♂, 2 ♀, (*R. A. Harrison*): 20.iv.1952, 1 ♀, (*K. P. Lamb*): Titirangi, ex light trap, -.xi.1952, 1 ♀; 18.ii.1953, 5 ♀, 1 ex.; 28.xi.1952, 1 ♀; 7.vii.1953, 2 ♀; 1.ii.1953, 1 ♀; 2.ii.1953, 2 ♀, (*C. R. Thomas*); -.vi.1945, 1 ♀, (*M. Carter*), (P.D.D.). AUCKLAND: Grafton, on foliage, 1.ix.1940, 3 ♂, 8 ♀, (*D. Spiller*), (P.D.D.). WELLINGTON: Karori, 12.xi.1893, 1 ♂, (*G. V. Hudson*); 26.x.1919, 1 ♀, (*Anon.*): Titahi, 27.x.1919, 1 ♂, (*Anon.*): Gollans Valley, 18.xii.1939, 1 ♀, (*G. V. Hudson*), (Dom. Mus.).

*Distribution*: Hen Island, Little Barrier Island, Waitakere Ranges, Auckland, Port Waikato, Wellington. (July, September to February, April, June).

*Remarks*: Most closely related to *S. simillima* and separated from that species by the presence of glossy black abdomen and black external genitalia in both sexes. The costal index and number of sternopleural bristles are discussed under remarks on *S. simillima*. As in *S. simillima*, variations between local populations have been observed in the colouration of the abdomen. The colour varies from blackish-brown to black but in all cases the abdomen is distinctly shining and has no trace of dusting.

The numbers on the diagrams showing male genitalia of *S. dichromata* and *S. simillima* given by Tonnoir and Malloch (1926b, Pl. ii, Figs. 16 and 17) should be reversed.

## Genus POECILOHETAERELLA Tonnoir and Malloch

*Poecilohetaerella* Tonnoir and Malloch, 1926. Rec. Cant.  
[N.Z.] Mus. 3 : 24.

Arista white or yellowish-white except yellowish-brown base. Anterior fronto-orbitals convergent. Face convex, glossy light brown to brown. Prescutellars present; 1 presutural and 3 postsutural dorsocentrals; 1 strong mesopleural bristle; 2 sternopleurals; prosternum bare. Preapical and apicals present on all tibiae, preapicals usually strong, apicals of fore and hind tibiae weak.

Type Species: *Poecilohetaerella bilineata* (Hutton)

The nearest genus is *Poecilohetaerus* Hendel from which *Poecilohetaerella* is separated by having a glossy brown convex face and white arista. External morphological characters do not differ much between species and colouration is used to separate them. There are however important differences in the male genitalia and often these differences can be seen *in situ*.

Distribution: New Zealand.

Species: *Poecilohetaerella antennata* sp.n.

*P. bilineata* (Hutton)

*P. dubiosa* Tonnoir and Malloch

*P. minuta* Tonnoir and Malloch

*P. punctatifrons* Tonnoir and Malloch

*P. scutellata* sp.n.

*P. watti* Tonnoir and Malloch

*Poecilohetaerella* is endemic to New Zealand and it would appear to have evolved from the genus *Poecilohetaerus*. Seven species are known and more probably await discovery. *P. bilineata* is the most widespread and appears to be restricted to lowlands. Its wide distribution need not be an indication that it is the oldest species. It has been taken frequently in gardens and appears to be the one species in the genus which has adjusted itself to the changing New Zealand environment over the past century. Perhaps its wide distribution in New Zealand is best explained by such adjustment. The other species are confined to forest or alpine habitats. *P. antennata* and *P. dubiosa* and perhaps *P. watti* appear to be confined to lowland forest areas. *P. minuta* and *P. punctatifrons* occur at higher altitudes. *P. scutellata* has been taken at only one locality, which is probably subalpine.

The relationship of the seven species is not obvious, for there appear to be gaps either in the form of species as yet undiscovered or of extinct species. However, the shape of the third antennal segment as indicated by the antennal index and the length of the clasper possibly give an indication of the course of evolution in the genus. It would be expected that the primitive species of the genus would have a low index and long clasper similar to *Poecilohetaerus*, whereas the more recently evolved species would have greater indices and shorter claspers. Hence *P. punctatifrons* could be regarded as nearest the primitive species for it has the lowest antennal index and the longest clasper and in this respect is closest of all known species to *Poecilohetaerus*. The fact that it is alpine or subalpine in distribution may mean that it is a remnant species of a larger array of species than is now known. The other alpine or subalpine species, *P. minuta*, also has a low index. Lowland forest forms such as *P. antennata* and *P. dubiosa*, which have a large index and short claspers, have possibly evolved from high altitude species such as *P. punctatifrons* or *P. dubiosa*.

KEY TO SPECIES OF POECILOHETAERELLA

- |   |   |                      |
|---|---|----------------------|
| 1 | Front entirely or almost entirely dark brown or velvety black between grey orbits .....                   | 2                    |
|   | Front yellowish-brown between grey orbits, bordered narrowly or widely with brown or blackish-brown ..... | 5                    |
| 2 | Parafacials with distinct velvety black median spot .....   | 3                    |
|   | Parafacials without distinct black spot .....   | 4                    |
| 3 | Third antennal segment 3 times as long as wide .....  | <b>bilineata</b>     |
|   | Third antennal segment about 5.5 times as long as wide .....  | <b>antennata</b>     |
| 4 | Wings with dark brown or black basal area .....   | <b>minuta</b>        |
|   | Wings not darkened basally .....  | <b>watti</b>         |
| 5 | Third antennal segment about 4.5 times as long as wide .....  | <b>scutellata</b>    |
|   | Third antennal segment about 2.0 to 2.5 times as long as wide .....                                       | 6                    |
| 6 | Front between orbits yellowish-brown with wide dark brown lateral border .....                            | <b>dubiosa</b>       |
|   | Front between orbits yellowish-brown with indefinite narrow, light brown lateral border .....             | <b>punctatifrons</b> |

**Poecilohetaerella bilineata** (Hutton). Figs. 17, 23, 25, 26

*Lauxania bilineata* Hutton, 1901. Trans. N.Z. Inst. 33 : 88.

*Lauxania carbonaria* Hutton, 1902. Trans. N.Z. Inst. 34 : 173.

*Poecilohetaerella bilineata* (Hutton): Tonnoir and Malloch, 1926. Rec. Cant. [N.Z.] Mus. 3 : 26.

A dark brown species with distinct, wide, median, velvety black vitta on front. Body length about 3.5 mm., wing length about 3.5 mm.

MALE AND FEMALE

HEAD (Fig. 17): Arista with the main axis evenly tapering to very fine apex, evenly pubescent and rays much shorter than width of basal segments. Antenna dark brown; 3rd segment elongate and gradually tapering to a rounded apex; antennal index about 3.0; 2nd segment with 1 strong and 1 weak dorsal bristle, about 2 ventral bristles, and black hairs mainly on apical margin; basal segment with a few dorsal apical hairs. Front dark brown or black, velvety area between the wide whitish-grey orbits, the orbits slightly indented by the dark median vittae just anterior to anterior orbit. Anterior fronto-orbital about five-sixths length of posterior orbital; postverticals weak; minute hairs anteriorly on front. Face with dull greyish spot at ventral median region; parafacials whitish-grey with dark brown or black median spot. Cheeks whitish-grey with brown spot anteriorly and changing to dark brown posteriorly. Few hairs along cheek and 2 bristles at lower posterior corner. Occiput dark brown. Eyes with a few very short fine hairs. Vertical diameter of eye about 5 times width of cheek in same axis. Proboscis brown; palpi dark brown and with several strong bristles about apical third.

THORAX: Somewhat shining dark brown; mesonotum with pair of whitish-grey longitudinal vittae bordered medianly by dorsocentrals about half width between dorsocentrals and supraalar bristle, extending onto scutellum and bordered by the basal and apical scutellar bristles, these vittae uniting narrowly behind apical bristles. All 4 dorsocentrals strong; basal scutellars parallel or divergent and equal to cruciate apicals; 1 humeral; 1 presutural; 2 notopleurals; 1 strong supraalar; 2 strong postalar; 1 small propleural hair.

Legs dark brown; mid and hind tarsi light brown. Fore femur with bristles on postero-dorsal, posterior, and postero-ventral surfaces, the last-named bristles the strongest; hind femur with short preapical on antero-dorsal surface and several small dorsal apicals.

Wings (Fig. 23) clear, veins yellowish-brown. Short stout costal spines extending about two-thirds distance between apices of 2nd and 3rd veins; 5th vein just traceable to wing margin. Wing indices: costal about 3.5; 4th vein about 1.5; 4c about 0.7; 5x about 0.5.

Halteres brown.

ABDOMEN: Dark shining brown.

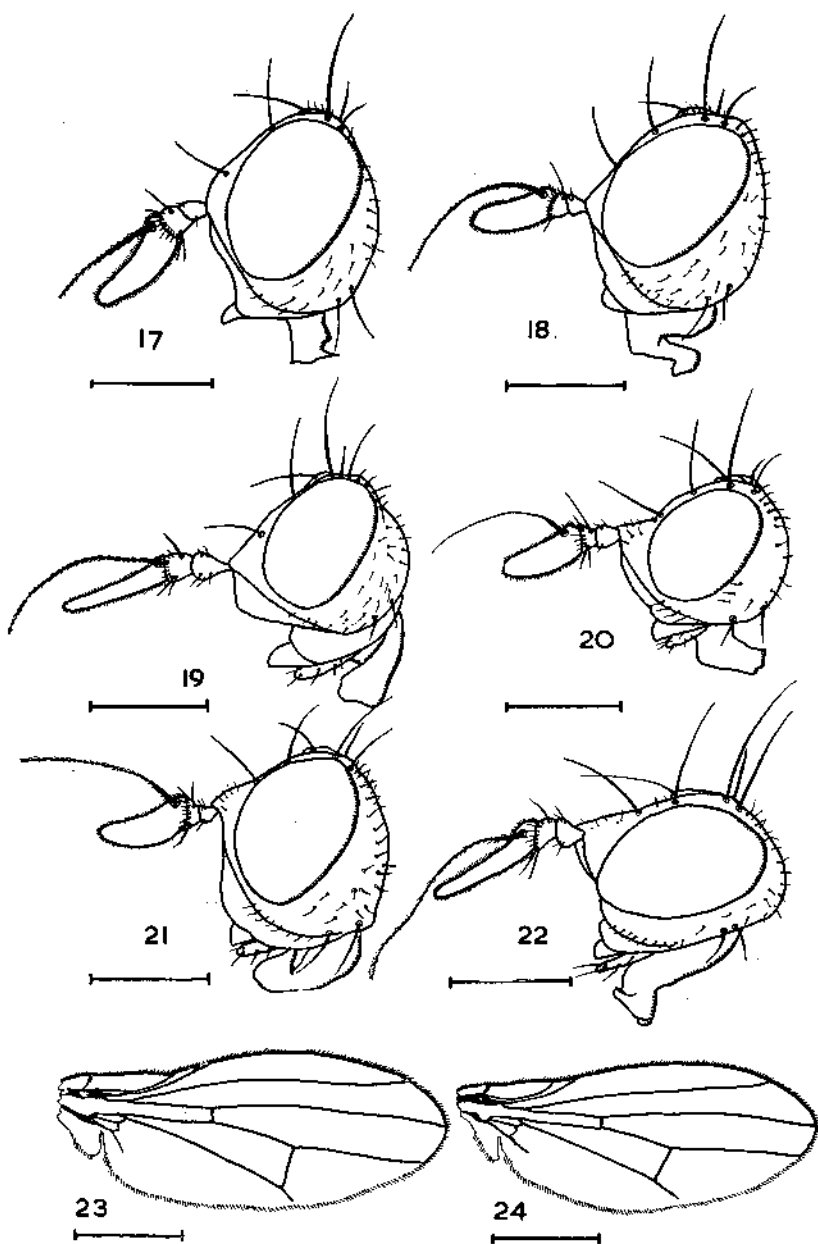


Fig. 17. Head of *Poecilohetaerella bilineata*  
 " 18. " " *P. dubiosa*  
 " 19. " " *P. antennata*  
 " 20. " " *P. minuta*  
 " 21. " " *P. punctatifrons*  
 " 22. " " *P. scutellata*  
 " 23. Wing of *P. bilineata*  
 " 24. " " *Poecilohetaerus punctatifacies*  
 Scale: Figs. 17-22, 0.5 mm.; Figs. 23-24, 1.0 mm.

Male genitalia (Figs. 25, 26) dark brown; genital arch with bristles over whole of surface, arch produced ventrally to a broad spine; anal plate with small bristles over whole of surface, separated from arch by wide membrane; clasper conical, ending in slightly curved broad spine at apex, 1 strong subapical bristle and other bristles over surface. Aedeagus with pair of unequal median processes, left process longer, curved at apex and ending in heavily chitinised spine, right process also curved at apex; lateral processes, one either side, curved inwards at apex and each with short subapical spine-like bristle; penis not as long as median processes.

*Holotype*: No data, but probably from Otago or Canterbury, ♀, (F. W. Hutton), (designated by A. Tonnoir), (Cant. Mus.).

*Material Examined*: Holotype, 13 ♂, 16 ♀.

*New Records*: AUCKLAND: Mt. Eden, on broad-bean foliage, 14.xi.1950, 1 ♂, (R. A. Harrison), (P.D.D.). PALMERSTON NORTH: on swede plants, -iv.1931, 1 ♂, 2 ♀; 2.vii.1931, 1 ♂, 2 ♀: Massey College grounds, 6.i.1930, 1 ♂, (W. Cottier), (P.D.D.). WAIPUKURAU: 16.x.1922, 1 ♀, (Anon.), (Dom. Mus.). WELLINGTON: 20.ii.1910, 1 ♂, (F. W. Hutton), (B.M.). KAITAWA: -xi.1923, 1 ♀, (Anon.), (Dom. Mus.). KUMARA: 29.iii.1929, 1 ♂, (J. W. Campbell), (U.S.N.M.). CHRISTCHURCH: Burwood, Bottle Lake, 22.xi.1924, 1 ♂, (Anon.), (U.S.N.M.): -1934, 2 ♂, 2 ♀, (G. A. H. Helson), (B.M.). DUNEDIN: Leith, 15.xi.1916, 1 ♀, (Anon.): Andrew Bay, 7.xi.1922, 1 ♂, 1 ♀, (Anon.), (Ak. Mus.): -xi.1921, 1 ♀, (M. N. Watt), (U.S.N.M.). PARADISE: 10.i.1945, 1 ♀, (E. S. Gourlay), (Cawt. Inst.). GLENORCHY: 25.xii.1922, 1 ♀, (F. S. Oliver), (U.S.N.M.). CHATHAM ISLANDS: Pitt Island, 16-26.i.1944, 1 ♂, (E. S. Gourlay), (Cawt. Inst.). NO DATA: 2 ♀, (C. Fenwick), (Dom. Mus.): 1 ♂, (Anon.), (U.S.N.M.): 1 ♀, (Clark), (B.M.).

*Distribution*: Auckland, Palmerston North, Waipukurau, Wellington, Kaitawa, Nelson, Kumara, Christchurch, Dunedin, Paradise, Glenorchy, Chatham Islands, Auckland Islands. (July, October to April).

*Remarks*: Characterised by the dark colouration, especially the completely black median area of the front and the black median spot on the parafacials. Separated from *P. antennata* by the relatively short third segment of the antenna.

### **Poecilohetaerella antennata** sp.n. Figs. 19, 29, 30

A brown species with long antennae. Body length about 3.5 mm., wing length about 3.5 mm.

#### MALE AND FEMALE

HEAD (Fig. 19): Arista pubescent, rays of pubescence less than width of basal segments. Antenna brown; 3rd segment light brown at extreme base and about insertion of arista; antennal index about 5.5; 2nd segment with 1 strong dorsal bristle, 2 strong ventral apical bristles and black hairs mostly at or near apical margin; basal segment just longer than 2nd, enlarged apically and wider than 2nd segment, some hairs dorsally and ventrally at apex. Front blackish-brown medianly and anterior to anterior fronto-orbital bristle, light brown on anterior median region; frontal orbits greyish-white, heavily dusted. Anterior fronto-orbital bristle, about three-quarters length of posterior orbital; postverticals weak; short brown hairs on orbits and anterior region of front. Parafacials light greyish-brown with large central black or blackish-brown spot. Cheeks light greyish-brown. Fine black hairs along cheek margin and 2 bristles at lower posterior corner. Occiput greyish-brown. Eyes with few fine short hairs. Vertical diameter of eye about 4 times width of cheek in same axis. Proboscis brown; palpi dark brown with some strong black bristles.



**THORAX:** Brown; mesonotum with wide greyish-white vitta placed just lateral to dorsocentral bristles extending onto lateral scutellum and terminating at apex; propleuron and dorsal mesopleuron with trace of greyish-white dusting. All four dorsocentrals strong, the posterior one the strongest; basal scutellars parallel and longer than cruciate apicals; 1 humeral; 1 presutural; 2 notopleurals, posterior of the pair the weaker; 1 strong supraalar; 2 postalars, the inner posterior bristle weaker; 1 minute propleural hair.

Legs brown; fore coxa except base, fore trochanter, extreme apex of fore femur, extreme apex of mid femur, apical half of mid tibia, mid tarsus, extreme apex of hind femur, apical third of hind tibia, and all hind tarsus, yellowish-brown. Fore femur with bristles along postero-dorsal surface, basal half of posterior surface, apical half, and at base and apex of postero-ventral surface; mid femur with short anterior and posterior apicals; hind femur with weak preapical on antero-dorsal surface and some scarcely differentiated apicals antero-dorsally and dorsally.

Wings shaded light yellow; veins light yellowish-brown. Short stout costal spines extending about two-thirds distance between apices of 2nd and 3rd veins; 5th vein traceable very faintly to wing margin. Wing indices: costal about 3.3; 4th vein about 1.8; 4c about 0.8; 5x about 0.5.

Halteres brown apically, light brown stalk.

**ABDOMEN:** Shining brown or dark brown.

Male genitalia (Figs. 29, 30) light brown; genital arch narrowed dorsally, produced ventrally to short wide process, about 15 to 20 short bristles evenly over surface; anal plate semicircular, separated from arch by membrane and with bristles mostly near lateral margin; clasper conical, short, with small bristles. Aedeagus with pair of wide median processes ending in a wide curved hook, short lateral process; penis broad and longer than processes.

Female genital plates brown.

*Holotype:* METHVEN: McLennans Bush, 9-10.xii.1941, ♂, (*E. S. Gourlay*), (Cawt. Inst.).

*Paratypes:* Same data as holotype, (2 ♂, Cawt. Inst., 1 ♂, P.D.D.). KAPITI ISLAND: Trig Station, 7.i.1928, (*A. Castle*), (1 ♂, P.D.D., 1 ♀, Dom. Mus.). WAIHO: Waiho Gorge, 20.ii.1927, 1 ♀, (*Anon.*), (Dom. Mus.). MARTINS BAY: 1-4.ii.1955, 1 ♂, 1 ♀, (*R. R. Forster*), (Cant. Mus.).

Three damaged specimens with the same data as the holotype are in the Cawthron Institute collection.

*Material Examined:* Holotype, 5 ♂ and 3 ♀ paratypes, 3 ex.

*Distribution:* Kapiti Island, Waiho, Methven, Martins Bay. (December to February).

*Remarks:* Separated from other species of the genus, except *P. scutellata*, by the long antennae, and from *P. scutellata* by the colouration of the front and characters of the male genitalia. Tonnoir and Malloch (1926b) record a male which they place doubtfully as *P. minuta* and which apparently has similarly shaped antennae. *P. antennata* cannot be confused with this specimen because the parafacials have a black spot and the base of the wings are not darkened as in *P. minuta*. As both males and females are known in the present species and are structurally very similar, the conjecture that the suspected male of *P. minuta* shows sexual characters in having the elongate antenna may be false and that specimen could readily represent a new species.

In the present series of *P. antennata*, females have darker brown abdomens than the males. The pair taken at Martins Bay are distinctly darker than all the other specimens. An examination of all characters, including the male genitalia, shows that there can be no doubt that these

specimens are *P. antennata*. If they are truly representative of the Martins Bay population, then that population can be separated from others by its dark brown or blackish-brown colour.

**Pocillohetaerella minuta** Tonnoir and Malloch. Fig. 20

*Pocillohetaerella minuta* Tonnoir and Malloch, 1926. Rec.  
Cant. [N.Z.] Mus. 3 : 26.

A dark brown species with dark brown wing bases. Body length about 3.0 mm., wing length about 3.5 mm.

FEMALE

**HEAD** (Fig. 20): Arista pubescent, rays much less than diameter of basal segment. Antenna light brown; 3rd segment brown on apical two-thirds and almost dark brown at apex; antennal index about 3.3; 2nd segment with 1 strong dorsal apical bristle, 2 strong ventral bristles and short black hairs; basal segment brown, with black hairs on apical margin. Front velvety dark brown with light brown area at anterior median region; frontal orbits greyish-white and heavily dusted. Anterior fronto-orbital bristle about equal to length of posterior; postverticals weak; a few minute hairs on front, chiefly on anterior region. Parafacials yellowish-brown and merging into whitish-grey frontal orbits dorsally; ptilinal suture dark brown dorsally. Cheeks yellowish-brown. Row of hairs along cheek margin; 2 strong bristles at lower posterior angle of cheek. Occiput brown or dark brown. Eyes with few, very fine short hairs. Vertical diameter of eye about 4.5 times width of cheek in same axis. Proboscis brown; palpi dark brown with 1 strong apical bristle and other short bristles.

**THORAX**: Generally shining dark brown; mesonotum with wide greyish-white longitudinal vitta lying just lateral to dorsocentrals, extending onto and ending at apex of scutellum; propleuron and prosternum light brown. Prescutellars short; all four dorsocentrals strong, the presutural one the weakest; basal scutellars convergent and about equal in length to the parallel apicals; 1 humeral; 1 presutural; 2 notopleurals: 1 supraalar; 2 postalars, both strong; propleuron bare.

Legs brown; fore coxa, fore trochanter, base of fore femur, mid trochanter, base of mid femur, apical half of mid tibia, mid tarsus, apical half of hind tibia and hind tarsus, light brown. Fore femur with strong bristles on postero-dorsal surface, 2 on basal half of posterior surface, and about 3 strong on apical half and 1 fine basal on postero-ventral surface; hind femur with 1 preapical antero-dorsal and few short apical dorsals.

Wings light yellow, brown or dark brown basally; veins light brown. Short stout costal spines extending about three-quarters distance between apices of 2nd and 3rd veins; 5th vein traceable to wing margin. Wing indices: costal about 3.0; 4th vein about 1.6; 4c about 0.8; 5x about 0.9.

Halteres dark brown apically, light brown basally.

**ABDOMEN**: Shining dark brown.

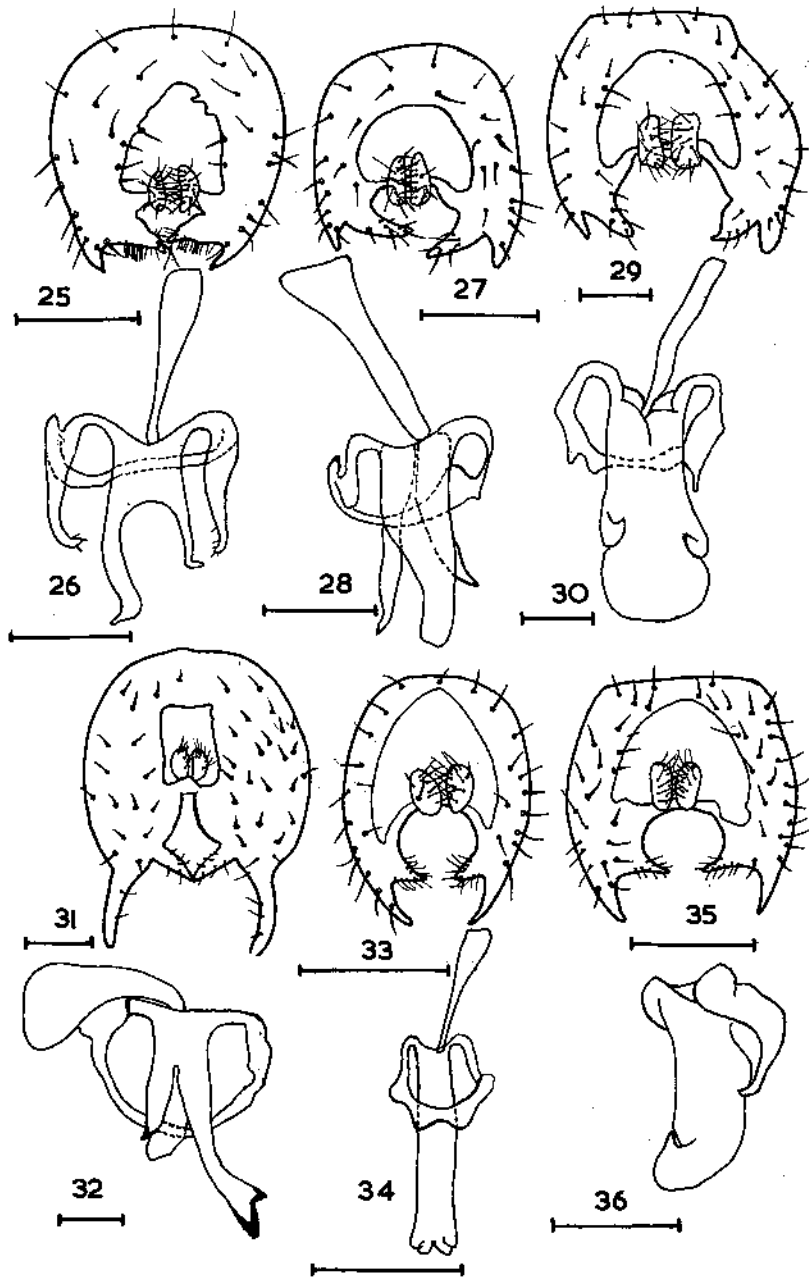
*Holotype*: OTIRA: 8.ii.1922, ♀, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined*: Holotype, 3 ♀.

*New Records*: ARTHURS PASS: 23.i.1943, 2 ♀, (*E. S. Gourlay*), (Cawt. Inst. and P.D.D.). KUMARA: No date, 1 ♀, (*J. W. Campbell*), (U.S.N.M.).

*Distribution*: Kumara, Otira, Arthurs Pass, Waiho. (January, February).

*Remarks*: Tonnoir and Malloch (1926b) recorded a male which they placed tentatively as this species. The specimen has not been located. They suspect the elongate antennae as being a sexual character, but this is a doubtful conclusion because of the similarity of antennae in males and females of *P. antennata*. In no species of this genus is sexual dimorphism marked. The dark brown wing base and absence of black spot on the parafacials are the important distinguishing characters of this species.



Figs. 25-36. External and internal male genitalia

- |  |   |
|--|---|
| 25, 26. <i>Poecilohetaerella bilineata</i> | 31, 32. <i>P. punctatifrons</i>               |
| 27, 28. <i>P. scutellata</i>               | 33, 34. <i>Poecilohetaerus punctatifacies</i> |
| 29, 30. <i>P. antennata</i>                | 35, 36. <i>Poecilohetaerella dubiosa</i>      |

Scale: Figs. 29-30, 0.1 mm.; Figs. 25-28, 31-36, 0.25 mm.

## **Poecilohetaerella watti** Tonnoir and Malloch

*Poecilohetaerella watti* Tonnoir and Malloch, 1926. Rec.  
Cant. [N.Z.] Mus. 3 : 26.

A brown to dark brown species. Body length about 3.5 mm.

### MALE

**HEAD:** Antenna with 3rd segment blackened apically. Front yellowish-orange, frontal orbits greyish-white heavily dusted, a blackish-brown velvety spot anterior to anterior fronto-orbital. Parafacials dusted with greyish-white, without black median spot but with reddish-brown shaded area beneath dusting, dorsally. Palpi black, yellowish-brown basally.

**THORAX:** Reddish-yellow; mesonotum with traces of 3 brown or dark brown vittae overlaid with white dust. Two rows of acrostichal hairs.

Legs yellowish-orange; fore femur and tibia except bases and entire fore tarsi, black.

Wings yellowish-brown. Inner cross vein placed slightly beyond middle of discal cell.

Halteres yellowish-brown.

**ABDOMEN:** Glossy; tergites largely blackened, basal tergites and external genitalia yellowish-orange, posterior margin of tergites black. External genitalia large.

*Holotype:* WANGANUI: 26.ix.1921, ♂, (*M. N. Watt*), (lost ?).

*Remarks:* The holotype is apparently lost and no other specimens referable to this species have been discovered. The description above is taken from Tonnoir and Malloch (1926b). The species would appear to be easily separated from the other species by the absence of the distinct black spot on parafacials and the presence of a spot anterior to the anterior orbital bristle.

## **Poecilohetaerella scutellata** sp.n. Figs. 22, 27, 28

A brown or dark brown species with light brown or yellowish-brown head. Body length about 4.0 mm., wing length about 4.5 mm.

### MALE

**HEAD** (Fig. 22): Arista about 1.75 times length of 3rd antennal segment; rays of pubescence just shorter than width of basal segment. Antenna light brown; 3rd segment gradually darkening from light brown basally to dark brown apically; antennal index about 4.5; 2nd segment with 1 long dorsal and 3 long ventral bristles and black hairs mostly about apical margin; basal segment just longer than 2nd segment, narrow basally, and apically as wide as 2nd segment, apical black hairs dorsally and ventrally. Front yellowish-brown; vertex light greyish-brown; ocellar region dark brown; frontal orbits greyish-white heavily dusted, with brown spot just anterior to anterior orbital bristle. Anterior fronto-orbital about three-quarter length posterior orbital; postverticals small, a few minute hairs on orbits anteriorly and on anterior median region of front. Parafacials light brownish-grey, large dark brown spot on dorsal half. Cheeks light yellowish-grey anteriorly, merging to light brown and brown posteriorly. A row of small hairs along cheek margin, 2 strong black bristles towards lower posterior corner. Occiput greyish-brown, heavily dusted. Eyes with few fine hairs. Vertical diameter of eye about 4.5 times width of cheek in same axis. Proboscis dark reddish-brown; palpi dark brown with strong bristles towards apex.

**THORAX:** Brown; mesonotum with greyish-white longitudinal vitta just lateral to dorsocentrals, extending along lateral margin of disc of scutellum and ending at apex; scutellum light brown; mesopleuron and sternopleuron shining dark brown; other pleura brown. Prescutellars weak; all four dorsocentrals strong, posterior bristle stronger than rest, anterior bristle placed well forward; basal scutellars stronger than apicals; 1 humeral; 1 strong presutural; 2 notopleurals, posterior one weaker; 1 supraalar; 2 postalar, posterior median bristle weaker; propleuron bare.

Legs: Fore leg brown, coxa, trochanter, base and apex of femur, and base and apex of tibia light brown, tarsus dark brown; mid leg light brown, femur

except base and apex brown; hind leg light brown, femur except base and apex dark brown. Fore femur with bristles on postero-dorsal surface, 1 median bristle on posterior surface, 2 strong bristles on apical half and 1 weak basal on postero-ventral surface; mid femur with anterior and posterior apical bristles; mid tibia with 1 strong and other apicals; hind femur with weak antero-dorsal preapical and apical, and weak dorsal apical.

Wings uniformly shaded light yellow; veins yellowish-brown. Short costal spines extending three-quarters distance between apices of 2nd and 3rd veins; 5th vein traceable to wing margin. Wing indices: costal about 3.7; 4th vein about 1.7; 4c about 0.7; 5x about 0.5.

Halteres brown, stalk light brown.

**ABDOMEN:** Shining blackish-brown.

Male genitalia (Figs. 27, 28): Genital arch brown with about 25 short bristles on either side, pointed ventrally; anal plate small, semicircular, separated from arch by wide membrane with about 25 bristles over outer surface; clasper conical attached to inner surface of arch by flattened base. Aedeagus with a short lateral process ending in a strong bristle, pair of long unequal median processes with heavily chitinised spine-like apex; penis broad basally, longer than median processes.

*Holotype:* RIMUTAKA RANGES: 24.ii.1928, ♂, (*A. Castle*), (Dom. Mus.).

*Material Examined:* Holotype.

*Distribution:* Rimutaka Ranges (February).

*Remarks:* Only one specimen is known. The colouration of the head shows some similarity to *P. punctatifrons*. However, the body is darker, the male genitalia quite distinct, lacking the long ventral process on the genital arch, and the antennae are much longer than in *P. punctatifrons*. The scutellum is yellowish-brown and this stands out in contrast to the dark brown mesonotum.

### **Poecilohetaerella dubiosa** Tonnoir and Malloch. Figs. 18, 35, 36

*Poecilohetaerella dubiosa* Tonnoir and Malloch, 1926. Rec. Cant. [N.Z.] Mus. 3 : 25.

A brown species with dark brown abdomen. Body length about 3.5 mm., wing length about 3.5 mm.

#### MALE AND FEMALE

**HEAD** (Fig. 18): Arista pubescent; rays of pubescence less than width of basal segment. Antenna light brown; 3rd segment brown to dark brown apically; antennal index about 2.5; 2nd segment with strong dorsal bristle, 2 weak ventral bristles and black hairs mostly on apical margin; basal segment with some apical dorsal black hairs. Front orange-brown in middle, bordered laterally by dark brown vittae, which widen anteriorly in front of anterior orbital bristle and are almost black in this region; frontal orbits light brownish-grey, heavily dusted; ocellar area black or blackish-brown. Anterior fronto-orbital bristle about three-quarters length posterior orbital; postverticals weak; few very short brown hairs between orbital bristles and on anterior region of front. Parafacials brownish-grey, heavily dusted and with large blackish-brown spot at centre. Cheeks yellowish-brown. Short black hairs along cheek margin; 2 strong bristles at lower posterior corner of cheek. Occiput brown with light colouring of orbits continued down occiput. Eyes bare. Vertical diameter of eye about 4 times width of cheek in same axis. Proboscis brown; palpi dark brown with strong bristles.

**THORAX:** Brown with a light dusting; mesonotum with wide whitish-grey vitta just lateral to dorsocentrals, extending onto lateral scutellum and ending at apex; a faint brown, narrow, median, longitudinal vitta between dorsocentrals evident in some specimens, particularly anteriorly; faint narrow light brown dusted vitta from propleuron across spiracle onto mesonotum. All 4 dorsocentrals strong, the presutural one placed well forward; divergent scutellars equal in length to cruciate apicals; 1 humeral; 1 presutural; 2 notopleurals; 1 supraalar; 2 postalar, the inner posterior of the pair the weaker; 1 very fine propleural hair.

Legs light brown; fore femur, fore tibia except apex, fore tarsus, basal half of mid tibia, hind femur, and basal half of hind tibia, brown. Fore femur with bristles on postero-dorsal surface, a few on posterior surface and 3 strong bristles on apical half and 1 weak basal on postero-ventral surface; mid femur with apicals on anterior and posterior surfaces; hind femur with 1 preapical antero-dorsal bristle, and few dorsal apicals.

Wings shaded pale yellow, veins very light brown. Short stout costal spines extending three-quarters distance between apices of 2nd and 3rd veins; 5th vein only faintly traceable to wing margin. Wing indices: costal about 3.4; 4th vein about 1.9; 4c about 0.8; 5x about 0.7.

Halteres light brown; apex dark brown.

ABDOMEN: Shining blackish-brown.

Female genital plates light brown.

Male genitalia (Figs. 35, 36): Genital arch light brown ventrally, ending in short pointed process, 35 to 40 bristles placed evenly over surface of each side; anal plate small, semicircular, separated from arch by wide membrane, with bristles over most of surface; clasper, conical with wide base, attached near lateral margin of arch, small bristles over surface. Aedeagus with lateral process with preapical bristle, pair of short median processes; penis large.

*Holotype*: CHRISTCHURCH: Kennedys Bush, 29.i.1925, ♀, (*Anon.*), (Cant. Mus.).

*Material Examined*: Holotype, 3 ♂, 5 ♀.

*New Records*: WELLINGTON: 14.xi.1949, 1 ♀, (*Anon.*), (Dom. Mus.). STEPHENS ISLAND: 14-28.i.1933, 3 ♂, 3 ♀, (*E. S. Gourlay*), (Cawt. Inst.). NELSON: Tahunanui, 11.ii.1954, 1 ♀, (*E. S. Gourlay*), (Cawt. Inst.).

*Distribution*: Wellington, Stephens Island, Nelson, Christchurch. (February).

### **Poecilohetaerella punctatifrons** Tonnoir and Malloch. Figs. 21, 31, 32

*Poecilohetaerella punctatifrons* Tonnoir and Malloch, 1926.

Rec. Cant. [N.Z.] Mus. 3 : 25.

A light brown species with dark brown abdomen. Body length about 4.0 mm., wing length about 4.0 mm.

#### MALE AND FEMALE

HEAD (Fig. 21): Arista pubescent, rays of pubescence shorter than width of basal segment. Antenna yellowish-brown; 3rd segment brown on about apical half, slightly tapering towards rounded apex, widest at insertion of arista; antennal index about 2.1; 2nd segment with 1 dorsal bristle, strong hairs about outer lateral apical margin and medianly placed on inner lateral margin, 2 or 3 of those at ventral area much stronger than others; basal segment with few dorsal and ventral apical hairs. Front yellowish-brown, orbits greyish-brown with dark brown spot anterior to anterior fronto-orbital and narrowly bordered laterally with whitish-grey which expands anteriorly at region of antennae to full width of orbit. Anterior fronto-orbital about equal to length of posterior orbital; a few, very fine short black hairs scattered over anterior region of front. Parafacials with dark brown spot heavily dusted with grey opposite base of antennae. Cheeks yellowish-brown. Fine hairs along cheek margin and two strong black bristles at lower posterior corner of cheek. Occiput light brown with grey dusting. Eyes with few fine short hairs. Vertical diameter of eye about 3.5 times width of cheek in same axis. Proboscis brown; palpi dark brown with strong bristles.

THORAX: Yellowish-brown; mesonotum with a faint greyish-white longitudinal vitta lateral to dorsocentrals and extending onto lateral margins of scutellum; pleura light brown. All 4 dorsocentrals strong, posterior bristle the strongest; hairs on mesonotum scarce and mainly in 2 acrostichal rows; basal scutellars parallel or convergent and about equal in length to apicals; 1 humeral; 1 strong presutural; 2 notopleurals; 1 supraalar; 2 strong postalar; 1 small propleural hair.

Legs yellowish-brown; apex of fore tibia and all fore tarsus brown or dark brown. Fore femur with bristles on postero-dorsal, posterior and apical half of

postero-ventral surfaces, the latter bristles the strongest; hind femur with preapical on antero-dorsal surface and some weak dorsal apicals.

Wings light brown, slightly darker brown at base; veins yellowish-brown. Short stout costal spines extending about three-fifths distance between apices of 2nd and 3rd veins; 5th vein traceable to wing margin. Wing indices: costal about 3.6; 4th vein about 1.5; 4c about 0.6; 5x about 0.6.

Halteres light brown, darker apically.

ABDOMEN: Shining dark brown with basal segments often brown or light brown.

Male genitalia (Figs. 31, 32): Genital arch light brown, narrowed ventrally to long dark reddish-brown process over half length of arch; about 30 small bristles evenly distributed over arch, ventral process with few bristles of similar strength; anal plate small, semicircular, with bristles on median half, separated from arch by narrow membrane; claspers dark reddish-brown, conical, attached to arch near median lateral margin, bristles scattered over whole surface. Aedeagus with 2 distinctly unequal median processes, right one the longer and divided into 2 apical spines, both dark brown apically; penis just longer than shorter of these processes.

*Holotype*: OTIRA: 9.ii.1922, ♂, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined*: Holotype, 1 ♂ paratype, 5 ♂, 3 ♀, 1 ex.

*New Records*: TARARUA RANGES: Slopes of Table Top, 4.xii.1952, 1 ♂, (*B. A. Holloway*), (Dom. Mus.). KUMARA: 20.xi.1929, 1 ♂, (*J. W. Campbell*), (U.S.N.M.). ARTHURS PASS: 23.i.1943, 1 ♂, 1 ♀, (*E. S. Gourlay*), (Cawt. Inst.). MAKARORA: 1-1,800 ft. -.xii.1924, 1 ♂, (*Fenwick*), (Dom. Mus.). BOLD PEAK: 27.xii.1944 to 1.i.1945, 2 ♀, (*E. S. Gourlay*), (Dom. Mus.). NO DATA: 1 ex, (*J. W. Campbell*), (U.S.N.M.): 1 ♂, (*J. Muggeridge*), (B.M.).

*Distribution*: Tararua Ranges, Kumara, Mt. Arthur, Otira, Arthurs Pass, Cass, Banks Peninsula, Makarora, Bold Peak. (November to February).

*Remarks*: A relatively large species recognised by the colouration of the front and face. Males can be distinguished by the external genitalia, the dark brown ventral processes of the genital arch being normally clearly visible *in situ*. The length of the third antennal segment is the most satisfactory character for separating this species from *P. scutellata*. Tonnoir and Malloch (1926b) record a variety *obscura* but the specimens of this so-called variety have not been located in collections.

## GENUS POECILOHETAERUS Hendel

*Poecilohetaerus* Hendel, 1907. Wien. ent. Ztg. 26:228.

Arista dark brown. Anterior fronto-orbitals convergent. Face not glossy, almost flat. Prescutellars present; 1 presutural and 3 postsutural dorsocentrals; 1 mesopleural; 2 sternopleurals; prosternum bare. Strong preapicals on fore and mid tibiae, absent on hind tibia.

Type Species: *Poecilohetaerus decora* (Schiner)

Very close to *Poecilohetaerella* Tonnoir and Malloch, and separated from that genus by the dark brown arista and non-glossy face. The male genitalia of both genera are of a similar pattern.

The type species is Australian.

*Distribution*: Australia, New Zealand.

*Species Occurring in New Zealand*:

*Poecilohetaerus punctatifacies* Tonnoir and Malloch

**Poecilobetaerus punctatifacies** Tonnoir and Malloch. Figs. 11, 24, 33,  
34

*Poecilobetaerus punctatifacies* Tonnoir and Malloch, 1926.  
Rec. Cant. [N.Z.] Mus. 3 : 24.

Generally a yellowish-brown species with brown areas on legs and abdomen.  
Body length about 3.0 mm., wing length about 3.5 mm.

MALE AND FEMALE

**HEAD** (Fig. 11): Arista thickly and evenly pubescent, rays of pubescence just less than diameter of basal segment. Antenna light brown; 3rd segment brown on dorsal and apical margins; antennal index about 2.0; 2nd segment with 1 dorsal bristle and 2 about same length on ventral apical margin, short black hairs on apical margin and a few on dorsal margin, apical hairs towards ventral margin longer than dorsal hairs; basal segment with few apical dorsal hairs. Front with light brown median longitudinal area often lighter in mid line and a broad grey dusted stripe between this area and eyes, anteriorly the light brown area is wider and curves back lateral to anterior fronto-orbital; ocellar area dark brown. Anterior fronto-orbital about two-thirds length of posterior orbital; verticals, especially inner vertical, strong; postverticals and ocellars weaker; 1 or 2 minute hairs between orbitals, anterior to anterior orbital and towards median anterior region of front. Face light yellowish-brown with grey dusting and a dark brown spot in middle of either side of face. Cheeks yellowish-brown. Row of small hairs along cheek to the 3 strong bristles at lower posterior corner. Occiput light greyish-brown. Eyes with few, very fine short hairs. Vertical diameter of eye about 6 times width of cheek in same axis. Proboscis light brown, palpi dark brown and with long apical bristle.

**THORAX**: Mesonotum yellowish-brown with light grey dusting, brown median longitudinal vitta not quite as wide as distance between dorsocentrals and extending onto disc of scutellum; lateral, light brown vitta from dorsal humerus through presutural bristle to region dorsal to supraalar and anterior postalar; pleura generally light yellowish-brown. All four dorsocentrals strong, posterior the strongest; basal scutellars parallel and equal to divergent apicals; 1 humeral; 1 presutural; 2 notopleurals; 1 supraalar; 2 postalar; 1 small propleural.

Legs yellowish-brown; light brown annulus near apex of all femora and base of all tibiae; fore tarsus brown. Fore femur with irregular double row of strong bristles on postero-dorsal surface and strong bristles on apical half of postero-ventral surface; fore tibia with weak apical; mid tibia with strong apical; hind femur with weak preapical on antero-dorsal surface and several weak dorsal apicals; hind tibia without apical.

Wings (Fig. 24) clear; veins light brown. Short stout costal spines extending about two-thirds distance between apices of 2nd and 3rd veins; 5th vein weakened apically but just traceable to wing margin. Wing indices: costal about 2.7; 4th vein about 1.7; 4c about 0.9; 5x about 0.75.

Halteres light brown.

**ABDOMEN**: Shining light brown.

Male genitalia (Figs. 33, 34) brown; genital arch narrow and ending ventrally in a wide spine-like process, bristles over most of surface; anal plate small with many bristles about size of those on arch; claspers conical with short hairs over surface. Aedeagus without any well developed median or lateral processes; penis long.

**Holotype**: BANKS PENINSULA: Hilltop, 15.i.1925, ♀, (*A. Tonnoir*), (Cant. Mus.).

**Material Examined**: Holotype, 9 paratypes, 8 ♂, 17 ♀.

**New Records**: WAITAKERE RANGES: Titirangi, ex light trap, 24.i.1953, 1 ♀; 11.ii.1953, 1 ♂; 18.ii.1953, 1 ♂; 19.ii.1953, 2 ♀; 28.ix.1955, 1 ♀, (*C. R. Thomas*), (P.D.D.). AUCKLAND: Grafton, on foliage, 1.ix.1940, 1 ♂, 5 ♀; —, 1940, 1 ♂, (*D. Spiller*), (P.D.D.). OHAKUNE: —, 1923, 2 ♂, 2 ♀, (*T. R. Harris*), (Cawt. Inst.). OHANGAI: 27.xii.1927, 1 ♀, (*A. Castle*), (Dom. Mus.). WELLINGTON: Karori, Fort Hill, 22.i.1947, 1 ♀, (*R. R. Forster*), (Dom. Mus.). NELSON:



28.x.1943, 1 ♀, (*E. E. Walker*), (Cawt. Inst.): Wakapuaka, swept off broom, 21.xi.1949, 1 ♀, (*A. W. Parrott*), (Cawt. Inst.). OTAGO: Martins Bay, 1-4.ii.1955, 1 ♂, (*R. R. Forster*): McKerrow Hut, 6.ii.1955, 1 ♀, (*R. R. Forster*), (Cant. Mus.). NO DATA: 1 ♀, (Ak. Mus.): 1 ♂, (*J. Muggeridge*), (B.M.).

*Distribution*: Waitakere Ranges, Auckland, Ohakune, Ohangai, Wellington, Nelson, Okariha, Lake Brunner, Waiho, Banks Peninsula, Otago. (August to April).

## Family SCIOMYZIDAE

Not more than three fronto-orbitals; postverticals parallel or divergent. Vibrissa absent. Clypeus not produced. Prosternum and propleuron normally separated by membrane. Femora with bristles. Tibiae with preapical bristles. Subcosta ending in costa and well separated from first vein at apex; anal vein usually reaching wing margin; second basal and anal cells small; costa unbroken.

Recognised by the parallel or divergent postverticals, absence of vibrissa, unbroken costa, and the usually complete anal vein.

Two major subfamilies, Sciomyzinae and Tetanocerinae, have been recognised in the Sciomyzidae (Seguy, 1934). Additional subfamilies of minor importance have also been recognised (Seguy, 1934; Colyer and Hammond, 1951), but these do not occur in New Zealand. The New Zealand representatives can be readily segregated into the two major subfamilies, and on the basis of the New Zealand fauna these two subfamilies appear to be natural divisions of the family. Malloch (1933d), however, could not satisfactorily divide the American sciomyzids into subfamilies and whether or not the present subfamily concepts can be retained for the world fauna can only be decided by a major revision of the family.

### *Genera Occurring in New Zealand:*

*Eulimnia* Tonnoir and Malloch  
*Helosciomyza* Hendel  
*Huttonina* Tonnoir and Malloch  
*Neolimnia* Tonnoir and Malloch  
*Polytocus* Lamb  
*Prosochaeta* Malloch  
*Xenosciomyza* Tonnoir and Malloch

### KEY TO SUBFAMILIES OF SCIOMYZIDAE

Propleural bristle present ..... SCIOMYZINAE (p. 36)  
 Propleural bristle absent or represented by 1 or few minute hairs  
 ..... TETANOCERINAE (p. 56)

## Subfamily SCIOMYZINAE

### KEY TO GENERA OCCURRING IN NEW ZEALAND

1 Arista arising near base of 3rd antennal segment ..... 2  
 Arista arising near apex of 3rd antennal segment .... PROSOCHAETA (p. 37)  
 2 Hind tibia with 1 preapical dorsal bristle ..... POLYTOCUS (p. 39)  
 Hind tibia with 2 preapical dorsal bristles ..... 3  
 3 Not more than 2 dorsocentrals ..... HELOSCIOMYZA (p. 41)  
 Four dorsocentrals, anterior one presutural ..... XENOSCIOMYZA (p. 53)

## Genus PROSOCHAETA Malloch

*Prosochaeta* Malloch, 1935. Rec. Cant. [N.Z.] Mus. 4: 95.

Arista preapical. Second antennal segment longer on inner side. Four verticals; postverticals parallel and posterior to vertex; 3 fronto-orbitals; ocellars minute and divergent. Face concave. One dorsocentral; scutellum bare; mesopleuron with bristle and hairs; propleural present; sternopleurals present. Hind tibia with antero-dorsal and dorsal preapical bristles. Wings shaded; no costal spines; anal vein terminated about three-quarters length to wing margin.

Type Species: *Prosochaeta prima* Malloch.

Separated from all other genera in the subfamily in New Zealand by the presence of the preapical arista.

The palearctic genus *Tetanura* (subfamily Tetanurinae) also has a preapical arista (Seguy, 1934; Colyer and Hammond, 1951), but it has no relationship at all to *Prosochaeta* which is a member of the subfamily Sciomyzinae. With two preapical bristles on the hind tibia and the prolonged inner surface of the second antennal segment, the genus appears most closely related to *Xenosciomyza*. The incomplete anal vein is similar to that found in *Huttonina*.

Distribution: New Zealand.

Species: *Prosochaeta prima* Malloch.

### **Prosochaeta prima** Malloch. Figs. 43, 46, 47, 52

*Prosochaeta prima* Malloch, 1935. Rec. Cant. [N.Z.] Mus. 4: 95.

A brown species, heavily dusted. Wings with distinctive transverse darkened areas. Body length 7.0 mm., wing length 6.5 mm.

#### MALE AND FEMALE

HEAD (Fig. 52): Arista arising at about apical quarter of 3rd antennal segment; light brown on basal half and blackish-brown on apical half; minutely pubescent; axis gradually tapering to apex. Antenna light brown; 2nd segment with black hairs, largest about apical margin, particularly dorsally and ventrally; 1st segment with black hairs dorsally. Front about as long as wide, brown or yellowish-brown with much dusting; median stripe often more shining than rest of front, and yellow to light brown; ocellar area distinctly raised and often dark brown. All three fronto-orbitals directed outwards, the posterior also somewhat reclinate and the 2 anterior bristles also somewhat proclinate, anterior shortest of the three; black hairs on anterior half of front and on length of frontal orbits. Face yellowish-brown, concave. Cheeks light yellowish-brown, haired on ventral half; about 3 bristles towards lower posterior angle of cheek. Occiput light brown. Eyes with few, very short hairs. Vertical diameter of eye about 3.5 times width of cheek in same axis. Proboscis dark brown; palpi yellowish-brown with numerous black hairs over most of its length.

THORAX: Brown or light brown with much dusting; mesonotum with median longitudinal narrow dark brown vitta; humerus light brown; scutellum brown to light brown. Prescutellars absent; parallel basal scutellars shorter than cruciate apicals; 1 humeral; presutural absent; 2 notopleurals; 1 supraalar; 2 postalars; 2 strong sternopleurals; propleural small; prosternum bare.

Legs light brown. Fore femur with 2 rows of postero-dorsal bristles; fore tibia with weak preapical; mid femur with small anterior and posterior apicals; mid tibia with preapical and several apicals, ventral one strong; hind tibia with 1 dorsal preapical and a weaker antero-dorsal preapical.

Wings (Fig. 43): Terminal section of 5th vein often curved towards apex and fading out before reaching wing margin; costal spines ending about one-third distance between apices of 2nd and 3rd veins; cross vein separating 2nd basal and discal cells not quite complete. Wing indices: costal about 4.0; 4th vein about 1.3; 4c about 0.5; 5x about 0.3.

Halteres brown, light brown basally.

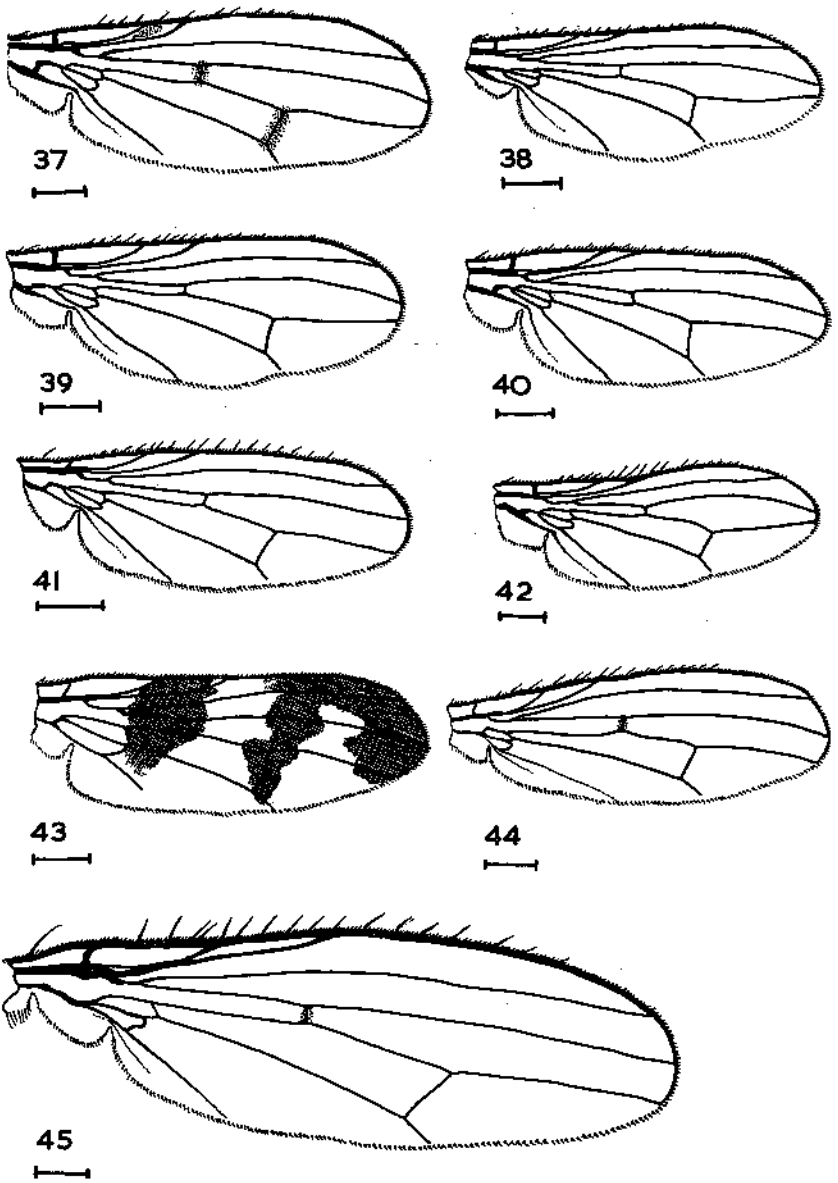


Fig. 37. Wing of *Helosciomyza femorata*  
 " 38. " " *H. subspinicosta*  
 " 39. " " *H. spinicosta*  
 " 40. " " *H. pseudosetuligera*  
 " 41. " " *H. subalpina*  
 " 42. " " *H. similima*  
 " 43. " " *Prosochaeta prima*  
 " 44. " " *Xenosciomyza prima*  
 " 45. " " *Polytocus spinicosta*  
 Scale: 1.0 mm.

ABDOMEN: Female: Tergites 1 to 3, broad, brown and dusted; tergite 3 often mainly yellowish-brown; remaining tergites shining reddish-black or reddish-brown.

Male (Figs. 46, 47): Tergites 1 to 5 brown and dusted. External genitalia enlarged and shining light brown; genital arch with fine long bristles on either side on dorsal half of posterior margin, few distinct short bristles over most of posterior two-thirds of surface; anal plate absent; clasper about half height of arch, rectangular with apical side convex and with about 4 or 5 minute protuberances, minute hairs on surface mostly on inner surface. Penis long and narrow with enlarged apex consisting of a pair of sacs covered with minute scales.

*Holotype*: AUCKLAND: no date, ♂, (D.E.I.).

*Material Examined*: 1 ♂, 4 ♀.

*New Records*: WAITAKERE RANGES: Titirangi, 27.xii.1942, 1 ♀; -iv.1947, 1 ♀, (M. Carter), (P.D.D.). KAITAWA: 19.xii.1922, 1 ♂, (Ethel Richardson), (Dom. Mus.). BANKS PENINSULA: Dyers Pass, 29.i.1927, 1 ♀, (Anon.), (Ak. Mus.). MT. ARTHUR: Gordons Pk., 2.iii.1927, 1 ♀, (A. Philpott), (Cawt. Inst.).

*Distribution*: Waitakere Ranges, Auckland, Kaitawa, Mt. Arthur, Banks Peninsula. (December, January, March, April).

*Remarks*: The holotype has not been examined. It was in poor condition when it was described, and Malloch (1935) considered it to have been in liquid at one stage. The additional specimens now known are intact, well preserved and have not been in liquid, with the result that the colouration of the body and the pattern of the wing appear more distinct and well defined than in the holotype.

### Genus POLYTOCUS Lamb

*Polytocus* Lamb, 1909. "Subantarct. Is. N.Z." 1: 144. Tonnoir and Malloch, 1928. Rec. Cant. [N.Z.] Mus. 3: 156.

Antenna perfect, 2nd and 3rd segments almost equal, and both much longer than basal segment. Front produced anteriorly. Two or 3 verticals. Face receding. Clypeus prominent. Prescutellars present; 4 dorsocentrals, anterior bristle presutural; presutural bristle present; 2 sternopleurals; 1 propleural. Costa with very strong spines; anal vein reaching wing margin.

*Type Species*: *Polytocus spinicosta* Lamb.

Lamb (1909) placed this genus in the Dryomyzidae and this designation was accepted by Hendel (1937) who did not examine the specimens. Tonnoir and Malloch (1928) placed it as a member of the Sciomyzinae and examination of specimens has shown that this is correct. Closest relatives appear to be *Helosciomyza* Hendel and *Xenosciomyza* Tonnoir and Malloch. It is separated from these two genera by having only one preapical bristle on the hind tibia. A character which may be of generic value is the hairiness of the male as compared with the female. This character is pronounced in the type species.

*Distribution*: New Zealand.

*Species*: *Polytocus spinicosta* Lamb

### *Polytocus spinicosta* Lamb. Figs. 45, 49, 53

*Polytocus spinicosta* Lamb, 1909. "Subantarct. Is. N.Z." 1: 144. Tonnoir and Malloch, 1928. Rec. Cant. [N.Z.] Mus. 3: 157.

A yellowish-brown and light brown species. Body length about 16.0 mm. in males; 13.0 mm. in females. Wing length about 16.0 mm. in males; 13.0 mm. in females.

MALE

HEAD (Fig. 53): Arista dark brown, light brown basally; minutely pubescent. Antenna yellowish-brown; 3rd segment light brown; 2nd segment just longer than 3rd, 1 dorsal bristle and black hairs over most of surface; basal segment with short black hairs mainly at dorsal apical margin. Front light brown. Two fronto-orbitals close together, anterior directed outwards and just longer than posterior; inner verticals strong; ocellars strong; black hairs on front except ocellar triangle. Face yellowish-brown; no antennal fossae but face produced medianly into a broad carina; parafacials broad. Cheeks light brown. Long black hairs on most of cheek and 3 bristles at lower posterior corner. Occiput yellowish-brown. Eyes bare. Vertical diameter of eye about 1.4 times width of cheek in same axis. Proboscis light brown; palpi yellowish-brown, black hairs over most of its surface.

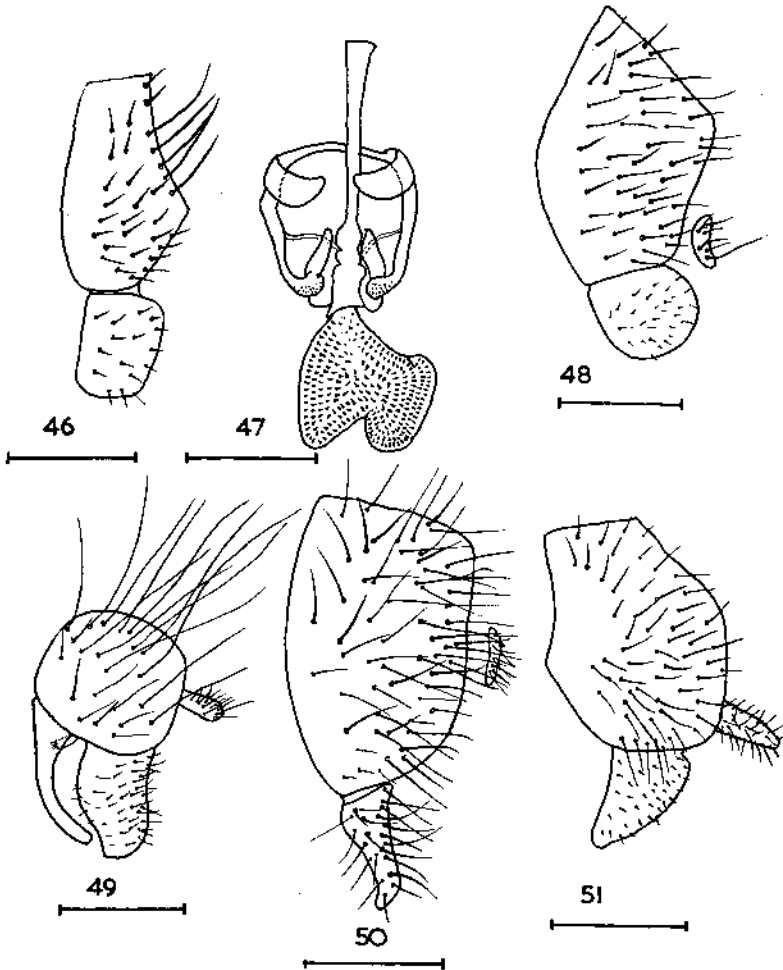


Fig. 46. External male genitalia of *Prosochaeta prima*  
 " 47. Internal " " "  
 " 48. External male genitalia of "*Helosciomyza rara*"  
 " 49. " " " "*Polytocus spinicosta*"  
 " 50. " " " "*Helosciomyza femorata*"  
 " 51. " " " "*Xenosciomyza turbotti*"

Scale: Figs. 46-50, 0.5 mm.; Fig. 51, 1.0 mm.

**THORAX:** Light brown or light reddish-brown. Anterior 2 dorsocentrals weaker than posterior 2; divergent basal scutellars just longer than cruciate apicals; scutellum bare; strong humeral; 2 notopleurals, anterior bristle strong; 1 strong supraalar; 2 strong postalar; mesopleuron and pteropleuron bare; prosternum bare.

Legs yellowish-brown. Long fine hairs thickly on all legs; fore femur with strong bristles on postero-dorsal and apical third of postero-ventral surfaces; fore tibia with preapical; mid tibia with preapical and several ventral apicals; mid tarsus with short spines at apices of each segment ventrally; hind tibia with preapical and short ventral apical; hind tarsus with short anterior spines at apices of segments.

Wings (Fig. 45) long and narrow; shaded uniformly with light brown; brown shading about the 2 cross veins; veins light brown. Costa with 2 rows of strong black spines from a point distal to humeral cross vein to near apex of 2nd vein, all spines greater than diameter of costa, those before apex of subcosta the strongest; short stout black costal spines ending three-quarters distance from apex of 2nd vein to apex of 3rd vein. Fifth vein not reaching wing margin; 2nd basal and anal cells small. Wing indices: costal about 6.4; 4th vein about 1.4; 4c about 0.3; 5x about 0.5.

Halteres small, light brown.

**ABDOMEN** (Fig. 49): Genital arch about as broad as high, thickly covered with long hairs, the longest about twice width of arch; anal plate small, covered with very short hairs and 1 long ventral hair; 1st clasper about as long as height of arch and half its width, covered, except at base, with short stout hairs; 2nd clasper very narrow, curved slightly posteriorly, about equal to 1st clasper in length and bare; small short process between claspers ending in cluster of hairs. Penis long and narrow, apex broad and curved back on itself; parameres with small cluster of hairs.

#### FEMALE

Similar to male except legs without long fine hairs; abdomen without long fine hairs on tergites or short fine hairs on sternites. Ovipositor plates narrow and light brown.

**Lectotype:** AUCKLAND ISLANDS: Carnley Harbour, -xi.1907, ♂, (G. V. Hudson), (B.M.). Designated, labelled and here published as the lectotype from the syntype series of 1 ♂ and 1 ♀.

**Material Examined:** Lectotype, 1 ♂ and 2 ♀.

**Distribution:** Auckland Islands. (November).

**Remarks:** So far only known from collections made by members of the 1907 Expedition of the Philosophical Institute of Canterbury.

#### Genus HELOSCIOMYZA Hendel

*Helosciomyza* Hendel, 1917. Dtsch. Ent. Ztg.: 33. Malloch, 1922, N.Z.J. Sci. Tech. 5 : 228. Tonnoir and Malloch, 1928, Rec. Cant. [N.Z.] Mus. 3 : 157.

Arista pubescent. Third antennal segment short and rounded. Face with a carina, sometimes slightly, but more often well formed. Eyes normally with few very minute hairs. Prescutellars present; 1 or 2 dorsocentrals; propleural bristle present; mesopleuron bare; 2 strong sternopleurals and hairs on sternopleuron. Hind tibia with 2 preapical dorsal bristles. Costa with strong spines; 1st posterior cell narrowed apically. Genital arch of male broad.

Type Species: *Helosciomyza ferruginea* Hendel.

Recognised by the long spines on the costa, one or two dorsocentrals and the two preapical bristles on the hind tibia.

The original generic diagnosis is modified slightly to be able to include *H. simillima* sp.n. which has only one dorsocentral. Tonnoir and Malloch (1928) discussed the genus and pointed out its hetero-

geneous nature. Very few additional specimens have been available for the present study and the understanding of the genus has not been increased greatly.

*Distribution:* Australia, New Zealand.

*Species Occurring in New Zealand:*

- Helosciomyza femorata* Tonnoir and Malloch
- H. pseudosetuligera* Tonnoir and Malloch
- H. rara* (Hutton)
- H. setuligera* Malloch
- H. simillima* sp.n.
- H. spinicosta* Malloch
- H. subalpina* Tonnoir and Malloch
- H. subspinicosta* Tonnoir and Malloch

The groupings within the genus are clear. Whether these groups warrant subgeneric status still seems a moot point. At present the grouping of the species is as follows:

1. *femorata* group of species. Distinguished by the high costal index of 6.0 or greater, the strong shading about the cross veins and the prominent vittae on the thorax. Includes *H. femorata* only.
2. *subalpina* group of species. Separated from other groups by the presence of hairs on the pteropleuron, a costal index of about 4.6, cross veins faintly but distinctly shaded and some hairs on the hypopleuron. *H. subalpina* is the only species known.
3. *setuligera* group of species. Distinguished by having the callus on the pteropleuron distinctly haired, the third and fourth veins slightly convergent towards their apices, a costal index between 3.0 and 4.0 and faint shading about cross veins. Includes *H. setuligera* and *H. pseudosetuligera*.
4. *spinicosta* group of species. Separated from other groups by the following combination of characters; third and fourth veins strongly converging towards their apices, bare pteropleuron, costal index about 3.5, no shading about cross veins. Includes *H. spinicosta* and *H. subspinicosta*.

*H. rara* and *H. simillima* are not placed in a species group at present. Both have costal indices about 3.0 and have their third and fourth veins strongly converging apically showing that they are probably closer to the *spinicosta* group than to any of the others, but the presence of one fronto-orbital and one dorsocentral respectively could be characters important enough to place them in separate and distinct groups.

On the basis of the costal indices, cross vein shading, and hairs on the pteropleuron, the *subalpina* group is intermediate between the *femorata* and *setuligera* groups. The *spinicosta* group is close to the *setuligera* group but quite distinct from the *femorata* group.

KEY TO SPECIES OF HELOSCIOMYZA IN NEW ZEALAND

1	One fronto-orbital .....	<i>rara</i>
	Two fronto-orbitals .....	2
2	One dorsocentral .....	<i>simillima</i>
	Two dorsocentrals .....	3
3	Pteropleuron haired on disc or on dorsal callus .....	4
	Pteropleuron bare .....	6

4	Pteropleuron with haired callus .....	5
	Pteropleuron with haired disc .....	subalpina
5	Basal segment of hind tarsus with short bristles on whole length of antero-ventral surface .....	setuligera
	Basal segment of hind tarsus with bristles only at base of antero- ventral surface .....	pseudosetuligera
6	Third and 4th veins strongly convergent towards apex .....	7
	Third and 4th veins only slightly convergent towards apex .....	femorata
7	Clasper of male distinctly incurved at apex .....	subspinicosta
	Clasper of male without distinct incurved apex .....	spinicosta

**Helosciomyza rara** (Hutton). Figs. 48, 55

*Tetanocera rara* Hutton, 1901. Trans. N.Z. Inst. 33 : 84.

*Helosciomyza rara* (Hutton): Malloch, 1922. N.Z. J. Sci. Tech.

5 : 228. Tonnair and Malloch, 1928. Rec. Cant. [N.Z.] Mus.

3 : 158.

A brown species with light brown wings. Body length about 9.0 mm., wing length about 9.5 mm.

**MALE**

**HEAD** (Fig. 55): Arista brown, rays of pubescence just greater than diameter of basal segment. Antenna brown; 2nd segment with 1 dorsal bristle, hairs on dorsal and inner surfaces and on apical margin, the ventral ones strongest; basal segment with some apical marginal hairs. Front golden-brown anteriorly, light reddish-brown dorsally, ocellar triangle and orbits dusted brown, anterior orbits narrow. One outwardly directed fronto-orbital and 2 hairs posterior to it on orbits; front, anterior to line of fronto-orbitals, haired; verticals, postverticals and ocellars strong. Face golden-brown, convex and broadly carinate; parafacials broad and heavily dusted. Cheeks light golden-brown. Hairs on most of cheek except dorsally; 2 bristles at lower posterior corner of cheek. Occiput dusted greyish-brown. Vertical diameter of eye about 1.8 times width of cheek in same axis. Proboscis brown to light brown; palpi light brown, apical third with bristles, basal two-thirds with fine long bristles.

**THORAX:** Mesonotum light brown with light greyish-brown lateral margins and a broad brown stripe on alar line; scutellum light brown with the brown stripe of mesonotum continued onto base of scutellum laterally; broad brown band from humerus across dorsal half of mesopleuron below wing base to haltere; rest of pleura greyish-brown. One unpaired prescutellar; 2 dorsocentrals; basal scutellars shorter than apicals; scutellum bare; 1 humeral; 1 presutural; 2 notopleurals; 1 supraalar; 2 postalar; pteropleuron, including callus, bare; sterno-index about 0.9; prosternum bare.

Legs light brown; mid and hind femora and hind tibia brown on apical quarters. Fore femur with strong bristles on postero-dorsal surface, and long fine bristles on postero-ventral surface, strong towards apex and fine long hairs plentiful on posterior and ventral surfaces; fore tibia with strong preapical and about 2 short apicals; mid femur with 1 bristle and a few short bristles dorsal to it at about apical third of anterior surface, thick mat of long fine hairs on ventral surface, those towards apex in form of rows of short black spines on antero- and postero-ventral surfaces, 1 preapical posterior bristle; mid tibia with preapical and several apicals; hind femur with clump of 3 bristles at apical quarter of antero-dorsal surface, 1 long fine bristle at middle of anterior surface, and long fine hairs thickly on length of ventral surface, those at apex in form of rows of short black spines restricted to antero- and postero-ventral surfaces; hind tibia with several apicals.

Wings light brown, stigma brown; veins light brown. Costa with pair of strong basal spines; other costal spines over twice diameter of costa; short stout costal spines ending two-fifths distance between apices of 2nd and 3rd veins; 3rd and 4th veins strongly convergent at apices. Wing indices: costal about 3.0; 4th vein about 1.5; 4c about 0.6; 5x about 0.9.

Halteres light yellow apex, light brown base.

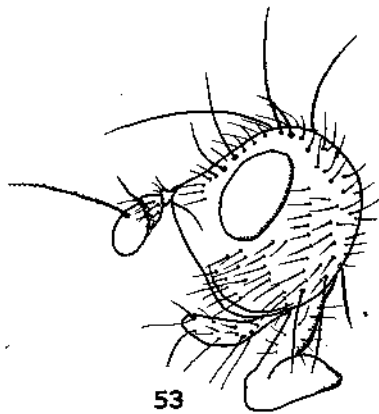
**ABDOMEN:** Greyish-brown.

**Genitalia** (Fig. 48). Genital arch broad, strong bristles over posterior two-thirds of its surface; anal plate small, triangular, lightly chitinised, with 1 long

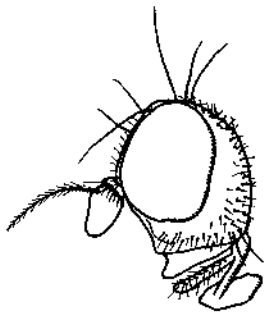




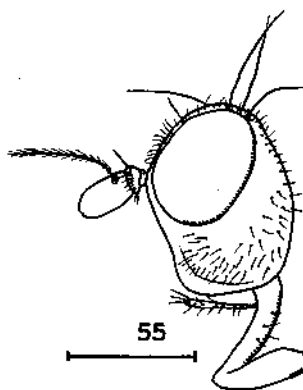
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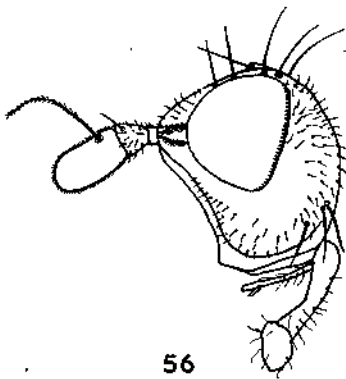
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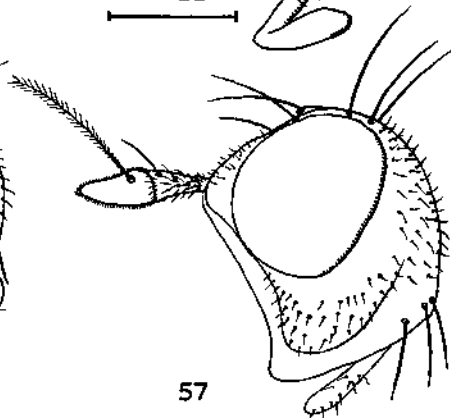
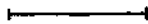
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55



56



57



Fig. 52. Head of *Prosochaeta prima*  
 " 53. " " *Polytocus spinicosta*  
 " 54. " " *Helosciomyza femorata*  
 " 55. " " *H. rara*  
 " 56. " " *Neolimnia diversa*  
 " 57. " " *N. sigma*

Scale: Figs. 52-54 0.5 mm.; Figs. 55-57, 1.0 mm.

strong bristle and many small curved hairs; clasper large, somewhat circular, with straight posterior margin and a few minute hairs. Penis long and narrow; parameres large and triangular with cluster of small spines on rounded knob at posterior corner.

*Holotype*: WELLINGTON: no date, ♂, (*G. V. Hudson*), (Cawt. Inst.).

*Material Examined*: Holotype.

*Distribution*: Wellington.

*Remarks*: The holotype is the only specimen known. The single unpaired prescutellar bristle may be an aberration in this particular specimen. Readily separated from all other species by having only one fronto-orbital bristle.

### ***Helosciomyza simillima* sp.n. Fig. 42**

A brown species with dark brown longitudinal vittae on thorax; wings clear. Body length 9.0 mm., wing length 9.0 mm.

#### MALE AND FEMALE

**HEAD**: Arista brown with light brown region near base of apical segment, hairs on entire length approximately equal to width of basal segment. Antenna reddish-brown; 3rd segment with short white pile; 2nd segment with 1 strong dorsal bristle, strong hairs around apical margin and short black hairs elsewhere; basal segment with short black hairs. Front reddish-brown; orbits brown with much dusting and distinct dark brown area about inner verticals; ocellar area dark brown. Anterior fronto-orbital about three-quarters length of posterior orbital; postverticals strong and equal to verticals; most of front with black hairs. Face light brown; distinct carina. Cheek light reddish-brown with some dusting. Black hairs on cheek and 1 or 2 bristles at lower posterior angle. Occiput greyish-brown. Vertical diameter of eye about twice width of cheek in same axis. Proboscis light reddish-brown; palpi yellowish-brown with short black hairs and some long slender hairs.

**THORAX**: Mesonotum light brown, lateral margins light greyish-brown with dark brown vitta between these areas, trace of a pair of narrow median longitudinal vittae anteriorly; scutellum yellowish-brown. Prescutellars about three-quarters length of dorsocentrals; 1 dorsocentral; parallel basal scutellars shorter than cruciate apicals; scutellum bare; 1 humeral; 1 presutural; 2 notopleurals; 1 supraalar; 2 strong postalar; pteropleuron including callus bare; sterno-index about 0.8; prosternum bare.

Legs yellowish-brown; apical third of femora and apical quarter of tibiae, brown. Fore femur with strong postero-dorsals and weak postero-ventrals on apical half, fine long hairs over most of femur, fore tibia with preapical and short apical; mid femur with few short bristles about middle of anterior surface, 1 strong posterior preapical, many black hairs on apical half of postero-ventral surface; mid tibia with preapical and several apicals; hind femur with about 3 strong and several weak bristles on anterior surface, clusters of black hairs on apical halves of antero- and postero-ventral surfaces; hind tibia with strong apical.

Wings (Fig. 42) clear, apex of subcostal cell brown; veins light brown; anterior cross vein duplicated in right wing of holotype. Costal spines at least twice diameter of costa; short stout costal spines extending about quarter distance between apices of 2nd and 3rd veins; 3rd and 4th veins strongly converging at apex; 5th vein faint and not reaching wing margin; anal vein weak and reaching wing margin as a fold. Wing indices: costal about 2.7; 4th vein about 1.5; 4c about 0.7; 5x about 0.9.

Halteres yellowish-brown.

**ABDOMEN**: Light brown. Strong bristles at lateral posterior margin of tergites.

External male genitalia light brown. Genital arch without strong bristles but hairs over most of surface; anal plate with fine hairs over all surfaces, those towards ventral margin long and fine; clasper approximately square with rounded outer side, and apex slightly incurved.

*Holotype*: ARTHURS PASS: 16.i.1922, ♂, (*Anon.*), (Ak. Mus.).

*Paratypes*: WAINUIOMATA: In forest, -xii.1900, 1 ♂, (*G. V. Hudson*), (Dom. Mus.). TARARUA RANGES: Slopes of Table Top, 4.xii.1952, 1 ♀, (*B. A. Holloway*), (Dom. Mus.).

*Material Examined*: Holotype and 2 paratypes.

*Distribution*: Tararua Ranges, Wainuiomata, Arthurs Pass. (December, January).

*Remarks*: The presence of only one dorsocentral bristle separates this species from all others in the genus.

### ***Helosciomyza subalpina* Tonnoir and Malloch. Fig. 41**

*Helosciomyza subalpina* Tonnoir and Malloch, 1928. Rec. Cant.

[N.Z.] Mus. 3 : 158.

A brown to light brown species. Body length about 5.0 mm., wing length about 5.5 mm.

#### MALE

**HEAD**: Arista dark brown; rays of pubescence much less than diameter of basal segments. Antenna reddish-brown; 3rd segment brown; 2nd segment light brown with black hairs, 1 short bristle at dorsal apex and long hairs at ventral apex; basal segment with black hairs around apical margin. Front yellowish-brown; ocellar area, narrow vitta from ocelli to near anterior margin of front and area enclosing fronto-orbitals and verticals, heavily dusted light brown; orbits greyish-white dusted anteriorly. Anterior fronto-orbital about four-fifths posterior bristle; other frontal bristles strong; postverticals slightly convergent; strong hair between posterior fronto-orbital and inner vertical; black hairs on anterior region of front and posterior to ocelli. Face light brown, dusted with white. Cheeks dusted with light whitish-grey. Short black hairs over most of cheek; 3 bristles at lower posterior corner. Occiput heavily dusted light brown. Vertical diameter of eye about twice width of cheek in same axis. Proboscis light brown; palpi with 3 strong black bristles at apex, finer bristles on outer margin and short fine hairs on all surfaces.

**THORAX**: Light brown; mesonotum light brown with wide light grey dusted lateral margins and wide brown vitta median to lateral margins; scutellum light brown; pleura dusted light greyish-brown, with brown vitta from dorsal propleuron, across mesopleuron, below wing base to haltere. Prescutellars about three-quarters posterior dorsocentral; hairs on dorsocentral row enlarged; convergent basal scutellars just shorter than cruciate apicals; scutellum bare; 1 humeral; 1 pre-sutural; 2 notopleurals; 1 supraalar; 2 strong postalars; pteropleuron with clump of hairs, some strong, near lower anterior corner; sterno-index about 0.7; strong propleural and long fine spiracular hair posteriorly; few small fine hairs on hypopleuron ventral to spiracle; prosternum bare.

Legs light brown with light dusting of greyish-brown; apical segments of tarsi brown to dark brown, femora often dark greyish-brown. Fore coxa with strong dorsal bristles; fore femur with strong postero-dorsals, postero-ventrals on apical half and fine hairs; fore tibia with strong preapical and few apicals; mid femur with cluster of short bristles at about apical third of anterior surface and 1 apical posterior bristle; mid tibia with strong preapical and several strong apicals; hind femur with 1 antero-dorsal bristle at apical third; hind tibia with 1 apical.

Wings (Fig. 41) very light brown; veins light brown, anterior cross vein dark brown, and membrane immediately about it brown. Costal spines longest about apices of subcosta and 1st vein, about 3 times width of costa; short stout costal spines extending about third distance between apices of 2nd and 3rd veins; 5th vein not reaching wing margin; anal vein traceable to wing margin; 3rd and 4th veins almost parallel at apex. Wing indices: costal about 4.6; 4th vein about 1.6; 4c about 0.6; 5x about 0.7.

Halteres light yellowish-brown.

**ABDOMEN**: Brown, basal segments dark brown.

External genitalia light brown; genital arch with long fine soft hairs; anal plates

large and flap-like, light brown and with covering of hairs similar to arch; claspers not visible *in situ* in holotype. Posterior sternite with pair of clumps of short black hairs.

#### FEMALE

Similar to male. Arista black; pubescent, rays very short. Third antennal segment almost circular and dark orange, dark brown dorsally.

Legs brown, apices of fore and hind tibiae brown.

*Holotype*: CASS: -ii.1925, ♂, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined*: Holotype, allotype, 1 ♂ and 2 ♀.

*New Records*: TOKAANU: 23.xi.1919, 2 ♀, (*Anon.*), (Dom. Mus.).

OTAGO PENINSULA: Allans Beach, from sedge swamp, 25.x.1953, 1 ♂, (*B. J. Marples*), (P.D.D.).

*Distribution*: Tokaanu, Cass, Mt. Arthur, Otago Peninsula. (October, November, February).

*Remarks*: Separated from other species by having hairs on the pteropleuron and hypopleuron and the almost parallel apical sections of the third and fourth veins.

### *Helosciomyza setuligera* Malloch. Figs. 70-72

*Helosciomyza setuligera* Malloch, 1922. N.Z. J. Sci. Tech. 5 :  
228. 1928. Rec. Cant. [N.Z.] Mus. 3 : 159.

A brown to light brown species. Body length about 6.5-8.0 mm., wing length 6.5-8.0 mm.

#### MALE

**HEAD**: Arista brown; rays of pubescence much shorter than diameter of arista. Antenna light reddish-brown; 3rd segment pitted; 2nd segment with 1 dorsal apical bristle, black hairs and a series of large hairs on ventral apical margin; basal segment with hairs on dorsal apical margin. Front light reddish-brown; ocellar triangle, area about fronto-orbitals, and orbits dusted greyish-brown. Anterior fronto-orbital about three-quarters length of posterior orbital; inner vertical stronger than outer vertical; black hairs on front anterior to ocelli, and 2 rows posterior to ocellar bristles. Face light brown; slightly carinate. Cheeks yellowish-brown. Hairs over most of cheek area, stronger posteriorly; 3 bristles at lower posterior angle. Occiput light greyish-brown dusted. Eyes with few very short minute hairs. Vertical diameter of eye about twice width of cheek in same axis. Proboscis light brown; palpi with long hairs on whole length.

**THORAX**: Light brown; mesonotum with faint traces of brown longitudinal vittae and with lateral margins greyish-brown dusted; pleura grey dusted; brown vitta from propleuron to haltere. Prescutellars about three-quarters length anterior dorsocentrals; anterior dorsocentral just shorter than posterior dorsocentral; basal scutellars just shorter than apicals; scutellum with hairs on disc, stronger towards lateral margins and fine hairs on ventral apex; 1 humeral; 1 presutural; 2 notopleurals; 1 supraalar; 2 postalars; pteropleuron bare, except for haired callus; sterno-index about 0.7; propleural strong and fine and a long spiracular bristle posteriorly, both bristles surrounded by few hairs; prosternum with hairs.

Legs light brown, apical segment of all tarsi dark greyish-brown. Fore and hind femora thickened; fore femur with strong bristles along postero-dorsal surface and 1 or 2 weak bristles at apex of postero-ventral surface; ventral surface with matt of fine hairs; fore tibia with strong preapical and some weak apicals; mid femur with a cluster of short bristles at about apical third of anterior surface, 1 posterior apical bristle, cluster of small spines on apical third of postero-ventral surface, ventral surface with matt of fine black hairs; mid tibia with strong pre-apical and several strong apicals; hind femur with 1 strong and few weaker bristles at apical quarter of antero-dorsal surface, ventral surface with matt of fine black hairs; hind tibia with strong apical, short bristles along most of antero-dorsal surface and matt of fine short hairs ventrally; basal segment of hind tarsus with 2 short stout spines at base of antero-ventral surface and short bristles along whole of this surface.

Wings shaded very light brown; veins light brown, the two cross veins brown, and membrane about them faintly shaded with brown. Largest costal spines about twice diameter of costa; short stout costal spines extending to about two-fifths distance between apices of 2nd and 3rd veins. Apical segments of 3rd and 4th veins slightly convergent; 5th vein not reaching wing margin; anal vein reaching wing margin. Wing indices: costal about 3.2-3.6; 4th vein about 1.5-1.7; 4c about 0.6-0.8; 5x about 0.9.

Halteres yellowish-brown.

ABDOMEN: Greyish-brown. Lateral bristles on tergites strong.

Genitalia (Figs. 70-72): Genital arch narrowed ventrally, hairs but no strong bristles over surface; anal plate elongate but small, very fine hairs on surface with few longer hairs at ventral margin; clasper small, triangular with distinctly rounded apex and curled in posterior margin, short stout hairs on outer surface; internal accessory clasper narrow, parallel-sided and strap-like. Parameres with heavily bristled lobe; penis strongly chitinised with four rounded lobes at apex and with large fan-like appendage near base.

#### FEMALE

Similar to male except femora not thickened and without matt of fine hairs.

*Holotype*: PARADISE: no date, ♂, (*C. Fenwick*), (Cawt. Inst.).

*Material Examined*: Holotype, allotype, 3 ♂ and 8 ♀.

*New Records*: WAIHO: Waiho Gorge, 26-31.xii.1931, 1 ♂, (*B. M. Heine*), (Dom. Mus.). OTAGO: Martins Bay, 1-4.ii.1955, 1 ♂, (*R. R. Forster*), (Cant. Mus.). NO DATA: 1 ♀, (*J. Muggeridge*), (B.M.).

*Distribution*: Waiho, Paradise, The Hump, Mt. Cleughearn, Wyndham, Martins Bay, (December to February).

*Remarks*: Similar to and closely allied to *H. pseudosetuligera*. Females of the two species are difficult to separate. Males differ in structure of male genitalia and also in the bristles on the antero-ventral surface of the basal segment of the hind tarsus.

### ***Helosciomyza pseudosetuligera* Tonnoir and Malloch. Fig. 40**

*Helosciomyza pseudosetuligera* Tonnoir and Malloch, 1928.

Rec. Cant. [N.Z.] Mus. 3 : 160.

A light brown species. Body length about 6.5 mm., wing length about 6.5 mm.

#### MALE

HEAD: Arista brown, rays of pubescence less than diameter of basal segments. Antenna light brown; 2nd segment light yellowish-brown, small dorsal bristle and long ventral apical hairs; 1st segment with black hairs around most of apical margin. Front yellowish-brown, ocellar triangle and area about orbitals grey dusted. Anterior fronto-orbital smaller than posterior; other frontal bristles all about equally strong; black hairs, some strong, over front anterior to ocelli and in 2 rows behind ocellar bristles; postverticals parallel. Face yellowish-brown, carinate. Cheeks yellowish-brown. Few weak hairs on cheek and stronger hairs posteriorly; about 4 bristles at lower posterior angle. Occiput light greyish-brown dusted. Vertical diameter of eye about 2.0 times width of cheek in same axis. Proboscis light yellowish-brown; palpi with long hairs stronger near apex.

THORAX: Light brown; mesonotum with wide greyish-brown lateral margins and traces of similarly coloured longitudinal vittae dorsally; pleura light brown with grey dusting except on dorsal propleuron, mesopleuron, and below wing base. Prescutellars about three-quarters length of anterior dorsocentrals; anterior dorsocentrals about equal to posterior dorsocentrals, enlarged hairs anterior to dorsocentrals; parallel basal scutellars just shorter than cruciate apicals, hairs on scutellum except on median line, and fine hairs below apex; 1 humeral; 1 pre-sutural; 2 notopleurals; 1 supraalar; 2 postalars; pteropleuron bare except for hairs on the blackish-brown callus; sterno-index about 0.66; 2 small fine hairs posterior to propleural; prosternum with hairs.

Legs yellowish-brown; fore and hind legs with enlarged femora. Mid femur with 2 bristles at about apical third or anterior surface, 1 apical posterior bristle and cluster of small stout short spines along apical half of postero-ventral surface; mid tibia with strong preapical and several strong apicals; basal segment of hind tarsus with 2 or 3 short stout spines at base of antero-ventral surface but without other bristles.

Wings (Fig. 40) shaded very light brown with brown spot in costal cell about apex of subcosta; veins light brown, cross veins brown. Costal spines about twice diameter of costa; short stout costal spines ending about quarter distance between apices of 2nd and 3rd veins; 5th vein not reaching wing margin; anal vein only faintly traceable to wing margin; 3rd and 4th veins slightly convergent at apex. Wing indices: costal about 3.8; 4th vein about 2.0; 4c about 0.7; 5x about 0.9.

Halteres light yellowish-brown.

ABDOMEN: Brown with some dark brown areas on tergites.

Genitalia yellowish-brown. Genital arch narrowed ventrally, thickly haired over surface; anal plate small, narrow, lightly chitinised with very short fine hairs over surface and few longer hairs at ventral margin; clasper small, rounded margin distinctly convex so that anterior and posterior margin are almost folded in, small but stout hairs on outer surface; internal accessory clasper strap-like and sinuate, ending in a point. Parameres with heavily bristled lobe; penis elongate, bulbous, apex not strongly chitinised, with small fan-like basal appendage.

#### FEMALE

Similar to male except that the fore and hind femora not thickened.

*Holotype*: Mt. ARTHUR: 5,000 ft., 25.xii.1921, ♂, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined*: Holotype and allotype.

*Distribution*: Mt. Arthur, Wanganui. (December).

*Remarks*: Similar to *H. setuligera* but differs from that species by the smaller size, lighter colour, male genitalia, and absence of bristles on the entire length of the antero-ventral surface of the basal segment of the hind tarsus. Females of the two species are difficult to separate.

### ***Helosciomyza femorata* Tonnoir and Malloch. Figs. 37, 50, 54**

*Helosciomyza femorata* Tonnoir and Malloch, 1928. Rec. Cant.  
[N.Z.] Mus. 3: 161.

A light brown species with brown and dark brown vittae. Body length about 9.0 mm., wing length about 9.0 mm.

#### MALE

HEAD (Fig. 54): Arista dark brown, light brown basally; rays of pubescence up to twice length of diameter of basal segments. Antenna light brown; 3rd segment often yellowish-brown basally; 2nd segment with 1 dorsal bristle and black hairs mainly on apical margin; basal segment with apical hairs. Front yellowish-brown, light reddish-brown at vertex; ocellar triangle dark brown; area about orbitals greyish-brown dusted; orbits narrowly greyish-white dusted. Anterior fronto-orbital about two-thirds length posterior orbital; other frontal bristles strong; small black hairs on most of front anterior to ocelli and hairs between ocellar and postvertical bristles. Face light brown, lunule brown, and ventral half of pilinal suture brown. Cheeks yellowish-brown. Black hairs along middle region of cheek and stronger hairs posteriorly; about 3 bristles at lower posterior corner. Occiput light brown. Vertical diameter of eye about 3 times width of cheek in same axis. Proboscis light brown; palpi with hairs and fine bristles on most of length.

THORAX: Light brown; mesonotum with brown median longitudinal area between and just outside dorsocentrals, this brown area continued onto disc of scutellum; dark brown vitta from humerus, across notopleural suture below wing base to haltere; pleura not differentiated except for small brown area at anterior dorsal

corner of sternopleuron. Prescutellars present as fine thin bristles about two-thirds length of anterior dorsocentrals; anterior dorsocentral just shorter than posterior dorsocentral; divergent basal scutellars about equal to cruciate apicals; scutellum bare; 1 humeral; 1 presutural; 2 notopleurals; 1 supraalar; 2 postalars; pteropleuron bare; sterno-index about 0.8; 1 or 2 small hairs posterior and dorsal to propleural; prosternum bare.

Legs light brown; apical third of femora brown; faint brown annulus at about basal quarter and brown preapical annulus on all tibiae. Fore femur with strong bristles along postero-dorsal surface and about apical third of postero-ventral surface, elsewhere on posterior surfaces many long fine hairs up to twice diameter of femur in length; fore coxa with long bristles and long hairs; fore tibia with normal short black hairs, except at apical third of postero-ventral surface, strong preapical, no apical; fore tarsus with long hairs on posterior surfaces of segments, claws brown with black apices; mid femur with short bristles at about apical third of anterior and antero-dorsal surfaces, 1 posterior apical bristle, fine black hairs on ventral and postero-ventral surfaces not as long as diameter of femur, elsewhere normal hairs; mid tibia with strong preapical and several apicals and long fine hairs along posterior and ventral surfaces; mid tarsus with long fine hairs mainly on anterior and on posterior surfaces of segments; hind femur with 3 or 4 strong bristles on apical half of antero-dorsal surface, row of strong bristles on basal three-quarters of antero-ventral surface and several adjacent rows of smaller bristles, fine black hairs not longer than diameter of femur on posterior and ventral surfaces; hind tibia with 1 short apical, fine long hairs on posterior and ventral surfaces; hind tarsus with long fine hairs mainly on anterior surfaces of segments.

Wings (Fig. 37): Membrane very light brown, slightly darker about cross veins and at stigma; veins light brown, cross veins, particularly anterior one, brown. Costal spines about twice diameter of costa; short stout costal spines ending about quarter distances between apices of 2nd and 3rd veins; 5th and anal veins fading out just before reaching wing margin; 3rd and 4th veins slightly converging towards apex. Wing indices: costal about 6.0-6.5; 4th vein about 1.3-1.6; 4c about 0.3-0.4; 5x about 0.8-0.9.

Halteres brown at apex, light brown stalk.

**ABDOMEN:** Brown with dark brown areas on posterior tergites.

Genitalia (Fig. 50): Genital arch much swollen and bulbous, light brown, long fine hairs over most of its surface; anal plate much reduced, fine short hairs over surface; clasper elongate and just under half height of arch, tapering to point, heavily chitinised and small hairs on outer surface. Penis elongate, bulbous and chitinised at apex.

#### FEMALE

Similar to male, except legs normally bristled and without long fine hairs. Genital plates dark brown.

*Holotype:* WAITAKERE RANGES: Nihotupu, 25.ii.1923, ♂, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined:* Holotype, 2 ♂ paratypes, 13 ♂ and 18 ♀.

*New Records:* WAITAKERE RANGES: Nihotupu, 2.i.1950, 1 ♂; 9.iii.1955, 1 ♀, (*R. A. Harrison*), (P.D.D.); Titirangi, 15.i.1944, 1 ♀, (*M. W. Carter*), (B.M.); -1947, 1 ♀ (*M. W. Carter*), (P.D.D.); 2.i.1950, 1 ♀, (*M. Knight*), (P.D.D.). WAIPOUA FOREST: 26.iv.1947, 1 ♀, (*E. G. Turbott*), (Ak. Mus.). NO DATA: 11 ♂, 12 ♀, (Ak. Mus.). WELLINGTON: Karori, Bush Hill, Scrub Gully, 12.xii.1897, 1 ♂; Korokoro, 9.xi.1920, 1 ♀, (*G. V. Hudson*), (Dom. Mus.).

*Distribution:* Waipoua Forest, Waitakere Ranges, Horahora, Wellington. (November to April).

*Remarks:* Characterised by the lateral, dark brown and median brown vittae of the thorax, and separated from all other species by the large costal index of 6.0 or more, and by the male having exceedingly hairy legs and a relatively large genital arch.

**Helosciomyza subspenicosta** Tonnoir and Malloch. Figs. 38, 74

*Helosciomyza subspenicosta* Tonnoir and Malloch, 1928. Rec.

Capt. [N.Z.] Mus. 3 : 161.

A light yellowish-brown species. Body length about 6.5-8.0 mm., wing length about 6.5-8.0 mm.

MALE

**HEAD:** Arista brown, basal segments light brown; rays of pubescence not greater than diameter of basal segments. Antenna yellowish-brown; 3rd segment light brown on basal half; 2nd segment with strong dorsal bristle and small black hairs which are longest on apical ventral margin; basal segment with small apical hairs. Front light reddish-brown anteriorly, light brown posteriorly; ocellar triangle and region about fronto-orbital bristles greyish-brown dusted; orbits narrowly light grey dusted. Anterior fronto-orbital about three-quarters length posterior orbital; other frontal bristles strong; postverticals parallel; small black hairs on front anterior to ocelli and between ocellar bristles and postverticals. Front light yellowish-brown, carinate. Cheeks yellowish-brown with light whitish-grey dusting. Hairs on most of median region of cheek and 3 bristles at lower posterior corner. Occiput dusted greyish-brown. Vertical diameter of eye about twice width of cheek in same axis. Proboscis light reddish-brown; palpi with 1 strong black apical bristle and other finer and light coloured hairs and bristles along its length.

**THORAX:** Light yellowish-brown; mesonotum whitish-grey dusted on lateral margins; pleura light brown along dorsal margins. Prescutellars close together and about equal to length of anterior dorsocentrals; anterior dorsocentral about three-quarters length posterior dorsocentral; basal scutellars smaller than apical scutellars; scutellum bare; 1 humeral; 1 presutural; 2 notopleurals; 1 supraalar; 2 strong postalars; pteropleuron including callus, bare; sterno-index about 0.8; few minute hairs posterior to propleural; prosternum bare.

Legs light yellowish-brown, femora shining. Fore femur thickened, with strong bristles on postero-dorsal surface, weak bristles on postero-ventral apical quarter, and soft short hairs on posterior and ventral surfaces; fore tibia with strong pre-apical and short apicals; mid femur with cluster of short bristles at about apical third of anterior surface, 1 posterior apical, short spines on apical third of antero- and postero-ventral surfaces and some soft short hairs on same two surfaces; mid tibia with strong preapical and several strong apicals; hind femur thickened, with about 3 bristles at about apical third of antero-dorsal surface, several rows of short spines on apical third of antero- and postero-ventral surfaces; hind tibia with strong apical.

Wings (Fig. 38) shaded very light brown, no darkening about cross veins, stigma light brown; veins light brown, cross veins not darkened. Costal spines about twice diameter of costa; short costal spines extending about third distance between apices of 2nd and 3rd veins; 3rd and 4th veins converging towards their apices; 5th vein not reaching wing margin; anal vein just traceable to wing margin. Wing indices: costal about 3.4; 4th vein about 1.5-1.7; 4c about 0.6; 5x about 1.0.

Halteres light yellowish-white.

**ABDOMEN:** Brown with some greyish dusting.

Genitalia (Fig. 74) yellowish-brown. Genital arch rectangular with hairs over most of surface and without strong bristles; anal plate elongate with small fine hairs over surface and long fine hairs ventrally; clasper evenly rounded with distinct incurved apex usually visible *in situ*; accessory internal clasper with almost parallel sides but rounded at apex and produced to a distinct point directed posteriorly. Parameres with bristled outer lobe and large cap-shaped inner lobe; penis long.

FEMALE

As for male except fore and hind femora not thickened. Costal index about 4.0.

**Holotype:** NELSON: Aniseed Valley, 2.iii.1922, ♂, (*A. Tonnoir*), (Cawt. Inst.).

**Material Examined:** Holotype and 9 ♂ and 6 ♀.

**New Records:** OHAKUNE: No date, 2 ♂, (*T. R. Harris*), (Dom. Mus.); 30.xi.1919, 1 ♂; 15.i.1920, 2 ♂, (*T. R. Harris*), (U.S.N.M.).  
MT. EGMONT: Dawson Falls, -.xii,1927, 1 ♂, (*A. Castle*), (Dom.



Mus.). WAINUIOMATA: -xii.1900, 1 ♂, (*G. V. Hudson*), (B.M.). NELSON: Upper Maitai, 29.i.1945, 1 ♀, (*B. Given*), (Cawt. Inst.): Glen Valley Bush, swept, 16.iii.1954, 1 ♂, (*A. W. Parrott*), (Cawt. Inst.). NO DATA: 1 ♂, 4 ♀, (Ak. Mus.). DUNEDIN: Opoho, 9.xii.1916, 1 ♀, (*Anon.*), (Ak. Mus.).

*Distribution:* Ohakune, Mt. Egmont, Wainuiomata, Nelson, Lake Brunner, Dunedin. (November to March).

*Remarks:* Generally a lighter-coloured species than *H. spinicosta* and with it, distinguished from other species of the genus by the marked convergence of veins three and four. The two species can be separated only by examination of male genitalia. Females cannot be readily separated, and those females recorded above are only tentatively placed as this species. The costal index of females of about 4.0 is greater than that recorded for males of this species or *H. spinicosta*.

### ***Helosciomyza spinicosta* Malloch. Figs. 39, 73**

*Helosciomyza spinicosta* Malloch, 1922. N.Z. J. Sci. Tech.  
5: 228. 1928. Rec. Cant. [N.Z.] Mus. 3: 160.

A light brown species. Body length about 7.25 mm., wing length about 7.0 mm.

#### MALE

**HEAD:** Arista dark brown; pubescent, rays almost equal to width of basal segment. Antenna orange-brown; 3rd segment about 1.5 times as long as broad, light brown centrally; 2nd segment with 1 short dorsal bristle, hairs over most of surface and long hairs on ventral apical margin; basal segment with apical dorsal hairs. Front light reddish-brown; ocellar triangle and area about orbitals dusted with greyish-brown; ocellar triangle bordered with reddish-brown, orbits narrowly light grey dusted. Anterior fronto-orbital about two-thirds length posterior orbital; ocellar bristles very strong, other frontal bristles not as long as ocellars; black hairs on most of front anterior to ocelli and between ocellar and postvertical bristles. Face yellowish-brown with well-marked carina. Cheeks yellowish-brown, dusted light grey dorsally. Small black hairs on median region of front and about 2 bristles at lower posterior corner. Occiput dusted greyish-brown. Vertical diameter of eye about 1.7 times width of cheek in same axis. Proboscis yellowish-brown; palpi with few black bristles and hairs at apex, elsewhere light-coloured fine hairs.

**THORAX:** Light brown; mesonotum with light greyish-brown lateral margin and without distinct vittae; scutellum light brown; wide brown area on dorsal mesopleuron and pteropleuron. Prescutellars equal to anterior dorsocentrals; anterior dorsocentral about four-fifths length of posterior dorsocentral; parallel basal scutellars about two-thirds cruciate apical scutellars; scutellum bare; 1 humeral; 1 presutural; 2 notopleurals; 1 supraalar; 2 strong postalars; pteropleuron bare, no hairs on callus; sterno-index about 0.7; some small hairs posterior to propleural; prosternum bare.

Legs yellowish-brown; tibiae and tarsi light brown. Fore femur thickened, with strong bristles along postero-dorsal surface, short bristles on apical quarter of postero-ventral surface and soft hairs on posterior and ventral surfaces; fore tibia with preapical and weak apicals; mid femur with cluster of bristles about apical third of anterior surface, 1 posterior apical, several rows of short bristles or spines at apical third of antero- and postero-ventral surfaces and short soft hairs on posterior and ventral surfaces; mid tibia with strong preapical and several strong apicals; hind femur thickened with several bristles about apical third of antero-dorsal surface, several rows of short bristles or spines on apical third of antero- and postero-ventral surfaces and soft short hair on postero-dorsal and postero-ventral surfaces; hind tibia with strong apical.

Wings (Fig. 39) shaded very light brown; stigma light brown; veins light brown, cross veins not darkened. Costal spines just over twice diameter of costa; thick short costal spines ending about third distance between apices of 2nd and 3rd veins; 3rd and 4th veins distinctly converging towards apex; 5th vein not reaching

wing margin; anal vein just traceable to wing margin. Wing indices: costal about 3.5; 4th vein about 1.4; 4c about 0.6; 5x about 1.0.

Halteres light brown.

ABDOMEN: Tergites light brown with some dark brown areas, basal tergites darker.

Genitalia (Fig. 73) light brown. Genital arch broad, rectangular with hairs over whole surface but no strong bristles; anal plate elongate and with fine short hairs over surface and long hairs ventrally; clasper almost square but broadly rounded on apical side, with a slight incurved fold at apex, small hairs on inner surface; accessory internal clasper elongate club-shaped but with straight posterior margin. Parameres with bristly outer lobe; penis long.

#### FEMALE

Similar to male; fore and hind femora not thickened.

*Holotype*: DUNEDIN: 20.xi.1921, ♂, (*M. N. Watt*), (Cawt. Inst.).

*Material Examined*: Holotype, 1 ♂ and 1 ♀ paratype, 4 ♂ and 5 ♀.

*New Records*: TARARUA RANGES: Mt. Holdsworth, -i.1902, 1 ♂, (*G. V. Hudson*), (Dom. Mus.). WAINUIOMATA: in forest, -xii.1900, 1 ♀, (*G. V. Hudson*), (Dom. Mus.). WELLINGTON: Karori, in house, 20.i.1941, 1 ♂, (*G. V. Hudson*), (Dom. Mus.). WAITATI: 13.ii.1921, 1 ♀, (*Anon.*), (Ak. Mus.). DUNEDIN: 22.ii.1921, 1 ♂, 1 ♀, (*Anon.*), (Ak. Mus.). MAUNGATUA: On mountain, 16.xi.1924, 1 ♀, (*Anon.*), (Ak. Mus.). METHVEN: McLennans Bush, 9-10.xii.1941, 1 ♀, (*E. S. Gourlay*), (Cawt. Inst.). NO DATA: 1 ♂, (*J. Muggeridge*), (B.M.).

*Distribution*: Ohakune, Tararua Ranges, Wainuiomata, Wellington, Moana, Mt. Grey, Christchurch, Waitati, Otago Peninsula, Dunedin, Maungatua, Methven, Hyde, Monowai. (October to February, April).

*Remarks*: The distinct convergence of the 3rd and 4th veins is the chief character which separates this species and *H. subspinicosta* from other members of the genus. Differentiated from *subspinicosta* by the generally light colour, and in males by the structure of the male genitalia. Females of the two species cannot be readily separated.

#### Genus XENOSCIOMYZA Tonnoir and Malloch

*Xenosciomyza* Tonnoir and Malloch, 1928. Rec. Cant. [N.Z.]

Mus. 3 : 162.

Arista pubescent. Second antennal segment produced on inner side at apex and about twice as long as on outer side. Prescutellars present; 4 dorsocentrals, anterior bristle presutural; propleural present. Hind tibia with 2 preapical dorsal bristles. Costa with strong spines.

Type Species: *Xenosciomyza prima* Tonnoir and Malloch

Separated from *Helosciomyza* Tonnoir and Malloch by having more than two dorsocentrals and from *Polytocus* Lamb by having two dorsal preapical bristles on the hind tibia.

*Distribution*: New Zealand.

*Species*:

*Xenosciomyza prima* Tonnoir and Malloch

*X. turbotti* Harrison

In *X. turbotti* the legs and abdomen of the males are covered with long hairs which are absent on the female. This sexual character may be a generic one. The two species of the genus are not closely related.

KEY TO SPECIES OF XENOSCIOMYZA

Mesopleuron and pteropleuron haired .....	<b>turbotti</b>
Mesopleuron and pteropleuron bare .....	<b>prima</b>

**Xenosciomyza turbotti** Harrison. Fig. 51

*Xenosciomyza turbotti* Harrison, 1955. Rec. Dom. Mus. [N.Z.]  
2 : 219.

A light brown species; wings light brown; legs yellowish-brown. Body length about 8.0 mm., wing length about 8.0 mm.

FEMALE

**HEAD:** Arista brown, short pubescence only visible under high magnification. Antenna yellowish-brown; 3rd segment with fine white pile; 2nd segment with 1 strong bristle, and distinct black hairs over most of its surface; basal segment short and with some small apical black hairs. Front yellowish-brown; area at each side of ocellar triangle golden-brown; orbits greyish-brown dusted. All frontal bristles approximately equally strong; 2 fronto-orbitals reclinate and directed over eyes; a covering of distinct black hairs over whole front except for 2 areas lateral to ocellar triangle and about the orbitals and verticals. Face light yellow, broadly carinate; clypeus narrow but protruding. Cheeks with black hairs except at upper and lower margins and with 2 or 3 bristles at lower posterior angle. Occiput with many black hairs laterally and a clump of hairs just dorsal to foramen. Eyes with very short white hairs. Vertical diameter of eye about 3.3 times width of cheek in same axis. Proboscis yellowish-brown; palpi light yellowish-brown, with black bristles and hairs denser towards apex.

**THORAX:** Mesonotum greyish-brown with 4 longitudinal vittae, sometimes not distinctive; 1 pair between dorsocentrals commencing at extreme anterior margin; lateral vitta consisting of a dark brown presutural area outside dorsocentral row and a similarly coloured postsutural area just lateral to dorsocentrals; lateral thorax brown to light brown. All thoracic bristles strong, with the prescutellars sometimes distinctly weaker; 4 marginal scutellars; 1 humeral; 1 presutural; 2 notopleurals; 1 supraalar; 2 postalars; 1 posterior dorsal sternopleural; mesopleuron with fine hairs dorsally and stronger hairs posteriorly, bare elsewhere; pteropleuron with clump of hairs below wing base; sternopleuron with hairs over most of its area; hairs of mesonotum normally strong and distinct; other thoracic pleura bare.

Legs light yellowish-brown, with covering of strong black hairs. Fore femora with strong bristles on postero-dorsal surface and on apical half of postero-ventral surface, 1 or 2 median posterior bristles; other femora usually without distinct bristles but some occasionally distinguishable at apex; fore and mid tibiae with 1 strong preapical dorsal bristle; mid tibia also with several lateral and ventral apical spines; hind tibia with 1 strong and 1 weak ventral apical bristle; apical postero-ventral region of tibiae and postero-ventral areas of tarsi, particularly of basal segment, with fine dense black hairs; claws and pulvilli large and distinct; mid tarsi with short stout spines, 1 strong, 1 weak at apex of each posterior and anterior surface.

Wings generally shaded light brown; most veins light brown; anterior cross veins dark brown and posterior cross vein brown, areas immediately surrounding these veins darkened. Costa with long black spines at regular intervals from before apex of subcosta to near apex of 2nd vein, weakened towards this latter region. Third costal section with heavy bristles extending over its basal third. Costa extending to 4th vein. Wing indices: costal about 6.9; 4th vein about 1.6; 4c about 0.4; 5x about 0.8.

Halteres yellowish-brown.

**ABDOMEN:** Yellowish-brown with extensive brown areas over most of tergites. Strong bristles on posterior margin of tergites, weak medianly but strong laterally. All tergites and sternites with covering of strong black hairs.

MALE

Similar to female except body hairs noticeably finer and longer than those of female. Hairs larger on abdomen and legs, giving the male a distinctly furry appearance.

External genitalia (Fig. 51): Genital arch wider ventrally than dorsally, hairs thick over most of surface, those towards anterior margin the strongest; anal plate 3 to 4 times as long as wide, strong hairs on most of its surface; clasper large, triangular, and with minute but stout spines on posterior surface and some small hairs on inner surface.

*Holotype*: AUCKLAND ISLANDS: Carnley Harbour, Tagua Bay, Station, -x.1944, ♀, (*E. G. Turbott*), (P.D.D.).

*Material Examined*: Holotype, 2 ♂ and 4 ♀ paratypes, and 5 ♀.

*Distribution*: Auckland Islands. (August, November, February to April).

*Remarks*: Separated from *X. prima* by the presence of one sternopleural, hairs on mesopleuron and pteropleuron and bristles on femora.

### ***Xenosciomyza prima* Tonnoir and Malloch. Fig. 44**

*Xenosciomyza prima* Tonnoir and Malloch, 1928. Rec. Cant.  
[N.Z.] Mus. 3 : 162.

A light brown species. Body length about 6.0 mm., wing length about 6.0 mm.

#### MALE AND FEMALE

**HEAD**: Arista dark brown, rays of pubescence not as wide as diameter of basal segment. Antenna light brown; 3rd segment brown on apical two-thirds; 2nd segment with a strong dorsal bristle, hairs over most of surface with strongest ones at ventral apical margin; basal segment with hairs on most of apical margin. Front yellowish-brown; orbits and ocellar triangle light yellowish-grey dusted. Two strong equal fronto-orbitals with hairs alternating with them; verticals, post-verticals and ocellars strong; anterior half of front with anteriorly directed hairs, thicker anteriorly. Face light brown; antennal fossae with a brown median spot. Cheeks light yellow. Black hairs on ventral half of cheek and about 3 strong bristles at lower posterior corner. Occiput yellowish-brown, dark brown area dorsal to foramen. Eyes bare. Vertical diameter of eye about 2.2 times width of cheek in same axis. Proboscis light brown; palpi light brown with some strong bristles and hairs.

**THORAX**: Mesonotum light brown with light greyish-brown dusted longitudinal vittae; 1 median, 1 wide one on dorsocentral row, narrow postsutural one on interalar line and a broad lateral one; scutellum light brown bordered with light greyish-brown; brown stripe from ventral half of humerus, across dorsal mesopleuron, below wing base to haltere; other pleura light brown. Prescutellars small, about three-fifths length of posterior dorsocentrals; divergent basal scutellars equal to parallel apicals; scutellum bare; 1 humeral; 1 presutural; 2 notopleurals; 1 supraalar; 2 postalars; mesopleuron and pteropleuron bare; 2 strong sternopleurals; weak ventral spiracular bristle posterior to propleural; prosternum bare.

Legs yellowish-brown. Fore femur with strong postero-dorsal bristles, a row of small bristles just ventral to them and strong postero-ventrals; fore tibia with strong preapical and a few weak apicals; mid femur with about 4 strong bristles surrounded by a few weak bristles at about apical third of anterior surface and a small anterior and posterior apical; mid tibia with strong preapical, 1 strong and other weak apicals; hind femur with a strong bristle at apical quarter and apical sixth of antero-dorsal surface; hind tibia with 2 preapicals and an apical.

Wings (Fig. 44) clear; veins light brown; brown shading about anterior cross vein and light brown shading about posterior cross vein. Costal spines up to 3 times diameter of costa; short stout costal spines ending just beyond apex of 2nd vein. Wing indices: costal about 4.5; 4th vein about 1.6; 4c about 0.7; 5x about 0.8.

Halteres yellowish-brown.

**ABDOMEN**: Brown with irregular light brown areas and light brown posterior margins of tergites. Strong bristles on posterior margin of tergites especially laterally. Female genital plates narrow and light brown.

External male genitalia: Genital arch brown to light brown, broad, and with very strong bristles; anal plate about third height of arch, brown, and with thick

covering of fine hairs; clasper as broad as arch basally, narrowed very strongly at basal third and thence as a narrow finger-like projection.

*Holotype*: WANGANUI: no date, ♀, (M. N. Watt), (Cawt. Inst.).

*Material Examined*: Holotype, 2 ♂.

*New Records*: TE WAIROA: 11.xi.1919, 2 ♂, (J. Muggeridge), (B.M).

*Distribution*: Wanganui, Te Wairoa. (November).

*Remarks*: The male is here recorded for the first time. Separated from *X. turbotti* by having two sternopleurals and no hairs on mesopleuron and pteropleuron.

### Subfamily TETANOCERINAE

#### KEY TO GENERA OCCURRING IN NEW ZEALAND

- |   |                   |   |
|---|-------------------|---|
| 1 Sternopleuron with bristles; anal vein not reaching wing margin     | HUTTONINA (p. 56) |   |
| Sternopleuron without strong bristles; anal vein reaching wing margin |                   | 2 |
| 2 Pteropleuron with bristles  | NEOLIMNIA (p. 67) |   |
| Pteropleuron bare   | EULIMNIA (p. 87)  |   |

### Genus HUTTONINA Tonnoir and Malloch

*Huttonina* Tonnoir and Malloch, 1928. Rec. Cant. [N.Z.] Mus. 3 : 174.

Arista pubescent. Antennae short; 3rd segment not much longer than broad, rounded at apex. Postverticals parallel; ocellars short and divergent. Face concave; mouth margin and labrum often produced. Prescutellars absent; 1 presutural and 3 postsutural dorsocentrals, all strong; mesopleuron with few hairs, small hairs on propleuron; prosternum bare. Hind tibia with 2 preapical bristles. Costa without strong spines; anal vein abruptly terminated about three-quarters distance to wing margin. Anal cell enclosed by a curved cross vein.

*Type Species*: *Huttonina abrupta* Tonnoir and Malloch

Recognised by the incomplete anal vein and the presence of sternopleural bristles. Tonnoir and Malloch (1928) pointed out that this genus is aberrant in having the anal vein ending before reaching the wing margin. They place it only tentatively in the Sciomyzidae.

The postverticals are described as being parallel and this is true for most specimens but in some there is a tendency towards slightly convergent postverticals. In some species, e.g. *H. furcata*, the tendency is quite marked. The male external genitalia are not particularly modified and are comparable to the normal genitalia of both the Sciomyzidae and Sapromyzidae.

The genus can be considered to be intermediate between the Sciomyzidae and the Sapromyzidae and there would be no advantage in transferring it from its original position in the Sciomyzidae to the Sapromyzidae.

*Distribution*: New Zealand.

#### KEY TO SUBGENERA OF HUTTONINA

- |   |                    |
|---|--------------------|
| Wings normal, not narrowed at base; anal angle normally developed | HUTTONINA (p. 57)  |
| Wings long and narrowed at base; anal angle not developed         | HUTTONELLA (p. 65) |

Subgenus HUTTONINA Tonnoir and Malloch

*Huttonina* Tonnoir and Malloch, 1928. Rec. Cant. [N.Z.] Mus. 3 : 175.

Wings not narrowed at base; no reduction of anal lobe or alula. Third vein bare.

Type Species: *Huttonina (Huttonina) abrupta* Tonnoir and Malloch

Separated from the subgenus *Huttonella* by having wings of normal shape.

- Species: *Huttonina (Huttonina) abrupta* Tonnoir and Malloch  
*H. (Huttonina) brevis* Malloch  
*H. (Huttonina) elegans* Tonnoir and Malloch  
*H. (Huttonina) furcata* Tonnoir and Malloch  
*H. (Huttonina) glabra* Tonnoir and Malloch  
*H. (Huttonina) scutellaris* Tonnoir and Malloch

Contains species with heavily patterned or clear wings. In those species with patterned wings there is a series of distinct brown longitudinal vittae on the thorax.

The number of sternopleurals is a good specific character; in only one species, *H. abrupta*, does the number vary at all, one specimen having two instead of three bristles on one side and another specimen two on both sides.

The subgenus consists of two groups of species as follows:

1. *elegans* group of species. Characterised by having two fronto-orbitals and patterned wings. Includes *H. elegans*, *H. glabra* and *H. scutellaris*.
2. *abrupta* group of species. Separated from the *elegans* group by having three fronto-orbitals, and clear wings with shading only about the cross veins. Includes *H. abrupta*, *H. brevis* and *H. furcata*. The first two species are closely related; the latter is distinct from them in having only one sternopleural.

KEY TO SPECIES OF SUBGENUS HUTTONINA

1	Wings with numerous brown spots .....	2
	Wings without brown spots and, at most, light shading about cross veins .....	4
2	Three sternopleurals .....	<b>elegans</b>
	Two sternopleurals .....	3
3	Scutellum with hairs ventral to apex .....	<b>scutellaris</b>
	Scutellum without ventral apical hairs .....	<b>glabra</b>
4	One sternopleural .....	<b>furcata</b>
	Three sternopleurals .....	5
5	Fore femur with 1 strong preapical bristle on postero-ventral surface .....	<b>abrupta</b>
	Fore femur with several bristles near apex of postero-ventral surface ..	<b>brevis</b>

***Huttonina elegans*** Tonnoir and Malloch. Figs. 58, 65

*Huttonina elegans* Tonnoir and Malloch, 1928. Rec. Cant. [N.Z.] Mus. 3 : 177.

A yellowish-brown species with dark brown vittae and patterned wings. Body length about 4.5-5.0 mm.; wing length about 4.5-5.0 mm.

FEMALE

HEAD: Arista dark brown; rays much shorter than diameter of basal segments of arista. Antenna brown to reddish-brown; third segment just longer than second; 2nd segment with short hairs; basal segment with small black dorsal hairs. Front

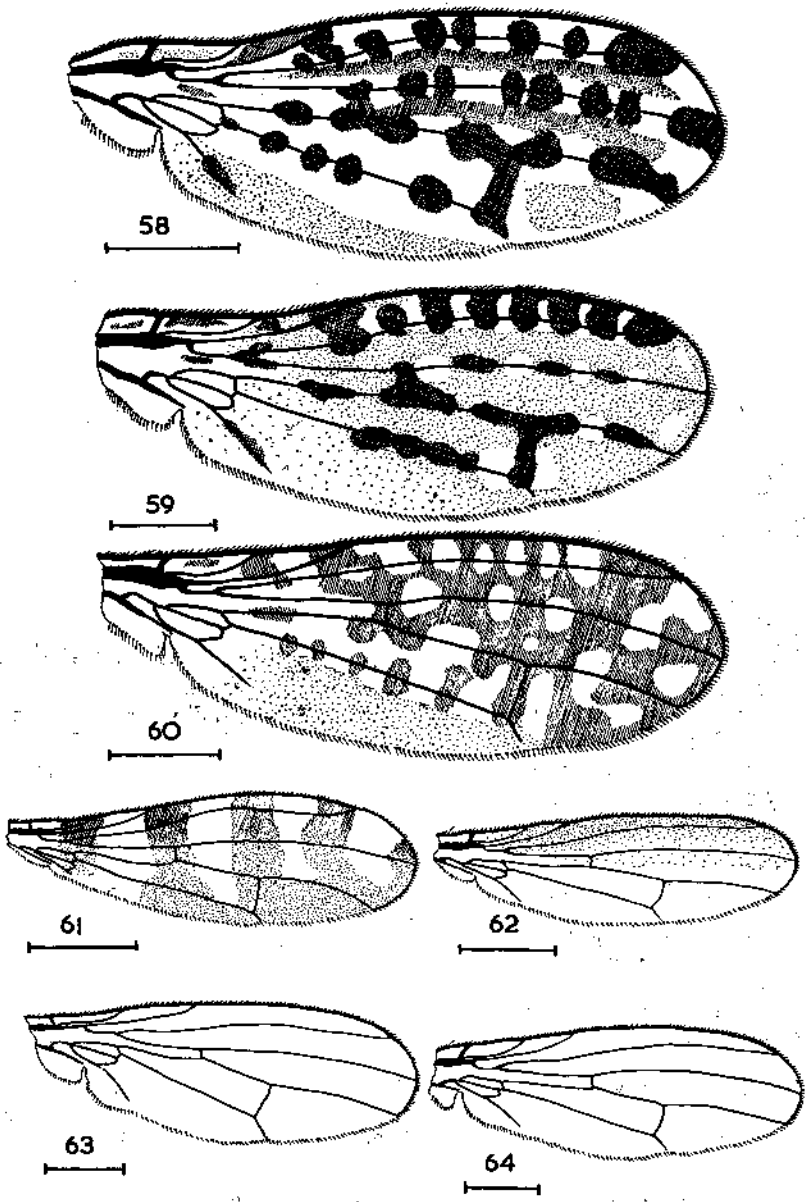


Fig. 58. Wing of *Huttonina elegans*  
 " 59. " " *H. scutellaris*  
 " 60. " " *H. glabra*  
 " 61. " " *H. angustipennis*  
 " 62. " " *H. claripennis*  
 " 63. " " *H. furcata*  
 " 64. " " *H. abrupta*

Scale: 1.0 mm.

yellowish-brown with 2 longitudinal dark brown vittae from ocelli to anterior region of front, separated by light brown stripes. Two fronto-orbitals, the anterior just over half posterior; verticals strong; postverticals weak; black hairs over most of front anterior to ocelli. Face yellowish-brown, brown area from base of antennae to eyes. Cheeks yellowish-brown. Fine black hairs along middle of cheek; about 3 strong bristles along posterior half of lower margin. Occiput yellowish-brown with wide median brown vitta and brown area bordering posterior margin of eye. Eyes with few very short fine hairs. Vertical diameter of eye about 2 to 3 times width of cheek in same axis. Proboscis light reddish-brown; palpi light brown with fine hairs.

**THORAX:** Yellowish-brown; mesonotum with 3 dark brown narrow longitudinal vittae, 1 median and 1 on each dorsocentral row, all three tending to unite posteriorly; faint trace of vitta through presutural bristle and only visible anterior to transverse suture, narrow vitta from humerus along notopleural suture and through wing base; scutellum with 2 wide brown vittae on disc separated by narrow yellowish-white line, brown vitta along sternopleural suture wider along ventral region of pteropleuron to haltere. Divergent basal scutellars equal in length to cruciate apicals; few fine hairs on disc of scutellum and on ventral apical surface; 1 humeral; 1 presutural; 2 notopleurals; 1 supraalar; 2 postalar; 3 strong sternopleurals, anterior the weakest; few minute spiracular hairs.

Legs yellowish-brown. Fore femur with bristles on postero-dorsal and posterior surfaces and one strong bristle at apical quarter of postero-ventral surface; fore tibia with preapical and apical; fore tarsus without strong basal ventral spines; mid femur with short anterior and posterior apicals; mid tibia with several strong preapicals and apicals; hind femur with 1 strong bristle at apical sixth of antero-dorsal surface; hind tibia with 1 apical.

Wings (Fig. 58): Many dark brown or brown markings. Small black costal spines ending about fifth distance between apices of 2nd and 3rd veins; 5th vein not reaching wing margin; 2nd vein wavy. Wing indices: costal about 3.8-4.0; 4th vein about 1.1-1.2; 4c about 0.5-0.6; 5x about 0.6-0.7.

Halteres yellowish-white.

**ABDOMEN:** Reddish-brown; tergites with broad brown lateral margins.

#### MALE

Similar to female except abdomen light brown with brown to dark brown posterior margins of tergites, which widen and darken on the more posterior tergites; dark brown bands on lateral margins of tergites, strong bristles on posterior margins of tergites, particularly laterally.

External genitalia (Fig. 65) light brown; genital arch dark brown dorsally, wide in middle but approximately rectangular, posterior margin curved forwards slightly to antero-ventral corner, strong bristles on posterior margin and black hairs over most of surface; anal plate reduced, lightly chitinised and with about 2 small black hairs; clasper about half width of arch at widest part, triangular and separated from arch by distinct suture, hairs, similar to those on arch, over surface.

**Holotype:** LAKE BRUNNER: 5.ii.1922, ♀, (*A. Tonnoir*), (Cawt. Inst.).

**Material Examined:** Holotype and 1 ♂ and 2 ♀.

**New Records:** ARTHURS PASS: 2-3.i.1943, (*E. S. Gourlay*), (1 ♀ P.D.D. and 1 ♀ Cawt. Inst.). MT. GREENLAND: 2,500 ft., 6.i.1943, 1 ♂, (*E. S. Gourlay*), (Cawt. Inst.).

**Distribution:** Mt. Arthur, Lake Brunner, Arthurs Pass, Mt. Greenland. (December to February).

**Remarks:** Recognised by the three sternopleurals, two dark brown longitudinal vittae on the scutellum, the hairs on dorsal and ventral surfaces of the scutellum and the wavy second vein. In general appearance close to *H. scutellaris* but it can be separated from that species as well as *H. glabra* by most of the characters above. Males are here recorded and described for the first time.



**Huttonina scutellaris** Tonnoir and Malloch. Figs. 59, 67

*Huttonina scutellaris* Tonnoir and Malloch, 1928. Rec. Cant.  
[N.Z.] Mus. 3 : 176.

A yellowish-white species with brown or dark brown vittae, and patterned wings. Body length about 5.0 mm., wing length about 4.5 mm.

MALE AND FEMALE

**HEAD:** Arista brown; rays of pubescence less than diameter of basal segments. Antenna light brown; 2nd segment with one dorsal bristle and other black hairs; basal segment with black apical hairs dorsally. Front yellowish-white, area between ocelli dark brown, pair of dark brown parallel vittae from ocelli to anterior margin of front, separated by yellowish-brown stripe; these vittae and the ocellar brown area united posteriorly and extending to postverticals. Anterior fronto-orbital two-thirds length posterior; verticals strong; postverticals and ocellars weak; fine black hairs on orbits and anterior region of front. Face yellowish-white, dark brown area from base of antennae to eyes. Cheeks yellowish-white. A few hairs along median region of cheek; 3 or 4 strong bristles towards lower posterior corner of eye. Occiput light brown with brown area laterally and bordering posterior margin of eye. Eyes with few minute hairs. Vertical diameter of eye about 2.3 times width of cheek in same axis. Proboscis light brown; palpi yellowish-brown with fine black hairs.

**THORAX:** Yellowish-white or yellowish-brown; mesonotum with dark brown vittae; 1 median, 1 on dorsocentral row, 1 through presutural bristle and hardly discernible posterior to suture, 1 from humerus along notopleural suture to wing base; the central three vittae uniting posteriorly and continued onto scutellum as broad median dark brown band; a dark brown vitta on sternopleural suture, continued posteriorly to haltere. Parallel basal scutellars just shorter than cruciate apicals, disc of scutellum with a few hairs and hairs also on ventral apical surface; 1 humeral; 1 presutural; 2 notopleurals; 1 supraalar; 2 postalars; 2 sternopleurals; fine hairs ventral to anterior spiracle.

Legs yellowish-brown often light brown towards apical segments. Fore femur with bristles along posterior surface and apical third of postero-dorsal surface, and 1 strong bristle at postero-ventral apical fifth; fore tibia with preapical and apical; mid femur with weak anterior and posterior apicals; mid tibia with about 2 strong preapicals and several strong apicals; hind femur about same diameter as fore femur and with 1 strong bristle at antero-dorsal apical fifth; hind tibia with 1 weak apical.

Wings (Fig. 59) clear or slightly opaque, with many brown areas; veins brown. Short black costal spines ending about fifth to quarter distance between apices of 2nd and 3rd veins; 5th vein just traceable to wing margin; 2nd vein wavy. Wing indices: costal about 3.9-4.5; 4th vein about 1.0; 4c about 0.5; 5x about 0.6.

Halteres whitish-brown.

**ABDOMEN:** Tergites brown to light brown with narrow brown median vitta and wide brown band on lateral margins. Strong bristles on posterior margins of tergites 2 to 5; bristles stronger laterally and on more posterior tergites.

External male genitalia (Fig. 67) yellowish-brown. Genital arch brown to dark brown on dorsal surface, elongate but about 1.5 times as wide in middle as at dorsal margin and both anterior and posterior margins convergent ventrally to the base of clasper which is about one-third greatest width of arch, strong bristles on posterior margin, dorsal ones the strongest and few smaller hairs over surface; anal plate reduced, lightly chitinised and with about 4 short hairs; clasper triangular with apex produced to small rounded point and directed posteriorly with few short hairs and matt of very minute light brown pile.

*Holotype:* SOUTHLAND: The Hump, 24.xii.1915, ♀, (*A. Philpott*), (Cawt. Inst.).

*Material Examined:* Holotype, allotype, 4 ♂ and 4 ♀ paratypes, 3 ♂ and 6 ♀.

*New Records:* CLIPPINGS: 22.xii.1944, 1 ♂, 3 ♀, (*E. S. Gourlay*), (Cawt. Inst.). WAIHO: *Waiho Gorge*, 21.ii.1927, 1 ♂, (*A. Castle*), (Dom. Mus.). MT. GREENLAND: 2,500 ft., 6.i.1943, 1 ♀, (*E. S. Gourlay*), (Cawt. Inst.). DUNEDIN: *Opoho*, 30.xi.192-, 1 ♂, (*Anon.*),

(Ak. Mus.). MAKARORA: 1,000 to 2,000 ft., -xii.1924, 1 ♀, (*C. Fenwick*), (Dom. Mus.). BLUE CLIFFS: 29.xii.1921, 1 ♀, (*Anon.*), (Ak. Mus.).

*Distribution*: Clippings, Mt. Greenland, Mt. Burns, Waiho, Banks Peninsula, Dunedin, Longwoods, Tisbury, Queenstown, The Hump, Makarora, Knife and Fork, Blue Cliffs, Wairaurahiri. (November to February).

*Remarks*: Close to *H. glabra* but differs from that species by the absence of darkening between the lateral two mesonotal vittae, presence of hairs beneath the apex of the scutellum, a wavy second vein, all femora approximately of equal diameter and a larger costal index.

### **Huttonina glabra** Tonnoir and Malloch. Figs. 60, 69

*Huttonina glabra* Tonnoir and Malloch, 1928. Rec. Cant. [N.Z.]

Mus. 3 : 177.

A yellowish-white species with patterned wings and enlarged hind femora. Body length about 6.0 mm., wing length about 6.0 mm.

#### MALE AND FEMALE

**HEAD**: Arista brown; rays of pubescence less than diameter of basal segments. Antenna brown; 3rd segment light brown basally; 2nd segment dorsally almost as long as 3rd segment, 1 strong dorsal bristle and other hairs; basal segment with hairs on apical margin. Front yellowish-white, ocellar area dark brown, 2 brown vittae from ocelli to anterior margin of front. Anterior fronto-orbital about two-thirds length posterior; verticals strong; ocellars and postverticals about equal and shorter than verticals; black hairs on orbits and anterior region of front. Face yellowish-white, dark brown area from base of antennae to eyes. Cheeks almost white. Fine brown hairs in an irregular row along cheek; about 2 bristles near lower posterior corner of cheek. Occiput yellowish-white; light brown area adjacent to posterior margin of eye. Eyes with few short fine hairs. Vertical diameter of eye about 2.5 times width of cheek in same axis. Proboscis light brown; palpi yellowish-brown with a long fine apical hair and shorter hairs along surface.

**THORAX**: Yellowish-white; mesonotum with 1 median vitta, 1 on dosocentral line, 1 on presutural line, and 1 from humerus along notopleural suture to wing base, all brown with area between last two light brown and first three merging posteriorly to light brown area continued as median vitta on scutellum; dorsal sternopleuron and ventral pteropleuron light brown. Divergent basal scutellars equal to cruciate apicals; scutellum with marginal hair on either side, near apical bristle, bare beneath apex; 1 humeral; 1 presutural; 2 notopleurals; 1 supraalar; 2 strong postalar; 2 sternopleurals below anterior spiracle.

Legs yellowish-brown. Fore femur with weak bristles postero-dorsally in 2 rows and 2 strong bristles about apical quarter of postero-ventral surface; fore tibia with preapical and apical bristles; mid femur with short anterior and posterior apicals; mid tibia with 2 strong preapicals and several strong apicals; hind femur about twice diameter of fore femur, and with strong antero-dorsal bristle at apical fifth; hind tibia with weak apical.

Wings (Fig. 60) opaque, membrane with many brown markings; veins brown; 2nd vein slightly wavy. Strong stout costal spines to third distance between apices of 2nd and 3rd veins. Wing indices: costal about 3.6; 4th vein about 1.0; 4c about 0.6; 5x about 0.7.

Halteres light reddish-brown.

**ABDOMEN**: Brown.

External male genitalia (Fig. 69): Genital arch rectangular, about 3 times as long on each side as wide, fine long bristles on posterior margin and few scattered hairs over surface, cluster of long fine hairs at ventral posterior corner; anal plate reduced with about 2 short black hairs; clasper broad at base almost equal to average width of arch, triangular with apex curved anteriorly so that

apical point is directed anteriorly, few long fine hairs on outer surface at postero-dorsal corner and shorter hairs on inner surface and on inner surface of ventral region of arch, clasper separated from arch by distinct suture.

*Holotype*: DUN Mt.: 2,000 ft., 3.ii.1921, ♀, (*A. Philpott*), (Cawt. Inst.).

*Material Examined*: Holotype, allotype, 1 ♀ paratype, and 1 ♀.

*New Records*: ARTHURS PASS: 23.i.1943, 1 ♀, (*E. S. Gourlay*), (Cawt. Inst.).

*Distribution*: Dun Mt., Arthurs Pass, Banks Peninsula. (November to February).

*Remarks*: The large hind femur and light brown area between the two lateral mesonotal vittae are the chief distinguishing characteristics of this species. Closely allied to *H. scutellaris* and separated from it by these two characters.

### **Huttonina furcata** Tonnoir and Malloch. Figs. 63, 68

*Huttonina furcata* Tonnoir and Malloch, 1928. Rec. Cant.  
[N.Z.] Mus. 3 : 175.

A yellowish-brown species with wings of normal shape and shading only at cross veins. Body length about 4.5 mm., wing length about 4.5 mm.

#### MALE

**HEAD**: Arista brown, light brown at base; rays of pubescence much shorter than diameter of basal segment. Antenna light yellowish-brown; 2nd segment with 1 dorsal bristle and short black hairs; basal segment with black hairs on apical dorsal margin. Front yellowish-brown, ocellar area brown. Three fronto-orbitals, ratio of their lengths, anterior to posterior, 2 : 3 : 4; verticals strong; ocellars and postverticals weak; short black hairs over most of front except broad triangle around ocelli. Face light yellowish-brown; parafacials convex and yellowish-white. Few black hairs along median region of cheek anteriorly near ptilinal suture, posterior hairs strong; about 4 strong bristles on posterior lower half of cheek. Occiput yellowish-brown. Eyes with few short fine hairs. Vertical diameter of eye about 3 times width of cheek in same axis. Proboscis yellowish-brown, palpi broad and with very short hairs.

**THORAX**: Yellowish-brown, notopleural suture brown. Parallel basal scutellars just shorter than cruciate apicals; scutellum bare; 1 humeral; 1 presutural; 2 notopleurals; 1 supraalar; 2 postalars; 1 sternopleural.

Legs yellowish-brown. Fore femur with bristles on postero-dorsal and posterior surface, without strong postero-ventrals; fore tibia with preapical and weak apical; basal segment of fore tarsus with several basal ventral spines; mid femur with 1 short apical posterior bristle; mid tibia with several strong preapical and apicals; hind femur with 1 strong antero-dorsal at apical fifth; hind tibia with weak apical.

Wings (Fig. 63) shaded faintly with light brown; veins light brown, cross veins and membrane about them, brown. Short stout costal bristles fading out about third distance between apices of 2nd and 3rd veins. Wing indices: costal about 4.2-4.6; 4th vein about 1.5-1.8; 4c about 0.6; 5c about 0.7-1.0.

Halteres light brown stalk, brown apex.

**ABDOMEN**: Tergites slightly shining light brown or brown.

External male genitalia (Fig. 68) light brown. Genital arch broad, parallel sides with posterior margin curved forward to anterior ventral corner, 1 strong bristle at dorsal posterior corner and successively smaller bristles down posterior margin, elsewhere distinct black hairs over surface; anal plate lightly chitinised, reduced to very small narrow strip-like plate and with 3 small black hairs; clasper small, broadly rounded apex, triangular, without strong suture separating it from arch, a few fine minute hairs on surface.

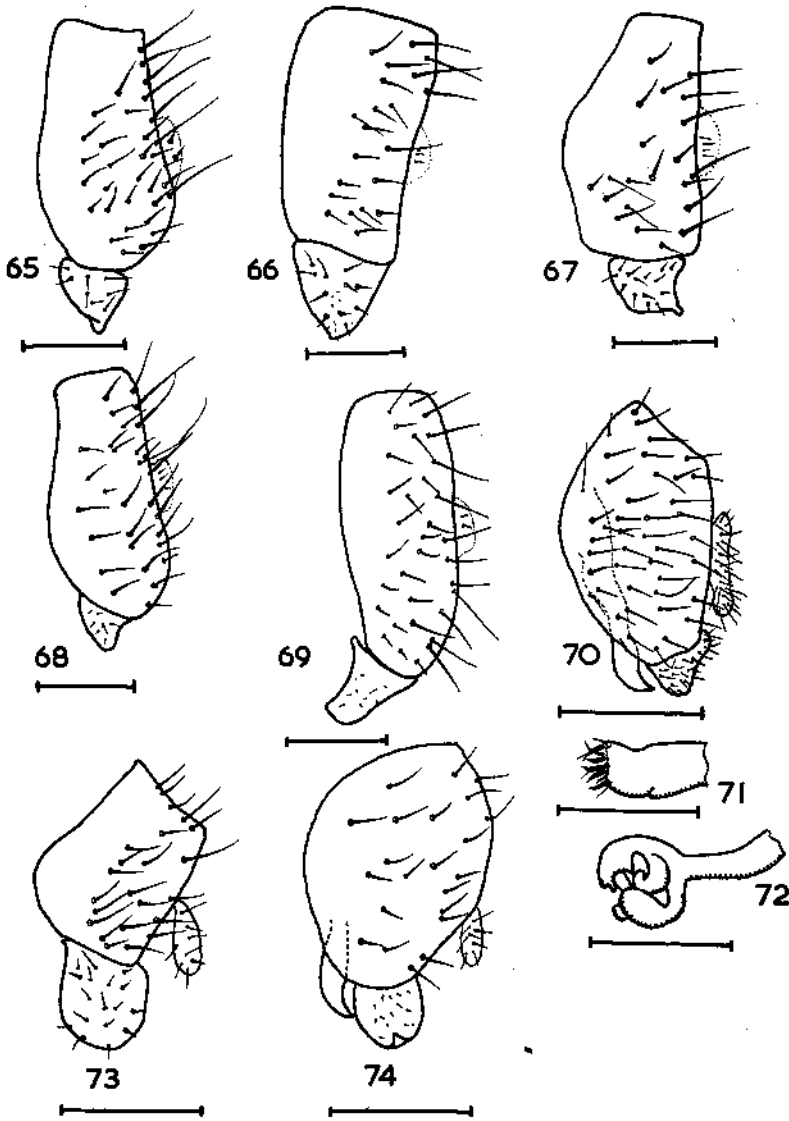


Fig. 65. External male genitalia of *Huttonina elegans*  
 " 66. " " " " " *H. claripennis*  
 " 67. " " " " " *H. scutellaris*  
 " 68. " " " " " *H. furcata*  
 " 69. " " " " " *H. glabra*  
 " 70. " " " " " *Helosciomyza setuligera*  
 " 71. Paramere of " " "  
 " 72. Penis of " " "  
 " 73. External male genitalia of *Helosciomyza spinicosta*  
 " 74. " " " " " *H. subspinicosta*

Scale: Figs. 65-69, 0.25 mm.; Figs. 70-74, 0.5 mm.

FEMALE

Similar to male except abdomen usually dark brown with 5th and 6th tergites brown and genital tergites and plates dark brown.

*Holotype*: ANISEED VALLEY: 22.iii.1922, ♂, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined*: *Holotype*, ♂ and ♀ paratypes, and 8♂, 11♀, and 1 ex.

*New Records*: WAITAKERE RANGES: Swanson, ex stream, 11.xii.1949, 1♀, (*R. A. Harrison*); 1♂, (*K. P. Lamb*): Oratia, swept near stream, 25.x.1953, 6♂, 6♀, (*R. A. Harrison*), (P.D.D.): Titirangi, 5.x.1927, 1 ex. (*E. S. Gourlay*), (Cawt. Inst.): Sharps Bush, 23.vii.1950, 1♂ (*K. A. J. Wise*), (P.D.D.). NO DATA, 1♀, (*Ak. Mus.*). OHAKUNE: -1923, 3♀, (*T. R. Harris*), (Cawt. Inst.).

*Distribution*: Waitakere Ranges, Ohakune, Nelson, Waiho, Lake Brunner, Kumara. (July, October to March).

*Remarks*: Distinguished by the three fronto-orbitals, one sternopleural, clear wings, and the absence of a large postero-ventral bristle on the fore femur. Colour variations are the occasional presence of a light brown or brown median longitudinal vitta on mesonotum. Separated from other members of *abrupta* group by the presence of only one sternopleural. Previously found only in the South Island but now recorded from the North Island and apparently widespread over both islands. Associated with streams in forested areas.

***Huttonina abrupta* Tonnoir and Malloch. Fig. 64**

*Huttonina abrupta* Tonnoir and Malloch, 1928. Rec. Cant. [N.Z.] Mus. 3: 175.

A yellowish-brown species with clear wings. Body length about 4.5-5.0 mm., wing length about 4.5-5.0 mm.

MALE AND FEMALE

**HEAD**: Arista brown, light brown basally; rays of pubescence just less than diameter of basal segments. Antenna yellowish-brown; 3rd segment light brown on apical two-thirds; 2nd segment just shorter than 3rd segment, with 1 dorsal bristle and small black hairs; basal segment with hairs on dorsal apical margin. Front yellowish-brown, ocellar spot brown, region about fronto-orbitals and posterior to them, light brown. Three fronto-orbitals, ratio of their lengths, anterior to posterior, 0.9:1.0:2.0; verticals strong; ocellars weak and shorter than postverticals; black hairs on most of front except on triangular area about ocelli. Face yellowish-brown. Cheeks yellowish-brown. Fine hairs on middle of cheek in a row extending to pitinal suture, 2 or 3 strong bristles towards lower posterior corner. Occiput light brown. Eyes bare. Vertical diameter of eye about 2.5-3.0 times width of cheek in same axis. Proboscis yellowish-brown; palpi short, with long hairs apically and fine shorter hairs elsewhere.

**THORAX**: Yellowish-brown. Convergent basal scutellars less than length of cruciate apicals; scutellum bare; 1 humeral; 1 presutural; 2 notopleurals; 1 supraalar; 2 strong postalar; 3 sternopleurals; small spiracular hairs.

Legs yellowish-brown. Fore femur with bristles on postero-dorsal surfaces, 1 strong preapical postero-ventral; fore tibia with preapical and apical; basal segment of fore tarsus with a few brown ventral basal spines; mid femur with weak anterior and posterior apicals; mid tibia with several strong preapicals and apicals; hind femur with bristle at apical quarter of antero-dorsal and postero-dorsal surfaces; hind tibia with 1 weak apical.

Wings (Fig. 64) clear; veins light brown, little or no darkening around cross veins. Short stout costal spines ending third distance between apices of 2nd and

3rd veins. Wing indices: costal about 4.5; 4th vein about 1.5; 4c about 0.6; 5x about 0.8.

Halteres brown with yellowish-brown stalk.

ABDOMEN: Yellowish-brown. Each tergite with dark brown posterior bands becoming progressively darker towards apex. Female genital plates brown.

*Holotype*: CHRISTCHURCH: Riccarton, Deans Bush, 16.x.1924, ♂, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined*: Holotype, allotype, 1 ♂ and 1 ♀ paratypes, and 1 ♂ and 2 ♀.

*New Records*: TARARUA RANGES: Above Fields Hut, 4.xii.1952, 1 ♂, 1 ♀, (*B. A. Holloway*), (Dom. Mus). NELSON: Aniseed Valley, 6.iii.1950, 1 ♀, (*A. W. Parrott*), (Cawt. Inst.).

*Distribution*: Tararua Ranges, Nelson, Mt. Arthur, Dun Mt., Waiho, Cass, Christchurch, Banks Peninsula, Tisbury, Lake Luna. (October to March).

### **Huttonina brevis** Malloch

*Huttonina brevis* Malloch, 1930. Rec. Cant. [N.Z.] Mus. 3 : 343.

A brown species with clear wings. Body length about 4.5 mm.

#### FEMALE

HEAD: Similar to *H. abrupta*. Three fronto-orbitals.

THORAX: Similar to *H. abrupta*. Mesonotum grey dusted with slight traces of dark stripes. Three sternopleurals.

Legs: Fore femur with 1 strong and several shorter bristles on postero-ventral surface.

Wings clear without shading about cross veins. Costal section between humeral cross vein and apex of subcosta about 1.75 times distance between apices of subcosta and 1st vein. First vein apex well before level of anterior cross vein.

*Holotype*: KUMARA: 20.x.1929, ♀, (*J. W. Campbell*), (U.S.N.M.).

*Remarks*: The holotype is the only specimen known. It is in the United States National Museum and has not been examined. Malloch states that this species is very close to *H. abrupta* and separates them on the basis of the position of the apex of the first vein in relation to the anterior cross vein and to the apex of the subcosta. Here the separation of the two species is made on the presence of one or more bristles near apex of the postero-ventral surface of the fore femur.

### Subgenus HUTTONELLA Tonnoir and Malloch

*Huttonella* Tonnoir and Malloch, 1928. Rec. Cant. [N.Z.] Mus. 3 : 178.

Wing narrowed, particularly at base; anal lobe and alula small; 3rd vein haired at base dorsally and ventrally.

Types Species: *Huttonina (Huttonella) angustipennis* Tonnoir and Malloch

The shape of the wing is important in separating this subgenus from the subgenus *Huttonina*.

#### *Species*:

*Huttonina (Huttonella) angustipennis* Tonnoir and Malloch

*H. (Huttonella) claripennis* sp.n.

The two species in this subgenus are not very closely related. It is conceivable that *Huttonella* with the modified wing shape has evolved

later than the subgenus *Huttonina* and that, if the number of fronto-orbitals is a character of great importance, as it is often regarded in generic synopses, then *H. angustipennis* could be a derivative of the *abrupta* group of species of the subgenus *Huttonina* and *H. claripennis* a derivative of the *elegans* group of species of that subgenus.

KEY TO SPECIES OF SUBGENUS HUTTONELLA

Three fronto-orbitals; wing with dark transverse stripes ..... *angustipennis*  
Two fronto-orbitals; wings without transverse stripes ..... *claripennis*

***Huttonina angustipennis* Tonnoir and Malloch. Fig. 61**

*Huttonina angustipennis* Tonnoir and Malloch, 1928. Rec.  
Cant. [N.Z.] Mus. 3 : 178.

A narrow bodied species; yellowish-brown with shining dark brown abdomen and narrowed, patterned wings. Body length about 4.5 mm., wing length about 4.5 mm.

MALE AND FEMALE

**HEAD:** Arista brown, dark brown basally; rays of pubescence very short and not equal to diameter of basal segments. Antenna yellowish-brown; 3rd segment light reddish-brown; 2nd segment with 1 dorsal bristle and other hairs; basal segment with short dorsal hairs. Front yellowish-brown, area between ocelli light brown. Ratio of lengths of the three fronto-orbitals, anterior to posterior, 1 : 2 : 2.3; verticals strong; ocellars weak and about equal to postverticals; short fine hairs particularly on orbits and anterior region of front. Face yellowish-brown. Cheeks yellowish-brown. Row of strong black hairs along cheek margin posteriorly, fine hairs anteriorly. Occiput yellowish-brown. Eyes bare. Vertical diameter of eye about 2.5 times width of cheek in same axis. Proboscis light brown; palpi with long apical hair and short hairs elsewhere.

**THORAX:** Yellowish-brown; notopleural suture brown. Basal scutellars parallel and about two-thirds length of cruciate apicals; fine hairs on disc of scutellum dorsally and ventrally; 1 humeral; 1 presutural; 2 notopleurals; 1 supraalar; 2 postalars; 2 sternopleurals.

Legs yellowish-brown. Fore femur with bristles on postero-dorsal surface, short bristles on apical quarter of dorsal surface and 1 strong postero-ventral at apical quarter; fore tibia with strong preapical and weak apical bristle; mid femur with anterior preapical and weak anterior and posterior apicals; mid tibia with 2 strong preapicals and several strong apicals; hind femur with strong bristle at apical quarter of antero-dorsal surface; hind tibia with 1 apical.

Wings (Fig. 61): Membrane clear with light brown shaded areas; veins light brown and brown in shaded areas. Short stout costal spines ending about quarter distance between apices of 2nd and 3rd veins; costa ending at 4th vein; 2nd vein with broad anteriorly directed curve near middle. Wing indices: costal about 2.9; 4th vein about 1.2; 4c about 0.8; 5x about 0.2.

Halteres yellowish-brown.

**ABDOMEN:** Shining dark reddish-brown.

External male genitalia: Genital arch rectangular, broad, and light brown with greyish dusting.

*Holotype:* MT. ARTHUR: 14.i.1922, ♂, (*A. Philpott*), (Cawt. Inst.).

*Material Examined:* Holotype, allotype and 1 ♀ paratype.

*Distribution:* Mt. Arthur. (January to March).

*Remarks:* Readily separated from other members of the genus by the narrow wings, and from *H. claripennis* by the presence of three fronto-orbitals and the dark brown areas on the wings. Male external genitalia have not been examined but from notes given by Tonnoir and Malloch (1928) they appear similar to those described and figured for *H. claripennis* sp.n.

## **Huttonina claripennis** sp.n. Figs. 62, 66

A shining yellowish-brown species with brown abdomen and narrow wings. Body length about 3.5-4.0 mm., wing length 4.5 mm.

### MALE AND FEMALE

**HEAD:** Arista dark brown, brown basally; rays of pubescence about half width of basal segment. Antenna yellowish-brown; 3rd segment disc-like; 2nd segment not as long as 3rd with short dorsal bristle and black hairs; basal segment with few long black apical hairs. Front shining yellowish-brown with trace of brown vitta from ocelli to anterior margin; anterior margin distinctly protruding. Two fronto-orbitals, anterior about three-quarters posterior; verticals strong; post-verticals and ocellars approximately equal and short; distinct black hairs on orbits and anterior half of front. Face yellowish-white, distinctly concave; brown area from antennae to eyes. Cheeks yellowish-white. About 3 strong bristles along cheek and fine hairs anteriorly. Occiput yellowish-brown, brown laterally. Eyes with few very short hairs. Vertical diameter of eye about 1.5 times width of cheek in same axis. Proboscis light brown; palpi yellowish-brown with short black hairs.

**THORAX:** Shining light brown; notopleural suture brown. Parallel basal scutellars shorter than cruciate apicals; scutellum with few hairs on disc; 1 humeral; 1 pre-sutural; 2 notopleurals; 1 supraalar; 2 postalars, inner one strong; 2 sternopleurals.

Legs yellowish-brown. Fore femur wide, with posterior bristles, 1 short postero-dorsal at apical quarter and a strong postero-ventral at apical quarter; fore tibia with preapical and apical; mid femur with strong antero-dorsal at apical quarter and a shorter preapical; mid tibia with several strong preapicals and apicals; hind femur with strong antero-dorsal bristle at apical fifth; mid and hind femur wide but not equal to width of fore femur; hind tibia with short but stout apical.

Wings (Fig. 62) clear with light brown shading on anterior half of wing particularly about 2nd and 3rd veins; veins light brown. Short stout costal spines extending over half distance between apices of 2nd and 3rd veins; 5th vein not reaching wing margin. Wing indices: costal about 4.1-4.4; 4th vein about 1.5-1.7; 4c about 0.6-0.7; 5x about 0.4-1.0.

Halteres light brown.

**ABDOMEN:** Shining light brown.

External male genitalia (Fig. 66): Genital arch about 1.5 times as long as broad on either side, postero-ventral corner curved round to clasper, fine long bristles bordering posterior margin the strongest bristles dorsally, few scattered fine black hairs over surface; anal plate much reduced and with about 3 short black hairs; clasper triangular, anterior margin curved outwards, bare on outer surface, fine short hairs on inner surface.

**Holotype:** ROUTEBURN: 2-5.i.1945, ♂, (*E. S. Gourlay*), (Cawt. Inst.).

**Paratypes:** Same data as holotype, (2 ♂ Cawt. Inst., 1 ♂ and 1 ♀, P.D.D.).

**Material Examined:** Holotype and 4 paratypes.

**Distribution:** Routeburn. (January).

**Remarks:** Recognised by the narrow elongate wings. Separated from *H. angustipennis* by the absence of dark brown transverse fasciae on wings, the presence of only two fronto-orbital bristles, and a wider cheek.

## Genus NEOLIMNIA Tonnoir and Malloch

*Neolimnia* Tonnoir and Malloch, 1928. Rec. Cant. [N.Z.] Mus.

3: 163.

Arista pubescent. Third segment of antenna parallel-sided, rounded apex and not tapered to apex; 2nd segment near same length as 3rd. Cheeks bare on dorsal region. Scutellum haired; mesopleuron haired; pteropleuron with bristles; sterno-



pleuron haired and without bristles; propleuron without bristles but cluster of hairs near ventral margin. Hind coxa without fine hairs above base of femur. Costa without long spines; anal vein and 5th vein traceable to wing margin.

Type Species: *Neolimnia obscura* (Hutton)

Readily recognised by the presence of pteropleural bristles, patterned wings and large antennae with large second and third segments. Composed of large flies, the mean body length is about 7.0 mm. and the smallest species measures about 5.0 mm. Most closely related to the more widespread genus *Limnia* Robineau-Desvoidy, but differs from it by shape of antennae, colouration of arista, and absence of fine hairs on hind coxa.

*Distribution*: New Zealand.

Two subgenera were recognised by Tonnoir and Malloch (1928) and an additional one is now proposed.

#### KEY TO SUBGENERA OF NEOLIMNIA

- |   |  |                             |
|---|--|-----------------------------|
| 1 | Posterior cross vein weakly sinuate .....        | 2                           |
|   | Posterior cross vein very strongly sinuate ..... | <i>Pseudolimnia</i> (p. 68) |
| 2 | Presutural bristles absent .....                 | <i>Sublimnia</i> (p. 72)    |
|   | Presutural bristles present .....                | <i>Neolimnia</i> (p. 74)    |

#### Subgenus PSEUDOLIMNIA Tonnoir and Malloch

*Pseudolimnia* Tonnoir and Malloch, 1928, Rec. Cant. [N.Z.]

Mus. 3 : 171.

Strong prescutellars present; presutural present. Posterior cross vein strongly sinuate; 3rd and 4th veins slightly convergent towards their apices.

Type Species: *Neolimnia (Pseudolimnia) sigma* (Walker)

Readily separated from other subgenera by the strongly sinuate posterior cross vein.

*Species*:

*Neolimnia (Pseudolimnia) sigma* (Walker)

*N. (Pseudolimnia) tranquilla* (Hutton)

The two species are closely related.

#### KEY TO SPECIES OF SUBGENUS PSEUDOLIMNIA

- |  |                   |
|--|-------------------|
| Wings with brown spots confined to anterior border and cross veins ..... | <i>sigma</i>      |
| Wings with many brown spots .....  | <i>tranquilla</i> |

***Neolimnia sigma*** (Walker). Figs. 57, 77, 89

*Tetanocera sigma* Walker, 1849. "List Dipt. Brit. Mus." 4 : 1084.

*Cylindra sigma* (Walker): Hutton, 1881. "Cat. Dipt. N.Z." p. 65.

*Limnia sigma* (Walker): Hutton, 1901. Trans. N.Z. Inst. 33 : 84.

*Neolimnia sigma* (Walker): Tonnoir and Malloch, 1928. Rec. Cant. [N.Z.] Mus. 3 : 171.

A large greyish-brown species with few dark markings on wings. Body length about 9.0 mm., wing length about 9.0 mm.

#### MALE AND FEMALE

**HEAD** (Fig. 57): Arista dark brown, basal segment brown; rays of pubescence, except at apex and base, up to twice as long as width of basal segments. Antenna light brown; 3rd segment light reddish-brown; 2nd segment equal to or longer

than 3rd segment with many thick black hairs and a dorsal bristle. Front light lemon-yellow, median reddish-brown vitta from ocelli to near anterior margin of front and a lighter indefinite vitta on row of orbital bristles, the region about base of bristles brown; ocellar area and region to postverticals brown. Occiput with median light brown vitta from postverticals to foramen, bordered by grey and elsewhere brownish-grey. Anterior fronto-orbital about three-quarters length posterior orbital; ocellars, verticals and postverticals strong, the latter the longest; black hairs on orbits and anterior front; black hairs between ocelli and posterior to postverticals. Face light yellow with grey dusting, brown band from base of antennae across dorsal parafacials to eye. Cheeks yellowish-grey dusted. Fine black hairs on middle of cheek and part of parafacials and about 5 black bristles in line at lower posterior corner of cheek. Eyes with few fine hairs. Vertical diameter of eye about twice width of cheek in same axis. Proboscis brown; palpi yellowish-brown with black hairs on surface, longest at apex.

**THORAX:** Mesonotum light greyish-brown with grey dusted lateral margin and faint brown vittae, 1 median pair, 1 bordering the lateral grey margin, and a broken one between this and the median vitta; scutellum greyish-brown with broad brown strip covering most of dorsal surface; pleura greyish-brown with dorsal brown vitta from humerus and propleuron, across mesopleuron, below wing base to haltere. Prescutellars equal in length to anterior dorsocentrals, latter just less than posterior dorsocentrals; convergent basal scutellars about three-quarters length apical; 1 humeral; 2 notopleurals; 1 supraalar; 2 postalars; 2 strong pteropleurals; prosternum sometimes with few hairs.

Legs light brown, apical segments of tarsi dark brown. Fore femur with strong bristles on postero-dorsal surface; fore tibia with preapical and several apicals and thick matt of short black fine hairs at apex of antero-ventral surface; fore tarsus with continuation of this matt on basal segment; mid femur with 1 bristle at middle of anterior surface; mid tibia with ring of apical bristles; hind femur with bristles on apical third of antero-dorsal surface, apical one the weakest, short stout bristles on apical third of antero-ventral surface and similar bristles on apical two-thirds of postero-ventral surface; hind tibia with preapical and apical and matt of black hairs similar to fore femur on apex of postero-ventral surface; hind tarsus with a continuation of this matt of hairs on all segments, broadest on basal segment.

Wings (Fig. 77): light brown with brown shading; veins brown. Short costal spines to about half way between apices of 2nd and 3rd veins. Two strong bristles on costa near wing base. Wing indices: costal about 2:1; 4th vein about 1.25; 4c about 0.75; 5x about 0.6.

Halteres light yellow, light brown basally.

**ABDOMEN:** Brown, without definite pattern but with brown spot towards lateral margin of tergites.

External male genitalia (Fig. 89) yellowish-brown. Genital arch about twice as high as broad, black hairs over most of surface, stronger dorsally, fairly strong hook-like projection at ventral quarter of anterior margin; anal plate lightly chitinised, hairs as long as longest of arch thickly over surface; clasper with posteriorly directed ventral prominence and rounded antero-ventral corner, minute hairs over surface; auxiliary clasper on antero-ventral corner of arch heavily chitinised, thick short black hairs on anterior half.

*Holotype:* NO DATA: ♂, (Mr. Earl), (B. M.).

*Material Examined:* Holotype, 5 ♂ and 7 ♀.

*New Records:* KAITAIA: -.ii.1917, 1 ♀ (Anon.), (Dom. Mus.). AUCKLAND: Mt. Albert, -.1919, 1 ♂, (A. E. Brookes), (B.M.). GISBORNE: 7.x.1906, 1 ♀, (W. Wesche), (B.M.). WAINUIOMATA: -.xii.1939, 1 ♂, (G. V. Hudson), (Dom. Mus.). CAMPBELLS HILL: ex bush, 17.xi.1912, 1 ♀, (G. V. Hudson), (Dom. Mus.). FRENCH PASS: -.i.1917, 1 ♂, (G. V. Hudson), (Dom. Mus.). STILLWATER: 2.iii.1927, 1 ♂, (Anon.), (Dom. Mus.). OTAGO PENINSULA: Sandy-mount, 7.xi.1915, 1 ♀, (Anon.), (Ak. Mus.). DUNEDIN: Leith, 27.xi.1921, 1 ♂, 1 ♀ (Anon.), (Ak. Mus.). NO DATA: 2 ♀, (J. Muggeridge), (B.M.).

*Distribution:* Kaitaia, Auckland, Gisborne, Wainuiomata, Campbells Hill, French Pass, Christchurch, Stillwater, Otago Peninsula, Dunedin. (October to March).

*Remarks:* Readily recognised by the very sinuate posterior cross vein and the few brown spots on the wings.

***Neolimnia tranquilla* (Hutton). Figs. 78, 90**

*Limnia tranquilla* Hutton, 1901. Trans. N.Z. Inst. 33 : 83.

*Neolimnia tranquilla* (Hutton): Tonnair and Malloch, 1928.

Rec. Cant. [N.Z.] Mus. 3 : 171.

A light brown species with patterned wings. Body length about 7.5 mm., wing length about 7.0 mm.

MALE AND FEMALE

**HEAD:** Arista brown, light brown towards base; rays of pubescence short on basal two segments but elsewhere up to twice width of basal segments. Antenna light reddish-brown; 3rd segment brown at apex; 2nd segment equal in length to 3rd segment, with 1 apical dorsal bristle and black hairs over all surfaces; basal segment with black hairs on dorsal apical margin. Front yellowish-brown, a longitudinal light brown vitta enclosing ocellar area and almost reaching anterior margin of front and with brown median line in front of ocelli; large brown spot at base of outer vertical. Occiput with median light brown to brown vitta from posterior to ocelli to foramen, bordered by light grey dusting, elsewhere dusted greyish-brown. Anterior fronto-orbitals about three-quarters length posterior orbitals, other bristles strong; fine black hairs on orbits and anterior front. Face light greyish-yellow, a broad brown area from eye to base of antenna at dorsal parafacial. Cheeks light yellowish-grey. Short fine hairs on median region of cheek anteriorly but stronger posteriorly, about 4 or 5 strong bristles towards lower angle of cheek. Eyes with few short fine hairs. Vertical diameter of eye about twice width of cheek in same axis. Proboscis brown; palpi brown basally elsewhere light brown.

**THORAX:** Mesonotum brown with pair of narrow faint brown vittae anteriorly, light greyish-brown band laterally bordered on inner margin with wide brown vitta; pleura light brownish-grey with wide brown vitta from humerus and propleuron across mesopleuron, below wing base to haltere; scutellum light brownish-grey with median dorsal brown stripe. Prescutellars present, anterior dorsocentral just shorter than posterior dorsocentral; basal scutellars over three-quarters length of apicals; 1 humeral; 2 notopleurals; 1 supraalar; 2 postalar; 2 strong bristles on pteropleuron; prosternum bare.

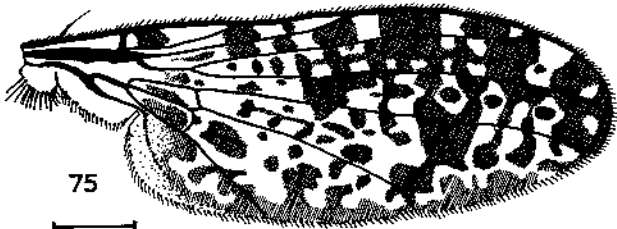
Legs light brown; fore femur greyish-brown; apex of fore tibia brown to dark brown; apical segments of fore tarsi dark brown; mid and hind femora brown, apices of mid and hind tibia brown; apical segments of mid and hind tarsi brown. Fore femur with strong postero-dorsal bristles; fore tibia with preapical and weak apical; mid femur with anterior median bristle; mid tibia with ring of preapical and apical bristles; hind femur with short bristles on apical two-thirds of postero-ventral surface and shorter ones on apical third of antero-ventral surface, some antero-dorsal bristles towards apex; hind tibia with preapical and strong apical and thick matt of brown hairs on apex of posterior surface and on same surface of tarsal segments.

Wings (Fig. 78) light brown or greyish-brown with brown markings. Short stout costal spines fading out about half way between apices of 2nd and 3rd veins. Wing indices: costal about 2.1; 4th vein about 1.0-1.3; 4c about 0.7-0.9; 5x about 0.3-0.4.

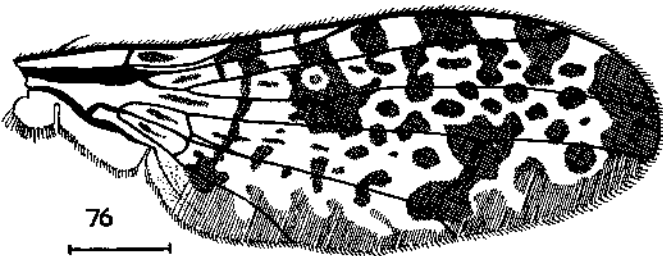
Halteres yellowish-brown, light brown basally.

**ABDOMEN:** Male tergites brown with grey lateral margins often enclosing or almost enclosing a brown or dark brown spot. Sternites greyish-brown with protuberances covered with shining blackish-brown hairs.

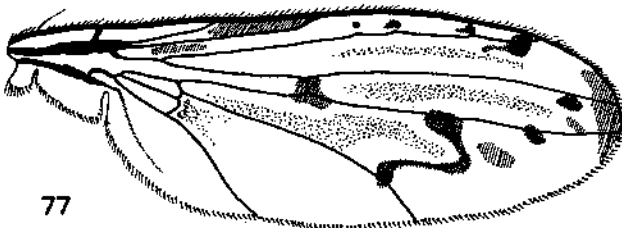
External male genitalia (Fig. 90): Genital arch narrow dorsally, strong black hairs dorsally, weak ventrally, weak posterior hook-like projection at ventral quarter of anterior margin; anal plate narrow with long curved black hairs thickly over surface; clasper strongly chitinised, strong posterior apical protuberance



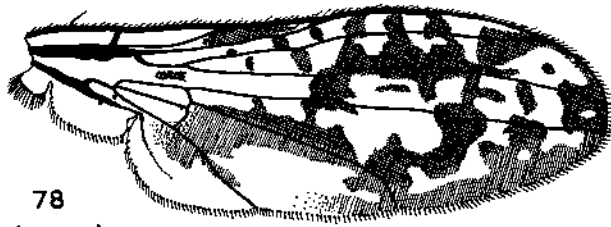
75



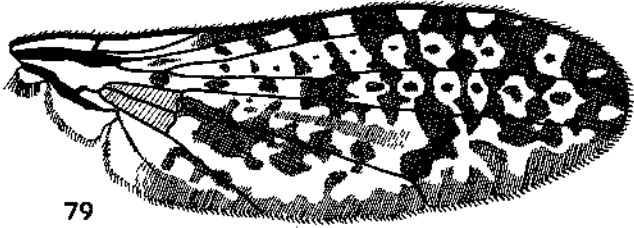
76



77



78



79

Fig. 75. Wing of *Neolimnia obscura*  
" 76. " " *N. ocellata*  
" 77. " " *N. sigma*  
" 78. " " *N. tranquilla*  
" 79. " " *N. striata*  
Scale: 1.0 mm.

and an anteriorly directed anterior apical prominence, very fine short brown hairs on surface; auxiliary clasper curved with thick matt of strong black hairs.

Female tergites light brown, lateral margins grey, enclosing or almost enclosing a light brown spot, sternites greyish-brown. Genital plates light brown with greyish dusting.

*Holotype*: AUCKLAND: no date, ♂, (Cant. Mus.).

*Material Examined*: Holotype, 13 ♂, and 16 ♀.

*New Records*: KAITAIA: -ii.1917, 1 ♂, 2 ♀, (*Anon.*), (Dom. Mus.). KAEO: 6.i.1921, 1 ♂, (*Anon.*), (Ak. Mus.). MITIMITI: 2.iii.1929, 1 ♂, (*D. Graham*), (Ak. Mus.). WHANGAREI: 11.i.1921, 1 ♂, (*Anon.*), (Ak. Mus.). WAITAKERE RANGES: Oratia, near stream, 25.iii.1950, 1 ♀, (*R. A. Harrison*); Sharps Bush, 23.vii.1950, 1 ♀, (*K. A. J. Wise*), (P.D.D.). AUCKLAND: Kauri Gully, 25.i.1921, 1 ♂, (*Anon.*), (Ak. Mus.); Owairaka, near stream, 2 ♀, (*D. Spiller*), (P.D.D.). CLEVEDON: Hills, 22.ii.1934, 1 ♂, (*Anon.*), (Ak. Mus.). HAMURANA: 19.xi.1919, 1 ♀, (*J. Muggeridge*), (B.M.). AKATARAWA: 22.xi.1936, 1 ♂, (*J. T. Salmon*), (Dom. Mus.). TE WAIROA: 11.xi.1919, 1 ♂, (*J. Muggeridge*), (B.M.). TITAHU: 27.x.1919, 1 ♂, (*Anon.*), (Dom. Mus.). MAKARA: 26.ix.1920, 1 ♀, (*Anon.*), (Dom. Mus.). WELLINGTON: 28.xii.1909, 1 ♀, (*F. W. Hutton*), (B.M.). SHERRY VALLEY: 14.xii.1949, 1 ♀, (*J. G. Dawber*), (Cawt. Inst.). NO DATA: 2 ♂, 5 ♀, (Ak. Mus.); 2 ♂, 1 ♀, (*J. Muggeridge*), (B.M.).

*Distribution*: Kaitaia, Kaeo, Mitimiti, Whangarei, Waitakere Ranges, Auckland, Clevedon, Hamurana, Akatarawa, Te Wairoa, Titahi, Makara, Wellington, Nelson, Sherry Valley, Kaikoura, Waiho. (July, September to March).

*Remarks*: Recognised by the extensive brown shading of wings and the sinuate posterior cross vein. Differs from *N. sigma* in wing pattern and characters of external male genitalia.

#### Subgenus SUBLIMNIA subgen. nov.

Presutural bristles absent. Weakly sinuate posterior cross vein; apical sectors of 3rd and 4th veins parallel.

Type Species: *Neolimnia (Sublimnia) nitidiventris* Tonnoir and Malloch

Separated from the other subgenera by the absence of a presutural bristle. Prescutellar bristles and a second (anterior) dorsocentral bristle are normally absent although in one paratype of *N. vittata* enlarged hairs are present at the normal position of these bristles. The markings on the wings in this subgenus are not as extensive as in species of the subgenus *Neolimnia*.

#### *Species*:

*Neolimnia (Sublimnia) nitidiventris* Tonnoir and Malloch

*N. (Sublimnia) vittata* sp.n.

#### KEY TO SPECIES OF SUBGENUS SUBLIMNIA

Scutellum with a distinct central brown area ..... *vittata*  
Scutellum without brown area ..... *nitidiventris*

#### *Neolimnia vittata* sp.n. Fig. 96

A grey species with very prominent distinct dark brown vittae. Body length about 5.0-6.0 mm., wing length about 5.0 mm.

#### MALE AND FEMALE

**HEAD:** Arista brown to dark brown; rays of pubescence less than diameter of basal segments. Antenna brown to dark brown; 2nd segment with hairs over all surfaces and one dorsal bristle; basal segment blackish-brown laterally. Front yellowish-brown; wide blackish-brown vitta bordered narrowly with reddish-brown from ocelli to near anterior margin of front; orbits broadly blackish-brown merging to yellowish-brown at about anterior third of front, narrow grey line at eye margin broader anteriorly; ocellar area blackish-brown; median vitta continued posteriorly from ocelli to occipital foramen; dark orbits continued onto occiput, rest of occiput heavily grey dusted. Fronto-orbitals small, anterior about three-quarters posterior; ocellars and postverticals stronger than verticals; small black hairs on orbits and anterior region of front. Face light greyish-yellow; slightly carinate dorsally; blackish-brown triangle in middle line, apex just ventral to antennal insertions; blackish-brown area from base of antenna to eye. Cheeks light greyish-yellow with large brown area posterior to base of ptilinal suture. Small black hairs on dark area of cheek and extending posteriorly to occiput; 4 or 5 bristles at lower posterior corner. Eyes with few distinct hairs. Vertical diameter of eye about 1.2 times width of cheek in same axis. Proboscis brown; palpi light brown, thin, enlarged slightly to club-like apex, short black hairs at apex and along basal two-thirds.

**THORAX:** Heavily dusted grey; mesonotum with distinct wide dark brown vittae, a median pair uniting posteriorly and extending onto scutellum, a very wide vitta between each median vitta and lateral margin, this vitta narrowed slightly posterior to suture and extending to base of scutellum, a short narrow postsutural vitta between median and lateral vittae; pleura broadly dark brown on dorsal half from humerus and propleuron to haltere, ventral half of sternopleuron brown. Prescutellars absent; 1 dorsocentral; short parallel basal scutellars just shorter than cruciate apicals; 1 humeral; 2 notopleurals; 1 supraalar; 2 postalar; 1 strong pteropleural; prosternum bare.

Legs light reddish-brown, fore femur and tibia shining; fore femur, apices of all tibiae brownish-black to black, all segments of fore tarsus and apical one or two segments of mid and hind tarsi dark brown, apices of mid and hind femora brown to dark brown. Fore femur with postero-dorsal bristles and strong spines on apical halves of antero- and postero-ventral surfaces; fore tibia with strong preapical and weak apical; mid femur with about 3 stout bristles near middle of anterior surface, strong spines on apical halves of antero- and postero-ventral surfaces; mid tibia with preapical and several apicals; hind femur with about 2 bristles at apical sixth; strong spines on apical halves of antero- and postero-ventral surfaces; hind tibia with preapical and short stout apical.

Wings (Fig. 96): Veins brown but light yellow basally. Short stout costal spines ending quarter distance between apices of 2nd and 3rd veins. Wing indices: costal about 1.7-1.9; 4th vein about 1.2; 4c about 0.8; 5x about 0.5.

Halteres light brown.

**ABDOMEN:** Tergites brown with light grey dusting, broadly grey on lateral margins and this area enclosing or nearly enclosing a brown spot, often a large spot particularly in female.

External male genitalia: Genital arch light brown, black hairs on surface stronger on dorsal and posterior surfaces; anal plate narrow with black hairs on surface.

*Holotype:* ROUTEBURN: 2-5.i.1945, ♀, (*E. S. Gourlay*), (Cawt. Inst.).

*Allotype:* ♂, in copula with holotype, (Cawt. Inst.).

*Paratypes:* Same data as holotype, (1 ♀, P.D.D. and 1 ♀; Cawt. Inst.).

*Material Examined:* Holotype, allotype and 2 paratypes.

*Distribution:* Routeburn. (January).

*Remarks:* Separated from *N. nitidiventris* by the brown vittae and brown marking of the thorax and particularly by the presence of a brown area on the disc of the scutellum. At present known from only one locality.

***Neolimnia nitidiventris* Tonnoir and Malloch. Fig. 84**

*Neolimnia nitidiventris* Tonnoir and Malloch, 1928. Rec. Cant. [N.Z.] Mus. 3 : 170.

A brown species with strong legs and light brown patterned wings. Body length about 7.0 mm., wing length about 6.5 mm.

FEMALE

**HEAD:** Arista with basal 2 segments light brown and apical segment blackish-brown; rays of pubescence not longer than diameter of basal segments. Antenna light brown; 3rd segment brown on apical half; 2nd segment equal to length of 3rd segment and with strong dorsal bristles; basal segment with a few apical dorsal hairs, the lateral one much stronger than others. Front yellowish-brown with green tinge; median longitudinal concave vitta, anterior margin of front, irregular areas lateral and posterior to orbital bristles, and strip from ocelli to postverticals, reddish-brown. Occiput with wide median brown vitta posterior to postverticals this bordered narrowly with greyish-white, and elsewhere light greyish-brown. Fronto-orbitals short, anterior bristle about three-quarters posterior; all verticals thick and strong, postverticals the longest; black hairs on orbits and anterior region of front. Face light greyish-yellow, a wide reddish-brown band from base of antennae across dorsal parafacial to eye; small brown area at median ventral margin. Cheeks light greyish-yellow merging to yellowish-brown posteriorly on lateral occiput. Fine black hairs over middle of cheek and extending up parafacial; about 3 bristles at lower posterior corner, the anterior one separated from others. Eyes with few hairs. Vertical diameter of eye about 1.5 times width of cheek in same axis. Proboscis brown; palpi light brown with brown base, swollen towards apex giving club-like appearance.

**THORAX:** Reddish-brown with grey dusting; mesonotum with pair of narrow median longitudinal brown vittae, wide lateral brown vitta just median to the grey margin of mesonotum and a postsutural narrow brown vitta between them; scutellum brown without much grey dusting; wide brown vitta along dorsal regions of pleura from humerus and propleuron to haltere. Prescutellars absent; 1 dorsocentral; basal scutellars not as long as apicals; 1 humeral; 2 notopleurals; 1 supraalar; 2 postalars; 1 strong pteropleural; prosternum bare.

Legs shining light reddish-brown; apex of fore tibia dark brown; apical segment of fore tarsus brown. Fore femur with bristles on postero-dorsal surface, strongest towards apex, thick strong spines on apical half of antero- and postero-ventral surfaces; fore tibia with preapical and apical; mid femur with strong, stout bristle on apical half of antero- and postero-ventral and 2 anteriors at apical quarter; mid tibia with preapical and many apicals; hind femur with strong stout bristles on apical half of antero- and postero-ventral surfaces and several dorsal preapicals; hind tibia with preapical and apical.

Wings (Fig. 84): Light grey membrane and light brown markings; veins light brown. Heavy costal bristles fading out about 3rd distance between apices of 2nd and 3rd veins. Wing indices: costal about 2.4; 4th vein about 1.1; 4c about 0.6; 5x about 0.5.

Halteres light brown.

**ABDOMEN:** Light brown, shining on sides of tergites; lateral margins of tergites 2 to 5 narrowly grey.

*Holotype:* MT. ARTHUR: 4,500 ft., 27.xii.1921, ♀, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined:* Holotype.

*Distribution:* Mt. Arthur. (December).

*Remarks:* One of the larger flies in this genus. All legs are strong and this helps to give the species the impression of size. Separated from *N. vittata* most readily by the absence of a brown area on the scutellum. The holotype is the only specimen known. †

Subgenus NEOLIMNIA Tonnoir and Malloch

*Neolimnia* Tonnoir and Malloch, 1928. Rec. Cant. [N.Z.] Mus. 3 : 165.

Presutural bristles present. Posterior cross vein weakly sinuate; apical sections of 3rd and 4th veins parallel or nearly so.

Type Species: *Neolimnia (Neolimnia) obscura* (Hutton)

Separated from other subgenera by the presence of a presutural bristle and the weakly sinuate posterior cross vein. Prescutellar bristles are normally absent but in one species *N. minuta* they are found to be either present or absent and hence they cannot be used as a subgeneric character.

Species:

- Neolimnia (Neolimnia) castanea* (Hutton)
- N. (Neolimnia) diversa* Tonnoir and Malloch
- N. (Neolimnia) dubiosa* Tonnoir and Malloch
- N. (Neolimnia) irrorata* Tonnoir and Malloch
- N. (Neolimnia) minuta* Tonnoir and Malloch
- N. (Neolimnia) obscura* (Hutton)
- N. (Neolimnia) ocellata* Tonnoir and Malloch
- N. (Neolimnia) striata* (Hutton)

Within this subgenus three groups of species can be recognised.

1. *ocellata* group of species. Separated from all other groups by having only one dorsocentral. The clasper of male is quadrangular and without any trace of an antero-ventral projection. Includes *N. ocellata* and *N. diversa*.

2. *obscura* group of species. Distinguished by the presence of two dorsocentrals and the grey lateral border of the tergites, which does not enclose a brown spot. The male clasper has a rounded knob-like antero-ventral projection. *N. obscura* is the only known species with these characters.

3. *striata* group of species. Separated from other groups by having two dorsocentrals, a distinct brown spot enclosed in the grey lateral border of the tergites and a distinct antero-ventral projection on the clasper of the male. Includes *N. striata*, *N. minuta*, *N. irrorata*, and *N. dubiosa*. The two former species are separated from the two latter by having a higher costal index and relatively shorter anterior projection to the clasper.

The species *N. castanea* is known from the female holotype only and is not placed in any group.

#### KEY TO SPECIES OF SUBGENUS NEOLIMNIA

- |   |  |                 |
|---|--|-----------------|
| 1 | Vertex and front chestnut brown; median frontal vitta shining black .....            | <b>castanea</b> |
|   | Vertex and front yellowish-brown; median frontal vitta not black .....               | 2               |
| 2 | One dorsocentral .....   | 3               |
|   | Two dorsocentrals .....  | 4               |
| 3 | Diameter of hind femur about 3 times diameter of hind tibia .....                    | <b>ocellata</b> |
|   | Diameter of hind femur not greater than twice the diameter of hind tibia .....       | <b>diversa</b>  |
| 4 | Lateral margins of tergites 2 to 5, grey and not enclosing a brown spot .....        | <b>obscura</b>  |
|   | Lateral margins of tergites 2 to 5, grey and distinctly enclosing a brown spot ..... | 5               |
| 5 | Fore femur with strong stout antero-ventral spines .....                             | <b>striata</b>  |
|   | Fore femur without strong stout antero-ventral spines .....                          | 6               |



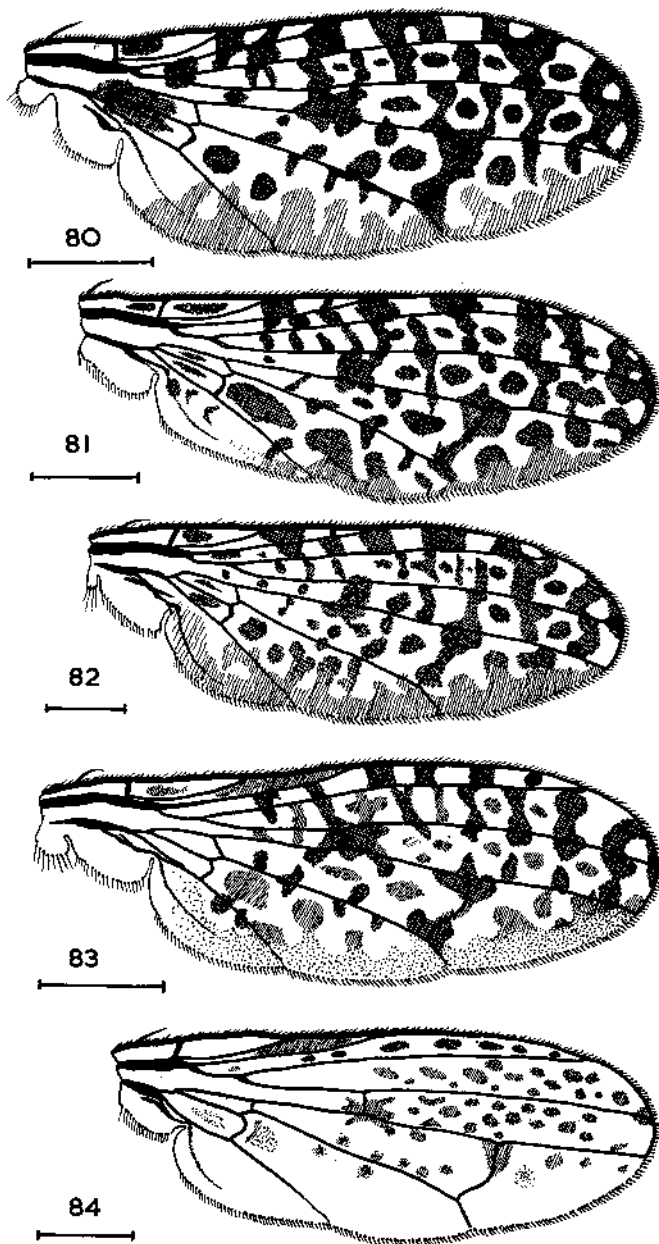


Fig. 80. Wing of *Neolimnia diversa*  
 " 81. " " *N. dubiosa*  
 " 82. " " *N. irrorata*  
 " 83. " " *N. minuta*  
 " 84. " " *N. nitdiventris*  
 Scale: 1.0 mm.

- 6 Costal index greater than 2.0 ..... **minuta**  
 Costal index less than 2.0 ..... 7
- 7 No distinct sub-median dark longitudinal vittae on mesonotum ..... **irrorata**  
 Pair of distinct sub-median dark longitudinal vittae on mesonotum .... **dubiosa**

**Neolimnia castanea (Hutton)**

*Limnia castanea* Hutton, 1904. Trans. N.Z. Inst. 36 : 153.

*Neolimnia castanea* (Hutton): Tonnoir and Malloch, 1928,  
 Rec. Cant. [N.Z.] Mus. 3 : 165.

A brown or brownish-grey species with patterned wings. Body length about 7.0 mm.

FEMALE

HEAD: (Now missing from holotype). Arista with short pubescence. Antenna reddish-yellow; 3rd segment brown to dark brown on outer surface at base. Front velvety chestnut brown, blackish-brown dorsal to antennae; median stripe shining black. Face silvery-grey. Palpi reddish-yellow.

THORAX: Mesonotum light brown dusted between dorsocentral lines with a pair of median longitudinal narrow brown vittae, lateral to dorsocentral row a broad brown band, lateral margin broadly light brownish-grey, brown band from humerus across dorsal half of mesopleuron below wing base to haltere; pleura light greyish-brown dusted. No prescutellars; 1 dorsocentral; convergent basal scutellars equal to convergent apicals; 1 humeral; 2 notopleurals; 1 supraalar; 2 postalars; pteropleuron with 2 bristles and a few hairs; prosternum bare.

Legs light brown; coxae silvery grey; apices of tibiae and apical tarsal segments blackish-brown. Fore femur with bristles on postero-dorsal surface, short thick black spines on postero-ventral surface; mid femur with 2 bristles near apical third of anterior surface and short thick spines on apical thirds of antero- and postero-ventral surfaces; mid tibia with preapical and several apicals; hind femur with 1 bristle at apical quarter of antero-dorsal surface and black spines on apical half of antero- and postero-ventral surfaces; hind tibia with preapical and apical.

Wings with brown pattern; veins brown. Costa with pair of strong basal spines; short black costal spines fading out just beyond apex of 2nd vein. Second, 3rd and 4th veins with distinct curves along their length. Wing indices: costal about 2.0; 4th vein about 1.1; 4c about 0.8; 5x about 0.4.

Halteres brown with light dusting of silvery grey.

ABDOMEN: Tergites greyish-brown, laterally light greyish-brown enclosing a brown area. Genital plates black.

*Holotype*: WELLINGTON: ♀, (Cawt. Inst.).

*Material Examined*: Holotype.

*Distribution*: Wellington.

*Remarks*: Separated from other species by the dark colouration of the front. Male unknown.

**Neolimnia ocellata** Tonnoir and Malloch. Figs. 76, 86

*Neolimnia ocellata* Tonnoir and Malloch, 1928. Rec. Cant.  
 [N.Z.] Mus. 3 : 166.

A light brown species, dark greyish-brown abdomen and heavily patterned wings. Body length about 7.0 mm., wing length about 6.5 mm.

MALE

HEAD: Arista dark brown merging to light brown basally; rays of pubescence just shorter than basal segments, short thick pubescence on the basal segments. Antenna light brown; 3rd segment yellowish-brown; 2nd segment with small apical notch, black hairs over all its surface and 1 dorsal preapical bristle; basal segment with black hairs dorsally. Front yellowish-brown, narrow, medium, slightly concave, longitudinal vitta from ocelli to near anterior margin, light reddish-brown margined with light orange; ocellar area and strip from ocelli through post-

verticals to occipital foramen, brown; region about verticals and occiput light greyish-brown heavily dusted. Both fronto-orbitals weak, the anterior bristle about three-quarters length posterior bristle, postverticals divergent and placed well behind ocelli; small black hairs on orbits lateral to fronto-orbital bristles and along the anterior margin of front. Face heavily dusted light whitish-yellow; dorsal parafacials with brown area from antennae to eyes. Cheeks heavily dusted light yellowish-white merging to yellowish-brown on occiput posteriorly. Fine short black hairs on cheek; 5 or 6 black bristles at lower posterior corner. Eyes with few short hairs. Vertical diameter of eye about 1.7 times width of cheek in same axis. Proboscis brown; palpi yellowish-brown gradually enlarged towards apex, black hairs prominent along most of outer margin.

**THORAX:** Light brown; mesonotum heavily dusted light brown with a dark brown lateral longitudinal vitta from area dorsal to humerus through presutural and alar bristles, ending at scutellar suture; grey margin to mesonotum; scutellum heavily dusted light brown, no dark ventral stripe; pleura light greyish-brown, heavily dusted, with wide dark brown vitta from ventral half of humerus and dorsal portion of propleuron across dorsal half of mesopleuron, beneath wing base and ending anterior to haltere. Prescutellars absent; the single dorsocentral bristle shorter than parallel basal scutellars, latter shorter than convergent apical scutellars; 1 humeral; 2 notopleurals; 1 supraalar; 2 postalar; 2 strong pteropleurals; prosternum bare.

Legs light brown; fore and hind femora brown to dark brown basally; all femora with preapical brown ventral area; fore tibia changing to dark brown apically; mid and hind tibia dark brown at apex; apical segments of tarsi dark brown. All coxae with strong bristles; fore femur with bristles on postero-dorsal surface and short stout black spines on apical half of postero- and antero-ventral surfaces; fore tibia with preapical and apical bristles and close matt of fine hairs on apical portion of anterior margin; basal segment of fore tarsus with similar matt of hairs; mid femur with 2 to 3 bristles in row at about apical third of anterior surface and short black bristles on about apical half of antero- and postero-ventral surfaces; mid tibia with preapical and several ventral apicals; hind femur about 3 times as thick as hind tibia, with 3 antero-dorsal bristles on apical third and short stout uneven bristles on apical half of antero- and postero-ventral surfaces; hind tibia with preapical and apical bristles.

Wings (Fig. 76): light grey with brown shading. Short costal bristles on basal quarter of section of costa between 2nd and 3rd veins. Wing indices: costal about 1.8-2.0; 4th vein about 1.0-1.2; 4c about 0.8-0.9; 5x about 0.3-0.4.

Halteres light yellowish-brown.

**ABDOMEN:** Greyish-brown. Tergites 2 to 5 with wide grey lateral margin and a brown band median to it; the lateral grey area with median brown spot; 4th and 5th sternites with enlarged wort-like processes.

External genitalia (Fig. 86) large, yellowish-brown. Genital arch broad, black hairs over most of surface, stronger towards posterior margin; anal plate narrow, thickly covered with black hairs longer than those on arch; clasper square, about half width of arch, with 5 short brown hairs on surface; arch with small anterior auxiliary clasper covered with black hairs.

*Holotype:* WAIRAURAHIRI: 31.xii.1916, ♂, (*A. Philpott*), (Cawt. Inst.).

*Material Examined:* Holotype and 1 ♂.

*New Records:* WELLINGTON: 28.xii.1909, 1 ♂, (*F. W. Hutton*), (B.M.).

*Distribution:* Wellington, Wairaurahiri. (December).

*Remarks:* Separated from *N. diversa*, the other member of the *ocellata* group, by the thickened hind femur.

***Neolimnia diversa*** Tonnoir and Malloch. Figs. 56, 80, 85 †

*Neolimnia diversa* Tonnoir and Malloch, 1928. Rec. Cant.  
[N.Z.] Mus. 3: 167.

A light brown species with greyish-brown abdomen and heavily patterned wings. Body length about 6.5 mm., wing length about 6.0 mm.

## MALE AND FEMALE

**HEAD** (Fig. 56): Arista light brown merging to dark brown at apex; longest rays of pubescence less than diameter of basal segment, very short pubescence on basal segments. Antenna yellowish-brown; 3rd segment light orange; 2nd segment with small apical dorsal notch and with short black hairs over all its surface, one short black bristle dorsally; 1st segment with few short dorsal apical hairs. Front yellowish-brown; median, slightly concave, longitudinal brown vitta bordered by light reddish-brown from ocelli to anterior margin of front; ocellar area brown and this colouration extending posteriorly through postverticals to occipital foramen. Occiput with whitish-grey slightly depressed area either side of the brown medium vitta, elsewhere light greyish-brown and heavily dusted. Two fronto-orbitals, weak anterior just over three-quarters length posterior bristle; verticals strong and equal; postverticals longer than verticals and slightly divergent; small black hairs on orbits lateral to orbitals and on anterior region of front. Face yellowish-white; light reddish-brown mark from base of antennae across dorsal parafacials to eyes. Cheeks yellowish-white merging to light brown posteriorly. Fine black hairs on middle of cheek and a few extending short way up parafacials; 1 or 2 bristles at lower posterior corner of cheek and 2 similar bristles more posteriorly. Eyes with few hairs. Vertical diameter of eye about 1.4 times width of cheek in same axis. Proboscis brown; palpi light brown with short black bristles on outer margin.

**THORAX:** Light brown; mesonotum heavily dusted light brown with light greyish-brown lateral margin and brown vitta between these areas, the vitta commencing dorsal to humerus and including presutural and alar bristles, not extending onto scutellum; pair of faint narrow median longitudinal vittae on anterior half of mesonotum; scutellum light brown, heavily dusted, no median dark stripe; pleura light greyish-brown; wide brown vitta from ventral half of humerus and dorsal half of propleuron through dorsal half of mesopleuron below wing base to haltere. Prescutellars absent; the single dorsocentral shorter than parallel basal scutellars, these shorter than convergent apicals; 1 humeral; 2 notopleurals; 1 supraalar; 2 postalars; pteropleuron with 1 strong and 1 weak bristle; prosternum bare.

Legs light brown; all femora (except at extreme apex), apical half of 1st tibia, apex of 2nd and 3rd tibiae, and apical two segments of all tarsi especially fore and hind, dark brown. Fore femur with bristles on postero-dorsal surface and short stout bristles on apical half of antero-ventral surface; fore tibia with preapical and apical; close matt of fine hairs on anterior surface of apex of fore tibia and basal segment of fore tarsus; mid femur with 2 to 4 bristles about apical third of anterior margin, and few short spines on apical third of antero-ventral margin; mid tibia with preapical and several apicals; hind femur about same or at most twice diameter of hind tibia with 1 or 2 antero-dorsals at apical third, black spines on apical third of antero- and postero-ventral surfaces; hind tibia with preapical and apical bristles.

**Wings** (Fig. 80): light grey membrane and many brown markings. Short thick costal spines fading out about 3rd distance between apices of 2nd and 3rd veins; 2 slight waves in 2nd vein between apices of 1st and 2nd veins. Wing indices: costal about 1.8; 4th vein about 1.2; 4c about 0.8; 5x about 0.5.

Halteres yellowish-white.

**ABDOMEN:** Male tergites greyish-brown with wide lateral grey margins distinctly enclosing grey spot on tergites 2 to 5; tergite 5 enlarged, about twice as long as preceding tergites and light brown. Small hairs over all tergites, larger towards lateral margins; 6th tergite also enlarged but only about half size of 5th.

External male genitalia (Fig. 85) yellowish or light brown. Genital arch broader ventrally than dorsally, distinct black hairs on dorsal and posterior portions of surface; anal plate lightly chitinised with hairs longer than those of arch on whole surface; clasper almost square, ventral margin slightly produced in middle, small hairs on most of surface; auxiliary clasper small, whole surface with small black hairs.

Female tergites greyish-brown; genital plates shining dark brown.

**Holotype:** KNIFE AND STEEL: 28.xii.1916, ♂, (*A. Philpott*), (Cawt. Inst.).

**Material Examined:** Holotype, 5 ♂, and 6 ♀.

**New Records:** ARTHURS PASS: -.xii.1922, 1 ♂, 1 ♀, (*H. Hamilton*),

(Dom. Mus.). ROUTEBURN: 2-5.i.1945, 1 ♂, (*E. S. Gourlay*), (Cawt. Inst.). BOLD PEAK: 27.xi.1944, -i.1955, 2 ♂, 1 ♀, (*E. S. Gourlay*), (Cawt. Inst.). WAITATI: 12.xi.1916, 1 ♀; 25.xi.1920, 1 ♂; 25.x.1925, 1 ♀, (*Anon.*), (Ak. Mus.). LAKE TE ANAU: End of South Arm, on Keplar Mts., 3.i.1925, 2 ♀, (*Anon.*), (Ak. Mus.).

*Distribution*: Arthurs Pass, Knife and Steel, Routeburn, Bold Peak, Waitati, Lake Te Anau. (October to January).

*Remarks*: Separated from *N. ocellata* by having a narrower hind femur. Recognised by the single dorsocentral, brown spots enclosed in grey lateral margins of tergites, and the normal unswollen femora. Colour variations are often quite pronounced in this species. Bold Peak specimens have a trace of brown on the posterior portion of the fronto-orbits, and the mesonotum has a pair of median narrow but distinct vittae on anterior half.

### ***Neolimnia obscura* (Hutton). Figs. 75, 93**

*Limnia obscura* Hutton, 1900. Trans. N.Z. Inst. 33 : 85.

*Neolimnia obscura* (Hutton): Tonnoir and Malloch, 1928.

Rec. Cant. [N.Z.] Mus. 3 : 166.

A brown species with many brown shaded areas on wings. Body length about 7.5 mm., wing length about 7.0 mm.

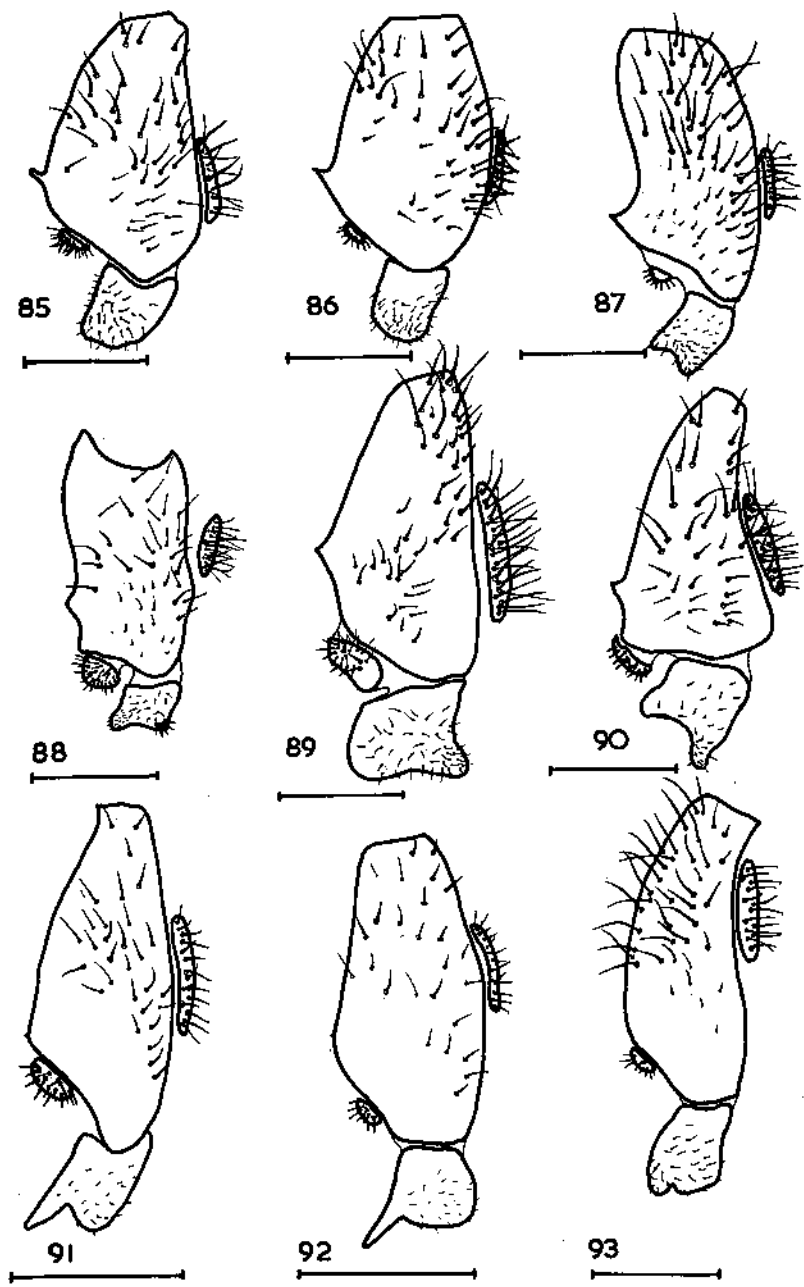
#### MALE

**HEAD**: Arista brown, light brown basally; rays of pubescence longer than diameter of basal segments. Antenna yellowish-brown; 3rd segment about 1.6 times as long as wide; 2nd segment covered with black hairs and with 1 dorsal apical bristle; basal segment with few minute hairs on dorsal apical margin. Front golden-brown with greyish-brown median vitta bordered by reddish-brown from ocelli to near anterior margin of front. Two fronto-orbitals, anterior bristle about half length posterior; ocellars, verticals and postverticals strong; fine black hairs along orbits and anterior region of front. Face greyish-yellow, heavily dusted; brown area from eyes to base of antennae across dorsal parafacials. Cheeks greyish-yellow, heavily dusted. Fine hairs on lower parafacials and extending along lower cheek margin with 3 strong bristles about the region of lower posterior corner. Occiput light reddish-brown in median line from postverticals to occipital foramen, elsewhere heavily dusted brown. Eyes with few fine hairs. Vertical diameter of eye about twice width of cheek in same axis. Proboscis brown; palpi narrow, light brown and with long fine black hairs along surface.

**THORAX**: Mesonotum broadly brown in middle, lateral margins greyish-brown, both areas separated by dark brown longitudinal stripe; scutellum heavily dusted light brown with dark brown vittae of mesonotum just extending onto base of lateral margins; pleura with wide dark brown vitta from dorsal propleuron and part of humerus, across mesopleuron, below wing base to haltere; rest of pleura greyish-yellow; prosternum greyish-yellow. Prescutellars absent; 2 strong dorso-centrals; apical and basal scutellars strong; 1 humeral; 2 notopleurals; 1 supraalar; 2 postalar; 2 strong, and sometimes a third, weaker pteropleural bristles; prosternum bare.

Legs light reddish-brown; fore femur shining reddish-brown; apex of fore tibia and apical segment of fore tarsus dark brown; all coxae greyish-brown. Fore femur with strong bristles on postero-dorsal surface and long fine hairs longer than general hair covering on postero-ventral and antero-ventral surfaces; fore tibia with preapical and apical bristles; mid femur with 1 bristle about middle of anterior surface; mid tibia with preapical and several apicals; hind femur with 1 or 2 preapical bristles on antero-dorsal surface, and short thick bristles on apical quarter of antero-ventral and apical third of postero-ventral surfaces; hind tibia with short preapical and apical; mid and hind coxae and trochanters with many thick hairs and bristles.

Wings (Fig. 75): Veins light brown. Short stout costal spines fading out about



Figs. 85-93. External male genitalia

- |                              |                          |
|------------------------------|--------------------------|
| 85. <i>Neolimnia diversa</i> | 90. <i>N. tranquilla</i> |
| 86. <i>N. ocellata</i>       | 91. <i>N. irrorata</i>   |
| 87. <i>N. minuta</i>         | 92. <i>N. dubiosa</i>    |
| 88. <i>N. striata</i>        | 93. <i>N. obscura</i>    |
| 89. <i>N. sigma</i>          |                          |

Scale: 0.5 mm.

third distance between apices of 2nd and 3rd veins. Wing indices: costal about 1.8-2.2; 4th vein about 1.1-1.3; 4c about 0.7-0.9; 5x about 0.3-0.4.

Halteres light yellowish-brown.

**ABDOMEN:** Brown; tergites 2 to 5 bordered laterally with dark brown and with greyish-brown lateral margin.

**External genitalia** (Fig. 93): Genital arch broader ventrally than dorsally, fine even hairs over dorsal two-thirds, and a few small hairs at middle of ventral third; anal plate narrow with long hairs over surface; clasper with distinct rounded protuberance at anterior ventral corner, surface with many very fine small brown hairs; auxiliary clasper small and disc-shaped with short stout black hairs over surface.

#### FEMALE

Similar to male, except mid and hind trochanters without thick beard of hairs and bristles.

**Holotype:** No data (according to Hutton (1901) and Tonnoir and Malloch (1928) this and the allotype came from Auckland and Wellington), ♂, (*Anon.*), (Cant. Mus.).

**Material Examined:** Holotype, allotype, 12 ♂, 10 ♀, and 1 ex.

**New Records:** AUCKLAND: 27.i.1921, 1 ♀, (*Anon.*), (Ak. Mus.). MT. EGMONT: Dawson Falls, -.xii.1927, 1 ♂: 3,100 ft., 8.xii.1927, 1 ♂, (*A. Castle*), (Dom. Mus.): 3,100 ft., 17.i.1955, 1 ♂, (*G. Ramsay*), (P.D.D.). WAIKAREMOANA: 12.xii.1946, 1 ♂, (*R. R. Forster*), (Dom. Mus.). WELLINGTON: Gollans Valley, 24.xii.1921, 1 ♀; 24.xi.1943, 1 ♂, (*G. V. Hudson*), (Dom. Mus.): Eastbourne, 29.xi.1947, 1 ♂, 2 ♀, (*G. Ramsay*), (P.D.D.). AKATARAWA: 6.ii.1953, 1 ♂, (*M. Redington*), (Dom. Mus.). NATIONAL PARK: Whakapapa, 12.i.1941, 1 ♀, (*G. V. Hudson*), (Dom. Mus.). NELSON: Upper Maitai Valley, 29.i.1945, 1 ♀, (*B. Given*), (Cawt. Inst.). DUN MT.: Track, 7.i.1950, 1 ♀, (*J. G. Dawber*), (Cawt. Inst.). KUMARA: 15.ix.1923, 1 ex.; 5.x.1929, 1 ♂; 12.xii.1929, 1 ♂; 14.xii.1929, 1 ♀, (*J. W. Campbell*), (U.S.N.M.). OTIRA: Otira Gorge, -.xii.1908, 1 ♂, (*G. V. Hudson*), (Dom. Mus.). MT. GREENLAND: 2,900 ft., 6.i.1943, 1 ♂, (*E. S. Gourlay*), (Cawt. Inst.). NO DATA: 1 ♂, 2 ♀, (Ak. Mus.).

**Distribution:** Auckland, Mt. Egmont, Waikaremoana, National Park, Akatarawa, Wellington, Nelson, Dun Mt., Moana, Refton, Otira, Kumara, Mt. Grey, Mt. Greenland. (September to February).

**Remarks:** Characterised by the pale greyish-brown stripes on margins of tergites, which do not enclose a brown spot, and the absence of strong bristles on antero-ventral surface of fore femur. The colouration of the tergites is sufficient to separate it from all other species in the subgenus *Neolimnia*.

### ***Neolimnia striata* (Hutton). Figs. 79, 88**

*Limnia striata* Hutton, 1903. Trans. N.Z. Inst. 36: 154.

*Neolimnia striata* (Hutton): Tonnoir and Malloch, 1928. Rec.

Cant. [N.Z.] Mus. 3: 169.

A greyish-brown species with brown vittae on thorax and brown markings on wings. Body length about 5.0 mm., wing length about 4.5 mm.

#### MALE AND FEMALE

**HEAD:** Arista dark brown, light brown basally; rays of pubescence not greater than width of basal segments. Antenna light brown; 3rd segment brown with light brown border; about 1.5 times as long as wide; 2nd segment with black hairs and 1 dorsal bristle; basal segment with black hairs on apical dorsal margin.

Front light golden-brown to reddish-brown; ocellar area dark brown; median vitta from ocelli to anterior region of front sunken and brown and narrowly bordered with reddish-brown; dark brown spot at base of each fronto-orbital bristle. Two fronto-orbitals, anterior bristle about two-thirds length of posterior; verticals, postverticals and ocellars strong; few black hairs on orbits outside fronto-orbitals and along anterior region of front. Face yellowish-grey dorsally, yellowish-brown ventrally, blackish-brown area dorsally on parafacials from eyes to base of antennae. Cheeks yellowish-grey dorsally and yellowish-brown ventrally. Few black hairs on ventral region of parafacials and extending posteriorly along lower half of cheek; 2 or 3 bristles at lower posterior corner of cheek. Occiput brown from postverticals to foramen, elsewhere heavily brown dusted. Eyes with few fine hairs. Vertical diameter of eye about 1.2 times width of cheek in same axis. Proboscis dark brown; palpi light brown and with fine black hairs.

**THORAX:** Mesonotum greyish-brown; pair of median brown longitudinal vittae merging between dorsocentrals posteriorly and extending onto scutellum as a brown area on middle of disc, a wider brown vitta from area dorsal to humerus, through presutural and supraalar bristles to posterior margin, small brown spots at base of hairs; dorsal region of pleura brown but not distinctly separated from remaining greyish-brown areas; prosternum light brown. Prescutellars absent; 2 strong dorsocentrals; parallel basal scutellars just shorter than cruciate apicals; 1 humeral; 2 notopleurals; 1 supraalar; 2 postalars; 1 strong pteropleural bristle and 1 or 2 small hairs; prosternum bare.

Legs brown, lightly dusted with grey; apex of fore tibia and apical segments of all tarsi dark brown. Fore femur with bristles on postero-dorsal surface and on apical third of antero-ventral surface; fore tibia with preapical and short apical; mid femur with 2 bristles near middle of anterior surface and few small spines on apical third of antero- and postero-ventral surfaces; mid tibia with preapical and several apical bristles; hind femur with bristles on apical third of dorsal surface and distinct spines on apical third of antero- and postero-ventral surfaces; hind tibia with preapical and weak apical.

Wings (Fig. 79) brown; veins light brown. Short black costal spines ending about third distance between apices of 2nd and 3rd veins. Wing indices: costal about 2.3; 4th vein about 1.5; 4c about 0.8; 5x about 0.4.

Halteres light brown.

**ABDOMEN:** Brown; posterior margins of tergites and posterior tergites light brown, brown spot near lateral margins of tergites 2 to 5 enclosed in grey area.

External male genitalia (Fig. 88): Genital arch broad with few strong hairs over surface particularly dorsally; anal plate narrow with hairs over surface shorter than on arch; clasper with clump of stout short black hairs at postero-ventral corner; auxiliary clasper small with short hairs.

*Holotype:* LONG BEACH: ♂, (Cawt. Inst.).

*Material Examined:* Holotype, 4♂ and 6♀.

*New Records:* TRIO ISLAND: 20.xii.1954, 2♂, 3♀, (*G. Ramsay*), (P.D.D.). MT. HECTOR: 28.ii.1932, 1♂, (*E. A. Plank*), (Dom. Mus.). SEDDON: 29.x.1942, 1♀, (*A. Hamilton*), (Cawt. Inst.). CASS: L. Sarah, Fan, 1,900 ft., 5.ii.1936, 2♀, (*J. T. Salmon*), (Dom. Mus.). NO DATA: 1♂, (Ak. Mus.).

*Distribution:* Trio Island, White Stone River, Nelson, Christchurch, Cass, Monowai, Mt. Hector, Seddon, Long Beach. (October to February).

*Remarks:* The bristles on the fore femur and the brown vittae and spots on mesonotum are the important distinguishing characters. There appears to be no good reason to recognise Tonnoir and Malloch's variety *N. striata brunneifrons* as a subspecies at this stage. Too few specimens are known to be able to decide whether the Monowai examples are really representatives of an allopatric population. Belongs to the *striata* group of species and separated from *N. minuta* by having stout antero-ventral spines on the fore femur and from *N. irrorata* and *N. dubiosa* by having a costal index greater than 2.0.



**Neolimnia minuta** Tonnoir and Malloch. Figs. 83, 87

*Neolimnia minuta* Tonnoir and Malloch, 1928. Rec. Cant.  
[N.Z.] Mus. 3 : 170.

A light reddish-brown species with patterned wings. Body length about 5.0 mm., wing length about 5.0 mm.

MALE AND FEMALE

**HEAD:** Arista dark brown, basal segment brown; rays of pubescence, except those at base and apex, distinctly longer than diameter of basal segments. Antenna light reddish-brown; 3rd segment brown towards apex; 2nd segment with black hairs, those at ventral apex stronger than rest, and 1 dorsal bristle. Front yellowish-brown; longitudinal median concave vitta from ocelli to near frontal margin, brown and lightly bordered with brown and this continued through vertex onto occiput; brown spot at base of orbitals. Median brown stripe of occiput bordered with grey, elsewhere on occiput greyish-brown dusted. Anterior fronto-orbital about half length posterior; ocellars, verticals and postverticals strong; black hairs on orbits and anterior region of front, 1 strong hair posterior to posterior orbital. Face light greyish-brown dusted; no dark brown spot but often small faint brown area on dorsal parafacial. Cheeks light greyish-brown dusted. Fine black hairs on cheek; 2 well separated bristles at lower posterior corner. Eyes bare. Vertical diameter of eye about 1.5 times width of cheek in same axis. Proboscis brown; palpi light brown enlarged club-like at apex, with black hairs.

**THORAX:** Mesonotum light reddish-brown, lateral margins greyish-brown dusted, small brown dots at base of hairs and 4 faint brown longitudinal vitta; scutellum brown; pleura yellowish-grey with brown vitta from ventral humerus and dorsal propleuron, across mesopleuron, below wing base to haltere. Prescutellars absent or present, half length posterior dorsocentral; 2 dorsocentrals, anterior just shorter than posterior; basal scutellars convergent and about two-thirds cruciate apicals; 1 humeral; 2 notopleurals; 1 supraalar; 2 postalar; 2 pteropleurals, dorsal just longer than ventral; prosternum bare.

Legs light yellowish-brown; apical two segments of tarsi dark greyish-brown. Fore femur with strong bristles on postero-dorsal margin; fore tibia with preapical and apical; mid femur with 2 bristles between apical half and third; mid tibia with preapical and several apicals; hind femur with strong bristles on apical third of antero-dorsal surface and short but strong bristles on about apical halves of antero- and postero-ventral surfaces; hind tibia with preapical and apical.

Wings (Fig. 83) light grey with brown markings; veins brown. Costa without normal short stout spines but with well separated short spines just longer than diameter of costa extending about third distance between apex of 2nd and 3rd veins. Wing indices: costal about 2.3-2.8; 4th vein about 1.2-1.3; 4c about 0.7-0.8; 5x about 0.4-0.5.

Halteres yellowish-brown, base brown.

**ABDOMEN:** Light reddish-brown, apical segments yellowish-brown; faint grey lateral margins of tergites.

External male genitalia (Fig. 87): Genital arch with long black hairs over all surface except anterior and ventral margins; anal plate lightly chitinised with fine long hairs over surface; clasper square shaped, antero-ventral corner produced to narrow process, postero-ventral corner to broad rounded process, hairs small and confined almost entirely to this latter process, few fine hairs on anterior margin; auxiliary clasper very small, with short erect black hairs over surface.

*Holotype:* WAIHO: 20.i.1922, ♂, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined:* Holotype, 1 ♂, and 5 ♀.

*New Records:* WAIHO: 20.ii.1927, 3 ♀, (*Anon.*), (Dom. Mus.).

*NO DATA:* 1 ♂, 2 ♀, (*Ak. Mus.*).

*Distribution:* Waiho, (January, February).

*Remarks:* The male holotype is now slightly greasy and the colouration, particularly of the thorax, is not as clear as given in the original description. The male genitalia are dissected out from this specimen but are not mounted with the insect and could not be located in collec-

tions. A description of male genitalia is given from the male in the Auckland Museum. Separated from *N. striata* by the absence of stout spines on fore femur and from *N. irrorata* and *N. dubiosa* by having a costal index greater than 2.0. The relatively long rays of the arista are also an important character of this species.

***Neolimnia irrorata* Tonnoir and Malloch. Figs. 82, 91**

*Neolimnia irrorata* Tonnoir and Malloch, 1928. Rec. Cant. [N.Z.]  
Mus. 3 : 167.

A light brown species with heavily patterned wings. Body length about 7.5 mm., wing length about 6.5 mm.

MALE AND FEMALE

**HEAD:** Arista black. Antenna orange. Front yellowish-brown with medium, longitudinal, slightly concave, light brown vitta from ocelli to anterior margin of front; ocellar area brown and a brown vitta extending posteriorly through postverticals to occipital foramen. Occiput with greyish-white stripe lateral to the median vitta, elsewhere light brown and heavily dusted. Anterior fronto-orbital about three-quarters length of posterior bristle, both small compared with other frontal bristles; postverticals strong; verticals equal; small fine hairs on orbits lateral to bristles and on anterior region of front. Face light brownish-grey, heavily dusted; wide light reddish-brown strip from base of antennae across dorsal parafacials to eye. Cheeks very light brown with grey dusting merging to brown on lateral occiput. Fine hairs on central region of cheek and extending up parafacials; 1 strong bristle at lower posterior corner of cheek and another equal bristle placed well posterior and dorsal to it. Eyes with few fine short hairs. Vertical diameter of eye about 2.2 times width of cheek in same axis. Proboscis light brown; palpi yellowish-brown with small bristle-like hairs at apex and on basal half.

**THORAX:** Mesonotum dull yellowish-brown, small brown dot at base of hairs, dots often confluent; lateral margin grey, and between this and the central area a brown longitudinal vitta; pleura grey with a wide brown vitta from ventral half of humerus and dorsal propleuron, across mesopleuron, below wing base to haltere and lateral postscutellum; scutellum dull yellowish-brown with brown spot on disc. Prescutellars absent; 2 dorsocentrals, anterior about three-quarters length posterior; basal scutellars just shorter than apicals; 1 humeral; 2 notopleurals; 1 supraalar; 2 postalars; pteropleuron with 1 strong and 1 weak bristle; prosternum bare.

Legs light brown; base of femora especially fore and hind femora and apex of tibiae dark brown; apical segments of tarsi brown. Fore femur with bristles on postero-dorsal surface and no stout spines on antero- or postero-ventral surfaces; fore tibia with preapical and apical; mid femur with a median bristle on anterior surface, some slightly thicker hairs on apical half of antero-ventral surface; mid tibia with preapical and several apicals; hind femur with 1 antero-dorsal bristle at apical quarter, apical third of antero-ventral surface and apical half of postero-ventral surface with strong spines; hind tibia with preapical and apical.

Wings (Fig. 82): Light grey membrane with brown markings. Costa with short spines fading out over half way between apices of 2nd and 3rd veins; 2nd vein with only 1 kink occurring midway between apices 1st and 2nd veins. Wing indices: costal about 1.7; 4th vein about 1.2; 4c about 0.8; 5x about 0.4.

Halteres light brown.

**ABDOMEN:** Light brown; tergites 2 to 5 with lateral grey margin enclosing brown pear-shaped spots. Sternites with wort-like structures.

External male genitalia (Fig. 91): Genital arch narrow, broader ventrally, with scattered black hairs, those dorsally the strongest; anal plates narrow with hairs over whole surface about equal to strongest hairs of arch; clasper with prominent pointed finger-like projection at antero-ventral angle; auxiliary clasper small and with small black hairs over surface.

*Holotype:* NELSON: Aniseed Valley, 1-4.xii.1923, ♂, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined*: Holotype, allotype and paratypes.

*Distribution*: Nelson, Dun Mt. (December, February).

*Remarks*: Separated from *N. dubiosa* by the absence of longitudinal vittae on the middle of the mesonotum and by a relatively narrower cheek, and from *N. striata* and *N. minuta* by having a costal index less than 2.0.

***Neolimnia dubiosa* Tonnoir and Malloch. Figs. 81, 92**

*Neolimnia dubiosa* Tonnoir and Malloch, 1928. Rec. Cant.  
[N.Z.] Mus. 3: 168.

A light brown species with greyish dark brown abdomen and patterned wings. Body length about 5.5 mm., wing length about 5.5 mm.

MALE

**HEAD**: Arista light brown or brown basally, and dark brown apically; rays of pubescence less than width of basal segments, basal segments finely and thickly pubescent. Antenna light brown; 3rd segment light reddish-brown; 2nd segment with black hairs over all surfaces, 1 dorsal bristle; basal segment with few dorsal hairs. Front light yellowish-brown with greenish tinge; median, longitudinal, slightly concave, brown vitta bordered by light reddish-brown, not reaching anterior margin of front; ocellar area greyish-brown and this continued posteriorly to just beyond postverticals where a brown strip continues to foramen. Occiput, apart from median strip, light greyish-brown. Anterior fronto-orbital just shorter than posterior orbital; verticals equal and slightly shorter than postverticals; few black hairs on orbits and anterior region of front. Face light greyish-white, heavily dusted; light brown area from base of antennae across dorsal parafacials to eye. Cheeks light greyish-white merging to yellowish-brown on lateral occiput. Fine hairs on cheeks and extending onto parafacials; about 4 bristles at lower posterior corner of cheek, anterior one usually separated from rest. Eyes with fine hairs. Vertical diameter of eye about 1.5 times width of cheek in same axis. Proboscis brown; palpi light brown, brown basally with apex slightly swollen giving a club-like appearance.

**THORAX**: Light brown; mesonotum with a pair of median longitudinal brown vittae, a wide lateral vitta just within the grey lateral margin of mesonotum and a narrow postsutural vitta between these two; scutellum with brown central area; pleura light greyish-brown with wide brown vitta from humerus and propleuron, across mesopleuron, below wing base to haltere. Prescutellars absent; anterior dorsocentral shorter than posterior bristle; basal scutellars slightly converging and just less than length of convergent apicals; 1 humeral; 2 notopleurals; 1 supraalar; 2 postalar; pteropleuron with 2 bristles, dorsal one stronger; prosternum bare.

**Legs**: All coxae light brown with grey dusting; all trochanters light brown; all femora shining brown, anterior one dark brown; tibiae light brown, apices dark brown; all tarsi light brown, apical two segments dark brown with grey dusting. Fore femur with long bristles on postero-dorsal surface, long hairs elsewhere with stronger hairs, but not stout bristles, on apical half of antero-ventral surface; fore tibia with preapical and apical; mid femur with 1 strong median bristle on anterior surface; mid tibia with preapical and several apicals; hind femur with 2 bristles about apical quarter of antero-dorsal surface, thick stout irregular spines on apical quarter of antero-ventral and apical third of postero-ventral surfaces, hind tibia with preapical and apical.

**Wings** (Fig. 81): Light grey membrane with brown markings; veins brown. Short stout costal spines fading out about third distance between apices 1st and 2nd veins. Wing indices: costal about 1.8; 4th vein about 1.1; 4c about 0.7; 5x about 0.4.

Halteres whitish-yellow, base of stalks brown.

**ABDOMEN**: Dark brown heavily dusted with grey; lateral margins of tergites 2 to 5 widely grey with large brown spot partly enclosed.

**External genitalia** (Fig. 92): Genital arch about twice as long as broad, strong black hairs over surface strongest dorsally; anal plate small, covered with black hairs equal to strongest of arch; clasper with prominent pointed finger-like

projection at antero-ventral corner; auxiliary clasper small, disc-like, and with short black hairs over surface.

FEMALE

Similar to male except: fore femur with fine hairs over all surfaces longer than those on other femora but shorter than male. Abdomen brown with greyish-brown dusting; posterior margins of tergites light brown; brown spot wholly enclosed in lateral grey band. Apical tergites and genital plates yellowish-brown.

*Holotype*: MT. ARTHUR: 4,500 ft., 21.xii.1921, ♂, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined*: Holotype, allotype, 1 paratype, and 1 ♂.

*New Records*: DUN MT.: 2,500 ft., 20.i.1921, 1 ♂, (*A. Philpott*), (Dom. Mus.).

*Distribution*: Mt. Arthur, Dun Mt. (December, January).

*Remarks*: The allotype was taken *in copula* with the holotype. Separated from *N. striata* and *N. minuta* by having a costal index less than 2.0. Closely allied to *N. irrorata* and most readily separated from it by having a wider cheek.

Genus EULIMNIA Tonnoir and Malloch

*Eulimnia* Tonnoir and Malloch, 1928. Rec. Cant. [N.Z.] Mus. 3: 172.

Arista pubescent. Third antennal segment rounded at apex; 2nd segment longer on inner side than outer. Cheeks bare on dorsal region. Scutellum haired, mesopleuron and pteropleuron bare, sternopleuron without distinct bristles, propleural bristles not developed, but cluster of hairs ventrally. Costa without distinct spines, 5th and anal veins reaching wing margin.

Type Species: *Eulimnia milleri* Tonnoir and Malloch

Similar to *Neolimnia* but separated from it by the absence of pteropleural bristles.

*Distribution*: New Zealand.

*Species*:

*Eulimnia milleri* Tonnoir and Malloch

*E. philpotti* Tonnoir and Malloch

Both species are large flies with pictured wings and distinctive brown markings on thorax. They are closely related.

KEY TO SPECIES OF EULIMNIA

Prescutellars absent ..... **milleri**  
Prescutellars present ..... **philpotti**

*Eulimnia millefi* Tonnoir and Malloch. Fig. 95

*Eulimnia millefi* Tonnoir and Malloch, 1928. Rec. Cant. [N.Z.] Mus. 3: 172.

A light brown species with patterned wings. Body length 8.0 mm., wing about 7.5 mm.

MALE AND FEMALE

HEAD: Arista light brown; rays of pubescence usually at least twice diameter of basal segments of arista and occurring on apical three-quarters of arista. Antenna yellowish-brown; 3rd segment about twice as long as wide, covered with white pile; 2nd segment two-thirds length of third, covered with black hairs, the apical dorsal one or two slightly stronger; basal segment with dorsal marginal black

hairs. Front yellowish-brown with green tinge in male; light reddish-brown in female; ocellar area and strip back through postverticals to occipital foramen, chocolate-brown; irregular reddish-brown median mark from ocellar area nearly to anterior margin of front; brown area at posterior fronto-orbital and minute brown area at anterior, both areas just meeting. Ocellar area distinctly raised well above front with anterior ocellus directed forwards, this raised area extending back in ridge-like formation to postverticals. Anterior fronto-orbital about two-thirds posterior; distinct black hairs behind ocellar bristles to postverticals; front with few fine black scattered hairs more particularly over anterior half in front of anterior orbitals. Face whitish-grey dusted, not markedly carinate; brown or dark brown area between base of antennae and eyes. Cheeks same colour as face and with small black hairs; 1 or 2 fairly widely separated black bristles at lower posterior corner. Occiput grey dusted on dorsal half and mostly bare and many black bristle-like hairs ventrally. Eyes with few short scattered hairs. Vertical

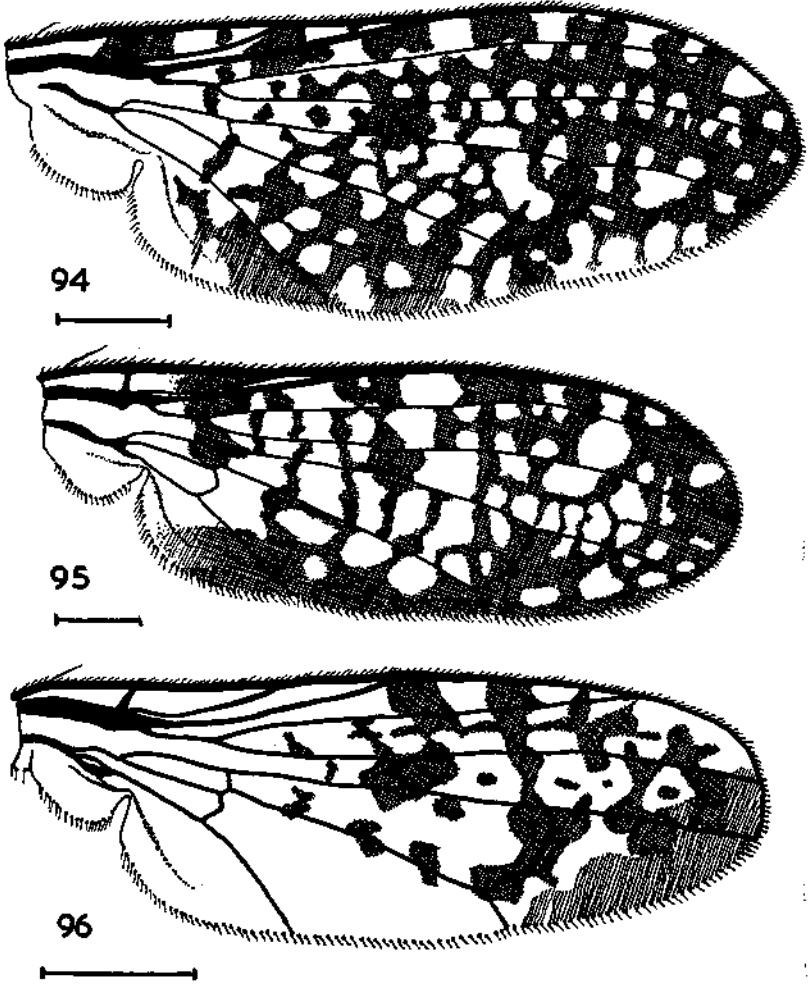


Fig. 94. Wing of *Eulimnia philpotti*  
 " 95. " " *E. milleri*  
 " 96. " " *Neolimnia vittata*  
 Scale: 1.0 mm.

diameter of eye about twice width of cheek in same axis. Proboscis brown; palpi light brown with long fine black bristles, longest towards base.

**THORAX:** Mesonotum generally light brown with greyish dusting; pair median narrow brown vittae anteriorly; 3 small brown spots near dorsocentral line, 1 median of presutural bristle, 1 postsutural, and 1 just anterior to anterior dorsocentral; 2 brown spots, 1 below supraalar and another about postalar and extending to scutellum, or these spots united into a continuous brown strip; scutellum with distinct brown median longitudinal band from base between apicals to just beneath apex; brown vitta along dorsal pleura to margin of postscutellum. Apical scutellar bristle just stronger than basal, latter equal to the posterior of the 2 dorsocentrals; posterior dorsocentral just stronger than anterior dorsocentral; 1 humeral; 2 notopleurals; 1 presutural; 1 supraalar; 2 postalar; sternopleuron with hairs over surface.

**Legs:** Femora with yellowish-brown annulus about middle, elsewhere brown; tibia with dark brown apices; apical segment of tarsi dark brown. Fore femur with strong bristles on apical half of postero-dorsal surface; hind femur with 1 or 2 fairly strong dorsal bristles at apical quarter.

**Wings** (Fig. 95) greyish-yellow with brown markings. Heavy short costal spines fading out midway between apices of 2nd and 3rd veins. Wing indices: costal about 2.6; 4th vein about 1.3; 4c about 0.8; 5x about 0.3.

Halteres light whitish-yellow or light brown.

**ABDOMEN:** Brown; greyish-brown median longitudinal area on 2nd, 3rd, and 4th tergites; grey lateral area on tergites 2, 3, 4, and 5, with brown spot within this grey area of latter three tergites, these spots may be narrowly united with the more median brown area of the tergites.

**Holotype:** WELLINGTON: Days Bay, 29.xi.1921, ♂, (*A. Tonnoir*), (Cawt. Inst.).

**Material Examined:** Holotype, 1 ♂, and 8 ♀.

**New Records:** LITTLE BARRIER ISLAND: Waipawa stream bed, 28.xi.1954, 2 ♀, (*R. A. Harrison*), (P.D.D.). AUCKLAND: -iv.1932, 1 ♀, (*Anon.*), (Ak. Mus.). WAINUIOMATA: -xii.1909, 1 ♀, (*G. V. Hudson*), (Dom. Mus.). WELLINGTON: Karori, Scrub Gully bush, -x.1882, 1 ♀; 2.xii.1898, 1 ♀; Gollans Valley, 23.xii.1937, 1 ♂; Wiltons Bush, 27.xi.1934, 1 ♀; 5.ii.1941, 1 ♀, (*G. V. Hudson*), (Dom. Mus.).

**Distribution:** Little Barrier Island, Auckland, Wainuiomata, Wellington. (October to December, February, April).

**Remarks:** The female, here recorded for the first time, differs from the male to the same degree as do the sexes in *E. philpotti*. In both species the female tends to be darker and the darker coloured front is the most conspicuous character. Separated from *E. philpotti* by the absence of prescutellar acrostichal bristles as well as by distinctions in colouration of thorax and wing.

### ***Eulimnia philpotti* Tonnoir and Malloch. Fig. 94**

*Eulimnia philpotti* Tonnoir and Malloch, 1928. Rec. Cant.  
[N.Z.] Mus. 3: 173.

A light brown species with patterned wings. Body length about 8.0-8.5 mm., wing length about 6-7 mm.

#### MALE AND FEMALE

**HEAD:** Arista brown to dark brown, yellowish-brown basally; rays of pubescence greater than diameter of basal segments. Antenna yellowish-brown; 3rd segment almost as wide as long, slightly reddish, and with fine white pile; 2nd segment almost equal to 3rd in length, covered with black hairs, the preapical dorsal three or four slightly stronger; basal segment with dorsal marginal black hair. Front light reddish-brown in female; light yellowish-brown with green tinge in male;

ocellar area raised and grey anteriorly, behind ocelli only slightly darker than surrounding area, no brown spots about bristles. Few fine scattered hairs about orbitals and anterior region of front more particularly at lateral margins; distinct black hairs behind ocelli to postverticals. Face light reddish-brown; brown narrow area from antennae to eyes. Cheeks light reddish-brown. Cheeks with short fine bristles; 2 bristles at lower posterior corner. Occiput hairy laterally and ventrally. Eyes with few fine hairs. Vertical diameter of eye about twice width of cheek in same axis. Proboscis dark reddish-brown; palpi yellowish-brown with long fine black bristles longest towards base.

**THORAX:** Mesonotum greyish-brown with brown irregular areas formed into 6 irregular vittae, 1 on dorsocentral line and 1 either side; scutellum grey with wide brown area not reaching anterior margin, and including apical bristles; mesopleuron with conspicuous circular brown dot. Prescutellars present; anterior dorsocentrals about two-thirds posterior dorsocentrals; apical scutellars just stronger than basals and equal to the posterior of the 2 dorsocentrals; 1 humeral; 2 notopleurals; 1 presutural; 1 supraalar; 2 postalars; sternopleuron with hairs over surface.

Legs brown, apices of tibiae and apical segments of tarsi dark brown. Fore femur with strong bristles on dorsal and postero-dorsal surfaces, mid femur with anterior bristle at apical third; hind femur with small preapical dorsal bristle.

Wings (Fig. 94) grey with brown marking. Short stout costal spines extend third way between 2nd and 3rd veins; posterior cross vein distinctly curved. Wing indices: costal about 3.9; 4th vein about 1.0; 4c about 0.6; 5x about 0.3.

Halteres, light yellow, darker basally.

**ABDOMEN:** Light brown; lateral region of tergites grey, enclosing a brown spot in middle.

*Holotype:* NELSON: Aniseed Valley, 1-4.xii.1923, ♀, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined:* Holotype and allotype.

*Distribution:* Nelson. (December).

*Remarks:* Separated from *E. milleri* by the presence of a pair of prescutellar bristles. Types were collected by Tonnoir, not Philpott as stated by Tonnoir and Malloch (1928). The colouration of the front is an important character differentiating the sexes.

## Family HELCOMYZIDAE

Postverticals parallel or divergent. Vibrissa absent. Propleuron and prosternum united as one continuous heavily chitinised plate. Marked angle, often elevated, on lower portion of facial ridges. Subcosta well separated from first vein; costa unbroken; second basal and anal cells large, anal vein traceable to wing margin.

Originally the genera of the Helcomyzidae were placed in the Coelopidae, but Malloch (1933d) separated them from the Coelopidae and considered that they showed closer relationships to the Dryomyzidae and Sciomyzidae. This relationship is generally accepted and several authors e.g. Czerny (1930), Oldroyd (1949), and Colyer and Hammond (1951) give the family subfamily ranking in the Dryomyzidae. However, Malloch (1933d) gave full family ranking to the Helcomyzidae on the basis of the union of the prosternum and propleuron.

*Genera Occurring in New Zealand:*

*Maorimyia* Tonnoir and Malloch

*Paractora* Bigot

The flies are usually associated with damp situations and both New Zealand genera are only found on the sea coast.

KEY TO GENERA OF HELCOMYZIDAE IN NEW ZEALAND

Mesopleuron with long hairs and one strong bristle posteriorly; pteropleuron with long hairs at centre .....	MAORIMYIA (p. 91)
Mesopleuron and pteropleuron bare .....	PARACTORA (p. 92)

Genus MAORIMYIA Tonnoir and Malloch

*Maorimya* Tonnoir and Malloch, 1928. Rec. Cant. [N.Z.] Mus. 3 : 155.

Second antennal segment with slight notch at apex, without distinct split. Ocellar bristles microscopic; 2 short but distinct fronto-orbitals, both on posterior half of front. Prescutellars present; 1 pair dorsocentrals; mesopleuron haired; pteropleuron haired; scutellum haired. Femora without ventral bristles; fore and hind tibiae with long fine preapicals; mid tibia with circle of spines at apex; empodia hair-like. Spines on costa.

Type Species: *Maorimya bipunctata* (Hutton)

Generic characters of most importance are the absence of ocellar bristles and the presence of hairs on the mesopleuron and pteropleuron.

Distribution: New Zealand.

Species: *Maorimya bipunctata* (Hutton)

Hutton (1901) placed the type species, then considered to be a *Trigonometopus*, in the Sciomyzidae while Tonnoir and Malloch (1928) referred it to the Dryomyzinae, which they considered as a subfamily of the Sciomyzidae. Its true position in the Helcomyzidae was first recognised by Malloch (1933d).

***Maorimya bipunctata* (Hutton). Fig. 97**

*Trigonometopus bipunctata* Hutton. 1901. Trans. N.Z. Inst. 33 : 86.

*Maorimya bipunctata* (Hutton): Tonnoir and Malloch, 1928. Rec. Cant. [N.Z.] Mus. 3 : 155.

A dark reddish-brown and grey species with shading on cross veins. Body length about 9.5–10.0 mm. in males; 8.0–9.5 mm. in females. Wing length about 9.5 mm. in males; 9.0–10.0 mm. in females.

MALE

HEAD: Arista short, reddish-brown, shining and thicker basally, minute pubescence just visible and present on all but basal portion. Antenna reddish-brown; 3rd segment about as long as broad, somewhat spherical in shape, brown or dark brown on apical half; 2nd segment with stout strong black hairs, several on dorsal and ventral surface enlarged; basal segment with short black hairs dorsally. Front reddish-brown, orbits as far as interior fronto-orbital, ocellar area and narrow median vitta, grey dusted. The 2 fronto-orbitals small and close together; verticals and postverticals strong; short black hairs over most of front between orbits. Face reddish-brown but entirely covered with grey dusting. Cheeks grey dusted. Hairs on cheek except ventral portion, posterior ones long and thin; no distinctly differentiated bristles at lower posterior corner. Occiput grey. Eyes bare. Vertical diameter of eye about 1.4 times width of cheek in same axis. Proboscis brown; palpi yellowish-brown with many long black hairs.

THORAX: Greyish-brown; mesonotum with pair of median longitudinal vittae between dorsocentral row, a wider reddish-brown vitta lateral to dorsocentral row, and a small interrupted vitta between these, a dark greyish-brown spot near dorsal posterior corner of mesopleuron, scutellum disc with greyish-brown longitudinal median furrow, elsewhere reddish-brown. Prescutellars about two-thirds or more length of dorsocentrals; basal scutellars parallel and just longer than parallel apicals; scutellum with short black hairs on disc except at median furrow; hairs on mesonotum short and stout; 1 humeral; 1 presutural; 2 notopleurals; true supraalar absent but postsutural interalar present; 2 postalar; 1 mesopleural



bristle and hairs on all its surface; 1 sternopleuron; 1 strong propleural bristle, and hairs on propleuron and prosternum about insertion of fore coxa.

Legs greyish or reddish-brown, base of tibiae light brown. All legs with long soft hairs; all coxae with strong antero-ventral and ventral bristles, and long hairs; fore tibia with thick matt of short yellowish-brown hairs on apical portion of anterior surface, this matt continued onto tarsus; mid tarsus with thick short spines on ventral surface of 1st segment and at ventral apex of remaining segments; hind tibia with short stout apicals and thick matt of hairs similar to fore leg on apical portion of posterior surface and along tarsal segments; fore and hind tarsi with chitinous process at ventral apex of basal segment.

Wings (Fig. 97) shaded very light brown, brown shading about 2 cross veins and at apex of subcosta; veins light brown. Costa with long spines, those before apex of subcostal vein about equal to diameter of costa, those beyond apex of vein longer than diameter of costa but becoming progressively shorter and disappearing just beyond apex of 2nd vein. Costa ends just beyond 4th vein; 5th vein not quite reaching wing margin; thick short costal spines fading out about halfway between apices of 2nd and 3rd veins. Wing indices: costal about 2.5; 4th vein about 1.3; 4c. about 0.7; 5x about 0.4.

Halteres brown, stalks light brown.

**ABDOMEN:** Dark greyish-brown; posterior margin of tergites, except 1st tergite, light greyish-brown; all segments covered with long soft hairs.

#### FEMALE

Similar to male except: Hairs on cheek not long and fine except towards lower posterior corner where there are also several thicker long bristles. Palpi with short black strong hairs.

The 6 thoracic vittae more clearly defined than in male. Pleura without the dense covering of long soft hairs but with short fine hairs. Propleural bristle more prominent than in male due to absence of associated long hairs; mesopleuron with 1 long and 1 or 2 shorter bristles.

Legs not covered with long soft hairs but with short hairs; fore femur with bristles on apical half of postero-dorsal surface; mid tarsus without thick short spines along ventral surface of basal segment; hind tibia with 2 preapicals; 1 on antero-dorsal margin, 2 stout apicals.

Abdomen with covering of hairs but without the long soft hairs of male.

*Holotype:* CHATHAM ISLANDS: no date, ♂, (*J. Fougere*), (Cant. Mus.).

*Material Examined:* Holotype, 3 ♂ and 3 ♀.

*New Records:* CAPE SAUNDERS: 11.iv.1920, 1 ♂, 2 ♀, (*Anon.*), (Ak. Mus.). DUNEDIN: Ocean Beach, 28.ix.1919, 1 ♂; 8.iv.1920, 1 ♀, (*Anon.*), (Ak. Mus.). NO DATA: 1 ♂, (*Osten-Sacken*), (B.M.).

*Distribution:* Cape Saunders, Dunedin, Invercargill, Chatham Islands. (September to November, January, April).

*Remarks:* The size variation between sexes is not as pronounced as Tonnoir and Malloch (1928) claim. Quite strong sexual dimorphism is apparent in this species, the most obvious difference between sexes being the remarkable hairiness of the male.

#### GENUS PARACTORA Bigot

*Paractora* Bigot, 1887. Miss. sci. Cap Horn, 6 (2) Ins. 5: 33.

*Actoceles* Enderlein, 1912. K. svenska VetenskAkad., Handl. 48 (3): 43.

Two backwardly and outwardly directed posterior fronto-orbitals. Face slightly concave. Postverticals parallel or slightly convergent. Cheeks strongly haired. Two pairs of scutellars. Mesopleuron and pteropleuron bare; area ventral to posterior spiracle without bristles. Tibiae without strong spines except at apex. Costa with small spines.

Type Species *Paractora fuegiana* Bigot

Separated most readily from *Maorimyia* by the bare mesopleuron and pteropleuron. The synonymy listed above is following Malloch (1933d).

*Species Occurring in New Zealand:*

*Paractora asymmetrica* (Enderlein)

***Paractora asymmetrica* (Enderlein), (*New Combination*)**

*Actoceles asymmetrica* Enderlein, 1930. S.B. Ges. naturf. Fr. Berl. p. 259.

A brown or blackish-brown species. Body length 5-8 mm., wing length 4.5-7.0 mm.

MALE

**HEAD:** Front yellowish-brown, one-quarter width of eye at narrowest part. Face white ventrally. Cheeks white. Long thick hairs on cheeks. Verticals and 2 fronto-orbitals present; ocellars present. Ocellar triangle longer than broad. Greatest width of cheek wider than height of eye.

**THORAX:** Black with most sutures white. Posterior half of mesonotum dark greyish-black with a darker median line and yellowish-brown posteriorly; scutellum partially yellowish-brown. Prescutellars present; 3 (?) dorsocentrals and 3 postalars; 1 sternopleural.

Legs yellowish-brown, with very long close set hairs on femora, tibiae, and dorsal surface of tarsi. Fore legs without strong bristles; basal segment of fore tarsus with heavily chitinised black plate on ventral surface; mid tibia with 3 short spines; basal segment of mid tarsus with 3 short stout spines and a row of 3 to 8 spines on ventral surface; hind tibia with 1 long ventral preapical and a short dorsal apical; basal segment of hind tarsus with 4 spines anteriorly and a short stout chitinous plate ventrally.

Wings hyaline, veins pale yellowish-brown; 1st vein brown. Fifth vein and anal vein only faintly reaching wing margin. Wing indices: costal about 2.0; 4th vein about 1.1; 4c about 0.6; 5x about 1.5.

**ABDOMEN:** Thickly covered with fine long hairs.

**Holotype:** MACQUARIE ISLAND: East Coast, ♂, (*L. Kohl*), (Berlin Museum).

**Distribution:** Macquarie Island.

**Remarks:** The holotype has not been seen and the above description is taken from the original description of the species.

Family COELOPIDAE

Flattened flies. Face usually deeply concave. Eyes small. Third antennal segment short and rounded. Postverticals usually convergent. Clypeus projects beyond margin of face. Distinct vibrissa absent. Prosternum and propleuron distinctly separated; prosternum in most cases haired. Legs stout and thickly covered with bristles and hairs; apical segments of all tarsi triangular in shape, narrow basally; empodium with long hairs; pulvilli with spine at base; claws strongly curved. Tibiae with preapical bristle. Costa not broken, subcosta entire and separated from first vein, anal vein present, reaching wing margin faintly; anal cell present.

Recognised and separated from other families by the flat elongate shape of the body, hairy and bristled legs, complete venation of wings, and the separate subcosta and first vein.

*Genera Occurring in New Zealand:*

*Apetaenus* Eaton  
*Baeopterus* Lamb  
*Chaetocoelopa* Malloch  
*Coelopa* Meigen  
*Coelopella* Malloch  
*Icaridion* Lamb  
*Protocoelopa* Malloch

The New Zealand coelopid fauna is of interest because it contains three genera with reduced wings. These three, however, have been found only on the subantarctic islands and have probably evolved as distinct genera in those islands. The main islands of New Zealand contain in the genera *Chaetocoelopa* and *Protocoelopa* some species which are among the largest flies of the family.

Malloch (1933a) separated the genera closely allied to *Coelopa* Meigen primarily on the vestiture of the metasternum. This character, although being a very sound one, is very often difficult to determine and in the following key use is made of it only to separate *Coelopa* and *Coelopella*.

KEY TO GENERA OF COELOPIDAE IN NEW ZEALAND

1	Wings reduced .....	2
	Wings normal .....	4
2	Wings about one-third length of thorax .....	3
	Wings about half body length .....	BAEOPTERUS (p. 94)
3	Mesopleuron bare, humeral bristle present .....	ICARIDION (p. 96)
	Mesopleuron haired, humeral bristle absent .....	APETAENUS (p. 98)
4	Stem vein of wing haired ventrally .....	PROTOCOELOPA (p. 99)
	Stem vein of wing bare .....	5
5	Mesopleuron with bristles and hairs .....	CHAETOCOELOPA (p. 100)
	Mesopleuron bare .....	6
6	Metasternum haired .....	COELOPA (p. 105)
	Metasternum bare .....	COELOPELLA (p. 109)

Genus BAEOPTERUS Lamb

*Baeopterus* Lamb, 1909. Subantarct. Is. N.Z. 1 : 141.

Antennae short, curved deeply into convexity of face. Ocellars the only frontal bristles present in males. Eyes bare. Palpi large. Only scutellar bristles present on thorax of males. Fore legs in males greatly thickened. Mid tibia with cluster of apical bristles; hind tibia with 2 preapicals. Halteres long and strong. Wings about half length of body; venation complete.

Type Species: *Baeopterus robustus* Lamb

Distinguished by the reduced wings and separated from other genera having reduced wings viz., *Icaridion* and *Apetaenus*, by having complete venation. Apart from the reduced wings this genus has the same general appearance as *Protocoelopa* which, in males, has greatly reduced hairs and bristles. However, with the haired mesopleuron and pteropleuron, the relationship of *Baeopterus* and *Protocoelopa* is not close and *Baeopterus* is probably closer to *Dasycoelopa* Malloch.

*Distribution:* New Zealand.

*Species:* *Baeopterus robustus* Lamb

## **Baeopterus robustus** Lamb. Fig. 98

*Baeopterus robustus* Lamb, 1909. Subantarct. Is. N.Z. 1 : 142.

A dark reddish-brown species with reduced wings. Body length about 10.0-14.0 mm. in males; 6.0-10.0 mm. in females. Wing length about 6.0-8.0 mm. in males; 3.0-5.0 mm. in females.

### MALE

**HEAD:** Arista shining brown, bare. Antenna dark reddish-brown; 3rd segment broader than long, about half length of 2nd segment; 2nd segment with a short dorsal apical bristle and short stout hairs elsewhere; basal segment with row of dorsal apical short stout hairs, the outer one strongest. Front dark reddish-brown; ocellar triangle grey dusted. Frontal bristles reduced to short stout hairs just longer than the minute stout hairs of the front, ocellars the strongest of the bristles; post-verticals not differentiated; 2 fronto-orbitals and the verticals just apparent; hairs extending onto dorsal parafacial. Face reddish-brown, deeply concave so that antennae are pendant and 3rd segment hidden somewhat by 2nd. Cheeks reddish-brown with grey dusting. Short stout hairs on cheek except ventral to eye; about 3 strong normal bristles at lower posterior angle. Occiput dark reddish-brown. Vertical diameter of eye about 1.4 times width of cheek in same axis. Proboscis dark brown, labella enlarged and yellow; palpi brown, strong and elongate with spines and bristles on apical half and long fine hairs basally.

**THORAX:** Mesonotum dark reddish-brown; pleura reddish-brown. All hairs and bristles reduced to minute spines; at position of bristles these spines are just longer than surrounding hairs and of the bristles the apical scutellars are the longest and are clearly discernible; mesopleuron, pteropleuron, hypopleuron posterior and ventral to spiracle, and sternopleuron, haired; some hairs ventral to anterior spiracle; propleuron with a few ventral hairs; prosternum haired with fine hairs. Humerus and callus anterior to halteres well developed.

Legs light reddish-brown. Hairs mostly reduced to short stout spines. Fore femur with a cluster of bristles at base and a row on apical third of antero-ventral surface, 1 or 2 rows of spines on apical third of postero-ventral surface; fore tibia with a pair of short dorsal bristles at basal quarter and 1 long preapical on dorsal surface, thick matt of hairs at apex of antero-ventral surface; fore tarsus with normal hairs, basal segment with thick matt of fine hairs antero-ventrally, and a strong protruding ventral apical plate, apical segment as long as the two preceding segments together and with strong spines; mid femur with very short spines on apical third of antero- and postero-ventral surfaces; basal segment of mid tarsus with row of strong spines on ventral surface, apical segment similar to that of fore tarsus; hind femur with strong thick spines and bristles on apical third of antero- and postero-ventral surfaces; hind tibia curved and with 2 apicals, matt of hairs on apex of postero-ventral surface; hind tarsus with thick matt of hairs on postero-ventral surfaces of basal two segments, apical segment similar to that of 1st tarsus.

Wings (Fig. 98) light brown; veins brown, spines and hairs on costa all very small; a few minute hairs on ventral surface of stem vein about humeral cross vein. Costal index about 3.2.

Halteres light brown.

**ABDOMEN:** Reddish-brown. All hairs and bristles reduced to minute stout spines, the strongest of these occurring laterally on 2nd tergite.

### FEMALE

Often much smaller than the male and with hairs and bristles not so greatly reduced.

**Lectotype:** CAMPBELL ISLAND: -1907, ♂, (*G. R. Marriner*), (B.M.). Designated, labelled and here published as the lectotype from the syntype series of 1 ♂ and 1 ♀.

**Material Examined:** Lectotype, 4 ♂, and 6 ♀.

**Distribution:** Campbell Island, Auckland Islands. (November).

## Genus ICARIDION Lamb

*Icaridion* Lamb, 1909. Subantarct. Is. N.Z. 1: 140.

Arista pubescent. Head thickly covered with hairs. Clypeus not greatly produced. Mesopleuron bare. Wings reduced to minute strips; venation greatly reduced.

Type Species: *Icaridion nasutum* Lamb

Readily separated from *Apetaenus* Eaton by the absence of mesopleural bristles, and from all other New Zealand genera by the greatly reduced wings. Relationships are probably closest with the genus *Coelopa* which also has a bare mesopleuron. The bristling and hairs of the genus is normal or the hairiness even more extensive than in some other genera and in particular provides a contrast with *Baeopterus* which with somewhat reduced wings has, particularly in males, minute hairs and bristles.

Distribution: Campbell Island.

Species: *Icaridion nasutum* Lamb

### *Icaridion nasutum* Lamb

*Icaridion nasutum* Lamb, 1909. Subantarct. Is. N.Z. 1: 141.

Harrison, 1955. Rec. Dom. Mus. N.Z. 2: 217.

A blackish-brown species with light brown legs and greatly reduced wings. Body length about 6.0 mm., wing length about 0.5 mm.

#### FEMALE

HEAD: Arista brown; distinctly pubescent, rays of pubescence at least equal to diameter of basal segment. Antenna blackish-brown; 3rd segment globular about as long as wide; 2nd segment with 1 strong dorsal apical bristle, several strong and weak hairs; basal segment with strong laterally placed convergent bristle and black apical dorsal hairs. Front blackish-brown; ocellar triangle brown or dark brown. Anterior fronto-orbital about 1.5 times length of posterior bristle; ocellars and verticals strong; postverticals weak; front thickly covered with strong long hairs. Face dark brown; deeply concave. Cheeks blackish-brown and brown. Hairs and a few bristles on most of ventral two-thirds of cheek. Occiput dark brown. Eyes bare. Vertical diameter of eye about 1.5 times width of cheek in same axis. Proboscis brown; palpi dark brown and with strong hairs.

THORAX: Mesonotum and scutellum blackish-brown; pleura reddish-brown or brown. Scutellum very small and about half as long as wide. Prescutellars weak; 1 posterior dorsocentral; basal scutellars about half length of apical scutellars; 1 strong humeral; no presutural; 2 strong notopleurals; 1 supraalar; mesopleuron and pteropleuron bare; sternopleuron with very strong postero-dorsal bristle and long hairs over rest of surface; few short small spines ventral to posterior spiracle; cluster of about 3 short hairs ventral to anterior spiracle; 1 strong propleural; prosternum haired.

Legs light brown or light reddish-brown. Fore femur with fine dorsal and postero-ventral bristles; fore tibia with long fine preapical dorsal bristle; mid femur with small black bristles on apical third of dorsal surface together with finer hairs; mid tibia with several strong stout but short preapical and apical spines; hind femur with bristles and hairs on apical third of dorsal surface as in mid femur; hind tibia with a long fine preapical dorsal bristle and several short stout preapical and apical spines.

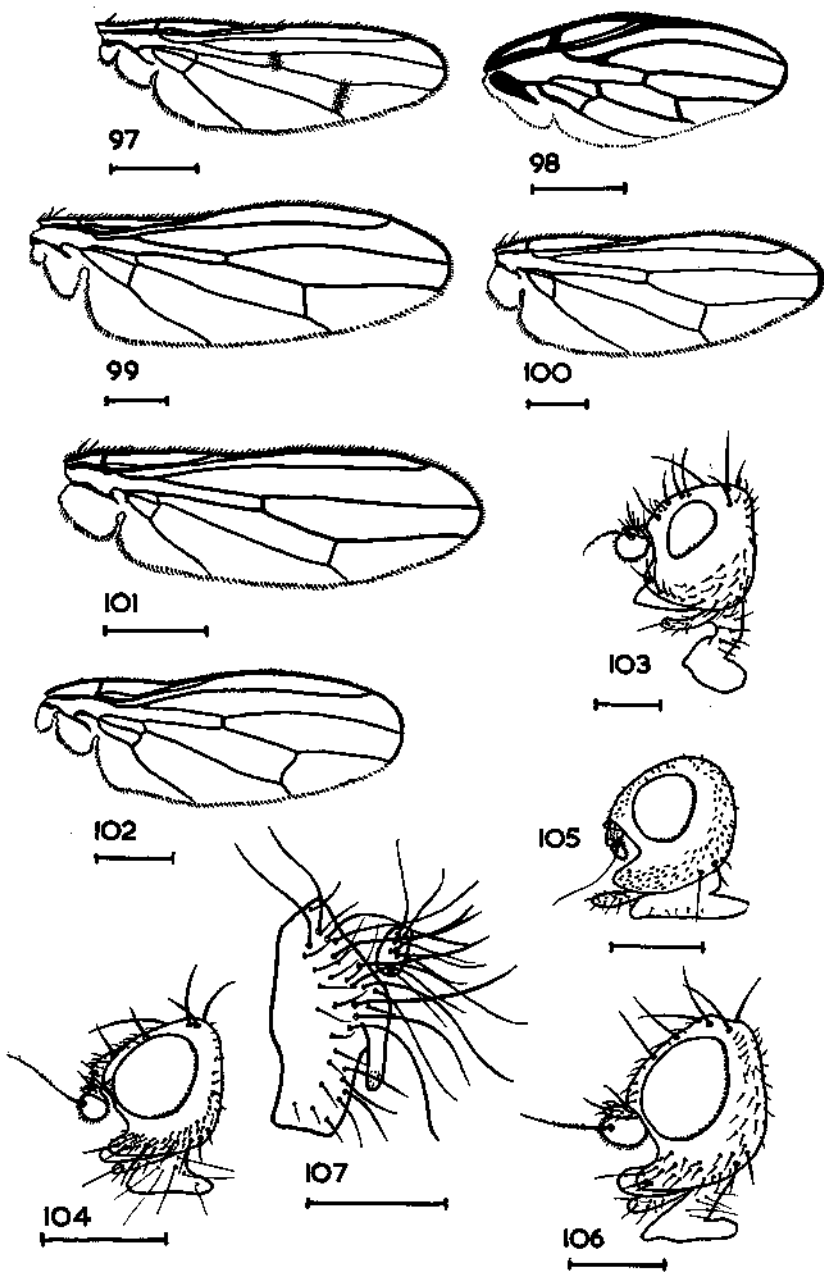
Wings reduced to minute structures. Costal vein present and haired; two other veins discernible on membrane.

Halteres absent.

ABDOMEN: Blackish-brown. Tergites with covering of long hairs. Sternites with very short hairs.

#### MALE

Similar to female. Legs with longer hairs.



Wings (Figs. 97-102):

- 97. *Maorimyia bipunctata*
- 98. *Baeopterus robustus*
- 99. *Coelopa curvipes*
- 100. *Chaetocoelopa littoralis*
- 101. *C. huttoni*
- 102. *Protocoelopa philpotti*

Heads (Figs. 103-106):

- 103. *Apetaemus litoralis*
- 104. *Chaetocoelopa littoralis*
- 105. *Protocoelopa philpotti*
- 106. *Chaetocoelopa huttoni*

External male genitalia:

- 107. *Chaetocoelopa littoralis*

Scale: Figs. 97, 98, 102, 2.0 mm.; Figs. 99-101, 1.0 mm.; Figs. 103-107, 0.5 mm.

*Lectotype*: CAMPBELL ISLAND: Monument Harbour, -xi.1907, ♀, (C. Chilton), (B.M.). Designated, labelled, and here published as the lectotype from the syntype series of 1 ♂ and 2 ♀.

*Material Examined*: Lectotype, 1 ♂ and 2 ♀.

*Distribution*: Campbell Island. (November).

*Remarks*: Data available about the habits of the species show that it can be found under stones on the shore line.

### Genus APETAENUS Eaton

*Apetaenus* Eaton, 1875. Ent. mon. Mag. 12 : 58.

Arista minutely pubescent. Frontal bristles mostly strong. Three dorso-centrals, 1 presutural; 2 pairs strong humerals; mesopleuron haired. Wings greatly reduced.

Type Species: *Apetaenus litoralis* Eaton

Recognised by the greatly reduced wings and separated from *Icari-dion* Lamb by the minute pubescence of the arista and the haired mesopleuron.

*Distribution*: Kerguelen Islands, Macquarie Island.

*Species Occurring in New Zealand*:

*Apetaenus litoralis* Eaton

### *Apetaenus litoralis* Eaton. Fig. 103

*Apetaenus litoralis* Eaton, 1875. Ent. mon. Mag. 12 : 58.

Womersley, 1937. Rep. Brit. Aust. N.Z. Antarct. Res. Exped.  
B 4 : 75.

A dark reddish-brown species with greatly reduced wings. Body length about 5.0 mm., wing length about 0.4 mm.

#### MALE AND FEMALE

**HEAD** (Fig. 103): Arista dark reddish-brown; rays of pubescence minute and much less than diameter of basal segments. Antenna dark brown; 3rd segment dark reddish-brown; 2nd segment with 1 strong and several shorter dorsal bristles and minute hairs laterally near apical margin; basal segment with a few dorsal apical hairs. Front brown with grey dusting particularly bordering ocellar triangle. Four strong fronto-orbitals, anterior one weakest; postverticals and ocellars strong; postverticals about two-thirds length of inner verticals and cruciate, few hairs on front and on orbits. Face heavily dusted with grey; carina distinct and yellowish-brown. Cheeks reddish-brown with some grey dusting. Strong hairs on ventral cheek margin just less than length of hair at vibrissal angle, the middle hair about twice length of vibrissal hair, strong hairs posteriorly on cheek. Occiput reddish-brown. Eyes bare. Vertical diameter of eye about 1.5-2.0 times width of cheek in same axis. Proboscis yellowish-brown; palpi dark brown with two strong apical hairs and weaker hairs elsewhere.

**THORAX**: Reddish-brown with light grey dusting. Prescutellars absent; anterior presutural dorsocentral almost as strong as posterior bristle, middle dorsocentral just posterior to transverse suture and about half length of posterior bristle; both pairs of scutellars equally strong; scutellum with a few hairs on dorsal surface; no humeral; 1 strong presutural; 2 small notopleurals; 1 strong supraalar; 1 posterior mesopleural and hairs on mesopleuron strongest towards posterior margin; 1 strong sternopleural and several strong hairs surrounding it; 1 propleural.

Legs brown with light dusting of grey. Hairs and bristles not strong.

Wings about half length of mesonotum. Costa strong, twice broken, distal break near apex of wing, strong hairs and bristles on entire length; membrane of wing with 2 discernible veins.

Halteres yellowish-brown, reduced and about third length of wing.

ABDOMEN: Reddish-brown. First segment about half length of abdomen. Strong bristles on most tergites.

**Lectotype:** KERGUELEN ISLANDS: Transit of Venus Expedition 1874, Specimen K.26, 23.xi.1874, ♂, (*A. E. Eaton*), (B.M.). Designated, labelled, and here published as the lectotype from the syntype series.

**Material Examined:** Lectotype, 1 ♂, and 2 ♀.

**Distribution:** Kerguelen Islands, Macquarie Island. (November, December).

**Remarks:** Only one specimen of Eaton's original series of specimens has been located in collections. This has now been designated the lectotype. Specimens from both localities have been examined and no differences seen between the two populations.

### Genus *PROTOCOELOPA* Malloch

*Protocoelopa* Malloch, 1933. *Ann. Mag. nat. Hist.* (10) 11 : 34.

Large flies, bristles and hairs in male greatly reduced. Mesopleuron bare; small hairs on metasternum ventral to posterior spiracle.

**Type Species:** *Protocoelopa philpotti* Malloch

Separated from other genera by the bare mesopleuron and presence of hairs on the ventral surface of the stem vein.

**Distribution:** New Zealand.

**Species:** *Protocoelopa philpotti* Malloch

The only known species is large and shows distinct sexual dimorphism, the males having most hairs and bristles on the head, thorax, and abdomen greatly reduced in size. If bristles are strong then, in males, they are greatly thickened.

### ***Protocoelopa philpotti* Malloch. Figs. 102, 105**

*Protocoelopa philpotti* Malloch, 1933. *Ann. Mag. nat. Hist.* (10) 11 : 346.

*Baeopterus longipes* Hendel, 1937. *Ann. naturh. (Mus.) Hofmus. Wien* 48 : 192. (*New Synonymy*).

A reddish-brown species. Body length 9.0–13.0 mm., wing length about 9.5–14.0 mm.

#### MALE

**HEAD** (Fig. 105): Arista long, light brown, dark brown basally, and bare. Antenna dark reddish-brown; 3rd segment blackish-brown, broader than long; 2nd segment with short dorsal apical bristle and short stout hairs elsewhere; basal segment with a very short stout lateral dorsal bristle and very short apical dorsal hairs. Front dark velvety reddish-brown; ocellar triangle and orbits dusted. The 2 fronto-orbitals, verticals, and ocellars reduced to very short spines; postverticals not differentiated; very minute thick hairs on most of front and on dorsal parafacials. Face reddish-brown with some grey dusting; strongly concave. Hairs on cheeks light reddish-brown with some grey dusting, except ventral to eye; all hairs short and stout; anterior angle bare; about 2 long normal bristles at lower posterior angle of cheek. Occiput reddish-brown. Eyes bare. Vertical diameter of eye about twice width of cheek in same axis. Proboscis yellowish-brown, labella enlarged; palpi reddish-yellow, fine hairs on basal half and thick short black spines apically.

**THORAX:** Mesonotum dark reddish-brown; pleura reddish-brown. Hairs and bristles all reduced to minute small spines except the normal apical scutellars; position of bristles indicated by the spines being slightly larger than rest; scutellum haired, very small spines ventral to anterior spiracle.



Legs light brown; all hairs on legs very minute and spine-like; fore femur with black stout spines on about apical halves of antero- and postero-ventral surfaces and around dorsal apical margin; fore tibia with 1 prebasal, 1 preapical dorsal, and 1 small posterior apical black bristle; apex of antero-ventral margin of basal segment of fore tarsus with protruding blackish-brown plate; mid femur with 2 thick spines at middle of antero-ventral surface; mid tibia with thick spines on apical third of anterior and posterior surfaces, several similar preapical and apical spines; basal segment of mid tarsus with paired row of black spines ventrally; hind femur with several strong and some weak black stout spines at about apical third of antero- and postero-ventral surfaces; hind tibia with black spine near basal quarter or middle, apical quarter and preapical positions of anterior surface, 2 strong preapical dorsal spines and 1 antero-ventral curved apical spine; apex of postero-ventral surface of hind tibia and all postero-ventral surface of basal segment of hind tarsus with dense matt of fine hairs; basal segment of hind tarsus with small ventral apical protruding plate.

Wings (Fig. 102) clear with very faint light brown shading between strong veins; veins brown. Costal spines and hairs reduced to very minute short spines; stem vein ventrally, about junction with humerus, with small stout hairs. Wing indices: costal about 2.8; 4th vein about 1.2; 4c about 0.6; 5x about 0.5.

Halteres light brown.

ABDOMEN: Dark reddish-brown. Tergites with short hairs; 2nd tergite laterally with long hairs and bristles.

#### FEMALE

Similar to male except: front bristles longer and quite distinct; postverticals present; hairs on front normal. Hairs on cheeks normal and not reduced to spines. Hairs on mesonotum not reduced to small spines. Minute prescutellars present; small posterior dorsocentral present and some enlarged hairs on dorsocentral line about the transverse suture; basal scutellars present as enlarged hairs, apicals normally strong, no humeral; no presuturals; 2 strong notopleurals; 1 supraalar; 2 postalars; 1 posterior dorsal sternopleural bristle. Hairs on legs normal, not reduced and spine-like; fore femur with small bristles on apical half of dorsal surface and 2 about middle of posterior surface; fore tarsus without protruding plate. Spines on costa not greatly reduced.

*Holotype*: INVERCARGILL: No date, ♂, (*A. Philpott*), (U.S.N.M.).

*Material Examined*: 2 ♂ and 2 ♀ paratypes, 4 ♂, and 9 ♀.

*New Records*: CAPE SAUNDERS: 11.iv.1920, 1 ♂, (*D. Miller*), (Cawt. Inst.). KARITANE: -xi.1948, 3 ♂, 4 ♀, (*J. Timlin*), (Cawt. Inst.). CHATHAM ISLANDS: Kaingaroa, -1954, 5 ♀, (*R. R. Forster*), (Cant. Mus.).

*Distribution*: Karitane, Cape Saunders, Invercargill, Chatham Islands. (November, April).

*Remarks*: Specimens of *Baeopterus longipes* Hendel have not been examined. The holotype has not been located in European museums and its present whereabouts is unknown. Hendel (1937) gave a full description of the fly and no character he describes differs from *Proto-coelopa philpotti* Malloch. The synonymy of the two species is therefore proposed here. The absence of hairs on the mesopleuron is an important generic character and *Baeopterus longipes* is thus separated immediately from the genus *Baeopterus*.

#### Genus CHAETOCOELOPA Malloch

*Chaetocoelopa* Malloch, 1933. Ann. Mag. nat. Hist. (10)  
11: 350.

At least 3 pairs of dorsocentrals; mesopleuron haired and with 1 strong posterior dorsal bristle and some weak bristles on surface; hypopleuron with short hairs

posterior and ventral to spiracle; pteropleuron bare. Fore coxa with row of strong bristles on posterior surface, curved and lying against pleura, stronger in males.

Type Species: *Chaetocoelopa littoralis* (Hutton)

(*Coelopa monstrosa* Hutton by original designation)

Separated from other genera by the haired mesopleuron and presence of bristles on the posterior surface of the fore coxa.

*Distribution*: New Zealand.

*Species*:

*Chaetocoelopa littoralis* (Hutton)

*C. huttoni* sp.n.

#### KEY TO SPECIES OF CHAETOCOELOPA

Body length 5.0–10.0 mm., arista almost bare, few small rays about middle of axis; bristles of legs and abdomen especially of males very strong ..... **littoralis**  
Body length 3.25–4.25 mm. in males and up to 6.25 in females; arista pubescent, rays about equal to diameter of base of main axis, bristles of legs and abdomen normal, not very strong ..... **huttoni**

***Chaetocoelopa littoralis*** (Hutton). Figs. 100, 104, 107

*Coelopa littoralis* Hutton, 1881. "Cat. Dipt. N.Z." p. 69.

Hutton, 1901. Trans. N.Z. Inst. 33 : 80.

*Chaetocoelopa littoralis* (Hutton): Malloch, 1933. Ann. Mag. nat. Hist. (10) 11 : 350.

*Chaetocoelopa monstrosa* (Hutton): Malloch, 1933. Ann.

Mag. nat. Hist. (10) 11 : 350. (*New Synonymy*).

A black and greyish-black species. Body length 5.0–10.0 mm., wing length 5.0–10.0 mm.

#### MALE AND FEMALE

**HEAD** (Fig. 104): Arista shining brown; very weak pubescence consisting of a few rays near middle of arista, less than diameter of main axis, rays often scarcely visible even under high power. Antenna brown; 3rd segment blackish-brown, wider than long; 2nd segment with 1 strong and 1 weak dorsal bristle and black hairs elsewhere on surface; basal segment with 1 strong bristle and hairs on dorsal apical margin. Front black; ocellar triangle blackish-brown. Two strong fronto-orbitals; hairs on orbits extending onto dorsal parafacials; hairs on anterior margin of front along pitilinal suture between bases of antennae and scattered hairs on front anterior to line of posterior fronto-orbitals; ocellars and verticals strong; postverticals weaker than ocellars. Face brown with some grey dusting, shining brown plate on inner margin of parafacials; face strongly concave. Cheeks brown with grey dusting. Hairs over most of cheek except below eye, and many equal to about half length of the strong anterior bristle, several bristles equal to length of this anterior bristle at lower posterior corner of cheek. Occiput dark brown. Eyes bare. Vertical diameter of eye about twice width of cheek in same axis. Proboscis dark brown; palpi elongate brown and dark brown apically, strong bristles on most of their length.

**THORAX**: Mesonotum black with greyish-black lateral and posterior margins wide at transverse suture; humerus reddish-brown and grey dusted; pleura reddish-brown or dark brown with grey dusting. Prescutellars present, weak in males, stronger in females, and often bordered laterally in that sex by a small bristle; 3 occasionally 4, postsutural and sometimes 1 or 2 small presutural dorsocentrals; parallel or convergent basal scutellars about half length of apicals; scutellum haired except at middle; 1 strong and 1 weak dorsal humeral bristle; 1 presutural; 2 notopleurals and a small anterior notopleural spine; 1 strong and 1 weak supra-alar; 2 postalars; mesopleuron with few hairs in female, few very short hairs in males; sternopleuron thickly haired with long fine hairs in female, males with few short bristles on dorsal half and short normal hairs ventrally, 1 postero-dorsal sternopleural bristle; 1 strong propleural; other pleura bare; prosternum haired.

**Legs**. Male: Fore femur with strong thick bristles on dorsal and basal half of postero-dorsal surface, small bristles on basal half of posterior surface and fine

very long hairs ventrally; fore tibia with long fine hairs, some very long; fore tarsus with cluster of short black spines on base of postero-ventral surface of basal segment and a protruding apical plate on same segment; mid femur with short stout bristles on antero-dorsal, anterior and antero-ventral surface except basally and apically, posterior and postero-ventral surfaces with a few small weak bristles; mid tibia with covering of very long fine hairs, a few ventral preapical and apical black spines; mid tarsus with thick matt of long fine hairs on basal three segments, apical segment not so thickly covered; hind femur with strong stout bristles on antero-dorsal, anterior and antero-ventral surfaces, the rows often duplicated and a few long fine hairs ventrally; hind tibia with covering of very long fine hairs, 2 strong curved apical spines on ventral surface; basal segment of hind tarsus with a cluster of about 3 strong spines at base of ventral surface and short spines along anterior surface, some very long fine hairs on dorsal surfaces of all segments; very thick matt of short golden hairs antero-ventrally on apex of fore tibia and on fore tarsal segments and postero-ventrally on apex of hind tibia and on hind tarsal segments; fore and hind tibia with 1 prominent long preapical hair.

**Legs.** Female: Similar to male except all bristles thin and long and often hair like; long hairs present but not as thick as in male; basal segment of fore tarsus without protruding plate but with a few short spines at this position; mid tibia with apical ring of spines, the dorsal one preapical, mid tarsus with antero-ventral spines on 3 basal segments; hind tibia with small preapical and antero-dorsal bristle besides the long preapical hair.

**Wings** (Fig. 100) faintly shaded light brown; veins brown. Costa with pair of spines near base, the dorsal one the stronger. Wing indices: costal about 2.6-3.05; 4th vein about 1.5-1.9; 4c about 0.7-0.8; 5x about 0.6-0.7.

**Halteres** light brown.

**Squamae** bordered with light brown and white hairs.

**ABDOMEN:** Black or blackish-brown posterior margins of tergites narrowly brown. Female with long hairs and bristles laterally on tergites, longer on apical tergites; male similar to female but bristles on basal tergites short and strong. Sternites with bristles, strong in male.

**External male genitalia** (Fig. 107) light brown to brown. Genital arch somewhat triangular, chitinised more heavily posteriorly, about 13 very long hairs and many much shorter ones arising on posterior half but not from margins; anal plate small, with long hind short hairs, the longest about half length of longest of arch; clasper heavily chitinised particularly at apex, finger-like, and with minute hairs on apical half.

**Holotype:** Either Dunedin or Wellington, on seaweed, ♂, (Cant. Mus.).

**Material Examined:** Holotype, 66 ♂ and 79 ♀.

**New Records:** BAY OF ISLANDS: ex *Ecklonia radiata*, 8.i.1947, 3 ♀, (C. Little); Waitangi, ex kelp, 14.iii.1949, 1 ♀, (K. P. Lamb), (P.D.D.). WHANGAREI: Horahora, 29.xi.1924, 2 ♂, (Anon.), (Dom. Mus.). HEN ISLAND: 18-25.x.1925, 1 ♂, 1 ♀, (H. Hamilton), (Dom. Mus.). LITTLE BARRIER ISLAND: Boulder Beach, 25.xi.1954, 1 ♂, 7 ♀, (R. A. Harrison), (P.D.D.). WHANGAPARAOA PENINSULA: Little Manly, on rocks, 14.iii.1949, 7 ♂, 7 ♀, (D. Spiller), (P.D.D.). AUCKLAND: Owairaka, 1948, 3 ♂, (C. Little); ex light trap, 19.vii.1949, 1 ♂, (M. Dye); indoors, 9.viii.1940, 1 ♂, (D. Spiller); bred ex *Ecklonia* compost, 24.iv.1948, 1 ♂, 1 ♀, (C. Little); Browns Bay, -.v.1949, 1 ♂; 1.xi.1949, 2 ♂; -.xii.1949, 1 ♂, (R. A. Harrison), (P.D.D.). WAITAKERE RANGES: Titirangi ex light trap, -.vi.1953, 1 ♀, (C. R. Thomas); Cornwallis, 13.iii.1949, 5 ♂, 5 ♀, (C. R. Thomas), (P.D.D.). PLIMMERTON: 27.v.1924, 5 ♂, 4 ♀, (Anon.), (Dom. Mus.). WELLINGTON: Fort Dorset, 18.ii.1936, 1 ♂, 1 ♀ (Anon.), (Dom. Mus.); Wiltons Bush, 30.x.1927, 1 ♀, (E. S. Gourelay), (Cawt. Inst.); 14.xi.1923, 1 ♂; 31.x.1920, 1 ♀, (Anon.), (Dom. Mus.); Kilbirnie,

-.iii.1947, 2 ♂, (G. Ramsay), (P.D.D.): Happy Valley, 23.ix.1918, 1 ♂, (Anon.), (Dom. Mus.): 20.xi.1941, 18 ♂, 11 ♀, (D. Spiller), (P.D.D.). PĀEKAKARIKI: 16.v.1927, 1 ♂, 1 ♀, (Anon.), (Dom. Mus.). KAPITI ISLAND: -.i.1928, 1 ♂, (Anon.), (Dom. Mus.). TITAHĪ BAY: -.xi.1907, 1 ♂, (Anon.), (Dom. Mus.). WARD: 26.v.1954, 2 ♂, 2 ♀, (N. Adamson), (Cawt. Inst.). NELSON: 6.i.1921, 1 ♂, (R. J. Tillyard). WHANGAMOĀ: 4.xi.1950, 1 ♀, (J. Timlin), (Cawt. Inst.). CHATHAM ISLANDS: Port Hutt, 3.ii.1954, 4 ♂, 27 ♀: Kaingaroa, 1954, 2 ♂, 4 ♀, (R. R. Forster), (Cant. Mus.).

*Distribution*: Bay of Islands, Whangarei, Little Barrier Island, Hen Island, Whangaparaoa Peninsula, Auckland, Waitakere Ranges, Plimmerton, Titahi Bay, Paekakariki, Wellington, Kapiti Island, Ward, Nelson, Dunedin, Fortrose, Chatham Islands, Auckland Islands, Campbell Island. (All the year).

*Remarks*: Holotypes of *C. littoralis* (Hutton) and *C. monstrosa* (Hutton) have been examined, and they appear to be near the extremes of the range of variations in this species. With the large number of specimens now available for study it is apparent that one species only is present and that *monstrosa* is synonymous with *littoralis*. Variations occur mainly in size and chaetotaxy. The most obvious variable characters are the prescutellar and dorsocentral bristles. The prescutellars may be minute bristles little larger than the surrounding hairs, or may be as large as about half the length of the posterior dorsocentrals. The dorsocentrals vary in number; there are normally three postsutural and one presutural, but occasionally four postsutural and two presuturals are present; the presuturals vary in size and may be minute and scarcely larger than the surrounding hairs or may be as large as the anterior of the postsutural dorsocentrals. All combinations of small and large prescutellars and small or large or one or two presutural dorsocentrals are present in the one population. Hutton (1901) separates his two species by colour of legs and certain wing characters but in the series available no clear cut distinctions of these characters are discernible. No differences have been observed in the male genitalia of Hutton's two holotypes.

### **Chaetocoelopa huttoni** sp.n. Figs. 101, 106

A black species with greyish-black dusting. Body length 3.5-4.25 mm. in males; 3.5-6.25 mm. in females. Wing length 3.25-4.25 mm. in males; 3.25-6.25 mm. in females.

#### MALE

**HEAD** (Fig. 106): Arista shining brown; pubescent, rays of pubescence small and few, about equal to diameter of main axis at base and not present on swollen basal quarter or at apex of the terminal segment. Antenna brown; 3rd segment bulbous and about as long as wide; 2nd segment with strong almost reclinate bristle near dorsal apical margin, a small proclinate one close to it and strong black hairs elsewhere; basal segment with dorsal apical hairs and strong convergent lateral bristle. Front black with blackish-green dusting; ocellar triangle and orbits blackish brown. Anterior divergent fronto-orbitals longer than posterior bristles; ocellars and verticals strong; postverticals weaker than outer verticals; hairs over most of front, strongest along anterior margin and overlapping lunule. Face brown, parafacials blackish-brown; deeply concave. Cheeks blackish-grey or blackish-brown with heavy grey dusting. Strong hairs and bristles on most of ventral two-thirds of cheek. Occiput black. Eyes with very few short hairs. Vertical diameter of eye about 3 times width of cheek in same axis. Proboscis brown or dark brown; palpi greyish-black with strong black bristles.

**THORAX:** Mesonotum and scutellum black, with thick greyish-black dusting; humeri and pleura grey dusted. Prescutellars present about half length of posterior dorsocentrals; 3 postsutural dorsocentrals, 1 strong and 1 weak presutural dorsocentral; parallel basal scutellars less than half length of parallel or divergent apical scutellars; scutellum haired except at middle of dorsal surface; 2 strong humerals; 1 presutural; 2 strong and 2 weak notopleurals; 1 supraalar and several strong hairs anterior and lateral to it; 2 strong postalars; sternopleuron with 1 strong postero-dorsal bristle, small bristles scattered over most of dorsal half and long fine hairs ventrally; 1 bristle ventral to anterior spiracle; 1 propleural; prosternum haired.

Legs light reddish-brown; fore femur blackish-brown. Fore femur with long hairs on posterior surface, bristles on dorsal and postero-dorsal surfaces; fore tibia with long hairs, 1 very long at preapical dorsal position; fore tarsus with long hairs, basal segment with ventral apical protruding plate, and cluster of 3 spines at base of postero-ventral surface, apical segment greatly enlarged, equal to length of middle 3 segments and with strong claws and pulvilli; mid femur with some strong bristles and spines on antero-dorsal, anterior, and antero-ventral surfaces except at base and apex, some long hairs on posterior surfaces; mid tibia with long hairs, several very strong preapical and apical ventral spines and a very long dorsal preapical hair; mid tarsus with some long hairs, basal segment with black spine on ventral or antero-ventral surface, basal segment large and about equal to length of two preceding segments; hind femur with long bristles mostly on antero-dorsal and antero-ventral surfaces; hind tibia thickly covered with long fine hairs, 1 very strong and 1 weak ventral apical spine and 1 very long preapical dorsal hair; hind tarsus with some long hairs, basal segment with cluster of about 3 ventral basal spines, a few antero-ventral spines on apical half and a small ventral apical protruding plate, apical segment about equal to length of 2nd and 3rd segments; thick mat of short golden hairs on apex of antero-ventral surface of fore tibia and all fore tarsal segments and apex of postero-ventral surface of hind tibia and on lengths of basal two segments of hind tarsus.

Wings (Fig. 101) clear; veins light brown. Pair of strong spines near base of costa; short stout costal spines fading out beyond apex of second vein. Wing indices: costal about 2.8; 4th vein about 1.7; 4c about 0.8; 5x about 0.7.

Halteres light yellowish-brown.

**ABDOMEN:** Greyish-black, strongest bristles on lateral regions of 2nd tergite.

#### FEMALE

Some hairs on mesopleuron long, sternopleuron with long fine hairs over most of its surface. Basal segment of fore and hind tarsi without apical ventral plate, mid tibia with some preapical dorsal spines; hind tibia with an antero-dorsal preapical spine as well as the long preapical dorsal hair; fore and hind legs with long hairs not as thick as in male, mid leg without long hairs; apical segments of all tarsi not as large as in male. Abdomen haired but without strong bristles on 2nd tergite.

*Holotype:* CORNWALLIS: 13.iii.1949, ♂, (*C. R. Thomas*), (P.D.D.).

*Paratypes:* Same data as holotype, 4 ♂, 29 ♀, (P.D.D.). HEN ISLAND: 9.xii.1924, 1 ♂, (*Anon.*), (Dom. Mus.). AUCKLAND: Browns Bay, 21.iii.1949, 1 ♂, 2.iv.1949, 1 ♀; 9.xii.1949, 1 ♀, (*R. A. Harrison*), (P.D.D.). WHANGAPARAOA PENINSULA: Little Manly, on rocks, 14.iii.1949, 5 ♂, 1 ♀, (*D. Spiller*), (P.D.D.). LITTLE BARRIER ISLAND: on beach, 24.xi.1954, 2 ♂, 10 ♀ (*R. A. Harrison*); in beach cave 25.xi.1954, 2 ♂, 17 ♀, (*K. A. J. Wise*): -.1.1955, 1 ♂, (*M. Parkin*), (P.D.D.). WAIHEKE ISLAND: Palm Beach, from decaying seaweed, 15.viii.1940, 1 ♂, 3 ♀, (*D. Spiller*), (P.D.D.). WELLINGTON: 19.x.1923, 1 ♂, 1 ♀, (*Anon.*): 20.i.1931, 2 ♂, 1 ♀, (*E. A. Plank*), (Dom. Mus.). KAPITI ISLAND: -.i.1928, 2 ♀, (*Anon.*), (Dom. Mus.). STEPHENS ISLAND: 14-28.i.1933, 1 ♀, (*E. S. Gourlay*), (Cawt. Inst.). MARTINS BAY: 1-4.ii.1955, 1 ♂, (*R. R. Forster*), (Cant. Mus.). NO DATA: 1 ♂, (*Anon.*), (Cant. Mus.); 10.xii.1912, 1 ♂, (*Anon.*), (Cawt. Inst.).

*Material Examined:* Holotype, 23 ♂ and 67 ♀ paratypes.

*Distribution:* Hen Island, Little Barrier Island, Waiheke Island, Whangaparaoa Peninsula, Auckland, Cornwallis, Wellington, Kapiti Island, Stephens Island, Martins Bay. (August to April).

*Remarks:* Three specimens bear labels of A. Tonnoir with manuscript names "*Coelopa huttoni* sp.n.". The name suggested by Tonnoir is retained. Separated from *C. littoralis* by its smaller size, more distinctly pubescent arista and weaker bristles on legs and abdomen. Males of the two species are readily separated but females are more difficult to separate.

### Genus COELOPA Meigen

*Coelopa* Meigen, 1830. "Syst. Besch. Zweif. Insekt." 6 : 8.

Scutellum wider at base than its length. Humerus bare or with one bristle; mesopleuron bare; metasternum haired. First vein with or without hairs.

Type Species: *Coelopa pilipes* Haliday (= *frigida* Meigen, nec Fabricius)

Separated from other genera mainly by the bare mesopleuron and haired metasternum. The type species of *Coelopa* Meigen has been regarded as *C. pilipes* Haliday following an original misidentification by Meigen. Malloch (1933a) who discussed the situation fully, first placed *Fucomyia* Haliday as a subgenus of *Coelopa* Meigen and reintroduced the combination *C. frigida* Meigen (nec Fabricius) as the type species of the genus.

*Subgenera Occurring in New Zealand:*

*Fucomyia* Haliday

### Subgenus FUCOMYIA Haliday

*Fucomyia* Haliday, 1837. In Curtis, "Guide Brit. Ins." 2nd ed. App. p. 280.

First vein without hairs on ventral surface.

Type Species: *Coelopa (Fucomyia) frigida* (Fabricius)

The absence of hairs on the ventral surface of the base of the first vein separates this subgenus from others. All New Zealand species belong to this subgenus.

*Species Occurring in New Zealand:*

- Coelopa (Fucomyia) curvipes* Hutton
- C. (Fucomyia) debilis* Lamb
- C. (Fucomyia) nigrifrons* Lamb
- C. (Fucomyia) rufa* Hutton

*Coelopa curvipes* and *C. nigrifrons* are closely related and can be placed in the same group of species. *C. debilis* is distinct from both of those species and belongs to a distinct group of species. *C. rufa* is known only from Hutton's short description (Hutton 1902a) and cannot yet be compared with the other three species. It cannot be included in the key to species.

#### KEY TO SPECIES OF SUBGENUS FUCOMYIA IN NEW ZEALAND

- 1 Humeral bristle normal, and equal to or just less than length of the posterior notopleural bristle ..... **debilis**

Humeral bristle much reduced and less than half length of the posterior notopleural bristle .....	2
2 Both notopleurals strong and approximately equal in length .....	<i>curvipes</i>
Anterior notopleural bristle less than half length of posterior notopleural .....	<i>nigrifrons</i>

### *Coelopa debilis* Lamb

*Coelopa debilis* Lamb, 1909. "Subantarct. Is. N.Z." 1: 140.

A brownish-grey species. Body length about 4.0 mm., wing length about 4.5 mm.

#### MALE

**HEAD:** Arista light brown; rays of pubescence almost twice as long as diameter of basal segments. Antenna dark brown; 3rd segment broader than long; 2nd segment with 1 strong dorsal bristle and strong hairs on most surfaces; basal segment with 1 long lateral dorsal apical bristle and strong hairs on dorsal apical margin. Front reddish-brown with thick grey dusting; orbits and ocellar triangle greyish-brown. Two fronto-orbitals, anterior about 1.25 times length of posterior; ocellars and verticals strong and equal; postverticals small and little longer than longest hairs of front; hairs on ocellar region and most of front and extending onto dorsal parafacials. Face concave, brown, sometimes light brown ventrally. Cheeks light or dark greyish-brown. Hairs on ventral half of cheek. Occiput dark greyish-brown. Eyes bare. Vertical diameter of eye about 2.5-3.0 times width of cheek in same axis. Proboscis light brown; palpi light brown with grey dusting and strong black hairs over most of ventral surface.

**THORAX:** Mesonotum blackish-grey, bordered laterally and narrowly posteriorly with brownish-grey; scutellum blackish-grey; pleura brownish-grey with sutures brown or light brown. One posterior dorsocentral and several distinctly enlarged hairs in dorsocentral line both postsutural and presutural; basal scutellars about half length of the strong apicals; scutellum haired; 1 strong humeral; no presutural; 2 strong notopleurals; 1 weak supraalar; 2 strong postalars; mesopleuron bare; few hairs postero-dorsally, ventral to posterior spiracle on hypopleuron; sternopleuron haired and 1 postero-dorsal bristle; 1 strong hair ventral to anterior spiracle; 1 small propleural; prosternum haired.

Legs yellowish-brown. Fore femur with long hairs posteriorly and a few dorsal apical bristles; fore tibia haired and 1 long thin preapical bristle; basal segment of fore tarsus with small protuberant apical plate; mid femur with long fine hairs postero-ventrally; mid tibia with strong preapical and apical spines on anterior, posterior and ventral surfaces; basal segment of mid tarsus with apical ventral spines; hind femur covered with some long fine hairs, about 1.5 times length of those on mid femur; hind tibia covered with long fine hairs, slightly curved, and with a stout black preapical anterior spine and a strong curved antero-ventral apical spine.

Wings shaded very faintly with brown; veins brown. Costa with a strong dorsal spine near base, costa beyond apex of subcosta with regularly spaced very fine dorsal hairs about 1.5 times diameter of costa. Wing indices: costal about 2.7; 4th vein about 1.9; 4c about 0.8; 5x about 0.6.

Halteres yellowish-brown.

**ABDOMEN:** Greyish-brown. Hairs but not strong bristles on sternites and tergites.

#### FEMALE

Similar to male except: hairs on abdomen and legs shorter than on male; basal segment of fore tarsus with about 3 apical ventral spines; mid tibia with preapicals and apicals on all surfaces; hind tibia with a long thin preapical dorsal bristle and 2 preapical anterior spines.

**Lectotype:** CAMPBELL ISLAND: Monument Harbour, -1909, ♂, (*Anon.*), (B.M.). Designated, labelled, and here published as the lectotype from the syntype series.

**Material Examined:** Lectotype, 2 ♂ and 4 ♀.

**New Records:** NELSON: Whangamoa, 4.ii.1950, 1 ♀, (*J. Timlin*), (Cawt. Inst.). CHATHAM ISLANDS: Kaingaroo, -1954, 1 ♂, 1 ♀,

(*R. R. Forster*), (Cant. Mus.): S.E. Island, —.1954, 1 ♀, (*R. R. Forster*), (Cant. Mus.). AUCKLAND ISLANDS: No date, 1 ♂, 1 ♀, (*Anon.*), (Cant. Mus.).

*Distribution*: Nelson, Chatham Islands, Auckland Islands, Campbell Island. (November, February).

*Remarks*: Separated most readily from *C. curvipes* and *C. nigrifrons* by having a normal humeral bristle.

### **Coelopa curvipes** Hutton. Fig. 99

*Coelopa curvipes* Hutton, 1902. Trans. N.Z. Inst. 34 : 172.

Malloch, 1933. Ann. Mag. nat. Hist. (10) 11 : 345.

*Coelopa macquariensis* Womersley, 1937. Rep. Brit. Aust. N.Z. Antarct. Exped. B4 : 72. (*New Synonymy*).

A greyish-black species with light reddish-brown legs. Body length about 4.5–6.5 mm., wing length about 5.0–7.5 mm.

#### MALE

**HEAD**: Arista brown, short basal segments thick and dark brown; strongly pubescent, rays equal to width of basal segments. Antenna dark reddish-brown; 3rd segment with grey dusting, broader than long; 2nd segment with 1 strong dorsal bristle and black hairs over most of surface; basal segment with row of strong medianly directed hairs on dorsal apical margin. Front dark reddish-brown with light dusting of grey; orbits and ocellar triangle heavily grey dusted. Two fronto-orbitals; postverticals weaker than ocellars and verticals; hairs over most of front and on dorsal parafacials. Face reddish-brown, heavily grey dusted, concave. Cheeks heavily grey dusted, vibrissal angle heavily chitinised, shining reddish-black, and slightly produced. Cheeks thickly haired except for bare strip ventral to eye. Occiput greyish-black. Eyes bare. Vertical diameter of eye about twice width of cheek in same axis. Proboscis dark-brown; palpi brown and covered with long hairs.

**THORAX**: Mesonotum blackish-brown with brown median area posteriorly and bordered by grey on lateral margins; scutellum dark brown; pleura greyish- and reddish-black; sutures mostly reddish-brown. No prescutellars; 1 small posterior dorsocentral; basal scutellars about half length of apicals; scutellum haired but bare medianly; 1 small humeral; no presutural; 2 strong notopleurals; 1 small supraalar; 2 strong postalars; mesopleuron bare; sternopleuron haired and with 1 fine long postero-dorsal bristle; hypopleuron haired postero-dorsally; a few hairs ventral to anterior spiracle; 1 propleural; prosternum haired.

Legs shining light reddish-brown. All segments thickly covered with very long fine hairs; mid tibia with strong spines round apical margin, none on dorsal surface; basal segment of mid tarsus with row of short spines on whole or part of antero-ventral surface and 2 or more at apex of this surface; hind femur about 1.5 times length of mid femur; hind tibia distinctly curved, equal to length of hind femur and with 2 antero-ventral apical spines.

Wings (Fig. 99) shaded with light brown; veins brown. Costa with pair of spines near base, the dorsal one placed nearer base and longer than other. Wing indices: costal about 2.0; 4th vein about 1.7; 4c about 0.8; 5x about 0.6.

Halteres light reddish-yellow.

**ABDOMEN**: Brown to blackish-brown. Tergites and sternites without bristles but thickly covered with long fine hairs.

#### FEMALE

Similar to male; not as hairy; hind legs not as strongly curved.

*Holotype*: AUCKLAND ISLANDS: On seashore, —.i.1901, ♂, (*F. W. Hutton*), (Cant. Mus.).

*Material Examined*: Holotype, 10 ♂, and 11 ♀.

*New Records*: WESTPORT: 25.x.1906, 1 ♂, (*W. Wesche*), (B.M.). DUNEDIN: no date, 1 ♂, (*Anon.*), (B.M.). CHATHAM ISLANDS: Kain-garoo, 1954, 3 ♂, (*R. R. Forster*), (Cant. Mus.).



*Distribution:* Westport, Dunedin, Auckland Islands, Macquarie Island, Chatham Islands. (December, January).

*Remarks:* The distinctions made by Womersley (1937) between *C. curvipes* and *C. macquariensis* are not substantiated from an examination of the type material of both species. The holotype of *C. curvipes* has spines on the whole length of the antero-ventral surface of the basal segment of the mid tarsus. The extent of the spines on this segment was the most important character used by Womersley (1937). All specimens of *C. macquariensis* examined agree with the holotype of *C. curvipes* and the synonymy must be made. Some of the other specimens in the series of *C. curvipes* examined have spines of this tarsal segment on the apical half or apical third and these are regarded here as variants.

### **Coelopa nigrifrons** Lamb

*Coelopa nigrifrons* Lamb, 1909. "Subantarct. Is. N.Z." 1: 140.

A blackish-brown species. Body length about 3.0-6.0 mm., wing length about 3.5-6.5 mm.

#### MALE

**HEAD:** Arista shining brown; rays of pubescence greater than diameter of basal segment. Antenna brown to dark brown; 3rd segment darker than other two segments and covered with short pile; 2nd segment with 1 bristle and many strong hairs; basal segment with strong hairs dorsally. Front dark chocolate brown; ocellar triangle and orbits heavily dusted with grey. Posterior fronto-orbital about four-fifths length of anterior; ocellars and inner verticals strong; outer verticals and postverticals weaker than posterior fronto-orbitals; strong hairs on all front except about the lateral margins of the ocellar triangle. Face brown between bases of antennae, light brown on the concave portion. Cheeks light brown with grey dusting. Strong hairs on cheek surface except just ventral to eye. Occiput blackish-brown with grey dusting. Eyes bare. Vertical diameter of eye about twice width of cheek in same axis. Proboscis light brown; palpi brown and bearing strong black hairs.

**THORAX:** Mesonotum and scutellum blackish-brown with thick grey dust; pleura brown with light covering of grey dust. No prescutellars; 1 dorsocentral and some hairs distinctly stronger than others on mesonotum in the dorsocentral line; apical scutellars strong and cruciate and about twice length of basal scutellars; humeral bristle short; 2 notopleurals, posterior one very strong and 3 times length of anterior bristle; 1 small supraalar and 1 strong and 1 weak postalar; mesopleuron and pteropleuron bare; 1 sternopleural; 1 propleural bristle and a strong hair ventral to anterior spiracle; prosternum and metasternum haired.

Legs brown or light brown. All legs covered with long fine hairs; fore tibia with a long fine preapical; basal segment of fore tarsus with an apical ventral plate-like projection; mid tibia with strong apical spines anteriorly and centrally; basal segment of mid tarsus with distinct black spines on apical third of antero-ventral surface; hind tibia not distinctly curved and with 1 short and 1 strong curved apical spine and a long fine preapical.

Wings very light brown; veins brown. Costa with 1 strong dorsal bristle near base. Short black costal spines ending just beyond apex of 2nd vein. Wing indices: costal about 2.2; 4th vein about 1.3; 4c about 0.7; 5x about 0.5.

Halteres light brown.

**ABDOMEN:** Tergites blackish-brown, the basal ones lighter than the apical tergites. Tergites and sternites with covering of hairs, those on or near the lateral margins of the tergites very long and fine. Genital arch shining blackish-brown with only a very fine dusting of grey.

*Lectotype:* MACQUARIE ISLAND: -1894, ♂. (Hamilton), (B.M.). Designated, labelled, and here published as the lectotype from the syntype series.

*Material Examined:* Lectotype.

*Distribution:* Macquarie Island.

*Remarks:* Separated from *C. debilis* by having a reduced humeral bristle and from *C. curvipes* most readily by having one strong and one weak notopleural bristle. The female of the syntype series labelled by Lamb as the female type has been examined and found to belong to the genus *Coelopella* Malloch.

### **Coelopa rufa** Hutton

*Coelopa rufa* Hutton, 1902. Trans. N.Z. Inst. 34 : 173.

A brown species. Body length about 5.0 mm., wing length about 5.0 mm.

**HEAD:** Basal two segments of antennae fulvous. Vertex dark brown. Face fulvous. Proboscis and palpi piceous.

**THORAX:** Brown dusted with grey.

Legs fulvous; femora fuscous dorsally for most of their length.

Wings colourless; veins brown, fulvous at base.

*Holotype:* The Snares, -i.1901, (*F. W. Hutton*), (Cant. Mus.?).

*Remarks:* The above description is taken from Hutton (1902a). The holotype has not been located in collections and the species must therefore remain comparatively unknown. It cannot be recognised and separated on the basis of the above description from other species of *Coelopa* known to occur in New Zealand.

### Genus COELOPELLA Malloch

*Coelopella* Malloch, 1933. Ann. Mag. nat. Hist. (10) 11 : 348.

Mesopleuron bare; metasternum bare. First vein bare ventrally.

Type Species: *Coelopella plebeia* Malloch

Recognised and separated from other genera by the combination of the three characters given above.

*Distribution:* New Zealand. (Malloch (1933a) also states Australia for an undescribed species).

*Species Occurring in New Zealand:*

*Coelopella plebeia* Malloch

### **Coelopella plebeia** Malloch

*Coelopella plebeia* Malloch, 1933. Ann. Mag. nat. Hist. (10) 11 : 348.

A greyish-brown species with yellowish-brown legs. Body length about 4.0 mm., wing length about 4.5 mm.

#### FEMALE

**HEAD:** Arista short, light brown, rays of pubescence about equal to diameter of basal segment. Antenna brown; 2nd segment with 1 strong dorsal apical bristle and black hairs over most of surface; basal segment with apical dorsal hairs. Front reddish-brown; orbits and triangle with thick covering of dust. Two fronto-orbitals, anterior stronger than posterior; verticals and ocellars equally strong; postverticals weak, about half length of verticals; black hairs on and posterior to ocellar area and on anterior half of front. Face grey, lunule greyish-brown; vibrissal angle with short shining black strip. Cheeks blackish-brown and heavily dusted with grey. Occiput heavily grey dusted. Eyes bare. Vertical diameter of eye about 2.5 times width of cheek in same axis. Proboscis light brown; palpi yellowish-brown and with black hairs on most surfaces.

THORAX: Mesonotum blackish-brown with grey dusting, anteriorly 3 narrow longitudinal golden brown vittae merging posteriorly to wide brown band between dorsocentrals, light grey margins laterally; scutellum golden brown; pleura black with grey dusting. Prescutellars weak; dorsocentral strong with some enlarged hairs on dorsocentral line; convergent basal scutellars half or just over half length of cruciate apicals; scutellum haired; humeral bristle about two-thirds length of posterior notopleural; no presutural; 2 notopleurals, anterior just shorter than posterior; 1 small supraalar; 2 strong postalar; sternopleural strong; propleural weak; a fine hair ventral to anterior spiracle; prosternum haired.

Legs yellowish-brown. Fore femur with fine bristle on postero-ventral surface; fore tibia with preapical; mid tibia with thick black preapical and apical spines; basal segment of mid tarsus with short black spines on antero-ventral surface; hind tibia with 1 strong and several weak dorsal preapicals and 1 short and 1 long strong curved ventral apical.

Wings shaded very light brown; veins brown. Costa at base with 1 dorsal and 1 anterior bristle. Fifth vein traceable to wing margin only as a fold in the wing membrane. Wing indices: costal about 2.25; 4th vein about 1.5; 4c about 0.8; 5x about 1.2.

Halteres pale yellow.

ABDOMEN: Dark greyish-brown. Hairs and bristles normal and not excessively strong or long.

#### MALE

Similar to female except legs and abdomen with long fine hairs; hind tibia without preapicals and only with apicals.

*Holotype*: INVERCARGILL: -ix.1923, ♂, (*Jacquier*), (U.S.N.M.).

*Material Examined*: 2 ♀ paratypes, 2 ♂, and 10 ♀.

*New Records*: BAY OF ISLANDS: Waitangi, Hobson Bay, 14.iii.1949, 1 ♀, (*K. P. Lamb*), (P.D.D.). ONERAHI: 28.vii.1926, 1 ♀, (*R. W. Tate*), (Dom. Mus.). GREAT BARRIER ISLAND: 23.xi.1940, 1 ♂, (*D. Spiller*), (P.D.D.). AUCKLAND: Long Beach, amongst *Carpophyllum*, 21.i.1954, 2 ♀, (*K. A. J. Wise*) (P.D.D.): Browns Bay, attracted to light, 2.iv.1949, 1 ♀; 9.x.1949, 1 ♀, (*R. A. Harrison*), (P.D.D.). MARTINS BAY: 1-4.ii.1956, 1 ♂, 1 ♀, (*R. R. Forster*), (Cant. Mus.). AUCKLAND ISLANDS: -1901, 2 ♀, (*F. W. Hutton*), (B.M.). MACQUARIE ISLAND: -1894, 1 ♀, (*Hamilton*), (B.M.).

*Distribution*: Bay of Islands, Onerahi, Great Barrier Island, Auckland, Dunedin, Invercargill, Martins Bay, Auckland Islands, Macquarie Island. (July, September to November, January to April).

*Remarks*: Three paratypes were presented to the British Museum but one is not *Coelopella*. Six specimens from the Osten-Sacken collection have also been examined and, although not labelled as paratypes, may be the specimens Malloch (1933a) referred to. One of the six, although on the same pin as two others, is not *Coelopella*.

#### Family HELOMYZIDAE

Antennae short, third segment more or less rounded. Postverticals convergent; one to three fronto-orbital bristles, reclinate or outwardly projecting but never proclinate. Vibrissa present. Face vertical or retreating, not concave. One or more sternopleurals; four marginal scutellars. At least one pair of tibiae with distinct preapical dorsal bristle. Costa slightly weakened to almost broken at apex of subcostal

vein; costa extending to fourth vein; subcostal vein distinct on its whole length though often close to first vein at apex; costa usually with well developed bristles; discal and second basal cells separated by a distinct cross vein, except in one genus; anal cell present; anal vein present.

The Helomyzidae can be recognised chiefly by the disc- or plate-like shape of the third antennal segment, convergent postverticals, strong vibrissa, complete subcosta which is often close to first vein at apex, and the reclinate or outwardly directed orbitals.

*Genera Occurring in New Zealand:*

*Allophylina* Tonnoir and Malloch  
*Allophylopsis* Tonnoir and Malloch  
*Aneuria* Malloch  
*Fenwickia* Malloch  
*Heloclusia* Malloch  
*Oecothea* Haliday  
*Prosopantrum* Enderlein  
*Pseudoleria* Garrett  
*Tephrochlamys* Loew  
*Tethinosoma* Malloch  
*Xeneura* Malloch

The New Zealand helomyzid fauna can be divided into three sections:

1. Immigrant genera. Includes the cosmopolitan and widespread genera *Pseudoleria*, *Oecothea*, and *Tephrochlamys*.
2. South American genera. *Heloclusia* is indigenous to New Zealand and contains three endemic species. *Prosopantrum*, previously recorded from New Zealand as *Acrostichalia*, by Tonnoir and Malloch (1927), is considered to be an immigrant from South America.
3. Endemic and indigenous genera. Includes *Fenwickia*, *Aneuria*, *Xeneura*, *Tethinosoma*, *Allophylina*, and *Allophylopsis*. The first three genera are very similar and closely related, and the latter two are also closely related. *Allophylopsis* is also found in Australia.

Apart from the immigrant genera which are frequently taken indoors or in association with man, most of the New Zealand genera are collected by sweeping in forest or forest margin. *Fenwickia*, *Xeneura*, *Allophylina*, and *Allophylopsis* are attracted to light and can be collected in light traps. *Heloclusia* has occasionally been collected on rotting fruit or taken in banana-baited *Drosophila* traps. *Prosopantrum* is recorded mostly from sandy ground near the coast.

No data is available on immature stages.

The limits of the family Helomyzidae have been defined differently by various authors. In its widest interpretation the family is considered to include *Trichoscelis* Rondani (originally *Trixoscelis*, an incorrect transliteration) and allied genera, while in a narrower sense these genera are excluded and given full family rank. Rondani (1856) erected the genus *Trichoscelis* when separating forms included in the earlier genus *Geomyza* Fallen, 1810. Some authors, e.g. Melander (1913) place *Trichoscelis* and allied genera in the Geomyzidae (Geomyzinae). Frey (1921) first proposed the family Trichoscelidae and many authors have accepted this family; Lindner (1923); Oldroyd (1949) (following Lind-

TABLE 1: Summary of some Characters of Helomyzidae, Trichoscelidae, and New Zealand Genera

	Helomyzidae	Trichoscelidae	<i>Heloclusia</i>	<i>Prosopantrum</i>	<i>Allophylina</i> <i>Allophylopsis</i>	<i>Tethinosoma</i>	<i>Aneuria Xeneura</i> <i>Fenwickia</i>
Fronto-orbitals	1 or 2	2	2 or 3	1 or 2	1 or 2	3	3
Dorsocentrals		5	4	3 or 4	3	5	3 or 4
Mesopleurals	absent	1	absent	absent	hairs only	3	1
Sternopleurals		2	1 or 2	2	1	1	1 or 2
Propleurals	present	present or hairs only	present	hairs only	hairs only	present	present or absent
Apices of subcosta and 1st vein	separated	fused	fused	fused	fused	fused	fused
Anal vein	reaching wing margin	not reaching wing margin	not reaching wing margin	not reaching wing margin	not reaching wing margin	not reaching wing margin	not reaching wing margin

ner 1923); Melander (1952) and Wheeler (1955). Curran (1934) included this genus and others allied to it in the family Chyromyidae. Czerny (1924) gave full family rank to Trichoscelidae but later (Czerny, 1927) reduced it to a subfamily of the Helomyzidae. Collin (1943) and Colyer and Hammond (1951) also give the genera subfamily status in the Helomyzidae. Tonnoir and Malloch (1927), and Malloch (1930d, 1933d) did not separate *Trichoscelis* and allied genera from the Helomyzidae and did not consider that they warranted subfamily ranking in that family. These latter authors were greatly influenced in their decision after studying the New Zealand and/or the South American helomyzid fauna. Other authors based their conclusions mainly on studies of Palaeartic and Nearctic faunas.

A summary of the important characters, as generally accepted, for the Helomyzidae and the Trichoscelidae and the corresponding characters for indigenous and endemic New Zealand genera is given in Table 1.

The table shows that New Zealand genera do not come within the limits of either of the two families. The relationships are obviously more with the Trichoscelidae than Helomyzidae but the definition of the former family would have to be enlarged considerably to include the New Zealand genera. With such a broadening of family concept there is no longer a gap between the two families. The same argument can apply if the group is considered as the subfamilies Helomyzinae and Trichoscelinae. Other subfamilies of the Helomyzidae sometimes recognised are Lerinae and Suillinae, and the New Zealand genera *Allophylina* and *Allophylopsis* have some characters that are used for separation of these subfamilies. This complication of the concepts of the grouping in the Helomyzidae was recognised by Tonnoir and Malloch (1927) and Malloch (1930d), and from our present knowledge it appears that the conclusions of those authors are the soundest to meet the requirements of the New Zealand fauna. All New Zealand genera are, therefore, placed in the Helomyzidae without any separation into subfamilies.

#### KEY TO GENERA OF HELOMYZIDAE IN NEW ZEALAND

1	Anal vein reaching wing margin .....	2
	Anal vein short and distinctly terminated before wing margin .....	4
2	Four dorsocentrals, anterior one presutural .....	3
	Three dorsocentrals, all postsutural .....	TEPHROCHLAMYS (p. 114)
3	Prescutellars present; pteropleuron haired .....	PSEUDOLERIA (p. 116)
	Prescutellars absent; pteropleuron bare .....	OECOTHEA (p. 117)
4	Mesopleuron without strong bristles .....	5
	Mesopleuron with 1 to 3 strong bristles .....	8
5	Mesopleuron bare .....	6
	Mesopleuron haired .....	7
6	Discal and 2nd basal cell united .....	HELOCLUSIA (p. 119)
	Discal and 2nd basal cell separated .....	PROSOFANTRUM (p. 124)
7	Prescutellars present .....	ALLOPHYLINA (p. 125)
	Prescutellars absent .....	ALLOPHYLOPSIS (p. 127)
8	One mesopleural bristle .....	9
	Three mesopleural bristles .....	TETHINOSOMA (p. 150)
9	Two sternopleurals .....	XENEURA (p. 151)
	One sternopleural .....	10
10	Three dorsocentrals, all postsutural .....	FENWICKIA (p. 152)
	Four dorsocentrals, anterior one presutural .....	ANEURIA (p. 162)

Genus *TEPHROCHLAMYS* Loew

*Tephrochlamys* Loew, 1862. Z. Ent. Breslau 13 : 72.

Front large and quadrangular. Two fronto-orbitals. Lunule recurved. Pre-scutellars present; propleural bristle present; mesopleuron bare; one sternopleural; pteropleuron bare. Legs large; fore tarsus larger than fore tibia. Wings with short costal spines; subcosta diverging from 1st vein at apex; anal vein reaching wing margin.

Type Species: *Tephrochlamys canescens* (Meigen)

Readily separated from those genera of the Helomyzidae known to occur in New Zealand which have the anal vein extending to the wing margin by the presence of three postsutural dorsocentral bristles. In one species often included in this genus, *T. halterata* (Meigen), there is a pair of small presutural dorsocentrals but as this species does not occur in New Zealand the character of the dorsocentrals can be used to separate New Zealand genera. Not hitherto recorded from New Zealand.

*Distribution*: Europe, England, North America, New Zealand.

*Species Occurring in New Zealand*:

*Tephrochlamys canescens* (Meigen)

***Tephrochlamys canescens* (Meigen). Figs. 108, 109, 123**

*Helomyza nigricornis* Meigen, 1830. "Syst. Besch. Zweifl. Insekt." 6 : 57.

*Tephrochlamys canescens* (Meigen): Becker, 1905. "Kat. Pal. Dipt." 4 : 51.

*Tephrochlamys rufiventris* (Meigen): Czerny, 1927. Fleig. Pal. Reg. 53 : 27.

A large grey species with reddish-grey abdomen and yellowish-brown legs. Body length 5.0-6.0 mm., wing length about 5.0 mm.

FEMALE

**HEAD** (Figs. 108, 109): Arista black with very fine short pubescence over most of its length. Antenna reddish-brown; 3rd segment brown except basally; 2nd segment with 1 differentiated short black dorsal bristle. Front reddish-brown with faint grey dusting, ocellar region and orbits densely grey dusted; orbits with dark brown spot near base of antennae. Two fronto-orbitals, anterior shorter, both directed outwards over eye; minute black hairs in irregular transverse rows over anterior half of front. Face whitish-yellow. Carina light yellow. Cheeks yellowish-white with much white dusting. A strong bristle at middle of cheek and 3 weak bristles at postero-ventral corner of head. Occiput grey, heavily dusted. Eyes with short fine hairs. Vertical diameter of eye about twice width of cheek in same axis. Proboscis brown, palpi yellow.

**THORAX**: Grey; brown areas on mesonotum arranged in 4 longitudinal irregular rows, only clearly defined anteriorly; black spot at base of bristles, particularly the 2 posterior dorsocentrals and the scutellars; apex of scutellum greyish-yellow. Prescutellars weak; 3 postsutural dorsocentrals; 1 strong humeral; prosternum bare.

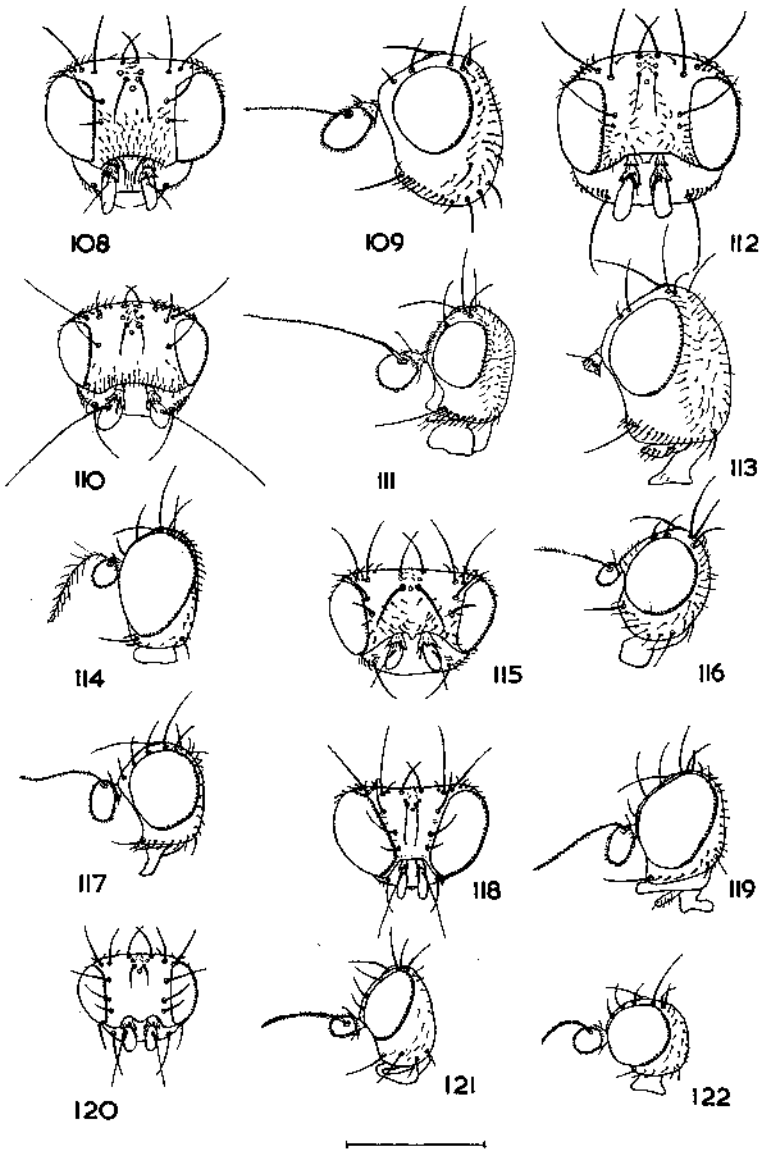
Legs yellowish-brown; fore tarsus gradually darkening to almost black at apical segment; mid and hind tarsi also darkened but not as distinctly as fore tarsus. Small dorsal preapicals on all tibiae and strong ventral apical on mid tibia.

**Wings** (Fig. 123): clear; costa yellowish-brown, other veins brown; stigma yellow. Costal spines not greater than diameter of costa; short stout costal spines ending about third distance between apices of 2nd and 3rd veins; 5th vein not reaching wing margin. Wing indices: costal about 4.0; 4th vein about 1.2; 4c about 0.5; 5x about 0.6.

Halteres yellow, brownish-yellow at base.

**ABDOMEN**: Light reddish-grey; ovipositor extended in all pinned specimens examined.

*Holotype*: Central Europe.



Figs. 108-122. Heads

- |           |                                |           |                            |
|-----------|--------------------------------|-----------|----------------------------|
| 108, 109. | <i>Tephrochlamys canescens</i> | 117.      | <i>Xeneura picata</i>      |
| 110, 111. | <i>Oecothoa fenestralis</i>    | 118, 119. | <i>Fenwickia hirsuta</i>   |
| 112, 113. | <i>Pseudoleria pectinata</i>   | 120, 121. | <i>Heloclusia antipoda</i> |
| 114.      | <i>Allophylina albitarsis</i>  | 122.      | <i>Aneuria bipunctata</i>  |
| 115, 116. | <i>Prosopantrum flavifrons</i> |           |                            |

Scale: 1.0 mm.



*Material Examined:* 7 ♀.

*New Zealand Records:* AUCKLAND: 12.v.1947, 1 ♀: Mt. Albert, at window of house, 28.iv.1952, 1 ♀, (*D. Spiller*); 26.x.1955, 1 ♀, (*R. A. Harrison*): Browns Bay, indoors, -.x.1951, 1 ♀, (*Mrs C. Metcalf*), (P.D.D.). MASTERTON: 19.xi.1949, 1 ♀, (*K. A. J. Wise*), (P.D.D.). WELLINGTON: Kilbirnie, 5.x.1947, 1 ♀; 19.x.1952, 1 ♀, (*G. Ramsay*), (P.D.D.).

*Distribution:* Auckland, Masterton, Wellington. (October, November, April, May).

*Remarks:* Not previously recorded from New Zealand but common in England where it is frequently found inside houses. As it has been collected from widely separated localities, it would appear to be widespread in New Zealand. Regarded as an immigrant species.

#### GENUS PSEUDOLERIA Garrett

*Pseudoleria* Garrett, 1921. Insec. Inscit. menst. 9 : 128.

Head deeper than long. One fronto-orbital. Eyes small. Prescutellars present; 4 dorsocentrals, 1 of them presutural; scutellum bare on disc; mesopleuron bare; pteropleuron haired and with 1 bristle in middle; 1 propleural bristle; 1 dorsal sternopleural. Mid tibia without median bristle and only preapical bristle dorsally. Costa with spines; subcosta diverging from 1st vein at apex; anal vein reaching wing margin.

*Type Species:* *Pseudoleria pectinata* (Loew)

The presence of prescutellar bristles and of hairs on the pteropleuron separates this genus from *Oecothea*. One important character, also found in *Oecothea*, is the presence of only one fronto-orbital.

*Distribution:* North and South America, Australia, New Zealand.

A Nearctic and Neotropical genus which does not show close affinities with any of the endemic New Zealand genera. Represented in New Zealand by one immigrant species.

*Species Occurring in New Zealand:*

*Pseudoleria pectinata* (Loew)

***Pseudoleria pectinata* (Loew).** Figs. 112, 113, 125, 137

*Blepharoptera pectinata* Loew, 1872. Berlin ent. Z. 16 : 99.

*Leria placata* Hutton, 1901. Trans. N.Z. Inst. 33 : 82.

*Pseudoleria pectinata* (Loew): Garrett, 1921. Insec. Inscit. menst. 9 : 128.

A dark brown or greyish-brown species with clear wings. Body length about 5.0–6.5 mm., wing length about 5.0–6.5 mm.

#### FEMALE

HEAD (Figs. 112, 113): Arista elongate; pubescent, rays less than diameter of basal segments. Antenna brown; 2nd segment with 1 dorsal apical bristle and short black hairs over surface of segment; basal segment with small black hairs. Front brown. Fronto-orbital bristle about three-quarters length of inner vertical; black hairs over most of front, anterior to ocelli; the hair anterior to the orbital bristle stronger than the rest. Face brown; carina scarcely developed, but deep sulcus whole length of face to clypeus. Cheeks light brown. One bristle at lower posterior angle of cheek about three-quarters length of vibrissa, row of black hairs from above vibrissa to posterior corner of cheek, otherwise cheek bare and hairs only posteriorly. Occiput greyish-brown. Eyes bare. Vertical diameter of eye about 1.5 times width of cheek in same axis. Proboscis brown, palpi light brown.

THORAX: Dark greyish-brown; mesonotum without obvious vittae or other pattern; scutellum about 1.5 times as wide as long, greyish-brown; humerus greyish-brown; all pleura uniformly greyish-brown. Prescutellars present, just over half length of posterior dorsocentrals; all four dorsocentrals strong; basal scutellar shorter than apicals and about quarter distance from base of scutellum to apex; postscutellum well developed; 1 humeral; 1 presutural; 2 notopleurals; 1 supraalar; 2 postalars; 1 posterior sternopleural; sternopleuron very hairy with fine long hairs and bristles ventrally; prosternum bare.

Legs (Fig. 137) light brown, fore and hind and often mid femora darker brown. Fore femur with bristles postero-dorsally, those towards base finer, posteriorly on basal two-thirds, and postero-ventrally; fore tibia with strong preapical and weak apical; mid femur with 1 anterior bristle about apical third and some stronger hairs dorsal to it, 1 small anterior and posterior apical; mid tibia with 1 preapical only and several strong apicals; hind femur with 2 or 3 antero-dorsals about apical quarter; hind tibia with strong preapical and stout apical; basal segment of fore and hind tarsi in males, produced, beak-like at the apex below.

Wings (Fig. 125) clear without brown shaded areas; veins light brown. Costa with spines before and beyond apex of subcosta, all much longer than width of costa; small black costal spines ending about quarter distance between apices of 2nd and 3rd veins; anterior cross vein weakened posteriorly; 5th vein fading out before wing margin. Wing indices: costal about 3.2; 4th vein about 1.7; 4c about 0.9; 5x about 0.5.

Halteres light yellowish-brown.

ABDOMEN: Dark greyish-brown. Female genital plates brown.

*Holotype*: North America.

*Material Examined*: 1 ♀.

*Distribution in New Zealand*: Christchurch, Chatham Islands.

*Remarks*: Male not seen. Not a common species in collections in New Zealand, and regarded as an immigrant species.

### Genus *OECOTHEA* Haliday

*Oecothea* Haliday, 1839. Ann. nat. Hist. 2: 187.

Front, face, and cheeks very large. Eyes small. One fronto-orbital bristle. Clypeus and antennal fossae large. Proboscis large. No prescutellars; scutellum haired; 4 dorsocentrals, 1 presutural; 1 sternopleural; pteropleuron bare. Legs long. Mid tibia with 2 preapicals and an antero- and postero-dorsal bristle near middle. Subcosta diverging from 1st vein at apex; anal vein ending at wing margin, faint apically.

Type Species: *Oecothea fenestralis* (Fallén)

Similar to the immigrant genus *Pseudoleria* and separated from it by the absence of prescutellar bristles and the bare pteropleuron. Widespread throughout the world. Nearest relative in New Zealand would appear to be *Prosopantrum* Enderlein, but it cannot be regarded as very close to any endemic genus.

*Distribution*: Europe, North and South America, New Zealand.

*Species Occurring in New Zealand*:

*Oecothea fenestralis* (Fallén)

### *Oecothea fenestralis* (Fallén). Figs. 110, 111, 124, 136

*Helomyza fenestralis* Fallén, 1820. "Dipt. Succ. Heteromyz." 5: 5.

*Oecothea fenestralis* (Fallén): Haliday, 1839. Ann. nat. Hist. 2: 187; Tonnoir and Malloch, 1927. Rec. Cant. [N.Z.] Mus. 3: 88.

A dark grey to greyish-brown species with clear wings. Body length about 4.0 mm., wing length about 6.25 mm.

#### FEMALE

**HEAD** (Figs. 110, 111): Arista elongate, light brown; rays of pubescence shorter than diameter of basal segment. Antenna yellowish-brown; 3rd segment brown; 2nd segment with 1 dorsal apical bristle and other black apical hairs. Front brown to dark greyish-brown with a darker brown vitta between ocelli and orbits and almost reaching anterior margin of front. The single fronto-orbital about two-thirds length of inner vertical; postverticals cruciate; small black hairs over most of front. Face brown with grey dusting. Carina weakly developed dorsally and very weak or absent ventrally. Cheeks brown with light grey dusting. No prominent bristles at lower posterior corner of cheeks but strong black hairs in a row from vibrissa to this corner; no other hairs on anterior half of cheek but black hairs posteriorly on occiput. Occiput dark grey. Eyes bare. Vertical diameter of eye about 1.5 times width of cheek in same axis. Proboscis dark brown; palpi brown.

**THORAX**: Generally dark greyish-brown; mesonotum heavily grey dusted, scutellum longer than wide, greyish-brown basally but lighter brown apically; pleura not heavily dusted, brown to dark brown. All 4 dorsocentrals strong; basal scutellar divergent or parallel, one-third distance from base of scutellum and just under two-thirds length of divergent apicals; disc of scutellum flat, with fairly strong black hairs and none beneath apex; 1 humeral; 1 strong presutural; 2 notopleurals; 1 strong supraalar; 2 strong postalar; hairs absent on mesopleuron, hairs present on sternopleuron; propleural bristle present; prosternum bare.

**Legs** (Fig. 136) light brown. Fore femur with bristles along postero-dorsal and postero-ventral surfaces; fore tibia with preapical and weak apical; mid femur with stout strong bristles on apical third or half of anterior surface and 1 similar posterior apical, short and finer bristles on basal half of antero-ventral surface and apical half of antero-dorsal surface; mid tibia with 1 antero-dorsal and 1 postero-dorsal at about basal third with occasionally smaller bristles just basal, 1 antero-dorsal at apical half to third, dorsal preapicals, position of these varying even in same individual, anterior one longer than other, several ventral apicals of varying lengths; hind femur with bristles at about apical third of antero-dorsal surface and shorter bristles on basal two-thirds of anterior surface and along antero-ventral surface; hind tibia with strong preapical and weak apical.

**Wings** (Fig. 124) shaded very light brown and no darkened areas; veins light brown. Costa with spines before and beyond apex of subcosta, most at least twice length of diameter of costa; short stout spines to quarter distance between apices of 2nd and 3rd vein; anterior cross vein weakened posteriorly; 5th vein faintly traceable to wing margin; costal break at apex of subcosta distinct. Wing indices: costal about 3.3; 4th vein about 1.6; 4c about 0.75; 5x about 0.4.

Halteres light yellow.

**ABDOMEN**: Dark greyish-brown.

*Holotype*: Europe (?).

*Material Examined*: 3 ♀.

*New Records*: OKERE: 20.xi.1919, (J. Muggeridge), (B.M.).

*Distribution in New Zealand*: Okere, Wanganui, Christchurch. (November, March, May).

*Remarks*: The most widespread and commonest species of the genus, and regarded as a recent immigrant. Found frequently indoors on windows. Apart from characters given in the key, the presence of only one fronto-orbital is important. There is some slight variation in the placing of the bristles near the middle of the mid tibia but the mere presence of bristles in this area separates the fly from others of the family in New Zealand.

Male not seen.

## Genus HELOCLUSIA Malloch

*Heloclusia* Malloch, 1933. "Dipt. Pat. S. Chili" 6: 184.

Basal segment of antenna almost as long as 2nd. Frontal orbits well differentiated, shining; the posterior fronto-orbital bristle the longest. Face broadly membranous in centre, the soft part edged with a chitinous raised rim forming a broad arch extending almost to antennal insertions. Vibrissa and 2nd oral bristle present. Four dorsocentrals, anterior one presutural; 1 supraalar; 2 postalars; 1 propleural; mesopleuron bare. Femora slightly thickened. Costa broken at apex of subcosta and weakened at humeral cross vein; subcosta fused with 1st vein apically; 1st posterior cell not narrowed; no cross vein separating discal and 2nd basal cells.

Type Species: *Heloclusia imperfecta* Malloch

Described and erected by Malloch (1933d) for a species found in South America. With the discovery of three species in New Zealand the generic diagnosis given by Malloch has had to be considerably revised.

The genus, as Malloch (1933d) suggests, shows some superficial resemblance to the Clusiidae but is placed in the Helomyzidae because of such characters as convergent postverticals, lack of mesopleural bristle, and the basal segment of antenna being almost as long as second segment. The genus is quite distinct from other helomyzid genera in New Zealand and is most readily separated from them by the lack of a separating cross vein between the discal and second basal cells.

*Distribution*: South America, New Zealand.

### KEY TO SUBGENERA OF GENUS HELOCLUSIA MALLÓCH

Two sternopleurals. Costa with strong spines ..... HELOCLUSIA (p. 119)  
One sternopleural. Costa with weak spines ..... HELUSCOLIA (p. 119)

### Subgenus HELOCLUSIA Malloch

Basal and 2nd segments of antennae with apical bristles. Three fronto-orbitals. Scutellum with bristles progressively longer from basal to apical pair, the latter very long; 2 sternopleurals. Tibiae with submedian bristles; hind and mid tibiae with bristles on antero-dorsal and postero-dorsal surfaces. Costal spines well developed on both the upper and lower surfaces of vein and for most part placed alternately; vein closing anal cell present and curved; anal vein almost complete.

Type Species: *Heloclusia (Heloclusia) imperfecta* Malloch

Of South American occurrence only, and readily separated from the New Zealand subgenus by having two sternopleurals and prominent costal spines. The only species, *H. imperfecta*, is much larger than New Zealand representatives of the genus.

### Subgenus HELUSCOLIA subgen. nov.

Basal segment of antenna without differentiated apical bristles. Two or 3 fronto-orbitals. Scutellum with apical and basal bristles only; one sternopleural. Costa with small fine spines usually placed alternately on upper and lower surfaces of costa; anal cross vein very weak, almost absent; anal vein not reaching wing margin.

Type Species: *Heloclusia (Heluscolia) antipoda* Harrison

Of New Zealand occurrence only. The presence of only one sternopleural, the generally small size of species and the absence of long costal spines separate this subgenus from *Heloclusia*.

*Distribution*: New Zealand.

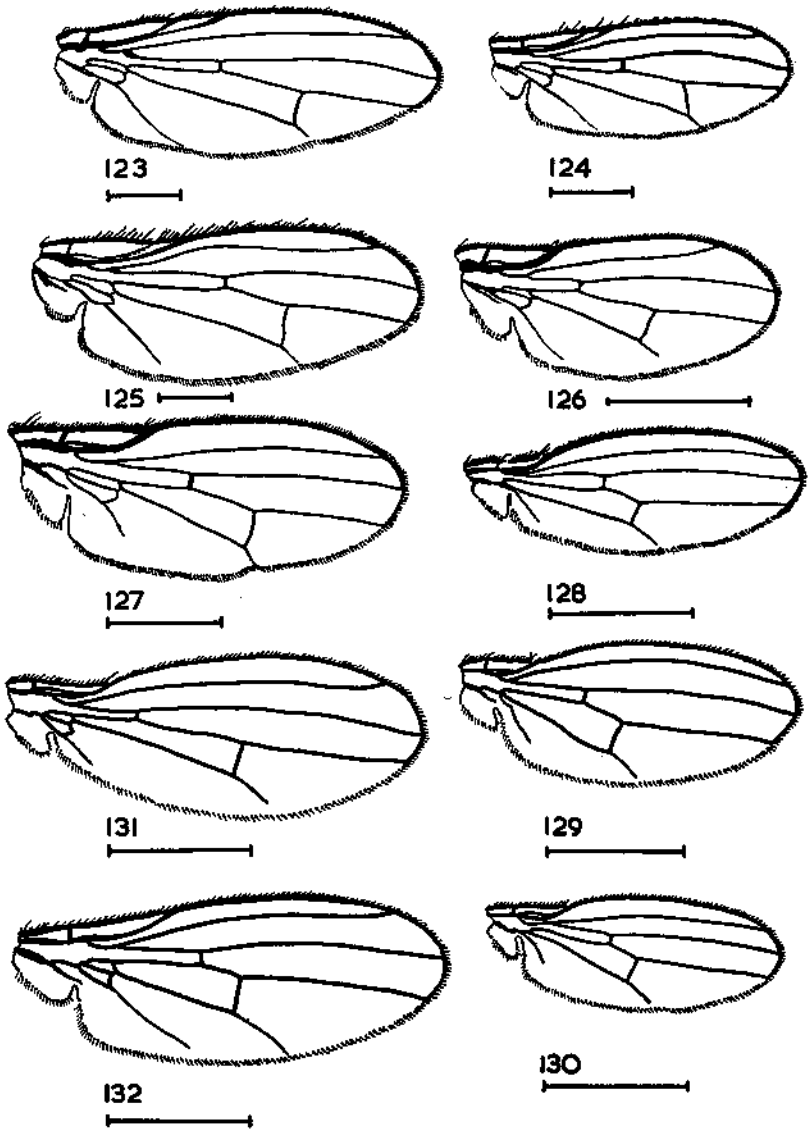


Fig. 123. Wing of *Tephrochlamys canescens*  
 " 124. " " *Oecothoa fenestralis*  
 " 125. " " *Pseudoleria pectinata*  
 " 126. " " *Allophylina albitarsis*  
 " 127. " " *Prosopantrum flavifrons*  
 " 128. " " *Heloclusia flavitarsis*  
 " 129. " " *H. antipoda*  
 " 130. " " *H. aristata*  
 " 131. " " *Aneuria angusta*  
 " 132. " " *Tethimosoma fulvifrons*

Scale: 1.0 mm.

*Species:*

*Heloclusia (Heluscolia) antipoda* Harrison

*H. (Heluscolia) aristata* sp.n.

*H. (Heluscolia) flavitarsis* sp.n.

There are two distinct groups of species in this subgenus:

1. *antipoda* group of species. Distinguished chiefly by the presence of three fronto-orbitals and an interalar bristle. Includes *H. antipoda* and *H. aristata*.
2. *flavitarsis* group of species. Distinguished by the presence of two fronto-orbitals and the absence of interalar bristle. Includes *H. flavitarsis*.

KEY TO SPECIES OF SUBGENUS HELUSCOLIA

- |   |  |                    |
|---|--|--------------------|
| 1 | Three fronto-orbitals .....  | 2                  |
|   | Two fronto-orbitals .....  | <b>flavitarsis</b> |
| 2 | Anterior fronto-orbital three-quarters length of middle bristle.   |                    |
|   | Arista about 4 times length of 3rd antennal segment .....  | <b>antipoda</b>    |
|   | Anterior fronto-orbital two-fifths length of middle bristle. Arista about 7 times length of 3rd antennal segment ..... | <b>aristata</b>    |

***Heloclusia flavitarsis* sp.n. Figs. 128, 146, 159**

A shining dark brown species. Wings clear. Body length about 2.5 mm., wing length about 2.5 mm.

MALE AND FEMALE

HEAD (Fig. 146): Arista shining dark brown; pubescent, rays about as long as diameter of basal segment. Antenna light brown; 3rd segment brown apically, bulbous and circular shaped; 2nd segment with hairs and bristles on apical margin and other hairs scattered over surface, a strong bristle on dorsal and 2 on ventral apical margins; basal segment with short black hairs on apical margin. Front shining blackish-brown, yellowish-brown anteriorly. Postverticals cruciate; verticals strong; ocellars strong; 2 fronto-orbitals, both reclinate, posterior of pair the stronger and directed more over eye; minute black hairs on fronto-orbital line and across anterior region of front. Face brown; the membranous central triangular area light brown, the lateral heavily chitinised areas shining dark brown; parafacials light brown. No carina. Cheeks brown anteriorly; blackish-brown posteriorly, oral margin shining brown. Vibrissa strong; 2nd oral bristle just over half length of vibrissa and about one-third distance along cheek; 2 bristles at lower angle of cheek. Occiput shining blackish-brown. Eyes bare. Vertical diameter of eye about 4.5 times width of cheek in same axis. Proboscis light brown; palpi dark brown.

THORAX: Shining dark brown with evidence of dusting particularly on mesonotum; scutellum dark brown and dusted. Two median acrostichal bristles placed between third and half distance along mesonotum; no prescutellars; apical scutellars cruciate, basal pair divergent; 1 humeral; 2 notopleurals; no interalar; outer postalars very strong.

Legs: Fore leg shining dark brown except for yellowish-brown inner margin of coxa, all trochanter, basal third of femur, extreme tip of femur, extreme base of tibia, extreme apex of basal segment of tarsus and all four apical segments of tarsus; the four apical segments of fore tarsus in female whitish-yellow; mid and hind legs yellowish-brown except brown or dark brown apical half of femora, basal half and apical sixth of tibiae; the hind tibia is not as distinctly marked as mid tibia. Ventral apical bristles on mid and hind tibiae.

Wings (Fig. 128) clear; veins light brown. Costa extending to apex of 4th vein; stout costal bristles to apex of 2nd vein or just beyond; pair of strong bristles at apex of subcosta; 4 strong bristles on costa near wing base; anal cell almost rudimentary; anal vein not quite traceable to wing margin and very faint apically. Wing indices: costal about 8.0; 4th vein about 4.6; 4c about 0.9; 5x about 1.4.

Halteres light brown.

**ABDOMEN:** Blackish-brown, sparsely haired or bristled; not distinctly shining. External male genitalia (Fig. 159): Genital arch large and recurved beneath abdomen, 1 strong bristle on either side near dorsal median line and clump of about 6 similar bristles at antero-ventral corner, smaller bristles scattered over whole surface with a tendency for more to occur near the large antero-ventral bristles than elsewhere; anal plate small somewhat elliptical with protuberance on posterior margin, entire surface with long bristles; clasper rod shaped, about as long as anal plate, with a rounded apex and with few fine short bristles on apical third.

Female genitalia dark brown.

**Holotype:** AUCKLAND: Owairaka, on rotting fruit, 24.vii.1950, ♂, (R. A. Harrison), (P.D.D.).

**Paratypes:** WAITAKERE RANGES: Oratia, 27.vii.1949, 1 ♂; 8.vii.1950, 3 ♂, (R. A. Harrison), (P.D.D.). AUCKLAND: Browns Bay, in rotting-fruit trap, 15.x.1950, 1 ♂; 20.xi.1949, 1 ♀; 15.ix.1951, 2 ♀: Avondale, 6.i.1950, 1 ♂; (R. A. Harrison), (P.D.D.): Henderson, Sunnyside, 2.x.1954, 1 ♂, 1 ♀, (*in cop.*), (K. A. J. Wise), (P.D.D.). LITTLE BARRIER ISLAND: Kauri Gully and tracks, 24.xi.1954, 1 ♂, 1 ♀; swept, 24.xi.1954, 1 ♀; Waipawa Stream, ex banana trap, 29.xi.1954, 1 ♂, (R. A. Harrison), (P.D.D.).

**Material Examined:** Holotype, 9 ♂ and 6 ♀ paratypes.

**Distribution:** Little Barrier Island, Waitakere Ranges, Auckland. (July, September to November, January).

### ***Heloclusia antipoda* Harrison. Figs. 120, 121, 129**

*Heloclusia antipoda* Harrison, 1955. Rec. Dom. Mus. N.Z. 2: 215.

A shining black fly with yellowish-brown face and cheeks and yellowish-brown areas on legs. Body length about 2.5 mm.; wing length about 2.5 mm.

#### FEMALE

**HEAD** (Figs. 120, 121): Arista blackish-brown; about 4 times length of third antennal segment; minutely pubescent, rays of pubescence not wider than basal segments. Antenna yellowish-brown; 3rd segment dusted with black and darker apically; 2nd segment with 1 strong dorsal bristle, 2 ventral bristles and a circle of smaller bristles about apex; basal segment dark brown. Front shining black posteriorly, merging to brown anteriorly; over half width of head at vertex; ocellar area slightly raised; orbits raised above level of front and lightly dusted. Two strong ocellar bristles; postverticals strong and cruciate; verticals strong; 3 fronto-orbitals, ratio of lengths, anterior to posterior, 3:4:5; all three reclinate, posterior directed outwards more than other two; inter orbital area with scattered, small hairs. Face with the membranous triangular area light brown, lateral areas shining brown. Cheeks yellowish-brown merging into the black occiput about middle of hind margin of eye. Vibrissa strong; strong bristles situated about middle of cheek; about 2 strong bristles at lower angle of cheek. Occiput black. Eyes bare. Vertical diameter of eye about 2.75 times width of cheek in same axis. Proboscis yellowish-brown; palpi blackish-brown for the apical two-thirds and with about 3 bristles on apical half, middle one strong.

**THORAX:** Shining black with much black dusting. One or 2 median strong presutural acrostichal bristles; 1 pair of very short, fine prescutellar acrostichals; apical scutellars about 1.5 times length of basals; 1 strong humeral; 1 strong presutural; 2 notopleurals; 1 interalar.

Legs black; coxae, trochanters, base and apex of femora and base of tibiae, brown to yellowish-brown; tibiae and tarsi of mid and hind legs brown. Fore tibia with 2 weak preapicals; mid tibia with strong apicals; hind tibia with small apical.

Wings (Fig. 129) clear; veins brown. Pair of strong costal bristles almost at wing base and another pair at the distal costal break; short stout bristles of costa

extending to apex of 2nd vein; costa extending to apex of 4th vein; subcosta entire but proximated to 1st vein at apex; anal vein fading out about two-thirds distance to wing margin. Wing indices: costal about 8.3; 4th vein about 3.6-4.0; 4c about 0.7-0.8; 5x about 1.3-1.4.

**ABDOMEN:** Black, sparsely haired and with greyish-black dusting in some lights.

*Holotype:* ANTIPODES ISLAND: Ringdove Bay, on plateau, 8.xi.1950, ♀, (R. K. Dell), (Dom. Mus.).

*Material Examined:* Holotype, 1 paratype, and 3 ♀.

*Distribution:* Antipodes Island, Campbell Island, Auckland Island, (November, December, February).

*Remarks:* The relatively short arista and short anterior fronto-orbital bristle separate it from *H. aristata* the other known member of the *antipoda* group. Of the three New Zealand species of the genus, *H. antipoda* shows the greatest similarity to the South American species *H. imperfecta*. The female only is known and Harrison (1955) was in error in giving a description under the heading of male and female.

### ***Heloclusia aristata* sp.n. Figs. 130, 160**

A dark brown species. Body length 2.0 mm., wing length 2.0 mm.

#### **MALE**

**HEAD:** Arista dark brown; about 7 times length of 3rd segment of antenna; pubescent, rays of pubescence greater than diameter of basal segments. Antenna black; 2nd segment with 1 strong dorsal and 2 strong ventral bristles, small black hairs around apical margin; basal segment with apical dorsal hairs. Front dark brown on posterior two-thirds, light brown anteriorly. Verticals and ocellars strong; postverticals weak; 3 fronto-orbitals, posterior one directed outward, ratio of their length, anterior to posterior, 2 : 5 : 5; small black hairs over most of front. Face light brown, membranous central area surrounded by shining brown margin. Cheeks light brown. Vibrissa strong; short 2nd oral bristle about one-third distance along cheek and 3 bristles, half length of vibrissa, at lower posterior angle of cheek. Occiput black. Eyes bare. Vertical diameter of eye about 4 times width of cheek in same axis. Proboscis light brown; palpi dark brown with light brown base and small black hairs over surface.

**THORAX:** Shining blackish-brown with some light dusting. Two small central presutural acrostichals; prescutellars not differentiated from hairs on mesonotum; apical scutellars about 2.5 times length of basal scutellars; 1 humeral; 1 strong presutural; 2 notopleurals; 1 small interalar.

Legs dark brown; base of fore coxa and hind coxa, all trochanters, basal 4th of all femora, basal two-thirds of mid and hind tibiae and mid and hind tarsi yellowish-brown. Fore femur with strong bristles on postero-dorsal and postero-ventral surfaces; fore tibia with small apical; mid tibia with strong apical; hind tibia with apical.

Wings (Fig. 130) clear; veins light brown. Pair of strong bristles on costa at base and at distal costal break; short stout costal spines extending to apex of 2nd vein; anal vein fading out half way to wing margin. Wing indices: costal about 7.0; 4th vein about 4.1; 4c about 0.85; 5x about 1.6.

Halteres light brown with brown stalk.

**ABDOMEN:** Black.

Male external genitalia (Fig. 160): Genital arch dark brown, heavily chitinised and produced to long ventral arm, 1 strong bristle dorsally on either side and about 25 to 30 shorter hairs on surface, chiefly on posterior half, a sinuate weakening of the arch across middle; anal plate quadrangular with few long fine hairs and matt of short hairs; clasper heavily chitinised, broad at base, swollen at apex but ending in a point, clump of small hairs at apex.

*Holotype:* LITTLE BARRIER ISLAND: Kauri Gully and tracks, 24.xi.1954, ♂, (R. A. Harrison), (P.D.D.).



*Material Examined:* Holotype.

*Distribution:* Little Barrier Island. (November).

*Remarks:* The relatively long arista separates this species from *H. antipoda*.

### Genus PROSOPANTRUM Enderlein

*Prosopantrum* Enderlein, 1912. K. svenska VetenskAkad. Handl. 48 : 135; Malloch, 1933. "Dipt. Pat. S. Chili" 6 : 199.

*Acrostichalia* Tonnoir and Malloch, 1927. Rec. Cant. [N.Z.] Mus. 3 : 86.

*Didymochaeta* Czerny, 1927. Konowia 8 : 87.

Arista short, twice as long as antenna. One or 2 fronto-orbitals, anterior bristle curved outwards more so than posterior bristle. Three or 4 pairs of acrostichal bristles, anterior pair just anterior to anterior dorsocentral; 3 dorsocentrals, all postsutural; disc of scutellum bare; 2 strong dorsal sternopleurals; mesopleuron and pteropleuron bare; no propleural bristle but small hairs present; prosternum bare. Mid tibia with 1 preapical dorsal bristle, 1 at apical quarter and a postero-dorsal at about apical eighth, 1 preapical antero-dorsal and 1 ventral apical. Costa without spines; subcosta close to 1st vein at apex; anal vein abruptly terminated at about half to three-quarters distance to wing margin.

Type Species: (?) *Prosopantrum diadematum* (Bigot).

The synonymy of *Acrostichalia* with *Prosopantrum* was discussed by Edwards in Malloch (1933d, p. 199). He considered it likely that the single New Zealand representative of the genus had been introduced to New Zealand by human agency.

Tonnoir and Malloch (1927) discussed the affinities of *Acrostichalia* and considered it closer to *Oecothoa* Haliday than *Allophylopsis* Lamb. This lack of close similarity to any endemic New Zealand genus is further evidence of the possibility of recent introduction. The genus is the only helomyzid in New Zealand having three or four acrostichal bristles.

*Distribution:* New Zealand, South America, South Africa.

*Species Occurring in New Zealand:*

*Prosopantrum flavifrons* (Tonnoir and Malloch)

***Prosopantrum flavifrons* (Tonnoir and Malloch). Figs. 115, 116, 127**

*Acrostichalia flavifrons* Tonnoir and Malloch, 1927. Rec. Cant. [N.Z.] Mus. 3 : 87.

*Prosopantrum flavifrons* (Tonnoir and Malloch): Malloch, 1933, "Dipt. Pat. S. Chili" 6 : 200.

A grey and yellowish-brown species with clear wings. Body length about 3.0 mm., wing length about 3.5 mm.

#### MALE AND FEMALE

HEAD (Figs. 115, 116): Arista brown to dark brown; finely and thickly pubescent, rays much less than width of basal segments. Antenna light brown to yellowish-brown; 3rd segment mostly greyish-brown with thick but short pile; 2nd segment greyish-brown towards apex and with 1 strong dorsal bristle. Front yellowish-brown, slightly darker posteriorly; ocellar area and area around orbitals thickly grey dusted and merging into similarly coloured occiput. All bristles strong; 2 fronto-orbitals, anterior about half posterior; postverticals cruciate; distinct short black hairs on anterior orbits and towards middle of anterior half of front. Face yellowish-grey. Cheeks yellowish-grey dusted. All hairs on cheek

fairly strong and 2 bristles at lower posterior corner, the larger one about two-thirds length of vibrissa. Eyes bare. Vertical diameter eye about 2.3 times width of cheek in same axis. Proboscis shining brown; palpi yellowish-brown with white pile and fine black hairs.

**THORAX:** Mesonotum grey, brown spot at base of each hair and bristle; scutellum and pleura grey. Basal scutellars convergent, about three-quarters divergent apically; 1 strong humeral; 1 presutural; 2 notopleurals, anterior bristle strong; 1 supraalar; 2 postalars, outer bristle very strong; sterno-index about 1.0.

Legs light brown; fore and hind femora greyish-brown; apical segments of tarsi brown. Fore femur with strong postero-dorsal and postero-ventral bristles and 1 median posterior; fore tibia with strong preapical and weak apical; mid femur with anterior bristles on apical quarter and 1 posterior apical; mid tibia with strong bristles; mid tarsus with spurs at apex of basal segment; hind femur with 1 bristle at apical quarter; hind tibia with strong preapical and weak apical.

Wings (Fig. 127) clear; veins light brown. First vein and costa thick and strong; costa reaching 4th vein and weakening gradually after 3rd vein; short thick costal spines ending at apex of 2nd vein and no large costal spines except pair at base of costa and at apex of 1st vein; costa slightly weakened at humeral cross vein and almost broken at 1st vein; 5th vein reaching wing margin. Wing indices: costal about 7.25; 4th vein about 1.5-1.8; 4c about 0.45; 5x about 0.6.

Halteres light yellow apically, brown basally.

**ABDOMEN:** Grey. Female genital plates greyish-brown.

Male genitalia: Hypopygium small and twisted to one side; parameres large, asymmetrical; genital arch small and with rigid finger-like claspers one on each side; anal plate weak. Penis enormously developed, permanently evaginated, and coiled at base of hypopygium when at rest, densely covered with scaly spines.

*Holotype:* CHRISTCHURCH: 17.ii.1932, ♀, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined:* Holotype and 7 ♀.

*New Records:* DUNEDIN: 1924, 1 ♀, (*C. Fenwick*), (Dom. Mus.).  
NO DATA: 1 ♀, (U.S.N.M.).

*Distribution:* Auckland, Rotorua, Ruapehu-Wanganui district, Nelson, Christchurch, Governors Bay, Alexandra, Redcliff, Dunedin. (July, September to November, February, June).

*Remarks:* This species has a costal index of about 7.25, which is one of the largest indices in the whole family. The second and third veins are close together and parallel right to wing margin.

Found usually on sandy ground near the shore. Males not yet discovered in New Zealand and male characters in the description are from South American specimens in the British Museum and from Edward's and Malloch's notes (Malloch 1933d).

### Genus ALLOPHYLINA Tonnoir and Malloch

*Allophylina* Tonnoir and Malloch, 1927. Rec. Cant. [N.Z.] Mus.  
3: 87.

Arista plumose. Two fronto-orbital bristles. Eyes large, narrowed ventrally. Cheeks narrow. Prescutellars present; 3 postsutural dorsocentrals; 4 scutellars; scutellum bare, broadly rounded at apex and wider than long; mesopleuron haired; 1 sternopleural; propleuron with small hairs. Mid tibia with pair of long strong dorsal bristles at apical quarter and several ventral apicals. Costal spines absent; anal vein not reaching wing margin; subcosta close to 1st vein.

Type Species: *Allophylina albitarsis* Tonnoir and Malloch

Closely related to the genus *Allophylopsis* and readily separated from it by the presence of prescutellar bristles.

*Distribution:* New Zealand.

*Species:* *Allophylina albitarsis* Tonnoir and Malloch

***Allophylina albitarsis* Tonnoir and Malloch. Figs. 114, 126, 158**

*Allophylina albitarsis* Tonnoir and Malloch, 1927. Rec. Cant.  
[N.Z.] Mus. 3 : 88.

A brown and grey spotted fly with relatively large thorax. Body length about 2.5-3.0 mm., wing length about 2.0-2.5 mm.

MALE AND FEMALE

**HEAD** (Fig. 114): Arista brown; long rays on dorsal and ventral margins, longest about width of third antennal segment and shorter rays on inner and outer margins. Antenna brown; 3rd segment covered with fine whitish-brown pile; 2nd segment dark brown with 1 dorsal bristle. Front chocolate-brown with bluish-grey dusting on inter-orbital area, narrow posteriorly but wide and extending to eyes anteriorly; vertex, spot at each fronto-orbital bristle, and a spot anterior to anterior ocellus, grey; ocellar region to postverticals and base of verticals, brown. Postverticals cruciate; inner and outer verticals strong, equal; ocellars equal to posterior fronto-orbitals; anterior fronto-orbital about two-thirds length of posterior fronto-orbital; anterior half of front with fine incurved hairs on either side of median line; short hairs on orbits lateral to, and posterior and anterior to anterior fronto-orbital. Face whitish-brown, carina and anterior half of face, brown. Carina slightly developed, not sulcate. Cheeks whitish-brown with brown spot above vibrissa and shining brown posteriorly. One strong bristle at lower posterior of angle of cheek. Eyes bare. Vertical diameter of eye about 10 times width of cheek in same axis. Proboscis blackish-brown; palpi blackish-brown basally, light brown apically.

**THORAX:** Brown, much grey spotting on mesonotum forming irregular longitudinal vittae, 3 between dorsocentrals, 1 on dorsocentral line and 1 on interalar line; pleura also with much grey spotting; scutellum without grey spotting but large black spot at each apical bristle. Prescutellars about three-fifths length of posterior dorsocentrals; anterior dorsocentral small; parallel basal and cruciate apical scutellars equal in length and about same length as posterior dorsocentrals; 1 strong humeral; 1 strong presutural; 2 notopleurals, anterior 1 strong; 1 strong supraalar; 2 postalar; sternopleural strong.

**Legs:** Fore legs blackish-brown, extreme apex of femur and base of tibia yellowish-brown, basal tarsal segment yellowish-white; middle legs brown, dark brown annulus at base and apical quarter of femur, at basal third and apex of tibia, tarsus light brown; hind leg dark brown, light brown at apex of femur, base and middle third of tibia and all tarsus. Fore femur with bristles on posterior surface and strong bristles on apical half of postero-ventral surface; fore tibia with strong dorsal bristle at apical quarter; mid femur with bristles on apical third of anterior surface; hind femur with 1 preapical bristle on anterior surface; hind tibia with dorsal bristle at apical quarter.

**Wings** (Fig. 126) light brown, base of wings to beyond humeral cross vein and including anal cell shaded dark brown; veins light brown. Fifth vein not reaching margin of wings; short stout costal spines to apex of 2nd vein; pair of short spines at apex of subcosta. Wing indices: costal about 2.4; 4th vein about 1.5; 4c about 0.9; 5x about 0.8-1.1.

Halteres light yellow.

**ABDOMEN:** Yellowish-brown. Tergites 4 to 6 with 3 brown spots, 1 of them median.

**External male genitalia** (Fig. 158): Genital arch fairly heavily chitinised with about 24 strong bristles scattered over each side, matt of minute hairs covering whole surface; anal plate not heavily chitinised, with about 24 bristles similar to those on arch, a region at ventral margin with matt of minute hairs; clasper large, hook shaped, broad basally, stretching over complete ventral margin of arch but displaced slightly medianly with bristles slightly weaker than those on arch or plate, scattered over whole surface, majority on inner surface except on small apical region which is bare of hairs.

*Holotype:* REEFTON: 13.i.1922, ♂, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined:* Holotype, allotype and 1 paratype, 5 ♂ and 2 ♀.

*New Records:* LITTLE BARRIER ISLAND: Waipawa stream bed, 25.xi.1954, 1 ♂, (*R. A. Harrison*), (P.D.D.). WAITAKERE RANGES: Goldies Bush, 10.i.1950, 1 ♂, (*K. A. J. Wise*): Titirangi, ex light trap, 10.xii.1952, 1 ♂; 19.ii.1953, 2 ♂; 9.vi.1953, 1 ♀, (*C. R. Thomas*), (P.D.D.). COOK STRAIT: Trio Island, 20.xii.1954, 1 ♀, (*G. Ramsay*), (P.D.D.).

*Distribution:* Little Barrier Island, Waitakere Ranges, Trio Island, Reefton. (November to April).

### Genus ALLOPHYLOPSIS Lamb

*Allophylopsis* Lamb, 1909. "Subantarct. Is. N.Z.", 1: 142:

Tonnoir and Malloch, 1927. Rec. Cant. [N.Z.] Mus. 3: 88.

*Huttonomyia* Malloch, 1922. N.Z. J. Sci. Tech. 5: 227.

Two outwardly directed or reclinate fronto-orbitals. Prescutellars absent; 3 dorsocentrals, all postsutural; scutellum with few fine hairs; mesopleuron haired and without posterior marginal bristle; 1 sternopleural; 1 or more small propleural hairs; prosternum haired. Mid tibia with 2 long strong dorsal bristles at about apical quarter and several strong ventral apicals. Costa with spines; subcosta fused with 1st vein at apex forming a broad dark area; 1 or 2 fine hairs on 1st vein near humeral cross vein on postero-dorsal surface; anal vein not reaching wing margin; anterior cross vein weakened posteriorly.

Type Species: *Allophylopsis laquei* (Hutton)

Related to *Diplogeomyza* Hendel of Australia and the New Zealand genus *Allophylina* Tonnoir and Malloch. Separated from the latter by the absence of prescutellar bristles.

*Distribution:* Australia, New Zealand.

Few species and specimens have been added to the genus since 1927 and there is not yet sufficient evidence to warrant any radical change in the status of the genus. The four subgenera recognised by Tonnoir and Malloch (1927) are retained, and one further subgenus proposed.

#### KEY TO SUBGENERA OF GENUS ALLOPHYLOPSIS

- |  |                        |
|--|------------------------|
| 1 Presutural bristle absent .....  | 2                      |
| Presutural bristle present .....   | 3                      |
| 2 Stump veins present .....  | ALLOPHYLELLA (p. 127)  |
| Stump veins absent .....   | PHILPOTTOMYIA (p. 129) |
| 3 Arista plumose or rays of pubescence at least equal to diameter of basal segments of arista .....  | PARAPHYLOPSIS (p. 132) |
| Arista pubescent, rays less than diameter of basal segment of arista .....   | 4                      |
| 4 Anterior dorsocentrals mid way between line joining presutural bristles and 2nd dorsocentral. Fore coxa without strong anterior median bristle ..... | ALLOPHYLLATA (p. 138)  |
| Anterior dorsocentral on or very close to line joining presutural. Fore coxa with median bristle .....   | ALLOPHYLOPSIS (p. 139) |

### Subgenus ALLOPHYLELLA Tonnoir and Malloch

*Allophylella* Tonnoir and Malloch, 1927. Rec. Cant. [N.Z.]

Mus. 3: 90.

Presutural bristle absent. Numerous stump veins arising from longitudinal veins.

Type Species: *Allophylopsis (Allophylella) philpotti* Tonnoir and Malloch

Stump veins are found only in this subgenus.

*Species: Allophylopsis (Allophylella) philpotti* Tonnoir and Malloch

**Allophylopsis philpotti** Tonnoir and Malloch. Figs. 133, 134, 161, 176, 179

*Allophylopsis philpotti* Tonnoir and Malloch, 1927. Rec. Cant. [N.Z.] Mus. 3 : 91.

A greyish-brown species; wings with stump veins and light brown shading about these and cross veins. Body length about 5.0 mm., wing length about 6.0 mm.

#### MALE

**HEAD** (Figs. 176, 179): Arista dark brown, gradually tapering to fine point at apex; finely pubescent, rays short, not as long as diameter of arista at base. Antenna brown; 3rd segment dark brown except at base; 2nd segment with 1 short bristle at apex dorsally and small black hairs about apex with larger hairs ventrally; basal segment with few small black hairs. Front bronze. All frontal bristles strong, anterior fronto-orbital three-quarters posterior bristle; small hairs on front anterior to ocelli and on orbits. Face brown with much grey dusting. Carina well formed dorsally but disappearing before reaching clypeus; clypeus well produced. Cheeks light brown with grey dusting. Eyes with very few very short hairs. Vertical diameter of eye 3 times width of cheek in same axis. Proboscis dark brown; palpi yellowish-brown with short black bristles.

**THORAX:** Mesonotum greyish-brown with faint, indistinct, narrow, brown longitudinal vittae, on median line, either side of dorsocentral, and on interalar area; scutellum with median longitudinal grey vitta extending onto mesonotum; dorsal pleura grey with brown areas, other pleura grey; prosternum brown. All three dorsocentrals strong; both pairs of scutellars divergent, basals about third distance from base of scutellum to apical bristles; 1 strong humeral; 2 notopleurals; 1 supraalar; 2 strong postalars; fine hairs on disc and beneath apex of scutellum; 1 fine propleural hair; strong hairs and bristles on ventral apex of sternopleural; fore tibia and hind tibia darker brown at apex; fore and hind tarsi yellowish-brown.

**Legs** (Figs. 133, 134) brown; fore and hind femora dark brown, greatly enlarged and about third to fourth as wide as long. Fore femur with row of short bristles postero-dorsally and larger bristles on apical third of postero-ventral surface; fore tibia with strong dorsal preapical and strong, though shorter, ventral apical; mid femur, not enlarged, strong antero-ventral bristles on apical half; short black apical bristles on each segment of mid tarsus; hind femur with 1 short preapical dorsal bristle; hind tibia with strong preapical dorsal; hind tarsus with short bristles at apex of each segment.

**Wings** (Fig. 161) clear with light brown shading about each stump vein and cross veins; veins light brown, but brown in shaded areas. Costa with pair of spines at apex of subcosta, none before subcosta, and about 8 spines from this position along basal half of this section of costa; 2nd vein with 5 posteriorly directed stump veins on apical section; 4th vein with 1 or 2 posteriorly directed stump veins on preapical section and 2 or 3 anteriorly directed on apical section; apical stump vein of 4th vein, bifurcate in right wing of holotype; short stout costal spines not clearly differentiated. Wing indices: costal about 5.8; 4th vein about 1.4; 4c about 0.46; 5x about 0.6.

Halteres light yellow.

**ABDOMEN:** Greyish-brown. Posterior tergites and external male genitalia yellowish-brown.

*Holotype:* SOUTHLAND: The Hump, 1.iii.1919, ♂, (*A. Philpott*), (Cawt. Inst.).

*Material Examined:* Holotype.

*Distribution:* Southland. (March).

*Remarks:* The chief characteristics of this species are the peculiar

wing venation with the many stump veins, the high costal index, the absence of costal spines before apex of subcosta and the enlarged fore and mid femora.

### Subgenus PHILPOTTOMYIA Tonnoir and Malloch

*Philpottomyia* Tonnoir and Malloch, 1927. Rec. Cant. [N.Z.]  
Mus. 3 : 91.

Presutural bristle absent. Short black spines near apex of antero-ventral surface of hind femur in both sexes. Costal index greater than 4.0.

Type Species: *Allophylopsis (Philpottomyia) lineata* Tonnoir and Malloch

The absence of stump veins separate this subgenus from *Allophylella* and the absence of a presutural bristle separates it from the other subgenera.

#### Species:

*Allophylopsis (Philpottomyia) lineata* Tonnoir and Malloch

*A. (Philpottomyia) rufithorax* Tonnoir and Malloch

#### KEY TO SPECIES OF SUBGENUS PHILPOTTOMYIA

Distinct dark brown vittae on mesonotum ..... *lineata*  
No dark brown vittae on mesonotum ..... *rufithorax*

### *Allophylopsis lineata* Tonnoir and Malloch. Figs. 138, 162

*Allophylopsis lineata* Tonnoir and Malloch, 1927. Rec. Cant.  
[N.Z.] Mus. 3 : 92.

A yellowish-brown species with distinct dark brown vittae on thorax and clear wings. Body length about 6.0 mm., wing length about 5.25 mm.

#### MALE AND FEMALE

**HEAD:** Arista dark brown, rays of pubescence not longer than diameter of basal segment. Antenna brown; 3rd segment light brown at basal quarter; 2nd segment with apical black hairs, 1 bristle dorsally and strong hairs ventrally; basal segment with black hairs. Front brown with slight grey dusting, more pronounced about orbital bristles; dark brown spot posterior to posterior orbital in males. Verticals and ocellars all approximately equally strong; postverticals and posterior fronto-orbitals about half to three-quarters length of verticals; ratio of orbitals, anterior to posterior, 1 : 1.3; hairs on orbits and most of front anterior to ocelli. Face light brown. Carina scarcely developed and only discernible dorsally. Clypeus not well developed. Cheeks yellowish-brown. One prominent bristle at lower posterior angle of cheek just greater than half length of vibrissa; distinct strong black hairs on lower half of cheek and extending back to occiput. Occiput greyish-brown. Eyes with few, very short hairs. Vertical diameter of eye about 3.5 times width of cheek in same axis. Proboscis brown; palpi light brown with thin black hairs.

**THORAX:** Generally light brown to yellowish-brown with light grey dusting; mesonotum with wide, dark brown vitta from dorsocentral row and half way to notopleurals anteriorly and to supraalar and outer postalar posteriorly, very faint anteriorly and extending along lateral margin of scutellum; brown spot at base of hairs and bristles, disc of scutellum yellowish-brown and heavily dusted; ventral half of humerus brown; mesopleuron and pteropleuron brown; prosternum yellowish-brown. Three dorsocentrals strong; basal scutellars divergent or parallel and about third distance from base of scutellum to apical bristles, apical bristles parallel and equal to basals in length; few fine hairs on disc and beneath apex of scutellum; 1 humeral; 2 notopleurals; 1 supraalar; 2 postalar; few minute hairs on propleuron; hairs on sternopleuron, stronger on ventral region; prosternum with long black hairs, middle the strongest.

Legs (Fig. 138) light brown; apical segments on all tarsi brown; fore femur brown on apical half of anterior margin, mid and hind femora with preapical

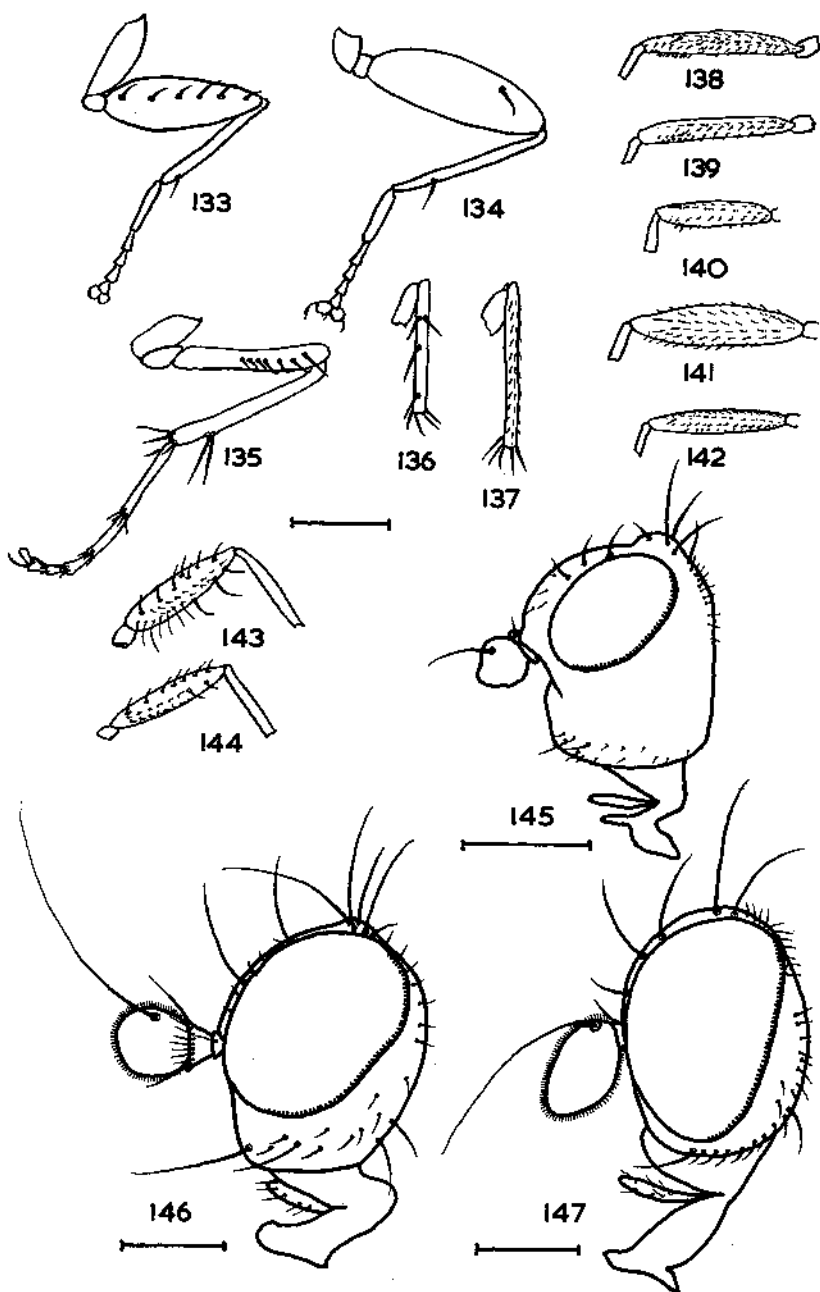


Fig. 133. Fore leg of *Allophytopsis philpotti*  
 " 134. Hind leg of *A. rufithorax* "  
 " 135. Mid leg of *A. rufithorax* "  
 " 136. Mid tibia of *Oecotheca fenestralis*  
 " 137. " " *Pseudoleria pectinata*  
 " 138. Hind femur of *Allophytopsis lineata*  
 " 139. " " *A. rufithorax*  
 " 140. " " *A. minuta*

Fig. 141. Hind femur of *A. hudsoni*  
 " 142. " " *A. fuscipennis*  
 " 143. Fore femur " *A. scutellata*  
 " 144. " " *A. bivittata*  
 " 145. Head of *Tethinosoma fulvifrons*  
 " 146. " " *Helochus flavitoris*  
 " 147. " " *Aneurta angusta*

Scale: Figs. 133-144, 2.0 mm.; Fig. 145, 0.5 mm.; Figs. 146-147, 0.25 mm.

brown ventral spot. Fore femur with strong bristles on postero-dorsal surface, those on apical third more dorsal than rest, and strong bristles on apical half of postero-ventral surface; fore tibia with strong preapical and weak apical; mid femur with strong bristles on apical half of anterior surface and 1 strong posterior apical; bristles of mid tibia strong; apical bristles of each segment of mid tarsus strong; hind femur with 1 antero-dorsal bristle at apical quarter; hind tibia with weak preapical and short apical.

Wings (Fig. 162) light brown, with slight brown shading about cross veins; veins light brown except dark brown anterior cross vein. Costal spines strong, longer than diameter of costa, the larger of pair at apex of subcosta distinctly stronger than the rest; about 4 spines before apex of subcosta; short black costal spines ending about apex of 2nd vein. Wing indices: costal about 4.06; 4th vein about 1.6; 4c about 0.7; 5x about 0.8.

Halteres brown.

ABDOMEN: Greyish-brown.

*Holotype*: KAITOUNA: 19.ii.1922, ♂, (*A. Tonnoir*), (Cant. Mus.).

*Allotype*: The full data of the allotype are indexed in the Hudson Collection catalogue at the Dominion Museum as: WELLINGTON: Wadestown, -x.1889, ♀, (*G. V. Hudson*).

*Material Examined*: Holotype and allotype.

*Distribution*: Kaitouna, Wellington. (October, February).

*Remarks*: The brown vittae of the thorax are distinctive and separate this species from *A. rufithorax*.

***Allophylopsis rufithorax*** Tonnoir and Malloch. Figs. 135, 139, 148, 163.

*Allophylopsis rufithorax* Tonnoir and Malloch, 1927, Rec. Cant. [N.Z.] Mus. 3 : 92.

A dull greyish-brown species; wings clear. Body length about 6.5 mm., wing length about 6.0 mm.

#### MALE AND FEMALE

HEAD: Arista brown, lighter brown basally, rays of pubescence short and not as long as width of basal segment. Antenna uniformly light brown; 2nd segment with 1 dorsal bristle, strong ventral hairs and short apical black hairs. Front light brown, ocellar area and orbits to anterior orbital bristle, grey dusted; vertical and ocellar bristles very strong, ratio of lengths of orbitals, anterior to posterior, 1 : 1.2; postverticals equal to posterior orbitals; orbits and most of front, anterior to orbitals, with scattered black hairs. Face brown. Carina scarcely differentiated. Cheeks light brown. One prominent bristle at lower posterior angle of cheek just under two-thirds length of vibrissa; hairs on lower half of cheek anteriorly but more extensive posteriorly. Occiput brown. Eyes bare. Vertical diameter of eye about 3.5 times width of cheek in same axis. Proboscis brown, palpi light greyish-brown.

THORAX: Generally brown; mesonotum with much greyish-brown dusting and without distinct vittae. Anterior dorsocentral about two-thirds length posterior; basal scutellars slightly divergent and about third distance from base of scutellum to apical bristles, apical bristles parallel and just longer than basal, few fine hairs on disc of scutellum and beneath apex; 1 humeral; 2 notopleurals; 1 strong supraalar; 2 strong postalars; hairs on sternopleuron; few hairs on propodeum; long hairs on prosternum.

Legs (Figs. 135, 139) light brown, apical segments of tarsi not noticeably darker. Fore femur with bristles on postero-dorsal surface, those on apical half more dorsal than rest, bristles on apical half of postero-ventral surface, 2 or 3 of these bristles very strong, short hair-like bristles on apical third of antero-ventral surface; fore tibia with strong preapical and weak apical; mid femur with heavy black bristles on apical half of anterior surface and 1 strong stout apical posterior bristle; mid tarsus with short black distinctive bristles at apices of segments; hind femur with cluster of very short but stout spines within apical half of antero-



ventral surface, 1 antero-dorsal bristle at apical quarter; hind tibia with strong preapical, very weak apical.

Wings (Fig. 163) light brown with very slight shading about cross veins; veins light brown, anterior cross vein brown. Costa with spines before and after apex of subcosta in single row except for pair at apex of subcosta, bristles longer than diameter of costal vein; the short stout costal spines fading out about apex of 2nd vein; 5th vein not reaching margin of wing. Wing indices: costal about 4.8, ranges from 4.0-5.3; 4th vein about 1.2; 4c about 0.5; 5x about 0.6.

Halteres brown.

ABDOMEN: Tergites greyish-brown.

Male genitalia (Fig. 148): Genital arch with short scattered bristles over most of its surface except towards anterior margin, more aggregated at antero-ventral corner, elongate and approximately quadrate with a distinct lightly chitinised horn-like projection about three-fifths down anterior margin, antero-ventral corner distinctly rounded, lower than ventral margin and overlapping clasper; anal plate ovoid about third length of arch, up to 30 bristles over its surface distinctly larger than those on arch; clasper broad, small hair-like bristles on inner surface. Penis evenly arched through more than 90°; parameres with fine apical hairs and 1 small subapical bristle.

*Holotype*: MT. ARTHUR: 5,000 ft., 26.ii.1921, ♂, (*A. Philpott*), (Cawt. Inst.).

*Material Examined*: Holotype, allotype and 1 paratype, 6 ♂, and 4 ♀.

*New Records*: MT. PEEL: 4,000 ft., 21.i.1943, 4 ♂, 1 ♀, (*E. S. Gourlay*), (Cawt. Inst.). HOMER SADDLE: 3,700 ft., 26.i.1946, 1 ♀, (*R. R. Forster*), (Dom. Mus.). HOMER FORKS: 31.i.1946, 2 ♂, 1 ♀, (*R. R. Forster*), (Dom. Mus.). HOMER: 9.ii.1955, 1 ♀, (*R. R. Forster*), (*Cant. Mus.*). The paratype, labelled 71h, is indexed in the Hudson Collection catalogue as: MT. ARTHUR: Tableland, Salisburys Opening, 3,600 ft., 6.ii.1898, (*G. V. Hudson*).

*Distribution*: Mt. Arthur, Mt. Peel, Homer Saddle and Homer Forks. (January, February).

*Remarks*: Separated from *A. lineata* by the absence of distinct dark vittae on thorax. Three of the ten specimens in the series available for study show slight variations, viz.: they have a costal index of 4.0 to 5.3; hairs on the genital arch of males do not extend to anterior margin as far as in other seven specimens and the hairs on the anal plate of males appear more aggregated near the inner or posterior margin than in others. These three specimens were taken at Mt. Peel and Homer Forks. The remaining specimens were collected at Mt. Arthur, Mt. Peel, Homer Forks and Homer Saddle. The two groups of specimens are, therefore, sympatric and specimens are regarded as variants of the same population.

#### Subgenus PARAPHYLOPSIS Tonnoir and Malloch

*Paraphylopsis* Tonnoir and Malloch, 1927. Rec. Cant. [N.Z.]  
Mus. 3: 93.

Arista plumose or pubescent with rays of pubescence at least as long as diameter of basal segments of arista.

Type Species: *Allophylopsis (Paraphylopsis) scutellata* (Hutton)

*Species*:

*Allophylopsis (Paraphylopsis) bivittata* sp.n.

*A. (Paraphylopsis) scutellata* (Hutton)

*A. (Paraphylopsis) subscutellata* Tonnoir and Malloch

A closely related group of three species all with rays on arista distinctly longer than in other species in the genus.

KEY TO SPECIES OF SUBGENUS PARAPHYLOPSIS

- |   |  |                      |
|---|--|----------------------|
| 1 | Dark brown thoracic vitta extending ventrally to extreme dorsal margin of mesopleuron and pteropleuron .....     | 2                    |
|   | Dark brown thoracic vitta extending ventrally over most of mesopleuron and pteropleuron .....                    | <i>subscutellata</i> |
| 2 | Rays of arista 2 or more times length of basal segments of arista. Males with long fine hairs on fore legs ..... | <i>scutellata</i>    |
|   | Rays of arista about equal to width of basal segments. Males without long fine hairs on legs .....               | <i>bivittata</i>     |

***Allophylopsis subscutellata*** Tonnoir and Malloch. Fig. 151

*Allophylopsis subscutellata* Tonnoir and Malloch, 1927. Rec. Cant. [N.Z.] Mus. 3 : 93.

A light brown species with a brown vitta on pleura. Body length about 4.5 mm., wing length about 4.5 mm.

MALE

HEAD: Arista light brown, rays of pubescence at least equal to greater diameter of basal segments. Antenna light reddish-brown except base of 3rd segment light brown; 3rd segment large and with distinct thick white pile; 2nd segment with apical black hairs, 1 bristle dorsally; basal segment with few short black hairs. Front brown, shade darker between orbits. Ratio of fronto-orbitals, anterior to posterior, 2 : 3; posterior orbital three-quarters length of postverticals and half length of inner verticals; fine black hairs over most of front anterior to ocelli and on orbits. Face light brown. Carina not developed. Cheeks yellowish-brown; 1 prominent bristle at lower posterior corner of cheek equal in length to vibrissa; few black hairs on lower half of cheek anteriorly and similar hairs posteriorly on occiput. Occiput light brown. Eyes with few very short fine hairs. Vertical diameter of eye about 4 times width of cheek in same axis. Proboscis brown; palpi yellowish-brown.

THORAX: Generally light brown; mesonotum somewhat yellowish-brown towards notopleural suture and dorsal humerus; scutellum yellowish-brown on disc, darker brown margins; pleura light brown with brown longitudinal vitta from humerus to halteres bordered dorsally by humeral bristle, notopleural suture, and base of wing, and ventrally by propleural hair, and pteropleural and sternopleural suture. All three dorsocentrals strong; basal scutellars divergent and equal to the parallel apicals; fine hairs on disc, margin, and beneath apex of scutellum; 1 humeral; 1 presutural; 2 notopleurals, posterior one weaker; 1 strong supraalar; 2 strong postalar; 1 small propleural hair; 1 or two prosternal hairs distinctly larger and blacker than rest.

Legs yellowish-brown. Fore femur with black bristles on postero-dorsal and apical half of postero-ventral surfaces; fore tibia with preapical and weak apical; mid femur with stout bristles on apical half of anterior surface, and 1 posterior apical bristle; hind femur with small bunch of short black spines about antero-ventral quarter and 1 antero-dorsal bristle at apical quarter; hind tibia with strong preapical and weak apical.

Wings lightly shaded without any evident darker shading about cross veins; veins light brown. Costal spines before and beyond apex of subcostal vein, all less than width of costa except the pair at the apex of subcosta which equal diameter of costa; short heavy costal spines ending just beyond apex of 2nd vein; 5th vein not reaching wing margin, but rather abruptly discontinued half way to margin. Wing indices: costal about 3.95; 4th vein about 1.45; 4c about 0.75; 5x about 0.7.

Halteres light brown.

ABDOMEN: Dark greyish-brown.

External genitalia (Fig. 151): Genital arch with 30 or more bristles over surface with an aggregate of them at the rounded antero-ventral angle, small projection at apical third of anterior margin; anal plate triangular with bristles over most of its surface; clasper broadly rounded at apex.

*Holotype*: DUN Mt.: 3,000 ft., 5-7.i.1922, ♂, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined*: Holotype.

*Remarks*: Readily separated from *A. scutellata* and *A. bivittata* by having the dark thoracic vitta on thorax lower on pleura. Female unknown.

***Allophylopsis scutellata* (Hutton). Figs. 143, 150, 164, 177, 180**

*Helomyza scutellata* Hutton, 1901. Trans. N.Z. Inst. 33 : 81.

*Huttonomyia scutellata* (Hutton): Malloch, 1922. N.Z. J. Sci. Tech. 5 : 227.

*Allophylopsis scutellata* (Hutton): Tonnoir and Malloch, 1927. Rec. Cant. [N.Z.] Mus. 3 : 93.

#### MALE AND FEMALE

**HEAD** (Figs. 177, 180): Arista brown, rays of pubescence, especially towards apex, 2 or more times width of basal segments of arista. Antenna brown; 2nd segment darker brown and with 1 strong apical dorsal and other shorter apical hairs, longer ventrally; basal segment also darker brown and with small black hairs. Front dark brown with some grey dusting. Ratio of lengths of fronto-orbitals, anterior to posterior, 1 : 1.25; posterior orbital about three-quarters postverticals and half inner verticals; fine black hairs over most of surface of orbit and front, anterior to ocelli. Face dark brown, but light brown beneath antennae. Carina scarcely differentiated. Cheeks light brown. One prominent bristle at lower posterior corner of cheek about equal in length to vibrissa; hairs on lower half of cheek anteriorly. Occiput dark brown. Eyes with few very short hairs. Vertical diameter of eye about 4.5 times width of cheek in same axis. Proboscis brown, palpi brown.

**THORAX**: Yellowish-brown; mesonotum with brown vitta covering whole area between dorsocentrals and extending onto middle of disc of scutellum, dark brown vitta arising on humerals and extending to near middle of postscutellum, dorsal margin along line bounded by presutural and between the two postalar, ventral margin from below humeral bristle across dorsal mesopleuron and pteropleuron. Basal scutellars divergent, about third distance to parallel apical scutellars from base; 1 humeral; 1 presutural; 2 notopleurals; 1 supraalar; 2 strong postalar; fine hairs on disc and beneath apex of scutellum; 1 fine short hair on propleuron.

Legs (Fig. 143) light brown; mid and hind femora broadly ringed with brown at apical quarter; mid and hind tibiae with similar ring near base and hind tibia also darkened at apex. Fore femur with long bristles on postero-dorsal and postero-ventral surface; in male, basal two-thirds of postero-ventral surface with long, fine brown hairs as long as the black bristles elsewhere on femur; fore coxa also with fine hairs at apex in males; fore tibia with strong preapical but weaker apical; mid femur with strong stout bristles on apical half of anterior surface and 1 posterior apical bristle; mid tarsus with strong short black spines at apices of each segment; hind femur with clump of short stump spines on apical quarter of antero-ventral margin and weak antero-dorsal bristle at apical quarter; hind tibia with preapical and weak apical.

Wings (Fig. 164) light brown with faint brown shading about cross veins; veins light brown except dark brown anterior cross vein. Costal spines before and beyond apex of subcostal vein all equal to or less than diameter of costa, except the longer pair of spines at apex of subcosta; short stout costal spines extending just beyond apex of 2nd vein. Wing indices: costal about 3.3; 4th vein about 1.7; 4c about 0.8; 5x about 0.7.

Halteres dark brown with light brown stalk and pedicel.

**ABDOMEN**: Dark brown with slight greyish dusting.

External male genitalia (Fig. 150): Genital arch with about 25 bristles<sup>1</sup> on either side aggregated near anterior ventral corner, slight projection at anterior margin; anal plate with long bristles over most of its surface; clasper triangular and somewhat pointed at apex and shaped as in diagram, bare of bristles on outer surface but with about 12 very short bristles arising from inner surface.

*Holotype*: ♂, (G. V. Hudson), (Cant. Mus.).

*Material Examined*: Holotype, 28 ♂, and 30 ♀.

*New Records*: WHANGAROA: -ii.1917, ♂, (Anon.), (Dom. Mus.).  
LITTLE BARRIER ISLAND: 22.xi.1954, 1 ♀: Thumb and Summit tracks, 23.xi.1954, 1 ♂, 1 ♀: Turners Stream, 29.xi.1954, 2 ♀, (R. A. Harrison), (P.D.D.). WAITAKERE RANGES: Swanson, ex stream, 11.xii.1948, 1 ♂, 1 ♀, (R. A. Harrison): Oratia, near stream, 25.iii.1949, 1 ♂, (R. A. Harrison): Titirangi, ex light trap, 20.ii.1953, 1 ♂; 2.ii.1953, 1 ♀; 8.ii.1953, 1 ♀; 4.viii.1953, 1 ♀, (C. R. Thomas), (P.D.D.).  
AUCKLAND: Avondale, ex bush, 27.viii.1948, 1 ♀ (R. A. Harrison), (P.D.D.). NATIONAL PARK: 4,000 ft., 6.xi.1949, 1 ♀, (K. P. Lamb), (P.D.D.). WELLINGTON: Wiltons Bush, 25.xi.1920, 1 ♀; 2.i.1941, 2 ♂; 5.ii.1941, 1 ♂, 1 ♀; 25.ii.1943, 1 ♂, 1 ♀; 17.xii.1943, 1 ♀, (G. V. Hudson), (Dom. Mus.): Karori, 23.x.1919, 2 ♀, (Anon.), (Dom. Mus.).  
STEPHENS ISLAND: 14-28.i.1933, 2 ♂, 1 ♀, (E. S. Gourlay), (Cawt. Inst.). NELSON: Aniseed Valley, native bush by swamp, 26.ii.1949, 2 ♂, 2 ♀, (A. Carsen); swept ex bush, 24.xi.1949, 1 ♂; 6.ii.1950, 1 ♂, (A. W. Parrott): Upper Maitai, 29.i.1945, 1 ♂, 1 ♀; Glen Valley Bush, swept, 16.iii.1951, 1 ♀, (A. W. Parrott): Cawthron Park, swept off Bracken fern, 16.ii.1950, 3 ♂, 2 ♀, (A. W. Parrott), (Cawt. Inst.).  
TAPAWERA: 11.xii.1942, 1 ♂, (P. Howell), (Cawt. Inst.). DUN MT.: Track, 17.i.1950, 1 ♂, 1 ♀, (J. G. Dawber), (Cawt. Inst.). MAKARORA: 1,000 to 2,000 ft., -xii.1924, 1 ♀, (C. Fenwick), (Dom. Mus.).  
DUNEDIN: Leith, 17.vii.-, 1 ♀, (Anon.), (Ak. Mus.): 2.x.1916, 1 ♂, (C. Fenwick), (U.S.N.M.). NO DATA: 6 ♂, 4 ♀, (Anon.), (Ak.Mus.).

*Distribution*: Whangaroa, Little Barrier Island, Auckland, Waitakere Ranges, National Park, Wellington, Makarora, Nelson, Stephens Island, Tapawera, Dun Mt., Lake Brunner, Christchurch, Banks Peninsula, Dunedin. (July, August, October to March).

*Remarks*: The commonest species of the genus and occurs over most of both islands. Characterised by the brown longitudinal vittae on thorax and separated from the closely related species, *A. bivittata*, by the relatively long rays of the arista.

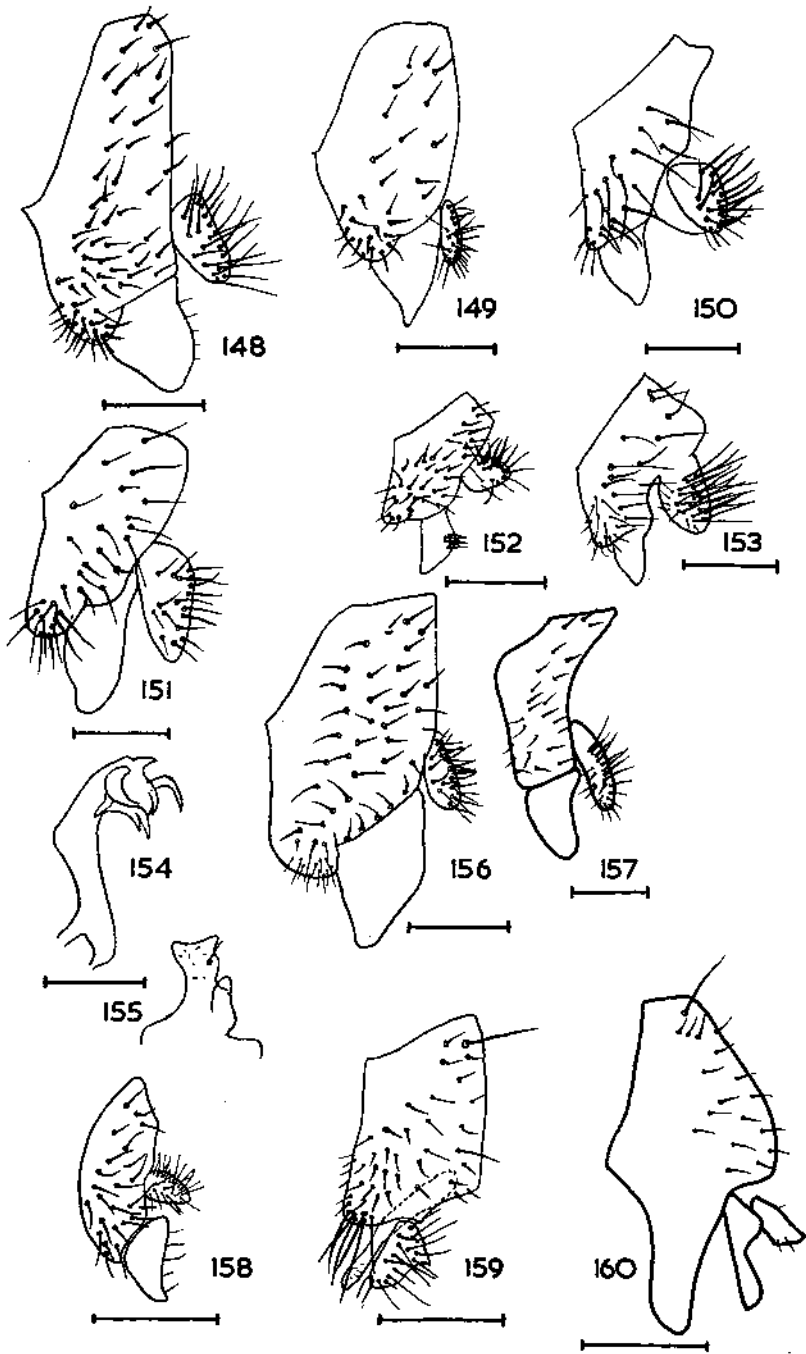
### ***Allophylopsis bivittata* sp.n. Figs. 144, 153, 166, 178**

A shining yellowish-brown fly with a dark brown vitta on each side of thorax. Body length about 5.0 mm., wing length about 4.0 mm.

#### MALE AND FEMALE

**HEAD** (Fig. 178): Arista pubescent, the longest hairs equal to width of base of arista; terminal segment black, basal segments light reddish-brown. Antenna with 1st segment and base of 2nd segment black, rest of 2nd segment and 3rd segment light reddish-brown. Front reddish-brown with light grey dusting on dorsal two-thirds. Ratio of lengths of fronto-orbitals, anterior to posterior, 1 : 1.3; verticals strong; hairs over front and orbits. Face yellowish-brown with irregular black marking across ventral third, slightly carinate. Cheeks yellowish-brown with faint grey dusting. One strong bristle at lower posterior corner of cheek about same length as vibrissa. Occiput grey dusted. Vertical diameter of eye about 4.5 times width of cheek in same axis. Proboscis dark brown; palpi yellowish-brown.

**THORAX**: Mesonotum yellowish-brown, light brown between dorsocentrals and on centre of scutellum; dark brown vitta completely covering humerus except for small ventral area, fringing dorsal mesopleuron, passing through wing base and extending to postscutellum which is completely dark brown; pleura light



External male genitalia:

- Fig. 148. *Allophyllopsis rufithorax*  
 ,, 149. *A. minuta*  
 ,, 150. *A. scutellata*  
 ,, 151. *A. subscutellata*  
 ,, 152. *A. inconspicua*  
 ,, 153. *A. bivittata*

Fig. 154. Penis of *A. minuta*

,, 155. Paramere of *A. minuta*

External male genitalia:

- Fig. 156. *A. hudsoni*  
 ,, 157. *A. obscura*  
 ,, 158. *Allophylina albitarsis*  
 ,, 159. *Heloclusia flavitarsis*  
 ,, 160. *H. aristata*

Scale: 0.25 mm.

yellowish-brown. Divergent basal scutellars equal to parallel apicals; 1 strong humeral; 2 notopleurals; 1 supraalar; 2 strong postalars; small propleural hair; one of prosternal hairs strong.

Legs (Fig. 144): Fore legs dark brown with tibia and tarsus brown; mid and hind legs with dark brown coxae and trochanters, remaining segments light brown except brown apex of hind femur. Fore femur with postero-dorsal bristle and postero-ventrals on apical half, without long fine hairs in male; fore tibia with preapical and weak apical; mid femur with strong anterior bristles on apical quarter and strong posterior apical; hind femur with 1 antero-dorsal at apical quarter, short spines on apical quarter of antero-ventral surface; hind tibia with preapical and weak apical.

Wings (Fig. 166) broad, light brown; faint shading about cross veins. Costal spines less than diameter of costa; short stout costal spines ending just beyond apex of 2nd vein; 5th vein terminated about half way to wing margin. Wing indices: costal about 3.8; 4th vein about 1.6; 4c about 0.6; 5x about 0.8.

Halteres yellowish-brown basally, brown to dark brown apically.

**ABDOMEN:** Dark brown, light brown apically.

External male genitalia (Fig. 153): Genital arch, anal plate, and clasper all chitinised and with a thick matt of minute hairs over whole surface. Genital arch broad, about 30 bristles on either side scattered over the surface, and about 12 of them smaller than the rest and situated near anterior ventral angle of arch, slight projection on anterior margin; anal plate with about 30 bristles placed over its surface; clasper fused completely to arch and subtriangular in shape with rounded apex, matt of hairs and no bristles on outer surface, and some minute bristles over entire inner surface.

*Holotype:* WAITAKERE RANGES: Titirangi, ex light trap, 19.ii.1953, ♂, (C. R. Thomas), (P.D.D.).

*Paratypes:* WAITAKERE RANGES: Titirangi, ex light trap, 17.ii.1953, 1 ♀; 14.vii.1953, 1 ♂, 1 ♀, (C. R. Thomas), (P.D.D.).

*Material Examined:* Holotype, 1 ♂ and 2 ♀ paratypes, 2 ♂, 4 ♀, and 1 ex.

*Other Records:* AUCKLAND: Browns Bay, in *Leptospermum* bush, 18.ii.1949, 1 ex, (R. A. Harrison), (P.D.D.). OHAKUNE: Blyth Track, 22.iv.1951, 2 ♂, (R. A. Harrison), (P.D.D.). TARARUA RANGES: Below Fields Hut, 1.xii.1952, 1 ♀; Fields Hut, 9.xii.1952, 1 ♀, (B. A. Holloway), (Dom. Mus.). STOKES VALLEY: 13.xii.1952, 1 ♀, (B. A. Holloway), (Dom. Mus.). WAIKAREMOANA: 12.xii.1949, 1 ♀, (R. R. Forster), (Dom. Mus.).

*Distribution:* Waitakere Ranges, Auckland, Ohakune, Waikaremoana, Tararua Ranges, Stokes Valley. (July, December, February, April).

*Remarks:* Closely related to *A. scutellata* and superficially both species look the same with the characteristic dark brown vitta on the lateral region of mesonotum and the light grey band just median to this vitta. The colour of central area between the dorsocentrals varies in intensity in both *bivittata* and *scutellata* and may be dark brown or scarcely differentiated. The males of *bivittata* lack the long hairs on fore femur, which are characteristic of *scutellata*. This character makes separation of males of the two species easy. The hairs on arista of *bivittata* are equal to or just longer than diameter of basal segment, whereas those of *scutellata*, at least on apical half of arista, are much longer than diameter of basal segment. This feature readily separates females. Characters of the external genitalia are different in both species but rarely need to be examined to determine the species.

### Subgenus ALLOPHYLLATA subgen. nov.

Anterior dorsocentral bristle mid way between line of presuturals and 2nd dorsocentral. Anterior coxa without strong median bristle. Clasper with clump of hairs near outer posterior margin.

Type Species: *Allophylopsis (Allophyllata) inconspicua* Tonnoir and Malloch

The most important character separating this subgenus from others is the hairs on the clasper. When male genitalia are not examined, and with females, the position of the anterior dorsocentral bristle is important.

Species: *Allophylopsis (Allophyllata) inconspicua* Tonnoir and Malloch

### **Allophylopsis inconspicua** Tonnoir and Malloch. Figs. 152, 165

*Allophylopsis inconspicua* Tonnoir and Malloch, 1927. Rec.  
Cant. [N.Z.] Mus. 3 : 95.

A light brown species with clear wings. Body length about 3.5-4.0 mm., wing length about 4.0 mm.

#### MALE AND FEMALE

**HEAD:** Arista dark brown apically, rays of pubescence shorter than diameter of basal segments. Antenna light brown; 3rd segment large, greyish-brown on apical two-thirds; 2nd segment with dorsal apical bristle. Front brown, light brown area about anterior fronto-orbital. Ratio of lengths of orbitals, anterior to posterior, 1 : 1.25; posterior bristles just shorter than postverticals and about half length of inner verticals; fine hairs over most of front, anterior to ocelli. Face brown, slightly carinate. Cheeks brown with light grey dusting. One prominent bristle at lower posterior angle of cheek about three-quarters length of vibrissa. Occiput brown. Eyes with a few very short hairs. Vertical diameter of eye about 3.75 times width of cheek in same axis. Proboscis light brown; palpi yellowish-brown.

**THORAX:** Generally brown; mesonotum without vittae; scutellum yellowish-brown. Anterior dorsocentral the weakest of the three; divergent basal scutellars about half way from base of scutellum to apical bristles and distinctly longer than the parallel or convergent apicals; disc of scutellum convex and fine hairs on its surface particularly at lateral margins and beneath apex; 1 humeral; 2 notopleurals; 1 strong presutural; 1 supraalar; 2 strong postalars; 1 posterior sternopleural; 1 small prepleural hair.

Legs light brown. Fore femur with row of postero-dorsal bristles and postero-ventrals on apical half and at base; fore tibia with strong preapical and weak apical; mid femur with strong and stout but short bristles on apical half of anterior surface, apical bristle distinctly stronger than rest and 1 apical posterior bristle similar to apical anterior; hind femur with 1 antero-dorsal at apical quarter, short antero-ventral spines about apical quarter, minute and often scarcely differentiated; hind tibia with distinct preapical and weak apical.

Wings (Fig. 165) light brown with trace of brown shading about cross veins and towards base of wing; vein light brown. Costa with spines before and beyond apex of subcosta, those before apex equal to or less than diameter of costa, those beyond apex much less than diameter of costa; short costal spines fading out about quarter distance between apices of 2nd and 3rd veins; 5th vein not reaching wing margin but terminated just over half way to margin. Wing indices: costal about 3.6-4.1; 4th vein about 1.8; 4c about 0.7; 5x about 0.7.

Halteres light brown stalk, brown apex.

**ABDOMEN:** Brown.

Female genitalia yellowish-brown.

Male genitalia (Fig. 152): Genital arch light brown, anal plates light brown, claspers light brown. Arch with about 35 to 40 bristles over surface, projection about half way down anterior margin; anal plate triangular, straight inner margin, bristles long, and most on this margin; clasper longer than broad, narrowed apically to rounded antero-ventral corner, clump of about 7 bristles on posterior margin where narrowing begins, upwards of 20 short fine bristle-like hairs on inner surface of clasper. Penis sharply angled at 90° near base.

*Holotype*: WAITAKERE RANGES: Nihotupu, 23.ii.1923, ♀, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined*: Holotype, 6 ♂, and 9 ♀.

*New Records*: LITTLE BARRIER ISLAND: Waipawa stream bed, 25.xi.1954, 2 ♂, 2 ♀: Turners Stream, 29.xi.1954, 3 ♂, 6 ♀, (*R. A. Harrison*), (P.D.D.). WAITAKERE RANGES: Titirangi, ex light trap, 7.vii.1953, 1 ♂, (*C. R. Thomas*), (P.D.D.). AUCKLAND: Browns Bay, 25.ix.1949, 1 ♀, (*R. A. Harrison*), (P.D.D.).

*Distribution*: Little Barrier Island, Waitakere Ranges, Auckland. (July, November, February).

### Subgenus ALLOPHYLOPSIS Lamb

*Allophylopsis* Lamb, 1909. "Subantarct. Is. N.Z." 1: 142.

Arista with rays of pubescence less than diameter of basal segment. Anterior dorsocentrals on line of presuturals or immediately posterior to them; presutural bristle present. Fore coxa with strong median anterior bristle.

Type Species: *Allophylopsis (Allophylopsis) laquei* (Hutton)

Readily separated from other subgenera by the presence of a presutural bristle, minute pubescence of the arista and the position of the anterior dorsocentral bristle.

#### *Species*:

- Allophylopsis (Allophylopsis) chathamensis* Tonnoir and Malloch
- A. (Allophylopsis) distincta* Tonnoir and Malloch
- A. (Allophylopsis) fulva* (Hutton)
- A. (Allophylopsis) fuscipennis* Tonnoir and Malloch
- A. (Allophylopsis) hudsoni* (Hutton)
- A. (Allophylopsis) laquei* (Hutton)
- A. (Allophylopsis) minuta* Tonnoir and Malloch
- A. (Allophylopsis) obscura* Tonnoir and Malloch

The largest subgenus in the genus and formed of species which are all closely related.

#### KEY TO SPECIES OF SUBGENUS ALLOPHYLOPSIS

- 1 Wings with distinct brown shading at apices of 2nd and 4th veins ..... **chathamensis**  
Wings without shading at apices of 2nd and 4th veins ..... 2
- 2 Costal spines distinctly greater than diameter of costa ..... 3  
Costal spines equal to or less than diameter of costa ..... 4
- 3 Body and wing length about 3.5 mm. .... **minuta**  
Body and wing length greater than 5.0 mm. .... **hudsoni**
- 4 Costal index greater than 5.0 ..... **laquei**  
Costal index less than 4.5 ..... 5
- 5 Mesonotum brown between dorsocentrals ..... **distincta**  
Mesonotum silvery-grey between dorsocentrals ..... 6
- 6 Costal index between 4.0 and 4.5 ..... **obscura**  
Costal index not greater than 3.5 ..... 7
- 7 Wings distinctly darkened towards base ..... **fuscipennis**  
Wings not darkened towards base ..... **fulva**



**Allophylopsis chathamensis** Tonnoir and Malloch. Fig. 170

*Allophylopsis chathamensis* Tonnoir and Malloch, 1927. Rec. Cant. [N.Z.] Mus. 3 : 94.

A yellowish-brown species with light brown wings having several distinctive dark brown areas. Body length about 5.0 mm., wing length about 5.0 mm.

FEMALE

**HEAD:** Arista dark blackish-brown merging to yellowish-brown at base, rays of pubescence minute and much less than diameter of basal segments. Antenna yellowish-brown; 3rd segment mostly brown or light brown; 2nd segment with 1 small apical dorsal bristle and with black hairs chiefly on apical margin; basal segment with short black hairs. Front yellowish-brown, orbits and ocellar region with some grey dusting. Anterior fronto-orbital about three-quarters length posterior; verticals strong; inner vertical about twice length posterior fronto-orbitals; postverticals just longer than posterior fronto-orbitals; short black hairs on all front and orbits anterior to posterior fronto-orbital. Face concave, yellowish-brown; brown area between base of antennae and eyes. Cheeks yellowish-brown; 1 strong bristle at lower posterior angle of cheek about two-thirds length of vibrissa. Occiput light brown with grey dusting. Eyes with small hairs. Vertical diameter of eye about 3.5 times width of cheek in same axis. Proboscis and palpi light brown.

**THORAX:** Light brown; mesonotum with brown spots at base of hairs; brown area between dorsocentrals posteriorly; scutellum brown on disc; pleura brown dorsally from propleuron to below wing base. All three dorsocentrals strong, the anterior bristle close to suture; basal scutellars equal to apicals, and one-third distance from base of scutellum to apical bristles; scutellum with hairs on disc and ventral to apex; 1 humeral; 1 presutural; 2 notopleurals; 1 supraalar; 2 strong postalars; mesopleuron haired; sternopleural strong.

Legs yellowish-brown. Fore femur with strong postero-dorsal bristles, those towards base placed more posteriorly and with strong bristles on apical half of postero-ventral surface; fore tibia with strong preapical and weak apical; mid femur with strong spines on apical half of anterior surface and 1 strong posterior apical bristle; mid tarsus with short black apical spines on segments; hind femur with 1 anterior bristle at apical quarter; hind tibia with preapical and small apical.

Wings (Fig. 170) light brown with dark brown shading about cross veins, apex of subcosta, base of 3rd vein, and apices of 2nd and 4th veins; cross vein at apex of 2nd basal cell dark brown. Costal spines small and less than diameter of costa, pair at base of costa and at apex of subcosta the strongest; small black costal spines ending at apex of 2nd vein; 5th vein ending just over half way to wing margin. Wing indices: costal about 4.3; 4th vein about 1.5-1.7; 4c about 0.6-0.7; 5x about 0.6. An aberration of venation in left wing of paratype is a small preapical stump vein on 2nd vein with a small dark brown area surrounding it.

Halteres light brown.

**ABDOMEN:** Light brown with brown posterior margins on tergites. Genital plates brown.

*Holotype:* CHATHAM ISLANDS: no data, ♀, (Cant. Mus.).

*Material Examined:* Holotype and 1 paratype.

*Distribution:* Chatham Islands.

*Remarks:* Separated from other species in the subgenus by the distinctive brown shaded areas of the wings.

**Allophylopsis minuta** Tonnoir and Malloch. Figs. 140, 149, 154, 155, 167

*Allophylopsis minuta* Tonnoir and Malloch, 1927. Rec. Cant. [N.Z.] Mus. 3 : 95.

A brown, grey dusted species. Body length about 3.5 mm., wing length about 3.5 mm.

#### MALE AND FEMALE

**HEAD:** Arista dark brown apically, light brown basally, rays of pubescence minute, less than width of basal segments. Antenna light brown; 3rd segment brown towards apex; 2nd segment with 1 dorsal apical bristle and short black hairs about apex and elsewhere; basal segment with small black hairs. Front brown, grey dusted more heavily on orbits. Ratio of fronto-orbitals, anterior to posterior, 1 : 1.5; anterior orbital four-fifths postverticals which are half inner verticals; fine hairs on orbits and middle portion of front anterior to ocelli. Face brown to light brown, slightly carinate. Cheeks light brown, grey dusted. One prominent bristle at lower posterior corner of cheek four-fifths length of vibrissa. Occiput greyish-brown. Eyes bare. Vertical diameter of eye about 4.5 times width of cheek in same axis. Proboscis dark brown; palpi light brown.

**THORAX:** Generally brown; mesonotum and scutellum heavily grey dusted. Posterior dorsocentral bristle just longer than other two; parallel basal scutellars about two-fifths distance from base of scutellum to apical bristles and just shorter than length of apicals, apical bristles parallel or divergent; scutellar disc almost flat with short fine hairs on surface and below apex; 1 humeral; presutural strong; 2 notopleurals; 1 supraalar; 2 strong postalars; 1 posterior sternopleural; 1 small propleural hair.

Legs (Fig. 140) light brown, fore femur brown. Fore femur with bristles on postero-dorsal surface, those at apex more dorsal, one very fine basal bristle and strong bristles on apical half of postero-ventral surface; fore tibia with strong preapical and weak apical; mid femur with strong short anterior bristles on apical half and 1 posterior apical; mid tarsus with strong spines at apex of each segment; hind femur with 1 antero-dorsal bristle at apical quarter and 1 or 2 very strong black spines at apical quarter of antero-ventral surface; hind tibia with strong preapical and weak apical.

Wings (Fig. 167) light brown with faint brown shading about cross veins; veins light brown. Costa with pair of strong spines at apex of subcosta, no spines basal to this pair but other spines along costa beyond subcosta, these spines greater than diameter of costa; short costal spines not clearly differentiated and ending at apex of 2nd vein; 5th vein not reaching margin of wing and terminated half way to margin. Wing indices: costal about 4.9; 4th vein about 1.6; 4c about 0.6; 5x about 0.7.

Halteres brown, darker apex.

**ABDOMEN:** Greyish-brown somewhat shining but with grey dusting. Genital plates of female greyish-brown.

Male genitalia (Figs. 149, 154, 155): External parts light brown; genital arch with a few short bristles scattered over whole surface, the majority about the rounded antero-ventral margin; anal plates small and ovoid, with bristles, the longest longer than those on arch and most placed on posterior and ventral margins; clasper triangular with apex produced slightly into a narrow rounded knob, no hairs on outer surface but distinct hair-like bristles over whole of inner surface. Penis enlarged in middle and angled through approximately 90° at preapical position; parameres with a few minute spines and bristles.

*Holotype:* MT. ARTHUR: 5,040 ft., 13.x.1921, ♀, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined:* Holotype, 2 ♂, and 2 ♀.

*New Records:* BEEBY KNOB: 4,200 ft., 23.ii.1954, 2 ♂, 2 ♀, (*E. S. Gourlay*), (Cawt. Inst.).

*Distribution:* Mt. Arthur, Beeby Knob. (October, February).

*Remarks:* Male previously unknown. The male genitalia are relatively large. In this species, the smallest of the genus, the penis is much larger than in larger sized species. The small size of the species together with the long costal spines most readily separates it from others in the subgenus.

**Allophylopsis hudsoni** (Hutton). Figs. 141, 156, 171

*Helomyza hudsoni* Hutton, 1901. Trans. N.Z. Inst. 33 : 8.

*Allophylopsis hudsoni* (Hutton): Tonnoir and Malloch, 1927.  
Rec. Cant. [N.Z.] Mus. 3 : 96.

*Allophylopsis proxima* Tonnoir and Malloch, 1927. Rec. Cant.  
[N.Z.] Mus. 3 : 96. (*New Synonymy*).

A greyish-brown species with light brown wings having distinct brown areas surrounding the cross veins. Body length about 6.0 mm., wing about 5.0 mm.

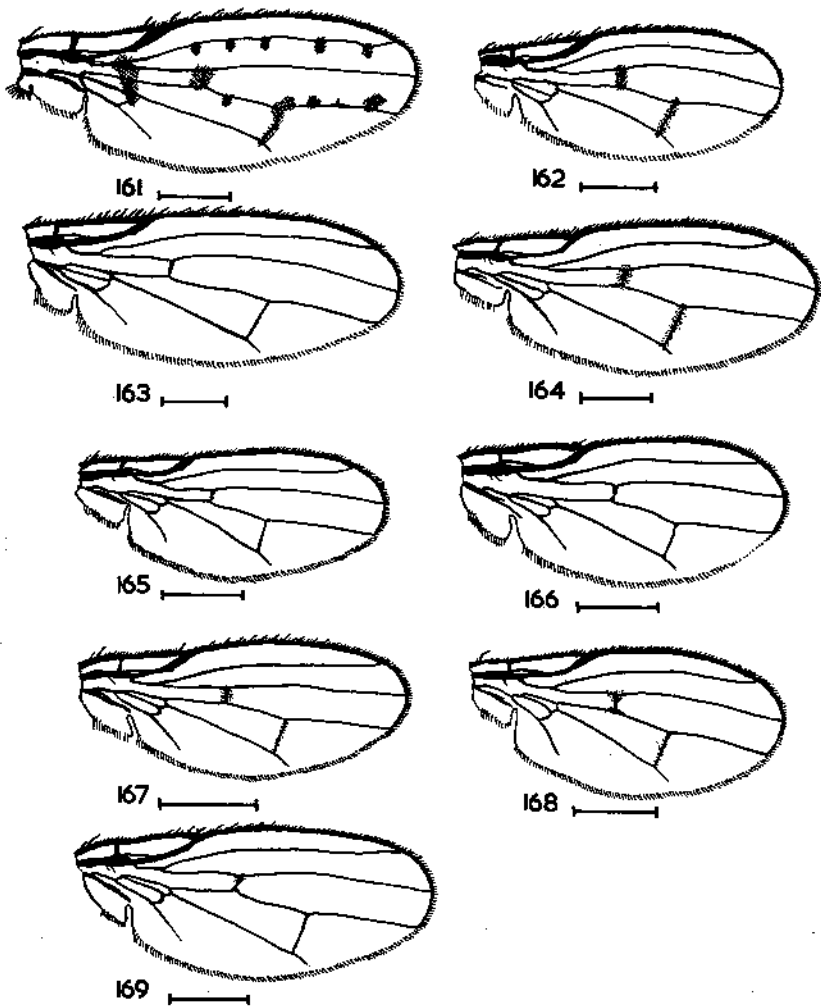


Fig. 161. Wing of *Allophylopsis philpotti*  
 " 162. " " *A. lineata*  
 " 163. " " *A. rufithorax*  
 " 164. " " *A. scutellata*  
 " 165. " " *A. inconspicua*  
 " 166. " " *A. bivittata*  
 " 167. " " *A. minuta*  
 " 168. " " *A. fuscipennis*  
 " 169. " " *A. obscura*

Scale: 1.0 mm.

## MALE AND FEMALE

**HEAD:** Arista dark brown; pubescent, rays of pubescence minute and much less than diameter of basal segments. Antenna brown; 2nd segment with a short dorsal apical bristle and black hairs on surface particularly around apical margin; basal segment with few short black hairs on inner apical margin. Front reddish-brown dusted with grey, more thickly on orbits. All frontal bristles strong, cruciate postverticals the shortest; small black hairs on front except region about ocelli. Face brown with grey dusting. Cheeks thickly grey dusted. One bristle at lower posterior angle of cheek about two-thirds length of vibrissa. Occiput reddish-brown with grey dusting. Eyes bare. Vertical diameter of eye about 4 times width of cheek in same axis. Proboscis brown; palpi light brown with grey dusting.

**THORAX:** Greyish-brown; mesonotum heavily dusted with grey with faint brown vittae between dorsocentrals and alars; faint brown area from propleuron, across dorsal mesopleuron to pteropleuron; hairs and bristles usually arising from small brown spot. All three dorsocentrals strong, the anterior one just posterior to the line of the presuturals; divergent basal scutellars about equal to apicals in length and about half distance from base of scutellum to apicals; scutellum haired on disc and below apex. 1 humeral; 1 strong presutural; 2 notopleurals; 1 strong supraalar; 2 strong postalars.

Legs (Fig. 141) light reddish-brown. Fore femur with strong bristles on postero-dorsal surface, those towards base more posterior than others, and strong bristles on apical half of postero-ventral surface; fore tibia with strong preapical; mid femur with strong bristles on apical half of anterior surface and 1 strong apical posterior; mid tibia with strong apicals; mid tarsus with strong spines at apex of each segment; hind femur with 1 bristle at about apical quarter of antero-dorsal surface; hind tibia with strong preapical and weak apical.

Wings (Fig. 171) light brown with brown areas about the 2 cross veins; veins brown. Costa with single row of spines longer than diameter of costa, a pair of similar spines at apex of subcosta, and 2 strong spines near base of costa; short stout costal spines ending just beyond apex of 2nd vein; anal vein ending about two-thirds distance to wing margin. Wing indices: costal about 4.6; 4th vein about 1.4; 4c about 0.6; 5x about 0.7.

Halteres light brown stalks, brown or dark brown knobs.

**ABDOMEN:** Light brown with faint, greyish dusting; dark or greyish-brown posterior band on each tergite.

Male genitalia (Fig. 156): Genital arch yellowish-brown, with bristles over most of the surface especially at antero-ventral rounded corner; anal plate yellowish-brown, small, with large number of bristles all finer but not longer than those on arch; clasper yellowish-brown, marginal apex narrowly rounded, bare on outer surface and with short hair-like bristles on inner surface. Penis broad basally and curved through about 70°.

Female genital plates reddish-brown.

*Holotype:* WELLINGTON: no date, ♀, (Cant. Mus.).

*Material Examined:* Holotype, allotype, 3 ♂, 6 ♀, holotype and paratypes of *A. proxima*.

*New Records:* SALISBURYS OPENING: 2,500 ft., 17.i.1943, 1 ♂, (*E. S. Gourlay*), (Cawt. Inst.). MT. ROBERT: 4,000 ft., 29.i.-2.ii.1946, 1 ♂, 1 ♀, (*E. S. Gourlay*), (Cawt. Inst.). MT. PEEL: 21.i.1943, 1 ♀, (*E. S. Gourlay*), (Cawt. Inst.). PORTERS PASS: Fog Peak, 4,000 ft., 28.xi.1954, 1 ♀, (*R. R. Forster*), (Cant. Mus.). NO DATA: 3-4.iv.1920, 1 ♂, 2 ♀, (*Anon.*), (Ak. Mus.): 1 ♀, (*J. W. Campbell*), (U.S.N.M.).

*Distribution:* Wellington, Salisburys Opening, Mt. Peel, Mt. Robert, Porters Pass. (November, January, February, April).

*Remarks:* Tonnoir and Malloch (1927) separate *A. hudsoni* and *A. proxima* by the absence of brown spots at the base of hairs on the mesonotum in *hudsoni* and their presence in *proxima*. The types of

*A. hudsoni* have brown spots present. The male genitalia of both species have been compared and no reliable differences found.

***Allophylopsis laquei* (Hutton). Figs. 173, 175**

*Heteromyza laquei* Hutton, 1902. Trans. N.Z. Inst. 34 : 173.

*Allophylopsis punctata* Lamb, 1909. "Subantarct. Is. N.Z."  
1 : 143.

*Allophylopsis laquei* (Hutton): Tonnoir and Malloch, 1927.  
Rec. Cant. [N.Z.] Mus. 3 : 97.

A brown species with greyish-brown abdomen. Body length about 5.0 mm., wing length about 5.0 mm.

MALE AND FEMALE

**HEAD:** Arista dark brown; rays of pubescence much less than width of basal segments. Antenna brown; 3rd segment light brown at base; 2nd segment with 1 small dorsal apical bristle and black hairs on apical margin; basal segment with few short black hairs. Front yellowish-brown, orbits grey dusted, and brown or dark brown vitta on either side of ocellar area converging to near middle of anterior margin of front and extending posteriorly to area behind each posterior ocellus; ocellar area grey dusted. Anterior fronto-orbital just shorter than posterior; ocellars and verticals strong; inner vertical about 1.5 times length of posterior fronto-orbital; small black hairs over most of front and orbits. Face brown to light brown, concave. Cheeks yellowish-brown. One bristle at lower posterior margin of cheek about two-thirds length vibrissa. Occiput greyish-brown. Eyes with few very short fine hairs. Vertical diameter of eye about 3.5 times width of cheek in same axis. Proboscis yellowish-brown; palpi yellowish-brown with fine black bristles and hairs.

**THORAX:** Light brown; mesonotum with brown spots at base of most hairs, with irregular brown vitta lateral to dorsocentral row and a brown triangular area posteriorly at scutellar suture between dorsocentrals; scutellum with brown area on disc; pleura with brown dorsal areas from propleuron to below wing base. All three dorsocentrals strong; anterior bristle just posterior to line between presuturals; basal scutellars about equal to apicals and nearly half distance from base of scutellum to apicals; scutellum with hairs on disc; 1 humeral; 1 presutural; 2 notopleurals; 1 supraalar; 2 strong postalar.

Legs yellowish-brown, all femora with brown ventral preapical spot. Fore femur with strong postero-dorsal bristles, those towards base placed more posteriorly and with strong postero-ventrals on apical half; fore tibia with pre-apical and weak apical; mid femur with strong spines on apical third of anterior surface and a single strong posterior apical; mid tibial bristles strong; mid tarsus with short black spines at apex of first four segments; hind femur with strong bristle at about apical quarter of anterior surface; hind tibia with strong preapical and several very short black apicals.

Wings (Fig. 173) light brown with brown areas about the 2 cross veins; veins light brown. Bristles on costa not greater than diameter of costa at their points of origin; short black costal spines ending just beyond apex of 2nd vein; 5th vein ending about two-thirds distance to wing margin. Wing indices: costal about 5.0-5.1; 4th vein about 1.6-1.7; 4c about 0.6; 5x about 0.5-0.6.

Halteres light brown, brown apically.

**ABDOMEN:** Male: dark brown with greyish dusting; sternites yellowish-brown.

Male genitalia (Fig. 175): Genital arch light brown, bristles over most of surface, more on dorsal half than ventral and a cluster of hairs at antero-ventral corner; anal plate with many black hairs particularly on or near posterior margin; clasper with concave edge posteriorly, broadly rounded apex, and convex edge anteriorly. Penis angled through greater than 90° at about apical third, heavily chitinised on apical third; parameres small.

Female: Light brown tergites with dark brown or greyish-brown posterior regions; sternites yellowish-brown. Genital plates brown.

*Holotype:* THE SNARES: -i.1901, ♀, (*F. W. Hutton*), (Cant. Mus.).

*Material Examined:* Holotype, allotype, 2 ♂, and 1 ♀.

*Distribution:* The Snares. (January, March).

*Remarks:* The large costal index and the small costal spines are the important distinguishing characters of this species.

### ***Allophylopsis distincta* Tonnoir and Malloch**

*Allophylopsis distincta* Tonnoir and Malloch, 1927, Rec. Cant.  
[N.Z.] Mus. 3 : 98.

A brown species with grey dusting and brown spots at base of hairs and bristles on mesonotum. Body length about 4.5 mm., wing length about 5.0 mm.

#### MALE AND FEMALE

**HEAD:** Arista dark brown, brown basally; rays of pubescence less than diameter of basal segments. Antenna light brown; 3rd segment brown on all but basal quarter; 2nd segment with 1 dorsal apical bristle, 2 or 3 ventral apicals, and small apical hairs elsewhere; basal segment with a few inner apical hairs. Front brown with grey dusting, heavier on orbits and ocellar area; brown spot at base of verticals. Anterior fronto-orbital just over three-quarters posterior bristle; inner vertical nearly twice length posterior fronto-orbitals; postverticals just shorter than posterior fronto-orbitals; short black hairs on anterior half of front. Face brown and with slight carina. Cheeks light brown with brown area about vibrissa and half way along cheek. One bristle at lower posterior angle of cheek about three-quarters length vibrissa. Occiput greyish-brown. Eyes bare. Vertical diameter of eye about 4 times width of cheek in same axis. Proboscis brown; palpi yellowish-brown.

**THORAX:** Mesonotum light brown, dusted particularly on lateral margin with grey, hairs and bristles arising from brown spots except those posteriorly between posterior dorsocentrals; scutellum light brown; pleura dark brown. All three dorsocentrals strong, anterior just posterior to transverse suture; parallel basal scutellars about equal to convergent apicals and one-third distance from base of scutellum to apicals; scutellum with few fine hairs on disc and on ventral surface; strong humeral; 1 presutural; 2 notopleurals; 1 strong supraalar; 2 strong postalars.

Legs light brown; apical segments of tarsi brown. Fore femur with strong bristles on postero-dorsal surface and apical half of postero-ventral surface; fore tibia with strong preapical and weak apical; mid femur with about 4 strong anterior bristles on apical half and 1 strong posterior apical; mid tibial bristles strong; apical spines on segments of mid tarsus; hind femur with 1 strong antero-dorsal bristle at apical quarter; hind tibia with preapical and weak apical.

Wings light brown with brown shaded areas about cross veins; distinctly darkened towards base. Costal spines not greater than diameter of costa; short black costal spines ending at apex of 2nd vein; 5th vein ends about three-quarters distance to wing margin. Wing indices: costal about 3.1; 4th vein about 1.5; 4c about 0.8; 5x about 0.6.

Halteres brown with light brown stalk.

**ABDOMEN:** Brown to greyish-brown basally, brown to light brown apically.

Male genitalia: Genital arch with a few fine bristles scattered evenly over surface and a cluster of hairs at antero-ventral corner; anal plate with bristles thickly on posterior half; clasper with slightly concave posterior margin, distinct apical portion, and concave anterior margin. Penis angled at mid point, narrowest at this portion; parameres distinctly curved into S shape, narrow and bare.

*Holotype:* CASS: -ii.1925, ♂, (*A. Tonnoir*), (Cant. Mus.).

*Material Examined:* Holotype, allotype, and 2 ♀.

*New Records:* NATIONAL PARK: Beech Forest, 17.iv.1949, 1 ♀, (*R. A. Harrison*), (P.D.D.). CHRISTCHURCH: New Brighton, Dyers Road, 15.iv.1922, 1 ♀, (*J. W. Campbell*), (B.M.).

*Distribution*: National Park, Nelson, Christchurch, Cass. (December, February, April).

*Remarks*: Most readily separated from other species of the subgenus that have short costal spines by the brown or light brown portion of the mesonotum between the dorsocentrals.

***Allophlyopsis obscura* Tonnoir and Malloch. Figs. 157, 169**

*Allophlyopsis obscura* Tonnoir and Malloch, 1927. Rec. Cant. [N.Z.] Mus. 3 : 99.

A greyish-brown species with brown vittae on mesonotum and light brown wings. Body length about 4.5 mm., wing length about 4.5 mm.

MALE AND FEMALE

**HEAD**: Arista brown; minute pubescence, the rays much less than diameter of basal segments. Antenna brown, 3rd segment lighter brown at base; 2nd segment with 1 dorsal apical bristle, apical hairs stronger ventrally. Front reddish-brown with grey dusting particularly on orbits. Ratio of fronto-orbitals anterior to posterior, 2 : 1.25; posterior orbitals just longer than post-verticals and two-thirds of inner verticals; fine hairs over most of front anterior to ocelli. Face reddish-brown with grey dusting. Carina scarcely developed. Cheeks reddish-brown. One bristle at lower posterior corner of cheek just over half length of vibrissa. Occiput greyish-brown. Eyes with few very short hairs. Vertical diameter of eye about 4 times width of cheek in same axis. Proboscis brown; palpi brown.

**THORAX**: Brown or greyish-brown; mesonotum grey dusted, wide brown longitudinal vitta lateral to dorsocentrals, faint and narrower anterior to presuturals and extending along margin of scutellum; scutellum grey dusted on disc and merging to yellowish-brown at apex; humerus grey dorsally, brown elsewhere; mesopleuron mostly dark brown; pteropleuron brown; sternopleuron brown; prosternum greyish-brown. All three dorsocentrals approximately equal but posterior the strongest; basal scutellars divergent, just shorter than divergent apicals and third distance from base of scutellum to apex; fine hairs on disc of scutellum arranged approximately in 2 longitudinal rows and also beneath apex; 1 humeral; 2 notopleurals; 1 strong supraalar; 2 strong postalar; 1 propleural hair.

Legs generally brown; fore femur and tibia dark brown; fore tarsus brown except yellowish-brown basal segment with brown apical annulus; mid and hind tarsi light brown on 2 basal segments. Fore femur with bristles on postero-dorsal surface, those towards apex more dorsally placed, strong postero-ventral bristles on apical half, short black spines on apical third of antero-ventral surface; fore tibia with strong preapical and weaker apical; mid femur with strong anterior bristles on apical half, apical one the strongest and equal to the single posterior apical; mid tarsus with strong spines at apex of each segment; hind femur with 1 antero-dorsal at apical quarter and a cluster of short stout spines along apical third of antero-ventral surface; hind tibia with preapical and very weak apical.

Wings (Fig. 169) light brown with faint brown shading about the two cross veins and towards base of wing; veins light brown, anterior cross vein darker brown. Costa with spines before and beyond apex of subcosta about equal to width of costa; heavy black short costal spines to apex of 2nd vein; 5th vein fading out about half way to margin of wing from posterior cross vein. Wing indices: costal about 4.3; 4th vein about 1.4; 4c about 0.6; 5x about 0.6.

Halteres brown, light brown stalk.

**ABDOMEN**: Greyish-brown.

Male genitalia (Fig. 157): Genital arch with about 30 to 40 bristles over surface; anal plate with many bristles, some longer than those on arch; clasper broadly rounded at apex, cluster of spines on inner surface about middle and minute spines anterior to them. Parameres with 1 or more bristles; penis strong.

*Holotype*: MT. ARTHUR: 23.xii.1921, ♂, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined*: Holotype, 3 ♂, and 1 ♀.

*New Records*: ARTHURS PASS: 3,500 ft., 23.xii.1922, 1 ♂; 24.xii.1922, 1 ♀, (G. Myers), (Cawt. Inst.). KUMARA: 1 ♂, (J. W. Campbell), (U.S.N.M.). NO DATA: ♂, (J. Muggeridge), (B.M.).

*Distribution*: Wanganui, Mt. Arthur, Arthurs Pass, Otira, Kumara. (December, February).

*Remarks*: Closely related to *A. fuscipennis* but separated from it by the higher costal index and the faint brown shading at the base of the wing.

### **Allophylopsis fuscipennis** Tonnoir and Malloch. Figs. 142, 168

*Allophylopsis fuscipennis* Tonnoir and Malloch, 1927. Rec. Cant. [N.Z.] Mus. 3 : 97.

A greyish-brown species with brown shaded wings. Body length about 4.0 mm., wing length about 4.0 mm.

#### FEMALE

**HEAD**: Arista brown, rays of pubescence not greater than diameter of basal segment. Antenna light brown; 3rd segment darker brown except at base; 2nd segment with 1 dorsal apical bristle and apical hairs, stronger hairs ventrally. Front dark reddish-brown with some grey dusting more particularly on orbits and ocellar triangle. Ratio of length of fronto-orbitals, anterior to posterior, 1 : 1.5; posterior orbital half length of inner vertical; small hairs on orbits and front anterior to ocelli. Face brown; carina not developed. Cheeks light brown to brown. One prominent bristle at lower posterior corner of cheek about three-quarters length of vibrissa. Occiput greyish-brown. Eyes with a few very fine short hairs. Vertical diameter of eye about 5 times width of cheek in same axis. Proboscis brown to light brown; palpi light brown.

**THORAX**: Generally brown; mesonotum heavily grey dusted, small brown areas and spots at base of hairs particularly anteriorly, brown vitta commencing dorsal to supraalar and extending posteriorly through dorsal postalar to scutellum and continued along margin of scutellum to apical bristle; scutellum also heavily grey dusted; pleura without much dusting. Anterior and mid dosocentrals approximately equal in size and both smaller than the posterior bristle; scutellars divergent, equal to parallel apicals and about two-fifths distance from base of scutellum to apicals; fine hairs on disc and beneath apex of scutellum; 1 humeral; 2 notopleurals; 1 supraalar; 2 strong postalars; 1 minute propleural hair.

Legs (Fig. 142) light brown; fore femur brown. Fore femur with postero-dorsal bristles, strong postero-ventral bristles on apical half and 1 long fine bristle basally; fore tibia with strong preapical and weaker apical; mid femur with strong stout anterior bristles on apical half and 1 stronger posterior apical; mid tarsus with strong black spines at apex of each segment; hind femur with 1 antero-dorsal at apical quarter without black spines at apical quarter of antero-ventral surface; hind tibia with preapical and very weak apical.

Wings (Fig. 168) light brown, slightly darker brown about the 2 main cross veins and towards base of wing; veins light brown, brown in darker shaded areas. Costa with spines before and beyond apex of subcosta and equal or less than diameter of costa; heavy costal spines ending at apex of 2nd vein; 5th vein terminated about half way to margin of wing. Wing indices: costal about 3.5; 4th vein about 1.7; 4c about 0.8; 5x about 0.8.

Halteres brown, lighter brown stalk.

**ABDOMEN**: Brown basally to yellowish-brown apically.

Female genital plates yellowish-brown.

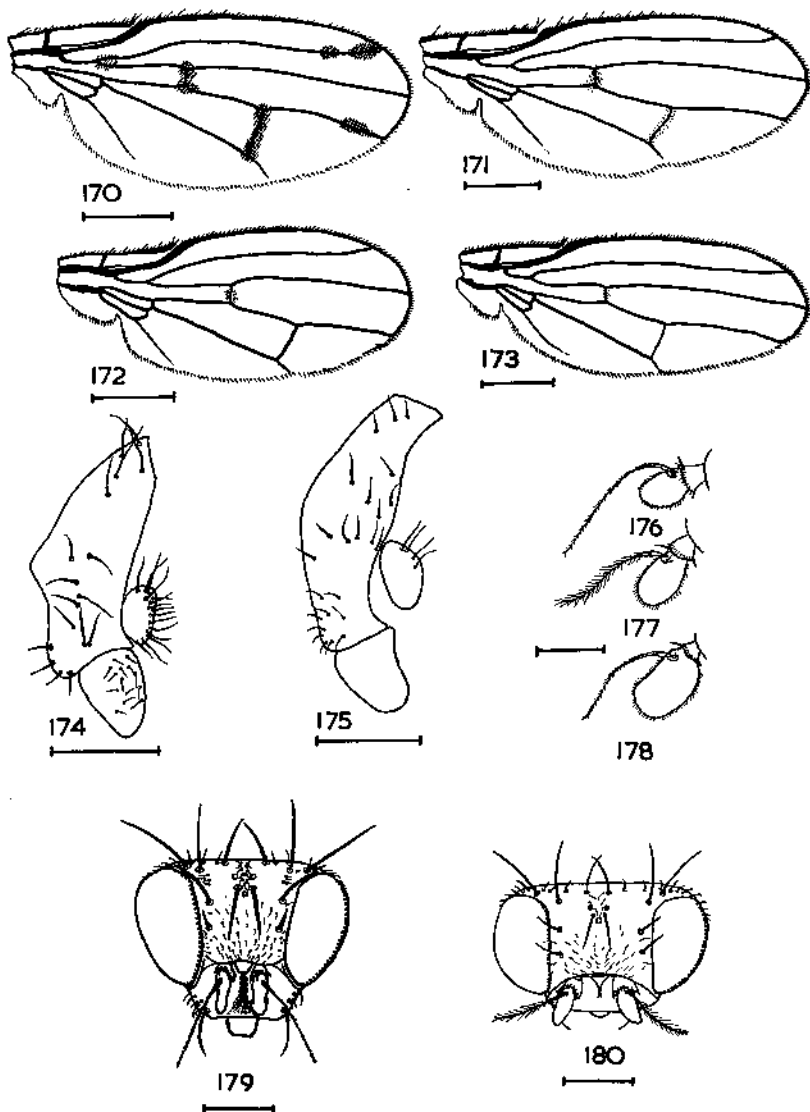
*Holotype*: COBB VALLEY: 10.xii.1922, ♀, (A. Philpott), (Cawt. Inst.).

*Material Examined*: Holotype.

*Distribution*: Cobb Valley. (December).

*Remarks*: Close to *A. obscura* and separated from it by brown areas and spots on mesonotum, and darker basal area of wing.





- Fig. 170. Wing of *Allophytopsis chathamensis*  
 " 171. " " *A. hudsoni*  
 " 172. " " *A. fulva*  
 " 173. " " *A. laquei*  
 " 174. External male genitalia of *A. fulva*  
 " 175. " " " " *A. laquei*  
 " 176. Antenna of *A. philpotti*  
 " 177. " " *A. scutellata*  
 " 178. " " *A. bivittata*  
 " 179. Head of *A. philpotti*  
 " 180. " " *A. scutellata*

Scale: Figs. 170-173, 1.0 mm.; Figs. 174, 175, 0.25 mm.; Figs 176-180, 0.5 mm.

**Allophylopsis fulva** (Hutton). Figs. 172, 174

*Leria fulva* Hutton, 1901. Trans. N.Z. Inst. 33 : 82.

*Allophylopsis fulva* (Hutton): Tonnoir and Malloch, 1927.

Rec. Cant. [N.Z.] Mus. 3 : 98.

A greyish-brown species with brown thoracic vittae. Body length about 5.0-5.5 mm., wing length about 4.5-5.5 mm.

MALE AND FEMALE

**HEAD:** Arista dark brown with brown basal segments; rays of pubescence about three-quarters diameter of basal segment. Antenna dark brown; 3rd segment yellowish-brown at base; 2nd segment with strong dorsal apical bristle, strong ventral apical hairs and minute apical black hairs; basal segment with fine black hairs. Front greyish brown, orbits heavily grey dusted; brown spot lateral to each posterior ocellus, and anterior to each inner vertical and at base of outer verticals; anterior margin of front yellowish-brown. Anterior fronto-orbital just less than posterior fronto-orbital; hairs on most of anterior half of front. Face brown, yellowish-brown ventrally; dorsal parafacials with reddish-brown area between base of antennae and eyes. Cheeks light grey with brown spot at vibrissal angle and brown area near lower posterior angle. One strong bristle at lower posterior corner of cheek about two-thirds length of vibrissa. Occiput light greyish-brown sometimes with light brown area at posterior margin of eye. Eyes with few minute hairs. Vertical diameter of eye about 3.5 times width of cheek in same axis. Proboscis and palpi light brown.

**THORAX:** Light greyish-brown. Mesonotum with distinct brown spots at base of hairs; a brown longitudinal vitta from between anterior dorsocentral and presutural bristles posteriorly to scutellar suture and continued along lateral margins of scutellum; scutellum light greyish-brown on disc; pleura brown. All three dorsocentrals strong, anterior pair just posterior to the line of the presuturals; basal scutellars divergent and just longer than divergent apicals, about two-fifths distance from base of scutellum to apicals; fine hairs on disc and below apex of scutellum; 1 humeral; 1 strong presutural; 2 notopleurals; 1 strong supraalar; 2 strong postalar.

Legs yellowish-brown; fore leg light brown to brown. Fore femur with strong bristles on postero-dorsal surface those basally placed more posteriorly, and with strong bristles on apical half of postero-ventral surface; fore tibia with strong preapical and weak apical; mid femur with thick strong spines on apical half of anterior surface and 1 strong apical posterior bristle; mid tarsus with spines at apices of segments; hind femur with bristle at apical quarter of antero-dorsal margin; hind tibia with preapical and weak apical.

Wings (Fig. 172) light brown; veins light brown; faint brown shading about the cross veins. Costa with spines, the largest equal to diameter of costa; short stout costal spines ending just beyond apex of 2nd vein; 5th vein ending about two-thirds distance to wing margin. Wing indices: costal about 3.2-3.4; 4th vein about 1.3-1.5; 4c about 0.8; 5x about 0.6-0.8.

Halteres light brown stalk, brown apex.

**ABDOMEN:** Male: Greyish-brown.

Male genitalia (Fig. 174): Genital arch with bristles scattered evenly over surface, the dorsal ones stronger, cluster of hairs at antero-ventral corner; anal plate with bristles, most on or near posterior margin; clasper with convex posterior margin and straight or slightly convex anterior margin, a few small hairs at middle of inner surface. Penis angled sharply at about mid way, broad at this region, heavily chitinised apically; parameres small, curved, with minute tomentum basally.

Female: Light brown. Genital plates light brown.

*Holotype:* CHRISTCHURCH: no date, ♂, (Cant. Mus.).

*Material Examined:* Holotype, allotype, 2 ♂, and 1 ♀.

*Distribution:* Christchurch, Dunedin. (October, November, January).

*Remarks:* Separated from *A. fuscipennis* and *A. obscura* by the absence of any darkening at wing base.

## Genus TETHINOSOMA Malloch

*Tethinosoma* Malloch, 1930. Rec. Cant. [N.Z.] Mus. 3 : 335.

Arista short. Antenna small. Three fronto-orbitals, the two posterior bristles curved outwards over eye, anterior bristle curved inwards and about mid way between vertex and antenna; short hairs on most of front. Vertical diameter of eye about equal to width of cheek in same axis. Five dorsocentrals, anterior pair presutural, next pair at suture; 3 strong posterior mesopleurals, dorsal bristle directed upwards; 1 sternopleural; 1 propleural; scutellum with hairs on disc. Tibiae with weak preapicals. Costa spined, subcosta close to 1st vein at apex; anal vein not reaching wing margin.

Type Species: *Tethinosoma fulvifrons* (Hutton)

Not closely allied to the three other New Zealand genera having a mesopleural bristle, viz., *Fenwickia*, *Aneuria*, and *Xeneura*, and separated from them by the wide cheek, short arista, and the presence of five dorsocentrals.

Species: *Tethinosoma fulvifrons* (Hutton)

### ***Tethinosoma fulvifrons* (Hutton). Figs. 132, 145**

*Agomyza fulvifrons* Hutton, 1901. Trans. N.Z. Inst. 33 : 93.

*Tethinosoma fulvifrons* (Hutton): Malloch, 1930. Rec. Cant. [N.Z.] Mus. 3 : 335.

A grey species. Body length about 3.25 mm., wing length about 3.25 mm.

#### FEMALE

HEAD (Fig. 145): Arista short, just longer than third segment of antenna, dark brown apically, brown basally; rays of pubescence minute and just discernible. Antenna small, reddish-brown; 3rd segment dark brown on apical half; 2nd segment without dorsal or ventral apical bristles but distinct apical hairs on inner margin; basal segment with few short hairs. Front heavily grey dusted. Three fronto-orbitals, posterior the strongest, hairs on front anterior to ocelli. Antennae close together and orbits wide at this region. Face grey. Cheeks heavily grey dusted. Second oral bristle directed dorsally and equal to vibrissa; short hairs along ventral margin of cheek; a few bristles at lower posterior angle of cheek just shorter than vibrissa. Occiput grey. Eyes bare. Vertical diameter of eye about 1.1 times width of cheek in same axis. Proboscis dark brown; palpi yellowish-brown.

THORAX: Heavily grey dusted; mesonotum with narrow longitudinal median brown vitta, brown area posterior to presutural bristle; disc of scutellum brown. No prescutellars; 3 postsutural dorsocentrals; 1 on transverse suture and 1 presutural dorsocentral; divergent basal scutellars about three-quarters parallel apicals; scutellum with fine hairs below apex; 1 humeral; 1 presutural; 2 notopleurals; 1 supraalar; 2 postalars; 3 posterior mesopleurals and hairs on mesopleuron; 1 sternopleural; prosternum bare.

Legs grey; fore and mid tarsus light greyish-brown; hind tarsus yellowish-brown. Fore femur with bristles on postero-dorsal and apical half of postero-ventral surfaces; mid tibia with few apicals.

Wings (Fig. 132) slightly clouded; veins brown. Costa with spines, the longest just greater than diameter of costa; short black costal spines extending about two thirds distance between apices of 2nd and 3rd veins; axillary vein represented by a fold nearly reaching wing margin. Wing indices: costal about 3.4; 4th vein about 3.3; 4c about 1.3; 5x about 1.7.

Halteres yellowish-brown.

ABDOMEN: Greyish-brown.

*Holotype*: CHRISTCHURCH: on sea-beach, no date, ♀ (F. W. Hutton), (Cant. Mus.).

*Material Examined*: Holotype.

*Distribution:* Christchurch, Kaikoura. (February).

*Remarks:* Recognised by the shape of the head, high cheeks, small antenna and arista, and the wide orbits at insertion of antennae.

### Genus XENEURA Malloch

*Xeneura* Malloch, 1930. Rec. Cant. [N.Z.] Mus. 3 : 339.

Three reclinate fronto-orbital bristles; centre of front with minute hairs. Cheeks narrow. Prescutellars absent; 4 dorsocentrals, 1 of them presutural, mesopleuron with 1 strong postero-dorsal bristle directed posteriorly; 2 sternopleurals; 1 strong propleural. Wings spotted; 2 adventitious cross veins connecting 2nd and costal veins on apical half of 2nd vein; anal vein not reaching wing margin; subcosta and 1st vein merging apically; long hair at apex of 3rd vein.

Type Species: *Xeneura picata* (Hutton)

Similar in appearance to *Fenwickia* and *Aneuria*. Differs from them chiefly by the presence of the adventitious veins, the presence of one pair of presutural dorsocentrals and two sternopleurals.

*Xeneura*, *Fenwickia*, and *Aneuria* are a group of three closely related genera with few structural differences. The latter two are probably more closely related to each other than to *Xeneura*. *Xeneura* is the only genus of the three with two sternopleurals and a propleural bristle, whereas the first two differ only in presence or absence of presutural dorsocentral. Hairs are present on the centre of the front and use cannot be made of this as a keying character for separating *Tethinosoma* as was done by Malloch (1930d).

*Distribution:* New Zealand.

*Species:* *Xeneura picata* (Hutton)

### *Xeneura picata* (Hutton). Figs. 117, 186, 197

*Milichia picata* Hutton, 1902. Trans. N.Z. Inst. 34 : 195.

*Xeneura picata* (Hutton): Malloch 1930. Rec. Cant. [N.Z.]  
Mus. 3 : 339.

A grey, brown-spotted fly with spotted wings. Body length about 2.25–3.0 mm., wing length about 2.5–3.25 mm.

#### MALE AND FEMALE

**HEAD** (Fig. 117): Arista light yellowish-brown basally, merging to dark brown apically; pubescent, rays not as wide as diameter of base of arista. Antenna light yellowish-brown; 3rd segment dark brown in centre of disc; 2nd segment with 1 strong dorsal bristle and other small hairs. Front light brown with grey dusting, small brown dots at base of all bristles and a large brown area on either side of anterior margin of ocellar triangle merging into yellowish-brown region at anterior margin of front. Inner verticals the strongest of frontal bristles, about 1.5 times outer verticals; fronto-orbitals, anterior to posterior, in proportion of 1 : 1.5 : 2.0. Face with brown centre, elsewhere light greyish-brown. Cheeks light yellowish-brown. Two bristles at lower posterior corner of cheek about two-thirds length of vibrissa. Occiput dark greyish-brown. Eyes with a few very short scattered hairs. Vertical diameter of eye about 11 times width of cheek in same axis. Proboscis whitish-yellow; palpi same colour with short black bristles over area.

**THORAX:** Grey with irregular brown areas forming indefinite longitudinal vittae, middle pair between dorsocentrals and a broad one outside of dorsocentrals; brown dot at base of dorsocentrals; scutellum light yellowish-brown with brown areas laterally at base; brown areas along notopleural region; humerus light brown;

pleura mostly brown; prosternum bare and dark brown. Enlarged hair between presutural and next posterior dorsocentral; divergent basal scutellars just longer than divergent or parallel apicals; scutellum bare; 1 humeral; 1 presutural; 2 notopleurals; 1 strong supraalar; 2 postalar, 1 strong.

Legs: Coxae brown; femora blackish-brown, yellowish-brown at apex; tibiae blackish-brown with yellowish-brown apical, basal and median areas; tarsi yellowish-brown merging to light brown on apical segments. Fore femur with strong bristles on postero-dorsal, and on apical third of postero-ventral surfaces; mid femur with short bristles on antero-dorsal surface and apical third of antero-ventral surface and apical bristles postero-dorsally and postero-ventrally; hind femur with 1 or 2 antero-dorsal bristles at apical quarter and, in males, a ventral bristle at basal quarter; all tibiae with dorsal preapicals and small ventral apicals.

Wings (Fig. 186) clear with many brown areas, veins mostly brown, costa yellowish-brown but brown at the darkened areas. Costal spines not greater than diameter of costa; short stout costal spines extending one-fifth distance between 2nd and 3rd veins; 5th vein distinctly terminated before reaching margin of wing. Wing indices: costal about 4.5-5.0; 4th vein about 1.5; 4c about 0.55; 5x about 1.3.

Halteres yellowish-brown; knobs light yellow.

ABDOMEN: Female: 1st and 2nd tergites dark brown; 3rd tergite dark brown with grey posterior margin interrupted medianly, grey, semicircular band on either side at anterior margin; 4th tergite grey with dark brown median area reaching anterior and posterior margins, and brown dot on either side half way to lateral margin; 5th tergite mostly brown with pair of grey areas on either side on anterior margin and 1 grey area on either side of median line on posterior margin; remaining tergites almost all brown.

Genital plates yellowish-brown.

Male: Similar colouration to female but grey areas are not as extensive.

Male external genitalia (Fig. 197): Genital arch dark brown heavily chitinised, about 12 bristles on either side near middle; anal plate delicate, light yellow, lightly chitinised, feather-like, narrow, and tapering evenly to a point at apex, surface with fine curved hair-like bristles and a series of extremely minute hairs over entire surface; clasper rod-like, heavily chitinised, and with short hair-like bristles on most of its surface; auxiliary clasper strip-like, bristles at apex.

*Holotype*: CHRISTCHURCH: no data, ♀ (Cant. Mus.).

*Material Examined*: Holotype, 7 ♂, and 4 ♀.

*New Records*: WAITAKERE RANGES: Titirangi, ex light trap, 28.xi.1952, 1 ♂; 20.xii.1952, 2 ♂; 22.xii.1952, 1 ♂; 14.i.1953, 2 ♂; 8.ii.1953, 1 ♀; 19.ii.1953, 1 ♀; 13.xii.1953, 1 ♂, (C. R. Thomas), (P.D.D.). NELSON: 24.xi.1944, 1 ♀; 20.i.1945, 1 ♀, (E. E. Walker), (Cawt. Inst.).

*Distribution*: Waitakere Ranges, Wellington, Nelson, Christchurch. (November to February).

### Genus FENWICKIA Malloch

*Fenwickia* Malloch, 1930. Rec. Cant. [N.Z.] Mus. 3: 336.

Small greyish-brown species. Front convergent anteriorly. Three reclinate fronto-orbitals, anterior bristle close to anterior margin of front; centre of front bare. Cheeks narrow. Prescutellars present; 3 postsutural dorsocentrals; mesopleuron haired and with 1 strong posterior bristle directed posteriorly; 1 sternopleural; no strong propleural bristle. Preapical tibial bristles well developed. Subcosta merging with 1st vein at apex; anal lobe of wing reduced; hair on costa at or near apex of 3rd vein; anal vein short and abruptly terminated.

Type Species: *Fenwickia hirsuta* Malloch

Closest relatives are the genera *Xeneura* Malloch and *Aneuria* Malloch. Separated from the former by the presence of only one sternopleural and from the latter by having only three dorsocentrals.

*Distribution:* New Zealand.

*Species:*

- Fenwickia affinis* sp.n.
- F. caudata* sp.n.
- F. claripennis* Malloch
- F. hirsuta* Malloch
- F. nuda* Malloch
- F. similis* Malloch

The type species *F. hirsuta* has been collected throughout New Zealand and is probably the primitive species of the genus. All species are very similar and while the subdivision into subgenera is not warranted three groups of species may be recognised.

1. *hirsuta* group. Large species; body length 3.0 mm. or more; scutellum with hairs on disc towards apex; prosternum haired; shaded wings; costal index about 4.6, 4th vein index about 1.4. Includes *F. hirsuta*.

2. *claripennis* group. Small species; body length 2.5–3.0 mm.; scutellum bare; prosternum bare; wings clear; costal index greater than 4.5; 4th vein index about 1.3. Includes *F. claripennis*, *F. similis*, *F. caudata*.

3. *nuda* group. Small species; body length 2.0–2.5 mm.; scutellum bare; prosternum haired; wings shaded; costal index below 4.0; 4th vein index about 1.6. Includes *F. nuda*, *F. affinis*.

The *hirsuta* group is intermediate to the other two groups and they may have arisen from it. The resemblance of the *claripennis* group to the *hirsuta* group lies chiefly in the costal index, which is over 4.5 in both groups, whereas the *nuda* group has shaded wings and haired prosternal plates which are also found in *hirsuta*.

A character which should probably be included in the generic diagnosis is the presence, in males, of a strong ventral bristle at about basal third of the hind femur. However, both sexes are not yet known for all species, and meanwhile the character is included in the species descriptions.

Malloch (1930d) used the number of rows of acrostichal hairs to differentiate species, but this character is not used here because a study of all specimens available shows that there is too much variation for this feature to be a satisfactory character.

#### KEY TO SPECIES OF GENUS FENWICKIA

- 1 Scutellum haired on disc ..... **hirsuta**  
Scutellum bare ..... 2
- 2 Wings clear, costal index above 4.5 ..... 3  
Wings shaded; costal index below 4.0 ..... 5
- 3 Anal plate wide, covering whole genitalia ..... **caudata**  
Anal plate narrow, not covering whole genitalia ..... 4
- 4 Clasper tapering whole length ..... **claripennis**  
Clasper tapering only at apical half ..... **similis**
- 5 Anal plate broad covering whole genitalia; 5th vein traceable to wing margin; hind femur with yellowish-brown ring at about apical third ..... **nuda**  
Anal plate narrow not covering whole genitalia; 5th vein abruptly terminated before reaching wing margin; hind femur without yellowish-brown ring at apical third ..... **affinis**

**Fenwickia hirsuta** Malloch. Figs. 118, 119, 184

*Fenwickia hirsuta* Malloch, 1930. Rec. Cant. [N.Z.] Mus.  
3 : 338.

A greyish-brown species with shaded areas on wings. Body length about 3.0-4.0 mm., wing length about 3.5-4.5 mm.

FEMALE

**HEAD** (Figs. 118, 119): Arista black, basal segments yellowish-brown; pubescent, hairs not as long as diameter of basal segments. Antenna light brown; 3rd segment with fine white pile; 2nd segment with 1 strong dorsal apical bristle and marginal apical hairs stronger ventrally; 1st segment with short black hairs. Front yellowish-brown, ocellar area and post-ocellar area brown, orbits light greyish-brown. Anterior fronto-orbital about half length of middle orbital, latter just less than posterior orbital; some small hairs along orbits and anterior margin of front. Face light brown. Cheeks whitish-brown. About 4 strong black hairs along cheek posterior to vibrissa and to region of the bristles at lower posterior angle of cheek. Occiput greyish-brown. Eyes with very few fine short hairs. Vertical diameter of eye about 7.5-8.5 times width of cheek in same axis. Proboscis light yellowish-brown; palpi yellowish-brown and with short black hairs along most of outer margin.

**THORAX**: Greyish-brown; scutellum with yellowish-brown margin; yellowish-brown area through humerus and notopleural area to wing base. Prescutellars half length of posterior dorsocentrals, latter equal to scutellars; basal scutellars parallel, apicals divergent; hairs on scutellum towards apex on both dorsal and ventral surfaces; 1 strong humeral; 2 strong notopleurals; 1 strong presutural; 1 strong supraalar; 2 strong postalar; propleuron with hair-like bristle; prosternum with 2, sometimes 3, small hairs.

Legs yellowish-brown; posterior femur dark brown on about apical two-thirds. All coxae with long black prominent bristles; anterior femur with strong bristles on postero-dorsal surface and 1 strong postero-ventral at apical quarter; mid and hind femora with 1 strong anterior bristle at apical quarter; fore and hind tibiae with weak, mid tibia with strong, apical bristles.

Wings (Fig. 184) light brown; veins brown; brown shading more pronounced about the two cross veins and at apices of 2nd, 3rd and 4th veins. Strong costal spines about width of costal vein; short stout costal spines extending one-third way between apices of 2nd and 3rd veins; 5th vein not reaching wing margin. Wing indices: costal about 4.6; 4th vein about 1.4; 4c about 0.6; 5x about 1.0.

Halteres yellowish-brown.

**ABDOMEN**: Dark greyish-brown; yellowish-brown areas on anterior margins of tergites on either side of mid line.

External genitalia yellow-brown.

*Holotype*: DUN MT.: 3,000 ft., 23.ii.1923, ♀, (*Anon.*), (Cant. Mus.).

*Material Examined*: Holotype, 5 ♀ paratypes, and 8 ♀.

*New Records*: WAITAKERE RANGES: Titirangi, light trap, 20.xi.1952, 1 ♀; 18.ii.1953, 1 ♀; 12.vi.1953, 1 ♀, (*C. R. Thomas*), (P.D.D.). TE WAIROA: 15.xi.1919, 1 ♀, (*J. Muggeridge*), (B.M.). WELLINGTON: Wiltons Bush, 30.x.1927, 1 ♀, (*E. S. Gourlay*), (Cawt. Inst.). NELSON: Upper Maitai, 9.xi.1950, 1 ♀, (*E. S. Gourlay*), (Cawt. Inst.). LAKE MOANA: 16-21.xii.1925, 2 ♀, (*A. Tonnoir*), (Cant. Mus.).

*Distribution*: Waitakere Ranges, Te Wairoa, Wellington, Nelson, Dun Mt., Moana, Otira, Waiho, Banks Peninsula. (October to December, February, April).

*Remarks*: The presence of hairs on the scutellum separates this species from others in the genus. No males have yet been discovered.

**Ferwickia caudata** sp.n. Figs. 185, 194

A greyish-brown species with clear wings. Body length about 2.5–3.0 mm., wing length about 3.0 mm.

MALE

**HEAD:** Arista blackish-brown, basal segments light brown; pubescent, rays less than diameter of basal segment. Antenna light brown; 3rd segment with thick short pile; 2nd segment with 1 strong dorsal apical bristle and short hairs around apical margin; basal segment with short apical hairs. Front golden yellow, ocellar area dark brown, orbits grey dusted. Anterior fronto-orbital about half length of the other 2 orbitals; hairs on anterior orbits. Face yellowish-white. Hairs posterior to vibrissa along cheek margin, about 3 bristles at lower posterior corner of cheek. Occiput greyish-brown. Eyes with few very short hairs. Vertical diameter of eye about 10 times width of cheek in same axis. Proboscis and palpi light yellow; palpi with short black hairs on entire length.

**THORAX:** Greyish-brown; scutellum with yellowish-brown margin, bare. Pre-scutellars about half length of posterior dorsocentrals; scutellar bristles all same length and equal to posterior dorsocentrals; basal scutellars divergent, apicals parallel; 1 humeral; 2 strong notopleurals; 1 strong presutural; 1 strong supraalar; 2 postalars, 1 strong; propleuron with 1 hair; no prosternal hairs or bristles.

Legs mainly yellowish-brown; fore coxa whitish-yellow. Fore coxa with 3 strong ventral bristles; fore femur with 1 strong bristle at apical quarter of postero-ventral and postero-dorsal surfaces, and other weaker bristles; mid coxa with long bristles; mid femur with 1 strong antero-ventral bristle at apical quarter, a distinct row of small bristles along entire postero-ventral surface; hind femur with long ventral bristle at basal third, 1 anterior bristle near apical quarter; all tibiae with weak apicals.

Wings (Fig. 185) clear; veins brown. Costal spines about equal to width of costal vein; short black bristles of costa extending to quarter distance between 2nd and 3rd veins; 5th vein not reaching margin. Wing indices: costal about 4.7; 4th vein about 1.3; 4c about 0.5; 5x about 1.2–1.5.

Halteres, yellow or light brown.

**ABDOMEN:** Brown; tergites 2, 3, and 4 with yellowish-brown areas on either side of median line and bordering the anterior margin; 5th tergite yellowish-brown except for narrow brown areas at lateral margins; 6th tergite shining dark brown. Sternites yellowish-brown to light brown.

External genitalia (Fig. 194): Genital arch shining dark brown, about 20 bristles on either side, 2 near dorsal margin thick and strong, 4 others strong, and remainder shorter and weaker; anal plate light yellow somewhat circular, 3 small bristles near base on outer surface, many small bristles on apical two-thirds of inner surface, many bristles longer than length of plate and other smaller bristles on or near margin and extending round apical two-thirds of the plate; irregular shaped clasper heavily chitinised with bunch of short stout bristles near apex; auxiliary clasper narrow and curved and with several short fine bristles.

**Holotype:** WAITAKERE RANGES: Titirangi, ex light trap, 22.xii.1952, ♂, (C. R. Thomas), (P.D.D.).

**Paratypes:** MOKO HINAU ISLANDS: Fanal Island, stream bed, 23.viii.1955, 15 ♂, (R. A. Harrison), (P.D.D.). WAITAKERE RANGES: Titirangi, ex light trap, 8.ii.1953, 1 ♂; 11.ii.1953, 1 ♂, 19.ii.1953, 1 ♂; 14.vi.1953, 1 ♂, (C. R. Thomas): Nihotupu, swept off foliage, 9.iii.1955, 1 ♂, (R. A. Harrison), (P.D.D.).

**Material Examined:** Holotype and 20 ♂ paratypes.

**Distribution:** Moko Hinu Island, Waitakere Ranges. (August, December, February, March, June).

**Remarks:** Readily separated from *F. claripennis* and *F. similis* by the large wide anal plate of males. These plates are similar to those of *F. nuda* but this latter species is distinguished by having spotted wings.



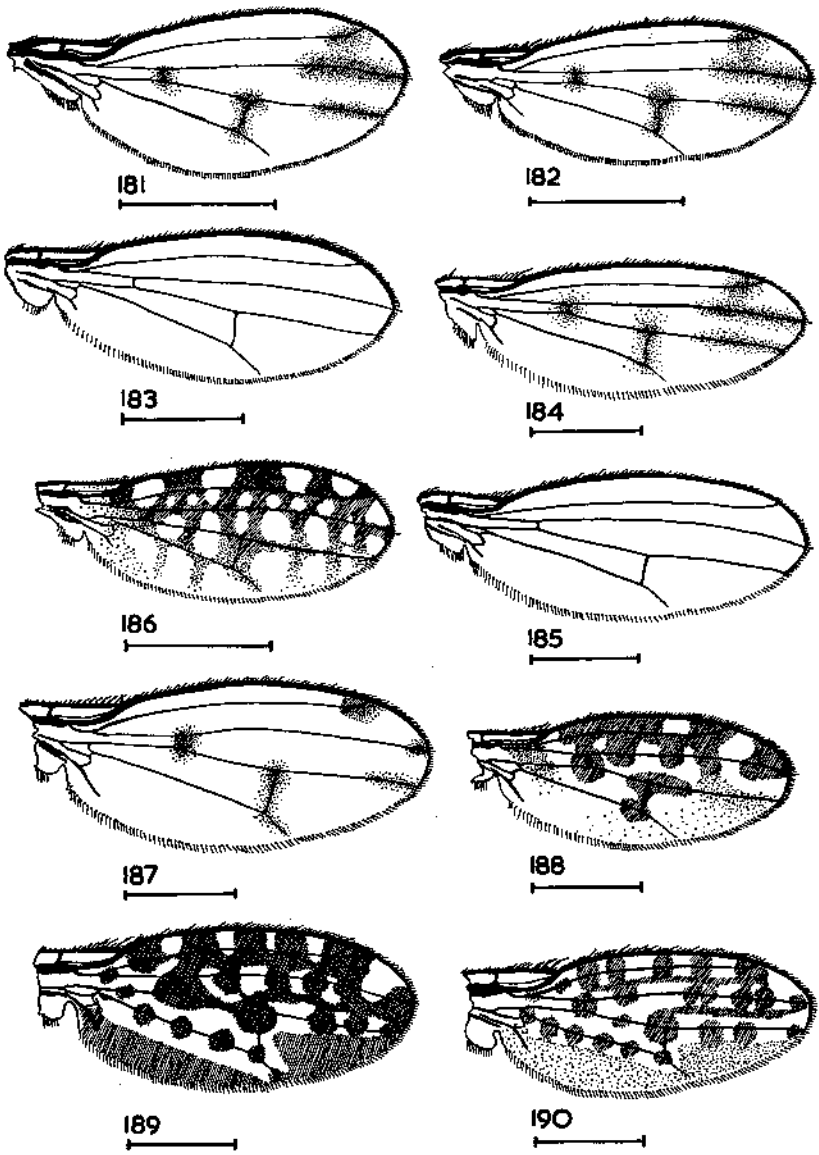


Fig. 181. Wing of *Fenwickia affinis*  
 " 182. " " *F. nuda*  
 " 183. " " *F. claripennis*  
 " 184. " " *F. hirsuta*  
 " 185. " " *F. caudata*  
 " 186. " " *Xeneura picata*  
 " 187. " " *Aneuria imitatrix*  
 " 188. " " *A. bipunctata*  
 " 189. " " *A. tripunctata*  
 " 190. " " *A. sexpunctata*

Scale: 1.0 mm.

No females have yet been identified as belonging to this species but the similarity to *claripennis* is such as to suggest that the colouration of the abdomen and the presence of the basal ventral bristle on the hind femur are possibly male characters.

**Fenwickia claripennis** Malloch. Figs. 183, 195

*Fenwickia claripennis* Malloch, 1930. Rec. Cant. [N.Z.] Mus.  
3: 337

A greyish-brown species with clear wings. Body length about 2.5 mm., wing length about 2.75 mm.

MALE AND FEMALE

**HEAD:** Arista blackish-brown, base yellowish-brown; pubescent, hairs not greater than diameter of basal segments. Antenna light brown; 3rd segment with fine light brown pile; 2nd segment with strong dorsal apical bristle and ring of apical marginal hairs; basal segment with short hairs. Front golden-brown; anterior margin of front broadly white to light yellow. Anterior fronto-orbital about half length of other two orbitals; few minute hairs on orbits otherwise front bare. Face light yellowish-brown. Cheeks whitish-yellow. About 2 bristles at lower posterior corner of cheek and a row of 6 to 9 hairs between these and the vibrissa. Occiput greyish-brown. Eyes with few small scattered hairs. Vertical diameter of eye about 8 to 9 times width of cheek in same axis. Proboscis light yellowish-brown, palpi yellowish-brown with short black hairs, on outer margin.

**THORAX:** Greyish-brown; scutellum margin with prominent or scarcely noticeable yellow band, pointed at apex, bare. Prescutellars just under half length of posterior dorsocentrals, which equal basal scutellars; apical scutellars parallel, just shorter than divergent basals; acrostichals in about 4 rows in males and about 6 irregular rows in female; 1 strong humeral; 2 strong notopleurals; 1 strong presutural; 1 strong supraalar; 2 postalars, 1 strong; propleuron with fine hair; prosternum bare.

Legs yellowish-brown, apex of hind femur brown to greyish-brown. Fore coxa with 4 ventrals; fore femur with bristles on postero-dorsal and postero-ventral surfaces; mid coxa with long bristles; mid and hind femora with anterior bristles at apical quarter; hind femur with single long ventral bristle at basal third, in male; all tibiae with short apicals.

Wings (Fig. 183) clear; veins greyish-brown. Costal spines equal to or just longer than diameter of costa; short stout costal spines extending one-third to half distance between 2nd and 3rd veins; 5th vein not quite reaching wing margin. Wing indices: costal about 4.9; 4th vein about 1.3; 4c about 0.55; 5x about 1.6. Halteres light yellowish-brown.

**ABDOMEN:** Male tergites 1 to 4 greyish-brown with yellowish-brown areas either side of medium line on anterior margin; 5th tergite yellowish-brown but for brown lateral margin; 6th tergite dark brown.

External male genitalia: (Fig. 195): Genital arch dark brown, other portions light yellowish-brown. Genital arch broad, with about 5 strong bristles and also 1 bristle near base on elongate tubercle; some smaller bristles on each side; anal plate somewhat quadrangular in shape with median edge straight and outer edge curved at apex, 2 strong marginal bristles on outer edge at about apical third, shorter marginal bristles along most of outer edge, surface with minute bristles on apical two-thirds of inner surface and 6 to 7 similar bristles at middle of outer surface; clasper strongly chitinised, tapering to apex, moderately convex posteriorly and with 5 to 6 distinct chitinous hooks on apical half of posterior margin; auxiliary clasper shorter and more convex posteriorly.

Female tergites dark brown posteriorly and medianly and laterally to anterior margin, yellowish-brown anteriorly.

Female genitalia yellowish-brown.

*Holotype:* NELSON: -iii-, ♂, (*A. Tonnoir*), (Cant. Mus.).

*Material Examined:* Holotype, 2 ♀ paratypes, 46 ♂, and 37 ♀.

*New Records:* LITTLE BARRIER ISLAND: Waipawa stream bed, 25.xi.1954, 6 ♂, 6 ♀; 28.xi.1954, 6 ♂, 1 ♀; Kauri Gully and tracks, 24.xi.1954, 10 ♂, 1 ♀; Thumb and Summit tracks, 23.xi.1954, 1 ♂, 2 ♀; ex banana trap, -.xi.1954, 1 ♀, (*R. A. Harrison*), (P.D.D.). WAITAKERE RANGES: Nihotupu, 2.i.1950, 6 ♂, 5 ♀; swept off foliage, 9.iii.1953, 4 ♂, 2 ♀; Oratia, 11.i.1953, 1 ♂, (*R. A. Harrison*); Dreamlands, in house, 1 ♂, 2 ♀, (*K. P. Lamb*); 11.ii.1950, 5 ♀, (*M. Knight*); Titirangi, ex light trap, 28.xi.1952, 2 ♂, 1 ♀; 19.xii.1952, 1 ♀; 22.xii.1952, 1 ♂; 16.i.1953, 1 ♀; 2.ii.1953, 2 ♀; 8.ii.1953, 1 ♂; 12.ii.1953, 2 ♂, 2 ♀; 18.ii.1953, 2 ♂, 2 ♀; 19.ii.1953, 1 ♂, (*C. R. Thomas*). AUCKLAND: Browns Bay, -.v.1950, 1 ♂, (*R. A. Harrison*), (P.D.D.). NELSON: 18.x.1925, 1 ♀; 8.ix.1926, 1 ♂, 1 ♀, (*W. Heighway*), (*Cawt. Inst.*). MT. PEEL: 28.ii.1921, 1 ♀, (*A. Philpott*), (*Cawt. Inst.*).

*Distribution:* Little Barrier Island, Waitakere Ranges, Auckland, Nelson, Otira, Okarahia, Kaikoura. (September to March, May).

*Remarks:* Malloch (1930d) in the key to species of the genus *Fenwickia*, separates *F. claripennis* and *F. similis* (*inter alia*) by the number of rows of acrostichal hairs. This is not a good character. In *claripennis* there are always four rows between the posterior pair of dorsocentrals while anterior to that point irregularities occur. Sometimes four rows are clearly defined, sometimes six rows, but usually there are some irregularly placed hairs which make the interpretation of the number of rows difficult.

The colour of the margin of the scutellum is also a variable character and not reliable enough to use for separation of species. In some specimens of *claripennis* the yellow margin is very marked, while in others only the apex of the scutellum is yellow.

The male genitalia are distinctive, with the anal plate comparatively narrow. The sexes differ in colouration of abdomen and the male is further distinguished by the presence of a strong ventral bristle at basal third of hind femur.

Because of the large number collected recently in the Auckland area, this species is numerically the strongest in the New Zealand collections. It is certainly one of the predominant species in that area but not in southern localities.

### ***Fenwickia similis* Malloch. Fig. 193**

*Fenwickia similis* Malloch, 1930. Rec. Cant. [N.Z.] Mus.  
3: 338.

A greyish-brown species with clear wings. Body length about 2.5 mm., wing length about 2.5 mm.

#### MALE

**HEAD:** Arista brown, rays of pubescence less than diameter of basal segments. Antenna yellowish-brown; 3rd segment brown dorsally; 2nd segment with 1 strong dorsal bristle and minute black hairs around apical margin. Front golden-yellow; ocellar triangle greyish-brown; orbits greyish-brown dusted. Middle fronto-orbital bristle just less than length of posterior; ocellars and verticals strong; postverticals about half length of inner verticals, minute hairs on orbits. Face pale yellow. Cheeks pale yellow, brown posteriorly. Occiput heavily dusted with greyish-brown. Eyes with a few short hairs. Vertical diameter of eye about 8 times width of cheek in same axis. Proboscis light brown; palpi yellow and with fine black hairs over surface.

**THORAX:** Mesonotum greyish-brown; pleura light greyish-brown. Prescutellars small; basal scutellars longer than apicals; scutellum bare; 1 strong humeral; presutural present; 2 notopleurals; 1 strong supraalar; 2 postalars, posterior one weak; small propleural, prosternum bare.

Legs yellowish-brown; hind femur with brown apical half. Fore femur with bristles on apical halves of postero-dorsal and postero-ventral surfaces; mid femur with 1 bristle at apical quarter of anterior surface; hind femur with bristle at apical quarter of antero-dorsal surface and 1 ventral bristle at basal third.

Wings clear; veins brown. Short stout costal spines extending about two-fifths distance between apices of 2nd and 3rd veins; 5th vein not reaching wing margin. Wing indices: costal about 5.0; 4th vein about 1.3; 4c about 0.5; 5x about 1.5.

Halteres pale yellow.

**ABDOMEN:** Tergites greyish-brown with light brown narrow posterior margins; 5th tergite pale yellow.

External genitalia (Fig. 193): Genital arch somewhat shining dark brown, fine long bristles on most of surface and a pair of stronger bristles near middle of anterior margin on either side; anal plate pale yellow, about as long as height of arch, strap-like with parallel sides, normally directed anteriorly along ventral surface of abdomen, apical region curved dorsally, very thick matt of fine hairs on inner surface, larger hairs scattered over outer surface; clasper shining brown, anterior margin almost straight, posterior margin curved to narrow apex; auxiliary clasper rod-like.

**Holotype:** WAITAKERE RANGES: Nihotupu, 23.ii.1923, ♂, (*A. L. Tonnoir*), (Cant. Mus.).

**Material Examined:** Holotype.

**Distribution:** Waitakere Ranges, Wanganui. (February).

**Remarks:** Separated from *F. claripennis* by the narrower, parallel sided, anal plate.

### **Fenwickia nuda** Malloch. Figs. 182, 191, 192

*Fenwickia nuda* Malloch, 1930. Rec. Cant. [N.Z.] Mus.  
3: 338.

A greyish-brown species: wings with pale brown areas on cross veins and at apices of some veins. Body length about 2.0-2.5 mm., wing length about 2.0-2.5 mm.

#### MALE AND FEMALE

**HEAD:** Arista brown, basal 2 segments yellowish-brown, rays of pubescence not longer than width of 2nd arista segment. Antenna yellowish-brown; 3rd segment light brown on dorsal margin, with fine whitish-yellow pile; 2nd segment with 1 strong dorsal apical bristle and some small hairs; basal segment with some small black hairs. Front golden-yellow; ocellar triangle and posterior region of orbits greyish-brown, anterior region of orbits dull yellow; anterior region of front yellowish-brown. Anterior fronto-orbital about half length middle orbital, latter about five-sixths posterior bristle; small hairs on anterior orbits. Face very light whitish-brown, slightly concave. Cheeks light whitish-brown, black hairs along cheek margin, and about 2 bristles at lower posterior corner of cheek. Occiput greyish-brown. Eyes with few fine short hairs. Vertical diameter of eye about 8 times width of cheek in same axis. Proboscis yellowish-brown; palpi yellowish-brown with few short black hairs.

**THORAX:** Greyish-brown; scutellum yellowish-brown at margin, particularly at apex. Prescutellars less than half length posterior dorsocentrals; divergent or parallel basal scutellars longer than divergent or parallel apicals; disc of scutellum bare; 1 strong humeral; 2 strong notopleurals; 1 strong presutural; 1 strong supraalar; 2 postalars; 1 small propleural; hairs on mesopleuron and sternopleuron; 1 or 2 small hairs on each prosternal plate.

Legs mainly yellowish-brown; fore coxa light yellowish-brown; femora brown to dark brown on dorsal areas; hind femur with yellowish-brown ring at about apical third separating basal and apical brown areas. Fore and mid coxae with

strong bristles; fore femur with bristles on postero-dorsal and postero-ventral surfaces, apical bristles strongest; mid femur with strong anterior bristle at about apical quarter; hind femur with antero-dorsal bristle at about apical quarter and, in males, 1 or sometimes 2 ventral bristles at middle; all tibiae with weak apicals.

Wings (Fig. 182): Brown shading about the two cross veins and apical half of apical section of 4th vein; veins light brown except brown in shaded areas. Fifth vein often just traceable to wing margin. Costal spines about equal to diameter of costa; short thick costal bristles extending two-fifths distance between apices of 2nd and 3rd veins. Wing indices: costal about 3.8; 4th vein about 1.6; 4c about 0.7; 5x about 1.1.

Halteres yellowish-orange.

ABDOMEN: Male greyish-brown; 5th tergite yellowish-brown.

External male genitalia (Figs. 191, 192): Genital arch broad and heavily chitinised; scattered strong bristles over surface, long bristle on long tubercle near ventral margin; anal plate light yellowish-brown, quadrate, numerous bristles on whole length of outer curved margin, similar bristles and small hairs on outer surface and fewer on inner surface; clasper chitinised, rod-like with angular rod-like projection at apex; minute bristles at apex and apex of projection, bunch of hairs at fork; auxiliary clasper smaller with minute spines on apical third.

Female tergites greyish-brown with yellowish-brown anterior region on either side of mid line.

*Holotype*: WAITAKERE RANGES: Nihotupu, 23.ii.1923, 1 ♂, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined*: Holotype, 18 ♂, and 5 ♀.

*New Records*: LITTLE BARRIER ISLAND: Kauri Gully and tracks, 24.xi.1954, 7 ♂; swept, 24.xi.1954, 2 ♂; Waipawa stream bed, 25.xi.1954, 6 ♂; 28.xi.1954, 1 ♂, (*R. A. Harrison*), (P.D.D.). WAITAKERE RANGES: Oratia, Kauri Rd., 11.i.1953, 2 ♂, 3 ♀, (*R. A. Harrison*): Titirangi, ex light trap, 10.ii.1953, 1 ♀, (*C. R. Thomas*), (P.D.D.). MOANA: 16-20.xii.1925, 1 ♀, (*A. Tonnoir*), (Cant. Mus.).

*Distribution*: Little Barrier Island, Waitakere Ranges, Moana. (November to February).

*Remarks*: Readily separated from *hirsuta* by its smaller size and lack of scutellar hairs. Males are readily distinguished by the wide flap-like light-coloured anal plate covering the remaining genitalia. Malloch (1930d) stated that the prosternal plates are bare, but small fine hairs are definitely present.

### ***Fenwickia affinis* sp.n. Figs. 181, 196**

A greyish-brown fly; wings with pale brown areas on some veins. Body length about 2.0-2.5 mm., wing length about 2.0-2.5 mm.

#### MALE AND FEMALE

HEAD: Arista brown, basal segments yellowish-brown, rays of pubescence about half width of basal segments of arista. Antenna light golden-brown; 3rd segment light brown on dorsal margin with fine light brown pile; 2nd segment with 1 strong dorsal apical bristle and minute black apical hairs; basal segment with few minute black hairs. Front golden yellow; ocellar triangle posteriorly and posterior region of orbits, greyish-brown. Anterior fronto-orbital about half middle orbital, latter about two-thirds posterior orbital; small hairs on anterior orbits. Face light yellowish-brown. About 4 hairs along cheek margin and 2 bristles at lower posterior angle of cheek. Occiput greyish-brown. Eyes with very few short minute hairs only visible under high magnification. Vertical diameter of eye about 9 times width of cheek in same axis. Proboscis whitish-yellow; palpi yellow with small black hairs.

**THORAX:** Mesonotum greyish-brown; pleura brown; apex of scutellum merging to yellow, bare. Prescutellars about half length posterior dorsocentrals; about 8 rows of acrostichal hairs; basal scutellars divergent and just longer than parallel or slightly divergent apically; 1 strong humeral; 2 strong notopleurals; 1 strong pre-sutural; 1 strong supraalar; 2 postalars, 1 strong; 1 minute propleural; hairs on mesopleuron and sternopleuron; 1 small hair on each prosternal plate.

Legs light yellowish-brown; fore coxae whitish-yellow; femora brown, hind femur darkest of the 3 and without yellowish-brown ring near apical third; basal half of mid tibia light brown; basal third of hind tibia brown. Fore coxa with strong bristles; fore femur with postero-dorsal and postero-ventral bristles, strongest apically; all tibiae with apicals; mid coxa with strong bristles; mid femur with 2 antero-ventral bristles about apical third; hind femur with 1 antero-dorsal at apical quarter, and, in males, 1 ventral about basal third.

Wings (Fig. 181): Brown shading about 2 cross veins and at apex of 2nd vein, apical third and apical half of distal section of 3rd and 4th veins respectively. Fifth vein abruptly discontinued three-quarters of distance from posterior cross vein to wing margin and not traceable to wing margin. Costal spines less than or equal to diameter of costa; heavy bristles on costa extending two-fifths between apices of 2nd and 3rd veins. Wing indices: costal about 3.6; 4th vein about 1.6; 4c about 0.8; 5x about 1.3.

Halteres light yellowish-brown.

**ABDOMEN:** Male slightly shining greyish-brown; anteriorly often merging to yellowish-brown; 5th tergite yellowish-brown.

External male genitalia (Fig. 196): Genital arch with about 15 to 20 bristles on either side; anal plate lightly chitinised, strip-like, about 4 times as long as broad, distinctly recurved posteriorly at apex, about 8 bristles on posterior surface, about 9 or 10 long adjacent bristles about the curved apex, and about 7 bristles more widely separated on outer margin; all together about 16 to 18 bristles on curved apex and along apical two-thirds of outer lateral margin, 2 bristles on anterior margin; stump-like clasper with straight posterior margin, concave anterior margin, and with minute hairs on these margins; 1st auxiliary clasper about same length as clasper and curved posteriorly, bare; 2nd auxiliary clasper even more curved posteriorly, and longer than clasper, small hair-like bristles on outer surface, the apex a distinct triangular spine.

Female grey brown; light brown areas on some anterior margin of tergites particularly laterally.

**Holotype:** WAITAKERE RANGES: Oratia, Kauri Rd., 11.i.1953, ♂, (R. A. Harrison), (P.D.D.).

**Paratypes:** LITTLE BARRIER ISLAND: Kauri Gully and tracks, 24.xi.1954, 6 ♂, 3 ♀; Waipawa stream bed, 25.xi.1954, 28 ♂, 12 ♀; 28.xi.1954, 2 ♂, 3 ♀; swept, 24.xi.1954, 1 ♂, 1 ♀, (R. A. Harrison), (P.D.D.). WAITAKERE RANGES: Oratia, Kauri Rd., 11.i.1953, 1 ♂, 1 ♀, (R. A. Harrison); Titirangi, ex light trap, 20.xii.1952, 1 ♂, (C. R. Thomas), (P.D.D.).

**Material Examined:** Holotype, 39 ♂ and 20 ♀ paratypes.

**Distribution:** Little Barrier Island, Waitakere Ranges. (November to January).

**Remarks:** Differs from *F. nuda* by the character of the fifth vein as given in the key. The colour of the legs also differs in the two species; the presence of a yellowish-brown band on the hind femora of *nuda* distinguishes it from *affinis*. The anal plates of *nuda* are large and very wide and cover the genitalia, whereas those of *affinis* are narrow and strap-like and not always folded back over the genitalia. In *nuda* there is one minute hair on each prosternal plate, and thus Malloch (1930d) was in error in suggesting that the absence of hairs on prosternum is a character which can help to separate *nuda* from others of the genus.

## Genus ANEURIA Malloch

*Aneuria* Malloch, 1930. Rec. Cant. [N.Z.] Mus. 3 : 360.

Front convergent anteriorly. Three reclinate fronto-orbitals; centre of front bare. Prescutellars present; 4 dorsocentrals, anterior bristle presutural; 1 posterior mesopleural, directed posteriorly; 1 sternopleural; no strong propleural bristle. Costa with spines about as long as diameter of costa at point where they arise; subcosta merging with 1st vein apically; long hair on costa at or near apex of 3rd vein; anal vein not reaching wing margin.

Type Species: *Aneuria elegans* by original designation. This is a *nomen nudum*. The type species is now chosen and designated as *Aneuria bipunctata* Malloch, 1930.

Closely related to *Fenwickia* Malloch. The only important and constant difference between the genera is the presence in *Aneuria* of a presutural dorsocentral, whereas this bristle is lacking in *Fenwickia*.

*Distribution*: New Zealand.

*Species*:

- Aneuria angusta* sp.n.
- A. bipunctata* Malloch
- A. imitatrix* Malloch
- A. sexpunctata* Malloch
- A. tripunctata* Malloch

The sections of the genus do not warrant subgeneric status and are best regarded as groups of species having close relationship to each other. The following groups may be recognised:

1. *bipunctata* group. Widespread species; vertical diameter of eye five to six times width of cheek in same axis; costal index less than 3.0; fifth vein terminated well before wing margin. Includes *A. bipunctata*.
2. *imitatrix* group. South Island species; vertical diameter of eye four to six times width of cheek in same axis; costal index over 3.0; fifth vein traceable to wing margin. Includes *A. imitatrix*, *A. tripunctata*, *A. sexpunctata*.
3. *angusta* group. North Island species; vertical diameter of eye eleven to thirteen times width of cheek in same axis; costal index over 4.0; fifth vein terminated well before wing margin. Includes *A. angusta*.

The *bipunctata* and *imitatrix* groups of species are more closely related to each other than to the *angusta* group. An important character in both these groups is the relatively wide cheek and this further separates these species from *Fenwickia*. The *angusta* group however, has a much narrower cheek, comparable to that in *Fenwickia* and indeed the only difference between *angusta* and *Fenwickia* spp. is the presence of the presutural dorsocentral.

All species in the genus have shaded wings varying from shading on the two cross veins in *angusta* to the almost complete shading of *tripunctata* and *sexpunctata*.

A male character in all species examined, where a comparison between sexes can be made, is the presence on the hind femur of a strong ventral bristle at about the basal third. This is also found in all known *Fenwickia* males.

Stump veins arising from the fourth vein occur in the genus, but not in every species, and in one, *A. bipunctata*, they may or may not occur and may be directed anteriorly or posteriorly.

KEY TO SPECIES OF ANEURIA

- 1 Vertical diameter of eye 11 to 13 times width of cheek in same axis ..... **angusta**  
Vertical diameter of eye 4 to 6 times width of cheek in same axis ..... 2
- 2 Wings with dark brown areas only at cross veins and apices of 2nd to 4th veins ..... **imitatrix**  
Wings with many dark brown areas ..... 3
- 3 Costal index less than 3.0; 2 dark areas in marginal cell, proximal one over twice length of distal ..... **bipunctata**  
Costal index greater than 3.0; 4 or more dark areas in marginal cell ..... 4
- 4 Three dark areas on 5th vein along discal cell, exclusive of the one at each extremity; prosternum bare ..... **tripunctata**  
Four dark areas on 5th vein along discal cell exclusive of the one at each extremity; prosternum haired ..... **sexpunctata**

**Aneuria angusta** sp.n. Figs. 131, 147, 201

A brown species with wings shaded only on cross veins. Body length about 2.75–3.25 mm., wing length about 3.0–3.25 mm.

MALE AND FEMALE

**HEAD** (Fig. 147): Arista shining blackish-brown, basal segments yellowish-brown; pubescent, rays much less than diameter of basal segments. Antenna yellowish-brown; 2nd segment light brown with short dorsal bristle and apical hairs; basal segment with a few black hairs. Front golden yellow; ocellar area dark brown; ocellar triangle and orbits dusted with brown. Ocellars and inner verticals strong; anterior fronto-orbital about two-thirds middle orbital, latter about three-quarters posterior orbital; few weak hairs on orbits; front strongly convergent anteriorly. Face yellowish-white. Cheeks yellowish-white. Few strong hairs in single row along cheek; 1 bristle at lower posterior corner of cheeks. Occiput greyish-brown. Eyes with few very short hairs. Vertical diameter of eye 11 to 13 times width of cheek in same axis. Proboscis almost white apically; palpi yellowish brown and with covering of short black hairs.

**THORAX**: Brown; scutellum with yellowish-brown apex; pleura not as heavily dusted as mesonotum. Prescutellars weak, about one-third posterior dorsocentrals; presutural dorsocentral weak; divergent basal scutellars strong, and longer than the parallel or slightly divergent apicals; scutellum bare; 1 humeral; 1 strong presutural; 2 notopleurals; 1 supraalar; 2 postalar, outer one as strong as basal scutellars; 1 small propleural hair; prosternum bare.

Legs yellowish-brown; fore femur brown; hind femur brown to dark brown. Fore and mid coxae with strong bristles; fore femur with weak bristles on postero-dorsal and postero-ventral surfaces and with 1 strong bristle at about apical quarter in these two rows; fore tibia with preapical and weak apical; mid femur with anterior bristle at apical quarter; mid tibia with preapical and apical; hind femur with 1 antero-dorsal bristle at apical quarter and, in males, a ventral bristle at about basal third; hind tibia with preapical and weak apical.

Wings (Fig. 131) clear with brown shading only about the 2 cross veins. Costal spines not longer than diameter of costa; short stout costal spines extending about one-third distance between apices of 2nd and 3rd veins; 5th vein terminated well before wing margin. Wing indices: costal about 4.6; 4th vein about 1.6; 4c about 0.6; 5x about 1.4.

Halteres light brown.

**ABDOMEN**: Male tergites 1 and 2 mostly yellowish-brown with dark brown posterior margins; tergites 3 and 4 dark brown with a pair of yellowish-brown areas on anterior margin; 5th tergite yellowish-brown with brown lateral margins and trace of median brown longitudinal stripe; 6th tergite dark brown.

Male genitalia (Fig. 201): Genital arch dark brown, about 16 bristles on either side; anal plate lightly chitinised with fine long bristles mostly on apical half and margin, the two longest at apex; clasper lightly chitinised, curved and tapering to a point, short spines on posterior margin; 1st auxiliary clasper longer than clasper, curved, narrow, but not tapering, fine bristles on apical half; 2nd



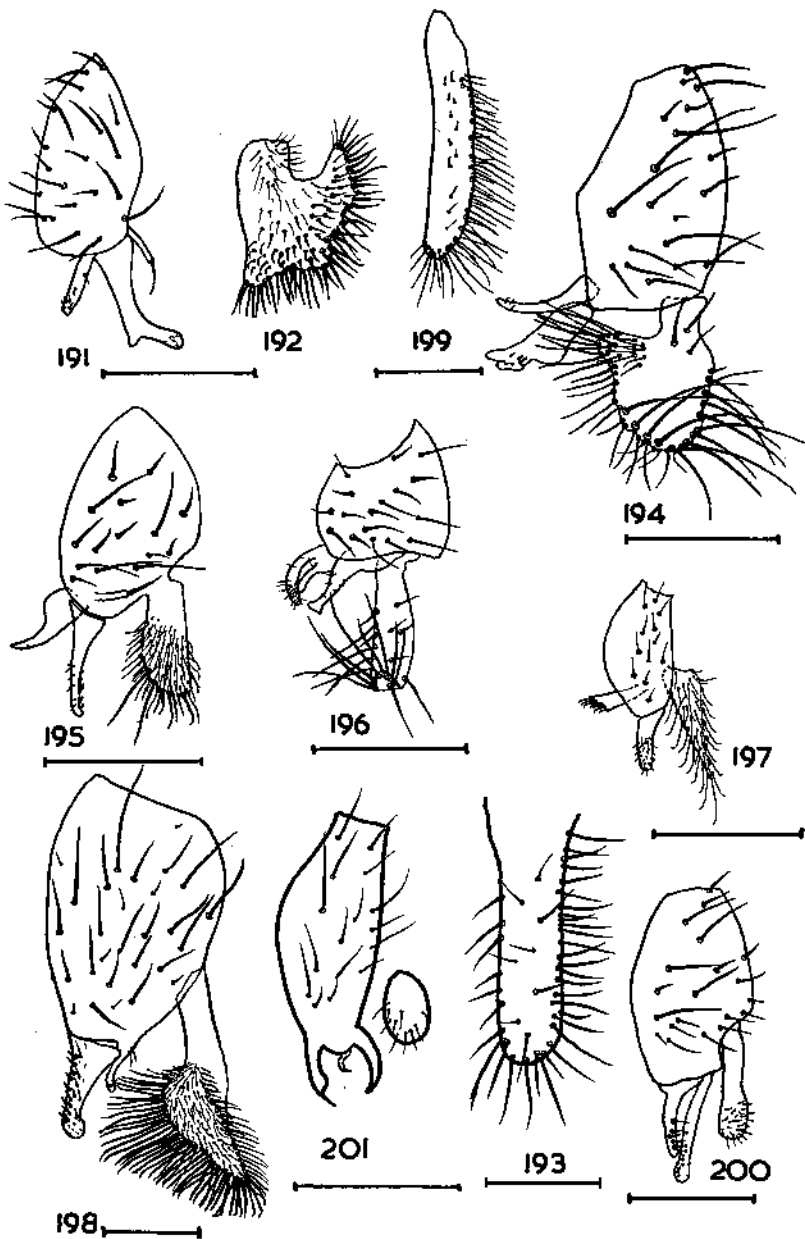


Fig. 191. External male genitalia of *Fenwickia nuda*  
 .. 192. Anal plate of *F. nuda*  
 .. 193. " " " *F. similis*  
 .. 194. External male genitalia of *F. caudata*  
 .. 195. " " " *F. claripennis*  
 .. 196. " " " *F. affinis*  
 Fig. 197. External male genitalia of *Xeneura picata*  
 .. 198. " " " *Aneuria imitatrix*  
 .. 199. Anal plate of *A. sexpunctata*  
 .. 200. External male genitalia of *A. bipunctata*  
 .. 201. " " " *A. angusta*  
 Scale: 0.5 mm.

auxiliary clasper with wide base, narrow, curved apical two-thirds and with a strong terminal spine. Penis wide basally, curved and split apically.

Female tergites dark brown with pair of yellowish-brown areas on anterior margin, small or often absent on 1st tergite but large on 5th.

Female genitalia yellowish-brown.

*Holotype*: LITTLE BARRIER ISLAND: Waipawa stream bed, 28.xi.1954, ♂, (R. A. Harrison), (P.D.D.).

*Paratypes*: LITTLE BARRIER ISLAND: Waipawa stream bed, 28.xi.1954, 3 ♀: Kauri Gully and tracks, 24.xi.1954, 2 ♂, (R. A. Harrison), (P.D.D.).

*Material Examined*: Holotype, 2 ♂ and 3 ♀ paratypes.

*Distribution*: Little Barrier Island. (November).

*Remarks*: The most important character separating this species from others in the genus is the narrow cheeks. Similar in general appearance to the species of *Fenwickia* particularly those with shaded wings and, in all respects, more closely related to that genus than are the other species of *Aneuria*.

### *Aneuria imitatrix* Malloch. Figs. 187, 198

*Aneuria imitatrix* Malloch, 1930. Rec. Cant. [N.Z.] Mus.  
3: 340.

A light brown species with greyish-brown dusting and spotted wings. Body length about 3.5–4.0 mm., wing length about 3.75–4.0 mm.

#### MALE AND FEMALE

**HEAD**: Arista greyish-black, basal segment yellowish-brown, slight pubescence with hairs short, less than diameter of basal segment. Antenna light yellowish-brown; 3rd segment with thick yellow pile; 2nd segment with 1 dorsal apical bristle and ring of apical black hairs, elsewhere bare; basal segment with few black hairs. Front orange brown, ocellar triangle and orbits heavily greyish-yellow dusted. Verticals and ocellars strong; small hairs on orbits about the orbital bristles; ocellar area with short hairs. Sides of front converging anteriorly. Face light brown dusted. Cheeks yellowish-brown dusted. Few strong hairs on cheek posterior to vibrissa and 3 or more bristles at lower posterior angle of cheek. Eyes with few short widely separated hairs. Vertical diameter of eye about 5 times width of cheek in same axis. Proboscis yellowish-brown; palpi yellowish-white with fine black hairs.

**THORAX**: Heavily dusted light greyish-brown, no spots at base of bristles. Prescutellars less than half length posterior dorsocentrals; enlarged hair anterior to anterior postsutural dorsocentral; divergent basal and parallel apical scutellars equal in length and strong; scutellum bare; 1 strong humeral; 2 notopleurals, posterior shorter; 1 strong presutural; 1 strong supraalar; 2 postalars, 1 strong; 1 propleural; prosternum bare.

Legs yellowish-brown; posterior femur often greyish-dark brown. Fore femur with postero-dorsals on basal and apical thirds and 1 strong subapical and shorter hairs on postero-ventral surface; mid femur with anterior bristle at apical quarter; hind femur with 1 long ventral bristle at basal third in males, and 1 antero-dorsal at apical quarter; all tibiae with fairly strong preapical, and weak apicals except mid tibia with strong apical.

Wings (Fig. 187) clear, with brown shading about 2 cross veins and apices of 2nd, 3rd, and 4th veins; veins in these darkened areas dark brown, elsewhere light brown. Costal spines just longer than diameter of costal vein; short stout spines of costa ending midway between apices of 2nd and 3rd veins; 5th vein traceable to wing margin. Wing indices: costal about 3.6; 4th vein about 1.5; 4c about 0.75; 5x about 0.65–0.95.

Halteres light brown.

**ABDOMEN:** Male tergites 1 to 4 greyish-brown; tergite 5 yellowish-brown; tergite 6 light brown and relatively wide.

**External male genitalia (Fig. 198):** Genital arch brown, bulbous and large, tapering to anteriorly directed ventral margin, covered with about 20 strong but short black bristles on either side and some smaller bristles; anal plate triangular and wide, covering most of the genitalia, with very distinct black bristles crowded along the lateral margin, small hair-like bristles on inner margin interlocking with those of opposite plate, surface with fine hairs; clasper stout and ending in small spherical club-like process, short black hairs on anterior margins and some small fine hairs on club; auxiliary clasper small, about half length and width of clasper, 2 short hairs at base.

Female tergites shining brown or light brown.

Female genitalia yellowish-brown.

**Holotype:** MT. ARTHUR: 4,000 ft., 12.xii.1921, ♂, (*A. Tonnoir*), (Cawt. Inst.).

**Material Examined:** Holotype, 1 paratype, 1 ♂, and 1 ♀.

**New Records:** ARTHURS PASS: 2-3.i.1943, 1 ♂, 1 ♀, (*E. S. Gourlay*), (Cawt. Inst.).

**Distribution:** Mt. Arthur, Arthurs Pass, Otira. (December to February).

**Remarks:** Separated from other species in the genus by having the shading on the wing restricted to the cross veins and apices of second and fourth veins.

### ***Aneuria bipunctata* Malloch. Figs. 122, 188, 200**

*Aneuria bipunctata* Malloch, 1930. Rec. Cant. [N.Z.] Mus.  
3 : 341.

A grey fly with brown spotted wings and generally yellowish-brown legs. Body length 2.5-3.0 mm., wing length about 2.5-3.25 mm.

#### MALE AND FEMALE

**HEAD (Fig. 122):** Arista dark brown, yellowish-brown basal segments, pubescent, the rays shorter than diameter of basal segments. Antenna light brown; 2nd segment with 1 strong dorsal apical and shorter central bristles and black hairs particularly on apical margin. Front yellowish-brown anteriorly, orbits, ocellar area, and triangle about it heavily dusted with grey, elsewhere reddish-brown. Inner verticals the strongest bristles and about 1.5 times length of outer verticals; ratio of lengths of orbitals, anterior to posterior, 1 : 2 : 2; 1 or 2 small hairs on orbits between orbitals and on ocellar area. Face brownish-grey. Cheeks brownish-grey. One strong and several short bristles at lower posterior corner of cheek, the large bristle almost equal in length to vibrissa; hairs on cheek strong; about half length of vibrissa. Occiput heavily grey dusted. Eyes with small, fine, few hairs. Vertical diameter of eye about 5 to 6 times width of cheek in same axis. Proboscis yellowish-brown; palpi same colour with fine black hairs scattered over surface.

**THORAX:** Greyish-brown with brown spots at base of bristles on mesonotum; pleura darker brown. Scutellum greyish-brown, darker on middle of disc. Prescutellars weak; anterior 3 dorsocentral bristles equally strong, posterior bristle very strong; divergent basal and parallel apical scutellar approximately equal in size; disc of scutellum bare; 1 humeral; 2 notopleurals; 1 presutural; 1 supraalar; 2 postalars; 1 small propleural hair; prosternum bare.

Legs mainly yellowish-brown or light brown; posterior femur, except apical section, dark brown. Fore femur with strong preapical postero-dorsal and postero-ventral, and weaker bristles on postero-dorsal surface, and 1 long but fine postero-ventral basal bristle; mid and hind femora with anterior bristle at apical quarter; hind femur, in male, with long fine ventral bristle at about basal third; all tibiae with preapical and weak apicals.

Wings (Fig. 188): shaded, with brown areas; veins brown, costal spines about width of costa; heavy stout costal spines extend to about three-fifths distance between 2nd and 3rd veins; 5th vein not quite reaching wing margin. One specimen with 1 wing vein with anteriorly directed stump vein off 4th vein; another with posterior stump vein on 4th vein. Wing indices: costal about 2.5; 4th vein about 2.0; 4c about 1.1; 5x about 1.4.

Halteres light brown with apical portion of apical segment yellowish-brown.

ABDOMEN: Blackish-brown with grey lateral spot anteriorly on 3rd and 5th tergites.

External male genitalia (Fig. 200): Genital arch dark brown, irregularly quadrangular in shape, 5 or 6 strong black bristles and some smaller black hairs on either side; anal plate only faintly pigmented, as long as width of genital arch and about one-fourth as wide as long, slightly clubbed at apex, apical third with matt of minute hairs on outer margin; clasper about same length as plate, slightly clubbed at apex, very short stout teeth-like spines on anterior margin of apical third, and other much finer hairs surrounding these spines; auxiliary clasper just shorter than clasper, widened to broad triangular shape at base, some fine hairs equal to width of clasper and other short fine hairs on surface, claspers light brown.

*Holotype*: BANKS PENINSULA: Hilltop, 14.i.1925, ♂, (*A. Tonnoir*), (Cant. Mus.).

*Material Examined*: Holotype, 5 ♂ and 3 ♀.

*New Records*: WAIKAREMOANA: 12.xii.1946, 1 ♀, (*R. R. Forster*), (Dom. Mus.). MOANA: 16-21.xii.1925, 1 ♂, (*A. Tonnoir*), (Cant. Mus.). DUNEDIN: Opoho, 10.x.1921, 1 ♀; Andrew Bay, 10.x.1922, 3 ♂, 1 ♀, (*Anon.*), (Ak. Mus.). MAUNGATUA: 24.x.1921, 1 ♂, (Ak. Mus.).

*Distribution*: Waikaremoana, Cass, Moana, Banks Peninsula, Dunedin, Maungatua. (October to January).

*Remarks*: Distinct variations in the intensity of wing shading occur in specimens from different localities, those specimens from the South Island being darker. The light brown areas on tergites also vary, those on specimens from the South Island being relatively smaller than those from the North Island. The pattern of the shading on the wings and the distinctive spotting at base of bristles on the mesonotum are two of the chief characters which separate this species from others in the genus. Stump veins have not been observed before in this species and Malloch (1930d) regarded their absence as a keying character. Two specimens in the series examined have stump veins in one wing only, and this inconsistency in their occurrence makes the character of little use for keying purposes.

### ***Aneuria tripunctata* Malloch. Fig. 189**

*Aneuria tripunctata* Malloch, 1930. Rec. Cant. [N.Z.] Mus.  
3 : 342.

A light grey species with brown spotted wings and light brown head and legs. Body length about 4.0 mm., wing length about 4.0 mm.

#### FEMALE

HEAD: Arista dark brown, basal segments yellowish-brown; pubescent, rays less than diameter of basal segments. Antenna light brown; 2nd segment with 1 dorsal apical, 2 shorter ventral apicals and black hairs elsewhere on apical margin; basal segment with few short black hairs. Front light brown or yellowish-brown, ocellar triangle and orbits light yellowish-grey dusted. Inner and outer verticals strong, the inner one the longer of the pair and about 1.3 times length of post-verticals; ratio of lengths of fronto-orbitals, anterior to posterior, 3 : 4 : 4; isolated

very short hairs on orbits about the bristles. Face light brown. Cheeks yellowish-brown. Two or 3 bristles at posterior corner of cheek about equal to length of vibrissa; cheek and occipital hairs strong. Occiput greyish-brown. Eyes with few very short fine hairs. Vertical diameter of eye about 6 times width of cheek in same axis. Proboscis light brown; palpi yellowish-brown with a few black hairs.

**THORAX:** Brown; mesonotum heavily grey dusted, small brown dots at base of bristles; transverse suture and scutellar sutures brown; scutellum greyish-brown, margin yellowish-brown; pleura without the heavy dusting of mesonotum. Prescutellars small; all scutellars long and strong; divergent basals just longer than parallel apicals; disc of scutellum bare; 1 humeral; 1 strong presutural; 2 notopleurals; 1 strong supraalar; 2 postalars, outer one strong; 1 strong presutural; prosternum bare.

Legs light brown, hind femur brown on basal three-quarters. Fore femur with strong bristles on postero-dorsal surface, strong hairs and 1 strong preapical bristle on postero-ventral surface; mid femur with strong anterior bristle at apical quarter; hind femur with strong antero-dorsal at apical quarter; all tibiae with strong preapicals and weak apicals.

Wings (Fig. 189) clear with many brown markings; vein light brown except dark brown in the shaded areas. Most costal spines longer than diameter of costa at the point where they arise; heavy costal spines extending half distance between 2nd and 3rd veins; 5th vein just traceable to margin; 2 posteriorly directed stump veins arising from distal portion of 4th vein and in each brown spot. Wing indices: costal about 4.0; 4th vein about 1.8; 4c about 0.75; 5x about 1.0.

Halteres yellowish-brown.

**ABDOMEN:** Shining brown; yellowish-brown areas laterally on all tergites except 1st, and smaller golden brown spot median to these areas and on anterior margins.

External genitalia yellowish-brown.

*Holotype:* MT. ARTHUR: 4,500 ft., 2.iii.1923, ♀, (*A. Philpott*), (Cant. Mus.).

*Material Examined:* Holotype, 1 paratype, and 1 ♀.

*New Records:* ARTHURS PASS: 21.i.1922, 1 ♀, (*Anon.*), (Ak. Mus.).

*Distribution:* Mt. Arthur, Dun Mt., Arthurs Pass, Otira. (January to March).

*Remarks:* Readily separated from other species by the shading of the wing. Male unknown.

### ***Aneuria sexpunctata* Malloch. Figs. 190, 199**

*Aneuria sexpunctata* Malloch, 1930. Rec. Cant. [N.Z.] Mus.  
3 : 342.

A light grey species with brown spotted wings, light brown head and legs. Body length about 3.5–4.0 mm., wing length about 3.5–4.0 mm.

#### MALE AND FEMALE

**HEAD:** Arista dark brown, with yellowish-brown basal segments; pubescent, rays not as long as width of basal segments. Antenna light brown; 2nd segment with 1 strong dorsal apical bristle and black hairs on apical margin, these hairs longer ventrally; basal segment with short black hairs. Front light brown, ocellar triangle and orbits heavily dusted with light yellowish-grey. Frontal bristles missing from type specimens except ocellars and one of the outer verticals; few minute hairs about orbits. Face light brown. Cheeks yellowish-brown. Bristles at lower posterior corner of cheek not as long as vibrissa; cheek hairs strong. Occiput greyish-brown. Eyes with few very short hairs. Vertical diameter of eye about 6 times width of cheek in same axis. Proboscis light brown; palpi yellowish-brown, with short fine black hairs.

**THORAX:** Brown; mesonotum dusted with grey; scutellum lighter brown on margin; pleura brown with less dusting than mesonotum. Prescutellars short; posterior dorsocentrals very strong and about equal to divergent basal and cruciate apical

scutellars; dorsocentrals progressively shorter anteriorly; 1 strong humeral; 1 presutural; 1 small presutural interalar on one side of holotype; 2 notopleurals; 1 strong supraalar; 2 postalars, 1 strong; no propleural; prosternum with 1 small black hair.

Legs light brown; hind femur brown. Fore femur with bristles on postero-dorsal surface and strong bristles at apical quarter and 1 weaker at basal third of postero-ventral surface; mid femur with anterior bristle at apical quarter; hind femur with antero-dorsal bristle at apical quarter, and, in male, 1 strong ventral at basal quarter; tibiae with strong preapical and weak apical.

Wings (Fig. 190) clear with many brown spots and brown areas; veins light brown but dark brown in shaded areas. Costal spines just longer than diameter of costa, short stout costal spines extending two-thirds distance between 2nd and 3rd veins; 5th vein traceable to wing margins; marginal cell with 6 brown spots; 4 brown areas on 5th vein along discal cell; distal portion of 4th vein with 2 stump veins extending posteriorly each in a brown shaded area. Wing indices: costal about 3.5; 4th vein about 1.75; 4c about 0.8; 5x about 1.1.

Halteres yellowish-brown.

ABDOMEN: Tergites light brown; tergites 2 to 6 with large triangular brown median area with apex anteriorly and dark brown band across lateral margins.

External male genitalia (Fig. 199): Genital arch light brown and strong and distinct black bristles evenly over the surface; anal plate light brown, long and strap-like, about one-third or quarter length of abdomen and curved anteriorly beneath, and covering other components of genitalia, covered with thick short light yellowish-brown pile, fine long hairs on outer and apical margin approximately equal to width of plate, short fine hairs on irregular row near inner margin; clasper yellowish-brown and covered with thick short black hairs; auxiliary clasper small.

*Holotype*: MT. ARTHUR: 4,500 ft., 21.xii.1921, ♂, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined*: Holotype and allotype.

*Distribution*: Mt. Arthur. (December).

*Remarks*: Readily separated from other species by the shading of the wing. Most closely allied to *A. tripunctata*.

## Family SEPSIDÆ

Metallic-coloured flies. Head almost spherical. Arista bare or with very short pubescence. Postverticals divergent. Vibrissa present or absent. Occiput convex. Palpi vestigial. Posterior thoracic spiracle with hairs on border in addition to normal pubescence. Fore legs on males with secondary sexual characters. Costa unbroken; subcosta entire and ending in costa well separated from apex of first vein. Abdomen basally constricted.

Readily recognised and separated from other families by the spherical head, constricted abdomen, and greatly reduced palpi.

*Genera Occurring in New Zealand*:

*Lasionemapoda* Duda

The family has not previously been recorded from New Zealand.

## Genus LASIONEMAPODA Duda

*Lasionemapoda* Duda, 1925. Ann. naturh. (Mus.) Hofmus.  
Wien 39: 30.

Outer verticals present. No orbital bristles; front conspicuously haired. Carina present. One dorsocentral; apical scutellars only; mesopleural bristle present. Fore

femur of both sexes with rows of short ventral spines. Wings without shaded area at apex. Third and 4th veins slightly convergent at apex of wing. First and 2nd basal cells separated. Abdomen constricted at base. Tergites without marginal bristles.

Type Species: *Lasionemapoda hirsuta* (De Meijere)

Distribution: World wide.

Species Occurring in New Zealand:

*Lasionemapoda hirsuta* (de Meijere)

***Lasionemapoda hirsuta* (de Meijere). Figs. 204, 211, 212**

*Sepsis hirsuta* de Meijere, 1906. Ann. hist.-nat. Mus. hung. 165.

Malloch 1925. Proc. Linn. Soc. N.S.W. 50 : 312.

*Lasionemapoda hirsuta* (de Meijere): Duda, 1925. Ann. naturh. (Mus.) Hofmus. Wien 39 : 30. Malloch, 1928. Proc. Linn. Soc. N.S.W. 53 : 307.

A metallic brown and blackish-brown species. Body length about 6.0 mm., wing length about 3.5 mm.

FEMALE

HEAD (Fig. 204): Arista shining blackish-brown, bare except for slight pubescence at base. Antenna yellowish-brown; 3rd segment brown dorsally, almost twice as long as wide and pointed at dorsal apical corner; 2nd segment with 1 small dorsal apical bristle and short black hairs mostly on apical margin; basal segment with a few dorsal apical hairs. Front shining light reddish-brown; ocellar triangle, vertex, and posterior half of fronto-orbits blackish-brown. Black hairs over most of front; ocellars very strong and divergent; postverticals strong; inner verticals stronger than outer verticals. Face light brown. Cheeks reddish-brown, dark brown posteriorly. About 3 bristles at vibrissal angle; cheeks with fine black hairs elsewhere. Occiput blackish-brown. Eyes bare. Vertical diameter of eye about 8 times width of cheek in same axis. Proboscis brown and light brown; palpi bearing 2 strong and some shorter black bristles at apex.

THORAX: Mesonotum and scutellum black, heavily dusted with dark greyish-green; humerus and pleura reddish-brown, shining except for light dusting of silvery-grey on humerus and most of sternopleuron. One dorsocentral; hairs on mesonotum fine and small; scutellars strong and convergent; pair of marginal hairs between scutellar bristles; 1 humeral; no presutural; 2 notopleurals; 1 supraalar; 1 postalar; mesopleuron with fine hairs and 1 strong bristle at postero-dorsal corner; sternopleuron with fine hairs; rows of about 3 fine long propleural hairs and several small hairs ventral to anterior spiracle; 1 strong and several weak bristles on ventral margin of posterior spiracle.

Legs (Fig. 212) light reddish-brown; femora shining; tibia and tarsi with light dusting of grey. Fore femur with 8 to 12 spines on apical half of antero-ventral margin and about 6 similar spines at apical half of postero-ventral margin; mid tibia with 2 posterior and 1 anterior bristle near apical third, a strong preapical, 1 strong apical and several smaller apical spines; hind tibia with 1 strong and 1 weak anterior bristle at apical quarter, a small preapical, and small apical.

Wings (Fig. 211) clear with faint shading at base near anterior margin; veins brown. Costa ending at 4th vein; short stout costal spines ending about two-thirds distance between apices of 2nd and 3rd veins. Wing indices: costal about 3.0; 4th vein about 3.2; 4c about 1.2; 5x about 1.5.

Halteres pale yellow with dark brown stalks.

ABDOMEN: Shining black; basal two tergites shining reddish-brown. Long fine black hairs over all tergites.

*Holotype*: Australia.

*Material Examined*: 2 ♀.

*New Records*: KERIKERI: 19.i.1956, 1 ♀, (K. A. J. Wise), (P.D.D.). BRYNDERWYN: swept from flowers of *Senecio kirkii*, 17.i.1956, 1 ♀, (K. A. J. Wise), (P.D.D.).

*Distribution in New Zealand:* Kerikeri, Brynderwyn. (January).

*Remarks:* Not previously recorded from New Zealand.

## Family PIOPHILIDAE

Shining black species, small areas of thorax dusted. Antenna short; second segment with prominent erect bristle. Postverticals weak and divergent. Vibrissa present. Two pairs scutellars; two sternopleurals. Tibiae without preapical dorsal bristles. Costa broken at or near apex of subcosta; subcosta complete and ending close to apex of first vein; anal vein fading out before reach wing margin.

Distinguishing characters are the shining black colouration with small grey dusted areas on the pleura, the divergent postverticals, and the presence of vibrissa.

*Genera Occurring in New Zealand:*

*Piophila* Fallén

*Protopiophila* Duda

### KEY TO GENERA OF PIOPHILIDAE IN NEW ZEALAND

One dorsocentral ..... PIOPHILA (p. 171)  
Four dorsocentrals ..... PROTOPIOPHILA (p. 173)

## Genus PIOPHILA Fallén

*Piophila* Fallén, 1810. "Sp.Ent. Nov. Dipt." p. 20.

Front with parallel or anteriorly convergent sides. Antennal fossae shallow. Ocellars shorter than posterior verticals. One dorsocentral. Wings clear; veins often lightly pigmented.

Types Species: *Piophila casei* (Linnaeus)

Recognised by the single dorsocentral and most readily separated from *Protopiophila* by this character.

*Distribution:* World wide.

*Species Occurring in New Zealand:*

*Piophila casei* (Linnaeus)

The sole New Zealand representative is an immigrant species.

## *Piophila casei* (Linnaeus). Figs. 202, 206

*Musca casei* Linnaeus, 1761. "Fauna Suec." p. 456.

*Piophila casei* (Linnaeus): Fallén, 1820. "Dipt. Suec. Heteromyz." p. 9.

*Piophila smithii* Hutton, 1901. Trans. N.Z. Inst. 33 : 89.

A small shining black species with some yellowing on legs and clear wings. Body length about 3.75-4.0 mm.; wing length about 3.75 mm.

### FEMALE

HEAD (Fig. 202): Arista light brown, bare. Antenna light brown; 3rd segment brown dorsally; 2nd segment with a few small hairs, 1st segment with short black marginal apical hairs. Front shining black and merging to light brown anteriorly, longer than wide between eyes; ocellar triangle just distinguished from rest of front as a more glossy area. No fronto-orbitals; ocellars short; verticals and divergent postverticals fairly short and all about equal; fine hairs on most of front. Face



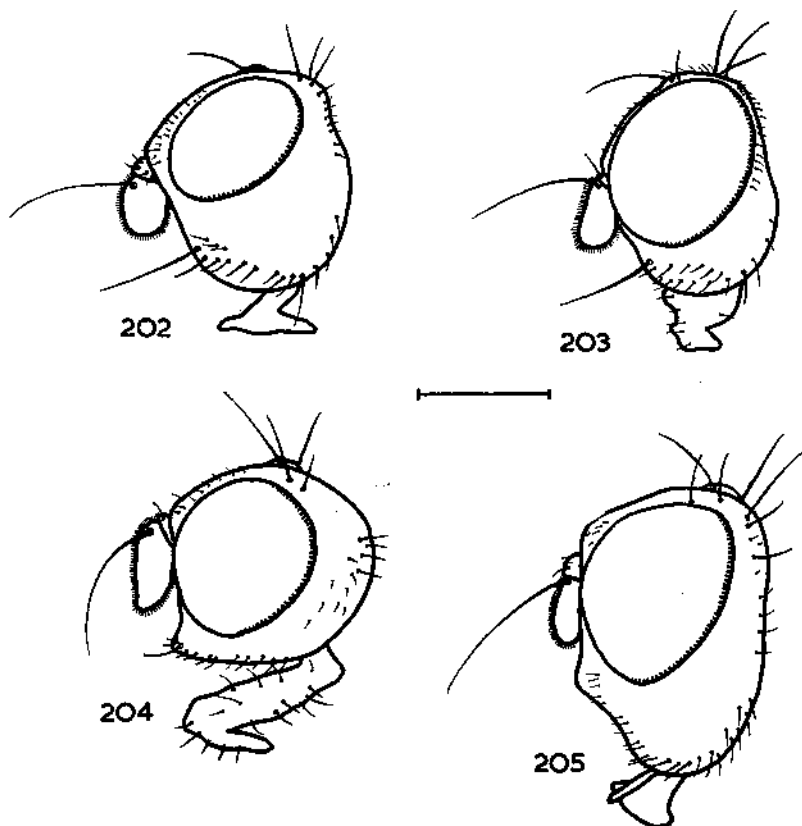


Fig. 202. Head of *Piophila casei*  
 " 203. " " *Protopiophila australis*  
 " 204. " " *Lasionemapoda hirsuta*  
 " 205. " " *Psila rosae*  
 Scale: 0.5 mm.

light brown with light grey dusting. Cheeks shining light yellowish-brown merging to shining black posteriorly. Three or 4 fine hair-like bristles at posterior lower angle of cheeks about half length of vibrissa; few fine hairs on lower portion of cheek. Occiput shining black. Eyes bare. Vertical diameter of eye about 1.5 times width of cheek in same axis. Proboscis brown; palpi light brown.

**THORAX:** Shining or glossy black; grey dusted spot between anterior spiracle and anterior coxa. No acrostichal bristles; basal scutellars parallel and about two-thirds length of cruciate apical scutellars; small humeral; 2 notopleurals; 1 supraalar; 2 postalar; mesopleuron haired; 2 small sternopleurals; 1 fine propleural.

Legs yellowish-brown except dark brown on apical two-thirds of fore femur, all fore tibia and fore tarsus, apical half of hind femur, and about apical half of hind tibia; apical segment of mid and hind tarsi brown. All tibiae with weak ventral apicals.

Wings (Fig. 206): Veins pale yellow. Costa weakened at apex of subcosta; no costal spines, costa with spine-like hairs to just beyond apex of 2nd vein then gradually changing to finer hairs; 5th vein reaching wing margin. Wing indices: costal about 2.6-3.1; 4th vein about 2.0; 4c about 1.2; 5x about 0.9.

Halteres light yellowish-brown.

**ABDOMEN:** Shining black. All segments with long fine black hairs.

*Holotype*: Europe.

*Material Examined*: 5 ♀ and 1 ex.

*New Records*: BULLS: Flockhouse Farm, ex bacon, 26.i.1951, 4 ♀, (A. J. Kears), (P.D.D.). AUCKLAND: New Lynn, 28.v.1949, 1 ♀, (P. Fry): Browns Bay, 22.xii.1951, 1 ex., (R. A. Harrison), (P.D.D.).

*Distribution in New Zealand*: Auckland, Bulls, Ashburton. (December, January, May).

*Remarks*: Commonly called the "cheese skipper" in the larval stage because the larvae have the habit of "skipping". Larval foods include cheese and meats, particularly bacon.

#### Genus PROTOPIOPHILA Duda

*Protopiophila* Duda 1924. *Konowia*, 3 : 109.

Front with slightly converging sides. Antennal fossae shallow. Four dorso-centrals, anterior one presutural. Wings clear; veins light brown.

Type Species: *Protopiophila latipes* (Meigen)

Separated from *Piophila* by the presence of four dorsocentrals. Duda (1924) proposed *Protopiophila* as a subgenus of *Piophila* Fallén. Full generic status has been given to this subgenus (Seguy, 1934) and such status is recognised here.

*Distribution*: New Zealand, Australia, Pacific Islands, East Indies, Europe, North America.

*Species Occurring in New Zealand*:

*Protopiophila australis* sp.n.

#### **Protopiophila australis** sp.n. Figs. 203, 207

A shining blackish-brown species with clear wings and yellowish-brown mid and hind legs. Body length about 3.0 mm.; wing length about 2.75 mm.

#### MALE AND FEMALE

**HEAD** (Fig. 203): Arista brown; few scattered small hairs much less than diameter of arista. Antenna yellowish-brown; basal segment brown. Front longer than wide, glossy black, slightly raised anteriorly. One fronto-orbital just shorter than the divergent postverticals and shorter than verticals and ocellars; few scattered black hairs over surface except the raised anterior ridge and row of hairs on orbits. Face whitish-grey with shining darker brown bands on margin of antennal fossae. Cheeks shining dark brown. Vibrissa strong but no clearly differentiated bristles at lower posterior corner of cheek; hairs on ventral half of cheek. Occiput dark brown. Eyes with few very short fine hairs. Vertical diameter of eye about 3.5 times width of cheek in same axis. Proboscis shining dark brown; palpi yellowish-brown, broad and long.

**THORAX**: Shining dark brown; greyish-white tomentum on dorsal margin of mesopleuron, surrounding anterior spiracle and over most of propleuron, and dorsal to hind coxa. No acrostichals; basal scutellars parallel or convergent and about two-thirds convergent apically; scutellum bare; 2 humerals; 1 presutural; 2 notopleurals; 1 supraalar; 2 postalars; 2 equal posterior sternopleurals; mesopleuron haired; 1 strong and 1 very weak propleural; prosternum bare.

**Legs**: Fore legs blackish-brown except yellowish-brown coxa, trochanter, base and apex of femur, and base of tibia; white pulvilli; other legs all yellowish-brown. Second segment of fore tarsus about 1.5 times as long as wide. Fore femur with postero-dorsal and postero-ventral bristles; apicals only on mid tibia.

**Wings** (Fig. 207): Short black stout costal spines ending just beyond apex of

2nd vein. Wing indices: costal about 4.3-4.7; 4th vein about 2.2-2.7; 4c about 0.9; 5x about 0.8-1.0.

Halteres light brown basally, light yellowish-brown apically.

ABDOMEN: Glossy blackish-brown; longest hairs and bristles on the posterior segments.

*Holotype*: WAITAKERE RANGES: Titirangi, ex light trap, 18.ii.1953, ♂, (C. R. Thomas), (P.D.D.).

*Paratypes*: WAITAKERE RANGES: Titirangi, ex light trap, 8.ii.1953, 1 ♀; 12.ii.1953, 1 ♀; 16.ii.1953, 1 ♂, 1 ♀; 18.ii.1953, 2 ex.; 23.ii.1953, 1 ♂; 10.xii.1953, 1 ♂; 11.xii.1953, 1 ♂; 13.xii.1953, 1 ♀, (C. R. Thomas): on decaying fruit, 3.ii.1953, 1 ♂, (R. A. Harrison), (P.D.D.). NEW SOUTH WALES: Sydney, Wahroonga, 26.i.1926, 1 ♀, (Anon.), (U.S.N.M.). FIJI: Lautoka, 12.ii.1919, 1 ♂; 17.iii.1919, 1 ♂; 18.viii.1919, 1 ♂, (H. Greenwood), (B.M.): Suva, 23.ix.1920, 1 ♂, (H. W. Simmonds): Tavuni, 20.xii.1921, 1 ♂, (H. W. Simmonds), (B.M.).

*Material Examined*: Holotype, 10 ♂, 5 ♀; and 2 ex. paratypes.

*Distribution*: Waitakere Ranges, Australia, Fiji. (August, September, December to March).

*Remarks*: Australian and Fijian specimens were previously determined as *Piophilina contecta* Walker by Malloch (1927) and Bezzi (1928). However, this species differs from *P. contecta*, chiefly by having hairs on the mesopleuron.

#### Family PSILIDAE

Antenna decumbent. Postverticals divergent or absent. Face perpendicular or receding in profile. Vibrissa absent. Humeral, mesopleural, and sternopleural bristles absent. Tibia without preapical bristles. Costa broken at apex of subcosta well before apex of first vein; extending to fourth vein; subcosta incomplete but reaching costa as a clear fold of wing membrane, this fold extending posteriorly across wing to second basal cell; second basal and anal cells large. Genitalia inconspicuous.

*Genera Occurring in New Zealand*:

*Psila* Meigen

*Remarks*: No endemic members of the family have been discovered in New Zealand and the only representative is the carrot rust fly *Psila rosae*.

Recognised by wing characters especially the fold across base of wing and the absence of sternopleural and humeral bristles.

#### Genus PSILA Meigen

*Psila* Meigen, 1803. Mag. Insektenk. 2: 278.

Antennae short; 3rd segment less than length of arista. Cheeks half eye height. One dorsocentral; pteropleuron bare; 1 notopleural; 1 pair scutellar bristles.

*Type Species*: *Psila frimetaria* Linnaeus

*Distribution*: World wide.

*Species Occurring in New Zealand*:

*Psila rosae* (Fabricius)

**Psila rosae** (Fabricius). Figs. 205, 208

*Musca rosae* Fabricius, 1794. Ent. Syst. 4 : 356.

*Psila rosae* (Fabricius): Kollar, 1837. "Naturg. d. schadl. Ins."  
p. 168.

A shining, dark reddish-brown species with yellowish-brown head and legs and light wings. Body length about 4.5-5.0 mm., wing length about 4.5 mm.

MALE AND FEMALE

**HEAD** (Fig. 205): Arista light brown; pubescent, rays of pubescence about equal to diameter of basal segment. Antenna light reddish-brown; 3rd segment dark brown on outer dorsal margin and about apex; 2nd segment just shorter than length of 3rd segment, without strong dorsal apical bristle but with brown hairs over most of surface of dorsal margin; basal segment small and with minute hairs. Front about as broad as long, light reddish-brown; ocellar area dark brown. Two light brown fronto-orbitals close together opposite ocelli, anterior just shorter than posterior; postverticals large and widely divergent; 1 inwardly directed vertical and 2, more lateral, outwardly directed verticals; few scattered short light brown hairs on orbits and median anterior region of front and from between postverticals to anterior ocellars. Face light brown or yellowish-brown, convex anteriorly; carina absent. Minute hairs on inner margin of parafacials. Cheeks yellowish-brown, mostly bare of hairs; no vibrissa nor bristles at lower posterior angle of cheek. Eyes with a few fine short hairs. Vertical diameter of eye about 2.2 times width of cheek in same axis. Proboscis light brown; palpi brown apically. Epistome blackish-brown between palpal fossae.

**THORAX**: Shining dark reddish-brown with white hairs except for bare areas on posterior margin of mesonotum, scutellum and metapleuron; hairs thick on mesonotum; fewer on sternopleuron. No acrostichals; 2 dorsocentrals with occasionally a weaker anterior; convergent apical scutellars, no basal scutellars; no presuturals; 1 posterior notopleural; 1 supraalar; 1 postalar; no propleural.

Legs yellowish-brown. No preapical tibials; mid tibia with apical; all hairs and bristles light yellowish-brown.

**Wings** (Fig. 208) clear; veins light yellowish-brown. Subcosta terminated just over half way to apex of 1st vein with clear patch of wing membrane extending at right angles from the end of subcosta to costal vein which is weakened at that point, this area continued posteriorly as a fold through fork of 2nd and 3rd veins across 4th vein to cross vein enclosing 2nd basal cell. Fifth vein and anal vein not traceable to wing margins. Costa ending at apex of 4th vein. Wing indices: costal about 6.0; 4th vein about 1.0; 4c about 0.4; 5x about 0.8.

Halteres yellowish-brown.

**ABDOMEN**: Shining dark reddish-brown with light brown hairs.

*Holotype*: Europe.

*Material Examined*: 25 ♂ and 25 ♀.

*New Records*: PUKEKOHE: swept off carrot foliage, 1952, 1953, many ex. (A. G. Smith and R. A. Harrison), (P.D.D.). AUCKLAND: swept off carrot foliage, 1942, many ex., (T. R. Rabone), (P.D.D.).

*Distribution in New Zealand*: Auckland, Pukekohe. (All the year).

*Remarks*: An immigrant species into New Zealand. At present only found in the North Island carrot-growing districts.

Family OTITIDAE

Front in both sexes equal in width. Fronto-orbitals on posterior half of front, never incurved as in Trypetidae; postverticals divergent or parallel. Vibrissa absent. Clypeus usually well developed. Proboscis short and stout; palpi large. Propleural present or absent; presutural dorsocentrals absent. Preapical bristle on tibiae absent. Costa not

broken at apex of subcosta; subcosta free from first vein and complete. Penis long and curved. Ovipositor three segmented, flattened.

A large family most closely related to Trypetidae and most consistently separated from it by character of the fronto-orbitals. Lindner (1923) gave full family ranking to the various segregates of this family, viz., Richardiidae, Platystomidae, Pterocallidae, Otitidae and Ulidiidae. Separation of these groups is as yet not resolved satisfactorily and in dealing with New Zealand forms the subfamily rankings are retained.

*Subfamily Occurring in New Zealand:*  
Platystominae

#### Subfamily PLATYSTOMINAE

Occiput swollen on lower half. Postvertical bristles small. Proboscis short and thick. Propleural bristle absent; three supraalars. Wings pictured; costa broken only near humeral cross vein; first vein haired dorsally; third vein ending before wing tip; anal vein reaching wing margin; axillary vein absent.

Various accorded family or subfamily ranking, this group of Diptera which includes two well known foreign genera, *Platystoma* and *Rivellia*, is here given subfamily ranking. An important distinguishing character of this subfamily and one which separates it from other related subfamilies is the single break in the costa near the humeral cross vein.

#### Genus ZEALANDORTALIS Malloch

*Zealandortalis* Malloch, 1930. Rec. Cant. [N.Z.] Mus. 3 : 243.

Arista minutely pubescent. Two reclinate fronto-orbitals. Palpi normal. One dorsocentral near or at middle of postsutural portion of mesonotum; 1 humeral; 2 notopleurals; mesopleuron with 1 bristle; propleuron, mesopleuron, pteropleuron and sternopleuron haired. Discal cell not strongly widened before anterior cross vein; 1st posterior cell not narrowed at apex; anal cell lobed.

Type Species: *Zealandortalis interrupta* Malloch

The generic diagnosis given above contains several modifications to the original list of characters, (Malloch, 1930c), on the evidence of a re-examination of the type species and from characters of the new species. The genus fits well into the subfamily Platystominae but the third vein ends closer to the apex of the wing than in the genera *Platystoma* and in this character is similar to *Rivellia*. The genus is close to *Rivellia* and is separated from it by the almost straight fourth vein before the anterior cross vein.

*Distribution:* New Zealand.

*Species:*

*Zealandortalis interrupta* Malloch  
*Z. philpotti* sp.n.

#### KEY TO SPECIES OF GENUS ZEALANDORTALIS

Prescutellars absent ..... *interrupta*  
Prescutellars present ..... *philpotti*

**Zealandortalis interrupta** Malloch. Fig. 209

*Zealandortalis interrupta* Malloch. Rec. Cant. [N.Z.] Mus.  
3 : 243.

A shining brown and blackish-brown species with brown shading on wings.  
Body length about 3.25–4.0 mm., wing length about 3.5–4.5 mm.

MALE AND FEMALE

HEAD: Arista brown, light brown basally; rays of pubescence less than diameter of basal segment. Antenna yellowish-brown; 3rd segment longer than other 2 segments together, at least 1.5 times as long as wide and light brown apically; 2nd segment with short black hairs and 1 small dorsal bristle; basal segment minute. Front yellowish-brown anteriorly, merging to brown at vertex; orbits greyish-brown; ocellar area blackish-brown. Fronto-orbitals equal to each other

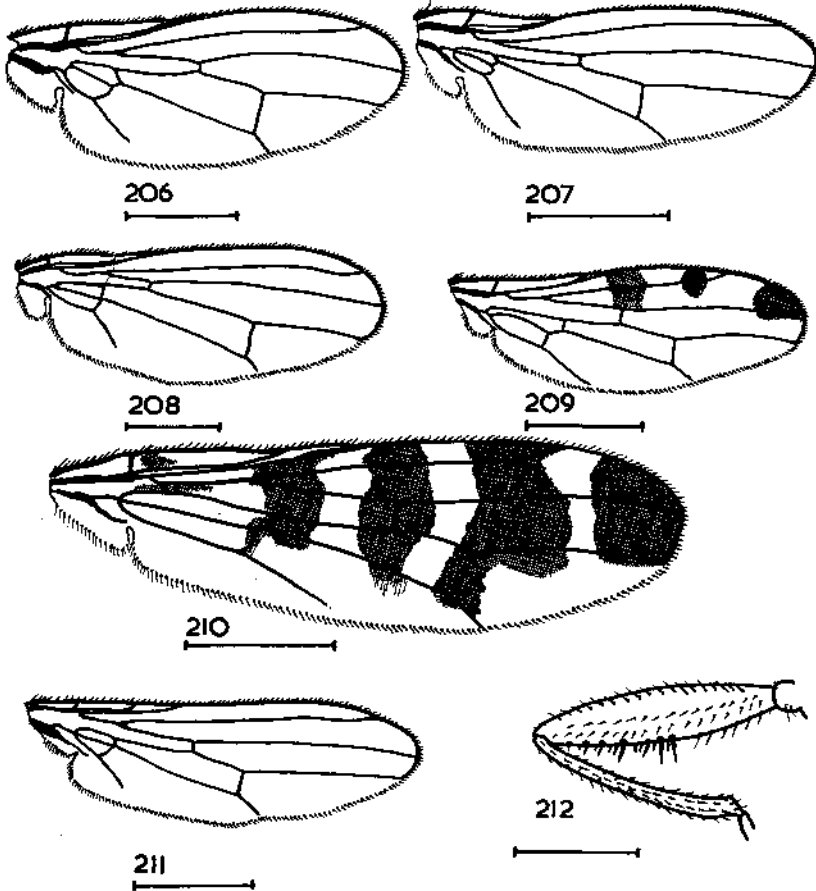


Fig. 206. Wing of *Ptophila casei*  
 " 207. " " *Protoptophila australis*  
 " 208. " " *Psila rosae*  
 " 209. " " *Zealandortalis interrupta*  
 " 210. " " *Zealandortalis philpotti*  
 " 211. " " *Lasionemapoda hirsuta*  
 " 212. Fore leg of *Lasionemapoda hirsuta*  
 Scale: Figs. 206-211, 1.0 mm.; Fig. 212, 0.5 mm.

and about equal to ocellars; verticals strong; hairs on front anterior to anterior fronto-orbital. Face light greyish-brown dusted. Cheeks light brown. Hairs on lower cheek margin; 1 bristle at about mid way along margin. Occiput dark greyish-brown. Eyes with a few fine short hairs. Vertical diameter of eye about 3 times width of cheek in same axis. Proboscis light brown; palpi yellowish-brown, distinct black hairs on apical half.

**THORAX:** Mesonotum grey dusted on reddish-brown, dusting absent leaving 4 shining reddish-brown longitudinal areas, a median pair between dorsocentrals united posteriorly and a wide one lateral to each dorsocentral row commencing just anterior to transverse suture and ending anterior to inner postalar; scutellum shining reddish-brown; pleura shining brown. Prescutellars absent; parallel basal scutellars equal to cruciate apicals; scutellum haired; strong hairs or short bristles between humeri on anterior margin of mesonotum; presutural absent; prosternum haired.

Legs light brown. Fore femur with bristles on apical half of postero-dorsal and postero-ventral surfaces, and 1 fine bristle at base of postero-dorsal surface; mid tibia with strong ventral apical; hind femur with 2 dorsal bristles at apical sixth.

Wings (Fig. 209) clear with some light brown shading; the apical light brown area at apex of submarginal cell and anterior half of apex of 1st posterior cell, all shaded areas lighter posteriorly; veins brown; costa extending to 4th vein; subcosta weakened near its apex. Wing indices: costal about 1.2; 4th vein about 2.0; 4c about 1.3; 5x about 0.6.

Halteres brown and dusted at apex, light brown basally.

**ABDOMEN:** Shining brown with dark brown posterior margins of tergites.

*Holotype:* OTIRA: 2.ii.1922, ♂, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined:* Holotype and 2 ♀.

*New Records:* BOLD PEAK: 27.xii.1944–4.i.1945, 1 ♀, (*E. S. Gourlay*), (Cawt. Inst.). MCKINNON PASS: 28.xii.1919, 1 ♀, (*Anon.*), (Ak. Mus.).

*Distribution:* Otira, Waiho, Bold Peak, McKinnon Pass. (December to February).

*Remarks:* Separated from *Z. philpotti* by the absence of prescutellars.

### ***Zealandortalis philpotti* sp.n. Fig. 210**

A brown and blackish-brown species with brown shaded areas on wings. Body length about 3.0–4.0 mm., wing length about 3.0–4.0 mm.

#### MALE AND FEMALE

**HEAD:** Arista brown, basal segment light brown; rays of pubescence less than diameter of basal segment. Antenna yellowish-brown; 3rd segment about length of other two segments together, about as long as wide and light reddish-brown dorsally; 2nd segment with a few dorsal black hairs and a dorsal bristle, elsewhere short fine white hairs. Front golden-brown anteriorly, brown posteriorly; orbits grey dusted, narrow; ocellar area dark brown. Fronto-orbitals about equal to each other and to ocellars; verticals longer and postverticals shorter than fronto-orbitals; hairs anterior to anterior fronto-orbital. Face light greyish-brown. Cheeks brown with light dusting of grey posteriorly. Hairs on ventral cheek margin, one bristle mid way and another at lower posterior corner of cheek. Occiput greyish-brown. Eyes with a few fine short hairs. Vertical diameter of eye about 3 times width of cheek in same axis. Proboscis brown; palpi yellowish-brown, with black hairs at apex and about middle.

**THORAX:** Mesonotum with greyish-brown dusting on reddish-brown, sometimes a narrow shining reddish-brown vitta lateral to dorsocentral row from just anterior to transverse suture to anterior of inner postalar; scutellum shining reddish-brown, not dusted; pleura shining brown; sternopleuron shining dark brown. Prescutellars present, just longer than dorsocentrals; parallel basal scutellars just longer than cruciate apicals; scutellum haired; presutural absent; prosternum haired.

Legs light brown; apical segments of tarsi brown. Fore femur with bristles on postero-dorsal and apical half of postero-ventral surfaces; mid tibia with ventral apical; hind femur with 2 dorsal bristles at apical sixth.

Wings (Fig. 210) clear with some light brown shading, the apical shaded area at apex of submarginal cell, whole width of first posterior, and a narrow anterior stripe of 2nd posterior cell, the portion in 1st posterior cell light in middle; veins brown. Costa extending to 4th vein; subcosta weakened near its apex. Wing indices: costal about 1.2; 4th vein about 2.0; 4c about 1.3; 5x about 0.6.

Halteres light reddish-brown apex, light brown stalk.

ABDOMEN: Shining dark reddish-brown. Female ovipositor plate light brown, sheath dark shining brown.

*Holotype*: AUCKLAND: 20.x.1929, ♂, (*in cop.*), (*A. Philpott*), (*Ak. Mus.*).

*Paratypes*: Same data as holotype, 1 ♀, (*in cop.*), (*Ak. Mus.*). AUCKLAND: 11.xi.1929, 1 ♂, 1 ♀, (*in cop.*): 15.x.1929, 1 ♂, (*A. Philpott*), (*P.D.D.*).

*Material Examined*: Holotype, 2 ♂ and 2 ♀ paratypes.

*Distribution*: Auckland. (October, November).

*Remarks*: As well as differing from *Z. interrupta* by the presence of prescutellars as indicated in the key, it differs by the following characters: the third segment of antenna is not as long as in *interrupta*; the mesonotal shining vittae are absent or reduced at most to a pair of narrow lateral ones; the tarsi are darkened at apices; and the shading of wings is more extensive as is shown by description of the apical area.

#### Family TRYPETIDAE

Head hemispherical. Two or more convergent fronto-orbitals on anterior of front, these close to eyes; postverticals parallel. Vibrissa absent. Proboscis short with strong labella. Strong pteropleural bristle; mesopleural present. Tibiae without preapical bristles. Wings pictured. Subcosta abruptly curved forward in a right angle at its apex, usually ending in costa but weak past the bend, costa broken at apex of subcosta, indistinctly broken near humeral cross vein; first vein haired; basal and anal cells present. Ovipositor enclosed in strong flattened sheath.

*Genera Occurring in New Zealand*:

*Tephritis* Latreille

*Trypanea* Schrank

*Remarks*: All species contained in these two genera are endemic to New Zealand. Malloch (1933d) on the basis of his study of the South American fauna and the New Zealand species, decided that these two genera warranted only subgeneric ranking in the genus *Trypanea*. All other authors retain the full generic status and this is done here.

With additional specimens available for study it has been possible to determine in a small measure the extent of variations in wing pattern, particularly in the genus *Trypanea*. Distinctions in wing pattern, however, still have to be used in separating many of the species.

Unfortunately little additional data is available at this stage on the host plants of the various species. At present it is impossible to indicate the course of evolution of the New Zealand fauna.



KEY TO GENERA OF TRYPETIDAE IN NEW ZEALAND

- Scutellum with 2 pairs of scutellar bristles ..... TEPHRITIS (p. 180)  
 Scutellum with 1 pair of scutellar bristles ..... TRYPANEA (p. 187)

Genus TEPHRITIS Latreille

*Tephritis* Latreille, 1804. "Nouv. Dict. His. Nat." 24. (Tab.)  
 : 196.

Two anterior convergent fronto-orbitals; 1 small pale yellow posterior fronto-orbital besides the usual black posteriors. Scutellum with two pairs of strong marginal scutellars; apical pair sometimes shorter than basal pair. Postero-ventral surface of fore femur with bristles on whole length. Female ovipositor sheath bare.

Type Species: *Tephritis arnicæ* (Linnaeus)

The synopsis given above is after Malloch (1931a). It is eminently suitable for the separation of the New Zealand species from those of the other genus occurring in New Zealand and does not rely on wing pattern, which would be hard to define for New Zealand species.

*Distribution*: World wide.

*Species Occurring in New Zealand*:

- Tephritis cassiniae* Malloch  
*T. fascigera* Malloch  
*T. marginata* Malloch  
*T. plebeia* Malloch  
*T. thoracica* Malloch

New Zealand species are all closely related.

KEY TO SPECIES OF TEPHRITIS IN NEW ZEALAND

- 1 Hind femur with 1 or more distinct bristles on apical half of antero-ventral surface ..... **fascigera**  
 Hind femur without bristles on antero-ventral surface ..... 2  
 2 Mesonotum grey with distinct brown vittae ..... **thoracica**  
 Mesonotum grey and without vittae ..... 3  
 3 First posterior cell with large unpigmented spot at apex ..... **plebeia**  
 First posterior cell pigmented at apex ..... 4  
 4 Complete or almost complete unpigmented fascia across wing beyond cross veins; clear spots of wing not bordered by band of pigment darker than elsewhere ..... **cassiniae**  
 No obvious unpigmented fascia across wing beyond cross veins; clear spots of wing bordered by band, pigmented darker than elsewhere ..... **marginata**

***Tephritis fascigera* Malloch. Fig. 213**

*Tephritis fascigera* Malloch, 1931. Rec. Cant. [N.Z.] Mus.  
 3 : 391. Gourlay, 1955. N.Z. Ent. 1(5) : 5.

A heavily dusted dull golden-brown species. Body length about 4.0 mm., wing length about 3.75 mm.

MALE AND FEMALE

HEAD: Arista reddish-brown; rays of pubescence much shorter than diameter of basal segments. Antenna light brown; 3rd segment light reddish-brown; 2nd segment with band of short distinct black hairs on inner dorsal surface; basal segment with light yellow hairs. Front yellowish-brown; ocellar area dark brown; orbits and ocellar triangle lightly grey dusted. All 3 fronto-orbitals approximately

equal in length; ocellars strong; verticals very strong; postverticals light yellow; few small light yellow scale-like hairs in line from ocelli to mid of anterior margin of front and on orbits lateral to fronto-orbitals. Face light brown. Cheeks light brown. Small black hairs over most of ventral half of cheeks. Occiput concave dorsally; bristles and hairs light yellow; few small black postocular hairs interspersed with light yellow bristles and hairs. Eyes with few short fine hairs. Vertical diameter of eye about 6 times width of cheek in same axis. Proboscis light brown; palpi light yellowish-brown with few apical black hairs, other hairs light yellow.

**THORAX:** Mesonotum heavily dusted dull golden-brown; scutellum flattened on disc, brown or light brown; pleura dusted with grey on purplish-brown; bristles black; hairs light yellow. Prescutellars absent; anterior dorsocentral equal to posterior; divergent basal scutellars about equal to length of cruciate apicals; disc of scutellum bare except for margin of hairs in row between basal and apical bristles; 1 humeral; 1 presutural; 2 notopleurals, posterior one small; 1 supraalar; 2 postalar; mesopleuron haired; 1 sternopleural and sternopleuron haired; pteropleuron with light yellow hairs; propleuron with row of strong hairs; prosternum haired.

Legs yellowish-brown. Fore femur with light yellow dorsal bristles, apical 3 or 4 black, black postero-dorsals; mid femur with strong black hairs at apex of postero- and antero-ventral surfaces and about dorsal apical surface; mid tibia with strong ventral apical; hind femur with a pair of preapical dorsal bristles and strong bristles on apical quarter of antero-ventral surface.

Wings (Fig. 213): Costa with pair of stout spines at apex of subcosta; short stout black spines ending about half distance between apices of 2nd and 3rd veins. Wing indices: costal about 2.5-3.0; 4th vein about 4.3-4.8; 4c about 1.9-2.0; 5x about 0.4.

Halteres yellowish-brown at apex, light brown basally.

**ABDOMEN:** Brown dusted. Black bristles on posterior margin of 5th tergite, elsewhere hairs and bristles light yellow. Small broad yellowish-brown triangular area on posterior margin of 5th tergite of male and wider area on 6th in female. Female ovipositor sheath shining brown and black.

*Holotype:* NELSON: -ii.1927, ♂, (*A. Tonnoir*), (Cant. Mus.).

*Material Examined:* Holotype, 3 paratypes, 13 ♂, 6 ♀, and 2 ex.

*New Records:* LITTLE BARRIER ISLAND: 26.xi.1954, 1 ♂, (*R. A. Harrison*), (P.D.D.). WAITAKERE RANGES: bred ex. *Senecio kirkii* flower heads, -v.1940, (*D. Spiller*), 4 ♂, 1 ♀ (P.D.D.), and 1 ♂, 3 ♀, and 2 ex., (B.M.). AUCKLAND: swept from foliage, -x.1940, 1 ♂, (*D. Spiller*), (P.D.D.). TRIO ISLAND: 20.xii.1954, 1 ♂, (*G. Ramsay*), (P.D.D.). NELSON: Tahuna, 27.i.1925, 1 ♂, 1 ♀, (*E. S. Gourlay*), (Cawt. Inst.). WEST COAST: -ii.1923, 1 ♂, (*T. R. Harris*), (B.M.). Mt. COOK: 20.i.1929, 1 ♂, (*A. Philpott*), (Cawt. Inst.). TARRAS: 1,000 ft., 16-22.i.1954, 1 ♀, (*E. S. Gourlay*), (Cawt. Inst.). OTAGO: McKerrow Hut, 6.ii.1955, 1 ♂, (*R. R. Forster*), (Cant. Mus.).

*Distribution:* Little Barrier Island, Waitakere Ranges, Auckland, Trio Island, Nelson, Banks Peninsula, Mt. Cook, Tarras, McKerrow Hut. (October to February, April, May).

*Remarks:* Separated from other New Zealand species by the presence of bristles on the hind femur and also by the presence of small hairs in the middle anterior region of the front.

### **Tephritis thoracica** Malloch. Fig. 217

*Tephritis thoracica* Malloch, 1931. Rec. Cant. [N.Z.] Mus.  
3 : 392.

A grey dusted species with brown thoracic vittae. Body length about 4.5 mm., wing length about 4.5 mm.

#### MALE AND FEMALE

**HEAD:** Arista dark brown; rays of pubescence small and much less than diameter of basal segment. Antenna light brown with some grey dusting; 2nd segment without distinctive dorsal apical bristle but black hairs over most of inner surface and on apical margin of outer surface; basal segment with some apical dorsal hairs. Front yellowish-brown; orbits heavily light grey dusted; ocellar region blackish-brown; ocellar triangle small and dusted with light grey, apex of triangle often extending narrowly towards anterior margin of front. Anterior two fronto-orbitals strong, equal in length, and longer than posterior; verticals strong; post-verticals light yellow and not differentiated from occipital and postocular bristles; very short fine black hairs on orbits lateral to fronto-orbitals. Face light brown with light greyish-brown dusting, concave. Cheeks light grey dusted. One strong bristle near middle of cheek a few light yellow hairs surrounding it and extending along cheek margin posteriorly. Occiput dark brown with grey dusting dorsally. Eyes haired. Vertical diameter of eye about 2.75 times width of cheek in same axis. Proboscis brown; palpi broad, light brown and with black hairs scattered over most of surface.

**THORAX:** Mesonotum distinctly dull grey dusted; bristles arising from brown spot; median brown longitudinal vitta, narrow anteriorly, broad posteriorly, a similar vitta arising dorsal to humerus passing through presutural bristle and terminated anterior to postalar; scutellum brown with grey median stripe and grey areas at base laterally; pleura grey. Prescutellars absent; 2 strong equal dorsocentrals, anterior just posterior to transverse suture; parallel basal scutellars longer than cruciate apicals; scutellum with few small light yellow hairs on lateral margins; hairs on mesonotum mostly small and black, some anterior hairs larger and light yellow; 1 strong humeral; 1 strong presutural; 2 notopleurals, posterior weak; 1 supraalar; 2 strong postalar; 1 strong sternopleural; propleuron with row of strong light yellow hairs; prosternum haired.

Legs light brown. Fore femur with bristles on dorsal and postero-dorsal surfaces; mid tibia with 1 strong and some weak ventral apicals.

Wings (Fig. 217): Costa with pair of strong spines at apex of subcosta; short stout costal spines ending about mid way between apex of 2nd and 3rd veins; 2 or 3 hairs at base of 3rd vein. Wing indices: costal about 2.5-2.8; 4th vein about 3.0-4.0; 4c about 1.5-1.6; 5x about 0.4.

Halteres light brown.

**ABDOMEN:** Grey; tergites 2 to 5 with a pair of median brown spots, those on 2nd tergite small, those on posterior tergite large. Hairs and bristles on tergites light yellow except black on posterior margin of 5th tergite of male and 6th of female. Female ovipositor sheath shining black, often with brown area centrally.

*Holotype:* QUEENSTOWN: 20.xii.1913, ♂, (*Anon.*), (Cant. Mus.).

*Material Examined:* Holotype, allotype, 1 ♂ and 1 ♀ paratype, and 1 ♂ and 2 ♀.

*New Records:* ALEXANDRA: 9.i.1923, (*C. Fenwick*), 1 ♀ (Dom. Mus.), 1 ♀ (B.M.). CROWN RANGE: 2,800 ft., 6.xii.1950, 1 ♂, (*E. S. Gourlay*), (Cawt. Inst.).

*Distribution:* Queenstown, Lake Luna, Cass, Ben Lomond, Milford, Alexandra, Crown Range. (November to January).

*Remarks:* Readily separated from all other New Zealand species by having distinct brown longitudinal vittae on the mesonotum. *T. plebeia* occasionally has faint vittae on thorax and the two species can be separated by the unpigmented apex of first posterior cell in *T. plebeia* and the completely pigmented apex of this cell in *T. thoracica*.

#### **Tephritis plebeia** Malloch. Fig. 215

*Tephritis plebeia* Malloch, 1931. Rec. Cant. [N.Z.] Mus. 3 : 393.

A grey species with yellowish-brown head and legs. Body length about 4.5 mm., wing length about 4.5 mm.

MALE AND FEMALE

**HEAD:** Arista dark brown apically, light brown or brown basally; rays of pubescence minute and much less than diameter of basal segment. Antenna light brown; 2nd segment with black hairs on most of inner surface and along outer apical margin, no distinct bristle; basal segment with a few apical dorsal hairs. Front yellowish-brown; orbits and the small ocellar triangle lightly grey dusted; ocellar area brown to dark brown. Two anterior fronto-orbitals strong, equal, and longer than the stouter posterior orbital; verticals strong; postverticals light yellow and not larger than surrounding occipital or postocular hairs; fine short light yellow hairs lateral to fronto-orbitals. Face grey dusted on light brown, concave. Cheeks yellowish-brown lightly dusted with grey. One brown bristle about middle of cheek and fine but long light brown hairs about it and posteriorly along cheek margin. Occiput blackish-brown, light grey dorsally and laterally. Eyes with a few short fine hairs. Vertical diameter of eye about 2.75 times width of cheek in same axis. Proboscis brown to dark brown; palpi broad and brown with some short black hairs.

**THORAX:** Mesonotum heavily grey dusted, distinct brown spot at base of each posterior dorsocentral, a small spot at base of each anterior dorsocentral; scutellum grey dusted with brown spot at base of basal bristles; pleura grey dusted. Prescutellars absent; anterior dorsocentral just posterior to transverse suture, strong and equal to posterior dorsocentral; parallel or slightly divergent basal scutellars very strong and about 1.3 times length of convergent apicals; scutellum with a few small light yellow hairs on lateral margins; hairs on mesonotum light yellow; 1 strong humeral; 1 strong presutural; 2 notopleurals, posterior weak; 1 supraalar; 2 strong postalar; 1 sternopleural; row of light yellow hairs on propleuron; prosternum haired.

Legs yellowish-brown. Fore femur with bristles on dorsal and postero-dorsal surfaces; mid tibia with strong ventral apical.

Wings (Fig. 215): Costa with pair of strong spines at apex of subcosta; short stout costal spines extending to apex of 3rd vein. Wing indices: Costal about 2.5-3.0; 4th vein about 3.8-3.9; 4c about 1.7-1.9; 5x about 0.3-0.4.

Halteres yellowish-brown.

**ABDOMEN:** Grey; tergites 3 to 5 with a pair of small faint brown median spots. Hairs and bristles light yellow on tergites except some black bristles on posterior margin of 5th tergite of male and 6th of female.

Female ovipositor sheath shining black.

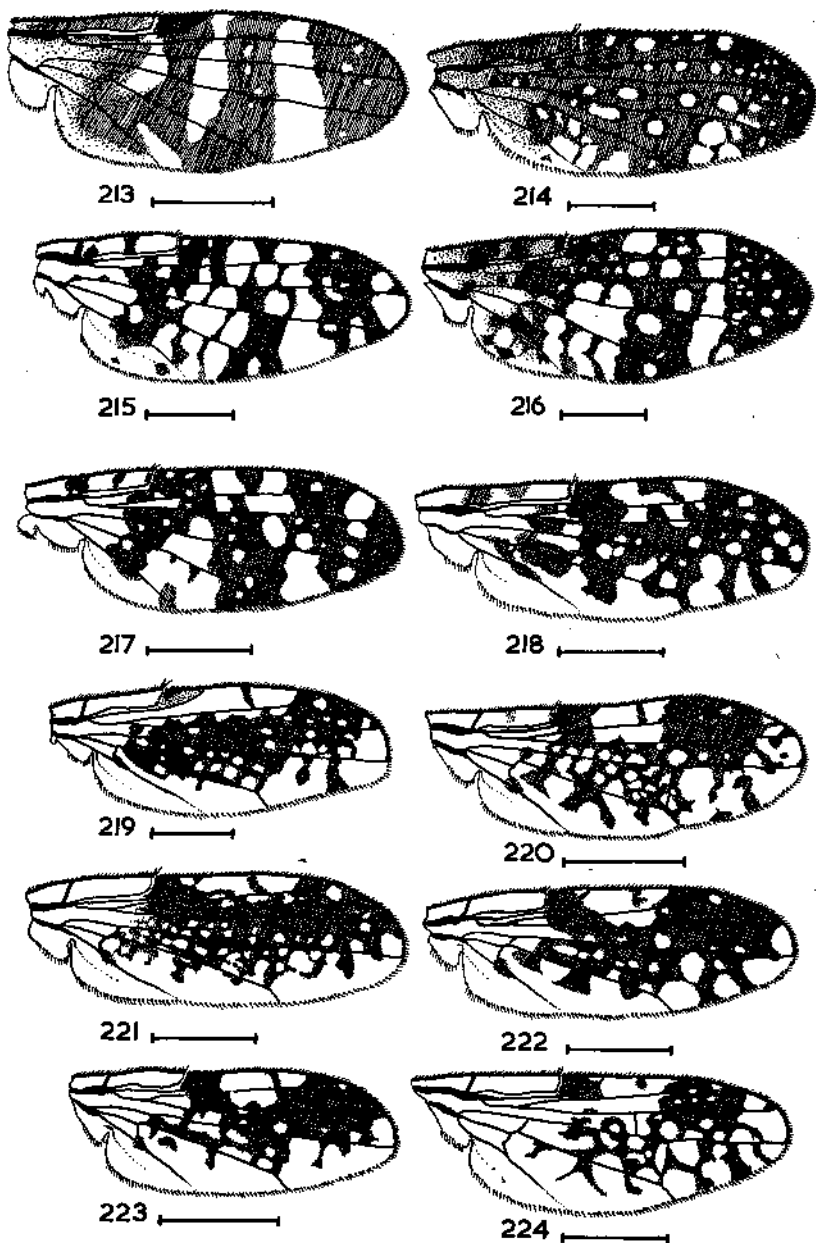
*Holotype:* CASS: -.ii.1925, ♂, (*A. Tonnoir*), (Cant. Mus.).

*Material Examined:* Holotype, 4 ♂ and 6 ♀ paratypes, 5 ♂ and 15 ♀.

*New Records:* PAEKAKARIKI: 17.iii.1915, 1 ♀, (*G. V. Hudson*), (B.M.). MAKAROA: 1,000 to 1,800 ft., -.xii.1924, 1 ♂, 3 ♀, (*C. Fenwick*), (Dom. Mus.). BROKEN RIVER: 25.xii.1934, 1 ♂, 6 ♀, (*S. Lindsay*), (Cant. Mus.). LAKE WAKATIPU: no date, 2 ♂, 1 ♀, (*G. V. Hudson*), (B.M.). OTAGO: McKerrow Hut, 23.i.1955, 1 ♂, 1 ♀, (*R. R. Forster*), (Cant. Mus.). MARTINS BAY, 2 ♀, (*R. R. Forster*) (Cant. Mus.). HOMER: 9.ii.1955, 1 ♀, (*R. R. Forster*), (Cant. Mus.).

*Distribution:* Paekakariki, Cass, Otira, Waiho, Mt. Grey, Mt. Cook, Broken River, Lake Wakatipu, McKerrow Hut, Martins Bay, Homer. (December to April.)

*Remarks:* There is variation in the colour of several structures. The female ovipositor sheath sometimes is irregularly brown at centre; the mesonotum may have a faint median longitudinal brown vitta; the brown spots on the tergites are usually small but in some specimens are about half width of tergite. Separated from all other New Zealand species by having a large unpigmented area at apex of first posterior cell.



Figs. 213-224, Wings:

- |                                 |                            |
|---------------------------------|----------------------------|
| 213. <i>Tephritis fascigera</i> | 219. <i>T. longipennis</i> |
| 214. <i>T. marginata</i>        | 220. <i>T. watti</i>       |
| 215. <i>T. plebeia</i>          | 221. <i>T. extensa</i>     |
| 216. <i>T. cassiniae</i>        | 222. <i>T. completa</i>    |
| 217. <i>T. thoracica</i>        | 223. <i>T. alboapicata</i> |
| 218. <i>Trypanea vittigera</i>  | 224. <i>T. fenwicki</i>    |

Scale: 1.0 mm.

**Tephritis cassiniae** Malloch. Fig. 216

*Tephritis cassiniae* Malloch, 1931. Rec. Cant. [N.Z.] Mus.  
3: 395.

A light greyish-brown species. Body length about 4.5 mm., wing length about 4.5 mm.

MALE AND FEMALE

**HEAD:** Arista dark brown, basal segments light brown; rays of pubescence about one-third width of basal segment. Antenna light brown with a light grey dusting; 2nd segment with small black hairs on inner surface and on apical margin of outer surface; basal segment with apical dorsal hairs. Front yellowish-brown; orbits and ocellar triangle whitish-grey; ocellar area blackish-brown. Two anterior fronto-orbitals strong and equal to posterior orbital; verticals very strong; postverticals light yellow and not differentiated from other occipital and postocular hairs; small hairs on orbits lateral to fronto-orbitals. Face yellowish-white, concave. Cheeks yellowish-white. Hairs along ventral cheek margin all light yellow and 1 brown bristle about middle of cheek. Occiput blackish-brown, greyish-brown dorsally and laterally. Eyes with few hairs. Vertical diameter of eye about 4 times width of cheek in same axis. Proboscis light brown; palpi yellowish-brown, broad, with black hairs only at apex.

**THORAX:** Heavily dusted with light greyish-brown; dark brown spot at base of dorsocentrals, basal scutellars, and faintly at presuturals. Prescutellars absent; anterior dorsocentral just posterior to transverse suture and equal to posterior dorsocentral; divergent basal scutellars strong and about two-thirds cruciate apically; a few strong light yellow hairs on disc and lateral margins of scutellum; hairs on mesonotum all light yellow; 1 strong humeral; 1 strong presutural; 2 notopleurals, posterior one weak; 1 strong supraalar; 2 strong postalars, inner one very strong; 1 sternopleural; row of propleural hairs; prosternum haired.

Legs yellowish-brown. Fore femur with bristles on dorsal and postero-dorsal surfaces; mid tibia with strong ventral apical.

Wings (Fig. 216): Costa with pair of spines at apex of subcosta; short stout spines extending about three-quarters distance between apices of 2nd and 3rd veins; 2 or 3 hairs at base of 3rd vein. Wing indices: costal about 2.7; 4th vein about 3.4; 4c about 1.6; 5x about 0.3.

Halteres light brown.

**ABDOMEN:** Greyish-brown; tergites 3 to 5 with a pair of median brown spots on anterior margins, those on 5th tergite the weakest. Hairs and bristles of tergites light yellow except for black bristles on posterior margin of 5th tergite in male.

Female ovipositor sheath shining light brown centrally, black anteriorly and posteriorly.

*Holotype:* NELSON: -xii.1923, ♂, (*A. Philpott*), (Cant. Mus.).

*Material Examined:* Holotype, allotype, 10 ♂ and 6 ♀.

*New Records:* KAEO: 13.i.1927, 1 ♀, (*Anon.*), (Ak. Mus.).

WHANGAREI: Waikaraka Valley, 17.i.1929, 1 ♀, (*Anon.*), (Ak. Mus.).

KAPITI ISLAND: The Spur, 8.i.1923, 1 ♀, (*Anon.*), (Dom. Mus.).

MAKARA: in bush, 31.xii.1923, 2 ♂, (*J. A. Thomson*), (Dom. Mus.).

RIMUTAKA RANGES: 27.ii.1928, 1 ♂, (*A. Castle*), (Dom. Mus.).

PAEKAKARIKI: 17.iii.1915, 1 ♀, (*G. V. Hudson*), (B.M.).

WELLINGTON: 20.iii.1910, 1 ♂, (*F. W. Hutton*), (B.M.); Gollans Valley,

26.ii.1929, 1 ♂, 1 ♀, (*A. Castle*), (Dom. Mus.).

D'URVILLE ISLAND: 19-24.i.1946, 1 ♂, 1 ♀, (*E. S. Goulay*), (Cawt. Inst.).

NELSON: Mackays Bluff, 400 ft., on *Cassinia leptophylla*, 4.v.1953, 1 ♂, (*E. S. Goulay*);

Glen Valley Bush, swept, 16.iii.1951, 1 ♂, (*A. W. Parrott*), (Cawt. Inst.).

NO DATA: 2 ♂, (B.M.).

*Distribution:* Kaeo, Whangarei, Makara, Rimutaka Ranges, Kapiti Island, Paekakariki, Wellington, D'Urville Island, Nelson, Dun Mt. (December to March, May).

*Remarks:* Variations in the wing pattern occur mainly in the clear transverse fascia beyond the outer cross vein. In some specimens this fascia is complete, and similar to that in *T. fascigera*, while in others, the majority, there are some brown areas in the form of small spots in the second posterior cell or first or second marginal cells.

Separated from other New Zealand species which have the apex of the first posterior cell pigmented by having wing spots without dark borders, mesonotum without brown vittae and hind femur without bristles.

***Tephritis marginata* Malloch. Fig. 214**

*Tephritis marginata* Malloch, 1931. Rec. Cant. [N.Z.] Mus.  
3: 394.

A dull golden-brown species. Body length about 4.0 mm., wing length about 4.0 mm.

MALE AND FEMALE

**HEAD:** Arista dark brown apically, light brown or brown basally; rays of pubescence very short and much less than diameter of basal segment. Antenna yellowish-brown; 2nd segment with very short black hairs on inner surface and on apical margin of outer surface, no bristles; basal segment with small dorsal apical hairs. Front yellowish-brown; orbits, central vitta, and ocellar triangle lightly dusted with grey; ocellar region dark brown. Two anterior fronto-orbitals equal and just longer than posterior orbital; vertical strong; postverticals light yellow and not differentiated from other occipital and postocular hairs; a few light yellow hairs lateral to fronto-orbitals. Face light grey dusted, concave. Cheeks light brown with light grey dusting. Light yellow hairs along ventral half of cheek, 1 near middle of cheek brown and slightly larger. Occiput dark greyish-brown about foramen, elsewhere dull golden-brown. Eyes with a few short hairs. Vertical diameter of eye about 3.5 times width of cheek in same axis. Proboscis light brown; palpi broad and light brown with black hairs at apex.

**THORAX:** Dull golden-brown, heavily dusted; brown spots at base of dorsocentrals. Prescutellars absent; anterior dorsocentral just posterior to transverse suture and equal to posterior dorsocentral; divergent basal scutellars very strong and half to two-thirds length of cruciate apicals; scutellum with a few light yellow hairs on lateral margins; hairs on mesonotum all light yellow; 1 strong humeral; 1 strong presutural; 2 notopleurals, posterior one weak; 1 strong supraalar; 2 strong postalar; 1 sternopleuron; row of light yellow hairs on propleuron; prosternum haired.

Legs yellowish-brown. Fore femur with bristles on dorsal, postero-dorsal surfaces; mid tibia with strong ventral apical.

Wings (Fig. 214): Costa with a pair of spines at apex of subcosta; short stout costal spines ending about third distance between apices of 2nd and 3rd veins; 2 or 3 hairs at base of 3rd vein. Wing indices: costal about 2.5-3.5; 4h vein about 2.5-3.2; 4c about 1.4-1.6; 5x about 0.3.

Halteres light brown.

**ABDOMEN:** Dark greyish-brown, heavily dusted; tergites 3 to 5 with pair of brown median spots on anterior margins. Hairs and bristles on tergites light yellow except some black bristles on posterior margin of 5th tergite of male.

Female ovipositor plate light brown centrally, elsewhere black.

*Holotype:* CASS: -ii.1925, ♂, (*A. Tonnoir*), (Cant. Mus.).

*Material Examined:* Holotype, allotype and 1 paratype and 1 ♀.

*New Records:* WAITATI: 4.xii.1921, 1 ♀, (*Anon.*), (Ak. Mus.).

*Distribution:* Cass, Mt. Cook, Waitati. (December, February).

*Remarks:* Separated from all other New Zealand species by the dark brown pigmentation about most of the clear spots in the wing.

## Genus TRYPANEA Schrank

*Trypanea* Schrank, 1796. "Mannh. Nat. Okon. Briefe uber Donau" p. 147.

Three convergent anterior fronto-orbitals, and sometimes a weak anterior 4th, 1 small posterior pale yellow fronto-orbital besides the usual black bristles. Scutellum with 1 pair of strong bristles. Postero-ventral surface of fore femur with bristles only on apical half. Female ovipositor sheath haired as on tergites.

Type Species: *Trypanea stellata* Fuessly

The generic diagnosis is based on Malloch (1931a). It is structural rather than based on wing pattern, as is that given by other authors, and is eminently suitable for the classification of the New Zealand species.

*Distribution:* World wide.

*Species Occurring in New Zealand:*

*Trypanea alboapicata* Malloch  
*T. centralis* Malloch  
*T. completa* Malloch  
*T. extensa* Malloch  
*T. fenwicki* Malloch  
*T. imperfecta* Malloch  
*T. longipennis* Malloch  
*T. vittigera* Malloch  
*T. wattii* Malloch

Too much importance should not be placed on the wing pattern in separating species. Many of the characters of the wing pattern vary considerably and if it is essential to use wing pattern to separate species the separation should not be restricted to one of the characters. As a group, the characters are useful, but if any one character is used as the sole criterion for species recognition or separation the validity of the conclusion must be doubted.

Variations in the pattern of the pigmented areas of the wing are extensive. One series of specimens (of *T. centralis*) were bred from the same host at the same time and are undoubtedly from the same population. Other series of specimens in other species, because of the information available about their capture, are strongly suspected of coming from the same respective populations. An examination of the *centralis* series shows that the following variations in colouration of wing occur. The findings are supported by studying the variation in the other suspected series and they can be regarded as a useful guide in the study of the genus.

1. The stigma colouration varies from almost clear, i.e. light yellow without any trace of darkening, to light yellow with a large light brown central area or a brown area on or at base of costa; or from completely dark brown to dark brown with light apex extending to about quarter length of costa.
2. The transverse brown fascia near centre of marginal cell may be absent or present as a darkening of costa or as a complete but light brown band across wing; if the fascia is dark brown it is usually a complete band between costa and first vein but often it falls short of the first vein.
3. The area immediately posterior to stigma in the marginal cell



varies from an area void of any pigmentation to one consisting of a wide light brown band from between first and second veins.

4. The apex of the submarginal cell often has a series of clear spots. One is at or near the apex of the second vein and varies little in size or position. The other is at or near the apex of the third vein. This latter spot can be present, absent, or on one wing only, and varies considerably in size within a species. If it is similar to or smaller than the anterior spot in many members of a population it can be minute or absent in other members. If, however, it is distinctly larger than the anterior spot in some flies, it is never absent in any member of that population.

5. The apex of the first posterior cell is completely dark in some species and has a clear unpigmented area in others. In the latter the extent of this clear area has been used as a species distinguishing character. However variations are extensive. In the one population it varies from being an incomplete spot, (i.e. does not extend the full width between the third and fourth veins), to a complete spot, or one that extends completely between the two veins for a considerable distance towards the cross vein.

6. The pigmented areas in the second posterior cell may or may not reach the margin of the wing. Where the pigmentation is strong and normally reaches the wing margin, it is rare to have any specimens where this feature is not present, but in species with light pigmented areas some specimens have the areas reaching the margin, others have the area stopping short of the margin.

7. The number of clear spots in the discal cell varies considerably and often shows a distinct variation between sexes.

Sexual dimorphism has been observed as modifications in the males.

The following are characters which may occur in males:

1. Fore femur thickened.
2. Fore tibia with two or more series of fine short erect hairs on dorsal and postero-dorsal surfaces.
3. Fore tarsus short, less than length of fore tibia and segments thickened.
4. Basal segment of mid tarsus antero-posteriorly compressed, posterior surface slightly concave, ventral margin in form of narrow ridge.
5. Fronto-orbitals and ocellars about half length of corresponding bristles of female.
6. An additional anterior fronto-orbital bristle present.
7. Discal cell usually with more clear spots than in female.

#### KEY TO SPECIES OF TRYPANEA IN NEW ZEALAND

- 1 Mesonotum with distinct longitudinal brown vittae ..... **vittigera**  
Mesonotum without vittae ..... 2
- 2 Males with 2nd posterior cell distinctly lobed. Wings long and narrow, and slightly lobed in females ..... **longipennis**  
Males without lobed margin of 2nd posterior cell. Wings normal ..... 3
- 3 Costal cell with small faint pigmented area ..... **watti**  
Costal cell without any trace of pigment ..... 4

- 4 Marginal cell pigmented irregularly between area posterior to stigma and apical pigmented areas ..... **extensa**  
 Marginal cell without pigmented areas between the area posterior to stigma and the apical areas ..... 5
- 5 Submarginal cell never with clear spot near apex of 3rd vein ..... **completa**  
 Submarginal cell normally with clear spot near apex of 3rd vein ..... 6
- 6 Stigma clear, light yellow with brown spot or with light brown area basally and on base of costa or with brown transverse area centrally; these brown areas based on costa; transverse brown fascia in marginal cell near apical brown spot absent or represented by darkening of costa or present as a band almost reaching 2nd vein; marginal cell posterior to stigma clear or with small brown areas based on 1st vein or brown band between 1st and 2nd veins; submarginal cell with clear spot near apex of 2nd vein and usually a small spot near apex of 3rd vein; 1st posterior cell clear at apex and this area either not reaching or reaching 3rd and 4th vein; discal cell with about 16 clear spots in males and about 12 spots in females ..... **centralis**  
 Not as above ..... 7
- 7 Stigma light yellow with brown shading varying from a faint area on middle of 1st vein to a wide band almost reaching costa, these areas based on the 1st vein ..... **imperfecta**  
 Stigma dark brown completely or with clear or light brown apex ..... 8
- 8 Submarginal cell with a clear spot near apex of 2nd vein and a similar or smaller spot near apex of 3rd vein; latter spot may be absent; apex of 1st posterior cell clear, this area either reaching 3rd and 4th veins or not ..... **alboapicata**  
 Submarginal cell with a clear spot near apex of 2nd vein and a larger spot near apex of 3rd vein always present; apex of 1st posterior cell clear, always reaching 3rd and 4th veins and normally extends basally a distance towards cross vein ..... **fenwicki**

**Trypanea vittigera** Malloch. Fig. 218

*Trypanea vittigera* Malloch, 1931. Rec. Cant. [N.Z.] Mus.  
 3 : 400.

A greyish-brown species with brown legs. Body length about 5.0 mm., wing length about 5.0 mm.

FEMALE

HEAD: Arista dark brown on apical half, brown basally; pubescence very minute. Antenna light brown; 3rd segment brown except for basal third; 2nd segment brown basally, a few stout enlarged hairs dorsally, small black hairs on inner surface and at outer apical margin; basal segment with some light yellow apical hairs. Front light brown merging to brown at vertex; orbits and ocellar triangle lightly dusted with grey; ocellar area not darker than triangle. Three strong convergent and 1 outwardly directed posterior fronto-orbitals, equal in length but anterior bristle shorter; verticals strong; postverticals light yellow and not distinguished from other postvertical and postocular hairs; fine light yellow hairs on orbits lateral to bristles. Face light grey. Cheeks light yellow with light grey dusting. Distinct band of black hairs along ventral margin of cheeks and merging into the light yellow hairs and bristles posteriorly. Occiput dark brown. Eyes with few hairs. Vertical diameter of eye about 4 times width of cheek in same axis. Proboscis brown; palpi broad, light brown with black hairs on most of its length.

THORAX: Grey; mesonotum with a brown median longitudinal vitta, a similar one on dorsocentral line and 1 just median to line of presutural and the median postalar; scutellum with faint trace of the lateral mesonotal vittae continued on lateral margins; posterior portion of mesopleuron, dorsal area of sternopleuron and all pteropleuron golden brown. Prescutellars absent; anterior dorsocentral just posterior to transverse suture and equal to posterior dorsocentral in length; scutellars about 1.5 times length posterior dorsocentral; scutellum with light yellow hairs mostly on lateral margins; hairs of mesonotum light yellow; 1 strong humeral;

1 strong presutural; 2 notopleurals, posterior bristle weak and light yellow; 1 strong supraalar; 2 strong postalar; 1 strong sternopleural; row of propleural hairs; prosternum haired.

Legs brown to light reddish-brown. Fore femur with bristles on dorsal and postero-dorsal surfaces, these bristles varying from light yellow to dark brown; mid tibia with strong ventral apical.

Wings (Fig. 218): Costa with pair of spines at apex of subcosta; short stout costal spines ending at apex of 3rd vein. First vein with hairs on most of its length on dorsal surface; base of 3rd vein with 1 or 2 hairs on ventral surface. Wing indices: Costal about 1.9; 4th vein about 3.3; 4c about 2.0; 5x about 4.0.

Halteres yellowish-brown.

ABDOMEN: Greyish-brown. Hairs all small, light yellow on tergites; 6th tergite with strong black bristles on posterior margin. Sheaths of ovipositor shining black with hairs as on tergites; ovipositor orange.

*Holotype*: Mt. ARTHUR: 4,500 ft., 1.i.1925, ♀, (*A. Philpott*), (Cant. Mus.).

*Material Examined*: Holotype.

*Distribution*: Mt. Arthur. (January).

*Remarks*: Separated from all other species by having brown vittae on the mesonotum.

### **Trypanea longipennis** Malloch. Fig. 219

*Trypanea longipennis* Malloch, 1931. Rec. Cant. [N.Z.] Mus.  
3 : 398.

A grey species with yellowish-brown legs. Body length about 3.5 mm., wing length about 3.75 mm.

#### MALE AND FEMALE

**HEAD**: Arista dark brown, basally brown; rays of pubescence short and much less than diameter of basal segments. Antenna light brown; 2nd segment with short black bristles dorsally, small black hairs on inner surface and on outer apical margin; basal segments with light yellow apical hairs. Front yellowish-brown, lighter anteriorly; orbits and ocellar triangle lightly grey dusted; ocellar area dark brown. Three incurved anterior fronto-orbitals and often a smaller fourth, anterior of the three the smallest, posterior of the three about equal to the dorsally directed posterior fronto-orbital, these bristles in males smaller than in females; verticals strong; fine hairs on and lateral to fronto-orbital row. Face yellowish-white, concave. Cheeks light yellowish-brown. Fine brown hairs along cheek margin, stronger posteriorly but without any distinctly enlarged bristles. Occiput dark greyish-brown. Eyes with few hairs. Vertical diameter of eye about 3.5 times width of cheek in same axis. Proboscis light brown; palpi broad, yellowish-brown with black hairs only at apex.

**THORAX**: Heavily grey dusted. No prescutellars; anterior dorsocentral just posterior to transverse suture and about equal to posterior dorsocentral; scutellar bristles divergent and large, about 1.75 length of posterior dorsocentrals; scutellum with few white hairs on disc and lateral margins; hairs of mesonotum white; 1 strong humeral; 1 presutural; 2 notopleurals, posterior one weaker and light yellow; 1 strong supraalar; 2 strong postalar; 1 sternopleuron; row of propleural hairs; prosternum haired.

Legs yellowish-brown. Fore femur curved and with bristles on dorsal and postero-dorsal surfaces; fore tarsus thickened and about two-thirds fore tibia in males; mid tibia with strong black ventral apical.

Wings (Fig. 219): Second posterior cell produced at apex in male. Costa with pair of strong spines at apex of subcosta; small black spines of costa ending just beyond apex of 2nd vein; 1 or 2 hairs at base of 3rd vein on dorsal surface. Wing indices: costal about 1.5-1.8; 4th vein about 3.7-3.8; 4c about 2.2-2.4; 5x about 0.8-0.9.

Halteres light brown.

ABDOMEN: Dark greyish-brown. Hairs on tergites light yellow with few long black bristles on posterior and lateral margins of 5th tergite in male and 6th in female. Female ovipositor sheath shining black, covered with hairs similar to abdominal tergites.

*Holotype*: CASS: -ii.1925, ♂, (*A. Tonnoir*), (Cant. Mus.).

*Material Examined*: Holotype, 1 ♂ and 1 ♀ paratypes, and 1 ♀.

*New Records*: OHAKUNE: -i.1912, 1 ♀, (*G. V. Hudson*) (B.M.).

*Distribution*: Ohakune, Cass, Mt. Grey, Mt. Arthur. (January, February, April).

*Remarks*: The males can be easily separated from all others by having the second posterior cell distinctly lobed. Females are more difficult to separate but can best be recognised by the long narrow wings.

### **Trypanea watti** Malloch. Fig. 220

*Trypanea watti* Malloch, 1931. Rec. Cant. [N.Z.] Mus. 3 : 403.

A greyish-brown species with light reddish-brown legs. Body length about 3.5 mm., wing length about 3.5 mm.

#### MALE AND FEMALE

HEAD: Arista blackish-brown, brown basally; rays of pubescence not half width of basal segment. Antenna light brown; 3rd segment mostly brown; 2nd segment with several strong black hairs dorsally, small black hairs on inner surface and very small black hairs on outer apical margin; basal segment with light yellow hairs on dorsal apical margin. Front yellowish-brown, brown posteriorly; orbits and ocellar triangle grey dusted. Three anterior convergent fronto-orbitals all about equal in length and 1 dorsally directed posterior fronto-orbital about same size, these bristles small in males; verticals strong; ocellars weak in males, strong in females; postverticals light yellow and not differentiated from other postvertical and postocular bristles; small fine hairs on orbits lateral to bristles. Face light greyish-yellow, concave. Cheeks light greyish-yellow. Band of black hairs along ventral margin of cheek. Occiput blackish-brown. Eyes haired. Vertical diameter of eye about 4.25 times width of cheek in same axis. Proboscis light brown; palpi light brown, broad and with black bristles at apex only.

THORAX: Greyish-brown; mesonotum with faint blackish-brown longitudinal vittae, 1 median and 1 on each dorsocentral line, all more prominent anteriorly; humerus light brown. Prescutellars absent; anterior dorsocentral just posterior to transverse suture and equal to length of posterior dorsocentral; scutellars slightly divergent and about 1.3 times length of posterior dorsocentral; scutellum with light yellow marginal hairs; mesonotum with light yellow hairs; 1 humeral; 1 presutural; 2 notopleurals, posterior one weak and light yellow; 1 supraalar; 2 postalars, inner one strong; 1 dark sternopleural and, in holotype, 1 smaller light yellow posterior bristle; row of propleural hairs; prosternum haired.

Legs light reddish-brown; fore femur almost brown. Fore femur with bristles on dorsal and postero-dorsal surfaces; fore tibia thickened in males; mid tibia with strong ventral apical; basal segment of mid tarsus in male compressed.

Wings (Fig. 220): Costa with pair of spines at apex of subcosta short stout costal spines ending at apex of 3rd vein; 3rd vein often with a black hair at base on ventral surface. Wing indices: costal about 1.6-1.8; 4th vein about 3.2-3.6; 4c about 2.0; 5x about 0.4.

Halteres light brown.

ABDOMEN: Greyish-brown. Tergites with light yellow hairs; 5th tergite with strong dark bristles on posterior and lateral margins.

*Holotype*: DUNEDIN: Cargill, 3.iv.1920, ♂, (*M. N. Watt*), (Cant. Mus.).

*Material Examined*: Holotype and 3 ♀.

*New Records*: TAKAKA HILL: 3,800 ft., 19.xii.1933, 3 ♀, (*E. S. Gourlay*), (Cawt. Inst.).

*Distribution:* Dunedin, Takaka Hill. (December, April).

*Remarks:* The only species which has pigmentation in the costal cell. This is very faint but is always discernible and hence a useful character in separating it from all other species.

**Trypanea extensa** Malloch. Fig. 221

*Trypanea extensa* Malloch, 1931. Rec. Cant. [N.Z.] Mus.  
3: 402.

A grey species with yellowish-brown legs. Body length about 4.5 mm., wing length about 4.5 mm.

MALE

**HEAD:** Arista blackish-brown, lighter brown basally; pubescence minute. Antenna light brown; 2nd segment with small black hairs on inner surface the dorsal of these stronger than rest and small fine black hairs on outer apical margin; basal segment with light yellow apical hairs. Front light brown with light covering of grey dust, the dusting thicker on orbits and ocellar triangle; ocellar area dark brown beneath the grey dusting. Three inwardly directed fronto-orbitals, the anterior one about two-thirds length of other two and outwardly directed posterior fronto-orbitals, in males the convergent bristle small and not extending to near middle of front; ocellars weak in males; verticals strong; postverticals light yellow and not differentiated from other postvertical and postocular hairs; fine brown hairs on orbits lateral to bristles. Face light brown. Cheeks light yellowish-grey. Band of small dark hairs along ventral margin of cheek ending in larger light yellow hairs posteriorly. Occiput dark greyish-brown. Eyes haired. Vertical diameter of eye about 4.5 times width of cheek in same axis. Proboscis light brown; palpi yellowish-brown.

**THORAX:** Grey. Prescutellars absent; anterior dorsocentral just posterior to transverse suture and equal to posterior dorsocentral; scutellars strong, about 1.5 times length of posterior dorsocentral and slightly divergent; scutellum with light yellow hairs on margins; mesonotum with light yellow hairs; 1 humeral; 1 pre-sutural; 2 notopleurals, posterior one small and light yellow; 1 supraalar; 2 postalars, inner of pair very strong; 1 sternopleural; row of propleural hairs, prosternum bare.

Legs yellowish-brown with tinge of red; coxae and trochanters light brown. Fore femur with bristles on dorsal and postero-dorsal surfaces; fore tarsus thickened in males and about two-thirds fore tibia; mid tibia with ventral apical; basal segment of mid tarsi flattened antero-posteriorly, bare on anterior surface and a row of minute black spines along the sharp ventral keel.

**Wings** (Fig. 221): Stigma dark brown, the apex light coloured for quarter to half distance along costa; area in marginal cell posterior to stigma all dark brown, this area continued irregularly along marginal cell beyond apex of 1st vein; transverse fascia in this cell present; submarginal cell with a clear spot at apex of 2nd vein and usually a smaller one at or near apex of 3rd vein, this latter may be absent; one specimen has spot on one wing and lacks it in other; the apex of 1st posterior cell clear and usually not extending to the 3rd vein; marking in 2nd posterior cell usually not reaching wing margin; discal cell with about 15 to 18 clear spots. Costa with 2 strong spines at apex of subcosta; short stout costal spines extending to just beyond apex of 3rd vein. First vein with black hairs along most of dorsal surface; 3rd vein sometimes with black hair at base at ventral surface. Wing indices: costal about 1.8; 4th vein about 3.8-4.0; 4c about 2.1-2.3; 5x about 0.5.

Halteres light brown.

**ABDOMEN:** Dark greyish-brown. Fifth tergite with long dark bristles on posterior and lateral margins; light yellow hairs elsewhere on tergites.

*Holotype:* WAIHO: 19.i.1922, ♂, (A. Tonnoir), (Cant. Mus.).

*Material Examined:* Holotype and 4 ♂.

*New Records*: NATIONAL PARK: Above Mangatepopo Hut, 26.ii.1949, 2 ♂, (*R. A. Harrison*): 4,000 ft., 6.xi.1949, 1 ♂, (*K. P. Lamb*), (P.D.D.). OHAKUNE: 1922–1923, 1 ♂, (*T. R. Harris*), (B.M.).

*Distribution*: National Park, Ohakune, Waiho, Kumara. (November, January, February).

*Remarks*: The only species with dark brown post stigmatal marking extending along the marginal cell beyond the level of the apex of the first vein.

### **Trypanea completa** Malloch. Fig. 222

*Trypanea completa* Malloch, 1931. Rec. Cant. [N.Z.] Mus. 3 : 400.

*T. unimaculata* Malloch, 1931. Rec. Cant. [N.Z.] Mus. 3 : 403 (*New Synonymy*).

A grey species with light brown legs. Body length about 4.0 mm., wing length about 4.0 mm.

#### FEMALE

**HEAD**: Arista dark brown, basal segment brown; pubescence minute. Antenna light brown 3rd segment, yellowish-brown 2nd and basal segments; 2nd segment with black hairs on inner surface and on outer apical margin; basal segment with light yellow apical hairs. Front yellowish-brown dusted with grey; orbits and ocellar triangle more heavily dusted; ocellar area dark brown beneath the grey. Three convergent fronto-orbitals, anterior small and less than half the other two, posterior divergent fronto-orbitals not as long as the two long convergent bristles; verticals very strong; postverticals light yellow and not differentiated from other postvertical and postocular hairs and bristles; minute black and light yellow hairs on orbits lateral to bristles. Face yellowish-brown with a light dusting of grey. Cheeks yellowish-brown. Band of black hairs along cheek margin; 1 strong black bristle mid way along this band and just dorsal to it. Occiput dark greyish-brown. Eyes with few fine short hairs. Vertical diameter of eye about 4.5 times width of cheek in same axis. Proboscis light brown; palpi yellowish-brown, black hairs on apical half.

**THORAX**: Grey. Prescutellars absent; anterior dorsocentral just posterior to transverse suture and about same length as posterior dorsocentral; scutellars convergent and about 1.5 times length of posterior dorsocentral; scutellum with light yellow hairs on margins; hairs of mesonotum all light yellow; 1 strong humeral; 1 strong presutural; 2 notopleurals, posterior bristle weak and light yellow; 1 strong supraalar; 2 strong postalar; 1 sternopleural; row of propleural hairs; prosternum bare.

Legs light brown. Fore femur with light yellow to black bristles on dorsal and postero-dorsal surfaces; mid tibia with strong ventral apical.

**Wings** (Fig. 222): Stigma dark brown with apical sixth to quarter light brown or almost clear; area in marginal cell, posterior to stigma all dark brown; transverse brown fascia near apex of marginal cell present; submarginal cell with clear spot near apex of 2nd vein and no clear spot near apex of 3rd vein; apex of 1st posterior cell with clear spot not extending to 3rd and 4th veins; shaded areas in 2nd posterior cell reaching or nearly reaching wing margin; discal cell with about 9 to 12 clear spots in females. Costa with pair of strong spines at apex of subcosta; small black costal spines extending to just beyond apex of 3rd vein; base of 3rd vein with 1 or 2 black hairs on dorsal and/or ventral surfaces. Wing indices: costal about 1.9; 4th vein about 3.7–4.0; 4c about 2.0; 5x about 0.5.

Halteres light greyish-brown.

**ABDOMEN**: Dark greyish-brown. Sixth tergite with black bristles on posterior margin, elsewhere on tergite light yellow hairs. Ovipositor sheath shining blackish-brown.

*Holotype*: CASS: -ii.1925, ♀, (*A. Tonnoir*), (Cant. Mus.).

*Material Examined*: Holotype, 1 ♀, and 1 ex.

*New Records: ATAWHAI: —xii.1948, 1 ex. (A. W. Parrott), (Cawt. Inst.).*

*Distribution: Christchurch, Cass, Kumara, Atawhai. (November, December, February).*

*Remarks: Separated from other species by the absence of a clear spot near apex of third vein in the submarginal cell. The extent of variation in the wing characters can only be determined from an examination of a series larger than that available at present.*

### **Trypanea centralis Malloch**

*Trypanea centralis* Malloch, 1931. Rec. Cant. [N.Z.] Mus. 3: 402.

A grey species with light brown legs. Body length about 3.0 mm., wing length about 3.25 mm.

#### MALE AND FEMALE

**HEAD:** Arista shining dark brown, brown basally; pubescence extremely minute. Antenna light brown with a light covering of grey dust; 2nd segment with black hairs on inner surface, stronger dorsally and fine hairs on outer apical margin; basal segment with some light yellow apical hairs. Front light brown with a light covering of grey dust, dusting heavier on orbits and ocellar triangle; ocellar area dark brown beneath the grey. Female with 3 convergent and 1 posterior, dorsally directed fronto-orbitals, equal in length except anterior bristle about two-thirds length of others, convergent bristles not quite reaching middle of front; male with 4 small fronto-orbitals anteriorly; ocellars strong in female, weak in male; verticals strong; postverticals light yellow and not differentiated from the postvertical and postocular hairs; few very small hairs on orbits lateral to bristles. Face light greyish-yellow, concave. Cheeks light greyish-yellow. Band of black hairs along ventral margin of cheek, stronger light yellow hairs posteriorly, 1 short black bristle about middle of cheek just dorsal to band of hairs. Occiput dark greyish-brown. Eyes with short fine hairs. Vertical diameter of eye about 4.5 times width of cheek in same axis. Proboscis light brown; palpi yellowish-brown with black hairs only at apex.

**THORAX:** Grey; humerus and notopleural area light greyish-brown. Prescutellars absent; anterior dorsocentral just posterior to transverse suture and equal to posterior dorsocentral; scutellars slightly divergent and just longer than posterior dorsocentral; scutellum with fine light yellow hairs on margins; mesonotum with light yellow hairs; 1 humeral; 1 presutural; 2 notopleurals, posterior one weak and light yellow; 1 supraalar; 2 postalars, inner of pair strong; 1 sternopleural; row of propleural hairs; prosternum haired.

Legs light brown with reddish tinge. Fore femur with bristles on dorsal, and postero-dorsal surfaces; fore tarsus thickened and about three-quarters tibia in males; mid tibia with strong ventral apical; basal segment of mid tarsus normal.

**Wings:** Stigma varies from clear, light yellow, light yellow with brown spot on costa basally, light yellow with light brown basally and on base of costa, to light yellow with brown transverse area centrally, the shading, if present, always based on costa; area in marginal cell posterior to stigma clear with a small brown area next to the 1st vein or a wide brown band between 1st and 2nd veins; transverse brown fascia before apical shading of marginal cell absent or represented by a darkening of costa or as a band nearly reaching 2nd vein; always a clear spot in submarginal cell at or very close to apex of 2nd and 3rd vein (holotype has one wing without spot near 3rd vein); 1st posterior cell clear at apex and this spot either extending completely between 3rd and 4th veins, or not, and may extend deeply down cell towards cross vein; shaded areas in 2nd posterior cell either reaching or stopping short of wing margin; discal cell with about 16 clear spots in males and 12 in females. Costa with pair of spines at apex of subcosta; short stout costal spines extending to just beyond apex of 3rd vein; 3rd vein with a small hair at base of ventral surface. Wing indices: costal about 1.8–1.9; 4th vein about 3.1; 4c about 1.8; 5x about 0.5.

Halteres light brown.

ABDOMEN: Dark greyish-brown. Sixth tergite with strong dark bristles on posterior margin; light yellow hairs elsewhere on tergites. Ovipositor sheath shining black.

*Holotype*: CASS: 29.xi.1929, ♀, (*A. Tonnoir*), (Cant. Mus.).

*Material Examined*: Holotype, 1 paratype, 4 ♂, and 5 ♀.

*New Records*: MT. TORLESSE RANGE: 3,000 ft., bred ex flower head of *Celmisia spectabilis*, 8.ii.1954, 4 ♂, 3 ♀, (*R. D. Dick*), (Cawt. Inst.). PORTERS PASS: Fog Peak, 4,000 ft., 28.xi.1954, 1 ♀, (*R. R. Forster*), (Cant. Mus.). WAIMAKARIRI GORGE: 24.iii.1928, 1 ♀, (*Anon.*), (Cant. Mus.).

*Distribution*: Cass, Wakatipu, Mt. Torlesse Range, Porters Pass, Waimakariri. (November, December, February, March).

*Remarks*: Recognised by a combination of wing characters, of which the chief are the light or clear stigma and the clear region in submarginal cell posterior to the stigma.

### **Trypanea imperfecta Malloch**

*Trypanea imperfecta* Malloch, 1931. Rec. Cant. [N.Z.] Mus.  
3: 403.

A grey species with light brown legs and brown or light brown bristles. Body length about 3.0 mm., wing length about 3.5 mm.

#### MALE AND FEMALE

**HEAD**: Arista dark brown on apical half, light brown or brown basally; pubescence extremely minute. Antenna light brown; 3rd segment brown on apical two-thirds; 2nd segment with black hairs on inner margin, those dorsally placed the strongest, and minute hairs on apical margin of outer surface; basal segment with light yellow apical hairs. Front light brown with a light covering of grey dust, the dusting heavier on orbits and ocellar triangle; ocellar area dark brown beneath the grey dusting. Three convergent fronto-orbitals anteriorly, the anterior about three-quarters length of other two, these latter almost reaching middle of front in female but small in males, dorsally directed posterior fronto-orbitals, the anterior black one same size as the two larger convergent anterior; ocellars strong in female, weak in male; verticals strong; postverticals light yellow; ocellars and verticals strong; postverticals light yellow and not differentiated from the other occipital and postocular bristles; very short fine hairs on orbits lateral to bristles. Face light brown with grey dusting, concave. Cheeks light brown. Band of brown hairs along ventral margin of cheek; 1 light brown bristle dorsal to this band and at middle of cheek. Occiput dark greyish-brown. Eyes with few short hairs. Vertical diameter of eye 4 to 5 times width of cheek in same axis. Proboscis light brown; palpi broad, yellowish-brown and with black hairs at apex only.

**THORAX**: Grey on a blackish-brown ground; humerus and notopleural area and most of pteropleuron light brown. Prescutellars absent; anterior dorsocentral just posterior to transverse suture and about equal to posterior dorsocentral; scutellars convergent and about 1.7 times length of posterior dorsocentral; scutellum with light yellow hairs on margins; mesonotum with light yellow hairs; 1 humeral; 1 presutural; 2 notopleurals, posterior bristle weak and light yellow; 1 supraalar; 2 postalars, inner of pair very strong; 1 sternopleural; row of propleural hairs; prosternum bare.

Legs light brown with tinge of red. Fore femur with bristles on dorsal and postero-dorsal surfaces; fore tarsus in males thickened and about two-thirds fore tibia; mid tibia with ventral apical; basal segment of mid tarsus in male compressed.

**Wings**: Stigma light yellow with central brown shading varying from faint area on middle of 1st vein to a wide band reaching costa, all shading based on 1st vein; area in marginal cell posterior to stigma all dark shaded; transverse brown fascia before apical shading in marginal cell always present; submarginal cell always with 1 clear spot at or close to apex of 2nd vein and a small clear



spot near apex of 3rd vein, this latter may equal former spot but normally minute or entirely absent (holotype has one wing with this spot absent); apex of 1st posterior cell clear and not normally extending completely between 3rd and 4th veins; shading in 2nd posterior cell usually not reaching wing margin; discal cell with about 16 to 22 clear spots in males and about 12 to 17 in females. Costa with pair of strong spines at apex of subcosta; short stout costal spines extending just beyond apex of 3rd vein. First vein with black hairs along most of length on dorsal surface; 3rd vein sometimes with a small hair at base on ventral surface. Wing indices: costal about 1.7; 4th vein about 3.8-4.0; 4c about 2.3; 5x about 0.4. Halteres yellowish-brown.

**ABDOMEN:** Dark greyish-brown. Sixth tergite with strong bristles on posterior margin; light yellow hairs elsewhere on all tergites. Ovipositor sheath shining black.

*Holotype:* OTARAMA: 17.x.1921, ♀, (*G. Archey*), (Cant. Mus.).

*Material Examined:* Holotype, 3 ♂, and 4 ♀.

*New Records:* WELLINGTON: Karori, Johnsons Hill, 2.vi.1946, 1 ♂, (*J. T. Salmon*), (Dom. Mus.). MAKARORA: 1,000 to 2,000 ft. 1.xii.1924, 1 ♂, 1 ♀, (*C. Fenwick*), (Dom. Mus.). OTAGO: Martins Bay, 1-4.ii.1955, 3 ♀, (*R. R. Forster*), (Cant. Mus.). WHITE ROCK: 26.xi.1922, 1 ♂, (*J. W. Campbell*), (B.M.).

*Distribution:* Otarama, Wellington, Makarora, Martins Bay, White Rock. (October to December, February, June).

*Remarks:* The additional specimens, which undoubtedly belong to *imperfecta*, have normally black or blackish-brown bristles. The holotype has brown bristles, and it is probably correct, as Malloch (1931a) suggests, that this specimen is teneral.

### ***Trypanea alboapicata* Malloch. Fig. 223**

*Trypanea alboapicata* Malloch, 1931. Rec. Cant. [N.Z.] Mus. 3 : 401.

*T. dubia* Malloch, 1931. Rec. Cant. [N.Z.] Mus. 3 : 401. (*New Synonymy*).

A grey species with brown legs. Body length about 2.5 mm., wing length about 2.5 mm.

#### MALE AND FEMALE

**HEAD:** Arista dark brown, brown basally; pubescence very minute. Antenna light brown, 3rd segment brown; 2nd segment with short black hairs on inner surface, some of the dorsal hairs stronger, and fine hairs on outer apical margin; basal segment with light yellow hairs. Front light yellowish-brown, all with a light covering of grey dust, this dusting thicker on orbits and ocellar triangle; ocellar region dark brown beneath the grey dust. Three convergent fronto-orbitals, anterior just shorter than other two, all too short to reach near middle of front in males but strong in females; 1 dorsally directed posterior fronto-orbital about equal to length of convergent bristles; verticals strong; ocellars weak in males but strong in females; postverticals light yellow and not differentiated from other occipital and postocular hairs. Face light greyish-yellow. Cheeks light greyish-brown. Band of black hairs along ventral cheek margin, no distinct bristle at mid way but several stronger black hairs in posterior half of band. Occiput dark greyish-brown. Eyes with few fine hairs. Vertical diameter of eye about 4.5 times width of cheek in same axis. Proboscis yellowish-brown; palpi broad, yellowish-brown, black hairs only at apex.

**THORAX:** Grey. Prescutellars absent; anterior dorsocentral just posterior to transverse suture and about equal to posterior dorsocentral; scutellars about 1.6 times length of posterior dorsocentrals; scutellum with light yellow hairs on margin; mesonotal hairs all light yellow; 1 humeral; 1 presutural; 2 notopleurals, posterior one weak and light yellow; 1 supraalar; 2 postalar; 1 sternopleural; row of propleural hairs; prosternum haired.

Legs light brown, femora brown. Fore femur with bristles on dorsal and postero-dorsal surfaces; fore tarsus about equal to fore tibia in males and not much thickened; mid tibia with strong ventral apical; basal segment of mid tarsus in males compressed.

Wings (Fig. 223): Stigma dark brown with usually the apical quarter to sixth light coloured; area in marginal cell posterior to stigma all dark brown; transverse fascia in marginal cell present; submarginal cell always with a clear spot at apex of 2nd vein; usually a similar or smaller spot at or near apex of 3rd vein; the latter spot varies in size (the holotype has one wing without this spot); the apex of 1st posterior cell clear and may either extend to 3rd and 4th veins or not; the markings in 2nd posterior cell not usually reaching wing margin; discal cell with about 13 spots in males and 12 in females. Costa with pair of spines at apex of subcosta, short stout costal spines ending at apex of 3rd vein; no hairs at base of 3rd vein. Wing indices: costal about 1.8; 4th vein about 3.9; 4c about 2.1; 5x about 0.5.

Halteres light brown.

ABDOMEN: Dark greyish-brown. Fifth tergite with black bristles on posterior and lateral margins; other hairs and bristles on tergites light yellow.

*Holotype*: Cass: -ii.1925, ♂, (*A. Tonnoir*), (Cant. Mus.).

*Material Examined*: Holotype, 6 ♂ and 14 ♀, and 1 ex.

*New Records*: TAKAKA HILLS: Canaan Track, under stones and logs, 15.ii.1949, 4 ♂, 11 ♀, (*A. W. Parrott*). BEEBY KNOB: 4,200 ft., 23.ii.1954, 3 ♀, (*E. S. Gourlay*), (Cawt. Inst.). PORTERS PASS: Fog Peak, 4,000 ft., 28.xi.1954, 2 ♂, (*R. R. Forster*), (Cant. Mus.). NO DATA: 1 ex., (B.M.).

*Distribution*: Nelson, Takaka Hills, Beeby Knob, Cass, Waiho, Porters Pass. (November, February).

*Remarks*: A common South Island species, recognised by the presence of a small clear spot in the submarginal cell near the apex of the third vein. Variations occur in the wing markings and all described characters should be checked to determine correct identification.

## **Trypanea fenwicki** Malloch. Fig. 224

*Trypanea fenwicki* Malloch, 1931. Rec. Cant. [N.Z.] Mus.  
3: 404.

A greyish-brown species. Body length about 3.25 mm., wing length about 3.5 mm.

### MALE AND FEMALE

HEAD: Arista dark brown apically, brown or light brown basally; minutely pubescent. Antenna light brown; 3rd segment brown; 2nd segment with several dorsal bristles and hairs elsewhere; basal segment with apical dorsal light yellow hairs. Front light brown; orbits and ocellar triangle heavily dusted with grey; ocellar area blackish-brown beneath the grey dusting. Four convergent fronto-orbitals in male, 3 in female on anterior of front, 1 black posterior fronto-orbital; verticals strong; ocellars equal to fronto-orbitals; postverticals light yellow and not differentiated from other occipital and postocular bristles; fronto-orbitals and ocellars small in males, large in female, the anterior fronto-orbital in female about half length of other two. Face light greyish-yellow. Cheeks yellowish-brown with grey dusting. Hairs on ventral half of cheeks, strongest posteriorly. Occiput greyish-brown. Eyes haired. Vertical diameter of eye about 5 times width of cheek in same axis. Proboscis yellowish-brown; palpi broad, yellowish-brown, covered with fine hairs black only at apex.

THORAX: Blackish-brown covered with heavy grey dusting. Sometimes trace of very faint longitudinal vittae on mesonotum. Prescutellars absent; 2 strong, equal dorsocentrals; scutellar bristles about 1.3 times length of posterior dorsocentrals; hairs on scutellum mostly on lateral margins; 1 strong humeral; 1 presutural; 2

notopleurals, posterior one weak and light yellow; 1 supraalar; 2 postalars; 1 strong sternopleural; row of propleural hairs; prosternum haired.

Legs light or yellowish-brown with light dusting of grey. Fore femur with bristles on postero-dorsal surface; fore tarsus of male about two-thirds length of fore tibia; mid tibia with ventral apical; basal segment of mid tarsus with short ventral spines and cluster of minute ones at apex, other segments with small apical ventral spines.

Wings (Fig. 224): Stigma dark brown but light coloured on apical third to quarter; area in marginal cell, posterior to stigma, all dark brown; the stigma and marginal cell in some specimens brown; transverse fascia in marginal cell present; submarginal cell with clear spot at apex of 2nd vein and a distinctly larger one at apex of 3rd vein; this latter varies in size but is always present and normally larger than the anterior spot; the apex of 1st posterior cell is clear and in all specimens examined reaches the 3rd and 4th veins and extends basally towards cross vein; the 2nd posterior cell with marking extending to wing margin; discal cell with about 12 clear spots in both sexes. Short stout costal spines ending before apex of 3rd vein. Wing indices: costal about 1.8; 4th vein about 3.7; 4c about 2.1; 5x about 0.5.

Halteres light brown.

ABDOMEN: Dark brownish-grey. Fifth tergite in male and 6th in female with strong black apical bristles. Ovipositor sheath shining blackish-brown.

*Holotype*: PARADISE: 1.i.1920, ♀, (C. Fenwick), (lost?).

*Material Examined*: 2 ♂ and 6 ♀.

*New Records*: OHAKUNE: -ii.1924, 1 ♀, (T. R. Harris), (B.M.). WELLINGTON: 1.ii.1933, 1 ♀, (Anon.), (Dom. Mus.). TAKAKA HILLS: 3,300 ft., 1-9.xii.1933, 2 ♂, 4 ♀, (E. S. Gourlay), (Cawt. Inst.).

*Distribution*: Ohakune, Wellington, Takaka Hills, Paradise. (December to February).

*Remarks*: The holotype has not been located in collections and appears to have been lost. Separated from other species by the distinct clear spot always present near apex of third vein in the submarginal cell. This distinctive spot is always larger than the spot in the same cell near the apex of the second vein.

## Family PALLOPTERIDAE

Antennae large; third segment moderately wide, rounded at apex or disc shaped. One fronto-orbital bristle; ocellars present; postverticals divergent. Vibrissa absent. Mid tibia without distinct preapical bristle. Wings pictured, but not extensively; costal vein broken at apex of subcosta and only slightly weakened near humeral cross vein; subcosta complete, lying close to first vein at apex; no long costal spines; anal cell short.

New Zealand Pallopteridae can be recognised by the pictured wings, glossy appearance, absence of vibrissa, strong bristles of front including one fronto-orbital, ocellars, two pairs of verticals, and divergent postverticals.

They agree with the synopsis of the Northern Hemisphere Pallopteridae in most respects. The chief differences lie in their having a concave occiput, sharp vertex, three sternopleurals, a strong propleural, postverticals strong and distinctly divergent, and two (postsutural) dorsocentrals. Malloch (1948, p. 496) gives as an important character of the Lonchaedidae, the narrower front of male than female. This has

not been recognised as a character of the Pallopteridae but is found in New Zealand representatives. The New Zealand species, however, cannot be confused with the Lonchaeidae because of their rounded head, rounded antennae, transverse lunule, and subcylindrical abdomen. Overall, there appears no doubt that there is far greater affinity with Pallopteridae than Lonchaeidae.

*Genera Occurring in New Zealand:*

*Neomaorina* Miller

Most specimens in New Zealand have been collected by sweeping vegetation. If there is any preferred habitat it would be within the forest in damp situations such as near streams. There is no preference for seashore habitats as with North American species.

Genus NEOMAORINA Miller

*Maorina* Malloch, 1930. Rec. Cant. [N.Z.] Mus. 3 : 235.

*Neomaorina* Miller, 1945. Proc. R. ent. Soc. Lond. 14 : 72.

Four strong verticals; strong divergent postverticals. Lunule transverse. Stout proboscis. Prescutellars absent; two postsutural dorsocentrals; 1 humeral; 1 pre-sutural; 2 notopleurals; 1 supraalar; 2 postalar; 3 sternopleurals; 1 propleural; mesopleuron bare; prosternum bare. Legs slender. Cross vein between posterior basal and discal cells broken near anterior extremity; costa without long spines; anal cell rounded at apex, the vein curving towards base of wing posteriorly; anal vein incomplete. Abdomen tapering to apex; ovipositor of female lance-like, telescoping within the non-retractable sheath.

Type Species: *Neomaorina bimacula* (Malloch)

Malloch (1930b) originally placed *Maorina* in the Opomyzidae but later (Malloch, 1933d) regarded it as belonging to the Pallopteridae and agreeing well with his concept of the family for the South American fauna. Hendel (1937) considered that this genus belongs to the Pallopterinae which he placed as a subfamily of Lonchaeidae.

The antenna of this genus is reminiscent of the Helomyzidae in having a rounded, often large, disc-shaped third segment and pubescent arista.

*Distribution:* New Zealand.

*Species:*

*Neomaorina apicalis* (Walker)

*N. aristata* (Malloch)

*N. bimacula* (Malloch)

*N. gourlayi* sp.n.

*N. lamellata* sp.n.

*N. macronycha* (Malloch)

*N. palpalis* (Malloch)

*N. pseudoapicalis* sp.n.

*N. scutellata* (Malloch)

There is marked sexual dimorphism in this genus. The chief dimorphic characters are:

1. The front in males is much narrower than in females. Usually the male front is approximately twice as long as broad whereas the female front is about as long as broad.

2. The wing spots in males are more extensive than in the females. This is most marked in *N. bimacula* and quite marked in *N. gourlayi* but not so obvious in the remaining species.
3. Palpi may be absent or peculiarly modified in males whereas in all known females the palpi are normal although often relatively broad or leaf-like when compared with those of other acalypterate Diptera.
4. Aristae may be modified in males whereas in females they are always normally pubescent.
5. The costal index may be approximately equal in both sexes or smaller in males.
6. Base of basal segment of the male fore tarsus is often flattened. This modification is never present in the female.
7. The base of basal segment of mid tarsus may have a series of black, curled bristles in male but not in female.
8. Males are usually smaller than females.

Because of the lack of modifications in females their separation is most difficult. An attempt has been made to assign females to the species *N. scutellata*, *N. gourlayi*, *N. bimacula*, *N. apicalis*, and *N. lamellata*, but with the possible exception of *N. bimacula* which has distinctive wing characters, the combinations of males and females as given here must be regarded as tentative only. To be certain that the sexes belong to the same species, specimens would have to be bred, taken *in copula*, or laboratory studies made on live material. Such evidence is not yet available for any species. In the case of *N. lamellata* and *N. gourlayi*, additional, but not conclusive evidence, is available from the collecting data. Both sexes of each of these species were taken at the same time at the same locality and *N. gourlayi* is as yet the only species discovered on Stephens Island.

The genus is thus not yet completely known and any attempt to propose definite groups of species would be premature. On the basis of known males, however, some divisions of the genus are indicated. *N. bimacula* would seem to be separated from the other known species by the nature of its wing pattern. The absence of palpi in males of this species may show that a relationship exists with *N. macronycha* and *N. scutellata*. Intermediate between these two species and those species having normal palpi, (e.g. *N. lamellata*, *N. pseudoapicalis*, and *N. apicalis*) are possibly the two species having peculiarly modified palpi, *palpalis* and *gourlayi*.

#### KEY TO SPECIES OF NEOMAORINA

1	Males .....	2
	Females .....	9
2	Large ventral bristle on mid tibia .....	<b>apicalis</b>
	No ventral apical bristles on mid tibia .....	3
3	Palpi absent .....	4
	Palpi present .....	6
4	Wings with 2 large brown shaded areas; 1 near base from humeral cross vein to apex of 1st vein and over disc of wing to 5th vein; the other on about apical half of wing in marginal, submarginal and part of 1st posterior cells .....	<b>bimacula</b>
	Wings with small brown shaded area at apex of marginal, submarginal and anterior portion of 1st posterior cells and at apex of subcostal cell .....	5

5	Scutellum entirely shining black .....	<b>macronycha</b>
	Scutellum yellowish-brown, narrowly dark at base .....	<b>scutellata</b>
6	Palpi thread-like and with apical lamella .....	7
	Palpi normal without apical lamella .....	8
7	Costal index about 10·0, apical shading of wing faint, extensive, and fading into clear area .....	<b>palpalis</b>
	Costal index about 7·5, apical shading of wing dark and confined to definite area .....	<b>gourlayi</b>
8	Arista with apical lamella .....	<b>lamellata</b>
	Arista without apical lamella .....	<b>pseudoapicalis</b>
9	Wings with 2 brown shaded areas; one near base over apices of subcostal and costa cells and over disc of wing to 4th vein, or faintly to 5th; the other at apex of wing .....	<b>bimacula</b>
	Wings with small brown areas at apex of wing and apex of subcostal cell .....	10
10	Arista with rays of pubescence distinctly longer and denser on apical fourth .....	<b>aristata</b>
	Arista normally pubescent .....	11
11	Front yellowish-brown .....	12
	Front wholly or partially black .....	<b>scutellata</b>
12	Costal index below 10·0 .....	<b>gourlayi</b>
	Costal index above 10·0 .....	13
13	Costal index between 10·0 and 11·0 .....	<b>apicalis</b>
	Costal index above 11·0 .....	<b>lamellata</b>

### **Neomaorina apicalis (Walker)**

*Opomyza apicalis* Walker, 1849. "List Dipt. Brit. Mus." 4 : 1114.

*Maorina apicalis* (Walker) : Malloch, 1930. Rec. Cant. [N.Z.] Mus. 3 : 241.

*Neomaorina apicalis* (Walker) : Miller, 1945. Proc. R. ent. Soc. Lond. 14 : 72.

A generally shining light brown or yellowish-brown species with some brown areas. Body length about 4·0–5·0 mm., wing length about 3·5–4·5 mm.

#### MALE AND FEMALE

**HEAD:** Arista brown, yellowish-brown basally, basal segment short and wider than other segments; evenly pubescent, rays about equal to width of basal segment. Antenna light brown; 3rd segment a shade darker brown dorsally; 2nd segment with 1 apical bristle and black hairs about apical margin and dorsally; basal segment with about 4 black hairs on dorsal apical margin distinctly longer than hairs on 2nd segment. Front longer than wide, generally light brown; ocellar area brown or dark brown. All bristles strong; fronto-orbital about three-fifths length of inner vertical and just shorter than postverticals; black hairs on anterior half or more of front, those towards anterior margin stronger and longer than the more posterior ones. Face light yellowish-brown. Narrow carina. Cheek yellowish-brown. Fine black and brown hairs along cheek. Occiput light brown. Eyes with very few short fine hairs. Vertical diameter of eye about 9 times width of cheek in same axis. Proboscis light brown; palpi light yellowish-brown, quite broad.

**THORAX:** Shining yellowish-brown; mesonotum with indefinite longitudinal brown or light brown vittae between and outside dorsocentral rows, more marked posteriorly; scutellum yellowish-white and not as glossy as mesonotum; humerus glossy yellowish-white; brown vitta from dorsal propleuron, across spiracle and dorsal mesopleuron, rest of mesopleuron light yellowish-brown with whitish-grey dusting; sternopleuron glossy brown; ventral pteropleuron, hypopleuron, most of metapleuron, and postscutellum all brown. Anterior dorsocentral about three-quarters length of posterior dorsocentral; basal scutellars convergent and just shorter than the cruciate apicals; disc of scutellum bare and convex; humeral

strong; anterior sternopleural weak; propleural strong and a small spiracular hair posterior to it.

Legs light yellowish-brown. Fore femur with postero-dorsal bristles and postero-ventrals on apical half; fore tibia without differentiated preapical and with weak apical; mid tibia with strong ventral apical; hind femur with large antero-ventral bristle at apical third; hind tibia without preapical or apicals.

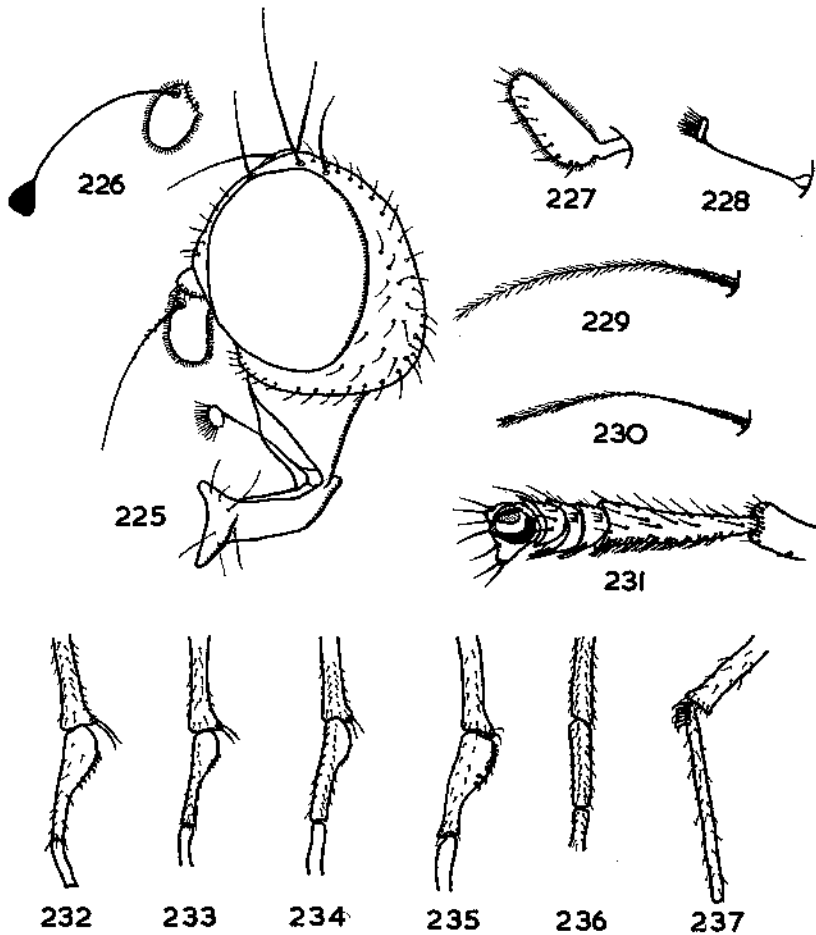


Fig. 225. Head of *Neomaorina palpalis*  
 " 226. Arista of *N. lamellata*  
 " 227. Palpus of *N. gourlayi* (female)  
 " 228. " " " (male)  
 " 229. Arista of *N. bimaculata*  
 " 230. " " *N. aristata*  
 " 231. Hind tarsus of *N. bimaculata* (male)  
 " 232. Fore tarsus of *N. scutellata* (male)  
 " 233. " " " *N. palpalis* (male)  
 " 234. " " " *N. gourlayi* (male)  
 " 235. " " " *N. lamellata* (male)  
 " 236. " " " *N. pseudoapicalis* (male)  
 " 237. Mid " " *N. bimaculata* (male)

Scale: 0.5 mm.

Wings glossy, clear; veins brown; small brown shaded area about apices of 2nd and 3rd veins. Short heavy spines of costa ending near apex of 2nd vein; costa ending at 4th vein; 5th vein not quite reaching wing margin; anal vein ends about two-thirds distance to wing margin. Anal lobe small. Wing indices: costal about 10·1; 4th vein about 1·7-2·0; 4c about 0·3-0·5; 5x about 0·7.

Halteres yellowish-white apically, yellowish-brown basally.

ABDOMEN: Shining brown to dark brown; posterior segments and ovipositor darker.

External male genitalia shining dark brown.

*Holotype*: NO DATA: ♂, (B.M.).

*Material Examined*: Holotype, 8 ♀.

*New Records*: OHAKUNE: 8.iii.1923, 1 ♀, (*A. Tonnoir*), (Cawt. Inst.). KAITAWA: 9.xii.1922, 1 ♀, (*Anon.*), (Ak. Mus.). BANKS PENINSULA: Akaroa, 11.xii.1924, 1 ♀, (*A. Tonnoir*), (Cant. Mus.). DUNEDIN: Andersons Bay, 24.x.1921, 1 ♀, (*Anon.*), (Ak. Mus.). CHATHAM ISLANDS: no date, 4 ♀, (*F. W. Hutton*), (Cant. Mus.).

*Distribution*: Ohakune, Ruapehu, Kaitawa, Wellington, Nelson, Mt. Arthur, Banks Peninsula, Dunedin, Chatham Islands. (October, December, March).

*Remarks*: The holotype is the only male examined and the ventral apical bristle of the mid tibia is well developed. This character separates males of this species from all others of the genus.

### ***Neomaorina bimacula* (Malloch). Figs. 229, 231, 237, 244, 245**

*Maorina bimacula* Malloch, 1930. Rec. Cant. [N.Z.] Mus. 3: 237.

*Neomaorina bimacula* (Malloch) : Miller, 1945. Proc. R. ent. Soc. Lond. 14: 72.

A shining light brown species with dark brown abdomen and two brown areas on wing. Body length about 3·0-4·0 mm. in males; 4·0-5·0 mm., in females. Wing length about 3·0-4·0 mm. in males; 4·0-4·5 mm. in females.

#### MALE

HEAD (Fig. 229): Arista dark brown, light brown basally; distinctly pubescent on whole length, rays of pubescence about equal to width of basal segment. Antenna light brown; 3rd segment about 1·5 times as long as wide, brown on most of area apical to arista insertion; 2nd segment with 1 strong dorsal apical and black hairs over dorsal and apical surfaces, stronger hairs ventrally; basal segment short. Front light brown merging to dark brown at vertex; ocellar area blackish-brown. All frontal bristles strong; fronto-orbital about two-thirds length of inner vertical and equal to postverticals; hairs on front more prominent and larger anteriorly, a few laterally on anterior margin almost bristle-like. Face yellowish-white. Cheek yellowish-white anteriorly, merging to yellowish-brown posteriorly. Fine hairs along cheek in 2 irregular rows, those anteriorly light brown, some longer hairs but no strong bristles at lower posterior corner. Occiput dark brown. Eyes with few fine hairs over surface. Vertical diameter of eye about 9 times width of cheek in same axis. Proboscis yellowish-brown; palpi absent.

THORAX: Shining light brown; mesonotum with a brown or dark brown vitta lateral to dorsocentrals and usually only visible posterior to suture; scutellum brown or dark brown on basal half; mesopleuron, anterior of pteropleuron, and anterior of sternopleuron yellowish-brown; remaining pleura and portions of pleura shining brown or dark brown. Anterior dorsocentral about three-quarters length of posterior dorsocentral, sometimes a much weaker third dorsocentral anteriorly; basal scutellars parallel and equal to or just less than convergent apicals; 1 strong humeral; 2 strong postalars, inner posterior bristle weaker; 3 sternopleurals,



anterior usually much weaker than other two; strong propleural and short spiracular hair just posterior to it.

Legs (Figs. 231, 237) light yellowish-brown; apical two segments of fore tarsus blackish-brown. Fore femur with bristles on postero-dorsal and postero-ventral surfaces, the apical bristles strong, a few small bristles medianly on posterior surface; fore tibia slender, without bristles; fore tarsus with basal three segments long and slender, apical two short and wide; mid femur with long ventral basal bristle; basal segment of mid tarsus with comb of short curved bristles ventrally at base; hind femur with strong antero-ventral bristle at apical third and weaker bristle often on same surface towards base; hind tibia without bristles; hind tarsus shorter than other tarsi, all segments thickened except basal two-thirds of basal segment, claws unevenly developed, the posterior of pair thickened and much curved.

Wings (Fig. 244) clear with brown shading about apex of 1st vein and extending posteriorly to about 5th vein; also on apical three-quarters of marginal, submarginal, and anterior region of 1st posterior cell. Short stout costal spines extending to about third distance between apices of 2nd and 3rd veins; 5th vein terminated just before wing margin. Wing indices: costal about 8.0-8.5; 4th vein about 1.6-1.8; 4c about 0.3-0.4; 5x about 0.8.

Halteres light whitish-yellow; base of stalk yellowish-brown.

ABDOMEN: Basal segments shining brown, apical segments shining dark reddish-brown; all tergites with many long bristles and hairs, those posteriorly and laterally on tergites the strongest. All tergites darker on posterior margin and with median longitudinal dark band.

#### FEMALE

Similar to male except: palpi present, wide with narrow stalk basally, yellowish-brown and with short hairs over most of surface. Legs normal, without dark brown segments on fore tarsus, and without modifications of tarsal segments as in male; mid femur with only a weak basal ventral; mid tibia with strong ventral apical. Wing (Fig. 245): apical brown shading not as extensive as male, only extending through apical third of cells. Ovipositor yellowish-brown apically.

*Holotype*: KAITUNA: 19.ii.1922, ♂, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined*: Holotype, 9 ♂ and 16 ♀.

*New Records*: LITTLE BARRIER ISLAND: Waipawa stream bed, 28.xi.1954, 1 ♀, (*R. A. Harrison*), (P.D.D.). WAITAKERE RANGES: Nihotupu, 29.x.1929, 1 ♂, (*A. Philpott*), (Ak. Mus.); 2.i.1950, 3 ♂, 1 ♀; 23.ii.1955, 1 ♀; 9.iii.1953, 3 ♀, (*R. A. Harrison*): Titirangi, 21.iii.1947, 1 ♀, (*M. W. Carter*), (P.D.D.). OHAKUNE: ---.1923, 1 ♀, (*T. R. Harris*), (Cawt. Inst.). PALMERSTON NORTH: Hokowhitu Bush, 10.xi.1889, 1 ♂, (*G. V. Hudson*), (Dom. Mus.). WELLINGTON: Wadestown, -xii.1912, 1 ♀; 6.ii.1916, 1 ♀; Wiltons Bush, 13.xi.1931, 1 ♀; Muritai Track, 2.ii.1943, 1 ♀; Karori Reserve, 4.iv.1913, 1 ♂, (*G. V. Hudson*), (Dom. Mus.). NELSON: 1.i.1921, 1 ♀, (*A. Philpott*), (Paratype?); 24.iii.1926, 1 ♂, (*W. Heighway*), (Cawt. Inst.). KAIKOURA: Blackmill, 31.xii.1927, 1 ♀, (*S. Lindsay*), (Cant. Mus.). CHRISTCHURCH: Kennedys Bush, 29.i.1925, 1 ♂, (*A. Tonnoir*), (Cant. Mus.). BANKS PENINSULA: Akaroa, 11.xii.1924, 1 ♂, (*A. Tonnoir*): Hilltop, 14.i.1925, 1 ♀, (*A. Tonnoir*), (Cant. Mus.). WAITATI: 18.xii.1916, 1 ♀, (*Anon.*), (Ak. Mus.).

*Distribution*: Little Barrier Island, Waitakere Ranges, Ohakune, Palmerston North, Wellington, Kaituna, Nelson, Waiho, Kaikoura, Christchurch, Banks Peninsula, Waitati. (October to April).

*Remarks*: Because of the unique character of two shaded areas of the wing it is possible to place females in *N. bimacula* with more certainty than in other species of this genus. This character separates both sexes from all other species.

**Neomaorina macronycha** (Malloch)

*Maorina macronycha* Malloch, 1930. Rec. Cant. [N.Z.] Mus. 3 : 239.

*Neomaorina macronycha* (Malloch) : Miller, 1945. Proc. R. ent. Soc. Lond. 14 : 72.

A small dark brown species with shining black thorax and scutellum. Body length about 3.0 mm.

MALE

HEAD: Arista almost bare. Antenna brown; 3rd segment dark brown, less than 3 times as long as 2nd segment. Front entirely shining black. Palpi lacking.

THORAX: Mesonotum glossy black; scutellum glossy black with extreme apex sometimes paler; whitish-grey dusting on mesopleuron and pteropleuron.

Legs: Fore tarsus yellow; hind femur and tibia largely blackened beyond middle. Fore tarsus normal; hind tarsus thickened, inner claw elongated, curled backwards and more or less scimitar-shaped.

Wings white, slight brown shading at apex of subcostal cell and at apex of wing, the apical area not clearly defined but gradually darkening towards apex especially in marginal cell.

ABDOMEN: Yellow on basal segments.

*Holotype*: KAITUNA: 19.ii.1922, ♂, (*A. Tonnoir*), (Cawt. Inst.) (lost?).

*Distribution*: Kaituna. (February).

*Remarks*: The holotype is not available and apparently has been accidentally destroyed. The absence of palpi is the major distinguishing character of this species. Differs from *N. bimacula* in having a much smaller and more indefinite apical spot on wing and no large brown area about apex of first vein, and from *N. scutellata* in having a more indefinite brown apical wing spot and much darker scutellum.

**Neomaorina scutellata** (Malloch). Figs. 232, 238, 239

*Maorina scutellata* Malloch, 1930. Rec. Cant. [N.Z.] Mus. 3 : 240.

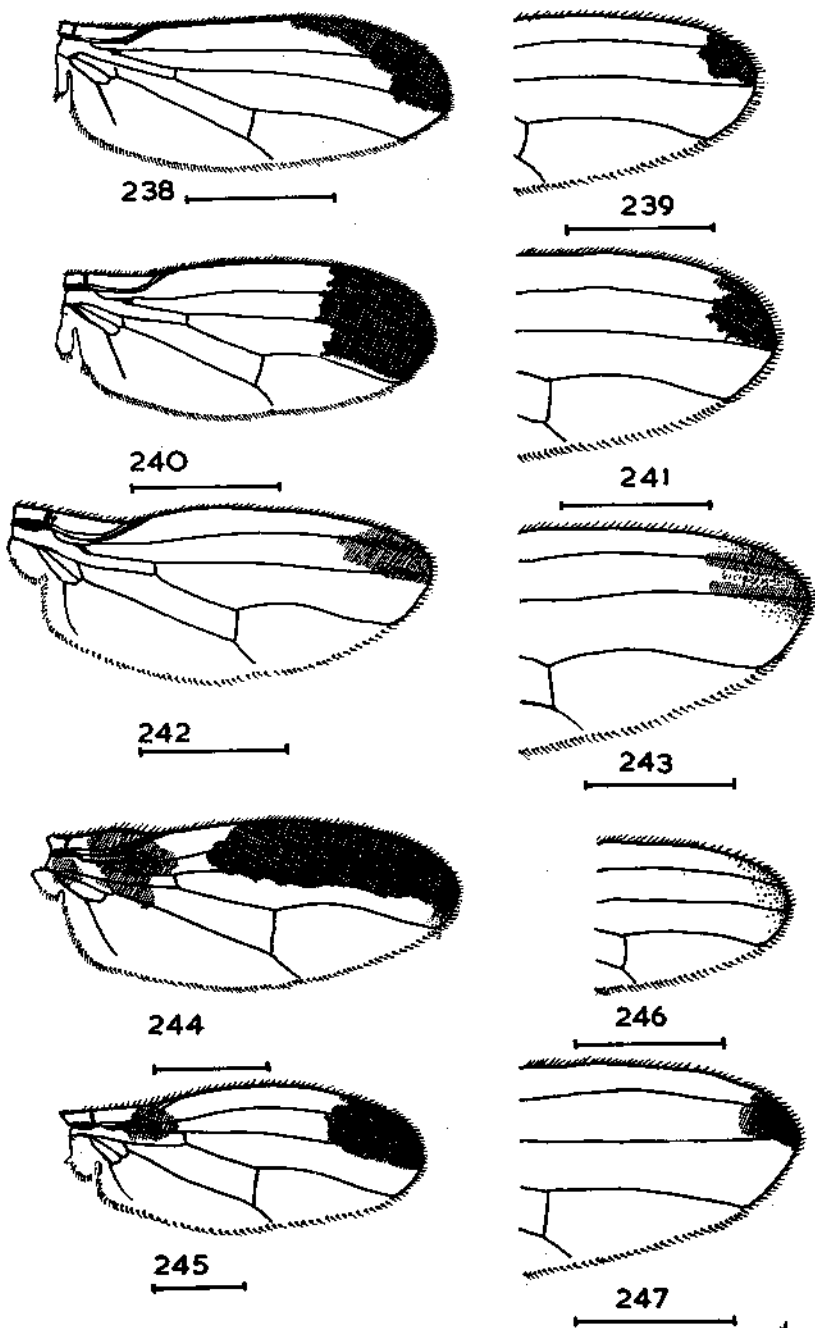
*Neomaorina scutellata* (Malloch) : Miller, 1945. Proc. R. ent. Soc. Lond. 14 : 72.

A shining dark brown species with yellowish-brown legs and a dark brown apical spot on wings. Body length about 3.0 mm. in males; 4.0-4.5 mm. in females. Wing length about 3.0 mm. in males; 4.0-4.5 in females.

MALE

HEAD: Arista shining dark brown, light brown basally, bare except at base. Antenna yellowish-brown, 3rd segment brown dorsally and apically; 2nd segment with 1 dorsal bristle and black hairs on dorsal margin and lateral apical margin; basal segment with some dorsal apical hairs overlapping 2nd segment and longer than hairs on 2nd segment. Front much narrower than long and converging anteriorly, shining dark brown but merging to light brown at anterior margin. All bristles strong; fronto-orbital about two-thirds length of inner vertical and equal to postverticals; fine long dark brown hairs over most of front more especially on anterior region. Face whitish-yellow. No carina. Cheeks all yellowish-brown. Few short hairs along cheek margin, some longer brown hairs but no strong bristles at lower posterior angle of cheek. Occiput shining dark brown. Eyes with few hairs ventrally. Vertical diameter of eye about 6.5 times width of cheek in same axis. Proboscis light yellowish-brown; palpi absent.

THORAX: Shining dark brown; scutellum yellowish-brown except brown at base; humerus light brown; central posterior margin of mesonotum narrowly light brown; pleura with whitish-grey dusting more marked on mesopleuron and pteropleuron. Anterior dorsocentral just over half length of posterior dorsocentral; basal scutellars convergent and about three-quarters length of cruciate apicals; 3 dorsal



Figs. 238-247, Wings:

- |  |                                   |
|--|-----------------------------------|
| 238. <i>Neomaorina scutellata</i> (male) | 243. <i>N. lamellata</i> (female) |
| 239. " " (female)                        | 244. <i>N. bimaculata</i> (male)  |
| 240. <i>N. gourlayi</i> (male)           | 245. " " (female)                 |
| 241. " " (female)                        | 246. <i>N. palpalis</i> (male)    |
| 242. <i>N. lamellata</i> (male)          | 247. <i>N. aristata</i> (female)  |

Scale: 1.0 mm.

sternopleurals; anterior bristle much weaker than the other two; strong propleural and a small spiracular hair posterior to it.

Legs (Fig. 232) light yellowish-brown. Fore femur with postero-dorsal bristles, those towards apex strong, and postero-ventrals on apical half, the apical ones strongest; fore tibia without strong preapical and apical; fore tarsus with base of basal segment flattened and with small spines on margin of this region; mid tibia with small apical; hind femur with a long strong antero-ventral at apical third; hind tarsus with posterior claw distinctly larger than anterior.

Wings (Fig. 238) clear; brown shading at apex of marginal, submarginal, and anterior portion of 1st posterior cells; veins brown. Short costal spines ending about apex of 2nd vein; costa extends to 4th vein; 5th vein terminated just before margin of wing; anal lobe small. Wing indices: costal about 8.1; 4th vein about 1.8; 4c about 0.4; 5x about 1.1.

Halteres white apically, yellowish-brown basally.

ABDOMEN: Shining dark brown.

#### FEMALE

As for male except: Arista pubescent on whole length, rays less than width of basal segment. Front at vertex about as wide as long. Palpi present, yellowish-brown with short narrow brown stalk. Scutellum broadly yellowish-brown at apex and lateral margins. Fore tarsus normal; mid tibia with strong ventral apical; claws of hind tarsus normal. Wings (Fig. 239): apical brown spot confined almost entirely to marginal and submarginal cells. Wing indices: costal about 11.0-11.6; 4th vein about 1.7; 4c about 0.4; 5x about 1.0. Abdomen shining dark brown with posterior margins of tergites blackish-brown.

*Holotype*: KAITUNA: 19.ii.1922, ♂, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined*: Holotype, 4 ♀.

*New Records*: OKARAHIA: 5.ii.1925, 1 ♀, (*A. Tonnoir*), (Cawt. Inst.). MOANA: 16-21.xii.1925, 1 ♀, (*A. Tonnoir*), (P.D.D.). CHRISTCHURCH: Deans Bush, 21.xi.1924, 1 ♀, (*A. Tonnoir*), (Cant. Mus.). WAITATI: 3.xi.1917, 1 ♀, (*Anon.*), (Ak. Mus.).

*Distribution*: Okarahia, Kaituna, Otira, Mt. Arthur, Flora River. (November, December, February).

*Remarks*: Although none of the females examined by Malloch (1930b) has been seen by the author, the specimens placed in this species correspond with his diagnosis.

The males have no palpi and are separated from *N. bimaculata* by having a small apical spot on wing and from *N. macronycha* by having a partly yellowish-brown scutellum.

### *Neomaorina palpalis* (Malloch). Figs. 225, 233, 246

*Maorina palpalis* Malloch, 1930. Rec. Cant. [N.Z.] Mus. 3 : 240.

*Neomaorina papalis* (Malloch) : Miller, 1945. Proc. R. ent.

Soc. Lond. 14 : 72.

A shining brown species, light yellowish-brown legs. Body length about 3.0 mm., wing length about 3.0 mm.

#### MALE

HEAD (Fig. 225): Arista brown, light brown at base; bare, some pubescence on basal quarter. Antenna yellowish-brown; 3rd segment brown on apical half; 2nd segment with one dorsal bristle and hairs on dorsal and outer apical margins; basal segment with apical dorsal hairs longer than those on 2nd segment. Front brown, anterior half light brown, narrower than long and narrowed anteriorly. Fronto-orbital about two-thirds length of inner vertical and equal to length of postverticals; fine light brown hairs on front, mainly anteriorly, and longest near anterior margin. Face light brown. Carina absent. Cheeks yellowish-brown. Row of hairs along cheeks, some longer hairs but no strong bristles at lower

posterior corner. Occiput shining brown. Eyes bare. Vertical diameter of eye about 10 times width of cheek in same axis. Proboscis yellowish-brown; palpi long and hair-like, with lamella at apex bearing comb of long black hairs on ventral margin.

**THORAX:** Shining brown; mesonotum with light brown area between dorsocentrals and from anterior dorsocentrals to scutellar suture; scutellum yellowish-brown; humerus and propleuron yellowish-brown; other pleura brown with greyish dusting more marked on mesopleuron and pteropleuron. Anterior dorsocentral about two-thirds posterior dorsocentral; basal scutellars parallel or convergent and about five-sixths length cruciate apicals; 1 strong humeral; 2 postalars, inner of pair very weak; 3 dorsal sternopleurals, anterior bristle much weaker than other two; strong propleural and a small spiracular hair posterior to it.

Legs (Fig. 233) shining light yellowish-brown. Fore femur with fine long dark brown bristles on postero-dorsal and most of postero-ventral surfaces; fore tibia without well developed preapicals or apical; fore tarsus with base of basal segment flattened; mid tibia with small apical; hind femur with long strong bristle at apical third of antero-ventral surface; hind tibia without apical and with small preapical; hind tarsus with claws longer than those on fore and mid tarsi but equal to each other.

Wings (Fig. 246) clear with light brown shading at apex of marginal and submarginal cells; veins brown. Costa extending to 4th vein; short stout costal spines ending at apex of 2nd vein; submarginal cell just narrowed apically; 5th vein not quite reaching wing margin; anal lobe small. Wing indices: costal about 10.3; 4th vein about 1.4; 4c about 0.3; 5x about 1.0.

Halteres white apically, yellowish-brown basally.

**ABDOMEN:** Shining dark brown with anterior margin of anterior tergites tending to be lighter brown.

*Holotype:* KAITUNA: 16.ii.1922, ♂, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined:* Holotype, 3 ♂.

*New Records:* OKARAHIA: 5.ii.1925, 1 ♂, (*A. Tonnoir*), (Cant. Mus.). CHRISTCHURCH: Kennedys Bush, 26.i.1925, 1 ♂, (*A. Tonnoir*), (P.D.D.). BANKS PENINSULA: Akaroa, 11.xii.1924, 1 ♂, (*A. Tonnoir*), (Cant. Mus.).

*Distribution:* Okarahia, Kaituna, Christchurch, Banks Peninsula. (December to February).

*Remarks:* The holotype has been examined and the arista has some pubescence on its basal quarter. This specimen has the appearance of being teneral and this would account for the generally light colour, particularly on the posterior portion of mesonotum. This area in other males is not so clearly differentiated from the rest of the mesonotum. Separated from *N. gourlayi*, the only other species known to have hair-like palpi, by having a larger costal index.

### ***Neomaorina gourlayi* sp.n. Figs. 227, 228, 234, 240, 241**

A shining, brown to dark brown species with clearly defined large brown shaded area at apex of wing; wings broad at apex. Body length about 3.0 mm. in males; 3.5-4.0 mm. in females. Wing length about 3.0 mm. in males; 4.0 mm. in females.

#### MALE

**HEAD** (Fig. 228): Arista dark brown, yellowish-brown basally; pubescent on basal half, rays of pubescence short and much less than diameter of basal segment, apical half bare. Antenna yellowish-brown; 3rd segment mostly light greyish-brown; 2nd segment with 1 strong dorsal bristle and short black hairs on dorsal and apical margins, those ventrally strong; basal segment with few black hairs on dorsal apical margin. Front narrow, longer than wide and converging anteriorly, shining brown; ocellar area dark brown. Fronto-orbital bristle about three-quarters

length of inner vertical and equal to postverticals; hairs over most of anterior half of front, the strongest near anterior margin. Face yellowish-brown. Cheeks yellowish-brown. Two clearly defined rows of small black hairs along cheek, some enlarged hairs but no strong bristles at lower posterior corner of cheek. Occiput shining dark brown, lighter brown at vertex. Eyes with few very short fine hairs. Vertical diameter of eye about 7.5 times width of cheek in same axis. Proboscis yellowish-brown; palpi long and hair-like with lamella at apex bearing an apical row of black hairs.

**THORAX:** Shining brown or dark brown; mesonotum without obvious darker vitta; scutellum light brown; humerus and propleuron light brown; mesopleuron and pteropleuron except dorsal area dusted with whitish-grey; sternopleuron dark brown; remaining pleura light brown. Anterior dorsocentral about half length of posterior dorsocentrals; basal scutellars convergent and about three-quarters length cruciate apically; strong humeral; 1 strong supraalar; 2 postalar; inner posterior bristle weaker; 3 sternopleurals, anterior much weaker than other two; strong propleural and a short spiracular hair just posterior to it.

Legs (Fig. 234) light yellowish-brown; apical two segments of mid tarsus brown. Fore femur with bristles on apical third of postero-dorsal surface, basal two-thirds of posterior surface, and on apical half of postero-ventral surface; fore tibia without distinct bristles; fore tarsus with basal segment having a basal ventral flattened area bearing minute stumpy black spines on margin; hind femur with long, strong antero-ventral bristle at apical third; claws on hind tarsus asymmetrical.

Wings (Fig. 240) clear with brown shading in a definite area extending over apical third of marginal and submarginal cells and over apical two-fifths of 1st posterior cell but not quite reaching 4th vein. Short stout costal spines ending just before apex of 2nd vein; 5th vein not quite reaching wing margin. Wing broad at apex. Wing indices: costal about 7.7; 4th vein about 1.6; 4c about 0.4; 5x about 1.1.

Halteres light yellowish-brown, yellowish-brown basally.

**ABDOMEN:** Shining dark brown, all tergites with bristles stronger on posterior and towards lateral margins.

#### FEMALE

As for male except: Arista pubescent on whole length, rays less than diameter of basal segments; front wider than in male but not quite as wide as long; palpi (Fig. 227) normal, light yellowish-brown. Fore tarsus normal; mid tibia with strong ventral apical bristle; claws of hind tarsus normal. Wings (Fig. 241) with brown shading at apex only of marginal and submarginal cells and only trace in extreme apex of 1st posterior cell; stigmal spot, radius at humeral cross vein, and junction of 2nd and 3rd veins dark brown. Wing indices: costal about 9.5; 4th vein about 1.6; 4c about 0.4; 5x about 0.9.

*Holotype:* STEPHENS ISLAND: 14-28.i.1933, ♂, (*E. S. Gourlay*), (Cawt. Inst.).

*Paratypes:* Same data as holotype, (1 ♂ Cawt. Inst.; 2 ♂ P.D.D.). WELLINGTON: 28.ix.1931, 1 ♂, (*E. M. Heine*), (Dom. Mus.).

*Material Examined:* Holotype, 4 ♂ paratypes, 9 ♀.

*Other Records:* STEPHENS ISLAND: 14-28.i.1933, (*E. S. Gourlay*), (2 ♀, P.D.D. and 4 ♀, Cawt. Inst.). DUNEDIN: Andrew Bay, 21.x.1922, 1 ♀, (*A. Tonnoir*), (Ak. Mus.). NO DATA: 1 ♀, (*Anon.*), (*Hutton Collection*, Cant. Mus.). PEEL FOREST: 20.xi.1930, 1 ♀, (*S. Lindsay*), (Cant. Mus.).

*Distribution:* Stephens Island, Wellington, Dunedin, Peel Forest. (September to November, January).

*Remarks:* Because of the doubt about the identity of females in this genus, the females recorded above are not placed as paratypes.

The species is named for E. S. Gourlay of the Cawthron Institute, Nelson.

Separated from *N. palpalis* by the lower costal index and wing shading. In *N. gourlayi* the shading in male is more extensive than in *N. palpalis*. The general body colour is lighter than in *N. palpalis* and the posterior pleura are light brown whereas they are dark brown in *N. palpalis*.

**Neomaorina lamellata** sp.n. Figs. 226, 235, 242, 243

A shining brown species with light yellow legs. Body length 3.0 mm. in males; about 4.0 mm. in females. Wing length 3.0 mm. in males; about 4.0 mm. in females.

MALE

**HEAD** (Fig. 226): Arista brown basally and blackish-brown apically with short sparsely situate pubescence basally and a flat almost circular lamella at apex. Antenna brown, all segments dark brown dorsally; 3rd segment strong, as wide as long, and with covering of fine whitish-brown pile; 2nd segment with minute black hairs and 1 dorsal bristle; 1st segment distinctly visible and with black apical hairs. Front brown, ocellar area black. Ocellars and vertical bristles strong; fronto-orbital not as strong; few black hairs near anterior margin of front. Face light brown, short, not as long as antennae in median line; sharply ridged but shallow carina. Parafacials brown but almost black at region of anterior ventral margin of eye. Cheeks light brown. Eyes bare. Vertical diameter of eye about 5.5 times width of cheek in same axis. Small hairs along oral margin with 2 or 3 longer hairs at lower corner of head. Occiput brown. Vertex distinctly angled. Proboscis light brown; palpi yellowish-brown, with some thick black hairs.

**THORAX:** Brown; lower portion of mesopleuron and pteropleuron slightly dusted with white; scutellum and extreme posterior margin of mesonotum yellowish-brown. Anterior dorsocentral about two-thirds posterior dorsocentral; convergent basal scutellars about two-thirds cruciate apicals; 1 strong humeral; 2 strong postalar, outer the stronger; 3 dorsal sternopleurals, anterior weakest; propleural strong.

Legs (Fig. 235) all light yellow. Fore femur with bristles on postero-dorsal and postero-ventral surfaces; mid femur without distinctive bristles; hind femur with strong bristle at apical third antero-ventrally; fore tibia enlarged at apex; other tibiae without distinct bristles or structures; basal segment of fore tarsus broadened at base into a keel-like structure with small black curved bristle-like hairs on margin of keel; other segments and other tarsi without distinctive bristles or structures, except asymmetrical claws on hind tarsus.

Wings (Fig. 242) clear with brown area completely covering apex of marginal, submarginal, and anterior of 1st posterior cells; apex of costal cell brown; veins brown. Fifth vein not quite reaching wing margin; heavy costal bristles to apex of 2nd vein. Wing indices: costal about 10.0; 4th vein about 1.7; 4c about 0.3; 5x about 1.25.

Halteres light brown.

**ABDOMEN:** Shining brown to dark reddish-brown, anterior tergites lighter brown.

FEMALE

Similar to male except: Arista normal, without apical lamella, pubescent on whole length. Thorax light brown. Fore tibia and tarsus normal; claws of hind tarsus normal; mid tibia with strong ventral apical.

Wings (Fig. 243): brown area at apex of marginal, submarginal, and 1st posterior cells, the brown marking much more distinct about 2nd and 3rd veins than on membrane of cells; shading generally less pronounced than in male. Wing indices: costal about 11.0-12.0; 4th vein about 1.6; 4c about 0.3; 5x about 0.8.

**Holotype:** NATIONAL PARK: 4,000 ft., 6.xi.1949, ♂, (*K. P. Lamb*), (P.D.D.).

**Paratype:** CHATHAM ISLANDS: Pitt Island, 16-26.i.1944, 1 ♂, (*E. S. Gourlay*), (Cawt. Inst.).

*Other Records:* Same data as holotype, 1 ♀, (P.D.D.). Same data as paratype, 2 ♀, (Cawt. Inst.).

*Material Examined:* Holotype, 1 paratype, and 3 ♀.

*Distribution:* National Park, Chatham Islands. (November, January).

*Remarks:* The lamellate arista of the male is the outstanding character of this species and separates it from all other species. The females do not have this unique structure and are only tentatively placed as this species. However, both male and female specimens were collected from the same localities on the same date, and this together with the nature of the apical spot of the wing makes the placing of these female specimens as members of this species more certain.

### ***Neomaorina pseudoapicalis* sp.n. Fig. 236**

A light brown species with small dark brown shaded area at apex of wing. Body length about 3.5–4.0 mm., wing length about 3.5–4.0 mm.

#### MALE

**HEAD:** Arista dark brown, brown basally; pubescent over whole length, rays of pubescence less than diameter of basal segments. Antenna light brown; 3rd segment brown on about apical two-thirds; 2nd segment with strong apical dorsal bristle, black hairs dorsally and about apical margin; basal segment with 1 strong bristle-like hair and other hairs at dorsal apical margin; stronger than hairs on 2nd segment. Front light brown, yellowish-brown anteriorly, ocellar area dark brown. Fronto-orbital bristle about half length inner vertical and equal to post-verticals; black hairs on front anterior to orbital, longer and more numerous anteriorly. Face yellowish-white. Cheeks yellowish-brown. Two rows of black hairs along cheek, no strong bristles but some strong brown hairs at lower posterior corner. Occiput light brown dorsally, elsewhere brown. Eyes with few short fine hairs. Vertical diameter of eye about 6.5 times width of cheek in same axis. Proboscis light brown; palpi normal but short, light brown.

**THORAX:** Light brown; mesonotum with 3 longitudinal dark brown irregular vittae, 1 between dorsocentrals and 1 on each side, lateral to dorsocentrals, only discernible posterior to suture; scutellum yellowish-brown; humerus yellowish-brown; brown vitta from dorsal propleuron, across spiracle to dorsal mesopleuron, fading out at wing base; rest of mesopleuron and all pteropleuron except ventral margin dusted with light greyish-yellow; sternopleuron, ventral pteropleuron, metapleuron and hypopleuron dark brown; prosternum yellowish-brown. Anterior dorsocentral about two-thirds length posterior dorsocentral; convergent basal scutellars about equal to cruciate apicals; 2 postalars, inner posterior of pair the weaker; 3 sternopleurals, the anterior much weaker than other two; 1 strong propleural and a small spiracular bristle posterior to it.

Legs (Fig. 236) yellowish-brown; hind femur with subapical brown annulus; hind tibia with sub-basal brown annulus. Fore femur with 2 strong and few weak bristles on postero-dorsal surface, band of strong but relatively short bristles on postero-ventral and ventral surfaces; fore tibia with band of short stout spines on basal half of ventral surface, no preapical or apical; mid tibia without ventral apical; hind femur with strong bristle at apical third of antero-ventral surface; hind tibia without bristles; hind tarsus with apical 4 segments short and with asymmetrical thickened claws.

Wings clear, small brown shaded area at apex of marginal and submarginal cells also at apex of subcostal cell. Short stout costal spines extending quarter distance between apices of 2nd and 3rd veins; 5th vein fading out before wing margin. Wing indices: costal about 9.0–9.4; 4th vein about 1.5; 4c about 0.3; 5x about 0.7.

Halteres yellowish-white, yellowish-brown stalk.

**ABDOMEN:** Light brown with dark brown posterior bands on tergites and some blackish-brown areas; apical segments blackish-brown.



*Holotype*: CHRISTCHURCH: 11.xi.1924, ♂, (*A. Tonnoir*), (Cant. Mus.).

*Paratype*: BANKS PENINSULA: Hilltop, 16.i.1925, 1 ♂, (*A. Tonnoir*), (P.D.D.).

*Material Examined*: Holotype and paratype.

*Distribution*: Christchurch, Banks Peninsula. (November, January).

*Remarks*: Differs from male of *N. apicalis* by the absence of an apical ventral bristle on mid tibia, by having thickened segments of the hind tarsus and by having asymmetrical hind claws.

### ***Neomaorina aristata* (Malloch). Figs. 230, 247**

*Maorina aristata* Malloch, 1930. Rec. Cant. [N.Z.] Mus. 3 : 241.

*Neomaorina aristata* (Malloch): Miller, 1945. Proc. R. ent. Soc. Lond. 14 : 72.

A shining blackish-brown species with light brown legs. Body length about 4.5 mm., wing length about 4.5 mm.

#### FEMALE

**HEAD** (Fig. 230): Arista light brown basally, dark brown apically; rays of pubescence minute basally but enlarging towards apex and at apex equal to diameter of basal segment, thus giving arista a club-like appearance. Antenna light brown; 3rd segment yellowish-brown at base; 2nd segment with dorsal bristle and black hairs; basal segment with dorsal hairs. Front shining black at vertex and changing to light brown at anterior margin. All bristles strong; ocellars longer than postverticals. Face light brown. Cheeks light brown. Small black hairs along cheek and no large bristles at lower posterior corner. Occiput blackish-brown. Eyes with few short hairs. Vertical diameter of eye about 7.5 times width of cheek in same axis. Proboscis shining dark brown; palpi yellowish-brown, normal.

**THORAX**: Shining dark reddish-black, mesonotum dusted and dull between dorsocentrals; humerus, small area dorsal to humerus, lateral portion of suture, and region about postalars yellowish-brown; scutellum mostly yellowish-brown but crescent-shaped dark brown area at base; propleuron light brown; mesopleuron heavily grey dusted; prosternum and anterior portion of sternopleuron grey dusted. Anterior dorsocentral about two-thirds length posterior; basal scutellars parallel or convergent, about three-quarters length cruciate apically; 3 sternopleurals, anterior one weak; 1 strong propleural and a spiracular hair just posterior to it.

Legs yellowish-brown, apical segments of tarsi light brown or brown. Fore femur with strong black bristles on postero-dorsal surface with basal bristles placed more posteriorly, and on apical half of postero-ventral surface; fore tibia without preapical or apicals; fore tarsus normal; mid tibia with strong ventral apical; hind femur with very strong antero-ventral at apical third; hind tibia without bristles; claws of hind tarsus normal.

Wings (Fig. 247) clear with small, brown, well defined spot at apex of marginal and submarginal cells; veins light brown. Stout costal spines ending at or just beyond apex of 2nd vein; stigmal spot, 1st vein at humeral cross vein and junction of 2nd and 3rd veins scarcely darkened. Wing indices: costal about 10.0-11.3; 4th vein about 1.4-1.5; 4c about 0.2-0.3; 5x about 1.0.

Halteres light brown.

**ABDOMEN**: Shining black; blackish-brown towards apex.

*Holotype*: OTIRA: 8.ii.1922, ♀, (*A. Tonnoir*), (Cawt. Inst.),

*Material Examined*: Holotype and 2 ♀.

*New Records*: ARTHURS PASS: 18.i.1922, 1 ♀, (*Anon.*), (P.D.D.).  
ROUTE BURN RIVER: 14.i.1926, 1 ♀ (*Anon.*), (Ak. Mus.).

*Distribution:* Oira, Arthurs Pass, Routeburn River. (January, February).

*Remarks:* Malloch (1930b) described this species from one specimen. The two further specimens now available correspond well with the type. The most important character is the nature of the pubescence of the arista. As only the females are known, it is possible that the males have been described under another name.

#### Family LONCHAEIDAE

Hutton (1902a) described one species, *Lonchaea aucklandica*, from Auckland Islands. The holotype has not been examined and cannot be found in the collections of the Canterbury Museum or Cawthron Institute. No other specimens referable to the genus *Lonchaea* are in collections and no information beyond Hutton's original description is available. The description needs elaboration before the species can be recognised and there must be some doubt as to the correct generic placing of Hutton's species until specimens are available.

#### Family OPOMYZIDAE

Postverticals absent or present and divergent; one reclinate fronto-orbital. Vibrissa absent or one cheek bristle strong and directed anteriorly, vibrissa-like. Palpi small or absent. Two to four dorso-centrals; humeral present or absent; sternopleural present; mesopleural present or absent; one or two pairs of marginal scutellars. Tibiae without preapicals or apicals. Wings narrowed basally, anal lobe and alula reduced or absent. Costa broken near apex of first vein.

*Genera Occurring in New Zealand:* *Teratomyza* Malloch

Previously considered to be represented in New Zealand by *Neomaorina* Miller and *Teratomyza* Malloch. The former genus, however, belongs to the Pallopteridae. The above synopsis is more extensive than that normally given for the family so that *Teratomyza* may be included as a member of the family.

#### Genus TERATOMYZA Malloch

*Teratomyza* Malloch, 1933. *Stylops* 2: 113.

Postverticals minute. Vibrissa represented by a strong bristle on cheek close to eye margin; vibrissal angle not produced. Humeral bristle absent; mesopleuron bare. Anal lobe greatly reduced; alula absent. Cross veins scarcely separated and close to base of wing; 2nd and 3rd veins divergent at apex; anal vein reaching wing margin.

Type Species: *Teratomyza neozelandica* Malloch

Malloch (1933b and 1933d) placed the genus in the Anthomyzidae and commented on the difficulty in assigning it satisfactorily to any family. Miller (1950) listed it under the Opomyzidae. The Anthomyzidae-Opomyzidae complex has been considered as one (Curran, 1934) and also as two distinct families (Seguy, 1934 and Oldroyd, 1949). Although not agreeing in all respects with the recognised synopsis of the Opomyzidae, *Teratomyza* is here placed in that family for

the following reasons: only one fronto-orbital is present and it is reclinate; postverticals although minute are divergent; a true vibrissa is absent but a vibrissa-like bristle is present on the cheek; palpi are absent; the occiput is concave; one sternopleural is present; wings are long and narrow, the anal lobe is greatly reduced and the alula is absent. In several important characters however, *Teratomyza* does not agree with the Opomyzidae as at present understood, viz.: The mesopleuron is bare; basal scutellars are entirely absent; second and third veins are divergent, and the wings are not pictured or shaded. Thus the true position of *Teratomyza* must remain in doubt. There is a certain similarity between *Teratomyza* and *Neomaorina* Miller but the absence of a vibrissa or strong cheek bristles and the normal shaped wings of *Neomaorina* make the distinctions between the genera quite marked.

*Distribution*: New Zealand, South America.

*Subgenera Occurring in New Zealand*: *Teratomyza* Malloch

#### Subgenus TERATOMYZA Malloch

*Teratomyza* Malloch, 1933. *Stylops* 2: 113. Malloch, 1933.

"*Dipt. Pat. S. Chili*" 6: 387.

Cheek with bristles near ventral margin, anterior one in vertical line with a strong bristle close to eye margin. Palpi absent. Two postsutural dorsocentrals.

*Type Species*: *Teratomyza (Teratomyza) neozelandica* Malloch

Malloch (1933d) described two species from South America and placed them in a subgenus distinct from the New Zealand species on the basis of the presence of palpi, presence of three dorsocentrals and absence of bristles near the ventral margin of the cheek.

*Distribution*: New Zealand.

*Species*: *Teratomyza (Teratomyza) neozelandica* Malloch

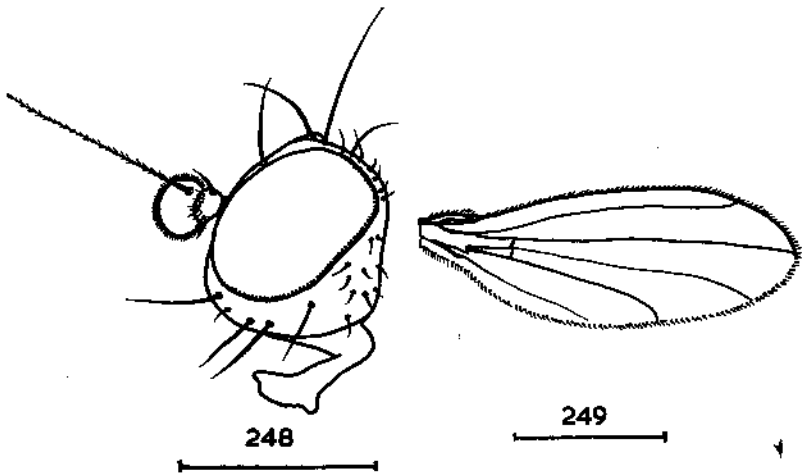


Fig. 248. Head of *Teratomyza neozelandica*  
 ,, 249. Wing of " "

Scale: Fig. 248, 0.5 mm.; Fig. 249, 1.0 mm.

**Teratomyza neozelandica** Malloch. Figs. 248, 249

*Teratomyza neozelandica* Malloch, 1933. *Stylops* 2: 114.

A. yellowish-brown and brown species. Body length about 2.5 mm., wing length about 2.75 mm.

MALE AND FEMALE

**HEAD** (Fig. 248): Arista dark brown; pubescent, rays of pubescence less than diameter of basal segments. Antenna porrect, light brown; 3rd segment disc shaped, brown at apex; 2nd segment produced but not angled on inner and outer margins, 1 apical dorsal bristle and small apical hairs; basal segment small. Front shining light brown with brown tomentum; ocellar area dark brown; ocellar triangle and orbits not differentiated. Ocellars strong and divergent; verticals strong; postverticals very small and divergent; the single fronto-orbital situated half way between inner vertical and anterior margin of front; no hairs on front except in ocellar area. Face light brown with greyish-brown tomentum; parafacials yellowish-brown and narrow; antennal fossae absent, face almost flat. Cheeks light brown. Small hair anterior to vibrissa-like bristle and 4 strong bristles near ventral margin of cheek, anterior of these the weakest, posterior the strongest. Occiput light brown, concave. Eyes haired. Vertical diameter of eye about 7 times width of cheek in same axis. Proboscis yellowish-brown.

**THORAX**: Shining light brown dorsally and dorsal half laterally; yellowish-brown laterally with light brown tomentum. Mesonotum bare of hairs except small hairs in dorsocentral row anterior to dorsocentral bristles and a few near middle of anterior margin; no prescutellars; dorsocentrals strong and equal, anterior one fairly close to transverse suture; strong convergent apical scutellars, a small hair just anterior to each bristle, scutellum bare elsewhere; 1 presutural; 2 notopleurals; 1 supraalar; sternopleural strong and few small hairs on sternopleuron; 1 minute propleural hair; other pleura bare.

Legs yellowish-brown. Fore femur with 2 strong bristles on postero-dorsal and postero-ventral surfaces; hind femur with small antero-dorsal preapical bristle.

Wings (Fig. 249) light brown; veins brown. Costa ending just beyond apex of 3rd vein; short stout costal spines ending about two-thirds distance between apices of 2nd and 3rd veins; 1 strong dorsal spine and weak ventral spine at apex of subcosta; subcosta separate from 1st vein and unpigmented on about apical quarter; 4th vein weak and lightly chitinised beyond cross vein; 5th vein strong; anal vein weak and lightly chitinised but traceable to wing margin; cross veins placed not far beyond apex of 1st vein; 2nd basal and anal cells enclosed. Costal index about 2.6; 5x index about 12.0.

Halteres brown, light brown stalk.

**ABDOMEN**: Tergites 1 to 5 brown centrally, dark brown laterally with small light brown area towards lateral margin anteriorly; 5th and 6th tergites all dark brown.

*Holotype*: MOANA: 16-21.xii.1925, ♂, (*A. Tonnoir*) (Cawt. Inst.).

*Material Examined*: Holotype, 11 ♂, 11 ♀, and 1 ex.

*New Records*: LITTLE BARRIER ISLAND: Kauri Gully and tracks, 24.xi.1954, 1 ♀; Turners Stream, 29.xi.1954, 4 ♂; 24.xi.1954, 1 ♂, 1 ♀; Waipawa stream bed, 28.xi.1954, 3 ♂, (*R. A. Harrison*), (P.D.D.). WAITAKERE RANGES: Nihotupu, swept, 17.ii.1954, 1 ♀, (*R. A. Harrison*): Titirangi, ex light trap, 18.ii.1953, 1 ♂; 28.ix.1955, 1 ♀, (*C. R. Thomas*), (P.D.D.).

*Distribution*: Little Barrier Island, Waitakere Ranges, Ohakune, Nelson, Moana. (September to December, February).

Family EPHYDRIDAE

Arista bare, pubescent or pectinate, rays of plumosity always dorsal. Antenna short; first segment small. Postverticals divergent or absent.

Face convex, often strongly so. Subcranial cavity large. Vibrissa absent. Tibiae without strong preapical dorsal bristles. Subcosta free from first vein basally but coalescing with it elsewhere; costa twice broken, the humeral break often weak, the break at apex of first vein often very deep. Second basal and discal cells united; anal cell absent or very minute.

Recognised best by the wing venation with the two costal breaks, subcosta united with first vein, united second basal and discal cells and the greatly reduced or absent anal cell. Also important are the absence of vibrissa and the large oral opening in many genera.

*Subfamilies Occurring in New Zealand:*

- Notiphilinae
- Hydrelliinae
- Ephydrinae

The canaceids were included in this family by Tonnoir and Malloch (1926a) but are here excluded. The subfamily divisions usually accepted for the Ephyridae are satisfactory for the division of the New Zealand fauna.

Although most species are endemic they belong to widespread genera or endemic genera having very close relationships to more widespread genera.

KEY TO SUBFAMILIES OF EPHYRIDAE

- 1 Second antennal segment with a spine or a strong curved bristle on apical dorsal margin and/or one proclinate and one reclinate fronto-orbital ..... NOTIPHILINAE (p. 216)
- Second antennal segment without apical dorsal spine and with one or two outwardly directed and often one proclinate fronto-orbital ..... 2
- 2 Subcranial cavity small. Eyes haired ..... HYDRELLIINAE (p. 223)
- Subcranial cavity much enlarged. Eyes bare. .... EPHYDRINAE (p. 233)

Subfamily NOTIPHILINAE

Second antennal segment with a spine or strong curved bristle at apex of dorsal surface. One proclinate and one reclinate fronto-orbital, the former closer to eye than latter and posterior to it.

The spine on the second antennal segment is not as strong in the New Zealand genera as it is in some others and could be mistaken for the bristle which normally occurs on this segment. However, its anterior position and inclination forward along the dorsal surface of the third segment is characteristic.

Cresson (1931, p. 93) splits this subfamily into Psilopinae and Notiphilinae, the latter including the Hydrelliinae. With the known New Zealand genera these distinctions are of no concern for they separate naturally into the subfamily categories as given.

*Genera Occurring in New Zealand:*

- Clasiopa* Stenhammar
- Hecamede* Haliday
- Psilopa* Fallén

KEY TO GENERA OF NOTIPHILINAE IN NEW ZEALAND

- 1 Postvertical bristles strong ..... 2
- Postvertical bristles weak ..... PSILOPA (p. 217)
- 2 Face with distinct central prominence ..... HECAMEDE (p. 219)
- Face normal, without prominence ..... CLASIOPA (p. 220)

## Genus *PSILOPA* Fallén

*Psilopa* Fallén, 1823. "Hydromyzides Sveciae" 6.

*Domina* Hutton, 1901. Trans. N.Z. Inst. 33 : 90.

Arista plumose. Ocellar bristles strong; postverticals weak. Face bare in centre. One strong bristle on side of face. Humeral present; 1 dorsocentral; 2 pairs of scutellar bristles. Costa ending at 4th vein.

Type Species: *Psilopa nitidula* (Fallén)

Separated from other New Zealand genera by having one strong bristle only on side of face and weak postverticals.

*Distribution*: New Zealand, Europe, North America, Pacific Islands.

*Species Occurring in New Zealand*: *Psilopa metallica* (Hutton)

### ***Psilopa metallica* (Hutton). Figs. 250, 262, 268, 269**

*Domina metallica* Hutton, 1901. Trans. N.Z. Inst. 33 : 90.

*Psilopa metallica* (Hutton): Tonnoir and Malloch, 1926. Rec.

Cant. [N.Z.] Mus. 3 : 12.

A shining black species with a light dusting of brown. Body length about 2.5 mm., wing length about 2.5 mm.

#### MALE AND FEMALE

**HEAD** (Fig. 262): Arista brown; 5 to 8 dorsal rays, the longest less than half length of main axis; pubescent on basal third, rays of pubescence greater than diameter of basal segments. Antenna dark brown; 3rd segment brown dorsally, light brown ventrally; 2nd segment with 2 strong dorsal and several ventral apical bristles, the anterior dorsal one curved forward but not as long as 3rd segment; basal segment small and bare. Front shining reddish-black with light dusting. The strong reclinate fronto-orbital about 1.5 times length of proclinate; 1 hair posterior to the proclinate fronto-orbital; verticals strong. Face narrow, shining black with grey dusting. The strong lateral bristle on face about one-third distance from ventral margin and a small hair ventral to it. Cheeks shining black with grey dusting. One strong median cheek bristle and black hairs posterior to it. Occiput blackish-brown. Eyes with fine hairs. Vertical diameter of eye about 10 times width of cheek in same axis. Proboscis dark brown; palpi short, club shaped, dark brown, and with 2 black apicals and several finer hairs.

**THORAX**: Shining black with a light dusting of brown. No prescutellars; parallel basal scutellars equal to divergent apicals; scutellum haired on dorsal surface; 1 presutural; 2 notopleurals; 1 interalar; 2 postalars; mesopleuron haired and with 1 strong bristle; 1 strong sternopleural and a strong anterior hair; small propleural hairs; small hairs on prosternum.

Legs dark or blackish-brown; tarsi yellowish-brown except dark brown apical segment. Fore femur with short bristles on postero-dorsal and apical half of postero-ventral surfaces; mid femur with a strong bristle at apical third of antero-ventral surface; mid tibia with strong apical.

Wings (Fig. 250) clear; veins light yellow. Costa with paired spines on basal section and with a strong pair at apex of subcosta; short stout costal spines ending just before apex of 3rd vein; costal vein weak between 3rd and 4th veins. Wing indices: costal about 1.2-1.7; 4th vein about 1.7-1.9; 4c about 1.1-1.2; 5x about 1.2-1.5.

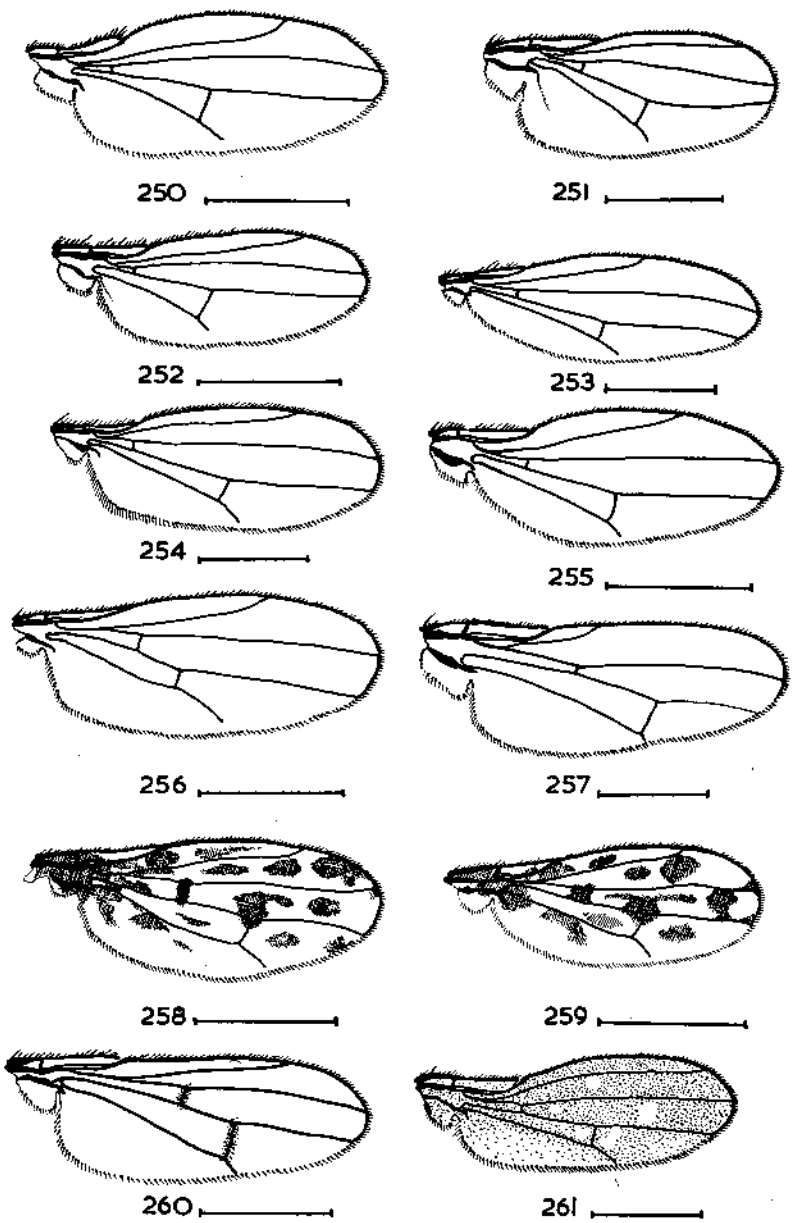
Halteres yellowish-white, stalk brown.

**ABDOMEN**: Shining black with some dusting on middle of basal tergites.

External male genitalia (Figs. 268, 269): Small genital arch, narrow mid-dorsally, about 13 hairs besides matt of fine hairs on either side; anal plate small with about 13 hairs on either plate; clasper twisted with 2 areas of dense fine hairs and spines on inner margin.

*Holotype*: CHRISTCHURCH: no date, (F. W. Hutton), (Cawt. Inst.).

*Material Examined*: Holotype, 9 ♂, and 6 ♀.



Figs. 250-261, Wings:

- |                                   |                                       |
|-----------------------------------|---------------------------------------|
| 250. <i>Psilopa metallica</i>     | 256. <i>Parahydina lacustris</i>      |
| 251. <i>Hecamede femoralis</i>    | 257. <i>Brachydeutera sydneyensis</i> |
| 252. <i>Clasiopa flavitarsis</i>  | 258. <i>Hyadina irrorata</i>          |
| 253. <i>Hydrellia acutipennis</i> | 259. <i>H. obscurifrons</i>           |
| 254. <i>H. tritici</i>            | 260. <i>Parydra neozelandica</i>      |
| 255. <i>H. enderbii</i>           | 261. <i>Neoscatella vittithorax</i>   |

Scale: 1.0 mm.

*New Records:* PALMERSTON NORTH: ex swede area, -iv.1931, 1 ♀, (W. Cottier), (P.D.D.). TIMARUA [Timaru?]: on manuka (*Leptospermum*), -viii.1930, 4 ♂, (A. Castle), (Dom. Mus.). CHARTERIS BAY: 21.ix.1925, 2 ♂, 1 ♀, (A. Tonnoir), (Cant. Mus.). ROXBURGH: swept from grass, 6.ix.1953, 1 ♀, (R. A. Harrison), (P.D.D.). MARTINS BAY: 1-4.ii.1955, 3 ♂, 3 ♀, (R. R. Forster), (Cant. Mus.).

*Distribution:* Palmerston North, Nelson, Timaru, Christchurch, Charteris Bay, Roxburgh, Martins Bay. (August, September, February, April).

### Genus *HECAMEDE* Haliday

*Hecamede* Haliday, 1838. "Guide Brit. Ins." (2nd ed.) p. 281.

Malloch, 1930. Rec. Cant. [N.Z.] Mus. 3 : 245.

Arista plumose. Frontal hairs and bristles present; postverticals strong. Face with central prominent protuberance, bare and glossy at apex of this feature, elsewhere heavily dusted. Prescutellars present; 1 dorsocentral; 3 pairs of scutellars; humeral present; 2 mesopleurals; 1 sternopleural. Fore femur with row of black spines on antero-ventral surface. Costa ending at 4th vein.

Type Species: *Hecamede albicans* Meigen

Separated from other New Zealand genera most readily by the raised structure at the centre of the face.

*Distribution:* Europe, Africa, New Zealand.

*Species Occurring in New Zealand:* *Hecamede femoralis* Malloch

### *Hecamede femoralis* Malloch. Figs. 251, 264, 270

*Hecamede femoralis* Malloch, 1930. Rec. Cant. [N.Z.] Mus. 3 : 245.

A grey species with yellowish-brown tibiae and tarsi. Body length about 3.0 mm., wing length about 2.75 mm.

#### MALE AND FEMALE

**HEAD** (Fig. 264): Arista with dark brown thickened basal section of main axis, elsewhere light brown; 6 rays of plumosity including the terminal fork. Antenna light brown with light dusting of grey; 3rd segment brown on dorsal half; 2nd segment with 2 strong and about 4 weaker bristles on dorsal surface and minute black hairs laterally, the apical bristle not as long as 3rd segment; basal segment minute and bare. Front dark brown merging to light brown on anterior margin and with heavy covering of greyish-brown dust; orbits narrow and with more grey dusting; ocellar triangle also more grey. The proclinate and reclinate fronto-orbitals equal in length; 2 proclinate frontals, posterior stronger, and several frontal hairs; ocellars absent; verticals strong. Face dark brown with light brown band at ptilinal suture; parafacials dark brown and heavily covered with grey dust. About 5 strong inwardly directed facial bristles and hairs in same row. Small carina between the antennal fossae and the central prominence, ventral to fossae. Cheeks heavily grey dusted on dark brown ground. Black hairs scattered over surface of cheek, 1 small bristle at lower posterior angle. Occiput heavily grey dusted. Eyes bare. Vertical diameter of eye about twice width of cheek in same axis. Proboscis dark brown; palpi dark brown.

**THORAX:** Heavily greyish-brown dusted. Four prescutellar acrostichal bristles; scutellum with the 3 pairs of marginal bristles short, dorsally with black hairs over all area, ventrally with a few very fine minute hairs at apex; 1 presutural; 2 notopleurals; 2 postalar; mesopleuron haired and the two posterior bristles strong; sternopleural weak; propleuron with 2 fine ventral hairs; prosternum bare.



Legs heavily grey dusted except yellowish-brown tibiae and tarsi, apical segment of fore tarsus greyish-brown. Fore femur with bristles on dorsal, postero-dorsal and apical half of postero-ventral surfaces; mid femur with small bristles on antero-ventral surface; mid tibia with strong ventral apical.

Wings (Fig. 251) clear; veins pale yellow. Costa with pair of strong basal bristles; a slightly enlarged spine at each break; short stout black costal spines extending three-fifths distance between apices of 2nd and 3rd veins. Wing indices: costal about 2.6-2.9; 4th vein about 1.7-1.8; 4c about 0.7; 5x about 1.1.

Halteres yellowish-brown knob, light reddish-brown stalk.

**ABDOMEN:** Silvery-grey dusted, with black hairs and small bristles.

External male genitalia (Fig. 270) small; genital arch narrow, wider ventrally than dorsally, covered with matt of very minute hairs and a few larger hairs on dorsal half; anal plate long and narrow, about twice length of arch, matt of very fine hairs and fine long hairs over most of surface, the largest on ventral half; clasper heavily chitinised about two-thirds length of anal plate, bare except at apex where there is a row on apical margin of about 6 broad blunt spines, smaller pointed spines preapically and a matt of fine hairs about these latter spines.

*Holotype:* NELSON: on beach, 20.ii.1924, ♀, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined:* Holotype, 7 ♂, and 12 ♀.

*New Records:* AUCKLAND: Browns Bay, caught on beach, 21.x.1949, 1 ♀, (*R. A. Harrison*), (P.D.D.). CLARKES BEACH: swept off dead shellfish on beach, 28.i.1953, 1 ♂, 2 ♀: swept off weeds on beach, 2.ii.1953, 2 ♂, 5 ♀, (*K. A. J. Wise*), (P.D.D.). OTAGO: Martins Bay, 1-4.ii.1955, 2 ♀, (*R. R. Forster*), (Cant. Mus.). CHATHAM ISLANDS: Pitt Island, 16-26.i.1944, 4 ♂, 2 ♀, (*E. S. Gourlay*), (Cawt. Inst.).

*Distribution:* Auckland, Clarkes Beach, Nelson, Martins Bay, Chatham Islands. (October, January, February).

### Genus CLASIOPA Stenhammer

*Clasiopa* Stenhammer, 1844. K. svenska VetenskAkad. Handl. 1843, p. 159.

Arista plumose. Postverticals strong; ocellars strong. Face with 2 rows of lateral bristles; not gibbous. One dorsocentral; scutellum haired; humeral present. Costa ending at 4th vein.

Type Species: *Clasiopa obscurella* (Fallén)

Separated from other genera by having two rows of hairs on the face and strong postverticals.

*Distribution:* New Zealand, Europe, N. America.

*Species Occurring in New Zealand:*

*Clasiopa affinis* Tonnoir and Malloch

*C. flavitarsis* Tonnoir and Malloch

#### KEY TO SPECIES OF CLASIOPA IN NEW ZEALAND

Antennae and tarsi completely dark; vertical diameter of eye twice width of cheek in same axis .....	<i>affinis</i>
Antennae and tarsi partly orange; vertical diameter of eye about 6 times width of cheek in same axis .....	<i>flavitarsis</i>

### *Clasiopa affinis* Tonnoir and Malloch

*Clasiopa affinis* Tonnoir and Malloch, 1926. Rec. Cant. [N.Z.] Mus. 3: 13.

A dark brown and grey species. Body length about 2.0 mm., wing length about 2.5 mm.

FEMALE

**HEAD:** Arista black, about six strong dorsal rays. Antennae black; 2nd segment with strong dorsal bristles and weak hairs elsewhere. Front heavily greyish-brown dusted. Two fronto-orbitals approximately equal in size, posterior one very close to eye margin; postverticals about four-fifths length of inner verticals; short hairs on orbits close to eye margin and fine short hairs on most of front. Face heavily grey dusted, antennal fossae deep. Three or 4 strong bristles on lateral margins of ventral half of face and small black hairs about them; short fine hairs on outer margin of suture. Cheeks grey dusted. One strong central bristle on cheek and short bristles posteriorly. Occiput concave, grey brown and heavily dusted. Eyes with few fine short hairs. Vertical diameter of eye about 2.5 times width of cheek in same axis. Proboscis blackish-brown; palpi blackish-brown with strong black hairs.

**THORAX:** Heavily dusted with greyish-brown. Prescutellars present about half length of dorsocentrals; basal scutellars about half length of apicals; 1 humeral; 1 presutural; 2 notopleurals; 1 supraalar; 2 postalars; 2 mesopleural bristles, mesopleuron haired; 1 sternopleural; 1 weak propleural.

Legs dark greyish-brown.

Wings clear, veins greyish-brown. Short stout costal spines ending at apex of 3rd vein; strong bristles on basal section of costa. Wing indices: costal about 2.5; 4th vein about 2.0; 4c about 0.9; 5x about 0.9.

Halteres yellowish-brown.

**ABDOMEN:** Tergites 1 to 3 shining with light dusting; tergites 4 and 5 black with dense brown dusting.

*Holotype:* WAIHO: 30.i.1922, ♀, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined:* Holotype.

*Distribution:* Waiho. (January).

*Remarks:* The holotype is the only specimen known, separated most readily from *C. flavitarsis* by having a much wider cheek.

***Clasiopa flavitarsis* Tonnoir and Malloch. Figs. 252, 265**

*Clasiopa flavitarsis* Tonnoir and Malloch, 1926. Rec. Cant.  
[N.Z.] Mus. 3 : 13.

A black species heavily dusted with dark golden-brown; tarsi yellowish-brown. Body length about 2.5 mm., wing length about 2.75 mm.

FEMALE

**HEAD (Fig. 265):** Arista shining black; 5 dorsal rays, longest about half length of axis. Antenna dark greyish-brown; 3rd segment yellowish-brown on ventral half, covered with long pile; 2nd segment with the dorsal apical bristle long but not quite reaching apex of 3rd segment, 1 fine median dorsal bristle and black hairs elsewhere; basal segment minute. Front dusted heavily with dark golden-brown. The outer posterior proclinate equal in length to the reclinate fronto-orbital; ocellars just anterior to anterior ocellus and about 1.25 length of post-verticals; verticals strong; few minute hairs on centre of front. Face heavily dusted with golden-brown; antennal fossae shallow. Row of about 5 hairs laterally on face, and just median to these a row of 2 strong bristles with alternating hairs. Cheeks heavily grey dusted. One strong median bristle on cheek with few hairs posterior to it. Occiput blackish-brown, concave; vertex distinct. Eyes with few fine hairs. Vertical diameter of eye about 6 times width of cheek in same axis. Proboscis dark brown; palpi light greyish-brown.

**THORAX:** Black with heavy dusting; mesonotum dark golden brown; pleura dusted with grey. Prescutellars present about half length of dorsocentral; convergent basal scutellars just over half length of divergent apicals; humeral strong; 1 presutural; 2 notopleurals; 2 postalars, outer one strong; mesopleuron haired and with 2 posterior bristles; 1 sternopleural; small propleural hair; prosternum bare.

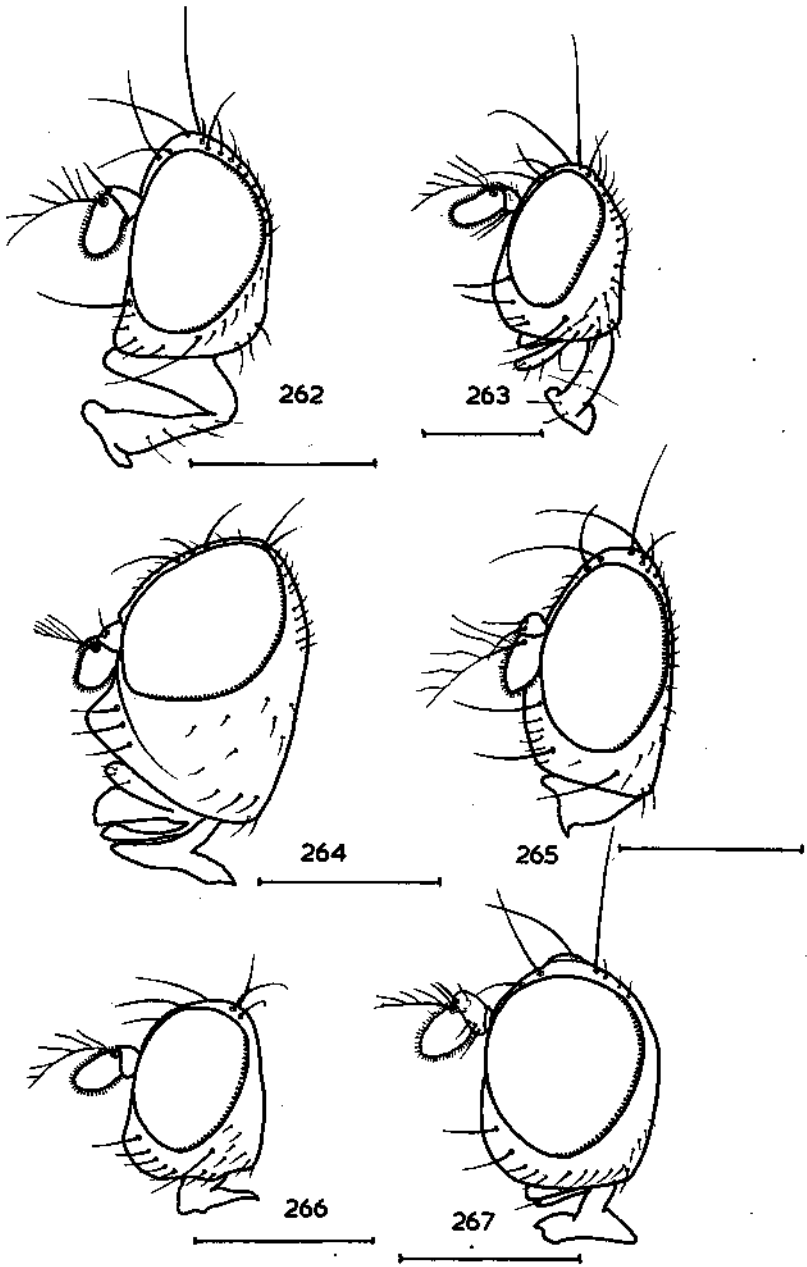


Fig. 262. Head of *Psilopa metallica*  
 " 263. " " *Hydrellia novae-zealandiae*  
 " 264. " " *Hecamede femoralis*  
 " 265. " " *Clasiopa flavitarsis*  
 " 266. " " *Hydrellia acutipennis*  
 " 267. " " *H. tritici*

Scale: 0.5 mm.

Legs black or greyish-brown; fore coxae light greyish-brown; tarsi yellowish-brown, apical segments light brown. Mid tibia with ventral apical.

Wings (Fig. 252) clear; veins dark brown. Short stout costal spines ending at apex of second vein. Wing indices: costal about 1.9; 4th vein about 1.9; 4c about 1.0; 5x about 1.0.

Halteres pale yellowish-white apex, light brown stalk.

ABDOMEN: Shining black with some greyish-black dusting.

*Holotype*: NELSON: 14.iii.1922, ♀, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined*: Holotype, 1 paratype and 4 ♀.

*New Records*: LITTLE BARRIER ISLAND: swept, 24.xi.1954, 2 ♀, (*R. A. Harrison*), (P.D.D.). WAITAKERE RANGES: Swanson, swept by stream, 11.xii.1949, 1 ♀, (*R. A. Harrison*): Titirangi ex light trap, 10.xii.1953, 1 ♀, (*C. R. Thomas*), (P.D.D.).

*Distribution*: Little Barrier Island, Waitakere Ranges, Nelson. (November, December, March).

*Remarks*: Separated from *C. affinis* by the light coloured tarsi and antennae and much narrower cheek. Males are unknown.

### Subfamily HYDRELLIINAE

Second antennal segment without curved spine or bristle at apex of dorsal surface. No reclinate fronto-orbitals but proclinate and outwardly directed bristles may be present. Eyes thickly haired. Subcranial cavity not greatly enlarged.

Separated most readily from the other subfamilies by the normal and not greatly enlarged subcranial cavity, the absence of reclinate fronto-orbitals and the absence of a curved proclinate spine on apex of second antennal segment.

#### KEY TO GENERA OF SUBFAMILY HYDRELLIINAE IN NEW ZEALAND

- 1 Postvertical bristles strong ..... HYDRELLIA (p. 223)
- Postvertical bristles absent or very weak ..... 2
- 2 One dorsocentral ..... HYADINA (p. 230)
- Two dorsocentrals ..... PARAHYADINA (p. 232)

### Genus HYDRELLIA Robineau-Desvoidy

*Hydrellia* Robineau-Desvoidy 1830. Mém. prés. Acad. Sci., Paris, 2 : 790.

Arista plumose. Ocellars weak; postverticals strong. Face with several bristles and hairs laterally; not gibbous. Acrostichal hairs anteriorly; humeral present; 1 mesopleural; 1 sternopleural; 2 pairs scutellars; scutellum usually bare dorsally. Costal index below 2.0. Costa ending at 4th vein.

Type Species: *Hydrellia griseola* (Fallén)

*Distribution*: New Zealand, Australia, North America, Europe.

*Species Occurring in New Zealand*:

*Hydrellia acutipennis* sp.n.

*H. enderbii* (Hutton)

*H. novae-zealandiae* sp.n.

*H. tritici* Coquillett

*H. velutiniifrons* Tonnoir and Malloch

*Remarks:* One species, *H. tritici*, is extremely common throughout the grasslands of New Zealand. It is an Australian species and can be regarded as an immigrant to New Zealand. The other species are endemic and, among these, two groups of species can be recognised:

1. *enderbii* group. Characterised by having three dorsocentrals, the anterior bristle presutural; no prescutellars; palpi blackish-brown or yellowish-brown; costal index about 1.2–1.5. Includes *H. enderbii*, *H. velutinifrons*, and *H. novae-zealandiae*. The first two species are very close while the latter is separated from them by a lower costal index and darker palpi.
2. *acutipennis* group. Characterised by the reduced wings; two dorsocentrals, both postsutural, and black palpi. Costal index is about 1.0 in the only known species of the group, *H. acutipennis*. This group has more affinities to *H. tritici* than has the *enderbii* group.

#### KEY TO SPECIES OF HYDRELLIA IN NEW ZEALAND

- |   |   |                         |
|---|---|-------------------------|
| 1 | Palpi blackish-brown .....  | 2                       |
|   | Palpi yellowish-brown .....   | 4                       |
| 2 | Wings narrow, reduced, about three-quarters length of body .....                                | <i>acutipennis</i>      |
|   | Wings normal, equal to length of body .....   | 3                       |
| 3 | Velvet black spot on mesonotum dorsal to wing base .....  | <i>tritici</i>          |
|   | No velvet black spot on mesonotum .....   | <i>novae-zealandiae</i> |
| 4 | Face light yellowish-brown; scutellum with a pair of minute hairs between apical bristles ..... | <i>enderbii</i>         |
|   | Face silvery-white, scutellum without minute apical hairs .....                                 | <i>velutinifrons</i>    |

#### *Hydrellia acutipennis* sp.n. Figs. 253, 266

A black or greyish-black species with thick dusting. Wings reduced. Body length about 2.0 mm., wing length about 1.5 mm.

#### MALE AND FEMALE

**HEAD** (Fig. 266): Arista shining blackish-brown; 4 or 5 dorsal rays. Antenna blackish-brown; 2nd segment with black hairs mainly near apical margin. Front blackish-brown on triangle and orbits, velvety black elsewhere. Posterior outwardly directed fronto-orbital about 1.5 times length of anterior proclinate fronto-orbital, a small hair between these two bristles; verticals strong; ocellars about half length of postverticals. Face light silvery-grey. Three strong bristles and a few fine hairs laterally on face. Cheeks grey ventrally, greyish-brown dorsally and posteriorly. One strong bristle at middle of cheek and hairs posterior to it. Occiput dull greyish-black. Vertical diameter of eye about 3.5 times width of cheek in same axis. Proboscis dark brown; palpi blackish-brown.

**THORAX:** Black; mesonotum with blackish-brown dusting; pleura dusted with grey or greyish-brown. No prescutellars; acrostichal hairs in 2 rows, absent on posterior quarter of mesonotum; 2 dorsocentrals, posterior pair almost in acrostichal row at prescutellar position, anterior pair just posterior to suture; basal scutellars equal to convergent apicals; strong marginal hair between the two scutellar bristles, scutellum otherwise bare of hairs; 1 presutural; 2 notopleurals; 1 strong interalar; 1 strong and 1 weak postalar; mesopleuron haired and with 1 posterior bristle; 1 minute propleural hair.

Legs blackish-brown with some grey dusting. Mid tibia with ventral apical spine.

Wings (Fig. 253) reduced, narrow and pointed; veins brown or dark brown. Costa with strong dorsal spines from wing base to apex of 1st vein; small spines not longer than diameter of costa from 1st vein to 3rd. Wing indices: costal about 1.0; 4th vein about 1.3; 4c about 1.3; 5x about 1.3.

Halteres lemon yellow apically; brown basally.

**ABDOMEN:** Blackish-brown with greyish-brown dusting.

**Male external genitalia:** Minute and black genital arch without bristles; anal plate with fine short hairs.

**Holotype:** OTAGO PENINSULA: Allans Beach, swept off salt-marsh flat, 15.i.1954, ♂, (*K. Paviour-Smith*), (P.D.D.).

**Paratypes:** Same data as holotype, (1 ♀ P.D.D. and 1 ♂ Dom. Mus.).

**Other Specimens:** Two other specimens in damaged condition with the same data as the types are in the P.D.D. collection.

**Material Examined:** Holotype, 1 ♂ and 1 ♀ paratypes and 2 ex.

**Distribution:** Otago Peninsula. (January).

**Remarks:** Although the wings are reduced in size, the fly is probably capable of flight. The reduction in the wing is noticeable mainly because of the narrow pointed shape. Venation is complete. Separated from other species in the genus by having reduced wings. The ocellar bristles cannot be described as weak although they are not as strong as the other frontal bristles. All other characters, however, show without doubt that this species belongs to *Hydrellia*.

### ***Hydrellia tritici* Coquillett. Figs. 254, 267, 271**

*Hydrellia tritici* Coquillett, 1903. Ent. News 14 : 324. Tonnoir and Malloch, 1926. Rec. Cant. [N.Z.] Mus. 3 : 14.

A shining black species dusted with greyish-brown. Body length about 2.0 mm., wing length about 2.0 mm.

#### **MALE AND FEMALE**

**HEAD (Fig. 267):** Arista brown; about 7 or 8 dorsal rays, the longest more than half length of main axis; pubescent on basal half, rays of pubescence not greater than diameter of basal segments. Antenna blackish-brown; 2nd segment with a dorsal and ventral apical bristle and black hairs; basal segment dark brown and bare. Front velvety black between the dark brown triangle and orbits; lunule one-third distance between base of antennae and vertex. Proclinate fronto-orbital just over half length of the posterior outwardly directed fronto-orbital; small hair between fronto-orbitals; verticals strong. Face brown with heavy silvery-grey dusting. Three bristles and 2 small hairs laterally on face. Cheeks blackish-brown. One median cheek bristle and hairs posteriorly. Occiput black with some grey dusting. Vertical diameter of eye about 6 times width of cheek in same axis. Proboscis brown; palpi dark brown.

**THORAX:** Shining black beneath a greyish-brown dusting; mesonotum with a velvet black area dorsal to wing base; pleura dusted with silvery-grey. No prescutellars; 2 strong equal dorsocentrals, anterior bristle just posterior to transverse suture, posterior bristle about half distance between anterior bristle and scutellar suture; parallel basal scutellars just shorter than cruciate apicals; 1 or 2 hairs on lateral scutellar margin between the bristles; 1 presutural; 2 notopleurals; 1 interalar; 1 postalar; mesopleuron haired besides the posterior bristle; minute propleural hair; prosternum bare.

Legs yellowish-brown; apical two-thirds of fore femur, all fore tibia and tarsus, basal halves of mid and hind tibiae brown to dark brown; mid and hind tibiae of females often scarcely darkened. Mid femur with a few bristles on apical third of anterior surface; mid tibia with apical.

Wings (Fig. 254) clear, veins brown. Short black costal spines ending about two-thirds distance between apices of 2nd and 3rd veins. Wing indices: costal about 1.7; 4th vein about 1.5; 4c about 1.0; 5c about 1.25.

Halteres lemon-yellow with brown stalk.

**ABDOMEN:** Shining black; lateral region of tergites and all sternites silvery-grey dusted.

External male genitalia (Fig. 271): Genital arch very narrow and with bristles; anal plate semicircular, about half height of arch, and about 16 bristles over its surface; ventral plates broad, united medianly about twice length of anal plates, without bristles but covered with minute hairs. Parameres bristled apically.

*Holotype*: Australia.

*Material Examined*: 47 ♂, 50 ♀, and 117 ex.

*New Records*: WHANGAREI: 2.i.1925, 14 ex., (*Anon.*), (*Dom. Mus.*). LITTLE BARRIER ISLAND: Te Titoki Point, swept at forest margin on grass, 25.xi.1954, 103 ex. (*R. A. Harrison*), (*P.D.D.*). AUCKLAND: Sandringham, on potatoes, 25.x.1941, 4 ♂, 3 ♀, (*G. Chamberlain*): Browns Bay, 1945, 1 ♀; 13.xi.1948, 1 ♀; 14.xi.1949, 1 ♀; attracted to light, 3.i.1949, 1 ♀; 15.i.1949, 4 ♂, 5 ♀; 22.i.1949, 1 ♂, 3 ♀; 23.i.1949, 2 ♂; 17.ii.1949, 1 ♂, 2 ♀; 18.ii.1949, 1 ♀; 7.viii.1949, 1 ♀; 27.xi.1949, 1 ♂; 19.xii.1949, 4 ♂, 3 ♀, (*R. A. Harrison*): Green Lane, on potatoes, 3.xi.1948, 1 ♂; 15.xii.1948, 2 ♂, 1 ♀; 16.xii.1948, 3 ♂, 2 ♀; 20.ii.1949, 2 ♂, 1 ♀; -iii.1949, 4 ♂, 1 ♀; -vii.1949, 2 ♀, (*K. P. Lamb*): Avondale, ex compost heap, 30.iv.1940, 4 ♂; 2.vii.1949, 1 ♂, (*R. A. Harrison*): Remuera, swept ex grass, 10.iv.1948, 3 ♂, 7 ♀, (*S. A. Rumsey*), (*P.D.D.*). WAITAKERE RANGES: Oratia, 2.iv.1949, 1 ♂, 3 ♀; 8.xii.1950, 1 ♀, (*R. A. Harrison*): Nihotupu, 2.i.1950, 3 ♂, 1 ♀, (*R. A. Harrison*), (*P.D.D.*). MIRANDA: ex grass, 3.xii.1950, 1 ♂, 1 ♀, (*K. A. J. Wise*), (*P.D.D.*). NATIONAL PARK: Mangatepopo, 26.xii.1949, 4 ♂, 7 ♀, (*R. A. Harrison*), (*P.D.D.*). MCKERROW: 6.ii.1955, 1 ♂, 1 ♀, (*R. R. Forster*), (*Cant. Mus.*).

*Distribution in New Zealand*: Whangarei, Little Barrier Island, Auckland, Waitakere Ranges, Miranda, Wairakei, National Park, Nelson, Waiho, Reefton, Kaikoura, Christchurch, McKerrow. (July to April).

*Remarks*: Considered to be endemic to Australia and recently attaining a wider distribution through the agency of man. Recorded as widespread in Australia. It is the most common species taken when pastures are swept and, as the distribution shows, is widespread throughout New Zealand.

Separated most readily from other New Zealand species by the presence of the velvety black area dorsal to wing base.

### ***Hydrellia novae-zealandiae* sp.n. Fig. 263**

A grey and greyish-brown species. Body length about 3.0 mm., wing length about 3.0 mm.

#### MALE AND FEMALE

HEAD (Fig. 263): Arista blackish-brown, thick and pubescent on basal third; rays of plumosity under half length of axis, 5 or 6 rays present. Antenna blackish-brown; 2nd segment with hairs and without strong bristles; basal segment minute and bare. Front dark brownish-grey centrally and on orbits, between these areas blackish velvet. Outwardly directed fronto-orbital about 1.3 times length of proclinate anterior fronto-orbital, a small hair between and external to the two fronto-orbitals; verticals strong; ocellars situated on level of anterior ocellus. Face light silvery-grey. About 5 bristles or hairs on cheek and hairs posteriorly. Occiput black, dusted with greyish-brown. Vertical diameter of eye about  $\frac{3}{5}$  to 4.0 times width of cheek in same axis. Proboscis blackish-brown; palpi blackish-brown.

THORAX: Mesonotum and scutellum heavily dusted with dark brown; pleura greyish-brown dusted; mesopleuron brown centrally. No prescutellars; acrostichal

hairs in 2 rows, not present on posterior quarter; 2 postsutural and 1 presutural dorsocentrals with strong hairs in same row, posterior bristles almost in prescutellar position; basal scutellars long and equal to apicals; no hairs on apical margin of scutellum between apical bristles, a strong lateral hair between each apical and basal scutellar bristle, rest of scutellum bare; humeral strong; presutural strong; 2 notopleurals anterior one strong; 1 strong interalar; 2 postalars, outer one strong; 1 strong mesopleural bristle and a few hairs on posterior portion of mesopleuron; 1 fine propleural hair; prosternum bare.

Legs dark greyish-brown; somewhat shining; tarsal claws and pads strong.

Wings clear; veins dark brown. Short costal spines on dorsal margin of costa not longer than costa. Wing indices: costal about 1.2; 4th vein about 1.1; 4c about 1.2; 5x about 1.4.

Halteres pale yellow, brown stalk.

**ABDOMEN:** Greyish-brown dusted. Fifth tergite in male equal to length of 3rd and 4th tergites combined.

External male genitalia: Genital arch bulbous, broad, pointed antero-ventrally, hairs over surface not as strong as normal abdominal bristles; anal plate semi-circular with many hairs; ventral plate with distinct matt of dense white hairs.

**Holotype:** WELLINGTON: Ohariu Valley: on pond, 16.x.1934, ♂, (*E. A. Plank*), (Dom. Mus.).

**Paratypes:** Same data as holotype. (1 ♀ P.D.D. and 1 ♀ Dom. Mus.).

**Material Examined:** Holotype and 2 ♀ paratypes.

**Distribution:** Wellington. (October).

**Remarks:** Separated from other species of the genus having blackish-brown palpi and normal wings by the absence of a velvety black area dorsal to wing base.

### ***Hydrellia enderbii* (Hutton). Figs. 255, 272, 273**

*Drosophila enderbii*, Hutton, 1902. Trans. N.Z. Inst. 34 : 174.

*Hydrellia enderbii* (Hutton): Tonnoir and Malloch, 1926.

Rec. Cant. [N.Z.] Mus. 3 : 15.

A greyish-brown species with golden-yellow face, grey pleura and lightly dusted grey legs. Body length about 2.5 mm., wing length about 2.5 mm.

#### MALE AND FEMALE

**HEAD:** Arista dark brown; 4 or 5 dorsal rays, the longest about half length of main axis; pubescent on basal half, the longest rays of pubescence about equal to diameter of basal segments. Antenna blackish-brown; 2nd segment with 1 dorsal and about four ventral apical bristles, small hairs elsewhere; basal segment minute and bare. Front velvet black; ocellar triangle and orbits velvet dark brown; lunule about third distance from base of antennae to vertex. Proclinate fronto-orbital just greater than half length of outwardly directed posterior fronto-orbital and a small hair between them; verticals strong. Face heavily dusted with golden-yellow merging to silvery-grey between and dorsal to antennae; antennal fossae very shallow. About 5 incurved marginal bristles on ventral half of face, the ventral bristles the weakest. Cheeks grey dusted. One median bristle on cheek and black hairs posteriorly. Occiput dark brown with some grey dusting. Vertical diameter of eye about 5 times width of cheek in same axis. Proboscis brown; palpi light brown apically, brown basally.

**THORAX:** Mesonotum and scutellum greyish-brown; pleura grey dusted except brown dorsal region of mesopleuron and pteropleuron. Two irregular rows of acrostichal hairs; no prescutellars; 2 postsutural and 1 presutural dorsocentrals; the posterior bristle almost in acrostichal line, the two other bristles close to suture; enlarged hairs on dorsocentral line anteriorly and 1 strong hair between the two postsutural bristles; basal scutellars strong but shorter than apicals; scutellum occasionally with a few hairs on dorsal surface and with a strong hair



between each basal and apical and a pair of hairs between the apical pair; 1 strong presutural; 2 notopleurals; 1 weak supraalar; 1 strong interalar; 2 postalars, inner one weak; mesopleuron haired besides the strong posterior bristle; 1 very weak propleural; prosternum bare.

Legs dark reddish-brown with light dusting of grey. Fore femur with small bristles on postero-dorsal, posterior, and postero-ventral surfaces; mid femur with bristles on apical half of anterior surface; mid tibia with apical.

Wings (Fig. 255) clear; veins brown. Costa with strong spines basally; short stout spines of costa well separated, equal to diameter of costa and ending near apex of 3rd vein. Hairs and spines of costa to apex of 1st vein much stronger than elsewhere. Wing indices: costal about 1.4-1.5; 4th vein about 1.5-1.7; 4c about 1.1; 5x about 0.8-1.0.

Halteres lemon-yellow apex, brown stalk.

ABDOMEN: Dark greyish-brown.

External male genitalia (Figs. 272, 273): Genital arch narrow and of even width, 1 bristle about third distance from dorsal margin; anal plate ovoid, about 18 to 20 bristles over surface, the ventral ones the strongest; ventral plate broad, extending between ventral corners of genital arch, a few small bristles in median line and fine hairs on ventral margin. Parameres strong, triangular, heavily spined on one surface.

*Holotype*: AUCKLAND ISLANDS: -i.1901, ♀, (F. W. Hutton), (Cant. Mus.).

*Material Examined*: Holotype, 14 ♂, and 19 ♀.

*New Records*: WAITAKERE RANGES: Oratia, swept near stream, 25.x.1953, 1 ♂ (R. A. Harrison), (P.D.D.). PALMERSTON NORTH: on swedes, 5.iii.1931, 1 ♀, (W. Cottier), (P.D.D.). TRENTHAM: 28.ii.1924, 1 ♀, (A. Castle), (Dom. Mus.). CHRISTCHURCH: Shirley, Horseshoe Lake, 25.ii.1924, 1 ♂, 1 ♀, (Heighway), (Cant. Mus.). ARTHURS PASS: 23.i.1943, 1 ♂, 1 ♀, (E. S. Gourlay), (Cawt. Inst.). OTAGO PENINSULA: Allans Beach from sedge swamp, 25.x.1953, 1 ♀, (B. J. Marples), (O.U.). DUNEDIN: ex trap on pond, 11.ix.1954, 2 ♂, 8 ♀, (J. A. Thomson), (P.D.D.). OTAGO: Martins Bay, 1-4.ii.1955, 7 ♂, 6 ♀, (R. R. Forster), (Cant. Mus.). CHATHAM ISLANDS: 28-30.i.1944, 2 ♂, (E. S. Gourlay), (Cawt. Inst.).

*Distribution*: Waitakere Ranges, Palmerston North, Trentham, Kaikoura, Christchurch, Arthurs Pass, Oтира, Otago Peninsula, Dunedin, Martins Bay, Chatham Islands, Auckland Islands. (September, October, January to March).

*Remarks*: Separated from *H. velutinifrons*, the only other New Zealand species having yellowish-brown palpi, by having a light yellowish-brown face and a pair of small hairs at apex of scutellum between the apical scutellars.

## **Hydrellia velutinifrons** Tonnoir and Malloch

*Hydrellia velutinifrons* Tonnoir and Malloch, 1926. Rec. Cant. [N.Z.] Mus. 3: 15.

A blackish-brown species with face, pleura, and legs dusted with silvery grey. Body length about 3.0 mm., wing length about 3.0 mm.

### MALE

HEAD: Arista with seven dorsal rays, the longest ray greater than half length of main axis; pubescent on basal half of main axis, rays of pubescence about equal to diameter of basal segment. Antenna blackish-brown; 3rd segment dark brown with thick pile; 2nd segment with short dorsal and ventral apical bristles and strong hairs elsewhere; basal segment minute and bare. Front velvet black;

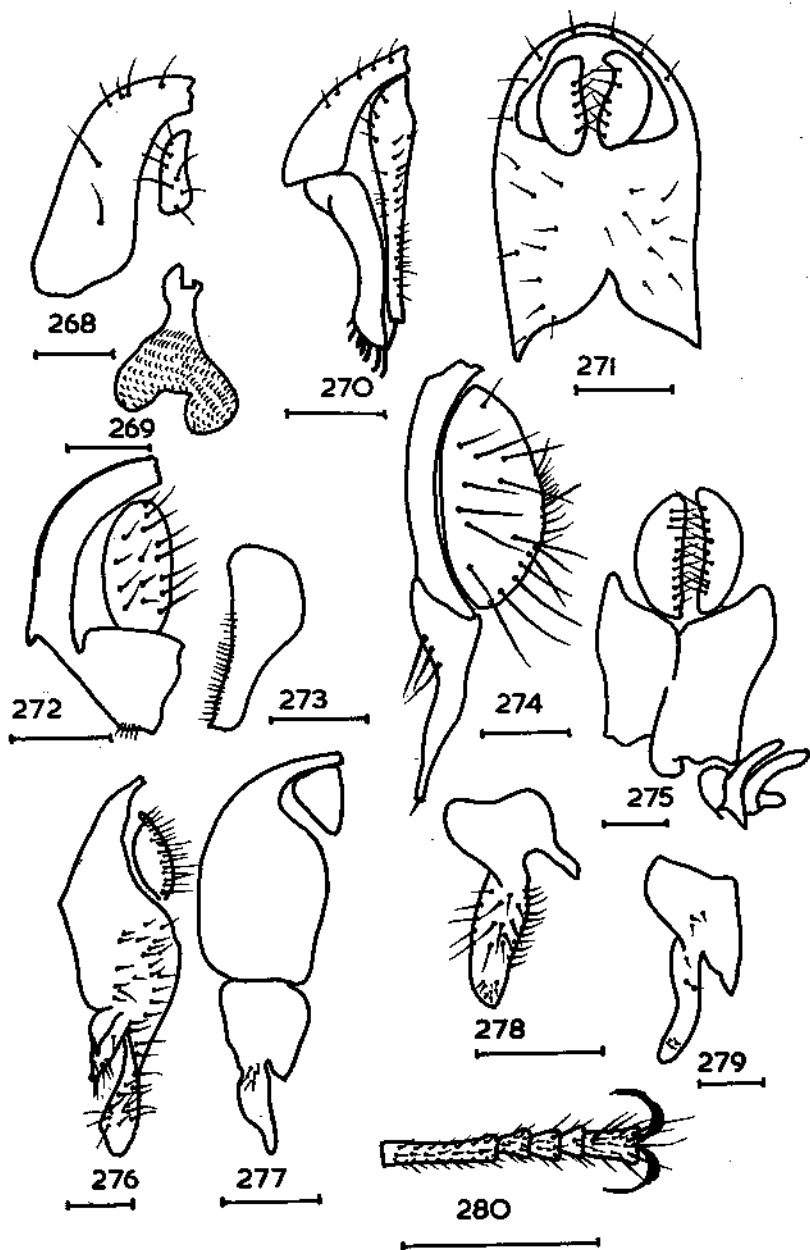


Fig. 268. External male genitalia of *Psilopa metallica*  
 „ 269. Clasper of *P. metallica*  
 „ 270. External male genitalia of *Hecamede femoralis*  
 „ 271. „ „ *Hydrellia tritici*  
 „ 272. „ „ *H. enderbii*  
 „ 273. Clasper of *H. enderbii*  
 External male genitalia:  
 Fig. 274. *Parahydina lacustris*  
 „ 275. *Brachydeutera sydneyensis*  
 „ 276. *Ephydrella spathulata*  
 „ 277. *E. aquaria*  
 „ 278. *E. novae-zealandiae*  
 „ 279. *E. assimilis*  
 „ 280. Tarsus of *Scatella unguiculata*  
 Scale: Figs. 268-275, 279, 0.1 mm.; Figs. 276-278, 0.25 mm.; Fig. 280, 0.5 mm.

triangle velvet blackish-brown; orbits greyish-brown about fronto-orbital and verticals and between these bristles; lunule extending about half distance between base of antenna and vertex. Proclinate fronto-orbital about three-fifths outwardly directed posterior orbital bristle; verticals strong; ocellars hair-like; small hair between the fronto-orbitals, otherwise front without hairs. Face silvery-grey. Three to 5 dorsally directed hairs on ventral half of face laterally. Cheeks grey dusted. One strong median bristle on cheek and strong black hairs posterior to it. Occiput grey dusted. Vertical diameter of eye about 4 times width of cheek in same axis. Proboscis brown; palpi yellowish-brown with a few distinct black hairs.

**THORAX:** Mesonotum and scutellum shining blackish-brown with light dusting of brown; pleura silvery-grey. Two rows of acrostichal hairs; no prescutellars; 2 postsutural and 1 presutural dorsocentral with enlarged hairs in dorsocentral row; divergent or parallel basal scutellars equal to convergent apicals and nearly twice length of marginal hair between them; scutellum bare; 1 presutural; 2 notopleurals; 1 weak supraalar scarcely distinguished from hairs; 1 strong interalar; 2 postalar, inner one weak; mesopleuron haired besides the strong dorsal bristle; 1 small propleural; prosternum bare.

Legs blackish-brown; tarsi dark brown; all with very silvery-grey dusting. Fore femur with short bristles on postero-dorsal, posterior and postero-ventral surface, latter the strongest; mid femur with bristles on apical half of anterior surface; mid tibia with strong apical.

Wings clear; veins light brown. Costa with bristles near base; short stout costal spines well separated, nearly as long as diameter of costa and continued to about half distance between apices of 2nd and 3rd veins. Wing indices: costal about 1.5; 4th vein about 1.5; 4c about 1.1; 5x about 1.3.

Halteres light brown with dark brown stalk.

**ABDOMEN:** Shining blackish-brown, lightly dusted.

External male genitalia black; genital arch narrow; anal plate semicircular and with covering of short fine hairs; ventral plate with matt of very short hairs.

**Holotype:** CHRISTCHURCH: 21.x.1924, ♂, (*A. Tonnoir*), (Cawt. Inst.).

**Material Examined:** Holotype, 1 paratype, and 1 ♂.

**Distribution:** Christchurch, Kaikoura, Otira. (September, October, February).

**Remarks:** Separated from *H. enderbii*, the only other New Zealand species having yellowish-brown palpi, by the silvery-white face and absence of hairs between the apical scutellars.

## Genus HYADINA Haliday

*Hyadina* Haliday, 1837. "Guide Brit. Ins." (2nd ed.) p. 288.

Tonnoir and Malloch, 1926. Rec. Cant. [N.Z.] Mus. 3 : 16.

No fronto-orbital; 1 vertical; postverticals absent. Face bare in centre. One dorsocentral (often regarded as prescutellar); 1 notopleural; mesopleural absent; sternopleural absent; pair of strong apical scutellars and a pair of weak basals. Costa ending at 4th vein.

Type Species: *Hyadina guttata* (Fallén)

Separated from other genera by the absence of postverticals and presence of only one dorsocentral bristle.

**Distribution:** New Zealand, Europe.

**Species Occurring in New Zealand:**

*Hyadina irrorata* Tonnoir and Malloch

*H. obscurifrons* Tonnoir and Malloch

KEY TO SPECIES OF HYADINA IN NEW ZEALAND

Acrostichal hairs absent ..... **obscurifrons**  
 Acrostichal hairs present ..... **irrorata**

**Hyadina obscurifrons** Tonnoir and Malloch. Fig. 259.

*Hyadina obscurifrons* Tonnoir and Malloch, 1926. Rec. Cant.  
 [N.Z.] Mus. 3 : 16.

A dark brown or blackish-brown species. Body length about 1.5 mm., wing length about 2.0 mm.

FEMALE

HEAD: Antenna dark brown; 2nd segment with small dorsal hairs. Front golden-brown; orbits dark brown and bordered on eye margin with silvery-grey; ocellar area distinctly raised above level of front. Ocellar bristles just shorter than verticals. Face silvery-grey; antennal fossae separated by distinct carina. Cheeks light brownish-grey, darker brown posteriorly; ptilinal suture extending diagonally across cheek to lower posterior corner of cheek; very fine hairs on cheek along line of suture. Occiput grey with a brown stripe on each side from vertex to foramen. Eyes with a few hairs. Vertical diameter of eye about 1.75 times width of cheek in same axis. Proboscis greyish-brown; palpi with short fine hairs.

THORAX: Mesonotum brown with 3 longitudinal darker brown vittae; 1 centrally and 1 on each dorsocentral line, lateral margins silvery-grey; scutellum brown; pleura grey; mesopleuron brown centrally. No acrostichal hairs; apical scutellars convergent and about twice length of mid lateral bristles; scutellum bare; humeral and presuturals absent; 1 postalar; mesopleuron and propleuron bare.

Legs greyish-brown.

Wings (Fig. 259): Membrane mainly brown; veins brown. Wing indices: costal about 1.8; 4th vein about 1.6; 4c about 1.2; 5x about 1.0.

Halteres yellowish-brown.

ABDOMEN: Dark brown.

*Holotype*: WAIRAKEI: 6.iii.1923, ♀, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined*: Holotype.

*Distribution*: Wairakei. (March).

*Remarks*: Separated most readily from *H. irrorata* by the absence of acrostichal hairs.

**Hyadina irrorata** Tonnoir and Malloch. Fig. 258

*Hyadina irrorata* Tonnoir and Malloch, 1926. Rec. Cant. [N.Z.]  
 Mus. 3 : 16.

A brown and grey species. Body length about 2.5 mm., wing length about 2.5 mm.

MALE

HEAD: Antenna greyish-brown; 2nd segment with small black hairs; first segment without hairs. Front brown about the raised ocellar area, this area bordered by dark greyish-brown; orbits blackish-brown with silvery-grey border on eye margin, lateral areas of vertex brown. Ocellars and verticals strong and approximately equal; 1 small black hair on orbit. Face silvery-grey; antennal fossae shallow and separated by broad carina. Cheeks silvery-grey; ptilinal suture extending across cheek to point dorsal of lower posterior corner of cheek. Black hairs on cheek ventral to suture, vibrissa stronger than other hairs. Occiput grey with distinct brown stripe on each side from vertex to foramen. Eyes with few hairs. Vertical diameter of eye about 1.3 times width of cheek in same axis. Proboscis greyish-brown; palpi blackish-brown.

THORAX: Mesonotum brown, bordered with grey, and with 6 light brown or light grey indefinite areas between dorsocentral rows, and a similar small area near supraalar position; scutellum brown with grey lateral areas; pleura grey; mesopleuron and pteropleuron extensively brown centrally. Acrostichal hairs present

in 1 or 2 irregular rows; basal scutellars about two-thirds apicals; scutellum bare; humeral and presutural absent; 1 postalar; mesopleuron and propleuron bare.

Legs greyish-brown; femora with brown area at about apical third, tibiae with corresponding brown area at basal third, tarsi brown.

Wings (Fig. 258) generally light brown with some distinct white area. Wing indices: costal about 1.5; 4th vein about 2.0; 4c about 1.5; 5x about 1.1.

Halteres light greyish-brown.

ABDOMEN: Dark reddish-brown.

*Holotype*: NELSON: 10.viii.1922, ♂, (*A. Tonnoir*) (Cawt. Inst.).

*Material Examined*: Holotype and 1 ♂ paratype.

*Distribution*: Nelson, Mt. Arthur, Cass. (August, December, February).

*Remarks*: Types only are known, and the single female paratype recorded by Tonnoir and Malloch (1926a) has not been found in any collections. Separated most readily from *H. obscurifrons* by having acrostichal hairs.

### Genus PARAHYADINA Tonnoir and Malloch

*Parahyadina* Tonnoir and Malloch, 1926. Rec. Cant. [N.Z.].

Mus. 3 : 17.

Arista pubescent. Only 1 outwardly directed fronto-orbital; ocellars present; postverticals absent or very weak. Eyes haired. Prescutellars absent; 2 dorsocentrals; humeral absent; 1 mesopleural; 1 sternopleural; 1 notopleural. Costal index below 1.5. Costa ending at 4th vein.

Type Species: *Parahyadina lacustris* Tonnoir and Malloch

Separated from other New Zealand genera by having very weak postverticals, and two dorsocentrals.

*Distribution*: New Zealand.

*Species*: *Parahyadina lacustris* Tonnoir and Malloch

### *Parahyadina lacustris* Tonnoir and Malloch. Figs. 256, 274, 293

*Parahyadina lacustris* Tonnoir and Malloch, 1926. Rec. Cant.

[N.Z.] Mus. 3 : 17.

A blackish-brown species. Body length about 2.5 mm., wing length about 2.75 mm.

#### MALE

HEAD (Fig. 293). Arista blackish-brown; rays of pubescence confined to dorsal surface of axis, the longest not greater than diameter of basal segments. Antenna dark brown; 3rd segment light brown on ventral half or two-thirds; 2nd segment without distinct bristle but hairs on surface and strong at apex, ventrally; basal segment small. Front shining black with some brown dusting; orbits with heavier tomentum. Verticals and ocellars strong; few hairs on orbits anteriorly. Face heavily dusted with silvery-grey tomentum. Two rows of facial hairs on either side bordering the ptilinal suture. Cheeks greyish-black with few hairs. Occiput blackish-brown with areas of grey dusting. Vertical diameter of eye about 2.2 times width of cheek in same axis. Proboscis dark brown; palpi brown with some fine hairs.

THORAX: Mesonotum blackish-brown with pair of faint median grey vittae between dorsocentrals, more distinct anteriorly and posteriorly; scutellum and pleura blackish-brown, latter with some grey areas. Two dorsocentrals, anterior one weak; parallel basal scutellars weak and about half length of parallel apical scutellars; scutellum without hairs; presutural not larger than surrounding hairs; one postalar; mesopleural small; sternopleural small; propleuron and prosternum bare.

Legs blackish-brown; tarsi brown, basal segment of hind tarsus lighter brown, mid tibia with apical ventral bristle.

Wings (Fig. 256) clear; veins light brown, a faint darkening about the cross veins. Wing indices: costal about 1.2; 4th vein about 3.2-3.4; 4c about 2.2; 5x about 4.0-4.5.

Halteres pale yellow.

ABDOMEN: Shining blackish-brown. Fourth and 5th tergites large.

External genitalia (Fig. 274): Genital arch very narrow and of even width, without bristles; anal plate large, ovoid, 20 or more bristles over surface; clasper strongly chitinised, as long as height of arch, broadest basally and tapering irregularly to apex, 3 hairs near middle of anterior margin, apex ending in 1 small hair.

*Holotype*: CHRISTCHURCH: Horseshoe Lake, 17.ix.1924, ♂, (Heighway), (Cawt. Inst.).

*Material Examined*: Holotype and 5 ♂.

*New Records*: AUCKLAND: Browns Bay, 31.vii.1949, 1 ♂; swept off grass, 12.viii.1950, 1 ♂, (R. A. Harrison); Green Lane, -.viii.1949, 1 ♂; 23.x.1949, 1 ♂, (K. P. Lamb); Owairaka, swept off weeds, 16.ix.1952, 1 ♂, (R. A. Harrison), (P.D.D.).

*Distribution*: Auckland, Nelson, Christchurch. (July to October).

### Subfamily EPHYDRINAE

Second antennal segment without curved spine or bristle at apex of dorsal surface. Fronto-orbitals outwardly directed, if present. Eyes bare. Subcranial cavity very large. Face strongly arched. Proboscis enlarged.

The most readily distinguished subfamily. The greatly enlarged subcranial cavity and the strongly arched face immediately separate it from the other subfamilies.

*Genera Occurring in New Zealand*:

*Brachydeutera* Loew

*Ephydrella* Tonnoir and Malloch

*Neoscatella* Malloch

*Parydra* Stenhammer

*Scatella* Robineau-Desvoidy

#### KEY TO GENERA OF SUBFAMILY EPHYDRINAE IN NEW ZEALAND

- |   |  |                        |
|---|--|------------------------|
| 1 | Costa ending at apex of 3rd vein .....     | BRACHYDEUTERA (p. 233) |
|   | Costa ending at apex of 4th vein .....     | 2                      |
| 2 | Ocellar bristles strong .....              | 3                      |
|   | Ocellar bristles very short and fine ..... | PARYDRA (p. 235)       |
| 3 | Two dorsocentrals .....                    | SCATELLA (p. 236)      |
|   | More than 2 dorsocentrals .....            | 4                      |
| 4 | Three dorsocentrals .....                  | NEOSCATELLA (p. 242)   |
|   | Five dorsocentrals .....                   | EPHYDRELLA (p. 244)    |

### Genus BRACHYDEUTERA Loew

*Brachydeutera* Loew, 1862. "Monogr. Dipt. N. Amer." 1: 162.

Arista plumose. Second antennal segment without bristles on dorsal surface. Fronto-orbitals present. Face lightly haired laterally. Epistome (clypeus) prominent. Second vein short; costa ending at apex of 3rd vein; apical section of 4th vein not pigmented.

Type Species: *Brachydeutera dimidiata* Loew

Separated from other New Zealand genera in the subfamily Ephydrinae by having the costa ending at the apex of the third vein.

*Distribution:* New Zealand, Europe, Africa, N. America.

*Species Occurring in New Zealand:*

*Brachydeutera sydneyensis* Malloch

**Brachydeutera sydneyensis** Malloch. Figs. 257, 275, 292, 297

*Brachydeutera sydneyensis* Malloch, 1924. Proc. Linn. Soc. N.S.W. 49 : 335.

A grey and greyish-brown species with clear wings. Body length 3.0 mm., wing length 3.0 mm.

MALE AND FEMALE

**HEAD** (Fig. 292): Arista black; plumose, about 12 long rays dorsally on basal half of axis. Antenna black; 3rd segment with white pile; basal segment minute. Frontal triangle greyish-brown dusted; orbits greyish-blue dusted; area between triangle and orbits dark brown dusted. Three equal outwardly directed fronto-orbitals and small hairs on orbits; verticals and postverticals present; a pair of convergent frontals; ocellars absent; small hairs on anterior region of triangle. Face blackish-brown; antennal fossae deep and reaching nearly to ventral margin. Few fine white hairs on face at lateral ventral regions. Cheeks brown with heavy silvery-grey dusting and tomentum on margin of subcranial cavity. Occiput brown dorsally, grey ventrally. Vertical diameter of eye about 6 times width of cheek in same axis. Proboscis blackish-brown, labella large with posterior hook-like structure; palpi flat diamond-shaped structures with dense silvery-white tomentum.

**THORAX:** Mesonotum greyish-brown, heavily dusted, grey at anterior margin and lighter brown laterally; scutellum greyish-brown dusted with central basal triangle of grey; pleura black with heavy silvery-grey dusting or tomentum. All bristles and hairs weak; very weak prescutellars; acrostichal hairs in two rows widening to about 4 rows posteriorly; 1 posterior with a few slightly enlarged hairs in dorsocentral row; convergent basal scutellars about two-thirds convergent apically; scutellum haired except on grey triangle; humeral absent or very weak; 1 presutural; 1 notopleural; 1 supraalar; 2 postalars; 1 mesopleural and small white hairs on mesopleuron; no sternopleural; propleuron and prosternum bare.

Legs light yellowish-brown with trace of light grey dusting; coxae except apices, apices of tibiae and tarsi, especially apices of each tarsal segment, blackish or dark brown.

Wings (Fig. 257) clear; veins light brown; apical section of 4th vein not pigmented. Short spines on dorsal surface of costa not as wide as diameter of costa and placed from apex of 1st vein to apex of 3rd vein, the distal spines scarcely discernible. Wing indices: costal about 0.3; 4th vein about 1.2-1.3; 4c about 2.2-2.4; 5x about 0.3-0.4.

Halteres light yellow apically, light brown basally.

**ABDOMEN:** Grey. Tergites with brown or dark brown areas on anterior and posterior margins; these areas uniting centrally on 4th tergite of male and 4th and 5th tergites of female.

External male genitalia (Fig. 275): Genital arch absent dorsally and present ventral to anus as wide plates united centrally, ventrally in centre forming a raised keel, antero-ventral corner produced into a finger-like projection; anal plate semicircular with bristles over most of surface; clasper arising from plate between keel and projection as a broad plate and then extending as curved finger-like projection with an apex.

**PUPA** (Fig. 297): Anterior spiracles long and narrow.

*Holotype:* Australia.

*Material Examined:* 11 ♂ and 4 ♀.

*New Records:* AUCKLAND: Mangere, 20.xi.1949, 1 ♂, (K. P. Lamb): Owairaka, P.D.D., bred ex pupa from surface of water reservoir,

7.ii.1955, 10 ♂, 3 ♀. (R. A. Harrison); 14.xii.1955, 1 ♀, (K. A. J. Wise), (P.D.D.).

*Distribution*: Auckland. (November, December, February).

*Remarks*: Regarded as an immigrant species from Australia.

### Genus PARYDRA Stenhammar

*Parydra* Stenhammar 1844. K. svenska VetenskAkad. Handl. 1843, p. 144.

Head large. Arista thick basally. Fronto-orbitals absent; verticals small; postverticals absent; ocellars short. Two rows of acrostichal hairs; dorsocentrals not all strongly developed, the posterior pair usually distinct; no humeral bristle; 1 mesopleural; apical scutellars strong, basals not differentiated from hairs. Costal index below 2.0. Costa ending at 4th vein.

Type Species: *Parydra coarctata* (Fallén)

Separated from other New Zealand genera in the subfamily Ephydrinae that have the costa extending to the fourth vein by having very short ocellar bristles.

*Distribution*: New Zealand, Europe, North America.

*Species Occurring in New Zealand*: *Parydra neozelandica* Tonnoir and Malloch

### *Parydra neozelandica* Tonnoir and Malloch. Fig. 260

*Parydra neozelandica* Tonnoir and Malloch, 1926. Rec. Cant. [N.Z.] Mus. 3 : 9.

A black species with golden-brown dusting. Body length about 2.5 mm., wing length about 2.75 mm.

#### FEMALE

**HEAD**: Arista distinctly hairy above. Antenna dark; 3rd segment somewhat lighter below. Face with 1 bristle on either side.

**THORAX**: Shining black with brown dusting on mesonotum and thicker tomentum on pleura. No prescutellars; acrostichal hairs long and more pronounced anteriorly; 1 dorsocentral and 4 or 5 enlarged hairs anterior to this bristle; apical scutellars convergent; scutellum haired; hairs on humerus; 1 weak presutural; 1 weak and 1 strong notopleural; 1 postalar; mesopleuron haired; 1 small sternopleural; propleuron and prosternum without distinct hairs.

Legs light brown; coxae and femora except apex of each femur, grey, no distinctive bristles on legs.

Wings (Fig. 260) clear, light brown shading about cross veins. Wing indices: costal about 1.6-1.7; 4th vein about 2.1-2.2; 4c about 1.6-1.8; 5x about 0.5.

Halteres brown with light brown stalk.

**ABDOMEN**: Black with grey dusting.

*Holotype*: NELSON: Maitai Valley, 16.iii.1922, ♀, (A. Tonnoir), (Cawt. Inst.).

*Material Examined*: Holotype.

*Distribution*: Nelson. (March).

*Remarks*: The holotype has its head missing and is the only specimen known.



## Genus SCATELLA Robineau-Desvoidy

*Scatella* Robineau-Desvoidy, 1830. Mém. prés. Acad. Sci., Paris  
2 : 801.

Arista pubescent. Two pairs of divergent fronto-orbitals; postverticals very weak; ocellars strong. Face with bristles. Proboscis enlarged. Prescutellars absent; 2 postsutural dorsocentrals; humeral absent; 1 mesopleural; 1 sternopleural; strong apical scutellars and a weak hair lateral to each bristle; scutellum bare. Costal index greater than 4.0. Costa ending at 4th vein.

Type Species: *Scatella stagnalis* (Fallén)

Separated from other genera by having strong ocellars, weak postverticals, two postsutural dorsocentrals, strong proboscis, and bristles and hairs on the face. The closest genus is *Neoscatella* which has three dorsocentrals.

*Distribution*: New Zealand, Australia, Pacific Islands, North America, Europe, South America.

### *Species Occurring in New Zealand*:

- Scatella nelsoni* Tonnoir and Malloch
- S. nitidifrons* Tonnoir and Malloch
- S. nitidithorax* Malloch
- S. nubeculosa* Tonnoir and Malloch
- S. unguiculata* Tonnoir and Malloch

*S. nitidithorax* is an Australian species and is probably a recent immigrant. All species are closely related and groupings are not apparent except that *S. nubeculosa* and *S. nelsoni* with narrow cheeks and relatively low costal indices appear to be more closely related to each other than to other species.

### KEY TO SPECIES OF SCATELLA IN NEW ZEALAND

- 1 Wings conspicuously darker on apical half ..... **nubeculosa**  
Wings not darker on apical half ..... 2
- 2 Tarsal claws large, as long as apical tarsal segment, curved and basally dilated ..... **unguiculata**  
Tarsal claws not large or dilated ..... 3
- 3 Pale distal spot in 1st posterior cell divided, and veins about this area distinctly undulating ..... **nitidithorax**  
Pale distal spot in 1st posterior cell not divided, and veins about it not obviously undulating ..... 4
- 4 Ocellar triangle heavily dusted ..... **nelsoni**  
Ocellar triangle glossy with only light dusting ..... **nitidifrons**

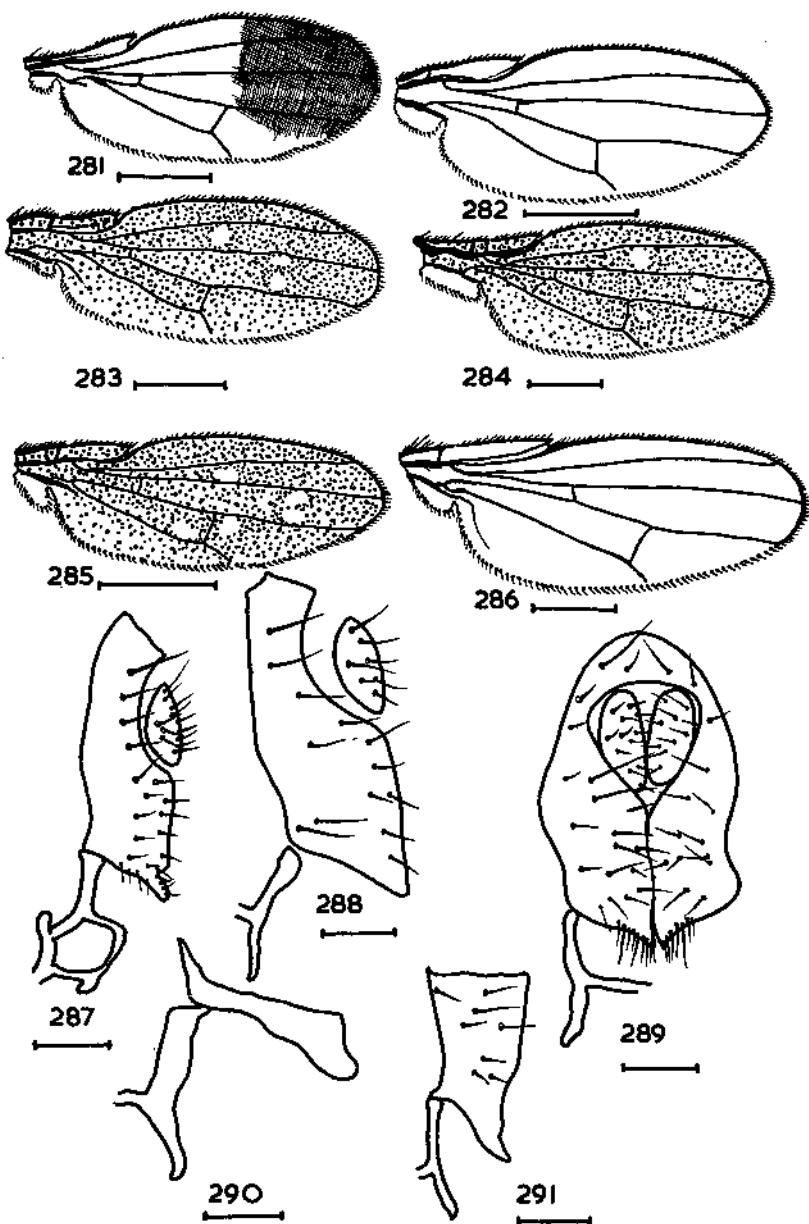
### ***Scatella nubeculosa* Tonnoir and Malloch. Figs. 281, 288**

*Scatella nubeculosa* Tonnoir and Malloch, 1926. Rec. Cant.  
[N.Z.] Mus. 3 : 10.

A brown and greyish-brown species with brown shading on wings. Body length about 2.0 mm., wing length about 2.0 mm.

#### MALE

HEAD: Arista dark brown; longest rays of pubescence about as long as diameter of basal segment. Antenna blackish-brown; 3rd segment mostly dark brown; 2nd segment with 1 dorsal bristle, several small apical ventral bristles and black hairs; basal segment small and bare. Front dark brown, dusted with brown or golden-brown; area between orbits and triangle scarcely differentiated in colour. Verticals strong; orbits with hairs alternating with fronto-orbital bristles; a few minute hairs on anterior region of front. Face heavily dusted with golden-brown; antennal fossae shallow. Protruding portion of front with hairs and bordered with bristles, a very large bristle at lateral ventral corner. Cheeks greyish-brown. One strong



Wings:

- Fig. 281. *Scatella nubeculosa*  
 " 282. *S. unguiculata*  
 " 283. *S. nitidithorax*  
 " 284. *S. nelsoni*  
 " 285. *S. nitidifrons*  
 " 286. *Ephydrella novae-zealandiae*

External male genitalia:

- Fig. 287. *Scatella nitidithorax*  
 " 288. *S. nubeculosa*  
 " 289. *Neoscatella vittithorax*  
 " 290. *Scatella unguiculata*  
 " 291. *S. nelsoni*

Scale: Figs. 282, 285, 286, 1.0 mm.; Figs. 281, 283, 284, 0.5 mm.;  
 Figs. 287-291, 0.1 mm.

median bristle on cheeks and a few hairs posterior to it. Occiput greyish-brown. Vertical diameter of eye about 6 times width of cheek in same axis. Proboscis greyish-brown; palpi small, light brown, and with small hairs.

**THORAX:** Dusted with brown or greyish-brown. One pair strong presutural acrostichals, and acrostichal hairs only anterior to these bristles; posterior dorso-central the larger, and enlarged hairs anteriorly in same line; apical scutellars long and divergent, the short bristle about one-third length of apicals and just anterior to apicals; 1 strong presutural; 2 notopleurals, posterior one weak; 1 strong postalar; mesopleuron haired; sternopleural strong; propleuron with a few very fine hairs; prosternum bare.

Legs greyish-brown. Fore femur with strong bristles on postero-ventral surface; mid femur with bristles on apical half of anterior surface; mid tibia with apical and weak preapical.

Wings (Figs. 281): Veins brown. Distal costal break pronounced and deep; pair of bristles near base of costa; short stout costal spines ending at apex of 2nd vein. Wing indices: costal about 4.0-4.1; 4th vein about 1.7-1.8; 4c about 0.6-0.7; 5x about 1.1.

Halteres yellowish-brown with brown stalk.

**ABDOMEN:** Heavily dusted greyish-brown.

External genitalia (Fig. 288): Genital arch narrower dorsally than ventrally, postero-ventral corner slightly produced, bristles over most of surface; anal plate with bristles smaller than on arch, clasper with minute hairs below curved apex.

*Holotype:* CASS: 29.xi.1924, ♂, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined:* Holotype and 2 paratypes.

*Distribution:* Kaikoura, Cass, Christchurch. (November, February).

*Remarks:* The dark apical shading of the wing separates this species from others.

### **Scatella unguiculata** Tonnoir and Malloch. Figs. 280, 282, 290

*Scatella unguiculata* Tonnoir and Malloch, 1926. Rec. Cant.

[N.Z.] Mus. 3 : 10.

A brown or greyish-brown species with light brown shaded wings. Body length about 3.0 mm., wing length about 3.25 mm.

#### MALE

**HEAD:** Arista blackish-brown; longest rays of pubescence about half width of basal segments. Antenna dark greyish-brown; 3rd segment greyish-brown basally; 2nd segment with 1 dorsal and several smaller ventral apical bristles and black hairs mainly on apical margin; basal segment bare. Front dark greyish-brown; orbits grey at lateral margins, more pronounced anteriorly. The outwardly directed fronto-orbitals strong and equal, verticals strong; black hairs on orbits alternating with the fronto-orbital bristles. Face heavily dusted with golden-brown; parafacials grey. Protruding portion of face with hairs and bordered by bristles; a very strong bristle at lateral ventral region. Cheeks grey. One strong bristle near middle of ventral margin of cheek and black hairs posterior to it. Occiput greyish-brown and grey. Vertical diameter of eye about 4.3 times width of cheek in same axis. Proboscis with haustellum heavily chitinised and grey; palpi small and light greyish-brown.

**THORAX:** Mesonotum and scutellum brown dusted; pleura greyish-brown dusted. Pair of strong presutural acrostichals with acrostichal hairs only anterior to these bristles; postsutural dorsocentrals strong, posterior larger; divergent apical scutellars strong and the small curved bristle, just anterior to apicals, less than half their length; strong presutural; 2 notopleurals, posterior weak; 1 supraalar; mesopleuron haired; sternopleural strong; propleuron with small fine hairs; prosternum bare.

Legs (Fig. 280) greyish-brown; tarsi brown. Fore femur with strong bristles on postero-ventral surface; mid femur with small bristles on apical half of anterior surface; mid tibia with apical; all tarsal claws as long as apical tarsal segments, distinctly curved and broadened at about basal quarter; empodia and pulvilli white and plumose.

Wings (Fig. 282): Light brown shading; veins brown. Distal costal break deep and distinct; costa with pair of bristles near base; short stout costal spines ending at apex of 2nd vein. Wing indices: costal about 4.9; 4th vein about 1.9; 4c about 0.6; 5x about 1.0.

Halteres yellowish-brown with light brown basal stalk.

ABDOMEN: Brown and greyish-brown. Fifth tergite in male about twice as long as 4th.

External genitalia (Fig. 290): Genital arch narrower dorsally than ventrally, postero-ventral corner produced into a short rounded prominence, bristles on surface mostly at ventral region; anal plate with bristles smaller than on arch; clasper with small hairs beneath curved apex of free arm.

*Holotype*: BANKS PENINSULA: Hilltop, 16.i.1925, ♂, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined*: Holotype, 1 paratype, and 1 ex.

*Distribution*: Te Aroha, Banks Peninsula, Chatham Islands. (January, February).

*Remarks*: Separated from other species by having large tarsal claws which have a distinct dilation near their bases.

### **Scatella nitidithorax** Malloch. Figs. 283, 287

*Scatella nitidithorax* Malloch, 1925. Proc. Linn. Soc. N.S.W.

50 : 330. Tonnoir and Malloch, 1926. Rec. Cant. [N.Z.]

Mus. 3 : 11.

A greyish-brown species with lightly shaded wings. Body length about 2.0 mm., wing length about 2.0 mm.

#### MALE AND FEMALE

**HEAD**: Arista dark brown; rays of pubescence minute basally, equal to or just greater than diameter of basal segment at middle at arista, absent at apex. Antenna greyish-brown; 3rd segment brown and dark brown dorsally; 2nd segment with one dorsal bristle and a few minute hairs at apex; basal segment minute and bare. Front about twice as wide at vertex as length between vertex and lunule; slightly shining brown with narrow grey-brown line median to the orbits. Strong fronto-orbitals equal in length; verticals strong; small hairs on line of fronto-orbitals. Face greyish-brown. Hairs on central triangle of face bordered by stronger hairs and with a strong bristle at lower lateral corner of haired area. Cheeks light grey. Strong hairs on postero-ventral half of cheeks. Occiput greyish-brown with grey dusting. Vertical diameter of eye about 5 times width of cheek in same axis. Proboscis with haustellum heavily chitinised, greyish-brown; palpi brown with fine hairs.

**THORAX**: Greyish-brown; humerus grey; mesonotum with pair of short faint grey vittae anteriorly. One pair of presutural acrostichals; apical scutellars strong and cruciate; the small marginal scutellar bristles near apicals; 1 strong presutural; 2 notopleurals; 1 postalar; a few interalar hairs; mesopleuron haired; sternopleural strong and small anterior hairs; no propleural bristle but small propleural hairs; prosternum bare.

Legs greyish-brown. Fore femur with strong hairs on posterior surfaces; mid tibia with apical ventral bristle.

Wings (Fig. 283) lightly shaded with brown; small white spots, 1 near middle of submarginal cell, 1 in posterior cell about mid way between the two cross veins, a pair in posterior cell about mid way between posterior cross vein and wing margin with the third and fourth veins curved outwards around them, 1 in discal cell close to 5th vein and at about apical quarter of cell, and a pair of spots in 2nd posterior cell near posterior cross vein; veins brown. Costa with pair of spines near base, and hairs on costa as far as 1st vein stronger than those beyond 1st vein; 5th vein not quite reaching wing margin; short stout costal spines ending at apex of 2nd vein and a few similar spines at intervals between apices of 2nd and 3rd vein. Wing indices: costal about 5.1; 4th vein about 2.8; 4c about 0.5; 5x about 1.2.

Halteres yellowish-brown, brown base.

ABDOMEN: Greyish-brown; 5th tergite in male about twice length of 4th.

External male genitalia (Fig. 287): Genital arch narrower dorsally than ventrally, postero-ventral corner produced finger-like, bristles over all surfaces with a slight concentration at postero-ventral region; anal plate with bristles smaller than on arch; clasper with a small hair at middle of free arm and 3 similar hairs beneath curved apical spine.

*Holotype*: Australia.

*Material Examined*: Holotype, 4 ♂, and 15 ♀.

*New Records*: AUCKLAND: 2.xi.1941, 1 ♀, (T. R. Rabone): Browns Bay, 14.xi.1949, 2 ♂, 5 ♀; 20.xi.1949, 1 ♀: Mt. Eden, swept off grass, 26.xii.1948, 1 ♂, 1 ♀; 28.xii.1949, 1 ♀, (R. A. Harrison): Greenlane, 23.x.1949, 1 ♀, (K. P. Lamb), (P.D.D.). WAITAKERE RANGES: Bethells Beach, swept off grass, 13.viii.1950, 1 ♀, (K. A. J. Wise): Titirangi ex light trap, 11.xii.1952, 1 ♂; 10.xii.1953, 1 ♀, (C. R. Thomas), (P.D.D.). NATIONAL PARK: 4,000 ft., 6.xi.1949, 3 ♀, (K. P. Lamb), (P.D.D.).

*Distribution in New Zealand*: Auckland, Waitakere Ranges, National Park, Nelson. (August, October to December).

*Remarks*: Separated from other species by having the distal spot in the first posterior cell divided and the veins about these spots distinctly undulating. An Australian species and regarded as an immigrant to New Zealand. New Zealand records show that this species is found mostly on grasslands.

### **Scatella nelsoni** Tonnoir and Malloch. Figs. 284, 291, 294

*Scatella nelsoni* Tonnoir and Malloch, 1926. Rec. Cant. [N.Z.]

Mus. 3: 11.

A heavily dusted brown species. Body length about 2.0 mm., wing length about 2.0 mm.

#### MALE AND FEMALE

**HEAD** (Fig. 294): Arista blackish-brown; rays of pubescence much shorter than diameter of basal segments. Antenna blackish-brown; 3rd segment light brown basally; 2nd segment with 1 dorsal and about 2 ventral apical bristles, elsewhere small hairs; basal segment small and bare. Front thickly dusted with brown; area between orbits and frontal plate dusted with blackish-brown. Fronto-orbitals strong and equal, 1 hair between and posterior and anterior to these bristles; verticals strong. Face heavily dusted golden-brown. Black hairs on most of face except fossae, strong hairs bordering the haired area and a strong bristle at lateral corner. Cheeks greyish-brown. One strong median bristle on cheeks and hairs posterior to it. Occiput greyish-brown. Vertical diameter of eye about 8 times width of cheek in same axis. Proboscis greyish-brown, haustellum enlarged and heavily chitinised; palpi light greyish-brown with tomentum only.

**THORAX**: Heavily dusted with brown. Pair of strong presutural acrostichals and 2 rows of hairs anterior to them; hairs anterior to the two strong postsutural dorsocentrals; (holotype with an additional acrostichal and an additional dorso-central); strong hair placed mid way between apical scutellars and base of scutellum, or just closer to apicals than base; 1 presutural; two notopleurals; no supraalar; 1 small interalar; 1 strong postalar; mesopleuron with hairs on surface; 1 sternopleural; a few fine propleural hairs; prosternum bare.

Legs greyish-brown; femora, tibiae, and tarsi dark brown. Fore femur without strong bristles; strong apical on mid tibia.

Wings (Fig. 284) light brown; veins brown; light areas in wing. Costa with deep break at apex of subcosta; short black costal spines ending at apex of 2nd vein. Wing indices: costal about 4.0-4.6; 4th vein about 1.5-1.7; 4c about 0.5; 5x about 1.0-1.2.

Halteres pale yellow, light brown basally.

**ABDOMEN:** Greyish-brown. Fifth tergite in male about twice length of 4th.

External male genitalia (Fig. 291): Genital arch narrow dorsally, broad ventrally, small bristles over surface with cluster at the slightly produced postero-ventral corner; anal plate ovoid with small bristles; clasper with small hairs below the curved apex of the free arm.

*Holotype:* NELSON: 12.viii.1923, ♂, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined:* Holotype, allotype, 1 paratype, 2 ♂ and 1 ♀.

*New Records:* KAPITI ISLAND: 4.i.1928, 1 ♂, (*Anon.*), (Dom. Mus.). NELSON: Tahuna, 22.i.1942, 1 ♂, 1 ♀, (*A. Hamilton*), (Cawt. Inst.).

*Distribution:* Kapiti Island, Nelson, Christchurch. (August, September, January, February).

*Remarks:* Separated from *S. nitidifrons* by having the ocellar triangle heavily dusted.

### **Scatella nitidifrons** Tonnoir and Malloch. Fig. 285

*Scatella nitidifrons* Tonnoir and Malloch, 1926. Rec. Cant.  
[N.Z.] Mus. 3: 11.

A brown species with faint brown shading over most of wing area. Body length about 2.5 mm., wing length about 2.5 mm.

#### FEMALE

**HEAD:** Arista dark brown; longest rays of pubescence about equal to width of basal segments. Antenna dark brown; 3rd segment brown to light brown basally; 2nd segment with 1 median dorsal and a few ventral apical bristles, and strong hairs on apical margin and on dorsal surface; basal segment small and bare. Front brown, narrow area between orbits and triangle dark brown. A hair between, and anterior, and posterior to fronto-orbitals; verticals strong; a few small hairs on anterior region of front. Face golden-brown; antennal fossae shallow. The protruding portion of face with hairs and bordered with strong bristles. Cheeks greyish-brown. One strong median bristle on cheek and small hairs posterior to it. Occiput greyish-brown. Vertical diameter of eye about 5 times width of cheek in same axis. Proboscis greyish dark brown, enlarged haustellum; palpi short, light brown, and with fine hairs.

**THORAX:** Brown, heavily dusted. Pair of strong presutural acrostichals and hairs anterior to them; strong hairs anterior to dorsocentrals; apical scutellars strong and divergent, the small lateral bristle about half length of apicals and just anterior to them; strong presutural; 2 notopleurals; 1 postalar; mesopleuron haired; sternopleural strong; propleuron bare; prosternum bare.

Legs greyish-brown. Fore femur with weak bristles on postero-dorsal, posterior and postero-ventral surfaces; mid femur with weak bristles on apical half of anterior surface.

**Wings** (Fig. 285): Light brown shading; veins brown. Distal costal break deep. Short black costal spines ending at apex of 2nd vein. Wing indices: costal about 4.3-4.7; 4th vein about 1.7; 4c about 0.6; 5x about 1.4.

Halteres light brown basally, pale yellow apically.

**ABDOMEN:** Brown, tergites with greyish-brown posterior margins.

Female genitalia greyish-brown and with a pair of strong black bristles.

*Holotype:* CHRISTCHURCH: 17.ii.1922, ♀, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined:* Holotype, 2 paratypes, and 1 ♀.

*New Records:* METHVEN: McLennans Bush, 9-10.xii.1941, 1 ♀, (*E. S. Gourlay*), (Cawt. Inst.).

*Distribution:* Nelson, Kaikoura, Christchurch, Methven. (December, February, May).

*Remarks:* Separated from *S. nelsoni* by having a glossy ocellar triangle covered with heavy dusting.

#### Genus NEOSCATELLA Malloch

*Neoscatella* Malloch, 1935. Bull. Bishop Mus., Honolulu  
114 : 9. Cresson, 1935. Trans. Amer. ent. Soc. 61 : 359.

Arista pubescent. Two pairs divergent fronto-orbitals; postverticals very weak; ocellars strong; face with bristles; proboscis enlarged. Prescutellars absent; 3 dorsocentrals, 1 of them presutural; humeral bristle absent; 1 mesopleural; 1 sternopleural; strong apical scutellars and a hair lateral to each of these bristles; scutellum bare. Costal index greater than 4.0. Costa ending at 4th vein.

Type Species: *Neoscatella atra* Malloch

Closely related to *Scatella* R-D. and separated from it only by the presence of a presutural dorsocentral bristle.

*Distribution:* New Zealand, Australia, Pacific Islands, North and South America, Europe.

*Species Occurring in New Zealand:* *Neoscatella vittithorax* (Malloch).

#### *Neoscatella vittithorax* (Malloch). Figs. 261, 289, 295

*Scatella vittithorax* Malloch, 1925: Proc. Linn. Soc. N.S.W.  
50 : 331.

*Neoscatella vittithorax* (Malloch): Cresson, 1935. Trans. Amer.  
ent. Soc. 61 : 360.

A grey or greyish-brown species, heavily dusted. Body length about 2.5 mm., wing length about 3.0 mm.

#### MALE AND FEMALE

**HEAD** (Fig. 295): Arista blackish-brown, thickened basally; pubescent except on about apical quarter, longest rays of pubescence equal to diameter of basal segments. Antenna blackish-brown with tinge of metallic blue; 2nd segment with 1 bristle at about middle of dorsal surface, black hairs elsewhere; basal segment bare. Front shining black with light dusting on triangle, orbits heavily dusted with brown or dark brown and area between triangle and orbits dull black. The two outwardly directed fronto-orbitals strong and equal; verticals strong; few hairs on orbits and on anterior of front. Face protruding, golden-brown, heavily dusted. Face haired centrally and the haired area bordered by bristles, the strongest at lateral ventral region of face. Cheeks grey dusted. One strong median bristle on cheek and fine hairs posterior to it. Occiput greyish-brown. Vertical diameter of eye about 5 times width of cheek in same axis. Proboscis with haustellum grey and heavily chitinised; palpi dark greyish-brown.

**THORAX:** Mesonotum with narrow bluish-grey longitudinal vittae alternating with brownish-grey vittae, the latter medianly placed, also on dorsocentral and interalar rows; lateral margins of mesonotum grey dusted; scutellum dusted with dark brown; pleura grey dusted except mesopleuron with greyish-brown dusting. One pair acrostichal bristles on or just anterior to suture with 2 rows of hairs anteriorly and 1 posteriorly; anterior dorsocentral just anterior to line of acrostichal bristles; apical scutellars strong, and strong curved hair on scutellar margin about third distance from each apical bristle to base of scutellum; no humeral; 1 presutural; 2 notopleurals; 1 postalar; mesopleuron haired; very small propleural hairs.

Legs dark brown; femora grey dusted.

Wings (Fig. 261) lightly shaded with brown; fine white spots; veins about the spot in the submarginal cell and the distal spot in the 1st posterior cell slightly undulating. Short black costal spines ending at apex of 2nd vein. Wing indices: costal about 4.6-4.9; 4th vein about 1.5-1.7; 4c about 0.5; 5x about 0.9.

Halteres pale yellow apex, light brown stalk.

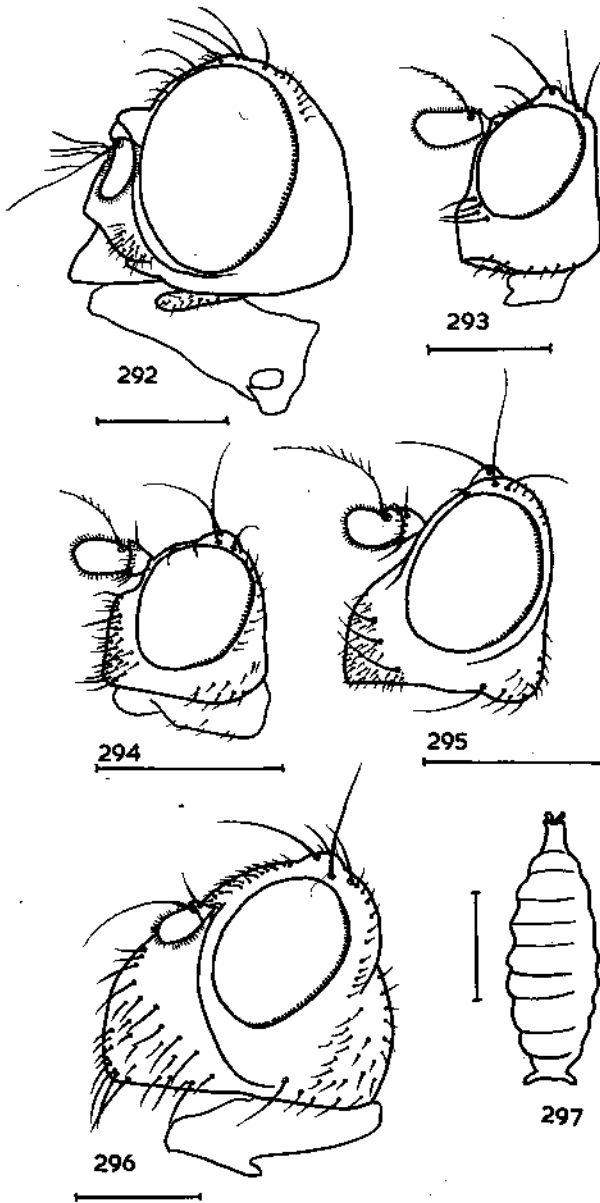


Fig. 292. Head of *Brachydeutera sydneyensis*  
 „ 293. „ „ *Parahydina lacustris*  
 „ 294. „ „ *Scatella nelsoni*  
 „ 295. „ „ *Neoscatella vittithorax*  
 „ 296. „ „ *Ephydrella novae-zealandiae*  
 „ 297. Puparium of *Brachydeutera sydneyensis*

Scale: Figs. 292, 293, 0.25 mm.; Figs. 294-296, 0.5 mm.; Fig. 297, 1.0 mm.



ABDOMEN: Male tergites grey dusted with greyish-brown areas medianly and anteriorly; 5th tergite about twice length of fourth.

External male genitalia (Fig. 289): Genital arch narrow, dorsally, broad ventrally, postero-ventral corner slightly produced, bristles over most of posterior half, and cluster at the produced postero-ventral corner; anal plate ovoid with some small bristles; clasper with 1 small hair about middle of free arm; 3 similar hairs and many minute hairs at apex.

Female: 5th tergite normal. Colouration as in male; genital plates dark greyish-brown.

*Holotype*: Australia.

*Material Examined*: 10 ♀ compared with holotype, 21 ♂, 30 ♀, and 3 ex.

*New Records*: AUCKLAND: Owairaka, P.D.D. ex glass house, 26.vii.-1948, 1 ♂; 27.x.1948, 2 ♂, 2 ♀, (*D. W. McKenzie*); 5.viii.1949, 2 ♂; 12.viii.1949, 2 ♂, 2 ♀, (*R. A. Harrison*); ex insectary, 24.i.1951, 6 ♂, 6 ♀, (*C. R. Thomas*); Avondale, 9.x.1949, 1 ♀, (*R. A. Harrison*); Browns Bay, -xi.1949, 1 ♀, (*R. A. Harrison*); Mangere, 18.ix.1948, 1 ♀, (*K. P. Lamb*); bred ex algae, -ix.1952, 1 ♀, (*K. A. J. Wise*); Hobson Bay, swept from seepage over beach, 2.viii.1952, 6 ♀, (*K. A. J. Wise*), (P.D.D.). MANUKAU HARBOUR: South side upper reaches, swept off beach, 17.vii.1952, 4 ♀, (*K. A. J. Wise*), (P.D.D.). PUKEKOHE: swept off carrot field, 8.ix.1952, 3 ♂, 5 ♀, (*R. A. Harrison*), (P.D.D.). NAPIER: ex *Antirrhinum* seed box, 1.vi.1934, 1 ♂, 3 ex., (*Anon.*), (P.D.D.). STEPHENS ISLAND: 14-28.i.-1933, 4 ♂, 1 ♀, (*E. S. Gourlay*), (Cawt. Inst.).

*Distribution in New Zealand*: Auckland, Manukau Harbour, Pukekohe, Napier, Stephens Island. (June to November, January).

*Remarks*: In general appearance this species is similar to *Scatella nitidifrons* Tonnoir and Malloch but the generic characters are distinct. Dr. D. J. Lee of Sydney University kindly examined the holotype and compared specimens. It is highly probable that this species is an immigrant to New Zealand.

### Genus EPHYDRELLA Tonnoir and Malloch

*Ephydrella* Tonnoir and Malloch, 1926. Rec. Cant. [N.Z.] Mus.

3 : 6. Cresson, 1935. Trans. Amer. ent. Soc. 61 : 354.

Arista pubescent. Two divergent fronto-orbitals; postverticals absent; ocellars strong. Frontal triangle extending broadly to anterior margin of front, no hairs on sides of triangle. Face gibbous, projecting far beyond margin of eye, and with bristles and hairs. Prescutellars present; 5 dorsocentrals, anterior one presutural; 2 pairs of marginal scutellars; humeral present; mesopleural and sternopleurals present. Fore femur with spines or enlarged hairs on apical half of antero-ventral surface. Costa with well separated short spines between apices of 1st and 2nd vein on dorsal surface; costa ending at 4th vein. Costal index greater than 4.0.

*Type Species*: *Ephydrella novae-zealandiae* Tonnoir and Malloch.

Originally described as a subgenus of *Ephydra* Fallén. Cresson (1935) gave it full generic status and this is accepted. Separated from other New Zealand genera by having five dorsocentral bristles.

*Distribution*: New Zealand.

Species:

- Ephydrella aquaria* (Hutton)  
*E. assimilis* (Tonnoir and Malloch)  
*E. novae-zealandiae* (Tonnoir and Malloch)  
*E. spathulata* Cresson

KEY TO SPECIES OF EPHYDRELLA

- 1 Legs blackish-brown ..... **aquaria**  
Legs blackish-brown with basal segment of mid tarsus yellowish-brown ..... 2  
2 Scutellum often with small distal hump and always with transverse ridges ..... **novae-zealandiae**  
Scutellum with smooth dorsal surface ..... 3  
3 Largest rays of arista about half diameter of base of arista ..... **assimilis**  
Largest rays of arista equal to diameter of base of arista ..... **spathulata**

***Ephydrella aquaria* (Hutton). Fig. 277**

*Ephydra aquaria* Hutton, 1901. Trans. N.Z. Inst. 33 : 90.

Tonnoir and Malloch, 1926. Rec. Cant. [N.Z.] Mus. 3 : 7.

*Ephydrella aquaria* (Hutton): Cresson, 1935. Trans. Amer. ent. Soc. 61 : 354.

A shining black or blackish-brown species with light dusting and a green tinge. Body length about 4.5 mm., wing length about 4.5 mm.

MALE AND FEMALE

HEAD: Arista blackish-brown; finely pubescent on the thickened basal third, rays of pubescence on middle third about equal to diameter of basal segment, apical third almost bare. Antenna blackish-brown with greenish-brown dusting; 2nd segment with a small dorsal bristle, a few short hairs; basal segment with few short hairs. Front blackish-brown and somewhat shining; orbits wide and heavily dusted; ocellar area heavily dusted; area between orbits and frontal plate dull black. Two strong outwardly directed fronto-orbitals about equal to each other and hairs in same row on whole length of orbits; verticals strong; hairs over most of front. Face dark greyish-green on dorsal half, protuberance blackish-brown and not dusted; heavily golden-brown dusted on ventral half. Cheeks greyish-brown, heavily dusted. One bristle near middle of cheek, hairs over most of area posterior to it and a few small bristles at lower posterior angle. Occiput greenish-brown. Vertical diameter of eye about 2.3 times width of cheek in same axis. Proboscis grey; haustellum greatly enlarged and heavily chitinised; palpi small and rod-like without hairs or bristles but a few tomentum.

THORAX: Mesonotum with light dusting, shining blackish-brown with green tinge; pleura heavily grey dusted. Three postsutural dorsocentrals, 1 presutural, and 1 on transverse suture; parallel basal scutellars about two-thirds length of divergent apicals; scutellum haired dorsally; 1 strong humeral and short dorsal hairs; 1 presutural; 2 notopleurals; 1 supraalar; 2 postalar; mesopleuron, besides the one strong posterior bristle, with several strong posterior hairs, elsewhere fine hairs; propleuron with fine hairs; prosternum haired.

Legs grey dusted with green tinge. Fore femur with long but fine bristles on postero-dorsal, posterior, and postero-ventral surfaces; hairs on fore tibia stout and distinct; mid femur with bristles on anterior surface, apical one the strongest; mid tibia with strong apical; hind tibia with some small ventral apicals.

Wings clear; veins brown. Costa with strong spines near base, the short spines along dorsal surface of costa to about apex of 2nd vein just less than diameter of costa; very short stout spines ending about third distance between apices of 2nd and 3rd veins. Wing indices: costal about 4.8-4.9; 4th vein about 1.4; 4c about 0.5; 5x about 0.5.

Halteres light brown.

ABDOMEN: Shining blackish-brown with greenish tinge.

External male genitalia (Fig. 277): Genital arch narrow dorsally; anal plate somewhat triangular, hairs confined to near posterior margin; clasper narrow on apical portion, apex with very small spines, hairs elsewhere on this apical portion.

*Holotype*: CHRISTCHURCH: no data, ♂, (*F. W. Hutton*), (*Cawt. Inst.*).

*Material Examined*: Holotype, 1 ♂, and 1 ♀.

*New Records*: NELSON: 3.xi.1923, 1 ♀, (*A. Tonnoir*), (*Cawt. Inst.*).

*Distribution*: Nelson, Christchurch. (November).

*Remarks*: The colouration of the legs and the absence of light yellowish-brown colouration of the basal segment of the mid tarsus separates this species from others.

***Ephydrella novae-zealandiae* (Tonnoir and Malloch). Figs. 278, 286, 296**

*Ephydra novae-zealandiae* Tonnoir and Malloch, 1926. Rec.

Cant. [N.Z.] Mus. 3 : 8.

*Ephydrella novae-zealandiae* (Tonnoir and Malloch): Cresson, 1935. Trans. Amer. ent. Soc. 61 : 354.

A golden-brown and grey species. Body length about 4.5 mm., wing length about 4.75 mm.

MALE AND FEMALE

**HEAD** (Fig. 296): Arista blackish-brown; pubescence strongest about middle of axis, rays not as wide as diameter of basal segment, apex bare, base with very fine pubescence. Antenna dark brown, heavily dusted; 2nd segment with a dorsal bristle, enlarged hairs at apex ventrally, elsewhere short hairs; basal segment with short apical hairs. Front shining black centrally with some golden-brown dusting, bordered laterally by dark brown tomentose stripe, widest anteriorly; orbits greyish-brown dusted. Anterior fronto-orbital just longer than posterior, hairs on line of these bristles on length of orbits; verticals strong; all front anterior to ocelli, except lateral tomentose stripes, with hairs. Face heavily dusted golden-brown, broad carina-like ridge between antennal fossae, lightly dusted transversely at middle and with small sulcus dorsally. Cheeks grey. Strong bristle near mid point of ventral margin of cheek, gena wide and bare, hairs elsewhere with strongest ones about lower posterior corner. Occiput greyish-brown. Vertical diameter of eye about 2.8 times width of cheek in same axis. Proboscis grey, haustellum large and heavily chitinised; palpi short rod-like with grey tomentum and fine short hairs.

**THORAX**: Mesonotum and scutellum golden-brown; without distinct vittae and only faint trace of darker areas on median line and line of dorsocentrals; mesopleuron brownish-grey, other pleura grey. Scutellum elongate in female, and in both sexes with slight basal hump and transverse furrows on disc. Prescutellars two-thirds length of posterior dorsocentrals; posterior dorsocentral bristle the strongest; acrostichal rows not clearly defined; basal scutellars nearly parallel, two-thirds convergent apically and situated mid way between apicals and base of scutellum; scutellum haired; 1 strong humeral and 2 much weaker dorsal bristles; 1 presutural; 2 notopleurals, posterior of pair much weaker; 1 supraalar; 2 postalar; mesopleuron with 1 strong and several weaker posterior bristles and hairs elsewhere; propleuron haired; prosternum with very few, very small hairs.

Legs grey; tarsi light reddish-brown, fore tarsi dark reddish-brown, mid and hind tarsi yellowish-brown, especially basal segment of mid tarsus. Fore femur with bristles on postero-dorsal, posterior and postero-ventral surfaces, strongest bristles apically; mid femur with bristles on apical half of anterior surface; mid tibia with distinct ventral apical; hind tibia with a few small apicals.

Wings (Fig. 286) clear; veins brown, costa light brown. Costa with bristles at base; the short dorsal spines from apex of 1st vein to near apex of 2nd vein less than diameter of costa; short black costal spines extending about sixth to third distance between apices of 2nd and 3rd veins. Wing indices: costal about 4.4-4.9; 4th vein about 1.3-1.6; 4c about 0.5-0.6; 5x about 0.5.

Halteres pale yellow.

ABDOMEN: Greyish-brown.

External male genitalia (Fig. 278): Genital arch narrow dorsally; anal plate elongate ovoid; clasper broadest at about middle of apical half, very short spines on apex, elsewhere small curved bristles.

*Holotype*: CHRISTCHURCH: 17.ii.1922, ♂, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined*: Holotype, 1 ♂ and 1 ♀ paratypes, 12 ♂, and 11 ♀.

*New Records*: MANUKAU HARBOUR: South side upper reaches, swept off beach, 17.vii.1952, 1 ♂, 3 ♀, (*K. A. J. Wise*), (P.D.D.). CLARKES BEACH: Swept off pool, 2.ii.1953, 1 ♂, (*K. A. J. Wise*), (P.D.D.). MIRANDA: On beach, 3.xii.1950, 3 ♂, 1 ♀, (*K. A. J. Wise*), (P.D.D.). NELSON: -.vii.1927, 1 ♂, (*D. Miller*), (Cawt. Inst.). OTAGO PENINSULA: Allans Beach, from surface of saline pond on salt meadow, 17.ix.1953, 6 ♂, 7 ♀, (*B. J. Marples*), (O.U.).

*Distribution*: Miranda, Clarkes Beach, Manukau Harbour, Nelson, Christchurch, Banks Peninsula, Otago Peninsula. (July, September, December, February).

*Remarks*: The undulations or transverse furrows on the scutellum separate this species from all others.

### *Ephydrella assimilis* (Tonnoir and Malloch). Fig. 279

*Ephydra assimilis* Tonnoir and Malloch, 1926. Rec. Cant. [N.Z.]

Mus. 3:7.

*Ephydrella assimilis* (Tonnoir and Malloch): Cresson, 1935.

Trans. Amer. ent. Soc. 61:354.

A greyish-brown species. Body length about 4.5 mm., wing length about 4.5 mm.

#### MALE AND FEMALE

**HEAD**: Arista blackish-brown; fine pubescence on thickened basal half, largest rays about at middle of arista and these about half diameter of basal segments. Antenna heavily dusted greyish-brown; 2nd segment with 1 dorsal bristle, some enlarged hairs at apex ventrally, elsewhere small hairs; basal segment with a few dorsal hairs. Front blackish-brown with greenish tinge; orbits grey; between orbits and front a velvety black band, wider and lighter anteriorly; brown area just posterior to verticals. The two strong, outwardly directed fronto-orbitals about equal and black hairs in same line as these bristles on length of orbit; hairs over most of front anterior to ocelli except on velvet stripes; verticals strong. Face golden-brown, heavily dusted; antennal fossae greyish-brown. Cheeks grey. Hairs on whole surface of cheek except genal area, hairs stronger at lower posterior corner. Occiput grey with the blackish-brown colouration of the front extending on to dorsal occiput as a triangular area. Vertical diameter of eye about 2.8 times width of cheek in same axis. Proboscis grey, haustellum greatly enlarged, heavily chitinised and with small black hairs on posterior surface; palpi short, grey, and rod-like with fine hairs.

**THORAX**: Mesonotum greyish-brown with faint darker brown vittae, 1 median, 1 on each dorsocentral line and from area of presutural to near inner postalar; scutellum with greenish tinge; mesopleuron greyish-brown; other pleura grey. Prescutellars small; acrostichal hairs mostly in 2 rows; posterior dorsocentral bristle the strongest; convergent basal scutellars about three-quarters length of parallel apicals and about mid way from apicals to base of scutellum; scutellum haired dorsally; 3 humerals, ventral one the strongest; 1 presutural; 2 notopleurals; 1 supraalar; 2 postalar; mesopleuron with 1 strong posterior bristle, several strong posterior hairs and fine hairs on rest of surface; propleuron with small fine hairs over most of surface; prosternum haired.

Legs grey; tarsi light reddish-grey; basal segment of mid tarsus yellowish-brown. Fore femur with weak bristles, the strongest on apical half of postero-dorsal and posterior surfaces; fore tibia and fore tarsus with thick hairs, particularly on ventral surface; mid tibia with very short preapical and long apical; hind tibia with a few short apical spines.

Wings clear; veins brown, costa light brown basally. Costa with strong spines basally, and the series of short spines dorsally, less than diameter of costa; short stout black costal spines extending about two-fifths distance between apices of 2nd and 3rd veins. Wing indices: costal about 4.6-4.8; 4th vein about 1.4-1.5; 4c about 0.5; 5x about 0.6.

Halteres pale yellow.

ABDOMEN: Bluish-grey, tergites greyish-brown on anterior half.

External male genitalia (Fig. 279): Genital arch very narrow dorsally; anal plate ovoid with hairs posteriorly; clasper narrow, apex with minute black spines, few hairs on basal portion.

*Holotype*: CHATHAM ISLANDS: Wharekauri, 12-14.xii.1923, ♂, (C. Lindsay), (Cawt. Inst.).

*Material Examined*: Holotype, 1 paratype, and 1 ♀.

*New Records*: INVERCARGILL: 16.iii.1924, 1 ♀, (Anon.), (Dom. Mus.).

*Distribution*: Chatham Islands, Akaroa, Christchurch, Invercargill. (December, January, March).

### ***Ephydrella spathulata* Cresson. Fig. 276**

*Ephydrella spathulata* Cresson, 1935. Trans. Amer. ent. Soc.

61 : 355. Salmon, 1950. Trans. roy. Soc. N.Z. 78 : 2.

*Mydaezealandia glauca* Salmon, 1937. Trans. roy. Soc. N.Z.

67 : 359.

A greenish-brown and grey species. Body length about 4.5 mm., wing length about 4.5 mm.

#### MALE AND FEMALE

HEAD: Arista dark brown; rays of pubescence at middle of arista equal to diameter of basal segment, apex bare, base of arista with fine pubescence. Antenna dark greyish-brown; 2nd segment with one fine dorsal bristle, enlarged hairs at ventral apex and few short hairs elsewhere; basal segment with a few short hairs. Frontal plate shining blackish-brown with light dusting, bordered by dull purplish-grey tomentose stripe; orbits greyish-brown. Hairs on line of fronto-orbitals along whole length of orbits; verticals strong; strong hairs on frontal plate anterior to ocelli. Face light greyish-brown; broad carina-like ridge between fossae, not dusted at middle, and with small dorsal sulcus. Cheeks grey. One strong bristle near middle of ventral margin of cheek with black hairs elsewhere on cheek except on the broad gena; several bristles at lower posterior corner. Occiput grey with frontal colour continuing over vertex in triangular form. Vertical diameter of eye about 2.4 times width of cheek in same axis. Proboscis grey, haustellum large and heavily chitinised; palpi grey, rod-like, and with a few hairs.

THORAX: Mesonotum with broad greenish-brown vitta on median and dorso-central lines, elsewhere, vitta not clearly distinguished from the greyish-green background; scutellum greenish-brown; pleura grey, mesopleuron with trace of brown. Prescutellars about two-thirds length posterior dorsocentrals; posterior dorsocentral the strongest; convergent basal scutellars about three-quarters convergent apicals and half way between apical and base of scutellum; scutellum haired; 3 humerals, dorsal two weak; 1 presutural; 2 notopleurals; 1 supraalar; 2 postalar; mesopleuron haired and with 1 strong and several much weaker posterior bristles; propleuron haired; prosternum with few hairs.

Legs grey; tarsi light greyish-brown. Fore femur with bristles on postero-dorsal, posterior and postero-ventral surfaces, strongest bristles towards apex; mid femur with several bristles on apical half of anterior surface; mid tibia with very short preapical and long apical; hind tibia with a few short apical spines.

Wings clear; veins brown, costa light brown. Costa with bristles at base; short dorsal spines between apices of 1st and 2nd veins about equal to diameter of costa; short stout black spines ending about one quarter distance between 2nd and 3rd veins. Wing indices: costal about 4.4-4.6; 4th vein about 1.5-1.6; 4c about 0.6; 5x about 0.5-0.6.

Halteres yellowish-brown.

ABDOMEN: Greenish-grey; tergites greyish-brown on anterior half.

External male genitalia (Fig. 276): Genital arch narrow dorsally, small bristles near posterior margin dorsally and over most of posterior half ventrally; anal plate ovoid with small bristles on posterior half; clasper broad apically, with very short spines, fine bristles over most of remaining portion.

*Holotype*: QUEENSTOWN: 12.xii.1922, ♂, (*Leon Cuetis*), (U.S.N.M.).

*Material Examined*: 2 ♀ paratypes and 7 ex.

*Distribution*: Napier, Queenstown, Glenorchy. (December, January, April).

### Family CANACEIDAE

Head large; subcranial cavity large; clypeus prominent. Proboscis large; palpi well developed. Arista pubescent or bare. Third antennal segment rounded. Three to five divergent fronto-orbitals; frontals present or absent; verticals strong; postverticals present or absent. Upper portion of face swollen. Vibrissa present. Four or more dorsocentrals; one humeral; one presutural. Costa broken at apex of subcosta but not at humeral cross vein; costa extends to fourth vein; subcosta separate from first vein almost to apex; second basal cell and discal cell separated; anal cell present; anal vein absent.

The canaceids are separated from the ephydriids by having complete second basal and anal cells; no break on costa near humeral cross vein and the subcosta complete, and free from first vein.

*Genera Occurring in New Zealand*: *Macrocanace* Tonnoir and Malloch

Originally the New Zealand members of the family were placed in the Ephydriidae. It has been common to have the family regarded as a subfamily of the Ephydriidae (Tonnoir and Malloch, 1926a) but many authors now regard the relationship with the Ephydriidae to be such that full family ranking should be accorded to the canaceids, (Wirth, 1951, Wheeler, 1952, Harrison, 1953b).

### Genus MACROCANACE Tonnoir and Malloch

*Macrocanace* Tonnoir and Malloch, 1926. Rec. Cant. [N.Z.]  
Mus. 3 : 5.

Three strong fronto-orbitals; ocellar bristles long. Face concave with small median carina. Four or 5 dorsocentrals; 2 pairs scutellars; mesopleuron and sternopleuron with bristles. First vein haired on apical half.

*Type Species*: *Macrocanace littorea* (Hutton)

An endemic New Zealand genus containing the largest species in the family. Separated from other genera by the presence of hairs on the apical half of first vein.

*Distribution*: New Zealand.

Species:

*Macrocanace australis* (Hutton)

*M. littorea* (Hutton)

Species occur only on the subantarctic islands of New Zealand.

KEY TO SPECIES OF MACROCANACE

Postverticals absent ..... *littorea*  
Postverticals present ..... *australis*

**Macrocanace littorea** (Hutton). Figs. 298, 299, 300

*Milichia littorea* Hutton, 1902. Trans. N.Z. Inst. 34 : 174.

*Macrocanace littorea* (Hutton): Tonnoir and Malloch, 1926.

Rec. Cant. [N.Z.] Mus. 3 : 5. Harrison, 1953. Trans. roy. Soc. N.Z. 81 : 274.

A dark grey fly having grey wings with brown areas. Body length 4-6 mm., wing length 3.5-5.0 mm.

MALE AND FEMALE

HEAD (Fig. 299): Arista brown, basal segment blackish-brown; very weakly pubescent, rays less than diameter of axis. Antenna blackish-brown; 2nd segment with strong dorsal apical bristles and minute hairs elsewhere; basal segment with strong hairs. Front blackish-brown with golden-brown tomentum; orbits narrowly light grey at eye margin; ocellar area raised above level of front and darker than front. Anterior two fronto-orbitals proclinate, posterior bristle distinctly divergent over eyes; ocellars and verticals strong; postverticals absent; fine hairs on orbits and ocellar area. Face black with heavy grey tomentum. Cheeks greyish-brown

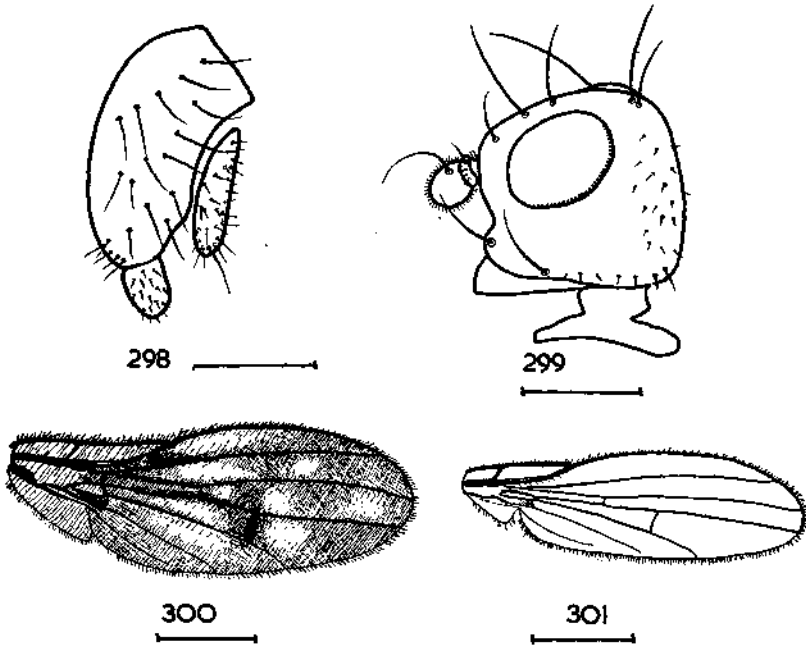


Fig. 298. External male genitalia of *Macrocanace littorea*

„ 299. Head of *M. littorea*

„ 300. Wing of *M. littorea*

„ 301. „ „ *M. australis*

Scale: Fig. 298, 0.25 mm.; Fig. 299, 0.5 mm.; Figs. 300, 301, 1.0 mm.

merging to blackish-brown posteriorly all with thick tomentum. Two strong bristles posterior to vibrissa; fine hairs on ventral margin of cheek and small bristles at lower posterior corner. Occiput greyish-brown. Eyes bare. Vertical diameter of eye about twice width of cheek in same axis. Proboscis reddish-grey; palpi with fine hairs.

**THORAX:** Mesonotum heavily grey dusted; golden-brown longitudinal vittae, 1 median, 1 on each dorsocentral row, and a broad irregular one on presutural and supraalar line; pleura grey. No prescutellars; 3 postsutural and 1 presutural dorsocentrals; parallel basal scutellars equal to cruciate apicals; scutellum haired laterally; 2 notopleurals; 1 supraalar; 2 postalars; 1 mesopleural, and hairs; 1 sternopleural; 1 propleural; prosternum bare.

Legs grey. Fore femur with bristles on postero-dorsal and postero-ventral surfaces; mid tibia with ventral apical; hind femur with anterior bristle at about apical quarter; basal segment of all tarsi about equal to length of other four segments.

Wings (Fig. 300) grey with brown areas; veins brown. Costa with short fine dorsal hairs, short black anterior spines, strongest basal to 1st vein and at this position in 2 rows, short stout black spines ventrally, ending about third distance between apices of 2nd and 3rd veins. Anal vein reaching wing margin; axillary vein faint to wing margin. Wing indices: costal about 4.0; 4th vein about 2.1; 4c about 0.8; 5x about 1.1.

Halteres yellow, reddish-yellow basally.

**ABDOMEN:** Greyish-brown. Second tergite broad; 1st tergite well haired, other tergites sparsely haired in females. Basal tergite broad and sparsely haired and other tergites in male with posterior marginal bristles.

Male genitalia (Fig. 298): Genital arch dark brown, broad dorsally, narrowed ventrally, about 25 bristles on each side; anal plate not as heavily chitinised as arch and with shorter bristles than arch; clasper with rounded apex, apical half with minute spines. Penis elongate.

*Holotype:* ANTIPODES ISLANDS: on pools between tide marks, -i.1901, (F. W. Hutton), (Cant. Mus.).

*Material Examined:* Holotype, 104 ex.

*Distribution:* Antipodes Island, Bounty Islands. (November, January).

*Remarks:* The largest species of the genus. Separated from the other species by absence of postverticals and the presence of clear areas in the wing. Considered to breed in penguin dung and found in large numbers in association with penguin colonies and with other nesting birds.

### **Macrocanace australis** (Hutton). Fig. 301

*Ochtiphila australis* Hutton, 1902. Trans. N.Z. Inst. 34 : 174.

*Macrocanace australis* (Hutton): Tonnoir and Malloch, 1926.

Rec. Cant. [N.Z.] Mus. 3 : 5.

*Macrocanace antipoda* Harrison, 1953. Trans. roy. Soc. N.Z. 81 : 276. (*New Synonymy*)

A slender black fly with turbid wings. Body length 3 mm., wing length 3.5 mm.

#### MALE AND FEMALE

**HEAD:** Arista black, bare. Antenna blackish-brown; 2nd segment with dorsal bristle and small black hairs; basal segment with hairs. Front black with golden tomentum on orbits and margins of ocellar triangle. Anterior fronto-orbital smallest, posterior largest; ocellars and verticals strong; postvertical strong and convergent; small hairs on orbits and most of front. Face blackish-grey. Cheeks brownish-grey. Two strong bristles posterior to vibrissa; few hairs on ventral margin of cheek, strong hairs at lower posterior angle of cheek. Occiput blackish-grey. Eyes bare. Vertical diameter of eye about 2.3-2.8 times width of cheek in same axis. Proboscis greyish-brown.



THORAX: Mesonotum greyish-black with brownish-grey dusting; pleura greyish-black dusted. No prescutellars; 3 postsutural dorsocentrals, 1 presutural, and 1 on transverse suture; scutellum haired; 2 notopleurals, posterior one weak; 1 supraalar; 2 postalars; 1 strong mesopleural and a few weaker hairs close to it on posterior margin; 1 sternopleural; small propleural; prosternum bare.

Legs greyish-black. Fore femur with bristles on postero-dorsal and postero-ventral surfaces; mid tibia with ventral apical.

Wings (Fig. 301) evenly brown shaded; veins brown. Costa with very fine short dorsal hairs, strong black spines about equal to diameter of costa in 2 irregular rows on antero-dorsal surface; short stout spines ending just beyond apex of 2nd vein. Anal vein reaching or not quite reaching wing margin, axillary vein fading out before wing margin. Wing indices: costal about 3.8-4.4; 4th vein about 2.4-2.8; 4c about 0.8; 5x about 1.5.

Halteres pale yellow, stalks light brown.

ABDOMEN: Greyish-black. Basal segments broad and sparsely haired.

*Holotype*: CAMPBELL ISLAND: ♂, (*F. W. Hutton*), (Cawt. Inst.).

*Material Examined*: Holotype and 1 ♀.

*New Records*: ANTIPODES ISLANDS: Ringdove Bay, on shore, ex spider web, 5.xi.1950, 1 ♀, (*E. G. Turbott*), (Ak. Mus.).

*Distribution*: Campbell Island, Antipodes Islands. (November).

*Remarks*: A re-examination of the holotypes of *M. australis* and *M. antipoda* has revealed slight differences which are not now regarded as sufficient to retain the previous distinction between the two species. The chief variations are: the second antennal segment of *M. australis* has a weaker dorsal bristle than does *M. antipoda*; the cheek of *M. australis* is slightly wider than that of *M. antipoda*; the legs of *M. australis* are lighter in colour than *M. antipoda*; the costal index and the 4th vein index are smaller in *M. australis* than in *M. antipoda*; the anal vein in *M. australis* reaches the wing margin whereas this vein ends just before the wing margin in *M. antipoda*. These differences are considered to be either differences between sexes or individual variations in the same species.

#### Family SPHAEROCERIDAE

Arista long, arising terminally or dorsally; bare or pubescent. Antennae short; third segment about as long as wide. Postverticals convergent, often reduced or absent; fronto-orbitals strong. Face usually concave. Vibrissa present. Basal segment of hind tarsus usually short and incrassate. Costa broken near humeral cross vein and apex of first vein.

Recognised most readily by the thickened basal segment of the hind tarsus. One New Zealand genus, *Protoborborus*, has a normal tarsal segment and can be recognised by the short antenna, long arista and characters of the wing.

*Genera Occurring in New Zealand*:

*Howickia* Richards

*Leptocera* Olivier

*Protoborborus* Malloch

*Sphaerocera* Latreille

Previous work on the New Zealand representatives of this family has been extremely meagre. Three species have been described from New Zealand and two other species recorded. Of those previously described,

two, *Howickia trilineata* (Hutton) and *Protoborborus neozelandicus* (Malloch), are endemic, and the other, *Leptocera empirica* (Hutton), is of world-wide distribution.

Many species of this family are practically world wide in distribution and it is thus not surprising that many such species are now recorded from New Zealand.

KEY TO GENERA OF SPHAEROCERIDAE IN NEW ZEALAND

- 1 Wings absent ..... HOWICKIA (p. 253)
- Wings present ..... 2
- 2 Basal segment of hind tarsus incrassate ..... 3
- Basal segment of hind tarsus normal ..... PROTOBORBORUS (p. 254)
- 3 Fourth and 5th veins reaching wing margin ..... SPHAEROCERA (p. 255)
- Fourth and 5th veins not reaching wing margin, not pigmented much beyond posterior cross vein ..... LEPTOCERA (p. 259)

Genus HOWICKIA Richards

*Howickia* Richards, 1951. Ruwenzori Exped. 1934-5, 11 (8) : 844.

Ocellars and verticals present; other frontal bristles weak or absent. Eyes large and bare with a distinct emargination anterodorsally. Mesonotum just broader than head, about 1.5 times as broad as long; scutellum with posterior margin almost straight. One dorsocentral; 1 strong sternopleural; 2 pairs of marginal scutellars. Mid tibia with set of dorsal bristles. Wings absent. Halteres normal. Abdomen nearly circular; margins of tergites sharp edged but not raised, deflexed; sternites broad.

Type Species: *Howickia trilineata* (Hutton)

Separated from other known genera in New Zealand by the absence of wings. The generic synopsis is a modification of the original one by Richards (1951).

Distribution: New Zealand.

Species: *Howickia trilineata* (Hutton)

**Howickia trilineata** (Hutton). Fig. 302

*Apterina trilineata* Hutton, 1901. Trans. N.Z. Inst. 33 : 93.

*Howickia trilineata* (Hutton): Richards, 1951. Ruwenzori Exped. 1934-5, 11 (8) : 844.

A shining black species without wings. Body length about 2.0 mm.

MALE AND FEMALE

HEAD (Fig. 302): Arista brown; rays of pubescence about equal to diameter of basal segment. Antenna brown; 2nd segment with distinct apical bristles and hairs and a distinct preapical dorsal bristle; basal segment with 1 small but distinct apical. Front brown with 3 longitudinal silvery-grey stripes, 1 median and 1 on inner margin of each orbit. Ocelli present and ocellar area normal in females; ocelli absent and ocellar area reduced in males. Fronto-orbitals absent, 2 fine frontals; ocellars strong; internal verticals strong, external verticals weak; post-verticals represented by short hairs. Face brown, concave, slightly carinate. Cheeks light brown. Small bristle on cheek near ventral margin about one-third length vibrissa, other cheek hairs and bristles absent. Occiput dark brown. Vertical diameter of eye about twice width of cheek in same axis. Proboscis brown; palpi brown and club shaped.

THORAX: Shining black. Prescutellars absent; basal scutellars parallel and about two-thirds length of apicals; 1 strong humeral; 1 strong notopleural; 1 strong prealar; 1 large postalar; 1 small and 1 weak sternopleural.

Legs blackish-brown; apices of coxae, all trochanters, apices of femora, bases of tibiae and all segments of mid and hind tarsi, light brown; fore tarsus yellowish-white. Fore femur with small bristles on postero-dorsal and apical half of postero-ventral surfaces; mid tibia with 1 strong bristle at basal third and about 3 bristles at apical third of dorsal surface and 1 ventral apical bristle; hind tibia without preapical or apical.

Halteres blackish-brown.

ABDOMEN: Shining black.

*Holotype*: AUCKLAND: Howick, ex leaves on ground, no date, ♀, (*Capt. Brown*), (*Cant. Mus.*).

*Material Examined*: Holotype, 2 ♂, and 7 ♀. (1 ♂ and 2 ♀ are in the B.M.).

*Distribution*: Howick.

*Remarks*: The only apterous member of the family found in New Zealand and hence readily separated from others. Hutton (1901) states that the species was found on the ground and was capable of jumping. There are minor differences between sexes as given in the above description and the most important is the presence of ocelli in females and their absence in males.

### Genus PROTOBORBORUS Malloch

*Protoborborus* Malloch, 1933. *Stylops* 2 (ii) : 261.

All frontal bristles well developed; three fronto-orbitals. Face with slight carina and with a few hairs at this area. One bristle on cheek, dorsal to vibrissa. Four dorsocentrals, 1 of them presutural; 2 pairs of marginal scutellars; 1 sternopleural. Basal segment of hind tarsus not incrassate. Subcosta weak apically and almost fused with 1st vein; anal cell small with nearly obsolete enclosing cross vein; cross vein between discal and 2nd basal cell incomplete.

Type Species: *Protoborborus neozelandicus* Malloch

An aberrant genus, and, as Malloch (1933c) states, difficult to place in the correct family. Readily separated from other New Zealand genera by the absence of a thickened basal segment of the hind tarsus.

*Distribution*: New Zealand.

*Species*: *Protoborborus neozelandicus* Malloch

### *Protoborborus neozelandicus* Malloch. Figs. 303, 307

*Protoborborus neozelandicus* Malloch, 1933. *Stylops*, 2 : 262.

A brown and yellowish-brown somewhat shining species with clear wings. Body length about 2.75 mm., wing length about 2.75 mm.

#### MALE

HEAD (Fig. 303): Arista long, rays of pubescence longer than width of basal segment. Antenna brown, not decumbent; 3rd segment circular; 2nd segment with 1 strong dorsal apical bristle and strong hairs on apical margin, those at ventral region of apical margin very strong; basal segment with strong hairs on inner and dorsal apical margins. Front somewhat shining brown, yellowish-brown anteriorly. Anterior fronto-orbital bristle about two-thirds length of middle bristle and about half length of posterior bristle; ocellars strong and divergent; postverticals cruciate; all verticals strong; small fine hairs on most of anterior half of front. Face yellowish-brown; carinate on dorsal half between antennae. Cheeks shining yellowish-brown. Strong hairs on cheek, 1 stronger than the rest placed near vibrissa and about one-third length of vibrissa; about 3 bristles at lower posterior corner of cheek each about half length of vibrissa. Occiput brown.

Eyes bare. Vertical diameter of eye about 5 times width of cheek in same axis. Proboscis yellowish-brown; palpi brown and with strong black hairs on most of surface.

**THORAX:** Mesonotum dark brown with trace of dusting; pleura brown also with faint dusting. Prescutellars about half length of posterior dorsocentrals; anterior three dorsocentrals approximately equal and about three-quarters length of posterior dorsocentral; some enlarged acrostichal hairs about regions of transverse suture; basal scutellars about half length of cruciate apicals; scutellum bare; 1 humeral; 1 presutural; 2 notopleurals; 1 interalar; 1 supraalar; 2 postalars; some fine sternopleural hairs; 1 propleural; other pleura bare.

Legs brown; coxae, trochanters, and base of all femora yellowish-brown. Fore femur with strong bristles postero-dorsally and on apical half of postero-ventral surface; fore tibia with small dorsal preapical; mid tibia with small preapical and strong ventral apical; hind femur with 1 bristle at apical quarter of antero-dorsal surface; hind tibia with small dorsal preapical.

Wings (Fig. 307) clear; veins light brown. Costa with pair of strong bristles near base and at apex of 1st vein; short black costal spines ending at apex of 2nd vein; costa extending to 4th vein; 2nd basal cell and discal cell united; subcosta merging with 1st vein at apex; 5th vein not reaching wing margin; anal vein fading out before reaching wing margin. Wing indices: costal about 7.75; 4th vein about 4.5; 4c about 0.9; 5x about 1.5.

Halteres pale yellow distally, light brown basally.

**ABDOMEN:** Blackish-brown with distinct dusting on basal six tergites; 7th tergite and external genitalia with very faint dusting.

*Holotype:* WANGANUI: no date, ♂, (M. N. Watt), (B.M.).

*Paratype:* OTIRA: 10.ii.1922, ♂, (A. L. Tonnoir), (Cant. Mus.).

*Material Examined:* Holotype and paratype.

*Distribution:* Wanganui, Otira. (February).

*Remarks:* The holotype is a ♂, not a ♀ as Malloch (1933c) records.

## Genus SPHAEROCERA Latreille

*Sphaerocera* Latreille, 1804. "Hist. Nat. Crust. Insect." 14 : 394.

Chaetotaxy reduced or lacking. No external vertical bristle; postverticals reduced. Mesopleuron with patch of short bristles; propleuron with 1 or 2 hairs; metapleuron produced to a blunt process; scutellum without marginal bristles, sometimes denticulate and its surface covered with scale-like hairs. Mid tibia without bristles; hind tibia with an apical curved spine extending under the basal segment of the hind tarsus. Fourth and 5th veins reaching wing margin; distal section of 5th vein longer than posterior cross vein; costa extends to apex of 4th vein; anal cell present and enclosed by cross vein.

Type Species: *Sphaerocera curvipes* Latreille

Recognised by the complete wing venation and particularly in having the 4th and 5th veins reaching the wing margin. The spine on the hind tibia and the reduction of the chaetotaxy are also useful characters in separating this genus from others.

*Distribution:* World wide.

*Subgenera Occurring in New Zealand:*

*Lotobia* Lioy

*Sphaerocera* Latreille

Probably not indigenous to New Zealand as the species known to occur in this country are world wide in distribution and are probably immigrants.

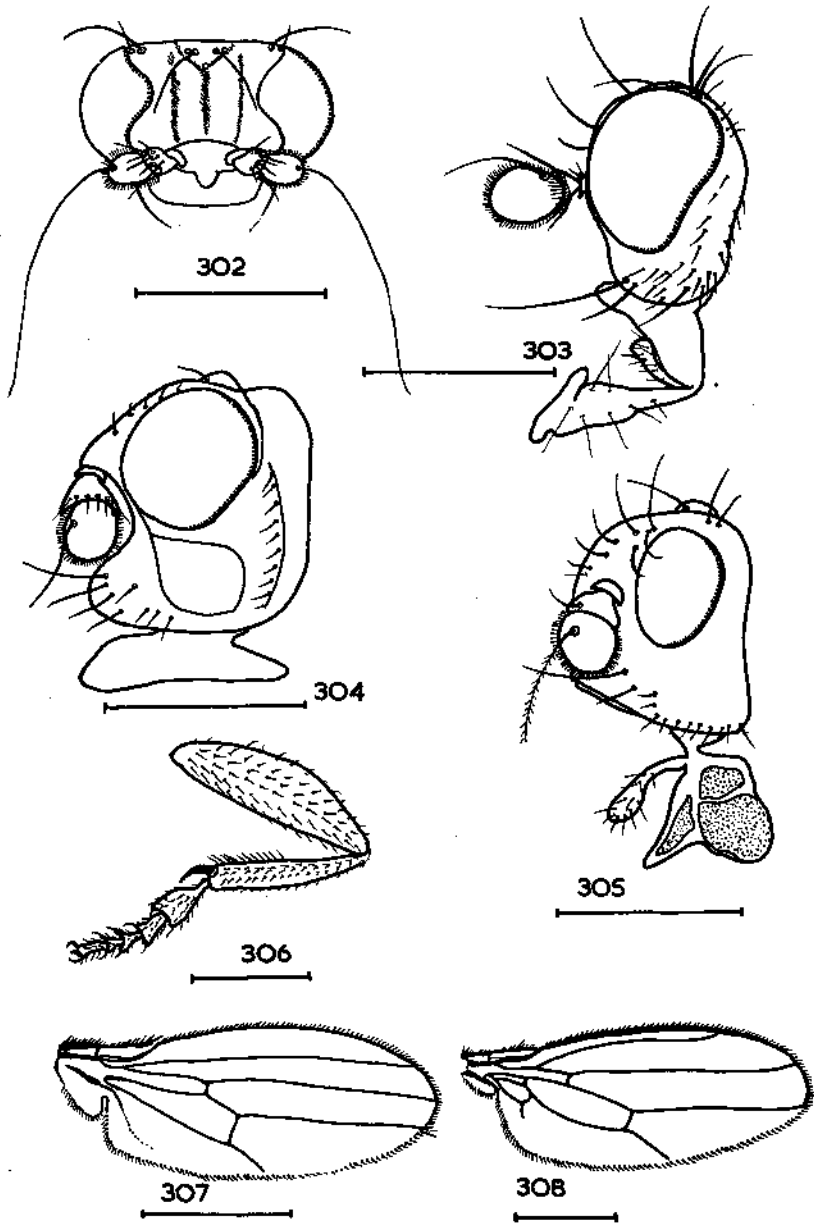


Fig. 302. Head of *Howickia trilineata* (female)  
 " 303. " " *Protoborborus neozelandicus*  
 " 304. " " *Sphaerocera curvipes*  
 " 305. " " *Leptocera empirica*  
 " 306. Hind leg of *Sphaerocera curvipes*  
 " 307. Wing of *Protoborborus neozelandicus*  
 " 308. " " *Sphaerocera pusilla*

Scale: Figs. 302-305, 308, 0.5 mm.; Figs. 306, 307, 1.0 mm.

KEY TO SUBGENERA OF SPHAEROCERA

Scutellum without marginal tooth-like spines ..... SPHAEROCERA (p. 257)  
Scutellum with distinct marginal tooth-like spines ..... LOTOBIA (p. 258)

Subgenus SPHAEROCERA Latreille

*Sphaerocera* Latreille, 1804. "His. Nat. Crust. Insect." 14 : 394.

Antennal fossae not enclosed ventrally. Mesonotum with very fine hair-like bristles. Scutellum without marginal tooth-like spines. Prealar callus not produced into a spine.

Type Species: *Sphaerocera (Sphaerocera) curvipes* Latreille

The sole New Zealand species belongs to the *curvipes* group of species and is the only member of the group. The group is distinguished by having the prealar callus strongly convex, the notopleural and prealar bristles short and stout, the mesopleuron and pteropleuron with patches of short bristles, and the hind femur, particularly in males, thick.

*Distribution*: World wide.

*Species Occurring in New Zealand*:

*Sphaerocera (Sphaerocera) curvipes* Latreille

**Sphaerocera curvipes** Latreille. Figs. 304, 306

*Sphaerocera curvipes* Latreille, 1804. "Hist. Nat. Crust. Insect."  
14 : 394.

A predominantly black fly with light brown wings. Body length 3.5 mm., wing length about 3.0 mm.

MALE

HEAD (Fig. 304): Arista dark brown, long, fine, and bare. Antenna brown; 3rd segment about twice as broad as long; 2nd segment dark brown with short light brown bristles mainly on apical margin; basal segment short and with 1 short light brown bristle. Front dull blackish-brown. All frontal bristles minute or absent; ocellars, one vertical and row of convergent frontals discernible, the two anterior pairs of frontals directed forwards. Face dull blackish-brown with brown area between bases of antennae; antennal fossae deep and separated by an irregular carina more prominent dorsally. Cheeks black, genal plate pitted and more shiny than rest of cheek. Fine brown vibrissa present and row of brown hairs from vibrissa to posterior corner of cheek. Occiput dull black and produced to small knob at region of vertical bristles. Eyes bare. Vertical diameter of eye about 1.3 times width of cheek in same axis. Proboscis brown.

THORAX: Dull blackish-brown; mesopleural suture light brown; prosternum light brown; humeri prominent; scutellum broader than long. Bristles of thorax, if present, much reduced; those bristles distinguishable being 2 notopleurals; 2 postalar and 1 propleural.

Legs (Fig. 306) dark brown; coxae and trochanters light brown. Hind femur enlarged and about twice diameter of other femora. Mid tibia with only small apical bristle; basal segment of hind tarsus just longer than, and at apex about twice as wide as, 2nd segment.

Wings light brown; veins light brown. Costa weakened at humeral cross vein and broken at 1st vein. Costal index about 2.0.

Halteres light brown.

ABDOMEN: Dull greyish-black.

*Holotype*: Europe.

*Material Examined*: 1 ♂.

*New Records*: AUCKLAND: Green Lane, on compost, 17.x.1948, 1 ♂, (K. P. Lamb), (P.D.D.).

*Distribution in New Zealand:* Auckland. (October).

*Remarks:* Not previously known to occur in New Zealand. It has almost a world-wide distribution. Recognised by its size and the strong spine on the hind tibia. Separated from *S. pusilla*, the other species of the genus known to occur in New Zealand, most readily by its size. Often referred to as *S. subsultans* (Linn.) but the type of that species has been shown to be a phorid (Malloch 1925).

#### Subgenus LOTOBIA Lioy

*Lotobia* Lioy, 1864. Atti Ist. veneto (3) 9 : 1114-26.

Antennal fossae enclosed ventrally by the epistome. Mesonotum with short thick scale-like hairs. Scutellum with distinct marginal tooth-like spines. Prealar callus and prealar bristle fused together into a stout spine-like process.

Type Species: *Sphaerocera pallidiventris* (Meigen)

*Distribution:* World wide.

*Species Occurring in New Zealand:* *Sphaerocera (Lotobia) pusilla* (Fallén)

Two groups of species have so far been recognised. *S. pusilla* belongs to the *pusilla* group which is characterised by having the scutellum with about nine marginal tooth-like spines and the fourth vein curved slightly posteriorly at apex.

#### *Sphaerocera pusilla* (Fallén). Fig. 308

*Copromyza pusilla* Fallén, 1820. "Dipt. Suec. Heteromyz." p. 5.

*Heteroptera pusilla* (Fallén): Macquart, 1835. "(Roret, Suite à Buffon) Diptères" 2 : 570.

*Borborus crenata* Meigen, 1838. "Syst. Besch. Zweifl. Insekt." 7 : 407.

*Sphaerocera scabricula* Haliday, 1836. Ent. Mag. 3 : 320.

*Copromyza crenata* (Meigen): Zetterstedt. "Dipt. Scand." 6 : 2489.

*Sphaerocera pusilla* (Fallén): Stenhammar, 1855. "Coprom. Scand." p. 177. Cottier, 1933, N.Z.J.Sci. Tech. 14 : 142.

A blackish-brown species with light brown legs and without normal bristles. Body length about 2.0 mm., wing length about 1.75 mm.

#### MALE AND FEMALE

**HEAD:** Arista long, dark brown; microscopic pubescence of few hairs, much shorter than diameter of arista stalk and only visible under high power. Antenna directed laterally and lying deep within their fossae, blackish-brown; 3rd segment covered with whitish pile; 2nd segment equal to 3rd in length and with thick short white hairs; basal segment minute. Front blackish-brown heavily punctured. All bristles of front short, thick, and opaque; 3 fronto-orbitals, row of convergent frontals on either side from level of anterior ocellars to anterior margin, the anterior bristle about twice as long as the rest. Face blackish-brown heavily punctured, antennal fossae distinct from face; labrum large and punctured. Cheeks shining blackish-brown slightly punctured. Vibrissa and the few long hairs posterior to it opaque, small opaque hairs on cheek in row to posterior lower corner. Occiput blackish-brown and punctured medianly; slightly raised, greyish-black areas with short opaque hairs on either side behind eyes. Eyes bare. Vertical diameter of eye about 1.5 times width of cheek in same axis. Proboscis light brown.

**THORAX:** Blackish-brown; pleura lighter ventrally, prosternum light brown. Mesonotum without distinct bristles but with short opaque hairs on whole surface

except for a pair of narrow bare stripes from anterior margin diverging to lateral corners of scutellum; scutellum with similar hairs on disc, about 8 short tooth-like spines on apical margin; scutellum twice as wide as long; no sternopleurals or other well developed thoracic bristles.

Legs light brown; tibiae and tarsi brown to dark brown; swollen basal segment of hind tarsus about one and a half times length of 2nd segment.

Wings (Fig. 308) clear; veins light brown. Short hairs on costa, no spines. Costal index about 2.4.

Halteres light brown.

**ABDOMEN:** Blackish-brown tergites with narrow brown lateral margins.

External male genitalia: Genital arch prominent, spherical, brown, and with about 15 short hairs over surface on either side; anal plate small and with 4 short bristles and several small hairs; clasper elongate, wide, distinctly rounded at apex, and with small hairs over most of surface.

*Holotype:* Europe.

*Material Examined:* 2 ♂ and 2 ♀.

*New Records:* AUCKLAND: Mangere, 28.xii.1948, 1 ♂, (K. P. Lamb), (P.D.D.).

*Distribution in New Zealand:* Mangere, Palmerston North. (December, March).

*Remarks:* Although only two records are known from New Zealand, it is probable that this species is more widespread in this country. Readily distinguished from *S. curvipes* by its small size.

### Genus LEPTOCERA Olivier

*Leptocera* Olivier, 1813. Mém. Soc. Agric. Seine 16 : 489.

External and internal verticals present; postverticals present. Propleuron with 1 or 2 small hairs. Hind tibia without apical spine, curved below basal segment of hind tarsus. Fourth and 5th veins not reaching wing margin and not pigmented much beyond the posterior cross vein; anal vein only slightly pigmented; anal cell absent.

Type Species: *Leptocera nigra* Olivier

The genus is distinguished and separated from other genera by the wing venation, viz.: the 4th and 5th veins do not reach the wing margin and are not pigmented much beyond the posterior cross vein.

*Distribution:* World wide.

*Subgenera Occurring in New Zealand:*

*Coproica* Rondani

*Leptocera* Olivier

*Limosina* Macquart

*Rachispoda* Lioy

*Thoracochaeta* Duda

The largest genus of the family. The majority of the species recorded from New Zealand are widely distributed throughout the world and are probably immigrants to this country. The new species described may not be endemic species and may later be shown to have a range extending beyond New Zealand.

#### KEY TO SUBGENERA OF LEPTOCERA IN NEW ZEALAND

- 1 Scutellum distinctly and strongly haired over whole of dorsal surface ..... COPROICA (p. 260)  
Scutellum bare or with a few hairs and bristles near apical lateral margins of dorsal surface ..... 2



2	Scutellum with 6 to 8 marginal bristles .....	3
	Scutellum with 4 marginal bristles .....	4
3	Anterior dorsocentral bristle directed medianly .....	RACHISPODA (p. 262)
	Anterior dorsocentral bristle directed posteriorly .....	LEPTOCERA (p. 263)
4	One to 3 postsutural and no presutural dorsocentrals ....	LIMOSINA (p. 265)
	Three or 4 postsutural and 1 or 2 presutural dorsocentrals, latter directed medianly .....	THORACOCOAETA (p. 277)

### Subgenus COPROICA Rondani

*Heteroptera* Macquart, 1835. "(Roret, Suite à Buffon) Diptères"  
2 : 570.

*Coproica* Rondani, 1861. "Dipt. Ital. Prodr." 4 : 10. (n.n. pro.  
*Heteroptera* Macquart).

All postverticals strong. Cheek hairs small. One dorsocentral; usually 6 to 8 rows of acrostichal hairs; more than 1 sternopleural; scutellum distinctly and strongly haired on dorsal surface. Mid tibia with bristles at intervals on dorsal or antero-dorsal surfaces, a mid ventral bristle and a small ventral apical; mid tarsus with some ventral bristles.

Type Species: *Leptocera (Coproica) pusilla* (Meigen)

Distribution: World wide.

Species Occurring in New Zealand:

*Leptocera (Coproica) ferruginata* (Stenhammar)

*L. (Coproica) hirtula* (Rondani)

Remarks: Two of the three recognised groups of species occur in New Zealand.

1. *ferruginata* group. Characterised by having a costal index of about 2.0; the costa with long bristles on basal section; one humeral and three sternopleurals; mid tibia with three sets of dorsal bristles. The only species of the group is *L. ferruginata*.

2. *lugabris* group. Characterised by having a costal index less than 1.0; the costa without long bristles on basal section; more than one humeral; mid tibia with three sets of dorsal bristles, the basal two sets containing only one strong bristle. Includes *L. hirtula*.

#### KEY TO SPECIES OF THE SUBGENUS COPROICA IN NEW ZEALAND

Costal index about 2.0 .....	<b>ferruginata</b>
Costal index about 1.0 .....	<b>hirtula</b>

#### ***Leptocera ferruginata* (Stenhammar). Fig. 309**

*Limosina ferruginata* Stenhammar, 1854. K. svenska  
VetenskAkad. Handl. p. 257-442.

*Leptocera ferruginata* (Stenhammar): Richards, 1930. Proc.  
zool. Soc. p. 307.

A dark brown species with blackish-brown abdomen, brown or light brown regions about most thoracic sutures and light brown head. Body length about 2.0 mm., wing length about 1.75 mm.

#### FEMALE

HEAD: Arista blackish-brown; rays of pubescence about twice width of basal segment. Antenna dark brown; 3rd segment light reddish-brown basally; 2nd segment with strong apical bristles particularly on inner margin and 1 preapical dorsal; basal segment with short black hairs on apical margin. Front dark brown merging to light golden-brown anteriorly, more particularly on anterior of fronto-orbits. Frontal bristles strong; inner postverticals stronger than outer postverticals;

anterior fronto-orbital stronger than posterior; 4 strong convergent frontals; row of short hairs from area median to fronto-orbitals to close to eye on anterior region of orbits. Face light brown, concave with weak carina dorsally. Cheeks brown. Row of black hairs on or very close to ventral margin of cheek and a row of similar hairs dorsal to this row, the anterior hair of this row large and about two-thirds length of vibrissa; lower posterior angle of cheek with 1 bristle about half length of vibrissa. Occiput blackish-brown. Eyes bare. Vertical diameter of eye about twice width of cheek in same axis. Proboscis blackish-brown; palpi yellowish-brown.

**THORAX:** Mesonotum dark brown dorsally merging to brown at lateral margins; scutellum dark brown, brown or light brown at basal lateral areas; mesopleuron blackish-brown posteriorly, light brown anteriorly; propleuron light brown; other pleura dark brown and usually with light brown or brown dividing sutures. Four prescutellar acrostichal bristles; divergent basal scutellars long and shorter than apicals; 1 strong dorsal and 1 short ventral humeral; 2 notopleurals; 1 supraalar; 1 strong postalar; 3 strong sternopleurals; 2 propleurals.

Legs dark brown; coxae and trochanters light brown, tarsi brown. Fore femur with bristles on postero-dorsal surface and apical half of postero-ventral surface; mid femur with 1 strong anterior preapical; hind tibia with a preapical dorsal bristle.

Wings (Fig. 309) smoky; veins light brown, costa brown. Basal section of costa with strong bristle; costa extending beyond apex of 3rd vein. Costal index about 2.0.

Halteres yellowish-brown with light reddish-brown apical knob.

**ABDOMEN:** Strongly bristled laterally; tergites blackish-brown. Genital plates shining blackish-brown.

*Holotype:* Europe.

*Material Examined:* 1 ♀.

*New Records:* AUCKLAND: Ellerslie, racecourse nursery, swept from chrysanthemums, 17.xii.1953, 1 ♀, (K. A. J. Wise), (P.D.D.).

*Distribution in New Zealand:* Auckland. (December).

*Remarks:* Not previously recorded from New Zealand.

### **Leptocera hirtula** (Rondani). Fig. 310

*Limosina hirtula* Rondani, 1880. Boll. Soc. ent. ital. 12 : 24, 40.

*Leptocera hirtula* (Rondani): Richards, 1930. Proc. zool. Soc. p. 308.

A blackish-brown species with milky wings. Body length about 1.5 mm., wing length about 1.25 mm.

#### FEMALE

**HEAD:** Arista brown, dark brown basally; rays of pubescence about twice width of basal segment. Antenna brown; 2nd segment with distinct apical bristles and 1 distinct preapical dorsal; basal segment with an inner and several dorsal bristles. Front blackish-brown. Inner and outer postverticals about equal; 2 strong posterior fronto-orbitals; 4 or 5 strong frontals; ocellars and verticals strong. Face brown to dark brown, concave with slight carina. Cheeks brown. Row of hairs along ventral cheek margin and also above the margin, the anterior hair in latter row enlarged and about half length of vibrissa; no distinct enlarged hair or bristle at lower posterior angle of cheek. Occiput blackish-brown. Eyes bare. Vertical diameter of eye about 3 times width of cheek in same axis. Proboscis brown; palpi light brown.

**THORAX:** Blackish-brown with most sutures brown. Prescutellars present, acrostichal hair lateral to each prescutellar, enlarged; divergent basal scutellars about two-thirds divergent apicals; 2 strong humerals; 1 presutural; 2 notopleurals; 1 supraalar; 1 postalar; 1 strong and 1 weak sternopleural; 1 small propleural.

**Legs:** Coxae and trochanters yellowish-brown; femora and tibiae brown; tarsi light brown. Fore femur with small bristles; mid femur with an anterior apical bristle.

Wings (Fig. 310) milky; veins light brown; costa brown. Small hairs on basal section of costa; costa extending beyond apex of 3rd vein. Costal index about 0.9. Halteres yellowish-brown.

ABDOMEN: Blackish-brown. Genital plates blackish-brown each ending in 2 long hairs.

*Holotype*: Europe.

*Material Examined*: 1 ♀.

*New Records*: AUCKLAND: Avondale, 1.i.1950, 1 ♀, (R. A. Harrison), (P.D.D.).

*Distribution in New Zealand*: Auckland. (January).

*Remarks*: Recognised by the milky wings and covering of hairs on scutellum, and separated from *L. ferruginata* by the low costal index and small bristles on basal costal section. Not previously recorded from New Zealand.

### Subgenus RACHISPODA Lioy

*Rachispoda* Lioy, 1864. Atti Ist. veneto 3 : 1116.

Inner postverticals weak. One strong bristle on cheeks posterior to vibrissa. Three postsutural and 1 to 3 presutural dorsocentrals, anterior dorsocentral curved towards centre line of mesonotum; 6 to 8 marginal scutellars; 2 strong humerals; 2 sternopleurals. Mid trochanter with a strong, dorsally directed bristle; mid tibia with 3 sets of dorsal bristles, a mid ventral and preapical ventral bristle; basal segment of mid tarsus with a mid ventral bristle. Costa with strong bristles on basal section.

Type Species: *Leptocera (Rachispoda) limosa* (Fallén)

Separated from other subgenera of the genus *Leptocera* by the strong incurved anterior presutural dorsocentrals, the six or eight marginal scutellars, the strong bristle on the mid trochanter, and the strong bristles on the costa.

*Distribution*: World wide.

*Species Occurring in New Zealand*: *Leptocera (Rachispoda) fuscipennis* Haliday

### *Leptocera fuscipennis* (Haliday)

*Borborus fuscipennis* Haliday, 1833. Ent. Mag. 1 : 178.

*Limosina fuscipennis* (Haliday): Haliday, 1836. Ent. Mag. 3 : 326.

*Leptocera fuscipennis* (Haliday): Richards, 1930. Proc. zool. Soc. p. 286.

A brown species dusted with grey, and with slightly opaque wings. Body length about 1.75–2.0 mm., wing length about 1.75 mm.

#### MALE AND FEMALE

HEAD: Arista brown; rays of pubescence greater than diameter of basal segment. Antenna brown; 3rd segment lighter brown; 2nd segment with 2 dorsal preapical bristles and strong hairs about apical margin; basal segment with apical hairs. Front dark brown with grey dusted stripes on orbits, on line of frontals, and on mid longitudinal line. Two strong divergent fronto-orbitals and small hairs on orbits; 3 strong and 1 weak anterior convergent frontals; ocellars strong; verticals strong; outer postverticals stronger than inner postverticals. Face dark brown; carina broad. Cheeks brown, light brown ventrally. The strong bristle near middle of cheek about three-quarters length of vibrissa; cheeks bare dorsally. Occiput brown with heavy grey dusting. Eyes bare. Vertical diameter of eye

about 2.3 times width of cheek in same axis. Proboscis light brown; palpi yellowish-brown with 2 strong apical black hairs.

**THORAX:** Brown to dark brown with light dusting of grey. Prescutellars present and about half length of posterior dorsocentrals; 3 presutural dorsocentrals, middle bristle of these very weak, anterior bristle strong and directed to mid line of mesonotum; strong divergent apical scutellars just longer than divergent basals, a weak marginal bristle, about half length of basal scutellar, between each apical and basal bristle; disc of scutellum bare in a wide median longitudinal band, elsewhere hairs, and a bristle near middle of each margin of the bare median band; 1 presutural; 2 notopleurals; 1 or 2 weak presutural interalar; 1 supraalar; 2 strong and 1 weak postalar; prosternum bare.

Legs light brown and yellowish-brown. Fore femur with bristles on postero-dorsal and apical half of postero-ventral surfaces; mid femur with a short stout blunt spine at base of ventral surface in males, short stout bristles on apical two-thirds of anterior surface and a strong apical bristle on anterior and on posterior surfaces; mid tibia with a pair of weak dorsal bristles at basal quarter, pair of strong bristles at basal third, a cluster of about 3 very strong bristles at apical third, and, in males, a cluster of very short black spines about the ventral preapical bristle; basal segment of mid tarsus with strong apical spurs.

Wings slightly opaque; veins light brown. Costa ending at apex of 3rd vein. Costal index about 1.6.

Halteres yellowish-brown.

**ABDOMEN:** Brown.

*Holotype:* Europe.

*Material Examined:* 1 ♂, 2 ♀.

*New Records:* CHRISTCHURCH: 17.ii.1922, 1 ♂, 2 ♀, (*A. L. Tonnoir*), (Cant. Mus.).

*Distribution in New Zealand:* Christchurch. (February).

*Remarks:* Not previously recorded from New Zealand. Recognised by the presence of some hairs or bristles on the lateral regions of the scutellum, and the six marginal scutellar bristles.

### Subgenus LEPTOCERA Olivier

*Leptocera* Olivier, 1813. Mém. Soc. Agric. Seine 16 : 489.

Three postsutural and 2 or 3 presutural dorsocentrals, presutural ones directed posteriorly; 8 marginal scutellars; scutellum bare of hairs; large humerals; 2 sternopleurals. Mid tibia with alternating antero- and postero-dorsal bristles, a mid ventral and an apical ventral bristle; mid tarsus with a mid ventral on basal segment. Costa with long bristles on basal section.

Type Species: *Leptocera (Leptocera) nigra* Olivier

Readily separated from other subgenera known to occur in New Zealand by having eight scutellar bristles.

*Distribution:* World wide.

*Species Occurring in New Zealand:* *Leptocera (Leptocera) caenosa* (Rondani)

### *Leptocera caenosa* (Rondani)

*Limosina caenosa* Rondani, 1880. Boll. Soc. ent. ital. 12 : 3-45.

*Leptocera caenosa* (Rondani): Richards, 1930. Proc. zool. Soc. p. 284.

A blackish-brown species. Body length about 2.75-3.0 mm., wing length about 2.75 mm.

#### MALE AND FEMALE

**HEAD:** Arista blackish-brown; pubescent, most rays of pubescence at least twice diameter of arista at base. Antenna blackish-brown; 3rd segment short, bulbous, as long as wide; 2nd segment about as long as 3rd with strong hairs or bristles about apex of inner lateral surface and near apex dorsally; basal segment short with few fine long hairs. Front completely dark brown or brownish-black. Two fronto-orbitals directed over eyes, anterior about four-fifths posterior; 4 convergent frontal bristles on either side, the posterior and anterior bristles weaker than middle two; ocellars and verticals strong; postverticals widely separated and convergent but not cruciate; black hairs just median to fronto-orbitals and posterior to ocellars to level of postverticals. Face dark brown with light brown ventral margin, scarcely carinate. Cheeks brown, merging to dark brown posteriorly. Strong vibrissa and 2 shorter but strong bristles just posterior to it, 1 directed ventrally, 1 dorsally; short hairs posterior to these bristles along ventral portion of cheek; 1 weak bristle at lower posterior corner of cheek. Occiput blackish-brown. Eyes bare. Vertical diameter of eye about twice width of cheek in same axis. Proboscis with rostrum light brown, haustellum dark brown; palpi short and relatively wide with short very narrow basal stalk, about 3 short apical bristles and fine hairs on rest of surface.

**THORAX:** Blackish-brown; mesonotum not shining but dusted; mesopleuron, dorsal to fore coxa light brown; anterior and ventral margins of pteropleuron light brown; prosternum brown. Prescutellars absent; presutural dorsocentrals small, almost as enlarged hairs; 2 humerals, dorsal bristle weak; 1 notopleural; 2 presuturals; 1 supraalar; 1 posterior interalar; 3 postalar, the middle bristle the weakest and outer anterior bristle the strongest; 1 strong and 1 weak sternopleural; 1 small propleural; other pleura bare; prosternum bare.

Legs dark brown, tibiae and tarsi brown. Fore femur with short bristles on postero-dorsal surface and strong bristles on apical third of postero-ventral surface; fore tibia without preapical and apical; mid femur with strong preapical anterior bristle; mid tarsus apical bristles on first four segments; hind tibia without preapical and with weak apical; basal segment of hind tarsus about two-thirds length 2nd segment and with posterior keel-like protruberance bordered with comb of hairs.

Wings shaded very light brown; veins light brown. Costal index about 1.4.

Halteres light brown.

**ABDOMEN:** Dark blackish-brown.

Male genitalia: Genital arch with strong hairs over most of posterior half, the ventral ones very strong; 1st clasper short, narrow, pointed, and directed posteriorly at apex, fine hairs on surface and stronger ones on apical section; secondary clasper almost square with a long fan-like projection, lightly chitinised apically, arising from anteroventral corner, some hairs on basal portion. Penis straight; parameres rod-like.

*Holotype:* Europe.

*Material Examined:* 21 ♂ and 28 ♀.

*New Records:* WAITAKERE RANGES: Titirangi, 13.xii.1953, 1 ♀, (C. R. Thomas), (P.D.D.). AUCKLAND: Avondale, 26.viii.1940, 2 ♀, (D. Spiller); 10.xii.1948, 1 ♀, (R. A. Harrison); Browns Bay, 30.x.1948, 2 ♀; ex compost, 14.xi.1948, 5 ♂, 12 ♀; 24.xi.1948, 3 ♀; 31.vii.1949, 1 ♀; 25.ix.1949, 1 ♂, 1 ♀; -.x.1949, 5 ♂, 1 ♀; 21.x.1949, 1 ♀; -.xi.1949, 2 ♂, 1 ♀; 18.xi.1949, 1 ♂; 24.xi.1949, 3 ♂, 2 ♀; 27.xi.1949, 1 ♂; 20.vii.1950, 1 ♂, (R. A. Harrison); Green Lane, ex compost, 17.x.1948, 1 ♂; 9.x.1949, 1 ♂, (K. P. Lamb), (P.D.D.).

*Distribution in New Zealand:* Waitakere Ranges, Auckland. (July to December).

*Remarks:* Belongs to the subgenus *Leptocera* and is the only representative of the subgenus so far found in New Zealand.

### Subgenus LIMOSINA Macquart

*Limosina* Macquart, 1835. "(Roret, Suite à Buffon) Diptères"  
2 : 571.

External verticals and external postverticals well developed. Cheek hairs fairly strong. One to 3 dorsocentrals all postsutural; scutellum bare; 2 pairs of marginal scutellars; at least 1 strong humeral; 1 strong sternopleural. Mid tibia with some dorsal bristles and a ventral apical; basal segment of mid tarsus without mid ventral bristle. Costa with hairs on basal section.

Type Species: *Leptocera (Limosina) silvatica* (Meigen)

The largest subgenus in the genus and well represented in New Zealand. Separated from other subgenera occurring in New Zealand by having postsutural dorsocentrals only, two pairs of marginal scutellars and the dorsal surface of the scutellum bare.

*Distribution:* World wide.

*Species Occurring in New Zealand:*

- Leptocera (Limosina) aucklandica* sp.n.
- L. (Limosina) empirica* (Hutton)
- L. (Limosina) flavipes* (Duda)
- L. (Limosina) heteroneura* (Haliday)
- L. (Limosina) knightae* sp.n.
- L. (Limosina) luteilabris* (Rondani)
- L. (Limosina) mediospinosa* (Duda)
- L. (Limosina) mirabilis* (Collin)
- L. (Limosina) thomasi* sp.n.

Many groups of species are recognised in this subgenus and five of them are present in New Zealand.

1. *appendiculata* group. Characterised by the absence of the inner postverticals; two dorsocentrals; mid tibia with a mid ventral and an apical bristle; ventral bristle of the basal costal pair twice as long as the dorsal. Includes *L. mirabilis*.

2. *minutissima* group. Characterised by having the inner postverticals almost as large as outer postverticals; mid ventral bristle of mid tibia absent in males. Includes *L. flavipes (minutissima)*.

3. *heteroneura* group. Characterised by the inner postverticals being absent; two dorsocentrals; mid tibia without mid ventral and only a small apical bristle; third vein curved forwards strongly giving a small costal index often less than 1.0. Includes *L. heteroneura*.

4. *plumosula* group. Characterised by the inner postverticals being absent; three dorsocentrals; long scutellum and scutellar bristle; female with mid ventral bristle on mid tibia; male with mid tibia bent, with short black spines on apical third of ventral surface, and with mid femur having short black spines at base of ventral surface. Includes *L. empirica*.

5. *crassimana* group. Characterised by having distinct inner postverticals; two dorsocentrals; scutellum long and long scutellar bristles; mid tibia with mid ventral and an apical bristle; third vein straight. Includes *L. luteilabris* and *L. mediospinosa*.

Three new species are described from New Zealand but are not placed in any of the groups of species. Their affinities are discussed in the text. The present concept of species group was suggested for a Northern Hemisphere fauna and, although elements of this fauna are world wide in distribution, the grouping may not be satisfactory for the

complete world fauna when it is known. Species having a restricted distribution in the Southern Hemisphere may quite readily be members of new groups.

KEY TO SPECIES OF SUBGENUS LIMOSINA IN NEW ZEALAND.

- |    |   |                     |
|----|---|---------------------|
| 1  | Hind tibia with strong curved bristle arising on mid point ventrally and extending to tarsus .....                | <b>mirabilis</b>    |
|    | Hind tibia without strong curved bristle .....  | 2                   |
| 2  | Cross veins approximated, separated on 4th vein by a distance much less than length of posterior cross vein ..... | <b>heteroneura</b>  |
|    | Cross veins separated on 4th vein by a distance greater than length of posterior cross vein .....                 | 3                   |
| 3  | Pigmentation of veins, except costa, very faint .....   | <b>flavipes</b>     |
|    | Pigmentation of veins light brown to brown .....  | 4                   |
| 4  | Three dorsocentrals .....   | 5                   |
|    | Two dorsocentrals, anterior one often weak .....  | 6                   |
| 5  | Wings narrowed, length about 3 times width; 3rd vein almost straight .....  | <b>empirica</b>     |
|    | Wings not narrowed, length about 2.25 times width; 3rd vein noticeably curved forward .....                       | <b>thomasi</b>      |
| 6  | Males .....   | 7                   |
|    | Females .....   | 10                  |
| 7  | Mid tibia without ventral spines on apical half .....   | 8                   |
|    | Mid tibia with ventral spines on apical half .....  | 9                   |
| 8  | Mid tibia with mid ventral bristle .....  | <b>luteilabris</b>  |
|    | Mid tibia without mid ventral bristle .....   | <b>knightae</b>     |
| 9  | Wings almost clear, faint opaqueness; 2 distinct dorsocentrals ..   | <b>mediospinosa</b> |
|    | Wings distinctly opaque; anterior dorsocentral very weak .....  | <b>aucklandica</b>  |
| 10 | Mid tibia with mid ventral bristle .....  | 11                  |
|    | Mid tibia without mid ventral bristle .....   | 12                  |
| 11 | Body and wing length 2.0 to 2.5 mm. ....  | <b>luteilabris</b>  |
|    | Body and wing length about 1.75 mm. ....  | <b>mediospinosa</b> |
| 12 | Outer postverticals strong; anterior dorsocentral weak .....  | <b>aucklandica</b>  |
|    | Outer postverticals weak; 2 strong dorsocentrals .....  | <b>knightae</b>     |

**Leptocera mirabilis (Collin)**

*Limosina mirabilis* Collin, 1902. Ent. mon. Mag. 38 : 59.

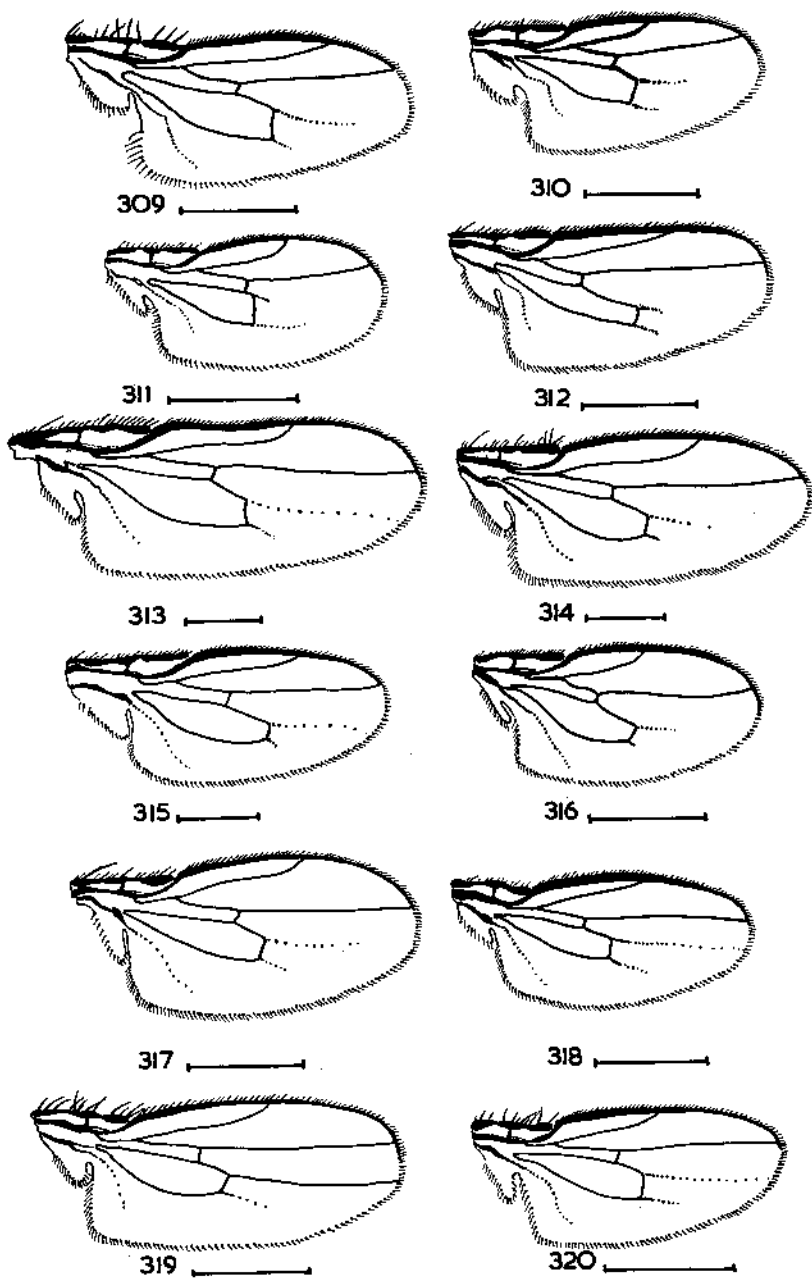
*Leptocera mirabilis* (Collin): Richards, 1930. Proc. zool. Soc. p. 294.

A blackish-brown species with clear wings. Body length about 1.5 mm., wing length about 1.25 mm.

FEMALE

HEAD: Arista blackish-brown; rays of pubescence at least twice diameter of basal segment. Antenna blackish-brown; 3rd segment brown and with thick light brown pile; 2nd segment with strong apicals and a strong preapical dorsal bristle; basal segment with 1 strong inner apical. Front dark brown. Inner postverticals very small or absent, outer postverticals strong; 2 strong dorsal fronto-orbitals; 4 strong convergent frontals; verticals and ocellars strong. Face dark brown, concave, and with slight carina. Cheeks brown merging to dark brown dorsally and posteriorly. Hairs on ventral cheek margin, an enlarged hair on cheek posterior to vibrissa and about one-third length of vibrissa. Occiput blackish-brown. Eyes haired. Vertical diameter of eye about 1.6 times width of cheek in same axis. Proboscis brown; palpi dark brown.

THORAX: Mesonotum blackish-brown; pleura dark brown, ventral pleura brown, sutures between pleura, light brown. Prescutellars small; 2 dorsocentrals, anterior small; parallel basal scutellars about half length of divergent apicals; 1 strong humeral; 1 presutural; 2 notopleurals; 1 supraalar; 1 postalar; a fine short hair anterior to sternopleural; small propleural hair.



Figs. 309-320, Wings:

- 309. *Leptocera ferruginata*
- 310. *L. hirtu a*
- 311. *L. heteroneura*
- 312. *L. flavipes*
- 313. *L. empirica*
- 314. *L. thomasi*

- 315. *L. luteilabris*
- 316. *L. knightae*
- 317. *L. mediospinosa*
- 318. *L. aucklandica*
- 319. *L. zealandica*
- 320. *L. brachystoma*

Scale: 0.5 mm.



Legs brown, tarsi light brown. Fore femur with short fine bristles; mid femur with an anterior apical bristle; mid tibia with 1 antero-dorsal at basal quarter, about 3 bristles on dorsal surface at apical quarter, a small ventral bristle mid way along tibia; hind tibia with a very strong curved bristle arising near mid point of ventral surface and extending beyond apex of tibia.

Wings clear; veins light brown. Costa with pair of basal bristles, ventral one twice dorsal; costa ending just beyond apex of 3rd vein. Costal index about 1.4.

Halteres brown, base light brown.

ABDOMEN: Blackish-brown.

Genital plates yellowish-brown each with distinct black preapical dorsal bristle.

*Holotype*: Europe.

*Material Examined*: 2 ♀.

*New Records*: AUCKLAND: Mangere, 15.i.1950, 1 ♀: Green Lane, 31.x.1948, 1 ♀, (K. P. Lamb), (P.D.D.).

*Distribution in New Zealand*: Auckland. (October, January).

*Remarks*: Recognised by its small size and the large curved hind tibial bristle, the latter character separating it from other species in the genus. Not previously recorded from New Zealand.

### **Leptocera heteroneura** (Haliday). Fig. 311

*Limosina heteroneura* Haliday, 1836. Ent. Mag. 3: 331.

Cottier, 1932. N.Z.J. Sci. Tech. 14: 142.

*Leptocera heteroneura* (Haliday): Richards, 1930. Proc. zool. Soc. p. 298.

A dark brown species. Body length about 1.5 mm., wing length about 1.5 mm.

#### MALE AND FEMALE

**HEAD**: Arista dark brown; pubescent, rays of pubescence about twice diameter of base of arista. Antenna blackish-brown; 3rd segment with long pile, small and spherical; 2nd segment about same length as 3rd, dark brown long hairs or short bristles apically; basal segment dark brown and with few small hairs. Front dark brown. Two fronto-orbitals, 4 or 5 frontals; postverticals widely separated, no inner pair. Face brown, slightly carinate. Cheeks brown, merging to dark brown posteriorly. Vibrissa strong, no strong hairs or oral bristles posterior to it but hairs along cheek margin; no strong bristle at lower posterior corner of cheek. Occiput dark brown. Eyes bare. Vertical diameter of eye about 3 times width of cheek in same axis. Proboscis brown; palpi short, yellowish-brown with minute black hairs.

**THORAX**: Dark brown; wing base, sutures around mesopleuron except anteriorly, and ventral margin of pteropleuron, light brown; prosternum yellowish-brown. Prescutellars small; 2 dorsocentral bristles; basal scutellars about two-thirds of apicals; 1 humeral; 1 presutural; 1 notopleural; 1 supraalar; 1 posterior interalar; 2 postalar; hair anterior to sternopleurals; small propleural; prosternum bare.

Legs light brown; femora brown to dark brown, particularly on dorsal surfaces, posterior femur darker than others. Fore femur with bristles on postero-dorsal surface and on postero-ventral surface at apical third; fore tibia without preapical and apical; mid femur with small anterior and posterior apicals; mid tibia without mid ventral, with 1 bristle at dorsal basal third and about 3 preapical dorsals; hind femur and tibia without bristles; basal segment of hind tarsus about three-quarters length of 2nd segment and with posterior keel-like structure fringed with hairs.

Wings (Fig. 311) slightly opaque; veins light brown. Hind vein curved forward strongly. Cross veins approximated. Costal index about 0.9-1.0.

Halteres light brown with yellowish-brown stalk.

ABDOMEN: Brown to dark brown.

*Holotype*: Europe.

*Material Examined*: 6 ♂ and 4 ♀.

*New Records in New Zealand*: AUCKLAND: Green Lane, ex compost, 27.x.1948, 1 ♂; 9.x.1949, 2 ♂; 11.vi.1949, 1 ♀; Mangere, 28.xii.1949, 2 ♂, 1 ♀, (K. P. Lamb); Browns Bay, 15.ix.1951, 1 ♂; 14.xi.1948, 1 ♀; 30.x.1949, 1 ♀, (R. A. Harrison), (P.D.D.).

*Distribution in New Zealand*: Auckland, Palmerston North. (June, September to January).

*Remarks*: Separated from other New Zealand species by the close approximation of the cross veins; chaetotaxy of thorax, especially the 2 dorsocentrals and the small prescutellars; also by the absence, in males, of bristles or hairs on base of ventral surface of mid femur.

***Leptocera flavipes* (Meigen). (*New Combination*). Fig. 312**

*Borborus flavipes* Meigen, 1830. "Syst. Besch. Zweifl. Insekt."  
6: 208.

*Limosina minutissima* Zetterstedt, 1847. "Dipt. Scand."  
6: 2505.

A blackish-brown species with brown to dark brown legs and slightly milky wings. Body length about 1.5 mm., wing length about 1.5 mm.

FEMALE

**HEAD**: Arista dark brown; rays of pubescence about 3 times width of basal segment. Antenna dark brown; 2nd segment with several strong bristles on inner apical margin; basal segment with 1 strong inner apical bristle. Front blackish-brown, brown anteriorly. Bristles strong; inner postverticals about two-thirds outer postverticals; 2 strong dorsal fronto-orbitals; 5 strong inwardly directed frontals on either side; small hairs on orbits inside row of fronto-orbitals; ocellars and verticals strong. Face blackish-brown, concave, with small carina more prominent dorsally. Cheeks brown, merging to dark brown posteriorly. Few hairs along ventral cheek margin about third length of vibrissa, 1 anteriorly directed bristle on ventral quarter of cheek, and one about mid way along cheek half length of vibrissa. Occiput black. Eyes with few fine short hairs. Vertical diameter of eye about 1.3 times width of cheek in same axis. Proboscis dark brown; palpi brown.

**THORAX**: Blackish-brown dorsally, brown ventrally; mesonotum blackish-brown; dorsal pleura dark brown; sternopleuron brown. Prescutellar acrostichals just over half length of posterior dorsocentrals; 2 dorsocentrals, anterior one weak; divergent basal scutellars about two-thirds divergent apicals; 1 strong humeral; 1 presutural; 2 notopleurals; 1 supraalar; 1 postalar; 1 weak anterior sternopleural hair; 1 propleural.

Legs brown; coxae, trochanters, and tarsi light brown. Fore femur with weak bristles on postero-dorsal and postero-ventral surfaces; mid femur with 1 preapical anterior bristle; mid tibia with 1 antero-dorsal at basal third and 3 dorsal or near dorsal bristles at about apical quarter.

Wings (Fig. 312) slightly milky; costa pigmented with dark brown; other veins faintly pigmented with light brown. Costa extends just beyond apex of 3rd vein. Costal index about 1.1.

Halteres brown.

**ABDOMEN**: Blackish-brown.

*Holotype*: Europe.

*Material Examined*: 1 ♀.

*New Records*: AUCKLAND: Browns Bay. 17.vii.1949, 1 ♀, (R. A. Harrison), (P.D.D.).

*Distribution in New Zealand*: Auckland. (July).

*Remarks:* Recognised by the nearly parallel-sided wings, light milky colour of wing membrane, and very light pigmentation of all wing veins apart from costa. Not previously recorded in New Zealand.

**Leptocera empirica** (Hutton). (*New Combination*). Figs. 305, 313, 321

*Borborus empiricus* Hutton, 1901. Trans. N.Z. Inst. 33 : 94.  
*Leptocera pectinifera* Villeneuve, 1918. Bull. Soc. ent. Fr.,  
1917, pp. 333-8. Richards, 1955. Rec. Dom. Mus. N.Z.  
2 : 241. (*New Synonymy*)

A dark to blackish-brown species with parallel sided wings. Body length about 2.75 mm., wing length about 2.75 mm.

MALE AND FEMALE

**HEAD** (Fig. 305): Arista dark brown; rays of pubescence about twice width of basal segment. Antenna dark brown; 2nd segment with distinct apical or near apical bristles and a preapical dorsal bristle; basal segment with 1 strong bristle on a distinct tubercle, and small dorsal apical hairs. Front dark brown, orbits and spot at base of fronto-orbitals grey dusted; light brown triangle from ocelli to anterior margin of front. Inner postverticals very weak or absent; outer postverticals small; 2 strong fronto-orbitals; 3 strong and about 2 weak frontals; verticals and ocellars strong. Face brown, concave, slightly carinate. Cheeks brown with some grey dusting. Second oral bristle just over half length of vibrissa, row of hairs along ventral cheek margin reduced in size posteriorly, 2 hairs dorsal to this row, the anterior hair enlarged and about two-thirds length of vibrissa. Occiput blackish-brown. Eyes bare. Vertical diameter of eye about 1.1 times width of cheek in same axis. Proboscis brown; palpi light brown.

**THORAX:** Mesonotum blackish-brown; scutellum long, dark brown; pleura dark brown with light brown areas about many of the sutures. Prescutellars small, under half length of posterior dorsocentrals; 3 postsutural dorsocentrals with some enlarged presutural hairs in same row; long divergent basal scutellars about three-quarters length of parallel apicals; 1 strong humeral; 1 small presutural; 2 notopleurals; 1 small supraalar; 2 strong postalars; small hairs on sternopleuron; small propleural hairs.

Legs brown; coxae, trochanters, and tarsi light brown. Fore femur with bristles on postero-dorsal surface and strong bristles on apical half of postero-ventral surface; mid femur with bristles on apical half of anterior surface, the apical one the strongest, an antero-ventral preapical and a postero-dorsal apical, in males with cluster of short black spines at base of ventral surface; mid tibia bent in males with a pair of dorsal bristles at basal quarter and about 3 strong and some weak bristles about apical quarter, a mid ventral bristle in both sexes, males also with short black spines on apical third of ventral surface; hind tibia with a long dorsal bristle at about apical fifth.

**Wings** (Fig. 313) almost parallel sided, clear; veins brown; costa ending at apex of 3rd vein. Costal index about 1.2.

Halteres brown, stalk yellowish-brown.

**ABDOMEN:** Male dark brown.

External male genitalia (Fig. 321): Genital arch small, small bristles over most of surface; anal plates membranous; claspers irregular in shape, one protuberance with stout apical spines, hairs elsewhere on margin, a rod-like projection from antero-ventral corner of arch uniting with the projection from the other side ventrally.

Female dark brown. Genital plates brown.

*Holotype:* CHRISTCHURCH: no date, ♀, (Cant. Mus.).

*Material Examined:* Holotype, 23 ♂ and 30 ♀.

*Distribution in New Zealand:* Campbell Island, Christchurch. ↙

*Remarks:* Recognised by the shape of the wings and the dorsal bristle on the hind tibia. The holotype has been examined by Dr O. W. Richards who confirms the synonymy of *L. pectinifera*.

**Leptocera thomasi** sp.n. Figs. 314, 323

A dull blackish-brown species. Body length about 2.25 mm., wing length about 2.0 mm.

MALE AND FEMALE

**HEAD:** Arista long dark brown; pubescent, rays of pubescence about equal to diameter of arista at base. Antenna blackish-brown; third segment bulbous, as wide as long, with thick pile; 2nd segment as long as 3rd, with 1 preapical short dorsal bristle and apical marginal bristles, those on internal margin of same length as dorsal bristle; 1st segment short and with 1 internal lateral bristle. Front dark brown, anteriorly brown or light brown. Two fronto-orbitals directed over eye, anterior bristle about three-quarters posterior; 4 pairs of convergent frontals all approximately the same size; ocellars and verticals strong; postverticals weak; few scattered short hairs on orbits and some fine hairs from ocellar bristles to level of postverticals. Face brown with small shallow but sharply ridged carina. Cheeks brown, dark brown posteriorly. Strong vibrissa and several long hairs along cheek margin; 2nd oral bristle about half length of vibrissa. Occiput blackish-brown. Eyes bare. Vertical diameter of eye about 3 times width of cheek in same axis. Proboscis with light brown rostrum and dark brown haustellum; palpi light brown with 2 apical black hairs and other fine hairs along surfaces.

**THORAX:** Blackish-brown; mesonotum slightly shining; light brown spots on ventral margins of mesopleuron and pteropleuron, notopleural suture light brown; prosternum brown. Pair of enlarged hairs at position of prescutellars; 3 dorso-centrals, posterior bristle strong; strong divergent basal scutellars about three-quarters length of strong divergent apicals; 1 humeral; 1 presutural; 1 notopleural; 1 supraalar; 1 weak interalar; 2 postalar, anterior bristle strong; few minute hairs on sternopleuron; propleuron with few minute hairs ventrally; other pleura bare.

Legs brown; coxae light brown; most segments dark brown dorsally. Fore femur with bristles on length of postero-dorsal and apical third of postero-ventral surfaces, in males this segment thickened; fore tibia without preapical and apicals; mid femur with short bristles on apical third of anterior surface and, in males, cluster of black spines basally on ventral surface; mid tibia curved, with pair of dorsal bristles at basal and apical thirds, with shorter bristles antero-dorsally at apical third, 1 antero-ventrally at middle and some apicals, males with short black spines at apex of ventral surface and females with mid ventral bristles; hind tibia without preapicals and apicals; basal segment of hind tarsus short, about half length of 2nd segment with keel-like thickening on posterior surface and fan of hairs arising from this structure.

Wings (Fig. 314) shaded very light brown; veins brown. Costal index about 1.2.

Halteres brown with light brown stalk.

**ABDOMEN:** Dark brown.

External male genitalia (Fig. 323): Genital arch narrow dorsally, antero-ventral corner on either side of arch connected by an arched ventral, heavily chitinised band which continues up anterior margins of arch, hairs over most of arch except antero-ventral region; anal plates reduced to membrane; clasper irregularly shaped and with strong stout hairs.

Female genital plates light brown.

**Holotype:** AUCKLAND: Browns Bay, swept off *Leptospermum*, 18.ii.1949, ♂, (R. A. Harrison), (P.D.D.).

**Paratypes:** MOKO HINAU ISLANDS: Fanal Island, stream bed, 23.viii.1955, 1 ♂, (R. A. Harrison), (P.D.D.). LITTLE BARRIER ISLAND: 22.xi.1954, 1 ♂: Thumb and Summit tracks, 23.xi.1954, 1 ♀: Kauri Gully and tracks, 24.xi.1954, 16 ♂, 14 ♀: stream bed, 24.xi.1954, 2 ♂: on beach, 24.xi.1954, 3 ♂, 3 ♀: swept off grass, 24.xi.1954, 5 ♀: Wai-pawa stream bed, 25.xi.1954, 3 ♂, 5 ♀: Te Titoki Point, 28.xi.1954, 1 ♀: Turners Stream, 29.xi.1954, 2 ♂, (R. A. Harrison), (P.D.D.). WAITAKERE RANGES: Nihotupu, 26.ii.1923, 2 ♀, (A. L. Tonnoir), (Cant. Mus.): Oratia, swept near stream, 25.x.1953, 1 ♀, (R. A. Harrison): Titirangi, ex light trap, 28.xi.1952, 2 ♀; 5.xii.1952, 1 ♀; 12.xii.

1952, 3 ♀; 20.xii.1952, 4 ♂, 2 ♀; 31.xii.1952, 1 ♂; 5.i.1953, 1 ♂, 1 ♀; 8.xi.1953, 3 ♂; 17.ii.1953, 1 ♂; 19.ii.1953, 1 ♀; 28.ix.1955, 4 ♂, 2 ♀, (C. R. Thomas): Swanson, ex stream, 11.xii.1949, 1 ♀, (K. P. Lamb): 25.ii.1950, 1 ♂, (M. Knight): Dreamlands, ex house, 27.xii.1950, 1 ♂, (K. P. Lamb), (P.D.D.). AUCKLAND: Green Lane, 15.xii.1948, 1 ♂; 16.xii.1948, 2 ♂; 17.i.1949, 6 ♂, 3 ♀; 18.i.1949, 2 ♂, 1 ♀; 20.ii.1949, 1 ♂, 1 ♀; 2.iii.1949, 1 ♀; 22.iii.1949, 1 ♂; 24.iii.1949, 1 ♀; 9.x.1949, 1 ♀; (K. P. Lamb): Browns Bay, 1.v.1949, 1 ♂; -x.1949, 1 ♂; -xi.1949, 1 ♂; -xi.1949, 1 ♂; 13.xi.1949, 1 ♂; 20.xi.1949, 2 ♂, 3 ♀; 27.xi.1949, 1 ♂; swept off *Leptospermum*, 18.ii.1949, 1 ♀, (R. A. Harrison): Avondale, 28.viii.1949, 1 ♀; on window, -viii.1949, 1 ♀; near stream, 1.i.1950, 4 ♂, (R. A. Harrison): Mangere, 10.vii.1950, 1 ♀; swept off grass, 30.iv.1950, 1 ♀, (K. P. Lamb), (P.D.D.). PAPA-KURA: bred ex soil, 17.ix.1952, 1 ♀, (R. A. Harrison), (P.D.D.). NATIONAL PARK: above Mangatepopo Hut, 26.ii.1949, 1 ♀, (R. A. Harrison): 4,000 ft., 6.xi.1949, 5 ♀, (K. P. Lamb), (P.D.D.). WANGANUI: no date, 1 ♂, 5 ♀, (M. N. Watt), (U.S.N.M.). PALMERSTON NORTH: on rotting swedes, 16.x.1930, 2 ♂, 1 ♀; in glass house, ex dry rot swede, 3 ♂, 3 ♀, (W. Cottier), (P.D.D.). TARARUA RANGES: Fields Hut, 7.xii.1952, 4 ♀, (B. A. Holloway), (Dom. Mus.). TRIO ISLAND: 20.xii.1954, 1 ♂, (G. Ramsay), (P.D.D.). BLENHEIM: on apples, 2.iii.1951, 1 ♂, (R. A. Harrison), (P.D.D.). NELSON: 9.xii.1921, 1 ♂; 4-7.iii.1922, 5 ♂, 3 ♀; 10.viii.1922, 1 ♂; 15.viii.1923, 1 ♂, 1 ♀; Maitai Valley, 19.iii.1922, 1 ♀; Aniseed Valley, 21.iii.1922, 1 ♂, (A. L. Tonnoir), (Cant. Mus.). KAIKOURA: 23.ii.1922, 2 ♀, (A. L. Tonnoir), (Cant. Mus.). CHRISTCHURCH: 17-18.ii.1922, 2 ♂, 2 ♀, (A. L. Tonnoir), (Cant. Mus.); Horseshoe Lake, 7.ix.1924, 1 ♂, 1 ♀, (Anon.), (U.S.N.M.). BANKS PENINSULA: Purau Creek, 20.ii.1922, 1 ♂, (A. L. Tonnoir), (Cant. Mus.). LAKE BRUNNER: 4.ii.1922, 1 ♀, (A. L. Tonnoir), (Cant. Mus.). OTIRA: 8.ii.1922, 4 ♂, (A. L. Tonnoir), (Cant. Mus.). DUNEDIN: 9.xi.1921, 1 ♂, (M. N. Watt), (U.S.N.M.). MANUKA GORGE: 6.ix.1953, 1 ♀, (R. A. Harrison), (P.D.D.). ROXBURGH: swept off grass, 6.ix.1953, 1 ♂, 3 ♀, (R. A. Harrison), (P.D.D.). CHATHAM ISLANDS: Kaingaroa, --.1954, 2 ♀, (R. R. Forster), (Cant. Mus.). NO DATA: (Hutton), (1 ♂, 4 ♀ Cant. Mus. and 1 ♂, 2 ♀, B.M.).

*Material Examined:* Holotype, 98 ♂ and 103 ♀ paratypes.

*Distribution:* Moko Hinau Islands, Little Barrier Island, Waitakere Ranges, Auckland, Papakura, National Park, Wanganui, Palmerston North, Tararua Ranges, Trio Island, Blenheim, Nelson, Kaikoura, Christchurch, Banks Peninsula, Lake Brunner, Otira, Dunedin, Manuka Gorge, Roxburgh, Chatham Islands. (All the year).

*Remarks:* Close to the *plumosula* group of species. Separated from *L. empirica* by having normal shaped wings. Widespread throughout New Zealand, as the records above show, and found in a diversity of habitats. If it is an endemic species it has adapted itself successfully to the variety of habitats which have arisen since the European colonisation of New Zealand.

Named for Mr C. R. Thomas of the staff of the Plant Diseases Division who has collected large numbers of interesting Diptera by means of a light trap at his home in Titirangi. Several specimens in the series

of *Borborus empiricus* Hutton belong to this species and the British Museum specimens recorded above are those which are referred to by Richards (1931) as being "a distinct species of Leptocera . . .".

### **Leptocera luteilabris** (Rondani). Fig. 315

*Limosina luteilabris* Rondani, 1880. Bull. Soc. ent. ital. 12 : 34.

*Leptocera luteilabris* (Rondani): Richards, 1930. Proc. zool. Soc. p. 304.

A black species with slightly milky wings. Body length about 2.0 mm., wing length about 2.5 mm.

#### MALE

**HEAD:** Arista dark brown; rays of pubescence about twice diameter of basal segments. Antenna black; 3rd segment blackish-brown, shorter than wide; 2nd segment with strong apical bristles; basal segment with 1 strong hair on inner apical margin and some small hairs elsewhere. Front blackish-brown; orbits and frontal triangle brown to dark brown. Fronto-orbitals strong; about 4 convergent frontals and smaller hairs; verticals and ocellars strong; inner postverticals very weak, outer postverticals strong; some small hairs on orbits. Face brown and dark brown, light brown between antennae and ventrally. Cheeks light greyish-brown, dark brown posteriorly. Hairs on oral margin, small bristle on cheek about third length of vibrissa and smaller bristles posteriorly. Occiput blackish-brown. Eyes bare. Vertical diameter of eye about three times width of cheek in same axis. Proboscis brown and dark brown; palpi yellowish-brown with black hairs.

**THORAX:** Black; pleura margined with blackish-brown or brown; sutures often yellowish-brown. Prescutellars about one-third length of posterior dorsocentral; 2 dorsocentrals, anterior about two-thirds posterior; basal scutellars about two-thirds length of apical scutellars; 1 humeral; 1 presutural; 2 notopleurals; 1 supraalar; 2 postalar; several small hairs anterior to sternopleural; minute propleural.

Legs dark brown; trochanters, apex of fore femur and base of fore tibia yellowish-brown; fore tarsus brown. Fore femur with strong bristles on postero-dorsal and apical third and at base of postero-ventral surfaces; mid femur with bristles at apex of anterior surface and black spines on rest of this surface; mid tibia with 2 bristles at basal third of antero-dorsal surface, 2 strong and some weak bristles at apical sixth of dorsal surface, and 1 bristle at middle of ventral surface; basal segment of mid tarsus with row of short spines on antero-ventral surface.

Wings (Fig. 315) slightly milky; veins light brown. Costal index about 1.2.

Halteres yellowish-brown.

**ABDOMEN:** Blackish-brown.

#### FEMALE

Similar to male except face blackish-brown.

*Holotype:* Europe.

*Material Examined:* 3 ♂, 1 ♀.

*New Records:* AUCKLAND: Owairaka, indoors, 21.vii.1949, 1 ♂, (S. A. Rumsey); Browns Bay, 27.xi.1949, 1 ♂, 1 ♀, (R. A. Harrison), (P.D.D.). CHRISTCHURCH: 17.ii.1922, 1 ♂, (A. L. Tonnoir), (Cant. Mus.).

*Distribution in New Zealand:* Auckland, Christchurch. (July, November, February).

*Remarks:* Separated from *L. knightae* by having a mid ventral bristle on the mid tibia. Not previously recorded in New Zealand.

### **Leptocera knightae** sp.n. Figs. 316, 322

A dull dark brown species. Body length about 1.5 mm., wing length about 1.5 mm.

MALE AND FEMALE

HEAD: Arista brown; pubescent, rays of pubescence about three times diameter of arista at base. Antenna dark brown; arista arising near apex; 3rd segment small and bulbous, and covered with matt of relatively long hairs; 2nd segment with fine dorsal bristle and other hairs chiefly on apical margin; basal segment with 1 anteriorly directed hair. Front dark brown, orbits wide and separated from rest of front by groove. Orbitals strong, ocellars and verticals strong; all postverticals weak. Frontal bristles small. Face dark brown; distinct dorsal carina between base of antennae. Cheeks dark brown. Vibrissa strong, few hairs along cheek margin. Occiput dark brown. Eyes bare. Vertical diameter of eye about 2.75 times width of cheek in same axis. Proboscis brown.

THORAX: Dark brown; pleura dark brown with brown sternopleural suture. Scutellum disc almost flat; apex between apical bristles and sides between bristles almost straight. Two dorsocentrals, anterior of pair weak; basal scutellars shorter than apicals; 1 humeral; 1 presutural; 1 notopleural; 1 supraalar; 1 posterior interalar; 2 postalar; sternopleural small and a smaller anterior bristle.

Legs brown, apices of coxae, trochanters, base of femora, and all tarsi light brown. Mid femur with anterior and posterior apicals; mid tibia with bristles towards apex of antero-dorsal surface and preapical and apical bristles, no mid ventral bristle in either sex; basal segment of hind tarsus about three-quarters length of 2nd segment.

Wings (Fig. 316) slightly opaque; veins light brown; costa between apices of 1st and 2nd veins dark brown and thicker than rest of costa. Costal index about 0.6.

Halteres light brown.

ABDOMEN: Dark brown.

External male genitalia (Fig. 322): Genital arch heavily chitinised, a few bristles on surface, 3 strong bristles on posterior margin, ventral portion with 1 of these bristles and cluster of fine hairs; anal plate not chitinised; claspers

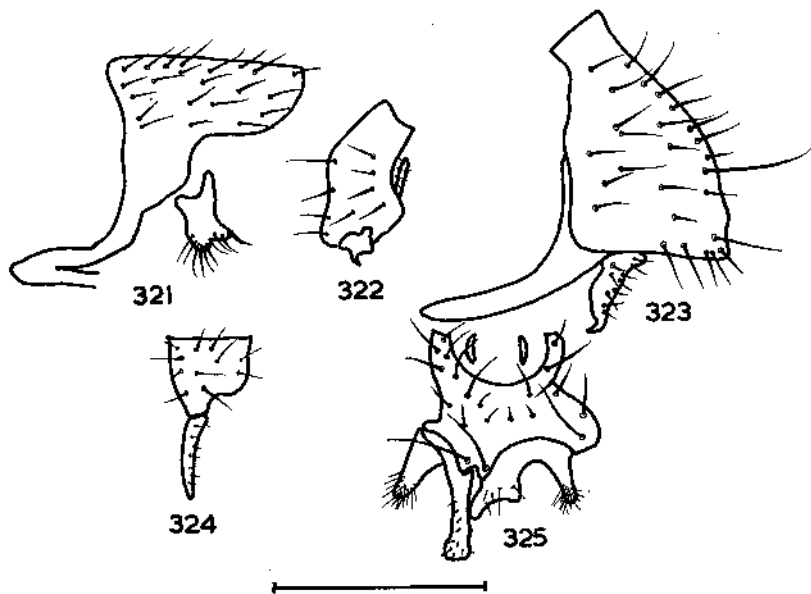


Fig. 321. External male genitalia of *Leptocera empirica*  
 " 322. " " " " " *L. knightae*  
 " 323. " " " " " *L. thomasi*  
 " 324. " " " " " *L. aucklandica*  
 " 325. " " " " " *L. zealandica*

Scale: 0.05 mm.

irregularly shaped, a very thick spine posteriorly, hairs, bristles, and smaller spines on other margins.

*Holotype*: WAITAKERE RANGES: 8.ii.1950, ♂, (*M. Knight*), (P.D.D.).

*Paratypes*: WAITAKERE RANGES: 9.ii.1950, 1 ♂; 10.ii.1950, 1 ♀; 12.ii.1950, 1 ♂, 2 ♀, (*M. Knight*), (P.D.D.).

*Material Examined*: Holotype, 2 ♂ and 3 ♀ paratypes.

*Distribution*: Waitakere Ranges. (February).

*Remarks*: Named for Miss M. Knight who during a period of employment at Plant Diseases Division collected many interesting Diptera from the Waitakere Ranges. Separated from *L. aucklandica* by having weak postverticals, and, in males, from *L. luteilabris* by the absence of the mid ventral bristle on mid tibia.

### **Leptocera mediospinosa** (Duda). Fig. 317

*Scotophilella mediospinosa* Duda, 1925. Arch. Naturgesch. 90,

A (11) : 182. Duda, 1929. Konowia 8 : 34.

*Leptocera mediospinosa* (Duda): Richards, 1931. "Dipt. Pat. S. Chili" 6 (2) : 84.

A blackish-brown species with generally light brown head and legs. Body length about 1.75 mm., wing length about 1.75 mm.

#### MALE AND FEMALE

**HEAD**: Arista dark brown; rays of pubescence about twice diameter of basal segment. Antenna dark brown; 3rd segment brown; 2nd segment with apical or near apical bristles and a preapical dorsal bristle; basal segment with small apical bristles. Front blackish-brown merging to light brown anteriorly. Inner postverticals weak; outer postverticals strong; 2 strong dorsal fronto-orbitals; 3 convergent frontals; verticals and ocellars strong. Face brown to dark brown, concave and slightly carinate. Cheeks light brown merging to blackish-brown posteriorly. About 4 strong hairs along ventral cheek margin and 2 hairs anteriorly and dorsal to these, the anterior of this pair enlarged and about half length of vibrissa. Occiput blackish-brown. Eyes bare. Vertical diameter of eye about 3 times width of cheek in same axis. Proboscis light brown; palpi yellowish-brown.

**THORAX**: Mesonotum blackish-brown; pleura brown except blackish-brown mesopleuron. Prescutellars about half length of posterior dorsocentrals; 2 dorsocentrals, anterior lateral to line of posterior bristle; divergent basal scutellars just greater than half length of divergent apicals; 1 strong humeral; 1 presutural; 2 notopleurals; 1 weak supraalar; 2 strong postalar; 1 strong and 1 fine weak sternopleural; fine propleural hairs.

Legs brown; coxae, trochanters, base of fore tibia and all tarsi light brown. Fore femur with fine but distinct bristles on postero-dorsal and apical half of postero-ventral surfaces; mid femur with an anterior apical bristle and in males 2 series of short black spines at base of ventral surface; mid tibia with a short black spine at basal quarter of antero-dorsal surface, a bristle on same surface at middle of tibia and a pair of dorsal bristles at apical quarter, in males a series of ventral short black spines on about apical half, a short ventral apical, and tibia distinctly bent, in females tibia without ventral spines, with a small median ventral bristle, and tibia not distinctly bent.

Wings (Fig. 317) clear; veins light brown. Costa ending at apex of 3rd vein. Costal index about 1.0.

Halteres dark brown at apex, brown basally.

**ABDOMEN**: Blackish-brown.

*Holotype*: Europe.

*Material Examined*: 4 ♂, 7 ♀.

*New Records*: AUCKLAND: Owairaka, ex soil off carrot fly cage, 25.ix.1942, 1 ♂, 3 ♀, (*T. R. Rabone*); 21.ix.1954, 1 ♀, (*R. A. Harri-*



son): Avondale, 20.viii.1950, 1 ♂, (*R. A. Harrison*): Browns Bay, 23.viii.1950, 1 ♂, (*R. A. Harrison*), (P.D.D.). NELSON: 30.viii.1922, 1 ♂, 1 ♀, (*A. L. Tonnoir*), (Cant. Mus.). CHRISTCHURCH: 27.ii.1922, 1 ♀, (*A. L. Tonnoir*), (Cant. Mus.). NO DATA: 1 ♀, (Hutton?), (Cant. Mus.).

*Distribution in New Zealand*: Auckland, Nelson, Christchurch. (August, September, February).

*Remarks*: Previously known from Australia, South Africa, and South America. Placed by Richards (1930) in the *crassimana* group of species of the subgenus *Limosina*. Separated from *L. luteilabris* the other member of this group in New Zealand by its smaller size and, in males, by having spines on the apical half of the ventral surface of the mid tibia. In this respect it is similar to *L. ochripes* Mg., which Richards (1930) regarded as an aberrant member of this group.

### **Leptocera aucklandica** sp.n. Figs. 318, 324

A blackish-brown fly with faint bluish-grey dusting and opaque wings. Body length about 1.75 mm., wing length about 1.75 mm.

#### MALE AND FEMALE

**HEAD**: Arista dark brown; pubescent, rays of pubescence about 2.5 times diameter of basal segments. Antenna blackish-brown; 3rd segment hemispherical and with matt of fine hairs; 2nd segment about equal to length of 3rd segment, strong black hairs on inner apical margin and 1 preapical dorsal strong hair; basal segment with one strong hair. Front blackish-brown. Ocellars strong; divergent fronto-orbitals and convergent frontals present, the posterior bristles of both series the strongest; inner postverticals weak, outer stronger; verticals strong; few hairs on orbits. Face dark brown; wide and shallow carina, most pronounced between antennae. Strong vibrissa and equally strong bristle just posterior to it and directed dorsally, hairs in 2 rows on ventral half of cheek to posterior margin; no strong bristles at lower posterior corner of cheek. Occiput blackish-brown. Eyes bare. Vertical diameter of eye about 2.5 times width of cheek in same axis. Proboscis dark brown.

**THORAX**: Mesonotum and scutellum blackish-brown with faint bluish-grey dusting; pleura dark brown with most sutures light brown. Prescutellars present, minute and equal to posterior dorsocentrals; 2 dorsocentrals, anterior near suture and very weak; basal scutellar bristles short and about two-thirds length of apicals; 2 short humerals; 1 short presutural; 1 notopleural; 1 supraalar; 1 small interalar; 2 small postalars; 1 strong and 1 weak sternopleural and other sternopleural hairs; 1 small propleural.

Legs brown, trochanters and tarsi light brown; apical segment of fore tarsus brown. Fore femur with small bristles on apical halves of postero-dorsal and postero-ventral surfaces; fore tibia without preapical and apical; mid femur with about 3 preapical small bristles on antero-dorsal margin, about 2 small preapical postero-dorsals and, in males, a row of about 5 to 7 strong black hairs at base of ventral margin; mid tibia with pairs of bristles at apical and basal quarters, 1 bristle of each pair on postero-dorsal margin and the other placed antero-dorsally, 1 small bristle at middle of antero-dorsal margin, males with spines on apical half, no ventral bristle in either sex; hind femur with a small bristle at apex of anterior and of posterior margins; hind tibia with small ventral apical; basal segment of hind tarsus about three-quarters length of 2nd segment, and small ventral keel of hairs.

Wings (Fig. 318) opaque, veins light brown, costa brown. Costa ending just beyond apex of 3rd vein. Costal index about 1.1. †

Halteres light brown.

**ABDOMEN**: Blackish-brown.

External male genitalia (Fig. 324) brown; genital arch with short bristles evenly placed over surface; anal plates membranous; claspers include long rod-

like anteriorly directed process arising from antero-ventral corner of arch, the rods not united ventrally, fine hairs on rod and longer hairs elsewhere.

*Holotype*: AUCKLAND: Blockhouse Bay, on beach, 9.iv.1950, ♂, (R. A. Harrison), (P.D.D.).

*Paratypes*: Same data as holotype, 5 ♂, 2 ♀, (P.D.D.).

*Material Examined*: Holotype, 5 ♂, and 2 ♀ paratypes.

*Distribution*: Auckland. (April).

*Remarks*: Characterised by hairs on base of ventral margin of mid femora in male and the short thoracic bristle.

### Subgenus THORACOAETA Duda

*Thoracochoeta* Duda, 1918. Abh. zool.-bot. Ges. Wein 10: 32.

Eyes small. Inner postverticals small. Scutellum bare. Three or 4 postsutural and 1 or 2 presutural dorsocentrals, presutural ones convergent; prescutellar present; 2 pairs marginal scutellars; 2 humerals; 2 sternopleurals. Mid tibia with 3 sets of dorsal bristles and a ventral apical. Bristles on basal section of costa often very strong.

Type Species: *Leptocera (Thoracochoeta) zosteræ* (Haliday)

Separated from other subgenera in New Zealand by the small eyes and convergent presutural dorsocentrals.

*Distribution*: World wide.

*Species Occurring in New Zealand*:

*Leptocera (Thoracochoeta) brachystoma* Stenhammar

L. (*Thoracochoeta*) *zealandica* sp.n.

Species are frequently taken in association with seaweeds.

#### KEY TO SPECIES OF THORACOAETA IN NEW ZEALAND.

Mid femur of male with cluster of spines at base of ventral surface ..... **zealandica**  
Mid femur of male without cluster of spines ..... **brachystoma**

### **Leptocera zealandica** sp.n. Figs. 319, 325

A brown species with opaque wings. Body length about 1.75 mm., wing length about 1.75 mm.

#### MALE

**HEAD**: Arista dark brown; pubescent, rays of pubescence about twice diameter of basal segments. Antenna brown to dark brown; 3rd segment nearly hemispherical and with matt of fine hairs; 2nd segment about equal to length of 3rd segment with strong hairs on inner apical margin and 1 preapical dorsal strong hair; basal segment light brown, with 1 strong and about 2 small hairs. Front brown with bluish tinge; strong ocellars; fronto-orbitals strong, weak hairs on orbits anteriorly; convergent frontals mostly strong; small hairs between orbitals and frontals; verticals strong; postverticals fine but long. Face brown; broad carina on whole length. Cheeks brown with bluish-grey dusting. Vibrissa strong; 1 more dorsally directed bristle posterior to and equal to vibrissa and hairs along ventral margin of cheek; no strong bristles at lower posterior corner of cheek. Occiput brown with bluish-grey dusting. Eyes bare. Vertical diameter of eye about twice width of cheek in same axis. Proboscis brown.

**THORAX**: Mesonotum and scutellum brown with bluish-grey dusting; pleura brown with light brown band at ventral margin of pteropleuron to halteres, prosternum light brown. Prescutellars equal in length to posterior dorsocentrals; 2 incurved anterior dorsocentrals near anterior margin; convergent basal scutellars about two-thirds length divergent apicals; 1 small presutural; 1 notopleural; 1 supraalar; 1 posterior interalar; 2 postalars; 1 strong and 1 weak sternopleural; 1 propleural; prosternum bare.

Legs brown. Fore femur with postero-dorsals and about 4 postero-ventrals on apical half; fore tibia without distinct preapical or apical; mid femur with strong preapical antero-dorsal and weak preapical postero-dorsal, a cluster of 15 black spines at base of ventral surface; mid tibia with small short but distinct spines on apical half of ventral surface; hind femur with short preapical on anterior and posterior surfaces; hind tibia with few bristles dorsally and 1 short ventral apical; basal segment of hind tarsus about three-quarters length of 2nd segment and with ventral keel of hairs and small apical bristle.

Wings (Fig. 319) opaque, veins light brown, costa brown. Costa ends immediately beyond apex of 3rd vein. Costal index 1.0-1.1.

Halteres light brown.

ABDOMEN: Dark brown.

Genitalia (Fig. 325): Genital arch dark brown, broad and with distinct short stout hairs evenly placed over surface; anal plate reduced to minute plate; primary clasper on left side broad, rod-like with swollen rounded apex and fine hairs on apical half, that on right side about half the length of former, tapering towards apex, and with a basal plate lightly chitinised bearing short hairs; secondary clasper broad basally, narrowed apically, not heavily chitinised, apex with cluster of fine hairs. Penis curved at apex; parameres thin, lightly chitinised plates.

#### FEMALE

Similar to male except mid femur without ventral basal cluster of spines.

Genital plates dark brown.

*Holotype*: WAIHEKE ISLAND: Palm Beach, on decaying seaweed, 15.viii.1940, ♂, (*D. Spiller*), (P.D.D.).

*Paratypes*: Same data as holotype, 15 ♂, 14 ♀. BAY OF ISLANDS: Waitangi, Hobson Bay, ex kelp, 14.iii.1949, 2 ♂, (*K. P. Lamb*), (P.D.D.). KAIKOURA: 23.ii.1922, 1 ♂, 3 ♀, (*A. L. Tonnoir*), (Cant. Mus.).

*Material Examined*: Holotype, 18 ♂ and 17 ♀ paratypes.

*Distribution*: Bay of Islands, Waiheke Island, Kaikoura. (February, March, August).

*Remarks*: Superficially similar to *L. brachystoma* but separated from it by the cluster of spines on base of mid femur in males.

### **Leptocera brachystoma** (Stenhammar). Fig. 320

*Limosina brachystoma* Stenhammar, 1854. K. svenska Vetensk.-Akad. Handl. 1853, p. 393.

*Leptocera brachystoma* (Stenhammar): Richards, 1930. Proc. zool. Soc. 1930, pp. 274-77, 290. Harrison, 1953. N.Z. Ent. 1 (3): 10.

A dark brown species with opaque wings. Body length about 1.5 mm., wing length about 1.5 mm.

#### MALE AND FEMALE

HEAD: Arista brown; pubescent, rays of pubescence about three times diameter of base of arista. Antenna widely separated and directed laterally, brown; 3rd segment short with long thick white pile; 2nd segment equal to length of 3rd segment, with a preapical dorsal, and inner lateral apical bristles or long hairs; basal segment short with 1 prominent bristle directed anteriorly. Front markedly convex, dark brown with brown median area, and the region about fronto-orbitals brown. All frontal bristles brown to dark brown; 2 fronto-orbitals directed over eyes, anterior just shorter than length of posterior three convergent frontals; ocelli and ocellar bristles widely separated; inner verticals strong; outer verticals smaller and equal to the widely separated convergent postverticals; a few hairs on orbits and anterior to frontals. Face brown and strongly convex, particularly between antennae. Cheeks brown. Vibrissa strong, strong hairs along cheek margin and 1 strong hair on surface of cheek. Occiput dark brown. Eyes narrowed

antero-posteriorly, almost reniform; bare. Vertical diameter of eye about twice width of cheek in same axis. Proboscis brown.

THORAX: Brown or dark brown dusted; humerus brown; mesopleuron and pteropleuron light brown ventrally. Prescutellars not as strong as dorsocentrals; 2 strong and 1 weak postsuturals, 2 small incurved presutural dorsocentrals; divergent basal scutellars about three-quarters length divergent apicals, 1 small presutural hair; prosternum bare.

Legs light brown to brown; fore and hind femora distinctly brown. Fore femur with small bristles on postero-dorsal and apical half of postero-ventral surfaces; fore tibia without preapical and apical; mid femur not as enlarged as other femora and with few but distinct black hairs, no basal ventral bristles in male; basal segment of hind tarsus about three-quarters length of 2nd segment and produced to small keel-like structure posteriorly.

Wings (Fig. 320) opaque; veins brown. Short hairs on costa beyond 1st vein. Costal index about 1.0-1.1.

Halteres brown with light brown stalk.

ABDOMEN: Brown or dark brown.

*Holotype*: Europe.

*Material Examined*: 3 ♂ and 18 ♀.

*New Records*: AUCKLAND: Owairaka, bred ex seaweed compost, 16.vi.1946, 3 ♂, 18 ♀, (C. Little), (P.D.D.).

*Distribution in New Zealand*: Auckland. (June).

*Remarks*: Specimens identified by Dr O. W. Richards. A widespread species occurring in Europe, Seychelles, North and South America. Recognised by its small size, clouded wings with long basal costal bristles, and by the chaetotaxy, particularly of the thorax. Separated from the other member of the subgenus occurring in New Zealand by the absence of hairs and bristles on basal ventral region of mid femur of male.

## Family ASTEIIDAE

Arista pubescent or plumose. Third antennal segment short. Post-verticals divergent. Humeral and mesopleural bristles absent. Wings long. Costa weakened but not broken at humeral cross vein and apex of subcosta; costa extending to fourth vein; second vein ends close to first vein or near wing apex; cross veins on basal third of wing; third and fourth veins convergent apically; anal cell and often second basal cell absent.

*Genera Occurring in New Zealand*: *Asteia* Meigen

Readily recognised by the wing venation, particularly the cross vein being near base of wing.

### Genus ASTEIA Meigen

*Asteia* Meigen, 1830. "Syst. Besch. Zweiff. Insekt." 6: 88.

Arista pubescent or plumose with rays on both dorsal and ventral surfaces of main axis. One reclinate fronto-orbital. Two dorsocentrals. Tibia without preapical dorsal bristles. Second vein ends close to 1st vein. Cross vein closing 2nd basal cell and the posterior cross vein absent.

Type Species: *Asteia amoena* Meigen

Recognised by the short second vein, which ends very close to first vein on costa, and the absence of cross veins between fourth and fifth veins.

Distribution: World wide.

Species Occuring in New Zealand:

*Asteia crassinervis* Malloch

*A. levis* Hutton

*A. tonnoiri* Malloch

KEY TO SPECIES OF ASTEIA IN NEW ZEALAND

- 1 Arista minutely pubescent ..... *levis*  
Arista plumose ..... 2  
2 Fifth vein noticeably thickened beyond cross vein ..... *crassinervis*  
Fifth vein not thickened ..... *tonnoiri*

*Asteia tonnoiri* Malloch. Figs. 326, 329

*Asteia tonnoiri* Malloch, 1930. Rec. Cant. [N.Z.] Mus. 3 : 233.

A shining brown and dark brown species with dull blackish-brown and light yellow abdomen. Body length about 2.75 mm., wing length about 3.0 mm.

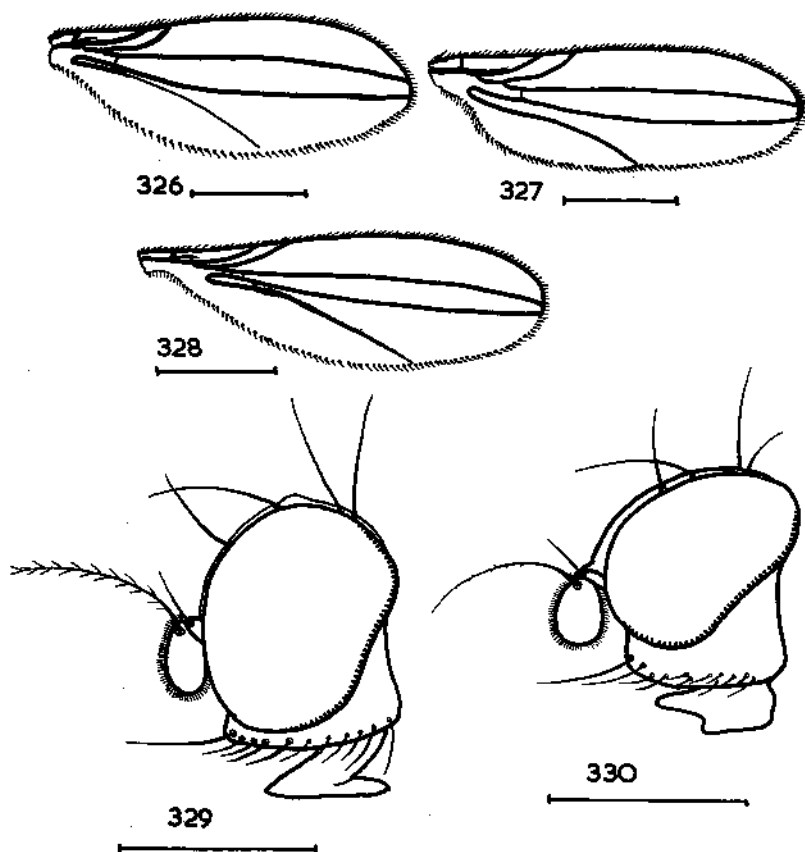


Fig. 326. Wing of *Asteia tonnoiri*  
" 327. " " *A. levis*  
" 328. " " *A. crassinervis*  
" 329. Head of *A. tonnoiri*  
" 330. " " *A. levis*

Scale: Figs. 326-328, 1.0 mm.; Figs. 329, 330, 0.5 mm.

#### MALE AND FEMALE

**HEAD** (Fig. 329): Arista brown; plumose, equal rays on dorsal and ventral sides of axis about 4 times width of basal segments. Antenna brown; 3rd segment blackish-brown with transverse light yellow band on inner surface from basal half of ventral surface to antero-dorsal corner, outer surface light brown ventrally, covered with thick white pile; 2nd segment with 1 strong dorsal apical bristle and small apical hairs; basal segment bare. Front brown not shining; orbits as far as bristle and ocellar area, blackish-brown and shining. Pair of strong hairs at middle of anterior margin of front; verticals and ocellars strong. Face with transverse light brown stripe dorsally, and in succession ventrally a whitish-brown stripe, a broad blackish-brown stripe, a white stripe and a narrow blackish-brown stripe on ventral margin. Cheeks light brown. Row of strong hairs posterior to vibrissa extending to posterior region of cheek. Occiput brown and dark brown, strongly concave. Eyes with a few minute hairs. Vertical diameter of eye about 8 times width of cheek in same axis. Proboscis shining brown; palpi brown.

**THORAX:** Dark reddish-brown dorsally, reddish-brown laterally, not shining dorsally but glossy laterally. No prescutellars; 3 strong dorsocentrals, anterior one presutural; 1 pair divergent scutellars; 1 bristle about half length of scutellars arising from about middle of lateral margin of scutellum; scutellum bare; humeral absent; 1 interalar just posterior to transverse suture; 2 notopleurals; 1 supraalar; 1 postalar; 2 sternopleurals; no propleural.

Legs brown; apices of femora, hind trochanter, bases of tibiae, basal half of hind tibia, and apical segments of tarsi light brown. Mid tibia with weak apical.

Wings (Fig. 326) clear; veins light brown. Fifth vein not thickened. Costal index about 0.09.

Halteres light yellow.

**ABDOMEN:** Basal tergites blackish-brown; apical tergites and sternites light yellow. Genital arch brown.

*Holotype:* NELSON: Aniseed Valley, 1-4.xii.1923, ♂, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined:* Holotype and 3 ♀.

*New Records:* HEN ISLAND: 18-24.x.1923, 2 ♀, (*H. Hamilton*), (Dom. Mus.). WAITAKERE RANGES: 10.ii.1950, 1 ♀, (*M. Knight*), (P.D.D.).

*Distribution:* Hen Island, Waitakere Ranges, Nelson. (October, December, February).

*Remarks:* Separated from *A. crassinervis* by the absence of thickening of the fifth vein and from *A. levis* by the strong pubescence of the arista.

#### ***Asteia levis* Hutton. Figs. 327, 330**

*Asteia levis* Hutton, 1902. Trans. N.Z. Inst. 34 : 175. Malloch, 1930. Rec. Cant. [N.Z.] Mus. 3 : 231. Dumbleton, 1953. Trans. roy. Soc. N.Z. 81 : 239.

A brown or dark brown species. Body length about 2.5 mm., wing length about 3.0 mm.

#### MALE AND FEMALE

**HEAD** (Fig. 330): Arista brown; sparsely pubescent with rays well separated and less than diameter of basal segment. Antenna light brown; 3rd segment brown dorsally; 2nd segment with one dorsal bristle and row of short hairs on apical margin; basal segment small. Front brown, light brown anteriorly and dark brown at vertex; light brown band posteriorly from fronto-orbital to vertex. Convergent pair of small bristles at middle of anterior margin of front, ocellars, verticals, and the single fronto-orbital strong; postverticals represented by minute hairs. Face brown on dorsal third merging to dark brown ventrally, this area separated distinctly from the more ventral white band, and the ventral margin of face shining dark brown. Cheeks light brown. Row of strong hairs posterior to vibrissa and

small fine hairs on posterior region of cheek. Occiput dark brown. Eyes with a few hairs. Vertical diameter of eye about 5.5 times width of cheek in same axis. Proboscis light brown; palpi light brown with fine hairs.

**THORAX:** Shining brown; mesonotum dark brown with brown border and a light dusting of brownish-grey; all pleura with a light dusting. No prescutellars; 3 dorsocentrals, anterior just posterior to transverse suture; strong cruciate apical scutellars, no basal scutellars; scutellum bare, no humeral; no presutural; 2 notopleurals; 2 interalar and a small third anterior bristle; other pleura bare.

Legs shining light brown. Fore femur with long fine median bristle on postero-dorsal surface; mid tibia with small ventral apical.

Wings (Fig. 327) clear; veins light brown. Costal index about 0.14.

Halteres brown and light brown.

**ABDOMEN:** Dark brown basal tergites in both sexes, whitish-yellow and lightly chitinised apical tergites in both sexes, except, in males, the genital arch dark brown and heavily chitinised.

*Holotype:* STEWART ISLAND: no date, ♂, (Cawt. Inst.).

*Material Examined:* Holotype, 7 ♂, 16 ♀.

*New Records:* S.W. STEWART ISLAND: Solomons Island, Cave on south coast, 28.i.1955, 7 ♂, 16 ♀, (R. K. Dell and B. A. Holloway), (Dom. Mus.).

*Distribution:* Stewart Island, Paringa River area, Karitane. (September, November, January).

*Remarks:* Dumbleton (1953) gave notes on this species and stated that it is found at coastal localities. Separated from other species in New Zealand by the almost bare arista.

### ***Asteia crassinervis* Malloch. Fig. 328**

*Asteia crassinervis* Malloch, 1930. Rec. Cant. [N.Z.] Mus.  
3: 232.

A species with shining brown head and thorax, and dull blackish-brown and yellowish-white abdomen. Body length about 2.0 mm.

#### FEMALE

**HEAD:** Arista brown; plumose, equal rays on dorsal and ventral surfaces of main axis about 3 times diameter of basal segment. Antenna brown; 3rd segment dark brown on apical and dorsal sector, circular; 2nd segment dark brown dorsally with a long dorsal bristle, minute black hairs along inner apical margin and long light brown hairs at ventral apex; basal segment with fine light brown hairs. Front parallel sided, shining brown, light brown anteriorly; ocellar area dark brown. One strong fronto-orbital; a pair of convergent strong hairs at middle of anterior margin of front; few fine light brown hairs on front; other frontal bristles absent or represented by minute hairs. Face brown on dorsal half; ventral half with broad white band bordered dorsally and ventrally by blackish-brown bands, the ventral band shining; dorso-ventral median line depressed; no carina. Cheeks shining brown. Short hairs over most of cheek; 1 small bristle at posterior corner of cheek about half length of vibrissa. Occiput shining brown, strongly concave. Eyes with a few very minute hairs. Vertical diameter of eye about 7 times width of cheek in same axis. Proboscis shining brown; palpi light brown with long hairs particularly on basal half.

**THORAX:** Shining brown; mesonotum with a light dusting. No prescutellars; 3 dorsocentrals, anterior one presutural; 1 pair of scutellars; scutellum bare; no humeral; no presutural; 2 notopleurals; 1 postalar; 2 sternopleurals; no propleural.

Legs shining yellowish-brown; fore femur light brown, fore femur with bristles on postero-dorsal surface.

Wings (Fig. 328) clear; veins light brown. Fifth vein thickened from level of cross vein to mid way to apex. Costal index about 0.08.

Halteres light brown.

**ABDOMEN:** Tergites 1 to 4 blackish-brown; apical tergites and all sternites yellowish-white.

*Holotype*: MT. ARTHUR: 4,000 ft., 28.xii.1921, ♀, (*A. Tonnoir*), (Cawt. Inst.).

*Material Examined*: Holotype.

*Distribution*: Mt. Arthur. (December).

*Remarks*: The holotype is now in poor condition, one wing and most of the other wing has been destroyed, and characters not now discernible have been taken from Malloch's original description. Separated from the other two New Zealand species by the marked thickening of the fifth vein.

## Family DROSOPHILIDAE

Arista plumose, pectinate, or pubescent. Third antennal segment rounded or oval. Front with conspicuous bristles. Postverticals convergent. Face with distinct antennal fossae and a carina. Vibrissa present. Costa twice broken; subcosta vestigial; first vein short; discal and second basal cells united; anal cell present.

Distinguished and separated from other families by having two costal breaks, discal and second basal cell united, subcosta vestigial, anal cell present, arista usually plumose with rays dorsally and ventrally on main axis, and convergent postverticals.

*Genera Occurring in New Zealand*:

*Drosophila* Fallén

*Scaptomyza* Hardy

Hutton (1901) first recorded and described New Zealand representatives of the family and Harrison (1952) described the domestic species of the genus *Drosophila* in New Zealand. None of the species considered up to 1952, with the possible exception of *D. marmorata* Hutton, is endemic. Endemic species are recorded here for the first time.

A species of *Leucophenga* was recorded by Miller (1921). This is shown below to be a *Drosophila* and as yet no true member of *Leucophenga* has been found in New Zealand. *Scaptomyza* has not previously been recorded from New Zealand.

Species additional to those recorded below are present in New Zealand but as they are represented in collections by few specimens and have not been examined in the live state, their description is postponed until further material is available. The subgenus *Pholadoris* and the *obscura* group of species appears to be represented in the undescribed material. In most New Zealand collections *Drosophilidae* are poorly represented. Compared with other families these flies are rarely taken in the sweep net and it is only when special collecting procedures are practised, such as the use of banana-baited traps, that large numbers are obtained. Such collecting has been confined, so far, to the Auckland district. When trapping can be extended in other areas of New Zealand a more complete picture of the fauna will be obtained.

### KEY TO GENERA OF DROSOPHILIDAE OCCURRING IN NEW ZEALAND

Two or 4 rows of acrostichal hairs ..... SCAPTOMYZA (p. 284)  
At least 6 rows of acrostichal hairs ..... DROSOPHILA (p. 289)



## Genus SCAPTOMYZA Hardy

*Scaptomyza* Hardy, 1849. Hist. Berwicksh. Nat. Cl. p. 361.

Occiput distinctly convex. Two or 4 rows of acrostichal hairs in front of transverse suture, 2 between dorsocentral bristles; prescutellars always absent. Thorax, abdomen, and wings slender.

Type Species: *Scaptomyza graminum* (Fallén)

Closely allied to *Drosophila* Fallén and separated by the characters given above, chief of which is the number of rows of acrostichal hairs.

*Distribution*: World wide.

*Species Occurring in New Zealand*:

*Scaptomyza flavella* sp.n.

*S. fuscitarsis* sp.n.

*S. graminum* (Fallén)

Not previously recorded from New Zealand. *S. graminum* is the most widespread species in the genus and has probably been introduced to New Zealand through commerce. The other two species are possibly endemic.

These species are most frequently collected by sweeping over foliage, and are regarded as leaf miners in grasses. *S. graminum* can be bred in the laboratory on unyeasted cultures, but *S. fuscitarsis*, the only other species which has been available as live material, has failed to culture.

### KEY TO SPECIES OF SCAPTOMYZA IN NEW ZEALAND

- |   |                    |
|---|--------------------|
| 1 Entirely yellow species .....                     | <b>flavella</b>    |
| Brown to black species .....                        | 2                  |
| 2 Dorsal surface of scutellum almost flat .....     | <b>graminum</b>    |
| Dorsal surface of scutellum distinctly convex ..... | <b>fuscitarsis</b> |

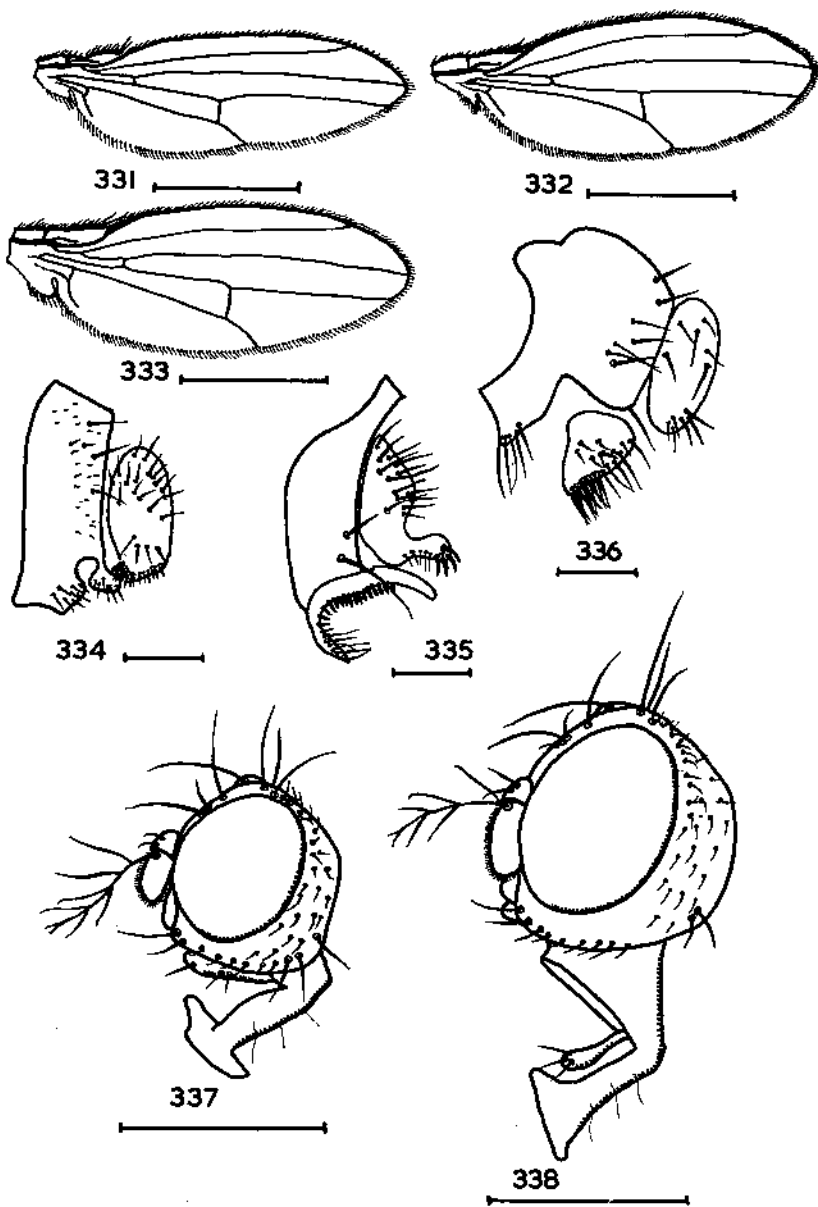
### *Scaptomyza flavella* sp.n. Figs. 333, 336, 338

A yellow species. Body length 2.75–3.0 mm., wing length 2.75–3.0 mm.

#### MALE AND FEMALE

**HEAD** (Fig. 338): Arista with 7 branches, two below in addition to the terminal fork; axis dark brown with basal segment light yellow. Antenna yellow; 3rd segment longer than 2nd segment, covered with fine white pile; 2nd segment with 2 strong black bristles and small black hairs. Front yellow, over half width of head at vertex; ocellar triangle small, enclosing ocelli and ocellar bristles and hairs, whitish-grey dusted; area between ocelli distinctly raised above level of front; ocelli clear; orbits light greyish-brown, pollinose. Postverticals cruciate; ratio of length of fronto-orbitals, anterior to posterior, 3 : 2 : 4; anterior reclinate bristle much closer to proclinate than to posterior reclinate and lateral to it; 1 small hair on frontal orbit anterior to orbitals; about 8 small black hairs near anterior median margin of front. Face yellowish-white. Carina wedge shaped, broad and prominent below; not sulcate. Cheeks yellowish-white. Vibrissa strong; 2nd oral bristle equal to vibrissa; 3 prominent bristles at lower posterior angle of cheek. Occiput yellow, bunch of black hairs immediately above foramen. Eyes dark red in pinned specimens; covered with short, whitish pile. Vertical diameter of eye about 5 times width of cheek in same axis. Proboscis yellow; palpi light yellow with 2 apical fine bristles, 1 longer than the other, and a few fine bristles on anterior margin.

**THORAX**: Yellowish-brown; scutellum yellowish-brown, flat disc. Acrostichal hairs in 2 rows; 2 enlarged hairs anterior to anterior dorsocentrals; basal scutellars divergent, equal in length to apical scutellars, both pairs strong; 1 strong humeral and 1 strong hair close to it; 2 enlarged hairs medial to presutural, 2 prominent sternopleurals, 1 enlarged hair dorsal to posterior bristle; sterno-index about 0.63.



- Fig. 331. Wing of *Scaptomyza fuscitarsis*  
 " 332. " " *S. graminum*  
 " 333. " " *S. flavella*  
 " 334. External male genitalia of *S. fuscitarsis*  
 " 335. " " " " *S. graminum*  
 " 336. " " " " *S. flavella*  
 " 337. Head of *S. fuscitarsis*  
 " 338. " " *S. flavella*

Scale: Figs. 331-333, 1.0 mm.; Figs. 334-336, 0.1 mm.; Figs. 337-338, 0.5 mm.

Legs yellowish-brown; apical segments of tarsi light brown. Apical bristle on 1st and 2nd tibiae; preapicals on all three tibiae.

Wings (Fig. 333) clear; veins light brown. Costa ending at apex of 4th vein but weakened between 3rd and 4th veins; third costal section with heavy bristles on basal three-fifths; pair of strong bristles at distal costal break. Wing indices: costal about 3.5-3.7; 4th vein about 1.6; 4c about 0.6; 5x about 1.8.

Halteres yellowish-brown.

**ABDOMEN:** Yellowish-white. Strong bristles on posterior margin of tergites, small black hairs elsewhere on tergites.

External male genitalia (Fig. 336): Genital arch lightly chitinised, parallel sided, with about 6 bristles near middle on either side; anal plate brown posteriorly, about 20 strong bristles and a cluster of fine short bristles at ventral margin; clasper with row of about 8 very strong black teeth and a subapical row of about 8 shorter stout black teeth with fine bristles between these teeth and between the rows of teeth.

*Holotype:* MOKO HINAU ISLANDS: Lizard Island, swept, 23.viii.1955, ♂, (R. A. Harrison), (P.D.D.).

*Paratypes:* MOKO HINAU ISLANDS: Lizard Island, swept, 23.viii.1955, 1 ♂; Burgess Island, 24.viii.1955, 1 ♂, (R. A. Harrison), (P.D.D.). BANKS PENINSULA: Charteris Bay, 21.ix.1955, 1 ♀, (A. Tonnoir), (Cant. Mus.).

*Material Examined:* Holotype, 2 ♂ and 1 ♀ paratypes.

*Distribution:* Moko Hinau Islands, Banks Peninsula. (August, September).

*Remarks:* Separated from *S. graminum* and *S. fuscitarsis* by the yellow colour, higher costal index, greater size, and, in males, by distinctive characters of the external genitalia.

### **Scaptomyza graminum** (Fallén). Figs. 332, 335

*Drosophila graminum* Fallén, 1823. "Dipt. Suec. Geomyz."  
8: 11.

*Scaptomyza graminum* (Fallén): Hardy, 1849. Hist. Berwicksh.  
Nat. Cl. p. 349.

A small light brown to greyish species. Body length 2.0-2.25 mm., wing length 2.0-2.75 mm.

#### MALE AND FEMALE

**HEAD:** Arista with about 7 branches, usually only 1 below in addition to the terminal fork; axis dark brown, basal segment light brown. Antenna light brown; 3rd segment dark on outer margin; 2nd segment darker on outer margin, with 2 bristles and smaller black hairs. Front brown posteriorly and medianly, yellowish-brown anteriorly; about half width of head at vertex; area between ocelli almost black in some specimens and raised above level of front; ocelli clear; frontal orbits greyish-brown about bristles, yellowish-brown anteriorly. Ratio of lengths of orbitals, anterior to posterior, about 7:3:9; anterior reclinate lateral to and just anterior to or level with proclinate; 1 or 2 small hairs on frontal orbit anterior to orbitals; a few minute hairs on median anterior region of front. Face yellowish-brown. Carina brown, narrow, ridge shaped, but slightly broader and nose-like below. Cheeks light yellow. Vibrissa strong; 2nd oral bristle about half length of vibrissa; 3 or 4 prominent bristles at lower angle of cheek. Occiput grey to dark purplish-grey. Eyes dark red in pinned specimens; covered with dense light-coloured pile. Vertical diameter of eye about 6 times width of cheek in same axis. Proboscis yellowish-brown; palpi with 1 strong apical bristle and some smaller black hairs. †

**THORAX:** Light brownish-grey to purplish-grey, dusted dorsally, sometimes lighter laterally, and yellowish-brown ventrally; broad light-coloured stripes on mesonotum extending from acrostichal rows through dorsocentral row to 1st row of hairs outside of the dorsocentral row; scutellum greyish-brown, almost flat disc.

Acrostichal hairs in 2 rows; 2 enlarged hairs anterior to anterior dorsocentrals; basal scutellars divergent, equal in length to apicals, both pairs strong; 1 strong humeral; 2 prominent sternopleurals, 1 enlarged hair dorsal to posterior bristle; sterno-index about 0.5.

Legs yellowish-brown; tarsi faintly but not distinctly darkened towards tip; preapical bristles on all tibiae; apicals on 1st and 2nd only.

Wings (Fig. 332) clear; veins light brown; costal ending at apex of 4th vein; third costal section with heavy bristles on its basal third; pair of strong bristles at distal costal break; 3rd vein with a slight bend posteriorly near apex, thus narrowing the 1st posterior cell somewhat. Wing indices: costal about 3.2; 4th vein about 1.7; 4c about 0.75; 5x about 1.3.

Halteres yellowish-greyish-brown.

ABDOMEN: Varies from light brown to blackish-brown, shining. Lightest areas occur about median region of anterior tergites, apical tergites the darkest and often almost completely black. Sternites light yellow.

External male genitalia (Fig. 335): Genital arch narrow dorsally, heavily chitinised anteriorly and posteriorly on dorsal half, ventral margin concave and produced posteriorly and anteriorly, 2 strong bristles at postero-ventral and antero-ventral regions; anal plate normal and oval on dorsal half and with bristles over most of this surface, ventral half modified to a posteriorly directed auxiliary clasper with 4 very strong apical teeth and a cluster of small bristles about them; clasper crescent shaped and fitting into ventral margin of arch, apical margin with strong teeth and bristles.

*Holotype*: Europe.

*Material Examined*: 5 ♂, 8 ♀, and 3 ex.

*New Records*: WAITAKERE RANGES: Swanson, ex stream, 11.xii.1949, 1 ♂, (R. A. Harrison). AUCKLAND: Owairaka, 26.vi.1940, 1 ex.; 3.vii.1940, 1 ex. (D. Spiller); 28.iii.1951, 1 ♀, (R. A. Harrison): Mt. Albert, 14.xii.1948, 1 ♀, (D. Hard): Green Lane, 18.i.1949, 1 ♀; 11.vi.1949, 1 ♂; on nasturtium, 15.viii.1948, 2 ♀, (K. P. Lamb): Avondale, 20.viii.1950, 1 ♂, 1 ♀, (R. A. Harrison): Browns Bay, 14.viii.1949, 1 ♂; (R. A. Harrison), (P.D.D.). PUKEKOHE: Swept off carrots, 11.viii.1952, 1 ♂, (R. A. Harrison) (P.D.D.). THE BROTHERS ISLANDS: 7.x.1954, 1 ♀, (R. Ornduff), (Cawt. Inst.). CHRISTCHURCH: 12.vii.1924, 1 ex. (A. Tonnoir), (Cant. Mus.). NO DATA: 15.v.1922, 1 ♀, (D. Miller), (Cawt. Inst.).

*Distribution in New Zealand*: Waitakere Ranges, Auckland, Pukekohe, Christchurch, The Brothers Islands. (July, August, October, December, January, March, May, June).

*Remarks*: Separated from *S. fuscitarsis* by having the scutellum almost flat dorsally and from *S. flavella* by its smaller size, darker colour, and lower costal index.

### **Scaptomyza fuscitarsis** sp.n. Figs. 331, 334, 337

A slender shining fly, usually black but varies from brown to black. Body length 1.75-2.25 mm., wing length 1.75-2.5 mm.

#### MALE AND FEMALE

HEAD (Fig. 337): Arista with 7 branches, 2 below in addition to the terminal fork; axis black, basal segment light brown. Antenna yellowish-brown, occasionally reddish-brown; 3rd segment somewhat pointed apically and about equal in length to 2nd segment; 2nd segment with 2 bristles and some minute black hairs. Front light yellowish-brown to dark brown occasionally tinged with red; dark and, in some lights, grey dusted at vertex; anterior region frequently light brown; orbits grey to dark brown, lighter anteriorly; area between ocelli dark brown to black and raised above level of front; ocelli clear. Ratio of lengths of orbitals, anterior to posterior, 2 : 1 : 3; anterior reclinate lateral to and level with or just

posterior to proclinate; usually 1 small hair on frontal orbit anterior to orbitals; a few minute black hairs on median anterior region of front. Face yellowish-brown, occasionally light yellow. Carina ridged, not sulcate, sometimes with a brown stripe on ridge. Cheeks yellowish-brown, black posteriorly. Vibrissa strong; 2nd oral bristle usually distinct from other hairs and third to half length of vibrissa; 3 prominent bristles at lower angle of cheek. Occiput brown or greyish-black with lightly dusted bands extending from vertex, at either side of ocelli to foramen. Eyes dull red in pinned specimens; covered with dense whitish pile. Vertical diameter of eye about 6 times width of cheek in same axis. Proboscis light yellowish-brown; palpi with 1 strong apical and 2 or 3 small bristles on anterior margin of apical third.

**THORAX:** Brown to purplish-black with much grey dusting dorsally and laterally, light ventrally; no pattern of stripes except lighter specimens have indications of yellowish-brown areas between the acrostichal and dorsocentral rows anteriorly; scutellum same colour as mesonotum, with distinctly convex disc. Acrostichal hairs in 2 rows; 2 enlarged hairs anterior to dorsocentrals; basal scutellars divergent and equal to or longer than apical scutellars, both pairs strong; 1 humeral and often 1 enlarged hair; 2 sternopleurals; sterno-index about 0.5.

Legs light yellowish-brown; anterior tarsus with apical three segments dark brown or black; other tarsi darkening gradually towards apices. Preapicals on all tibiae; apicals on 1st and 2nd tibiae only.

Wings (Fig. 331) clear; veins light brown. Costa ending at apex of 4th vein but weakened between 3rd and 4th vein; 3rd costal section with heavy bristles on its basal two-thirds; pair of strong bristles at distal costal break. Wing indices: costal about 2.5-3.1; 4th vein about 1.9; 4c about 0.9; 5x about 1.6.

Halteres light yellow, darkened basally.

**ABDOMEN:** Shining blackish-brown with lighter area anteriorly. In the light-coloured specimens the anterior tergites may be brown, or even yellowish-brown dorsally, but apical segments and lateral regions of anterior segments are always dark brown.

External male genitalia (Fig. 334): Genital arch broad and parallel sided, about 3 bristles near middle of posterior margin, cluster of short bristles along ventral margin, narrow posteriorly directed arm arising near postero-ventral corner; anal plate ovoid, bristles over most of surface except at middle; shorter and thicker bristles clustered about ventral margin; clasper small with very short almost tooth-like bristles on ventral margin.

**Holotype:** AUCKLAND: Browns Bay; swept off *Leptospermum* foliage 14.viii.1949, ♀, (R. A. Harrison), (P.D.D.).

**Paratypes:** AUCKLAND: Browns Bay, swept off *Leptospermum* foliage, 14.vii.1949, 1 ♂, 2 ♀; Browns Bay, 1.v.1949, 1 ♂; 17.vii.1949, 1 ♂, 2 ♀; swept off foliage, 28.v.1950, 1 ♂; Browns Bay, 15.ix.1951, 1 ♂, 1 ♀, (R. A. Harrison), (P.D.D.); Owairaka, 28.i.1940, 1 ♀; 20.vi.1940, 1 ♀, (D. Spiller), (P.D.D.); Mangere, 28.xii.1949, 1 ♀; Green Lane, 28.xii.1948, 1 ♀; -viii.1949, 1 ♀; 23.x.1949, 3 ♀; 27.x.1949, 1 ♀, 1 ♂, (K. P. Lamb), (P.D.D.); Avondale, 2.vi.1949, 1 ♂; Ellerslie, swept off chrysanthemums, 17.xii.1953, 2 ♀, (K. A. J. Wise), (P.D.D.). PUKEKOHE: swept off carrots, 11.vii.1952, 1 ♂, (R. A. Harrison), (P.D.D.). PALMERSTON NORTH: flying around rotting swedes, 16.x.1930, 1 ♂, (W. Cottier), (P.D.D.). BANKS PENINSULA: Charteris Bay, 21.ix.1925, 1 ♀, (A. L. Tonnoir), (Cant. Mus.). CHRISTCHURCH: 10.xi.1924, 1 ♀, (A. L. Tonnoir), (Cant. Mus.). OKARAHIA: 5.ii.1925, 1 ♂, (A. L. Tonnoir), (Cant. Mus.).

**Additional Specimens:** AUCKLAND: Owairaka, 26.vi.1940, 2 ex., (D. Spiller); carrot cage in insectary, 25.ix.1942, 1 ex., (T. R. Rabone); Avondale, 2.vii.1949, 3 ex., (R. A. Harrison); Green Lane, 27.x.1949, 1 ex., (K. P. Lamb), (P.D.D.). PALMERSTON NORTH: flying around rotting swede, 16.x.1950, 1 ex.; on new swede area, 5.vi.-

1931, 1 ex., (*W. Cottier*), (P.D.D.). ROXBURGH: swept off grass, 6.ix.1953, 1 ♂, 1 ♀, (*R. A. Harrison*), (P.D.D.).

*Material Examined*: Holotype, 10 ♂ and 18 ♀ paratypes, 1 ♂, 1 ♀, and 9 ex.

*Distribution*: Auckland, Pukekohe, Palmerston North, Christchurch, Banks Peninsula, Okarahia, Roxburgh. (All the year).

*Remarks*: Readily separated from *S. graminum* and *S. flavella* by the distinctly convex scutellum.

Genus DROSOPHILA Fallén

*Drosophila* Fallén, 1823. "Dipt. Suec. Geomyz." 2 : 4.

Arista plumose. Postverticals large; ocellars present; 3 fronto-orbitals, anterior proclinate, dorsal two reclinate, middle one smallest of the three. Prescutellars present or absent; 2 dorsocentrals; 2 pairs of scutellars; scutellum bare; 1 presutural; 2 notopleurals; 2 supraalars; 2 postalars, mesopleuron bare; 6 or 8 rows of acrostichal hairs anterior to anterior dorsocentral. Preapical bristles usually on hind tibia. Costa extending to 4th vein; 2 bristles on costa just basal to distal costal break.

Type Species: *Drosophila funebris* (Fabricius)

Readily recognised by the plumose arista, three fronto-orbitals including both proclinate and reclinate bristles. Separated from *Scaptomyza* by the presence of at least six rows of acrostichal hairs anterior to the anterior dorsocentral bristles.

*Distribution*: World wide.

*Subgenera Occurring in New Zealand*:

*Dorsilopha* Sturtevant

*Drosophila* Fallén

*Pholadoris* Sturtevant

*Sophophora* Sturtevant

Intensive taxonomic studies on the genus in recent years has resulted in subgenera diagnoses being based on larval, pupal, and internal adult characters as well as normal external adult characters.

KEY TO SPECIES OF DROSOPHILA IN NEW ZEALAND

- 1 Prescutellars present ..... **neozelandica**
- Prescutellars absent ..... 2
- 2 Mesonotum distinctly marked with spots or stripes ..... 3
- Mesonotum not distinctly marked ..... 5
- 3 Mesonotum grey with dark brown spots at base of hairs and bristles ..... 4
- Mesonotum yellowish-brown with dark brown longitudinal vittae ..... **busckii**
- 4 Costa darkened at distal break ..... **repleta**
- Costa not darkened at distal break ..... **hydei**
- 5 Yellowish-brown species ..... 6
- Dark brown or brown species ..... **kirki**
- 6 Costal index less than 3.0 ..... 7
- Costal index greater than 3.0 ..... 8
- 7 Vertical diameter of eye about 7 or 8 times width of cheek in same axis. Genital arch of male with large posterior process ..... **simulans**
- Vertical diameter of eye about 5 times width of cheek in same axis. Genital arch of male with small posterior process ..... **melanogaster**

- 8 Fore femur with row of short stout spines on apical half of antero-ventral surface ..... **immigrans**  
 Fore femur without short stout spines ..... **funebria**

### Subgenus PHOLADORIS Sturtevant

*Pholadoris* Sturtevant, 1942. Univ. Tex. Publ. 4213 : 28.

Wheeler, 1949. Univ. Tex. Publ. 4920 : 143-56.

Shining dark brown or yellow species; egg filaments 4 to 10, usually 6 to 8; skipping larvae; anterior spiracle of puparium borne on extremely short stalk or none at all; branches of anterior spiracle 4 to 8; posterior spiracles tightly parallel or closed; pupation in or near cotton stoppers in laboratory vials; acrostichal hairs in 6 or 8 rows; prescutellars present; upper series of frontal hairs with their bases arranged in a rough V; arista with 7 to 8 branches, 2 below in addition to the terminal fork; 2nd oral short, usually less than half 1st; sterno-index 0.7-0.9; middle sternopleural usually well developed; costal index usually less than 2.0; 4th vein index 2.2-2.4; cheeks narrow, one-sixth to one-tenth greatest diameter of eyes; anterior Malpighian tubes much longer than posterior; posterior tubes apposed at their ends forming a ring around the gut but without a continuous lumen; testes elliptical; ventral receptacle short, finger-like; male genitalia with bristled genital arch, bristled anal plate which is not attached to the arch, and clasper with a single row of primary teeth; male hypopygium recessed in abdomen.

Type Species: *Drosophila (Pholadoris) victoriae* Sturtevant.

The subgeneric diagnosis above is after Wheeler (1949). Most readily separated from other subgenera by the presence of prescutellar bristles.

*Species Occurring in New Zealand: Drosophila (Pholadoris) neozelandica* sp.n.

### *Drosophila neozelandica* sp.n. Figs. 339 to 345

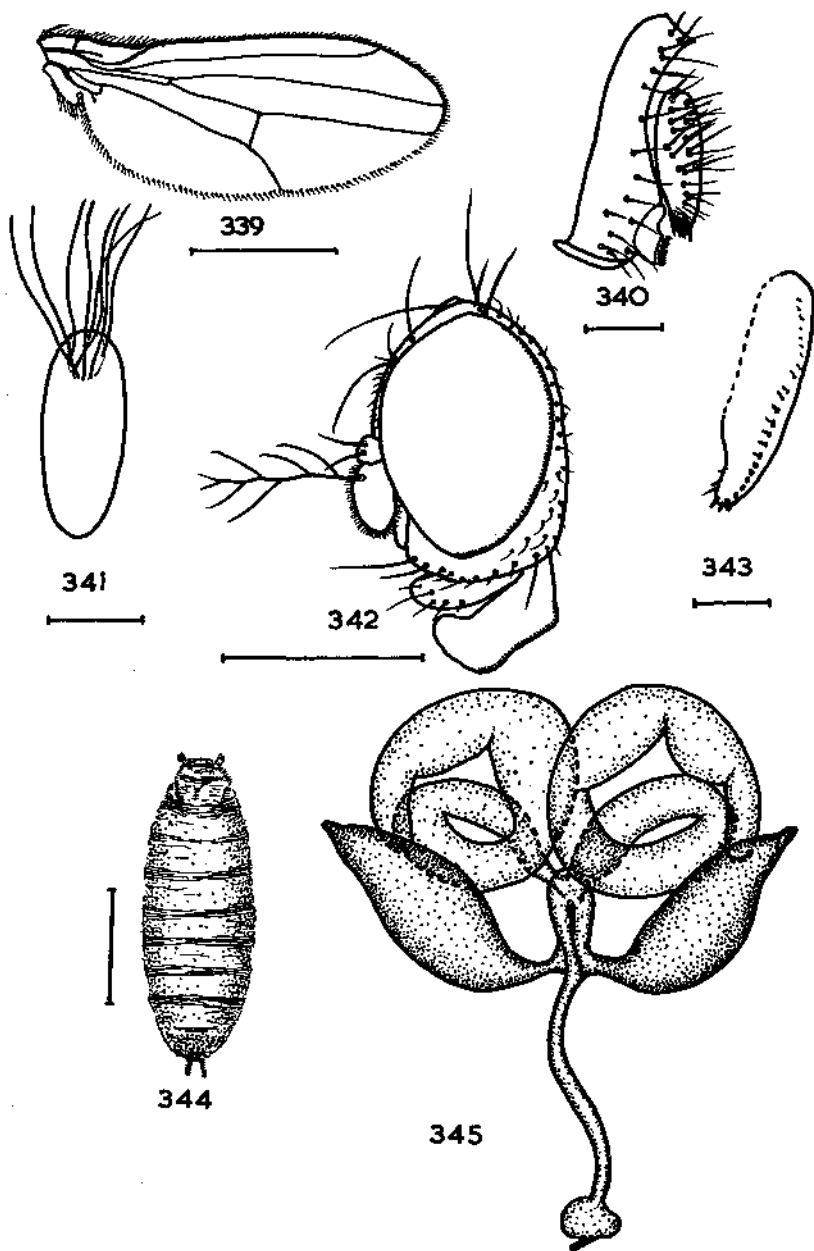
A brown species with dark brown abdomen. Body length about 2.5 mm., wing length about 2.75 mm.

#### MALE AND FEMALE

**HEAD** (Fig. 342): Arista shining blackish-brown, basal segments light brown; 7 branches, 2 below in addition to the terminal fork. Antenna yellowish-brown; 3rd segment brown with fine brown pile; 2nd segment with 2 dorsal bristles and small black hairs; basal segment with few apical dorsal hairs. Front light brown posteriorly; yellowish-brown anteriorly; orbits about verticals and fronto-orbital bristles distinctly dusted; ocellar area dusted; brown spot between and just posterior to the two posterior ocelli. Ratio of length of fronto-orbitals, anterior to posterior, 2 : 1 : 2; anterior bristle reclinate, lateral and just posterior to proclinate; ocellars and verticals strong; postverticals weaker. Face dusted with light yellowish-brown; carina prominent and sulcate dorsally. Cheeks light brown. Second oral bristle about half length of vibrissa; 2 bristles at lower posterior corner of cheek. Occiput greyish-brown. Eyes haired. Vertical diameter of eye about 8 times width of cheek in same axis. Proboscis light brown; palpi yellowish-brown.

**THORAX:** Brown; mesonotum dusted. Prescutellars about half length of posterior dorsocentrals; enlarged hairs anterior to prescutellars; acrostichal hairs in 8 rows immediately anterior to anterior dorsocentral; anterior dorsocentral about three-fifths posterior, hairs in dorsocentral rows slightly enlarged; cruciate apical scutellars about three-quarters length of divergent basals, basals about half way from scutellar suture to insertion of apicals; 2 strong and 1 weak ventral humerals; presutural with 1 or 2 enlarged hairs median to it; 2 supraalars, ventral of pair weak; 2 postalars, ventral of pair the stronger; 3 sternopleurals, the two dorsal ones about equal, the ventral one directly below posterior dorsal bristle, sterno-index about 0.8.

Legs light brown. Fore femur with strong bristles on postero-dorsal and postero-ventral surfaces; fore tibia with preapical and apical.



Figs. 339-345, *Drosophila neozelandica*:

- |                              |                              |
|------------------------------|------------------------------|
| 339. Wing                    | 343. Female genital plate    |
| 340. External male genitalia | 344. Pupa                    |
| 341. Egg                     | 345. Internal male genitalia |
| 342. Head                    |                              |

Scale: Figs. 339, 344, 1.0 mm.; Figs. 340, 343, 0.1 mm.;

Fig. 341, 0.25 mm.; Fig. 342, 0.5 mm.



Wings (Fig. 339) clear; veins brown. One strong and 1 weak bristle at distal costal break; stout costal spines extending half distance between apices of 2nd and 3rd veins. Wing indices: costal about 2.9; 4th vein about 2.0; 4c about 0.9; 5x about 1.7.

Halteres light yellow.

ABDOMEN: Tergites yellowish-brown anteriorly, blackish-brown posteriorly; the posterior band produced to anterior margin narrowly at centre and at lateral margins. Variations of width of the blackish-brown band occur within the same population: in dark specimens this band extends over most of tergites especially the basal ones.

External male genitalia (Fig. 340) lightly chitinised. Genital arch relatively narrow, somewhat broader ventrally, about 20 bristles on either side, only few of these on middle region, ventral margin more heavily chitinised than rest of plate and produced anteriorly into a small anterior projection; anal plate about two-thirds height of arch, about 35 to 40 normal bristles on dorsal four-fifths and a cluster of shorter thicker bristles on ventral fifth; clasper more heavily chitinised than arch or anal plate, triangular in shape, base facing posteriorly with a series of about 10 thick short teeth on ventral two-thirds of this margin and with about 4 short bristles arising between or near teeth.

Female genital plates (Fig. 343): Long spines near apex and short stout spines elsewhere.

INTERNAL CHARACTERS: Malpighian tubes about equal in length, common stalk of both anterior and posterior pair about one-sixth total length, tips of posterior pair opposed. Testes (Fig. 345) elliptical, reddish-orange. Spermathecae large, with small, heavily chitinised centres. Ventral receptacle small, angled greater than 90°.

Egg (Fig. 341): Filaments two-thirds to three-quarters length of egg. Seven to 10 filaments, usually 8.

LARVA: White. Skip.

PUPA (Fig. 344): Anterior spiracles minute. Pupation takes place in cotton plug of culture vessel.

*Holotype*: WAITAKERE RANGES: Nihotupu, 2.i.1950, ♂, (*R. A. Harrison*), (P.D.D.).

*Paratypes*: LITTLE BARRIER ISLAND: —.xi.1954, 2 ♀. WAITAKERE RANGES: Nihotupu, ex banana trap, 5.ii.1953, 3 ♀; swept, 17.ii.1954, 3 ♀; swept, 9.iii.1955, 3 ♀; ex banana trap, 5.ii.1953, parent ♀ and 2 F1 ♀; Oratia, ex banana trap, 14.xii.1952, 2 ♀, (*R. A. Harrison*), (P.D.D.).

*Other Records*: LITTLE BARRIER ISLAND: Waipawa Stream, ex banana trap, 27.xi.1954, 1 ♂, 2 ♀, (*R. A. Harrison*). WAITAKERE RANGES: Nihotupu, banana-baited trap, 5.ii.1953, 6 ♀; 16.iii.53, 67 ♀; 23.iii.1955, 5 ♂, 57 ♀; 30.iii.1955, 5 ♂, 440 ♀; 6.iv.1955, 7 ♂, 292 ♀; 14.iv.1955, 2 ♂, 28 ♀; 27.iv.1955, 2 ♂, 18 ♀; 4.v.1955, 5 ♀; 8.vi.1955, 1 ♂, 3 ♀; 15.vi.1955, 4 ♀; 29.vi.1944, 1 ♂; 7.vii.1955, 1 ♀; 13.vii.1955, 1 ♀; 10.viii.1955, 3 ♀; 31.viii.1955, 4 ♀; 7.ix.1955, 1 ♀; 14.ix.1955, 4 ♀; 21.ix.1955, 2 ♂, 32 ♀; 29.ix.1955, 13 ♀; 4.x.1955, 16 ♀; 10.x.1955, 4 ♂, 74 ♀; 17.x.1955, 1 ♂, 10 ♀; Nihotupu, swept off foliage, 9.iii.1953, 4 ♂, 3 ♀; 12.ii.1954, 2 ♂, 3 ♀; Oratia, 14.xii.1952, 1 ♀; Titirangi, banana-baited trap, 14.xii.1953, 1 ♀, (*R. A. Harrison*); Titirangi, ex light trap, 7.vii.1953, 2 ♀, (*C. R. Thomas*). AUCKLAND: Henderson, banana-baited trap, 14.i.1955, 1 ♀, (*K. A. J. Wise*), (P.D.D.).

*Material Examined*: Holotype, 16 ♀ paratypes, and 37 ♂, and 1092 ♀.

*Distribution*: Little Barrier Island, Waitakere Ranges, Auckland. (All the year).

*Remarks:* Agrees with the definition of the *victoria* group of species as given by Wheeler (1949) in having divergent basal scutellars, a projection on the antero-ventral corner of the genital arch and the anal plate with dense mass of bristles at the ventral margin. However it differs from that group by having eight rows of acrostichals, the common trunk of the posterior Malpighian tubules about one-sixth total length of tubules, and by the absence of a ventrally directed extension beyond the teeth of the clasper. Mather (1955) defined the *coracina* group of species with which *D. neozelandica* agrees in having eight acrostichals, divergent basal scutellars, and the absence of a projection beyond the clasper teeth. The costal index of *D. neozelandica* conforms with that of the Australian members of the *coracina* group in being greater than 2.0, but not with *D. coracina* itself, which has a costal index of 1.5. It differs from this species group by having a dense cluster of bristles at the ventral margin of the anal plate and by the presence of bristles on the whole length of the genital arch. The affinities of *D. neozelandica* with the *mirim*, *maculosa*, and *levis* groups is not close and it thus cannot be placed definitely in any of the groups as yet proposed. Breeds in laboratory cultures but not easily bred through several generations. Oviposition by wild females is usually prompt and plentiful but a large mortality occurs at pupation time.

#### Subgenus DORSILOPHA Sturtevant

*Dorsilopha* Sturtevant, 1942. Univ. Tex. Publ. 4213 : 28.

Yellowish species, mesonotum longitudinally striped; preapicals not evident on 2nd and 3rd tibiae; larvae with dorsal processes; 4 egg-filaments; posterior Malpighian tubes fused; ventral receptacle not kinky; sterno-index about 0.3.

Type Species: *Drosophila (Dorsilopha) busckii* Coquillet

The subgeneric diagnosis given above is after Sturtevant (1942).

Separated from other subgenera most readily by the presence of distinct brown longitudinal vittae on thorax.

*Species Occurring in New Zealand:* *Drosophila (Dorsilopha) busckii* Coquillet

#### *Drosophila busckii* Coquillet. Figs. 346, 352, 363

*Drosophila busckii* Coquillet, 1901. Ent. News 12 : 18. Harrison, 1952. Trans. roy. Soc. N.Z. 79 : 507.

*Drosophila rubrostriata* Becker, 1908. Mitt. zool. Mus. Berl. 4 : 155.

*Drosophila plurilineata* Villeneuve, 1911. Wien. Ent. Ztg. 30 : 38.

A yellowish-brown species with distinctive dark brown bands on thorax. Body length about 2.0–2.5 mm., wing length about 2.0–2.5 mm.

#### MALE AND FEMALE

HEAD: Arista blackish-brown, basal segment yellowish-brown with 9 branches, 2 below in addition to the terminal fork. Third segment of antenna dark brown; 2nd segment yellowish-brown with about 2 dorsal bristles. Front yellowish-brown with a silvery-grey ocellar triangle, yellowish-white or grey orbits and anterior margin of front, ocellar area dark brown. Ratio of fronto-orbitals, anterior to posterior, 3 : 2 : 4; anterior reclinate bristle lateral to and level with, just posterior to or anterior to proclinate bristle; 1 or 2 small hairs posterior to 2 anterior orbitals and row of hairs extending anteriorly from these bristles along orbits;

hairs on anterior region of front. Face light yellow; carina narrow, not sulcate. Cheeks light yellow. Second oral bristle about seven-eighths length of vibrissa; about 3 strong bristles at lower posterior corner of cheek about half length of vibrissa. Occiput brown. Eyes thickly haired. Vertical diameter of eye about 4 times width of cheek in same axis. Proboscis yellow; palpi with 1 subapical bristle.

**THORAX:** Light yellowish-brown; mesonotum with dark brown vittae; 1 on mid longitudinal line bifurcating near anterior dorsocentral, continuing to scutellar suture and uniting with other vittae; vitta on dorsocentral line not reaching anterior or posterior margins of mesonotum; 1 vitta arising near humerus and extending to wing base and occasionally a shorter lighter vitta between this and the dorsocentral vitta; a wide vitta from propleuron extending to just below wing base or to haltere; a short stripe across sternopleuron and a dark area at postero-ventral corner of hypopleuron. Acrostichal hairs in 8 rows; prescutellars absent but several hairs in this region often slightly enlarged; no enlarged hairs in dorsocentral lines; basal scutellars parallel or slightly convergent and shorter than cruciate apicals; 2 strong humerals and occasionally a weak third bristle dorsally; 2 sternopleurals, sterno-index about 0.3.

Legs uniformly yellowish-brown. Fore femur with 1 dorsal bristle at apical quarter, 2 or 3 postero-dorsals on middle area and 3 postero-ventrals on apical two-thirds.

Wings (Fig. 346) clear; veins brown. Short costal spines extending one-fifth distance between apices of 2nd and 3rd veins. Pair long bristles at distal costal break. Wing indices: costal about 3.1; 4th vein about 2.0; 4c about 0.9; 5x about 2.0.

Halteres yellowish-brown with basal segments partly dark brown.

**ABDOMEN:** Yellow; each tergite with posterior blackish-brown band, wider on posterior segments, interrupted mid dorsally, narrowed to almost interrupted near mid lateral region, and interrupted just before lateral margin.

External male genitalia (Fig. 363): Genital arch slightly narrower dorsally, most bristles on ventral posterior half with a few similar bristles on dorsal half; anal plate with bristles over most of surface; clasper with about 12 teeth on posterior margin.

Female ovipositor plates with minute spine. (Fig. 352).

**INTERNAL CHARACTERS:** Testis with about 2 outer coils yellowish-orange. Ventral receptacle small and composed of about 5 coils. Spermathecae small.

**Egg:** Four filaments about two-thirds length of egg.

*Holotype:* Europe.

*Material Examined:* 222 ex.

*New Records in New Zealand:* LITTLE BARRIER ISLAND: ex banana trap, 25.xi.1954, 2 ♂, (R. A. Harrison), (P.D.D.).

*Distribution in New Zealand:* Little Barrier Island, Auckland, Waitakere Ranges, Palmerston North, Wallaceville, Nelson. (All the year).

*Remarks:* A cosmopolitan species frequently found in association with man.

#### Subgenus SOPHOPHORA Sturtevant

*Sophophora* Sturtevant, 1939. Proc. nat. Acad. Sci. 25 : 139.

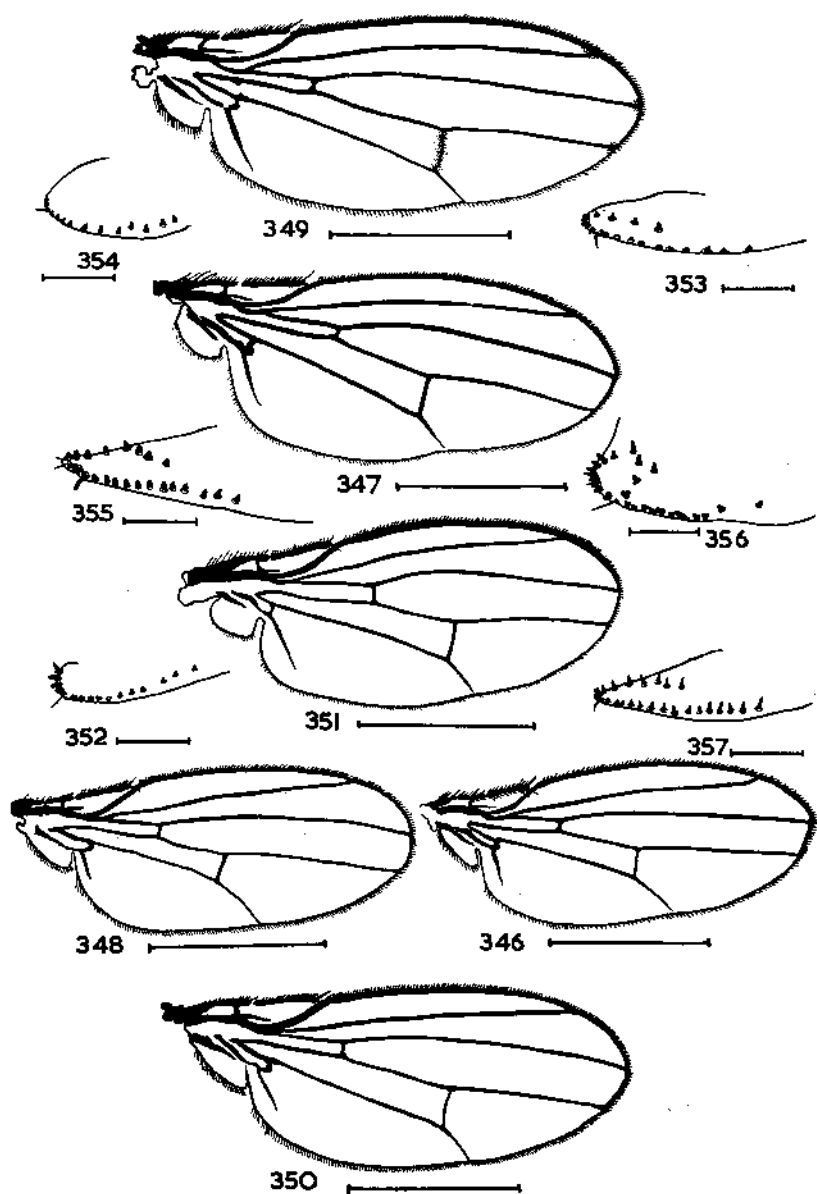
Sturtevant, 1942. Univ. Tex. Publ. 4213 : 38. Wheeler, 1949,

Univ. Tex. Publ. 4920 : 174.

Eggs with 2 blunt filaments; ventral receptacle not kinky; posterior Malpighian tubes free at their distal ends; sterno-index 0.6 or less; anterior spiracle and its stalk not over one-fifth length of puparium; 2nd to 5th abdominal tergites with posterior dark bands that are never broken or narrowed in mid dorsal line; cheeks always relatively narrow.

Type Species: *Drosophila (Sophophora) melanogaster* Meigen

The subgeneric diagnosis given above is after Sturtevant (1942).



Wings:

- Fig. 346. *Drosophila busckii*  
 " 347. *D. hydei*  
 " 348. *D. simulans*  
 " 349. *D. immigrans*  
 " 350. *D. funebris*  
 " 351. *D. repleta*

Female genital plates:

- Fig. 352. *D. busckii*  
 " 353. *D. hydei*  
 " 354. *D. simulans*  
 " 355. *D. immigrans*  
 " 356. *D. funebris*  
 " 357. *D. repleta*

Scale: Figs. 346-351, 1.0 mm.; Figs. 352-357, 0.1 mm.

Separated from other subgenera mainly by the two blunt filaments on the egg, the colouration of abdomen, and width of cheeks.

*Species Occurring in New Zealand:*

*Drosophila (Sophophora) melanogaster* Meigen

*D. (Sophophora) simulans* Sturtevant

A large subgenus containing several widespread and cosmopolitan species.

***Drosophila simulans* Sturtevant. Figs. 348, 354, 358**

*Drosophila simulans* Sturtevant, 1919. Psyche. 26 : 153.

Harrison, 1952. Trans. roy. Soc. N.Z. 79 : 512.

A yellowish-brown species. Body length about 2.0 mm., wing length about 2.0 mm.

MALE AND FEMALE

**HEAD:** Arista blackish-brown, yellowish-brown basally; about 10 branches, 2 below in addition to terminal fork. Third segment of antenna light brown; 2nd segment yellowish-brown with 2 dorsal bristles. Front yellowish-brown; ocellar triangle brown; orbits brown about fronto-orbital bristles. Ratio of lengths of fronto-orbitals, anterior to posterior, 2 : 1 : 2.1; anterior reclinate bristles lateral to and level with or just posterior to proclinate; row of about 5 hairs from orbitals anteriorly along orbit; about 4 hairs on either side of anterior region of front. Face light yellowish-brown; carina prominent, narrow dorsally, not sulcate. Cheeks yellowish-brown. Second oral bristle equal to vibrissa; 3 or 4 bristles at lower posterior angle of cheek. Occiput brown or light brown. Eyes haired. Vertical diameter of eye about 7 or 8 times width of cheek in same axis. Proboscis predominantly yellowish-brown; palpi yellow with several bristles apically.

**THORAX:** Light reddish-brown dorsally, light yellowish-brown ventrally, no pattern. Acrostichal hairs in 8 rows; prescutellars absent, no enlarged hairs at this region, no enlarged hairs in dorsocentral line; basal scutellars convergent or almost parallel and shorter than cruciate apicals; 2 humerals with occasionally 1 small extra dorsal bristle; 2 sternopleurals, sterno-index about 0.5.

Legs shining yellowish-brown. Fore femur with 1 dorsal bristle at apical quarter, bristles on postero-dorsal and postero-ventral surfaces; fore tibia with small preapical and apical; sex comb of male consisting of row of about 10 shining black bristles; mid tibia with preapical and apical.

Wings (Fig. 348) clear; veins brown. Short stout costal spines extending one-third distance between apices of 2nd and 3rd veins; pair strong bristles at distal costal break. Wing indices: costal about 2.25; 4th vein about 2.5; 4c about 1.3; 5x about 2.0.

Halteres yellowish-brown.

**ABDOMEN:** Black or dark brown posteriorly, yellowish-brown anteriorly. Male darker than female. Each tergite with dark brown posterior band, wide mid dorsally and narrow laterally, often fading out before reaching lateral margin.

External male genitalia (Fig. 358): Genital arch broad, narrowing ventrally to a rounded apex, bristles on most of posterior surface, longest ones at or near ventral apex; large process on posterior margin ventral to anal plate; anal plate oval with small bristles, denser ventrally; clasper long and narrow with about 10 to 13 teeth in an irregular row.

Female ovipositor plate broad and with minute spines. (Fig. 354).

**INTERNAL CHARACTERS:** Testis yellow with about 3 coils. Spermathecae small. Ventral receptacle small and composed of 4 to 6 whorls.

**EGG:** Two filaments with enlarged apical portions.

**PUPA:** Anterior spiracles with about 7 branches.

*Holotype:* America.

*Material Examined:* 217 ex.

*Distribution in New Zealand:* Auckland, Waitakere Ranges. (August, October, January, February, April).

*Remarks:* Of the two species *D. simulans* and *D. melanogaster*, the former is the predominant species in the Auckland district. The latter occurs farther south. Recognised by its small size, yellowish-brown colouration, sex comb in male, and costal index of less than 3.0. Separated from *D. melanogaster* by the narrow cheek and shape of posterior process on the genital arch of male.

### ***Drosophila melanogaster* Meigen. Fig. 359**

*Drosophila melanogaster* Meigen, 1830. "Syst. Besch. Zweifl. Insekt." 6: 85. Harrison, 1952. Trans. roy. Soc. N.Z. 79: 513.

*Drosophila nigriventris* Zedderstedt, 1847. "Dipt. Scand." 6: 2557.

*Drosophila ampelophila* Loew, 1862. Berl. ent. Z. 6: 231.

*Drosophila uvarum* Rondani, 1875. Boll. Com. agr. Parm.

A yellowish-brown species. Body length about 2.0 mm., wing length about 2.0 mm.

#### MALE AND FEMALE

**HEAD:** Similar to *D. simulans* except vertical diameter of eye about 5 times width of cheek in same axis.

**THORAX:** Similar to *D. simulans*.

**ABDOMEN:** Black or dark brown posteriorly, yellowish-brown anteriorly. Male darker than female. Tergites with dark brown posterior band, wide mid dorsally, narrow laterally, and often fading out before reaching lateral margin.

External male genitalia (Fig. 359) similar to *D. simulans* except posterior process of genital arch small; clasper larger than posterior process, teeth in irregular sinuate row, about 5 dorsally and 13 to 17 ventrally.

*Holotype:* Europe.

*Material Examined:* 14 ex.

*Distribution in New Zealand:* Auckland, Nelson. (October to March).

*Remarks:* Recognised by small size, yellowish-brown colouration, and costal index under 3.0. Separated from *D. simulans* by the comparatively wide cheek and small posterior process on genital arch of male.

### Subgenus *DROSOPHILA* Fallén

*Drosophila* Fallén, 1823. "Dipt. Suec. Geomyz." 2: 6.  
Sturtevant, 1942. Univ. Tex. Publ. 4213: 30.

Three or 4 egg filaments, at least anterior ones tapering; ventral receptacle long, fine, usually kinky; testes long, spiral; posterior Malpighian tubes forming a closed loop around the gut, their distal ends sometimes merely opposed but usually fused and with a continuous lumen; dark posterior bands on abdomen usually narrowed or broken in mid-dorsal line; sterno-index usually 0.5 or more; cheeks often wide; puparial "horns" often more than one-fifth length of puparium.

Type Species: *Drosophila (Drosophila) funebris* Fallén

The subgeneric diagnosis given above is after Sturtevant (1942).

The largest subgenus and separated from other subgenera by the number of egg filaments and the colouration of the abdomen.

*Species Occurring in New Zealand:*

- Drosophila (Drosophila) funebris* (Fallén)
- D. (Drosophila) hydei* Sturtevant
- D. (Drosophila) immigrans* Sturtevant
- D. (Drosophila) repleta* Wollaston
- D. (Drosophila) marmorata* Hutton

***Drosophila funebris* (Fabricius). Figs. 350, 356, 364**

*Musca funebris* Fabricius, 1787. "Mant. Ins." 2 : 345.

*Drosophila clarkii* Hutton, 1901. Trans. N.Z. Inst. 33 : 91.

*Drosophila funebris* (Fabricius): Sturtevant, 1921. Publ. Carnegie Instn. 301 : 84; Harrison, 1952. Trans. roy. Soc. N.Z. 79 : 515.

*Leucophenga atkinsoni* Miller, 1921. N.Z. J. Sci. Tech. 3 : 302. (New synonymy).

A yellowish or reddish-brown species. Body length about 3.0 mm., wing length about 3.0 mm.

MALE AND FEMALE

**HEAD:** Arista black, basally yellowish-brown; about 12 branches with 4 below in addition to the terminal fork. Third antennal segment dark brown; 2nd segment dark brown dorsally and with about 3 dorsal bristles. Front light reddish-brown; ocellar triangle dark brown. Ratio of lengths of fronto-orbitals, anterior to posterior, 2 : 1 : 4; anterior reclinate bristle almost level with and lateral to proclinate; small hairs on anterior half of front and from orbitals anteriorly along orbits. Face yellowish-brown; carina prominent, not sulcate. Cheeks yellowish-brown. Second oral bristle about three-quarters length of vibrissa; 2 or 3 bristles at lower posterior corner of cheek. Occiput light brown. Eyes haired. Vertical diameter of eye about 5 times width of cheek in same axis. Proboscis yellowish-brown; palpi with about 4 bristles, apical ones stronger.

**THORAX:** Reddish-brown on yellowish-brown. Acrostichal hairs in 8 rows; no enlarged hairs in prescutellar region; several enlarged hairs in dorsocentral row; parallel or convergent basal scutellars about equal to cruciate apicals; 2 humerals and often a small third dorsal bristle; 2 sternopleurals and usually 1 or 2 smaller bristles between them, sterno-index about 0.6.

Legs shining yellowish-brown. Fore femur with 1 dorsal bristle at apical quarter and few postero-dorsal and postero-ventrals; fore and mid tibiae with preapical and apical.

Wings (Fig. 350) clear; veins brown. Short stout costal spines extending half distance between apices of 2nd and 3rd veins; pair short bristles at distal costal break. Wing indices: costal about 3.5; 4th vein about 1.3; 4c about 0.6; 5x about 1.0.

Halteres yellowish-brown.

**ABDOMEN:** Yellowish-brown. Tergites with posterior brown or dark brown band. Band in male very dark and wide and appears to cover whole tergite; in female this band interrupted mid dorsally on anterior tergites.

External male genitalia (Fig. 364): Genital arch narrower ventrally, bare of bristles but with about 5 or 6 strong stout teeth near ventral margin; anal plate large with strong bristles over most of surface, about 10 to 20 strong curved spines, most on ventral surface and few at posterior curved apex; clasper fused with arch, large, round, with about 12 primary teeth and few interspersed hairs, and about 4 to 6 secondary teeth.

Female ovipositor plates broad, spines small. (Fig. 356).

**INTERNAL CHARACTERS:** Testis with large white inner coils and about 9 light yellow outer coils. Spermathecae large. Ventral receptacle long and coiled.

**EGG:** Four filaments almost as long as egg. †

**PUPA:** Anterior spiracle with about 16 branches.

*Holotype:* Europe.

*Material Examined:* 63 ex.

*Distribution in New Zealand:* Auckland, Wellington (?), Rangiora, Dunedin. (January to April).

*Remarks:* Miller (1950) states that the type of *Leucophenga atkinsoni* Miller is lost. Apparently no holotype was created but rather a series of syntypes which are recorded as syntypes No. 1240, (Miller, 1921). Three of these syntypes are in the Miller collection and have been examined and found to be *D. funebris*. The description of *L. atkinsoni* Miller, 1921 gives sufficient data in both text and diagrams to show that the species was not a *Leucophenga* and has many characters of *D. funebris*. Separated from other species by the large number of arisal rays, absence of spines on fore femur and lack of shading on cross veins.

### ***Drosophila immigrans* Sturtevant. Figs. 349, 355, 362**

*Drosophila brouni* Hutton, 1901. Trans. N.Z. Inst. 33 : 91.

Harrison, 1952. Trans. roy. Soc. N.Z. 79 : 514. (Suppressed name, Opin. int. Comm. zool. Nom. 396.)

*Drosophila immigrans* Sturtevant, 1921. Publ. Carnegie Instn. 301 : 83.

A yellowish-brown species. Body length about 3.0 mm., wing length about 3.0 mm.

#### MALE AND FEMALE

**HEAD:** Arista black, yellowish-brown basally; about 11 branches, 3 or 4 below in addition to the terminal fork. Third antennal segment brown, light brown ventrally; 2nd segment yellowish-brown with 2 to 4 bristles dorsally. Front reddish or yellowish-brown; ocellar triangle dark brown. Ratio of length of fronto-orbital bristles, anterior to posterior, 2 : 1 : 2; anterior reclinate orbital mid way between other two bristles or just closer to anterior and in line with them or just lateral to them; few hairs between anterior orbital and mid point of anterior frontal margin; hairs from orbitals anteriorly along orbits. Face yellowish-brown; carina prominent not sulcate. Cheeks yellowish-brown. Second oral bristle about three-quarters length of vibrissa; 2 strong bristles at lower posterior corner of cheek. Occiput light brown. Eyes haired. Vertical diameter of eye about 4.5 times width of cheek in same axis. Proboscis yellowish-brown; palpi light yellow and with 3 bristles apically.

**THORAX:** Yellowish-brown. Acrostichal hairs in 8 rows; no enlarged hairs in prescutellar region; no enlarged hairs in dorsocentral row; basal scutellars parallel or convergent and equal to cruciate apicals; 2 humerals; 3 sternopleurals, dorsal posterior bristle the weakest, sterno-index about 0.6.

Legs yellowish-brown, tarsi light brown or brown. Fore femur with 1 dorsal bristle at apical quarter, 3 or 4 postero-dorsals on basal three-quarters, about 6 postero-ventrals, row of about 9 to 10 short, stout bristles on apical half of antero-ventral surface; fore and mid tibia with preapical and apical; fore tarsus in male with long recurved hairs on basal segment.

Wings (Fig. 349) clear except for slight darkening about posterior cross vein and at apices of 2nd, 3rd, and 4th veins. Short stout costal spines extending one-third distance between apices of 2nd and 3rd veins; 1 strong bristle at distal costal break. Wing indices: costal about 4.2; 4th vein about 1.2; 4c about 0.5; 5x about 1.0.

Halteres light yellowish-brown.

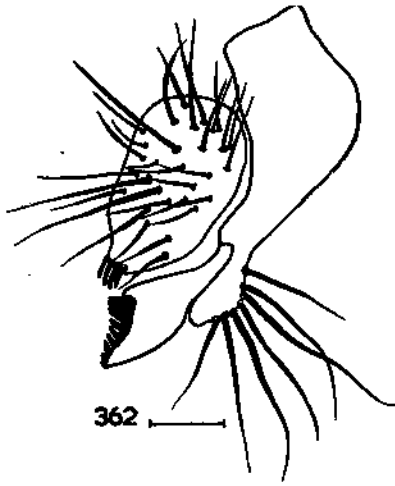
**ABDOMEN:** Yellowish-brown with a blackish-brown band on posterior margin of each tergite, wider on posterior tergites.

External male genitalia (Fig. 362): Genital arch broad dorsally with about 8 long and strong ventral bristles; anal plate with bristles over all surface and about 5 short stout bristles at ventral apex; clasper triangular, large, about 15 teeth on posterior margin.

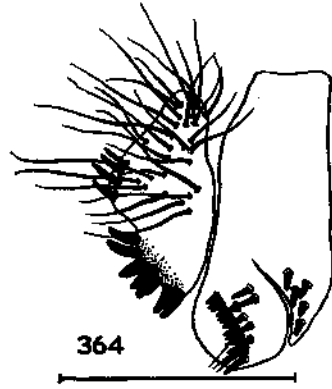
Female ovipositor plate narrow and pointed, spines short (Fig. 355).

**INTERNAL CHARACTERS:** Testis light yellow with about 5 coils. Spermathecae small. Ventral receptacle elongate and coiled.

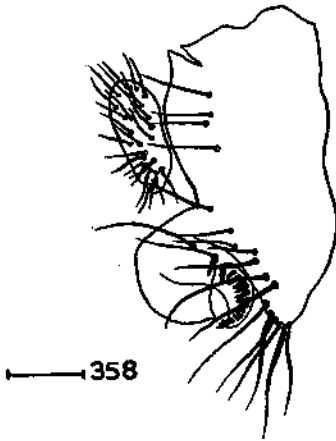




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364



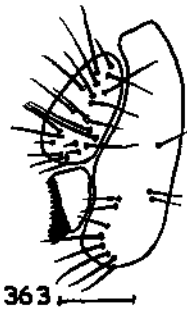
358



359



361



363



360

Figs. 358-364, External male genitalia:

358. *Drosophila simulans*

362. *D. immigrans*

359. *D. melanogaster*

363. *D. busckii*

360. *D. repleta*

364. *D. funebris*

361. *D. hydei*

Scale: 0.1 mm.

EGG: Four filaments about two-thirds length of egg.

PUPA: Anterior spiracles elongate and with about 18 branches.

*Holotype*: AUCKLAND: ♀, (*H. Suter*), (Cant. Mus.).

*Material Examined*: Holotype, 5 ♀, and 771 ex.

*New Records in New Zealand*: LITTLE BARRIER ISLAND: banana-baited trap, 25–29.xi.1954, 75 ex., (*R. A. Harrison*). WAITAKERE RANGES: Titirangi, ex light trap, 14.vi.1953, 1 ♀; 13.xii.1953, 1 ♀, (*C. R. Thomas*), (P.D.D.). NELSON: 8.v.1944, 1 ♀, (*Anon.*); Cawthron Park, swept off bracken fern, 17.x.1951, 2 ♀, (*A. W. Parrot*), (Cawt. Inst.).

*Distribution in New Zealand*: Little Barrier Island, Waitakere Ranges, Auckland, Palmerston North, Nelson. (All the year).

*Remarks*: Separated from other species in the subgenus *Drosophila* by the presence of a row of short black spines on the fore femur.

### ***Drosophila hydei* Sturtevant. Figs. 347, 353, 361**

*Drosophila hydei* Sturtevant, 1921. Publ. Carnegie Instn.  
301 : 101. Harrison, 1952. Trans. roy. Soc. N.Z. 79 : 510.

A dark brown species with light grey mesonotum and dark brown spots at base of each hair and bristle. Body length about 2.5 mm., wing length about 2.5 mm.

#### MALE AND FEMALE

**HEAD**: Arista black, basally yellowish-brown; 7 branches, 2 below in addition to the terminal fork. Antenna dark brown but yellowish-brown ventrally; 2nd segment with 3 dorsal bristles, 1 strong. Front dark reddish-brown; ocellar triangle blackish-brown; orbits grey posteriorly and about orbital bristles, dark brown or brown anteriorly; dark brown spot at base of each orbital, those about posterior orbital and verticals often merged. Ratio of length of fronto-orbital bristles, anterior to posterior, 2 : 1 : 2; anterior reclinate bristle closer to proclinate than posterior reclinate and lateral to them; hairs on anterior region of front from mid lunule to anterior orbital bristle. Face brown; carina prominent, sulcate. Cheeks yellowish-brown. Second oral bristle about half length of vibrissa. Eyes haired. Vertical diameter of eye about 4.5 times width of cheek in same axis. Proboscis yellowish-brown, rostrum brown; palpi with 1 strong apical bristle.

**THORAX**: Reddish-brown; mesonotum light grey with dark brown spots at base of hairs and bristles, spots often fusing to form large dark areas. Acrostichal hairs in 8 rows; no enlarged hairs in prescutellar region; some enlarged hairs in dorsocentral line; basal scutellars convergent and shorter than cruciate apicals; 3 humerals, dorsal one weak; 2 sternopleurals, sterno-index about 0.7.

Legs all yellowish-brown. Fore femur with a dorsal bristle at apical quarter, about 4 postero-dorsals and 6 postero-ventrals; fore tibia with preapical and apical fore tarsus in male with many short and some long slender recurved hairs; mid tibia with preapical and apical.

Wings (Fig. 347) clear, veins brown. Short stout costal spines extending half distance between apices of 2nd and 3rd veins; pair of bristles at distal costal break and costa not darkened at this region. Wing indices: costal about 3.5; 4th vein about 1.75; 4c about 0.75; 5x about 1.1.

Halteres yellowish-brown with basal segments brown anteriorly.

**ABDOMEN**: Yellowish-brown with dark brown bands posteriorly on each tergite, interrupted mid dorsally, narrowed before reaching lateral margin of tergite and extending whole width of tergite at lateral margin.

External male genitalia (Fig. 361): Genital arch broader basally, bristles over most of surface, few dorsally, cluster on ventral apex; anal plate oval, fused to arch; clasper with about 10 teeth and several small posterior marginal bristles.

Female ovipositor plates narrow with broadly rounded apex and small spines. (Fig. 353).

INTERNAL CHARACTERS: Testis orange with about 40 coils. Spermathecae small and on long thick stalks. Ventral receptacle exceedingly long and coiled.

EGG: Four filaments tapering to apex and about as long as egg length.

PUPA: Anterior spiracles moderately long with about 16 branches.

*Holotype*: America.

*Material Examined*: 1 ♂ and 46 ex.

*New Records in New Zealand*: LITTLE BARRIER ISLAND: 26.xi.1954, 1 ♂, (R. A. Harrison), (P.D.D.).

*Distribution in New Zealand*: Little Barrier Island, Paihia, Auckland (All year).

*Remarks*: The commonest member of the *repleta* group of the subgenus *Drosophila* found in New Zealand. Recognised by the grey mesonotum with dark brown spots at base of hairs and bristles, the absence of dark spot at distal costal break, and, in males, by the slender recurved hairs of fore tarsus.

### ***Drosophila repleta* Wollaston. Figs. 351, 357, 360**

*Drosophila repleta* Wollaston, 1858. Ann. Mag. nat. Hist.

41 : 117. Harrison, 1952. Trans. roy. Soc. N.Z. 79 : 508.

*Drosophila punctulata* Loew, 1862. Berl. ent. Z. 6 : 232.

*Drosophila adpersa* Mik, 1886. Wein. ent. Ztg. 5 : 328.

A dark brown species with light grey mesonotum with dark brown spots at base of hairs and bristles. Body length about 2.5 mm., wing length about 2.5 mm.

#### MALE AND FEMALE

HEAD: Arista black, basally light brown; 7 branches, 2 below in addition to terminal fork. Third antennal segment dark brown, light brown ventrally; 2nd segment yellowish- or light reddish-brown with dark brown patch dorsally and 3 dorsal bristles. Front predominantly dark reddish-brown and silvery-grey; ocellar triangle almost black; areas lateral to ocelli dark reddish-brown; a narrow median longitudinal light brown vitta from ocelli to anterior margin of front; orbits silvery-grey posteriorly and about the bristles, reddish-brown anteriorly; each fronto-orbital arising from a dark brown spot. Ratio of lengths of fronto-orbitals, anterior to posterior, 2 : 1 : 2; anterior reclinate orbital closer to proclinate than posterior reclinate and lateral to them; row of hairs from anterior orbital along orbit; an irregular row of hairs from orbitals to mid point of anterior frontal margin. Face brown or dark brown with blackish-brown areas; carina broad ventrally, slightly sulcate ventrally. Cheeks brown to dark brown. Second oral bristle about half length of vibrissa; 3 bristles at lower posterior angle of cheek. Occiput dark brown with greyish dusting. Eyes with thick matt of hairs. Vertical diameter of eye about 5 times width of cheek in same axis. Proboscis brown; rostrum dark brown; palpi yellowish-brown with about 4 or 5 bristles evenly spaced on lateral margin, the apical one the longest.

THORAX: Dark brown; mesonotum light grey with dark brown spot at each hair and bristle, these spots often fusing; scutellum with narrow yellowish-brown margin merging to dark brown ventral area. Acrostichal hairs in 8 rows; several enlarged hairs in dorsocentral line; prescutellars absent; basal scutellars convergent and shorter than cruciate apicals; 3 humerals, dorsal bristle the weakest; 2 sternopleurals, sterno-index about 0.8.

Legs reddish-brown, fore coxa dark brown. Fore femur with 1 dorsal bristle at apical quarter, about 4 postero-ventrals; fore and mid tibiae with preapical and apicals; fore tarsus without recurved hairs.

Wings (Fig. 351) clear, veins brown. Short stout costal spines extending half distance between apices of 2nd and 3rd veins; pair small bristles at distal costal break and costa dark brown about this region. Wing indices: costal about 3.0; 4th vein about 1.7; 4c about 0.8; 5x about 1.3.

Halteres light reddish-brown.

**ABDOMEN:** Tergites yellowish-brown with wide dark brown band posteriorly, interrupted mid-dorsally; a yellowish-brown area near anterior corner of lateral margins of tergites.

External male genitalia (Fig. 360): Genital arch broad, bristles on surface, majority near ventral margin; anal plate fused with arch, cluster of short bristles at ventral apex; clasper with about 10 teeth and some bristles on posterior margin.

Female ovipositor plates tapering to pointed apex; spines distinct. (Fig. 357).

**INTERNAL CHARACTERS:** Testis long and extensively coiled. Spermathecae large on short stalks. Ventral receptacle long and coiled.

**EGG:** Four tapering filaments.

**PUPA:** Anterior spiracles moderately long.

*Holotype:* Madeira.

*Material Examined:* 13 ex.

*Distribution in New Zealand:* Auckland, Paihia. (December, March, April).

*Remarks:* Not common in New Zealand but of cosmopolitan distribution. Recognised by the brown spots at base of hairs and bristles on mesonotum and the brown spot at distal costal break.

### ***Drosophila marmorata* Hutton**

*Drosophila marmorata* Hutton, 1901. Trans. N.Z. Inst. 33 : 91.

The holotype is in poor condition and cannot be fully described. No other specimens are known. Similar in many respects to *D. hydei* and may possibly be this species.

*Holotype:* AUCKLAND: ♀, (*H. Suter*), (Cant. Mus.).

### SPECIES UNCLASSIFIED AS TO SUBGENUS

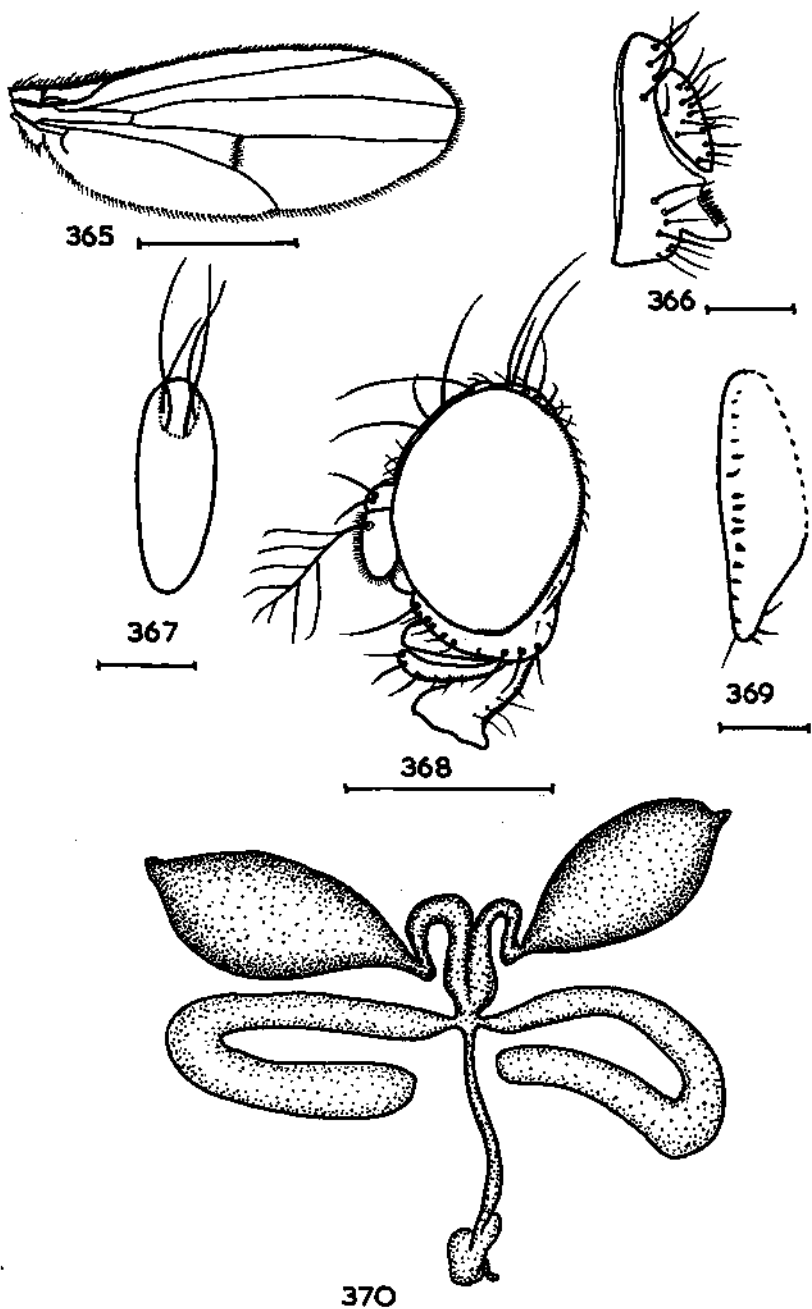
#### ***Drosophila kirki* sp.n. Figs. 365 to 370**

A dark brown species with brown mesonotum. Body length about 2.75 mm., wing length about 3.0 mm.

#### MALE AND FEMALE

**HEAD** (Fig. 368): Arista blackish-brown, brown basally; 8 branches, 2 below in addition to the terminal fork. Antenna greyish-brown; 2nd segment brown with 1 strong median dorsal bristle and several strong apical hairs. Front golden brown; ocellar area blackish-brown, ocellar triangle grey dusted; orbits as far anterior as proclinate orbital bristle, dark brown with grey dusting. Ratio of fronto-orbitals, anterior to posterior, 3 : 2 : 4; anterior reclinate fronto-orbital lateral to and just posterior to proclinate orbital; inner vertical strongest of all frontal bristles; distinct row of black hairs from middle fronto-orbital anteriorly along orbit; an irregular row of inwardly directed hairs on either side of middle line of front anterior to ocelli. Face light brown, antennal fossae and anterior margin of face dark brown; carina not sulcate. Cheeks light brown with dark brown ventral margin. Second oral bristle less than half length of vibrissa and scarcely differentiated from hairs along cheek margin; 2 or 3 bristles at lower posterior corner of cheek. Occiput chocolate brown. Eyes with thick matt of hairs. Vertical diameter of eye about 12 times width of cheek in same axis. Proboscis brown; palpi brown with strong bristles.

**THORAX:** Dark brown, mesonotum brown with light dusting. Prescutellars absent; anterior dorsocentral about two-thirds length of posterior, no enlarged hairs in dorsocentral row; divergent basal scutellars longer than apicals and about one-third distance from scutellar suture to apical bristles; acrostichal hairs in 8 rows immediately anterior to anterior dorsocentral; 2 humerals; 2 supraalar, anterior of pair very weak; 2 postalar, posterior of pair weaker; 3 strong sternopleurals, anterior of the two dorsal bristles the weaker, ventral bristle just posterior to



Figs. 365-370, *Drosophila kirki*:

- |                              |                              |
|------------------------------|------------------------------|
| 365. Wing                    | 368. Head                    |
| 366. External male genitalia | 369. Female genital plate    |
| 367. Egg                     | 370. Internal male genitalia |
- Scale: Fig. 365, 1.0 mm.; Figs. 366, 369, 0.1 mm.; Fig. 367, 0.25 mm.;  
Fig. 368, 0.5 mm.

posterior dorsal, row of hairs down sternopleuron, the dorsal one very strong and about half length anterior sternopleural, sterno-index about 0.6.

Legs brown; all trochanters, extreme base and apex of fore femur and tibia, all fore tarsus, base and apical third of mid femur and tibia, all mid tarsus, base and apex of hind femur, and tibia and all hind tarsus yellowish-brown. Fore femur with long fine bristles on postero-dorsal and postero-ventral surfaces; fore and hind tibia with weak bristles, mid tibia with strong preapical and apical.

Wings (Fig. 365) clear, veins brown. Pair of bristles at distal costal break, dorsal of pair the stronger; short costal spines extending two-thirds distance between apices of 2nd and 3rd veins. Wing indices: costal about 2.9; 4th vein about 2.1; 4c about 0.9; 5x about 1.7.

Halteres light yellow.

ABDOMEN: Basal tergite yellowish-brown, other tergites blackish-brown, apical ones darker with median longitudinal yellow band and yellow anterior margins; sternites yellowish-brown.

External male genitalia (Fig. 366): Genital arch narrow dorsally, broad ventrally, about 4 bristles on either side dorsally, and 7 on postero-ventral corner; anal plate about half length of arch with about 20 bristles on surface and a cluster of small bristles at ventral angle; clasper with 11 or 12 strong teeth on posterior margin.

Female ovipositor plates with short spines; apical one the strongest and with 1 strong and a few weak apical hairs. (Fig. 369).

INTERNAL CHARACTERS: Testes elliptical, light lemon-yellow. (Fig. 370).

EGG (Fig. 367): Four filaments about equal to length of egg.

*Holotype*: LITTLE BARRIER ISLAND: Waipawa stream bed, 25.xi.1954, ♂, (R. A. Harrison), (P.D.D.).

*Paratypes*: LITTLE BARRIER ISLAND: Waipawa Stream, banana-baited trap, 29.xi.1954, 42 ♂, 16 ♀; Kauri Gully, 24.xi.1954, 6 ♂, (R. A. Harrison). WAITAKERE RANGES: Oratia, ex house, 21.i.1952, 1 ♀, (R. A. Harrison); Titirangi, ex light trap, 15.vi.1953, 1 ♀, (C. R. Thomas), (P.D.D.). PAPA KURA: Kirks Bush, banana-baited trap, 9.i.1953, 27 ♂, 13 ♀, (R. A. Harrison). PUKEKOHE: banana-baited trap, 9.i.1953, 1 ♂, (R. A. Harrison). AUCKLAND: Browns Bay, banana-baited trap, 15.vii.1951, 1 ♂; 2.ix.1951, 1 ♂; 12.xii.1951, 1 ♀, (R. A. Harrison), (P.D.D.).

*Material Examined*: Holotype, 78 ♂ and 32 ♀ paratypes.

*Distribution*: Little Barrier Island, Auckland, Waitakere Ranges, Papakura, Pukekohe. (June, July, November to January).

*Remarks*: The testes show similarities with the subgenus *Pholadoris* and to some members the *obscura* group of the subgenus *Sophophora*. However, the four egg filaments, the absence of prescutellars, and the divergent basal scutellars are important characters which separate this species from one or both of those subgenera. This species does not agree with the diagnosis of any of the eight subgenera so far proposed for the genus *Drosophila*. Although eggs have been laid occasionally on laboratory culture medium, no success has been achieved in breeding this species.

## Family AGROMYZIDAE

Arista bare or with short pubescence. Postverticals strongly divergent; ocellars present; hairs on frontal-orbits; centre of front usually bare; anterior fronto-orbitals convergent; posterior fronto-orbitals erect or slightly reclinate; ocellars present. Vibrissa present. Carina present.

One humeral; one presutural; one strong posterior mesopleural; one sternopleural. Tibiae with short apical spurs. Costa broken at apex of subcosta; anterior cross vein present.

The important distinguishing characters are the presence of only one break in the costa, the divergent postverticals, the presence of vibrissa, the convergent anterior fronto-orbitals, and the presence of a mesopleural bristle.

*Subfamilies:* Agromyzinae  
Phytomyzinae

All endemic New Zealand species belong to the Phytomyzinae, and only one species, an immigrant species, belongs to the Agromyzinae. Endemic species were originally placed in *Agromyza*, *Phytomyza*, and *Haplomyza* (Watt 1923, 1924). Not one true *Agromyza* occurs in New Zealand and the species originally in that genus are here placed in several genera of the Phytomyzinae.

The majority of the Agromyzidae are leaf miners and some are of economic importance. Watt (1923 and 1924) gives full notes and descriptions of the mines and food plants of the endemic species he described. *Phytomyza atricornis* and *Cerodontha denticornis* are two cosmopolitan leaf mining pests which are now well established in New Zealand. The economic importance of the former has been discussed by Miller and Watt (1915), Watt (1923), and Kelsey (1937), and that of the latter by Morrison (1938).

#### KEY TO SUBFAMILIES

- Subcosta developed throughout its length, coalescing with 1st vein before reaching costa; the 1st vein somewhat broadened at union with costa  
AGROMYZINAE (p. 306)
- Subcosta distinct only basally, becoming a fold distally and ending in costa separately from 1st vein; 1st vein not broadened at union with costa  
PHYTOMYZINAE (p. 308)

#### Subfamily AGROMYZINAE

Subcosta complete, coalescing with first vein immediately before reaching costa; first vein broadened at its union with the costa and contiguous with costa anteriorly for a short distance. Wings, when at rest, only partly folded over abdomen and never folded completely one over the other.

The complete subcosta which unites distally with the first vein is the most important distinguishing character of the Agromyzinae.

*Genera Occurring in New Zealand: Melanagromyza* Hendel

No endemic species in this subfamily are as yet known from New Zealand. *Agromyza australiensis* Mik, 1881 is scarcely known. No additional material has been discovered since the original specimens were collected on Auckland Islands in 1874 by Dr Krone. The type material, which was probably located in a European Museum, cannot be found and must be considered to be lost. Mik's description is too brief to characterise the species or to enable it to be placed in its true generic position, and until fresh material is obtained it appears best to disregard this species in any study on New Zealand Agromyzidae.

## Genus MELANAGROMYZA Hendel

*Melanagromyza* Hendel, 1920. Arch. Naturgesch. A84 : 126.

Shining black species sometimes with brilliant green metallic sheen. Third antennal segment rounded at apex. Frontal lunule large, extending one-third to half way to ocelli; pitilinal fissure deep. Ocellar triangle large but not conspicuous. Carina narrow and flattened. Vibrissa not strong. One supraalar; 2 postalars, inner one weak; 1 propleural; 2 notopleurals. Costa usually reaching 4th vein; posterior cross vein present often close to anterior cross vein. Halteres black or dark brown.

Type Species: *Melanagromyza aeneiventris* (Fallén)

Recognised by the black halteres and the narrow flattened carina.

*Distribution*: World wide.

*Species Occurring in New Zealand*: *Melanagromyza aeneiventris* (Fallén)

### **Melanagromyza aeneiventris** (Fallén). Fig. 371

*Agromyza aeneiventris* Fallén, 1823. "Dipt. Succ. Agromyz." 2 : 4.

*Melanagromyza aeneiventris* (Fallén): Hendel, 1920. Arch. Naturgesch. A84 : 126.

A black species with light brown wings. Body length about 3.0 mm., wing length about 3.0 mm.

#### MALE AND FEMALE

**HEAD**: Arista brown, dark brown basally; pubescent, rays of pubescence much less than diameter of basal segments. Antenna black; 3rd segment broader than long; 2nd segment dark brown at apex, 1 dorsal bristle and minute hairs; basal segment small. Front blackish-brown; ocellar triangle and orbits somewhat shining; lunule extending at most one-third distance to vertex. Four strong fronto-orbitals; row of many short hairs lateral to fronto-orbitals; ocellars, verticals and postverticals strong. Face black. Cheeks dark brown. Row of hairs posterior to vibrissa. Occiput black. Eyes with a few fine hairs mostly dorsally. Vertical diameter of eye about 4 times width of cheek in same axis. Proboscis brown; palpi black with apical hairs the strongest.

**THORAX**: Black; sutures between some pleura brown. No prescutellars; acrostichal hairs in about 10 rows; 4 dorsocentrals, 3 postsutural basal scutellars parallel or convergent and about equal to cruciate apicals; scutellum bare; 1 interalar; mesopleuron haired dorsally and posteriorly; sternopleural strong and 2 smaller bristles anterior to it.

Legs blackish-brown. Fore femur with postero-dorsal bristles.

Wings (Fig. 371) shaded light brown; veins brown. Wing indices: costal about 4.0; 4th vein about 4.0; 4c about 1.1; 5x about 1.6.

Halteres dark brown.

Squamae light brown bordered with brown band bearing brown hairs.

**ABDOMEN**: Black.

*Holotype*: Europe.

*Material Examined*: 1 ♂ and 5 ♀.

*New Records*: PALMERSTON NORTH: bred ex ragwort, 8.iv.1930, 4 ♀, (W. Cottier), (P.D.D.). WAIHO: 17.i.1922, 1 ♂, 1 ♀, (A. L. Tonnoir), (Cant. Mus.).

*Distribution in New Zealand*: Palmerston North, Waiho. (January, April).

*Host Plants*: *Senecio jacobaea* L.

*Remarks*: Larvae mine the stems of ragwort.



### Subfamily PHYTOMYZINAE

Subcosta only distinct basally, becoming a fold distally and ending in costa distinctly separated from first vein; first vein not broadened at its union with the costa. Wings when at rest folded one above the other on the abdomen.

The weak subcosta ending in costa distinct from the first vein is the most important distinguishing character of the subfamily.

*Genera Occurring in New Zealand:*

*Cerodontha* Rondani

*Haplomyza* Hendel

*Liriomyza* Mik

*Phytobia* Lioy

*Phytomyza* Fallén

*Liriomyza* and *Phytobia* are new generic records for New Zealand although the New Zealand species included in them were previously known under *Agromyza*.

#### KEY TO GENERA OF PHYTOMYZINAE IN NEW ZEALAND

- 1 Two pairs of scutellar bristles ..... 2  
One pair of scutellar bristles ..... CERODONTA (p. 308)
- 2 Hairs on frontal orbits proclinate ..... PHYTOMYZA (p. 312)  
Hairs on frontal orbits erect or reclinate ..... 3
- 3 Scutellum completely yellow or with yellow longitudinal band ..... 4  
Scutellum concolourous with mesonotum and usually dark brown  
PHYTOBIA (p. 316)
- 4 Posterior cross vein present ..... LIRIOMYZA (p. 320)  
Posterior cross vein absent ..... HAPLOMYZA (p. 326)

### Genus CERODONTA Rondani

*Cerodontha* Rondani, 1861. "Dipt. ital. Prodr." 4: 10.

Black species with yellow markings. Third antennal segment elongate with a claw-like apex, or drawn out to an acute angle, or bearing a sharp spine. Usually 4 fronto-orbitals; hairs on frontal orbits erect or reclinate. Vibrissa well developed. Prescutellars absent; 3 or 4 dorsocentrals, anterior one presutural; 1 pair of scutellars; 1 propleural. Costa extending to 4th vein; posterior cross vein usually present. Halteres white or yellow. Male genitalia with genital arch broader ventrally; anal plate small; clasper slender and without spines.

Type Species: *Cerodontha denticornis* (Panzer)

Most readily recognised by the presence of only one pair of scutellars.

*Distribution:* World wide.

*Species Occurring in New Zealand:*

*Cerodontha angustipennis* sp.n.

*C. denticornis* (Panzer).

The type species is cosmopolitan in distribution and is well established in New Zealand. The two species are not closely related.

#### KEY TO SPECIES OF CERODONTA IN NEW ZEALAND

- Four dorsocentrals ..... **denticornis**  
Three dorsocentrals ..... **angustipennis**

**Cerodontha denticornis** (Panzer). Fig. 372

*Chlorops denticornis* Panzer, 1806. "Faun. Germ." 104 : 22.

*Cerodontha denticornis* (Panzer): Lioy, 1864. Atti Ist. veneto,  
(3) 9 : 1315.

A greyish-brown species with yellow legs. Body length about 1.75 mm., wing length about 1.75 mm.

MALE AND FEMALE

**HEAD:** Arista dark brown, minutely pubescent. Antenna yellowish-brown; 3rd segment blackish-brown on outer surface and an antero-dorsal sector, dorsal apical spine black; 2nd segment with 1 small dorsal apical bristle and small black hairs over most of surface; basal segment bare. Front yellow; orbits yellowish-white; ocellar area black and blackish-brown. Three fronto-orbitals and weak anterior pair and a few hairs lateral to the fronto-orbitals; ocellars, verticals and postverticals very strong. Face yellowish-white, slightly carinate. Cheeks light yellow. Hairs on cheek margin about one-third length of vibrissa. Occiput dark brown dusted. Eyes with a few fine short hairs. Vertical diameter of eye about 2.5 times width of cheek in same axis. Proboscis light yellow; palpi light orange with one black apical hair.

**THORAX:** Heavily dusted greyish-brown; humerus except area anterior to bristle, wing base and sutures between, and most of pleura, light yellow. Acrostichal hairs, if present, few in number and on anterior half of mesonotum; 4 strong dorsocentrals; scutellar bristles cruciate or convergent; scutellum bare; 2 small notopleurals; 1 strong supraalar; 1 weak interalar; 1 strong postalar and a small inner hair; few hairs at postero-dorsal corner of mesopleuron; prosternum bare.

Legs yellow; tibiae and tarsi light brown. Fore femur with a few small bristles on postero-dorsal surface.

Wings (Fig. 372) clear; veins brown. Wing indices: costal about 4.3; 4th vein about 5.0-6.0; 4c about 1.5; 5x about 2.5.

Halteres yellowish-brown.

**ABDOMEN:** Shining brown; tergites with narrow posterior yellowish-brown band; 6th tergite in both sexes about twice length of 5th and with a broad yellowish-band; 7th tergite in female black and dusted. Ovipositor blackish-brown.

*Holotype:* Europe.

*Material Examined:* 46 ♂ and 39 ♀.

*New Records:* MOKO HINAU: Burgess Island, 24.viii.1955, 1 ♂, 2 ♀, (R. A. Harrison), (P.D.D.). LITTLE BARRIER ISLAND: Te Titoki Point, 25.xi.1954, 1 ♂, 3 ♀, (R. A. Harrison), (P.D.D.). WAITAKERE RANGES: Titirangi, ex light trap, 15.xi.1952, 1 ♂; 18.i.1953, 1 ♂; 8.ii.1953, 1 ♀; 16-18.ii.1953, 3 ♂, (C. R. Thomas): Nihotupu, 2.i.1950, 2 ♂, (R. A. Harrison): Dreamlands, 27.xii.1950, 2 ♂, 1 ♀, (K. P. Lamb): Oratia, 2.iv.1949, 1 ♀, (R. A. Harrison), (P.D.D.). AUCKLAND: Owairaka, bred ex mines in perennial rye grass, 19.ix.1949, 4 pairs in copula, 3 ♂, (R. A. Harrison): Ellerslie, 17.xii.1953, 1 ♂, (K. A. J. Wise), (P.D.D.). PUKEKOHE: Swept off carrots, 16.viii.1952, 1 ♀, (R. A. Harrison), (P.D.D.). WAIUKU: Swept off carrots, 29.ix.1952, 1 ♀, (R. A. Harrison), (P.D.D.). MAYOR ISLAND: 28.xi.1948, 4 ♂, (S. A. Rumsey), (P.D.D.). PALMERSTON NORTH: -iv.1931, 1 ♂, 2 ♀, (W. Cottier), (P.D.D.). WANGANUI: 26.ii.1921, 2 ♂, 1 ♀, (M. N. Watt), (U.S.N.M.). NATIONAL PARK: Mt. Ngauruhoe, 26.ii.1949, 2 ♂, 2 ♀, (R. A. Harrison), (P.D.D.). NELSON: 14.xii.1921, 1 ♀; 2.i.1922, 1 ♀; 7.v.1922, 1 ♂; 25-26.xi.1923, 1 ♂, (A. L. Tonnoir), (Cant. Mus.): 22.x.1925, 1 ♂, (W. Heighway), (Cawt. Inst.): Aniseed Valley, 22.iii.1922, 1 ♀, (A. L. Tonnoir), (Cant. Mus.). MT. ARTHUR: 20-23.xii.1921, 1 ♂, 1 ♀, (A. L. Tonnoir), (Cant. Mus.). CASS: 1.xii.1924, 1 ♀, (A. L. Tonnoir), (Cant. Mus.). OTIRA: 10.ii.1922, 3 ♀, (A. L. Tonnoir), (Cant. Mus.). WAIHO: 12.i.1922, 1 ♂, 2 ♀,

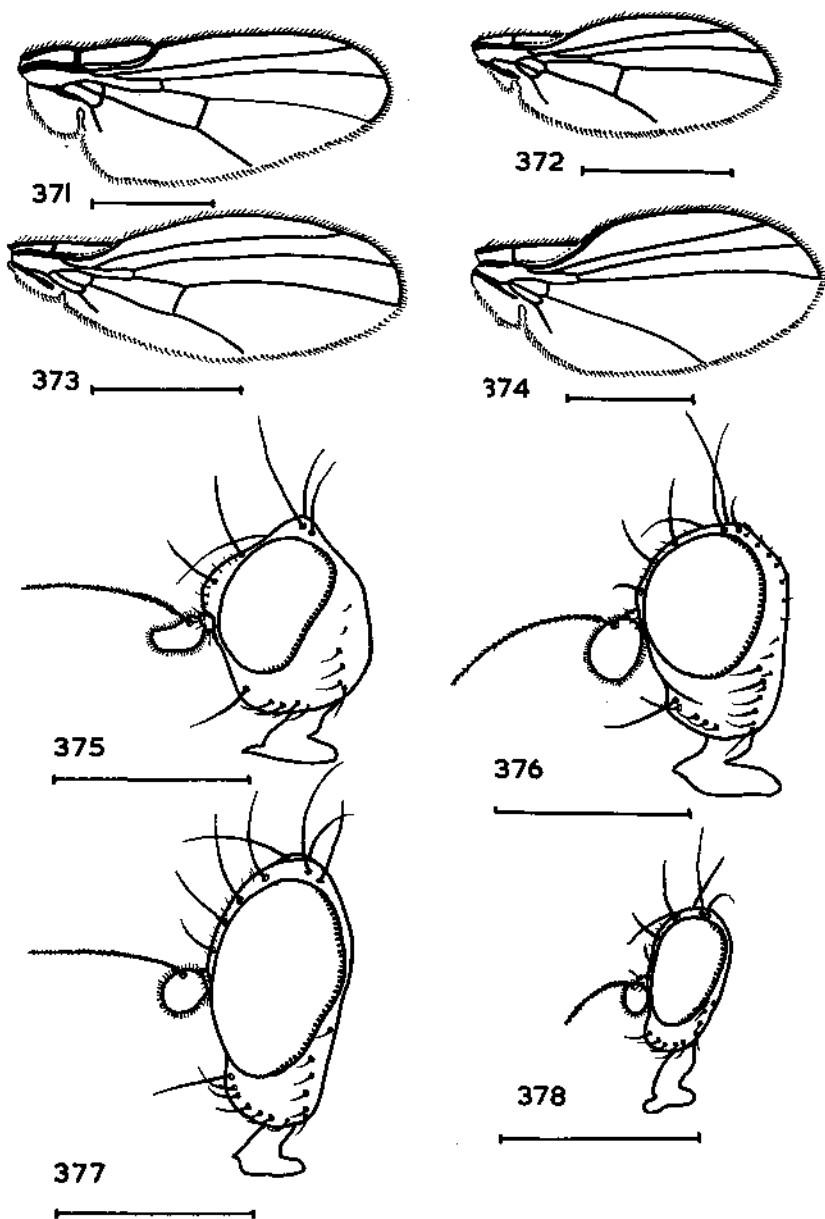


Fig. 371. Wing of *Melanagromyza aeneiventris*  
 " 372. " " *Cerodontha denticornis*  
 " 373. " " *C. angustipennis*  
 " 374. " " *Haplomyza chenopodii*  
 " 375. Head of *Cerodontha angustipennis*  
 " 376. " " *Phytomyza costata*  
 " 377. " " *Phytomyza umbrina*  
 " 378. " " *Haplomyza chenopodii*  
 Scale: Figs. 371-373, 1.0 mm.; Figs. 374-378, 0.5 mm.

(*A. L. Tonnoir*), (Cant. Mus.). CHRISTCHURCH: 17.ii.1922, 1 ♂; 12.x.1924, 1 ♂, (*A. L. Tonnoir*): Horseshoe Lake, 12.x.1924, 1 ♂, 4 ♀, (*Anon.*), (Cant. Mus.). BANKS PENINSULA: Hilltop, 10.i.1925, 1 ♂, (*A. L. Tonnoir*), (Cant. Mus.). DUNEDIN: ---.1924, 1 ♂, (*C. Fenwick*), (Dom. Mus.): Tomahawk Lagoon, 29.i.1954, 2 ♀, (*E. S. Gourlay*), (Cawt. Inst.). MARTINS BAY: 1-4.ii.1955, 8 ♂, 2 ♀, (*R. R. Forster*), (Cant. Mus.). CHATHAM ISLANDS: Pitt Island, 10-26.i.1944, 2 ♀, (*E. S. Gourlay*), (Cawt. Inst.).

*Distribution in New Zealand:* Moko Hinau Islands, Little Barrier Island, Waitakere Ranges, Auckland, Pukekohe, Waiuku, Mayor Island, Palmerston North, National Park, Nelson, Mt. Arthur, Otira, Cass, Waiho, Christchurch, Banks Peninsula, Dunedin, Martins Bay, Chatham Islands. (August to May).

*Host Plants:* *Hordeum vulgare* L., *Triticum aestivum* L., *Lolium perenne* L.

*Remarks:* An immigrant species. Separated from *C. angustipennis* by the presence of four dorsocentrals, the generally dull appearance of the body, and the wings with distinct alula and anal angle.

### ***Cerodontha angustipennis* sp.n. Figs. 373, 375, 389**

A shining dark brown and yellow species with wings narrowed at base. Body length about 1.75-2.0 mm., wing length about 2.0-2.25 mm.

#### MALE AND FEMALE

**HEAD (Fig. 375):** Arista dark brown; rays of pubescence much less than diameter of base of arista. Antenna short; 3rd segment dark brown or black, apex truncate, and dorsal corner of apical margin produced into a short stout spine; 2nd segment yellow, with 1 dorsal bristle and small black hairs on apical margin, those on ventral surface stronger; basal segment yellow and bare. Front yellow; ocellar area dark brown; indefinite brown and light brown area between ocelli and lunule. One slightly reclinate fronto-orbital and 1 or sometimes 2 inwardly directed fronto-orbitals; frontal orbits with few hairs; verticals, postverticals, and ocellars strong. Face pale yellow; carina very narrow and shallow. Cheeks yellow. Hairs on ventral margin of cheek about half length of vibrissa. Occiput dark brown laterally, brown to yellowish-brown centrally. Eyes haired. Vertical diameter of eye about twice width of cheek in same axis. Proboscis pale yellow; palpi with minute black hairs.

**THORAX:** Mesonotum and scutellum shining dark brown with faint dusting; notopleural triangle, wing base and dorsal mesopleuron yellow; pleura dark brown; prosternum yellow. Acrostichals absent; 3 dorsocentrals, all strong, anterior one presutural; scutellars erect; 1 small notopleural; 1 very strong supraalar; 1 strong postalar.

Legs yellow; tibiae and tarsi yellowish-brown.

**Wings (Fig. 373):** clear; veins light brown. Alula and anal lobe greatly reduced. Wing indices: costal about 3.6; 4th vein about 5.0; 4c about 1.5; 5x about 2.0.

Halteres yellow.

**ABDOMEN:** Dark brown with posterior margins of tergites narrowly and faintly yellowish-brown; the 6th tergite in females with a broad yellow posterior band. Ovipositor black or dark brown.

**External male genitalia (Fig. 389):** Genital arch dark brown with about 7 or 8 bristles on dorsal half of each side, posterior ventral corner with cluster of very small spines, anterior ventral corner produced into finger-like projection bearing small posteriorly directed hairs and spines; anal plate lightly chitinised, about half height of arch and 3 to 4 times as long as broad, whole surface covered with hairs; clasper arising about middle of side of arch, heavily chitinised, very narrow and without spines.

*Holotype*: MANUKA GORGE: swept off grass, 6.ix.1953, ♂, (R. A. Harrison), (P.D.D.).

*Paratypes*: AUCKLAND: Green Lane, 28.xii.1948, 1 ♀; 11.xii.1949, 1 ♂, (K. P. Lamb), (P.D.D.). OHAKUNE: no date, 1 ♀, (T. R. Harris), (Dom. Mus.). NELSON: 23.v.1922, 1 ♂, 2 ♀, (A. L. Tonnoir), (Cant. Mus.). KAIKOURA: 22.ii.1922, 1 ♀, (A. L. Tonnoir), (Cant. Mus.). CHRISTCHURCH: 17.ii.1922, (A. L. Tonnoir), (2 ♂, Cant. Mus., 1 ♂, 1 ♀, U.S.N.M.). CASS: -ii.1925, 1 ♂, (A. L. Tonnoir), (Cant. Mus.). WAIHO: 19.i.1922, 1 ♀, (A. L. Tonnoir), (Cant. Mus.). Same data as holotype, 2 ♂, 3 ♀, (P.D.D.). ROXBURGH: swept off grass, 6.ix.1953, 3 ♀, (R. A. Harrison), (P.D.D.). MARTINS BAY: 1-4.ii.1955, 3 ♂, 2 ♀, (R. R. Forster), (Cant. Mus.).

*Material Examined*: Holotype, 11 ♂ and 15 ♀ paratypes.

*Distribution*: Auckland, Ohakune, Nelson, Kaikoura, Christchurch, Cass, Waiho, Manuka Gorge, Roxburgh, Martins Bay. (September, December to February, May).

*Remarks*: Recognised and separated from *C. denticornis* by having three dorsocentrals, a shining body, and wings narrowed basally. With three dorsocentrals it is similar to *C. flavicornis* Eggar but it is quite distinct from that species which has narrow wings and a single notopleural bristle.

### Genus PHYTOMYZA Fallén

*Phytomyza* Fallén, 1810. Sp. Ent. nov. Dipt. p. 21.

Black and yellow species. Arista sometimes greatly thickened basally, tapering uniformly distally. Third antennal segment rounded at apex. Three or 4 fronto-orbitals. Hairs on frontal orbits proclinate. Vibrissa well developed. Prescutellars absent; 4 dorsocentrals, anterior one presutural; interalar absent; 2 pairs scutellars; 1 propleural; 2 notopleurals. Costa extending to 3rd vein; posterior cross vein absent; anterior cross vein closer to base of wing than is junction of 1st vein with costa; 4th vein weak; anal cell complete; anal vein present and extending faintly to wing margin.

Type Species: *Phytomyza flaveola* Fallén

Recognised by the absence of the posterior cross vein, the costa ending at the apex of the third vein, the presence of two notopleurals, and the small hairs on the frontal orbits being directed anteriorly.

*Distribution*: World wide.

*Species Occurring in New Zealand*:

*Phytomyza atricornis* Meigen

*P. clematadi* Watt

*P. costata* sp.n.

*P. atricornis* is world wide in distribution. The other species are probably indigenous and possibly endemic to New Zealand.

*P. affinis* Fallén has not been seen and it is doubtful whether it is present in New Zealand. Kirk (1894), Thomson (1922) and Miller (1929 and 1950) recorded it from New Zealand from ragwort, sow thistle, cineraria, and other common plants, but it is probable that the specimens they examined were *P. atricornis*.

KEY TO SPECIES OF PHYTOMYZA IN NEW ZEALAND

- |   |  |                   |
|---|--|-------------------|
| 1 | Palpi large and almost spherical .....         | <b>clematadi</b>  |
|   | Palpi small and not distinctly spherical ..... | 2                 |
| 2 | Fore coxa blackish-brown .....                 | <b>atricornis</b> |
|   | Fore coxa yellowish-brown .....                | <b>costata</b>    |

**Phytomyza clematadi** Watt. Figs. 379, 390

*Phytomyza clematadi* Watt, 1923. Trans. N.Z. Inst. 54 : 484.

A greyish-black species with light yellow head. Body length about 3.0 mm., wing length about 3.0 mm.

MALE AND FEMALE

**HEAD:** Arista dark brown; thickly and minutely pubescent, rays of pubescence less than diameter of basal segment. Antenna yellowish-brown; 3rd segment light brown and almost brown dorsally, or blackish-brown; 2nd segment with 1 dorsal bristle and hairs on or close to apical margin; basal segment with 1 or 2 dorsal apical hairs. Front light yellow; orbits almost white; ocellar area and a narrow band through postverticals to occiput and region about verticals, blackish-brown. Four fronto-orbitals, anterior bristle about half length of others; about 3 hairs lateral to fronto-orbitals close to eye margin and 1 or 2 similar hairs anterior to the anterior fronto-orbital; postverticals and verticals strong and almost equal; ocellars little weaker than verticals. Face pale yellow. Cheeks pale yellow. Three or 4 strong hairs on cheek along ventral margin posterior to vibrissa. Occiput dark brown. Eyes with a few hairs. Vertical diameter of eye about 5 times width of cheek in same axis. Proboscis light yellow; palpi almost spherical, same colour as antenna and with black apical hairs.

**THORAX:** Greyish-black; humerus and propleuron light brown; prosternum yellowish-white; notopleural suture, wing base and suture between pleura whitish-yellow. Cluster of acrostichal hairs on anterior half of front; 4 dorsocentrals, anterior presutural; convergent basal scutellars just less than length of cruciate apicals; scutellum bare; 1 supraalar; 2 postalars, inner bristle small; mesopleuron with hairs; prosternum bare.

Legs yellowish-brown or brown. Fore femur with postero-dorsal bristles.

Wings (Fig. 379) clear; costa brown, other veins brown or light brown; all veins light yellow towards base. Costal index about 2.5-3.0.

Halteres light yellow.

**ABDOMEN:** Dark greyish-brown. Tergites and sternites posterior and lateral margins narrowly light yellow. Female 7th tergite shining brown on posterior half.

External male genitalia (Fig. 390): Genital arch brown, about 30 bristles on each side and in addition a cluster of smaller sharply pointed bristles on ventral margin; anal plate lightly chitinised, about one-third width of arch, bristles over most of its surface; clasper short with few short hairs and a pointed projection at apex.

**Holotype:** DUNEDIN: Opoho, reared ex mine of *Clematis paniculata*, 6.xii.1921, ♂, (M. N. Watt), (Dom. Mus.).

**Allotype:** Same data as holotype, (Dom. Mus.).

**Material Examined:** Holotype, allotype, 13 ex., 4 ♂, and 3 ♀.

**New Records:** THREE KINGS ISLAND: bred ex mines of *Clematis paniculata* J. F. Gmelin, 24.i.1952, 1 ♂, 1 ♀, (G. T. S. Baylis), (P.D.D.). LITTLE BARRIER ISLAND: bred ex mines in *Clematis* sp., 29.xi.1954, 3 ♂, 2 ♀, (K. A. J. Wise), (P.D.D.).

**Distribution:** Three Kings Islands, Little Barrier Island, Trentham, Dunedin. (October, November to January).

**Host Plants:** *Clematis paniculata* J. F. Gmelin

**Remarks:** North Island specimens are lighter in colour than South Island specimens. This is particularly so in the case of the antennae,

palpi, and legs. Readily separated from other species of the genus in New Zealand by the large almost spherical palpi and the presence of many acrostichal hairs.

**Phytomyza atricornis** Meigen. Figs. 380, 391

*Phytomyza atricornis* Meigen, 1838. "Syst. Besch. Zweifl. Insekt." 7: 406. (as *albiceps* Meigen): Miller and Watt, 1915. Trans. N.Z. Inst. 47: 279. Watt, 1923, Trans. N.Z. Inst. 54: 485. Kelsey, 1937, N.Z. J. Sci. Tech. 18: 762.

A blackish-grey species with light yellow head. Body length about 2.5 mm., wing length about 2.5 mm.

MALE AND FEMALE

**HEAD:** Arista blackish-brown; pubescent, rays of pubescence less than diameter of basal segments. Antenna dark brown; 3rd segment blackish-brown, circular in outline; 2nd segment light brown on apical margin; 1 dorsal bristle and a few black hairs mainly on apical margin; basal segment yellowish-brown with a dorsal apical hair. Front light yellow; ocellar area and area posteriorly as far as postverticals, blackish-brown. Three fronto-orbitals with sometimes a small hair between anterior inwardly directed bristle and the middle bristle; row of small hairs on orbits lateral to fronto-orbitals; verticals strong; postverticals and ocellars shorter than verticals. Face light yellow. Cheeks light yellow merging to blackish-brown occiput posteriorly. Strong hairs on cheek margin and on posterior margin just anterior to blackish-brown area of occiput; no bristles at lower posterior angle of cheek comparable with vibrissa. Occiput blackish-brown, angle of vertex yellow. Eyes with few hairs. Vertical diameter of eye about 3 times width of cheek in same axis. Proboscis light yellow; palpi brown to dark brown, short and paddle shaped, with 1 strong and a few short apical hairs.

**THORAX:** Blackish-brown, heavily dusted with grey; notopleural suture and suture between mesopleuron and pteropleuron and area to about wing base and below haltere, light yellow. No prescutellars; acrostichal hairs usually absent, if present represented by 1 or a few hairs on anterior half of mesonotum; 4 dorso-centrals, anterior bristle presutural; convergent basal scutellars just shorter than cruciate apicals; scutellum bare; 1 supraalar; 2 postalar, the inner one small and hair-like; mesopleuron with a few hairs.

Legs blackish-brown; all trochanters light brown; apices of femora and bases of tibiae light yellow. Fore femur with bristles on postero-dorsal and apical half of postero-ventral surfaces.

Wings (Fig. 380) clear; veins light brown, 4th vein almost unpigmented. Costal index about 4.0.

Halteres light yellow with light yellowish-brown stalk.

**ABDOMEN:** Blackish-brown; posterior and lateral margins of tergites narrowly light yellow.

External male genitalia (Fig. 391): Genital arch broad dorsally, narrow rounded margin ventrally, about 14 bristles on each side of arch, situated near posterior margin; anal plate narrow, lightly chitinised, about half height of arch, small sharply pointed, often curved, spines on whole of outer surface; clasper short, with slight posterior curve, hairs absent, small bristles on apical third.

*Holotype:* Europe.

*Material Examined:* 6 ♂, 5 ♀, and 44 ex.

*New Records:* MOKO HINAU ISLAND: bred ex mines in *Plantago* sp. 24.viii.1955, 1 ♀, (R. A. Harrison), (P.D.D.). LITTLE BARRIER ISLAND: 23.xi.1954, 1 ♂, 2 ♀, (R. A. Harrison), (P.D.D.). AUCKLAND: bred ex leaves, -.xi.1953, 3 ♂, (J. A. Hunter), (P.D.D.). Green Lane, bred ex sow thistle, 28.viii.1948, 1 ♀, (K. P. Lamb), (P.D.D.). TE KUITI: bred ex ragwort (*Senecio jacobaea*), 18.xi.1940, 44 ex., (M. B. MacKenzie), (P.D.D.). NELSON: 1917(?), 1 ♀, (A. Philpott): -.xi.1921, 1 ♂, (Anon.); 23.v.1922, 1 ♂, (A. L. Tonnoir), (Cant. Mus.).

*Distribution in New Zealand:* Widespread through the country.

*Host Plants:* *Sonchys arvensis* L., *S. asper* (L.) Hill, *S. olearaceus* L., *Xanthium* sp., *Cryptostemma calendulacea* R. Br., *Plantago* spp., *Erechtites arguta* D.C., *E. prenanthoides* (A. Rich.) D.C., *Senecio vulgaris* L., *S. jacobaea* L., *S. cruentus* D.C., *Chrysanthemum* sp., *Melilotus* sp., *Cirsium lanceolatum* (L.) Scop., *Taraxcum officinale* Weber, *Bellis perennis* L.

**Phytomyza costata** sp.n. Figs. 376, 381, 392

A generally dark grey species. Body length about 2.0 mm., wing length about 1.75 mm.

MALE AND FEMALE

**HEAD** (Fig. 376): Arista blackish-brown; minutely pubescent. Antenna brown; third segment black; second segment with a small dorsal bristle and black hairs about apical margin; basal segment with a few short apical hairs. Front yellowish-brown; orbits light yellow; ocellar area and area about outer vertical bristles blackish-brown with grey dusting. Three strong approximately equal fronto-orbitals; 1 or 2 hairs lateral to and anterior to fronto-orbitals; verticals and post-verticals strong; ocellars short, much weaker than verticals. Face yellowish-white. Cheeks light yellow. Row of hairs along cheek margin, middle one almost equal to vibrissa. Occiput blackish-brown with grey dusting. Eyes haired. Vertical diameter of eye about 2.5 times width of cheek in same axis. Proboscis yellowish-brown; palpi narrow, black and with a distinct apical hair.

**THORAX:** Thickly grey dusted, pleural sutures and wing base light yellow. Acrostichal hairs absent or confined to a few on anterior half of mesonotum; convergent basal scutellars equal to cruciate apicals; scutellum bare; 2 notopleurals; 1 supraalar; 2 postalars, inner bristle small; mesopleuron with a few hairs; prosternum bare.

Legs blackish-brown; fore coxa, all trochanters, apices of all femora, and bases of all tibiae yellowish-brown. Fore femur with postero-dorsal bristles.

Wings (Fig. 381) clear; costa, 2nd and 3rd veins brown, other veins light brown. Costal index about 3.0.

Halteres light yellow.

**ABDOMEN:** Greyish-brown on anterior half of tergites, yellowish-brown on posterior half, both areas merging into each other; 6th tergite of female with yellowish band broader than on other segment; 7th tergite black, shining black on posterior two-thirds.

External male genitalia (Fig. 392): Genital arch slightly broader dorsally than ventrally, ventral margin distinctly incurved and bearing about apical region a matt of short stout sharp spines, short bristles along postero-ventral region and about 12 to 16 long bristles on or near posterior margin; anal plate, narrow, lightly chitinised, about one-quarter length of arch, and with sharp bristles over most of surface; clasper not differentiated from arch.

**PUPA:** Length about 2.5 mm., width about 0.9 mm., length (dorso-ventrally) about 0.75 mm. Shining reddish-brown. Anterior spiracles black and about 1.5 times length of posterior spiracles. Segments bare, inter-segmental areas with very fine tomentum.

Well cemented to floor and roof of mine.

*Holotype:* BEEBYS KNOB: bred ex leaves of *Ranunculus* sp., 23.ii. 1954, ♂, (B. B. Given), (Cawt. Inst.).

*Paratypes:* Same data as holotype, (11 ♂, 11 ♀, Cawt. Inst., 1 ♂, 1 ♀, Dom. Mus. and 1 ♂, 1 ♀, P.D.D.).

*Material Examined:* Holotype, 13 ♂ and 13 ♀ paratypes.

*Distribution:* Beebys Knob. (February).

*Host Plants:* *Ranunculus* sp.



*Remarks:* Somewhat similar to *P. atricornis* and most readily separated from it by the yellow fore coxa, the characters of the wing, and the relatively short ocellar bristles.

### Genus PHYTOBIA Lioy

*Phytobia* Lioy, 1864. Atti Ist. veneto (3) 9: 1313.

Third antennal segment rounded. One or 2 reclinate posterior fronto-orbitals and usually 3 or 4 convergent anterior fronto-orbitals; small hairs on frontal orbits reclinate. Proboscis short. Scutellum dark and always same colour as mesonotum. Three or 4 dorsocentrals, anterior bristle presutural or postsutural; 2 pairs of scutellars; 1 propleural. Costa extending to fourth vein; posterior cross vein present. Male genitalia: genital arch incurved ventrally; anal plate slender; clasper separated from arch and bearing several usually very stout short spines apically.

Type Species: *Phytobia errans* (Meigen)

The important distinguishing characters are: the colour of the scutellum is the same as the mesonotum, the costa ends at the fourth vein, and the hairs on the frontal orbits are reclinate.

*Distribution:* World wide.

*Species Occurring in New Zealand:*

*Phytobia flavolateralis* (Watt)

*P. flavopleura* (Watt)

*P. umbrina* (Watt)

*P. umbrinella* (Watt)

None of these species fall readily into the subgeneric categories so far proposed for the genus. *P. umbrina* and *P. umbrinella* are closely related and differ from all other members of the genus in having three dorsocentrals, the anterior of which is presutural. The generic diagnosis above includes this character for the first time.

#### KEY TO SPECIES OF PHYTOBIA IN NEW ZEALAND

- |   |  |                       |
|---|--|-----------------------|
| 1 | Three dorsocentrals .....  | 2                     |
|   | Four dorsocentrals .....   | 3                     |
| 2 | Costal index less than 4.0; lateral margins of mesonotum brown .....           | <i>umbrinella</i>     |
|   | Costal index greater than 4.0; lateral margins of mesonotum light yellow ..... | <i>umbrina</i>        |
| 3 | Shining brown species .....  | <i>flavopleura</i>    |
|   | Dull brown species .....   | <i>flavolateralis</i> |

***Phytobia umbrinella* (Watt). (*New Combination*). Figs. 382, 393**

*Agromyza umbrinella* Watt, 1923. Trans. N.Z. Inst. 54: 469.

Dark brown or blackish-brown species. Body length about 1.5-1.75 mm., wing length about 1.5-1.75 mm.

#### MALE AND FEMALE

HEAD: Arista dark brown, rays of pubescence less than half diameter of basal segments. Antenna blackish-brown. Second segment with short dorsal apical bristles and minute apical hairs. Front dark brown, orbits brown. Three fronto-orbitals and a few minute hairs on orbits. Ocellars, postverticals and verticals strong. Face dark brown. Cheeks brown, ventral margin dark brown. Strong hairs on ventral margin of cheek. Eyes bare. Vertical diameter of eye about 5 times width of cheek in same axis. Occiput dark brown. Proboscis brown; palpi dark brown.

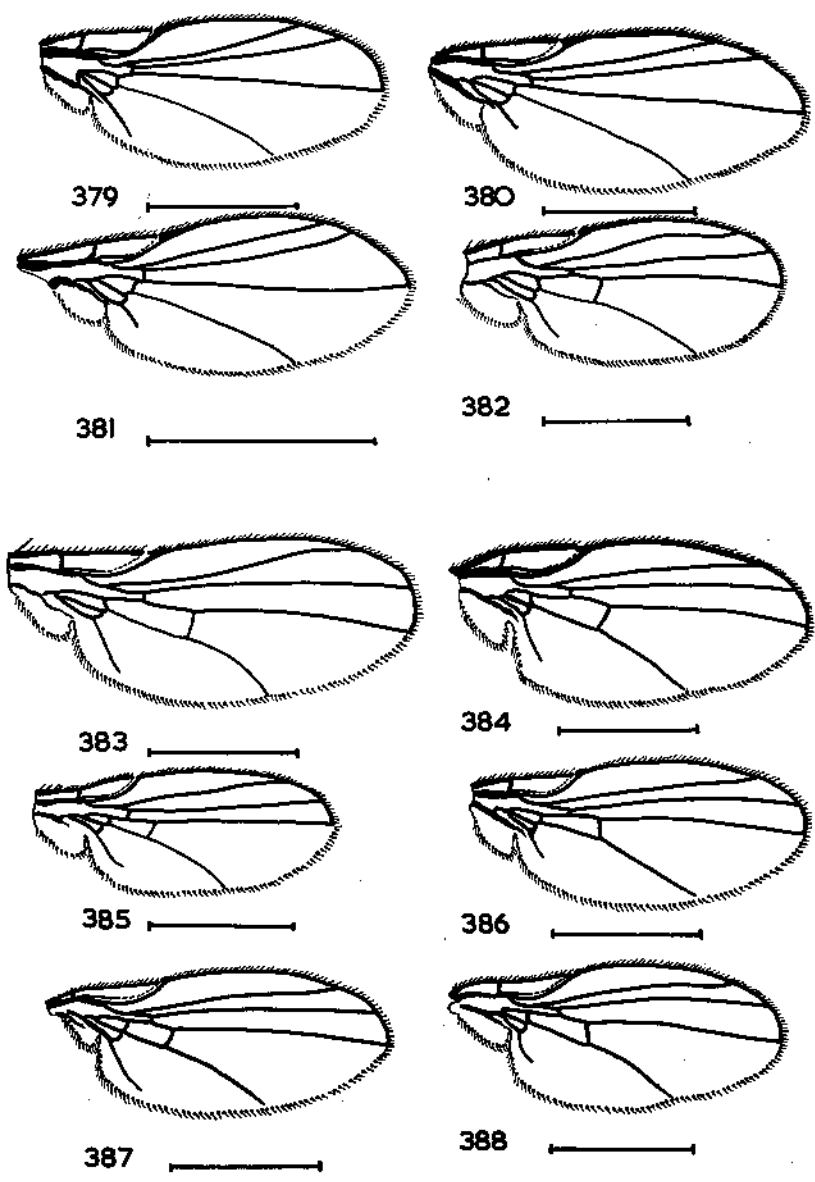


Fig. 379. Wing of *Phytomyza clematadi*  
 " 380. " " *P. atricornis*  
 " 381. " " *P. costata*  
 " 382. " " *Phytobia umbrinella*  
 " 383. " " *P. flavopleura*  
 " 384. " " *P. umbrina*  
 " 385. " " *P. flavolateralis*  
 " 386. " " *Liriomyza flavocentralis*  
 " 387. " " *L. cianthi*  
 " 388. " " *L. umbrosa*  
 Scale: 1.0 mm.

**THORAX:** Mesonotum dark brown and dusted with brown; lateral margins of scutellum dark brown; pleura shining dark brown with yellowish-brown sutures. Three dorsocentrals, anterior one presutural; convergent basal scutellars about four-fifths length of cruciate apicals; 1 supraalar; 1 interalar; 2 postalars; several mesopleural hairs; prosternum bare.

Legs dark brown.

Wings (Fig. 382) clear, veins dark brown. Wing indices: costal about 3.3; 4th vein about 7.0; 4c about 1.7; 5x about 4.4.

Halteres light brown.

**ABDOMEN:** Dark brown with heavy dusting.

External male genitalia (Fig. 393): Genital arch narrow dorsally, ventrally bearing a very stout short spine; anal plate about half height of arch, with strong bristles about margin ventrally and many short bristles elsewhere; clasper about one-quarter height of arch, with 1 strong and 1 weak very stout spine on apical margin, and short bristles anteriorly to the spines.

*Holotype:* DUNEDIN: Woodhaugh Gardens, bred ex *Veronica colensoi* (?) 18.iii.1921, ♂, (W. G. Howes), (Dom. Mus.).

*Allotype:* Same data as holotype, (Dom. Mus.).

*Material Examined:* Holotype, allotype, and 7 ex.

*Distribution:* Mt. Ruapehu, Dunedin. (June, September, January, March).

*Host Plants:* *Hebe* sp.

*Remarks:* Closely related to *P. umbrina* and separated from it by its size, the colour of thorax and the costal index.

### **Phytobia umbrina** (Watt). (*New Combination*). Figs. 377, 384, 395

*Agromyza umbrina* Watt, 1923. Trans. N.Z. Inst. 54 : 467.

A blackish-brown and brown species with yellow bands on thorax. Body length about 2.75 mm., wing length about 2.75 mm.

#### MALE AND FEMALE

**HEAD** (Fig. 377): Arista dark brown; rays of pubescence less than diameter of basal segments. Antenna blackish-brown; 2nd segment with 1 dorsal bristle and other hairs mostly on apical margin; basal segment with a strong dorsal apical hair. Front brown, dark brown anteriorly, light brown or yellowish-brown towards vertex; ocellar and postvertical areas and area about verticals dark brown. Four strong fronto-orbitals with often a small anterior 5th; fine hairs lateral to fronto-orbitals near eye margin; postverticals, verticals and ocellars strong. Face dark brown, slightly carinate. Cheeks dark brown anteriorly, merging to light brown posteriorly. Strong hairs along cheek margin at least half length of vibrissa. Occiput blackish-brown. Eyes with a few short hairs. Vertical diameter of eye about 4 times width of cheek in same axis. Proboscis yellow; palpi narrow, dark brown, and with 2 apical hairs stronger than the rest.

**THORAX:** Mesonotum blackish-brown, dusted, a light yellow band lateral to line of presutural and supraalar bristles, small blackish-brown spot anterior to anterior notopleural; humerus brown anterior to bristle; scutellum dark brown or brown; pleura shining brown or dark brown with light yellow sutures between most pleura. Acrostichal hairs in 4 rows on anterior half of mesonotum, and irregular rows, or hairs absent, on most of posterior half; 3 dorsocentrals, anterior bristle presutural; convergent or parallel basal scutellars equal to cruciate apicals; scutellum bare; 1 supraalar; 1 or rarely 2 small interalars; 2 postalars; mesopleuron with hairs; prosternum bare.

Legs brown; tarsi, apex of each femur, and base of each tibia light brown. Fore femur with strong hairs over most of posterior surfaces, the strongest, bristle-like, on postero-ventral surface.

Wings (Fig. 384) clear; veins brown. Wing indices: costal about 4.4; 4th vein about 6.0; 4c about 1.2; 5x about 4.1.

Halteres light yellow, stalk light brown.

ABDOMEN: Shining brown; posterior margins of tergites light brown; 7th tergite in female small and shining black.

External male genitalia (Fig. 395): Genital arch very narrow dorsally, ventral margin bearing a very stout short spine, bristles over most of surface; anal plate narrow, about third height of arch, strong bristles on ventral margin and short bristles elsewhere; clasper about half height of arch, with a very stout short spine on ventral margin and a few short narrow spines on ventral half.

*Holotype*: DUNEDIN: Botanical Gardens, bred ex *Veronica* sp. 5.xii.1921, ♂, (*M. N. Watt*), (Dom. Mus.).

*Allotype*: Same data as holotype, (Dom. Mus.).

*Material Examined*: Holotype, allotype, 1 ♂, 1 ♀, and 49 ex.

*New Records*: PALMERSTON NORTH: Bred ex leaf mine of *Veronica* sp. -xii.1934, 1 ♂, 1 ♀, (*W. Cottier*), (P.D.D.).

*Distribution*: Palmerston North, Dunedin. (October, December, February, April).

*Host Plants*: *Hebe salicifolia* (Forst. f.) Penn., *H. speciosa* (R. Cunn. ex A. Cunn.) Ckn & Allan.

*Remarks*: Closely related to *P. umbrinella* and separated from that species by the larger size, colouration of the thorax, and the costal index.

### ***Phytobia flavopleura* (Watt). (*New Combination*). Figs. 383, 394**

*Agromyza flavopleura* Watt, 1923. Trans. N.Z. Inst. 54 : 481.

A shining brown and yellow species with yellow legs. Body length about 2.5 mm., wing length about 2.5 mm.

#### MALE AND FEMALE

HEAD: Arista dark brown, light brown basally; rays of pubescence about half width of basal segments. Antenna yellowish-brown; 3rd segment light orange; 2nd segment with 1 dorsal apical bristle and strong apical hairs; basal segment with 1 dorsal apical hair. Front yellowish-brown; orbits brown; ocellar area dark brown with dusting; area lateral to inner verticals shining brown. Three or 4 fronto-orbitals and several strong hairs in same row. Verticals very strong; postverticals and ocellars weaker than verticals. Face pale yellow, no carina. Cheeks pale yellow. Hairs on ventral cheek margin less than half of vibrissa. Occiput shining brown, light brown near vertex. Eyes bare. Vertical diameter of eye about 6 times width of cheek in same axis. Proboscis yellowish-brown; palpi pale yellow with short black apical hairs.

THORAX: Mesonotum shining brown with only a slight trace of dusting; scutellum shining brown; lateral margins of scutellar suture and area posterior to postalar yellowish-brown; pleura yellowish-brown; ventral two-thirds of sternopleuron light brown; postscutellum, dorsal hypopleuron, and spot near ventral margin of hypopleuron, shining brown. Four dorsocentrals, anterior two shorter and finer than posterior two, anterior one presutural; basal scutellars parallel, just shorter than convergent apical; 1 supraalar; 2 postalar; some strong mesopleural hairs; prosternum bare.

Legs yellow; fore tarsus, mid and hind tibiae and tarsi light brown.

Wings (Fig. 383) clear; veins dark brown. Wing indices: costal about 3.6; 4th vein about 3.6; 4c about 1.0; 5x about 3.0.

Halteres light brown.

ABDOMEN: Shining brown, basal tergite yellowish brown.

External male genitalia (Fig. 394): Genital arch narrow dorsally, postero-ventral region bearing about 15 to 20 short stout spines on or near margin, strong bristles over most of surface; anal plate minute, about one-sixth height of arch; clasper incurved and apical margin bearing a row of 6 to 10 very stout short spines.

*Holotype*: DUNEDIN: Botanical Gardens, bred ex fern, 27.iii.1921, ♂, (*M. N. Watt*), (Dom. Mus.).

*Allotype*: Same data as holotype, 26.ii.1921, ♀, (Dom. Mus.).

*Material Examined*: Holotype, allotype, and 46 ex.

*Distribution*: Wanganui, Wellington, Dunedin. (June, February to April).

*Host Plants*: *Asplenium flaccidum* Forst. f., *A. lucidum* Forst. f., *Blechnum filiforme* Ettingsh., *Polypodium billardieri* (Willd.) C.Chr., *P. diversifolium* Willd.

***Phytobia flavolateralis* (Watt). (*New Combination*). Figs. 385, 396**

*Agromyza flavolateralis* Watt, 1923. Trans. N.Z. Inst. 54 : 471.

A dark brown and yellow fly with brown and dark brown legs. Body length about 1.75–2.25 mm., wing length about 1.75–2.25 mm.

MALE AND FEMALE

**HEAD**: Arista brown; pubescence less than diameter of basal segment. Antenna yellowish-brown; 2nd segment with small dorsal apical bristles and minute apical hairs. Front yellowish-brown; ocellar area shining dark brown; area about lateral vertical light brown. Four fronto-orbitals, anterior one smaller than others; ocellars, verticals and postverticals strong; black hairs on orbits on eye margin. Face yellowish-brown; slight carina. Cheeks yellowish-brown. Hairs on ventral margin of cheek about half length of vibrissa. Occiput shining brown. Eyes bare. Vertical diameter of eye about 5 times width of cheek in same axis. Proboscis yellowish-brown; palpi yellowish-brown with minute bristles.

**THORAX**: Mesonotum brown with light dusting and with broad lateral yellow band; humerus brown anterior to bristle; scutellum brown with light dusting; pleura brown with light brown sutures. Four dorsocentrals, anterior two much smaller than posterior two and anterior bristle presutural; parallel basal scutellars about equal to cruciate apicals; 1 strong supraalar, 2 postalars; several mesopleural hairs; prosternum bare.

Legs mainly brown; femora darker brown, apices of femora and bases of tibiae light brown; tarsi light brown.

Wings (Fig. 385) clear; veins brown. Wing indices: costal about 3.8; 4th vein about 9.0; 4c about 1.8; 5x about 6.0.

Halteres yellowish-brown.

**ABDOMEN**: Brown to dark brown.

External male genitalia (Fig. 396): Genital arch very narrow dorsally, ventral margin with a very stout short spine and many long bristles over surface; anal plate about half height of arch, with stronger bristles on ventral margin than elsewhere; clasper about one-quarter height of arch, about 3 times as long as broad, with a very strong stout apical spine and a few short curved bristles near apical margin.

*Holotype*: WELLINGTON: Botanical Gardens, bred ex *Melicytus ramiflorus*, 14.xi.1921, ♂, (*M. N. Watt*), (Dom. Mus.).

*Allotype*: Same data as holotype, 27.x.1921, ♀, (Dom. Mus.).

*Material Examined*: Holotype, allotype, and 49 ex.

*Distribution*: Wanganui, Wellington. (June, October, November).

*Host Plants*: *Melicytus ramiflorus* Forst.

Genus LIRIOMYZA Mik

*Liriomyza* Mik, 1894. Wien. ent. Ztg. 13 : 284.

Small species up to 3.0 mm. in length. Shining black and yellow. Third antennal segment rounded at apex or rarely forming a blunt dorsal angle. Normally 2 dorsally directed posterior fronto-orbitals and 2 convergent anterior bristles;

small hairs on frontal orbits erect or reclinate; postverticals present. Vibrissa well developed. Mesonotum mostly black, sometimes yellow area posteriorly; scutellum with wide median longitudinal yellow area; humerus and pleura partly yellow. Prescutellars absent; 2 to 6 rows of acrostichals anteriorly, usually absent posteriorly; 2 pairs of scutellars; 4 dorsocentrals, anterior one presutural; interalar absent or not strong; 1 propleural. Costa extending to 4th vein; posterior cross vein usually present; 6th vein not reaching wing margin. Halteres yellow. Male genitalia: genital arch broad ventrally, spines on ventral margin; anal plate long and slender; clasper separated from arch and usually bearing some very short stout spines.

Type Species: *Liriomyza urophorina* Mik

Readily recognised by the black and yellow colouration, particularly the yellow central band of the scutellum, the costa ending at the fourth vein and the erect or reclinate hairs on the frontal orbits.

*Distribution:* World wide.

*Species Occurring in New Zealand:*

- Liriomyza citreifemorata* (Watt)
- L. clianthi* (Watt)
- L. flavocentralis* (Watt)
- L. umbrosa* (Watt)
- L. urticae* (Watt)

KEY TO SPECIES OF LIRIOMYZA IN NEW ZEALAND

- 1 Antennae yellow or yellowish-brown ..... 2
- Antennae brown or blackish-brown ..... 4
- 2 Interalar bristle absent; femora mostly yellowish-brown ..... 3
- Interalar bristle distinct; femora mostly dark brown ..... **flavocentralis**
- 3 Body length about 2.0 mm., 4th vein index 9.0 or larger ..... **clianthi**
- Body length about 3.0 mm., 4th vein index less than 9.0 ..... **citreifemorata**
- 4 Antennae, mesonotum, and legs blackish-brown ..... **umbrosa**
- Antennae, mesonotum, and legs brown ..... **urticae**

***Liriomyza flavocentralis* (Watt). (New Combination). Figs. 386, 397**

*Agromyza flavocentralis* Watt, 1923. Trans. N.Z. Inst. 54 : 474.

A blackish-brown species with head and areas on thorax light yellow. Body length about 2.75 mm., wing length about 2.75 mm.

MALE AND FEMALE

**HEAD:** Arista dark brown; pubescent, rays of pubescence less than diameter of basal segments. Antenna yellow; 2nd segment with 1 small dorsal bristle and a few black hairs chiefly on apical margin; basal segment with 1 small apical dorsal hair. Front yellowish-white; ocellar area through postverticals to occiput and area about outer vertical blackish-brown. Three or 4 fronto-orbitals, the 4th (anterior) bristle, when present, about two-thirds length of other three; minute hairs on orbits lateral to fronto-orbitals. Face yellowish-white. Cheeks yellowish-white. Strong hairs on cheek margin posterior to vibrissa and 1 bristle posterior to lower posterior angle of cheek about equal in length to vibrissa. Occiput blackish-brown. Eyes with a few fine hairs. Vertical diameter of eye about 5 to 6 times width of cheek in same axis. Proboscis yellow; palpi yellow with black hairs, the strongest two at apex.

**THORAX:** Mesonotum blackish-brown with grey dusting, light yellow band lateral to line of presutural and supraalar bristles, small blackish-brown spot anterior to anterior notopleural, humerus brown anterior to bristle; scutellum light yellow in a broad median band, blackish-brown laterally; pleura shining blackish-brown with light yellow sutures between most pleura. Acrostichal hairs in 2 to 4 irregular rows; 4 dorsocentrals, anterior bristle presutural; convergent basal scutellars equal to cruciate apicals; scutellum bare; 2 notopleurals; 1 supraalar;

1 interalar about half length posterior dorso-central; 2 postalars, inner of pair weak; mesopleuron with several hairs; prosternum bare.

Legs: Coxae and trochanters brown; femora and tibiae blackish-brown; tarsi light brown or brown, apex of each femur, and base of each tibia light yellow. Fore femur with small bristles on postero-dorsal and postero-ventral surfaces; fore tibia with small ventral apical; mid tibia with ventral apical; hind tibia with small ventral apical.

Wings (Fig. 386) clear; veins brown, yellow towards base of wing. Wing indices: costal about 4.7; 4th vein about 9.0; 4c about 1.7; 5x about 4.3.

Halteres light yellow.

ABDOMEN: Dark brown; tergites with narrow posterior and wide lateral band of light yellow; 6th tergite in female with wide posterior band; 7th tergite in female shining black.

External male genitalia (Fig. 397): Genital arch very narrow dorsally, broad ventrally, posterior margin curved strongly posteriorly, anterior margin with distinct curved horn, many strong bristles over most of surface, and ventral margin ending in a very stout short spine; anal plate narrow, lightly chitinised, about half height of arch, some strong marginal bristles ventrally, elsewhere many short bristles; clasper about third height of arch and twice as long as wide, apex smoothly rounded except for interruption on postero-ventral corner by a short very stout spine directed posteriorly, and thin minute spines on apical quarter.

*Holotype*: DUNEDIN: Botanical Gardens, bred ex *Veronica* sp. 20.vii.1921, ♂, (*M. N. Watt*), (Dom. Mus.).

*Allotype*: Same data as holotype, 27.vii.1921, ♀, (Dom. Mus.).

*Material Examined*: Holotype, allotype, 2 ♂, 3 ♀, and 18 ex.

*New Records*: AUCKLAND: Owairaka, bred ex leaves of *Veronica* sp. 29.xi.1951, 1 ♂, 3 ♀, (*K. A. J. Wise*), (P.D.D.). RANGITOTO ISLAND: 9.iv.1949, 1 ♂, (*R. A. Harrison*), (P.D.D.).

*Distribution*: Auckland, Rangitoto Island, Mt. Egmont, Wanganui, Wellington, Christchurch, Dunedin, Milford Track. (July, November, January, April).

*Host Plants*: *Hebe salicifolia* (Forst. f.) Penn., *H. speciosa* (R. Cunn. ex A. Cunn.) Ckn & Allan.

*Remarks*: The number of fronto-orbitals is not constant. In one specimen there are 4 on one side and 3 on the other.

### ***Liriomyza clianthi* (Watt). (*New Combination*). Figs. 387, 398**

*Agromyza clianthi* Watt, 1923. Trans. N.Z. Inst. 54 : 479.

A lemon-yellow species with dark greyish-brown thorax and area on pleura. Body length 1.75 mm., wing length 2.0 mm.

#### MALE AND FEMALE

HEAD: Arista dark brown; rays of pubescence much less than diameter of basal segments. Antenna yellowish or light orange brown; 3rd segment almost circular; 2nd segment with brown inner surface, 1 or 2 strong dorsal bristles, and several minute black hairs; basal segment with a black dorsal apical hair. Front yellowish-brown merging to light orange-yellow on anterior middle region; ocellar area blackish-brown; area posterior to ocelli surrounding postverticals and orbits from inner vertical posteriorly, brown. All three fronto-orbital bristles strong; few minute black hairs on orbits; all other frontal bristles strong, ocellars just shorter than postverticals. Face light brown; minute narrow sharply ridged carina. Cheeks yellowish-brown. Four or 5 strong hairs along cheek margin to posterior corner all about half length of vibrissa; no strong bristles at lower posterior corner of cheek. Occiput slightly concave, blackish-brown. Eyes with few fine hairs. Vertical diameter of eye about 4 times width of cheek in same axis. Proboscis yellowish-brown; palpi with black hairs, strongest hair at apex.

**THORAX:** Light lemon-yellow; mesonotum dark greyish-brown as far laterally as line of presutural and alar bristles; scutellum with dark brown areas laterally; brown or dark brown areas on dorsal humerus, ventral half of mesopleuron, most of pteropleuron, all except narrow dorsal stripe of sternopleuron, all metapleuron, and all postscutellum; propleuron light brown. Four dorsocentrals, anterior bristle the weakest; parallel or convergent basal scutellars equal to cruciate apicals; interalar not differentiated; prosternum bare.

**Legs:** Coxae, trochanters and femora yellowish-brown except brown base of coxae, base of all femora and apex of hind femur; tibia and tarsi brown. Fore tibia with weak preapical and apical; mid tibia with weak preapical and strong apical; hind tibia with weak preapical.

**Wings (Fig. 387)** clear, veins brown except yellow at base of wing. Wing indices: costal about 4.4; 4th vein about 9.0-13.0; 4c about 4.0; 5x about 8.0.

Halteres light yellow, yellowish-brown base.

**ABDOMEN:** Tergites brown merging to light yellowish-brown at lateral margins, 6th tergite with distinct yellow posterior margin; 7th tergite blackish-brown in female.

**External male genitalia (Fig. 398):** Genital arch almost oval shaped on each side, posterior margin straighter than anterior, about 18 strong bristles scattered over surface of each side, ventral margin rounded, short fine and often curved bristles and 1 thick short spine, at or near ventral margin; anal plate narrow, about half height of arch, long fine sharp bristles on margin of ventral third, shorter bristles elsewhere on margin and surface; clasper about one-quarter length of arch, postero-ventral corner with short stout spine and small bristles anterior to it.

**Holotype:** WANGANUI: Virginia Reserve, bred ex *Clianthus puniceus*, 26.ix.1921, ♂, (M. N. Watt), (Dom. Mus.).

**Allotype:** Same data as holotype. (Dom. Mus.).

**Material Examined:** Holotype, allotype, 1 ♂, 4 ♀, and 54 ex.

**New Records:** AUCKLAND: Mangere, 8.xii.1952, 2 ♀, (K. A. J. Wise), (P.D.D.). INVERCARGILL: bred ex mines on *Clianthus* leaves, 26.vi.1951, 1 ♂, 2 ♀, (Anon.), (P.D.D.).

**Distribution:** Auckland, Wanganui, Wellington, Dunedin, Invercargill. (September, November, December, June).

**Host Plants:** *Clianthus puniceus* Banks and Solander.

**Remarks:** Most readily separated from *L. citreifemorata* by the smaller size and larger 4th vein index.

### **Liriomyza citreifemorata (Watt). (New Combination)**

*Agromyza citreifemorata* Watt, 1923. Trans. N.Z. Inst. 54 : 478.

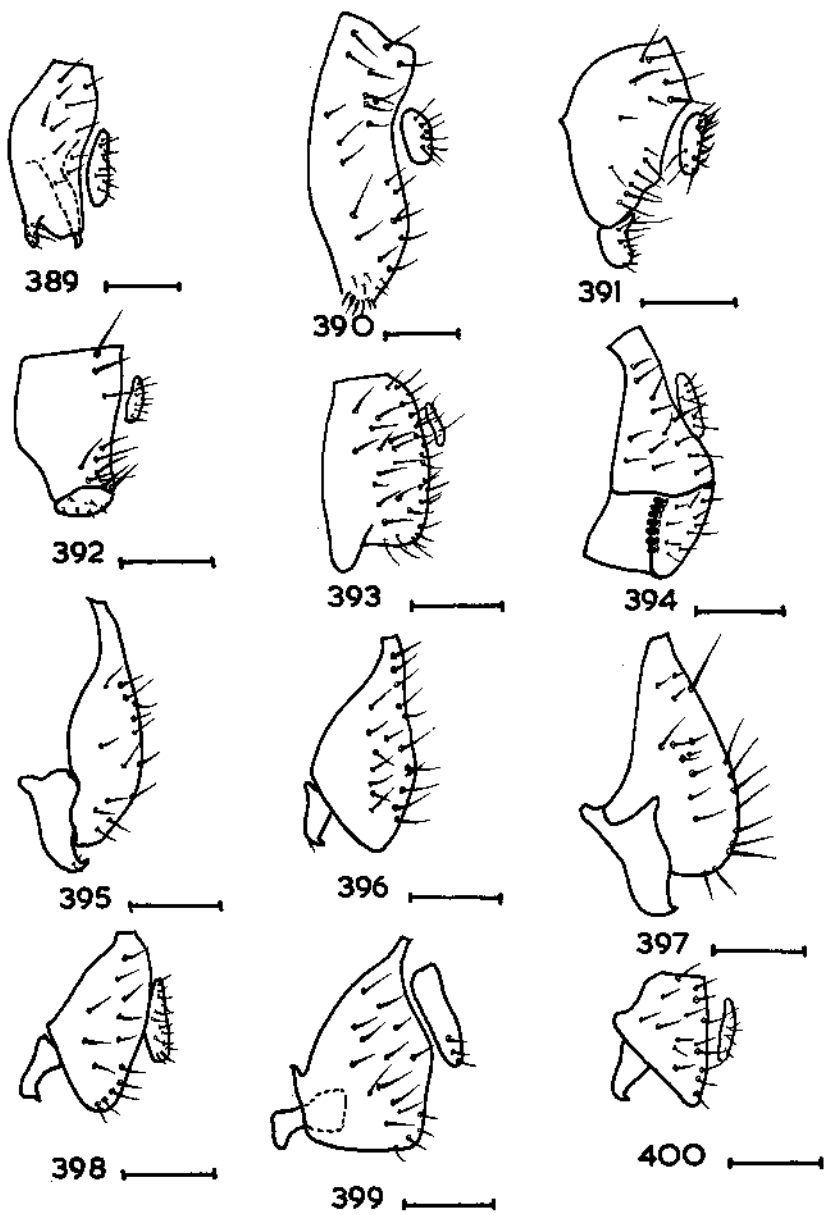
A blackish-brown and yellow species. Body length about 3.0 mm., wing length about 3.0 mm.

#### FEMALE

**HEAD:** Arista dark brown, rays of pubescence much less than diameter of basal segment. Antenna yellowish-brown. Second segment with small dorsal black bristle and a few fine black hairs. Front yellowish-brown; ocellar area blackish-brown. Four fronto-orbitals; small minute hairs near eye margin. Ocellars, post-verticals, and verticals strong. Face yellowish-brown, slightly carinate. Cheeks yellowish-brown. Ventral margin of cheek with 4 or 5 strong hairs at least half length of vibrissa. Occiput blackish-brown. Eyes bare. Vertical diameter of eye about 3 times width of cheek in same axis. Proboscis yellowish-brown; palpi with cluster of strong hairs at apex.

**THORAX:** Mesonotum blackish-brown with faint grey dusting and yellow margins lateral to presutural and supraalar bristle; small black area anterior to humeral bristle; scutellum yellow with lateral margins broadly blackish-brown at base; pleura yellow with ventral portion of mesopleuron, anterior strip of pteropleuron,





Figs. 389-400, External male genitalia:

- |                                      |                                      |
|--------------------------------------|--------------------------------------|
| 389. <i>Cerodontha angustipennis</i> | 395. <i>P. umbrina</i>               |
| 390. <i>Phytomyza clematadi</i>      | 396. <i>P. flavolateralis</i>        |
| 391. <i>P. atricornis</i>            | 397. <i>Liriomyza flavocentralis</i> |
| 392. <i>P. costata</i>               | 398. <i>L. cianthi</i>               |
| 393. <i>Phytobia umbrinella</i>      | 399. <i>L. umbrosa</i>               |
| 394. <i>P. flavopleura</i>           | 400. <i>Haplomyza chenopodii</i>     |

Scale: 0.1 mm.

base of hypopleuron, ventral four-fifths of sternopleuron, and most of propleuron brown or dark brown. Four dorsocentrals, anterior 2 weaker than posterior 2, anterior one presutural; parallel basal scutellars just longer than cruciate apicals; 2 notopleurals; 1 supraalar; 2 postalars; prosternum bare.

Legs light brown. Fore coxae and all femora yellowish-brown.

Wings clear; veins brown, yellow at wing base. Wing indices: costal about 4.25; 4th vein about 7.3; 4c about 1.5; 5x about 5.0.

Halteres yellowish-brown.

**ABDOMEN:** Blackish-brown, posterior margins of tergites very narrowly yellowish-brown. Sixth tergite with a broader posterior band. Ovipositor sheath shining black.

*Holotype:* DUNEDIN: Tomahawk Lagoon, ex ngaio (*Myoporum laetum*), 3.ix.1921, ♀, (*M. N. Watt*), (Dom. Mus.).

*Material Examined:* Holotype and 2 ♀.

*Distribution:* Wanganui, Christchurch, Dunedin. (September, November, January).

*Host Plants:* *Myoporum laetum* Forst. f.

*Remarks:* Three specimens only are in the Watt Collection at the Dominion Museum. One bears a red disc on the mounting pin and presumably was meant to be the holotype although the data is not the same as given by Watt (1923). Close to *L. clianthis* and most readily separated from that species by the large size and smaller 4th vein index.

### ***Liriomyza umbrosa* (Watt). (*New Combination*). Figs. 388, 399**

*Agromyza umbrosa* Watt, 1923. Trans. N.Z. Inst. 54 : 476.

A black and brown species. Body length about 2.0 mm., wing length about 2.0 mm.

#### MALE

**HEAD:** Arista dark brown; pubescence minute and much less than width of basal segment. Antenna blackish-brown; 2nd segment with 1 dorsal apical bristle and strong apical hairs. Front brown; anterior region of middle front and ocellar area dark brown. Four strong fronto-orbitals; ocellars, postverticals and verticals strong, verticals the strongest. Few very minute hairs on orbits. Face dark brown, slight carina. Cheeks brown. Hairs on ventral cheek margin, about half length of vibrissa. Eyes bare. Vertical diameter of eye about 6 times width of cheek in same axis. Occiput dark brown. Proboscis brown; palpi dark brown at apex and with apical black hairs.

**THORAX:** Mesonotum blackish-brown with light brown lateral margins; scutellum blackish-brown with central brown longitudinal band; pleura dark brown with light brown sutures. Four dorsocentrals, the anterior presutural; parallel or convergent basal scutellars equal to cruciate apicals; 2 notopleurals; 1 strong supraalar; 1 weak interalar; 2 postalars, anterior one very strong; prosternum bare.

Legs dark brown.

Wings (Fig. 388) clear; veins dark brown. Wing indices: costal about 4.0; 4th vein about 9.0; 4c about 2.0; 5x about 4.1.

Halteres yellowish-brown.

**ABDOMEN:** Dark brown.

External male genitalia (Fig. 399): Genital arch very narrow dorsally, anterior margin with distinct curved horn, posterior margin strongly curved, ventral margin bearing a very stout short spine, many bristles over surface; anal plate narrow, lightly chitinised, with strong marginal bristles ventrally and small bristles elsewhere; clasper about third height of arch and about 2.5 times as long as wide, apical margin bearing 1 very stout short spine and short bristles on apical quarter.

*Holotype:* DUNEDIN: Botanical Gardens, bred ex *Veronica monticola*, 12.xii.1921, ♂, (*M. N. Watt*), (Dom. Mus.).

*Material Examined*: Holotype and 4 ♂.

*New Records*: AUCKLAND: Green Lane, 23.x.1949, 1 ♂, (K. P. Lamb), (P.D.D.).

*Distribution*: Auckland, Dunedin. (October, December).

*Host Plants*: *Hebe montana* (J. B. Armst.) Ckn & Allan.

*Remarks*: The central yellow band of the scutellum is not as well defined in this species as in others of the genus. The position of this species in *Liriomyza* is not certain. Appears close to *L. urticae* and separated from that species most readily by the darker colouration of antennae, front, and legs.

### ***Liriomyza urticae* (Watt). (*New Combination*)**

*Agromyza urticae* Watt, 1924. Trans. N.Z. Inst. 55 : 685.

A dark brown and yellow species with brown legs. Body length about 2.0 mm., wing length about 2.5 mm.

#### MALE

**HEAD**: Arista brown, pubescence much less than width of basal segments. Antenna brown; 2nd segment with 1 dorsal apical bristle and minute apical hairs. Front brown; orbits light brown; ocellar area and area about verticals, dark brown. Four fronto-orbitals; ocellars, verticals, and postverticals strong. Face light brown with slight carina. Cheeks brown. Ventral margin of cheek with strong hairs at least half length of vibrissa. Occiput dark brown. Eyes bare. Vertical diameter of eye about 6 times width of cheek in same axis. Proboscis light brown; palpi yellowish-brown with black apical hairs.

**THORAX**: Mesonotum dark brown with wide lateral lemon-yellow margins; humerus with dark brown spot anterior to bristle; a small spot anterior to anterior notopleural; scutellum lemon-yellow with dark brown patches at base laterally; postscutellum dark brown; mesopleuron pale yellow dorsally, dark brown ventrally; pteropleuron pale yellow with irregular patches of dark brown; sternopleuron dark brown with narrow dorsal yellow band; hypopleuron yellow with dark brown patch ventrally; propleuron dark brown. Four dorsocentrals; parallel or convergent basal scutellars just less than length of cruciate apicals; 2 notopleurals; 1 strong supraalar; 2 postalars, outer one very strong; prosternum bare.

Legs brown. Apices of femora and bases of tibiae yellowish-brown. Tarsi light brown.

Wings clear; veins brown, basally yellowish-brown. Wing indices: costal about 3.7; 4th vein about 6.7; 4c about 1.5; 5c about 5.0.

Halteres yellow.

**ABDOMEN**: Tergites brown, posterior margins yellowish-brown.

*Holotype*: CHRISTCHURCH: Governors Bay, bred ex *Urtica ferox*, 1.xii.1922, ♂, (Mr Tapley), (Dom. Mus.).

*Material Examined*: Holotype.

*Distribution*: Christchurch. (December).

*Host Plants*: *Urtica ferox* Forst.

*Remarks*: Closest to *L. umbrosa* and separated most readily from it by generally lighter colouration of antennae, front, and legs.

### Genus HAPLOMYZA Hendel

*Haplomyza* Hendel, 1914. Ent. Mitt. 3 : 73.

Black species variably marked with yellow. Arista thickened noticeably on basal fifth, slender, distally tapering. Third segment of antenna rounded at apex. Lunule dorsally terminating in a constricted curve. Three or 4 fronto-orbitals.

Hairs on frontal orbits erect or reclinate. Vibrissa moderately strong. Scutellum yellow at least at centre. Prescutellars absent; 4 dorsocentrals, anterior one presutural; acrostichals few, and absent posteriorly; 1 propleural. Second, 3rd, and 4th veins undulating; costa reaching 4th vein; posterior cross vein absent; anal veins weak; anal cell complete. Halteres white. Genital arch of male genitalia with a very stout short spine at postero-ventral angle; anal plate small; clasper separated from arch by a suture and with 1 to 3 very stout short apical spines.

Type Species: *Haplomyza togata* (Melander)

Recognised chiefly by the absence of the posterior cross vein, the presence of a yellow area on scutellum, and the erect or reclinate hairs on the frontal orbits.

*Distribution*: World wide.

*Species Occurring in New Zealand*: *Haplomyza chenopodii* Watt.

This New Zealand species is tentatively placed in the genus *Haplomyza*. The majority of its characters agree with the diagnosis of the genus but it differs in having only three fronto-orbitals and the longitudinal veins are not markedly undulating.

### **Haplomyza chenopodii** Watt. Figs. 374, 378, 400

*Haplomyza chenopodii* Watt, 1924. Trans. N.Z. Inst. 55 : 683.

A small brown and yellow species with light brown legs. Body length about 1.25 mm., wing length about 1.6 mm.

#### MALE AND FEMALE

**HEAD** (Fig. 378): Arista brown, yellowish-brown at base. Antenna light brown; second segment with 1 strong dorsal apical bristle. Front yellowish-brown. Ocellar area dark brown. Three fronto-orbitals and small hairs on orbits on eye margin. Postverticals and verticals strong, ocellars not quite as long as postverticals. Face yellowish-brown, slight carina. Cheeks yellowish-brown. Ventral margin of cheek with hairs about half length of vibrissa. Occiput dark brown. Eyes bare. Vertical diameter of eye about 5.5 times width of cheek in same axis. Proboscis light brown; palpi light brown with several minute black apical hairs.

**THORAX**: Mesonotum dark brown with broad lateral yellow margins; humerus with small brown area anterior to bristle; scutellum yellow with brown area on lateral margins near base; pleura yellow; small anterior patch on mesopleuron, small dorsal patch on pteropleuron, most of sternopleuron and ventral patch on hypopleuron, brown; postscutellum dark brown. Four dorsocentrals, anterior two about half length of posterior two, anterior one just presutural; parallel basal scutellars equal to cruciate apicals; 2 notopleurals; 1 supraalar; 1 postalar; prosternum bare.

Legs light brown; femora mostly yellowish-brown.

Wings (Fig. 374) clear, veins light brown, yellowish-brown at base of wing. Costal index about 4.0.

Halteres yellow.

**ABDOMEN**: Dark brown, 6th tergite in male with broad posterior yellow margin.

External male genitalia (Fig. 400): Genital arch dark brown, about 18 short bristles on either side, posterior margin about twice length of anterior margin, postero-ventral corner with a cluster of short fine spines and 1 very stout short spine at the apex; anal plate elongate, lightly chitinised, about 4 long bristles on margin of apical third, elsewhere shorter bristles on margin and surface; clasper about half length of arch, bare of hairs and bristles except short narrow spines about apical region and 1 very stout short spine at apex.

*Holotype*: WANGANUI: bred ex beet, 31.xii.1923, ♀, (M. N. Watt), (Dom. Mus.).

*Material Examined*: Holotype, 30 ♂, and 25 ♀.

*New Records:* WAIMAUKU: bred ex silver beet, 13.xii.1955, 5 ♂, 5 ♀, (Gilbertson), (P.D.D.). WHAKATANE: bred ex silver beet, -xii.1955, 24 ♂, 24 ♀, (Dep. Agric.), (P.D.D.).

*Distribution:* Waimauku, Auckland, Whakatane, Napier, Wanganui, Christchurch. (December).

*Host Plants:* *Cerastium glomeratum* Thuill., *C. vulgatum* L., *Chenopodium album* L., *Beta vulgaris* L., *Stellaria media* (L.) Vill., *Spinacia oleracea* L.

## Family CRYPTOCHAETIDAE

Arista absent. Third antennal segment large. Postverticals divergent and small; fronto-orbitals small. Scutellum large. Wings short and broad. Sternopleurals absent; mesopleuron haired. Costa broken at apex of subcosta and near humeral cross vein. Abdomen short.

The family contains only one genus. Its relationships are not very clear and the genus has been placed at times in such families as the Agromyzidae, Drosophilidae and Chamaemyiidae. Its most common placing seems to have been the Agromyzidae but Frick (1952) pointed out that, with two costal breaks, the genus could not be associated with the Agromyzidae. Full family ranking appears to be the most satisfactory way of dealing with the genus.

The family can be recognised at once by the absence of aristae, the large antennae, short abdomen, large scutellum, and the short but wide wings.

*Genera:* *Cryptochaetum* Rondani

### Genus CRYPTOCHAETUM Rondani

*Cryptochaetum* Rondani, 1875. Boll. Soc. ent. ital. 7 : 167.

Generic characters as for family.

Type Species: *Cryptochaetum grandicorne* Rondani

*Distribution:* World wide.

*Species Occurring in New Zealand:* *Cryptochaetum iceryae* (Williston)

The only New Zealand representative is an introduction from Australia, and parasitises *Icerya purchasi* Maskell.

### **Cryptochaetum iceryae** (Williston). Figs. 401, 402

*Leptophonus iceryae* Williston, 1888. Insect Life 1 : 21.

*Cryptochaetum iceryae* (Williston): Mik, 1889. Wien. ent. Ztg. 8 : 281.

A stout blackish-brown species with clear wings. Body length about 1.5-2.0 mm., wing length about 1.5-1.75 mm.

#### MALE AND FEMALE

HEAD (Fig. 401): Arista absent but a very short spine at apex of antenna. Antenna blackish-brown; 3rd segment about half height of head; 2nd segment small, without distinct bristles; basal segment small. Front shining blackish-brown; ocellar triangle very large. Bristles not developed but a row of stronger hairs along vertex and hairs over most of front. Face shining blackish-brown. Cheeks

linear, eye almost reaching oral margin in middle of cheek. Row of short black hairs along cheek margin; no vibrissa nor bristles at lower posterior angle of cheek. Occiput black or blackish-brown. Eyes distinctly haired; widest part of eye at level of insertion of antennae. Proboscis small, dark brown; palpi dark brown.

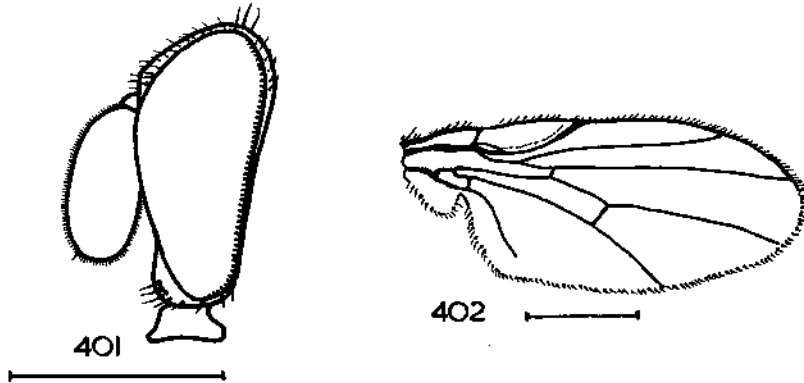


Fig. 401. Head of *Cryptochaetum iceryae*  
 „ 402. Wing of „ „  
 Scale: 0.5 mm.

**THORAX:** Mesonotum and scutellum shining blackish-brown; pleura generally lighter brown. Distinct matt of thick hairs on mesonotum and scutellum and bristles not developed. Scutellum about half length of mesonotum. Mesopleuron with black hairs along posterior margin; other pleura bare.

Legs brown; tarsi light brown. Apical and preapical tibial bristles scarcely developed.

Wings (Fig. 402) wide, clear membrane; veins brown. Subcosta short but traceable to wing margin by a narrow fold in membrane; costa extending to apex of 3rd vein; 5th vein and anal veins reaching wing margins; no cross vein separating 2nd basal and discal cells; pair of short bristles at costal break at 1st vein apex. Wing indices: costal about 2.2; 4th vein about 2.8; 4c about 1.2; 5x about 0.3.

Halteres dark brown, brown basally.

**ABDOMEN:** Shining blackish-brown covered with thick brown hairs.

*Holotype:* Australia.

*Material Examined:* 7 ♂, 7 ♀.

*New Records:* MOKO HINAU ISLANDS: Fanal Island, swept from stream bed, 23.viii.1955, 1 ♂, (R. A. Harrison), (P.D.D.). WAITAKERE RANGES: Titirangi, bred ex *Icerya purchasi* on citrus, emerged 28.vii.1942–10.viii.1942, 4 ♂, 6 ♀, (M. W. Carter), (P.D.D.). AUCKLAND: Devonport 25.iv.1942, 1 ♂, (N. Crump), (P.D.D.): Sunnyvale, in house, 18.iv.1954, 1 ♀, (K. A. J. Wise), (P.D.D.). WANGANUI: Bred ex *Icerya purchasi*, emerged 2.iv.1943, 1 ♂, (Dep. Agric.), (P.D.D.).

*Distribution in New Zealand:* North Island. (April, July, August).

### Family MILICHIIDAE

Third antennal segment rounded. Ocellar triangle often strongly developed. Postverticals convergent or parallel; anterior fronto-orbitals convergent; frontals often present. Vibrissa present. Proboscis long

and geniculate or normal. Costa twice broken, ending at either third or fourth vein; subcosta distinct or weak apically and close to first vein; fourth vein weakened apically or normal; second basal and anal cells small or absent; anal vein weak.

New Zealand milichiids can be recognised by the short parallel postverticals, the convergent anterior fronto-orbitals and the presence of vibrissa.

*Genera Occurring in New Zealand: Australimyza* Harrison

The sole New Zealand genus is endemic.

### Genus AUSTRALIMYZA Harrison

*Australimyza* Harrison, 1953. Trans. roy. Soc. N.Z. 81 : 277.

Head rounded. No frontal bristles; postverticals small and parallel or slightly convergent or divergent. Cheek consists of orbit (gena), bucca, and lower occiput. Strong vibrissa present. Upper occiput slightly concave. Anterior eye facets larger than rest. Proboscis normal, not geniculate or elongate. Two pairs scutellars; mesopleural bristles absent; 2 sternopleurals. Costal break at humeral cross vein weak; costa extending to apex of 4th vein but weakened after 3rd vein; subcosta ending in costa, weakened and close to 1st vein at its apex, 4th vein not weakened; 1st posterior cell not narrowed; discal cell separated from 2nd basal cell; anal cell present; anal vein present.

Type Species: *Australimyza anisotomae* Harrison

*Australimyza* is not a very typical milichiid because of the absence of frontal bristles and the normal rather than geniculate proboscis, but the presence of convergent anterior fronto-orbitals, the absence of mesopleural bristles, and the two breaks in the costa are sufficient to warrant its inclusion in the family.

The important distinguishing characters are the small parallel postverticals, normal proboscis, absence of mesopleural bristles, two sternopleurals, and costa ending at the fourth vein. The genus shows some similarities to *Hemeromyia* Coquillet. In the original diagnosis, Harrison (1953b) compared it with *Euchlorops* Malloch but this latter genus has been shown to be a true chloropid (Sabrosky, 1941) and the relationships are not close as originally suggested.

*Distribution:* New Zealand.

*Species:*

*Australimyza anisotomae* Harrison

*A. longiseta* sp.n.

*A. macquariensis* (Womersley)

*A. salicorniae* sp.n.

*A. setigera* sp.n.

The five known species are all found on or near the seashore and are suspected of being miners in various seashore plants. They are all closely related species and, apart from *A. setigera* with the presutural dorsocentral, are not easy to separate. Male genital characters are important but dissection is usually necessary for examination.

#### KEY TO SPECIES OF AUSTRALIMYZA

- |   |  |                  |
|---|--|------------------|
| 1 | Four dorsocentrals, one of them presutural ..... | †                |
|   | Three postsutural dorsocentrals .....            | <i>setigera</i>  |
|   |  | 2                |
| 2 | Small species less than 2.0 mm. ....             | <i>longiseta</i> |
|   | Large species 2.0 mm. or larger .....            | 3                |

- |   |  |                      |
|---|--|----------------------|
| 3 | Prescutellars absent .....   | <i>macquariensis</i> |
|   | Prescutellars present .....  | 4                    |
| 4 | No acrostichal bristles near transverse suture .....                 | <i>anisotomae</i>    |
|   | Acrostichal bristles and enlarged hairs near transverse suture ..... | <i>salicorniae</i>   |

***Australimyza setigera* sp.n. Fig. 410**

A dull blackish-brown species. Body length about 1.75 mm.; wing length about 1.75 mm.

MALE AND FEMALE

**HEAD:** Arista light brown, dark brown basally; bare. Antenna light brown; 2nd segment with 2 dorsal bristles and other black hairs; 1st segment with 2 black hairs on inner apical margin. Front converging anteriorly, blackish-brown with grey dusting, small area anteriorly, light brown. Postverticals small and slightly convergent about two-fifths length of inner verticals; ocellars, verticals and fronto-orbitals strong; all fronto-orbitals about equal in length; most of front with strong black hairs. Face light brown, no carina. Cheeks light brown merging to blackish-brown posteriorly. Three bristles along cheek margin from vibrissa to posterior corner all as strong as vibrissa. Occiput greyish-black. Eyes haired. Vertical diameter of eye about 6.5 times width of cheek in same axis. Proboscis light brown; palpi yellowish-brown.

**THORAX:** Blackish-brown with light grey dusting. Prescutellars present, about third length posterior dorsocentrals; enlarged hairs in middle of the two acrostichal rows about region of transverse suture; 4 dorsocentrals, 1 presutural; basal scutellars divergent or parallel and about two-thirds cruciate apical scutellars; 1 humeral; 1 presutural; 2 notopleurals; 1 supraalar; 2 postalars; 1 propleural hair; prosternum bare.

Legs brown; coxae, trochanters, tarsi, fore tibia, and apices of other tibiae, yellowish-brown. Fore femur with bristles on apical third of postero-dorsal and postero-ventral margins, strongest at about apical quarter of postero-ventral surface; mid femur with small bristles on apical third of antero-ventral margin; mid tibia with ventral apical bristle.

Wings clear; veins light brown. Stout short costal spines thinning out towards apex of 2nd vein and terminated just beyond apex of this vein; anal vein weak but as a fold nearly reaches wing margin. Pair of bristles at distal costal break. Wing indices: costal about 8.3-9.3; 4th vein about 3.4-3.6; 4c about 0.5; 5x about 1.6.

**ABDOMEN:** Brown with very light grey dusting.

External male genitalia (Fig. 410): Genital arch narrow dorsally; anal plate with bristles equal to width of clasper basally; clasper wide at base narrowed near base, widened about middle, and tapering to rounded apex, small spines over most of surface.

*Holotype:* RANGITOTO ISLAND: 9.iv.1949, ♀, (*R. A. Harrison*), (P.D.D.).

*Paratypes:* Same data as holotype, 1 ♂. BAY OF ISLANDS: Waitangi, Hobson Bay, 14.iii.1949, 2 ♂, (*K. P. Lamb*), (P.D.D.).

*Material Examined:* Holotype, and 3 ♂ paratypes.

*Distribution:* Bay of Islands, Rangitoto Island. (March, April).

*Remarks:* Separated from the other species by the presence of a distinct presutural dorsocentral as well as the three postsutural dorsocentrals.

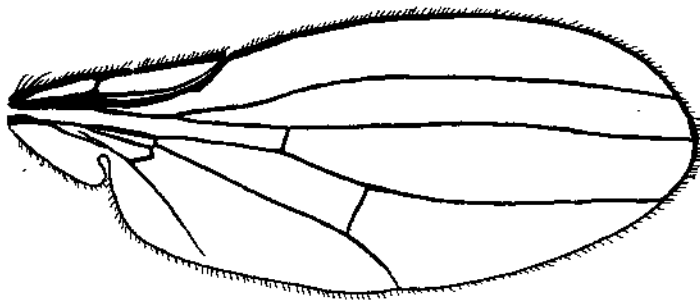
***Australimyza longiseta* sp.n. Fig. 409**

A grey dusted black species with yellowish-brown legs. Body length about 1.5-1.75 mm., wing length about 1.5-1.75 mm.

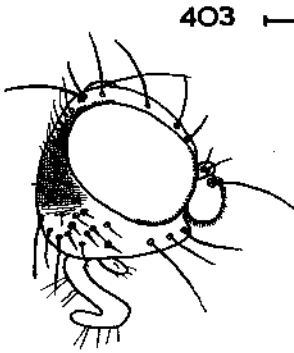
MALE AND FEMALE

**HEAD:** Arista shining blackish-brown, bare. Antenna yellowish-brown; 2nd segment with 2 dorsal bristles and few small black hairs; basal segment with 2

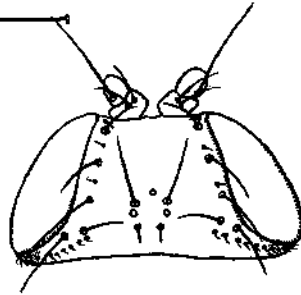




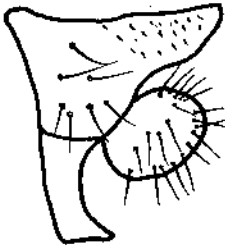
403



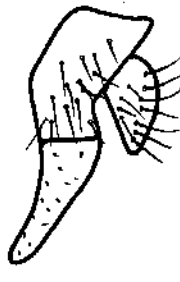
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405



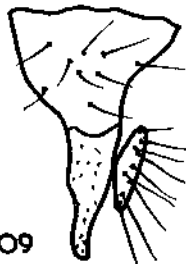
406



407



408



409



410

Fig. 403. Wing of *Australimyza anisotomae*  
 „ 404, 405. Head of *Australimyza anisotomae*  
 External male genitalia:

Fig. 406. *A. salicorniae*

Fig. 409. *A. longiseta*

„ 407. *A. anisotomae*

„ 410. *A. setigera*

„ 408. *A. macquariensis*

Scale: Figs. 403-405, 0.5 mm.; Figs. 406-410, 0.1 mm.

apical hairs. Front heavily grey dusted; ocellar area slightly raised above level of front. Postverticals about half length of inner verticals and parallel or slightly convergent; ocellars widely divergent; 3 fronto-orbitals, the posterior one slightly larger than others; few hairs on orbits and centre of front. Face dusted with pale yellow. Cheeks heavily dusted, orbits and oral margin pale yellow, centre of cheek grey. Vibrissa strong and about 3 bristles posterior to it along cheek equal in length to vibrissa. Occiput grey dusted. Eyes haired. Vertical diameter of eye about 6 times width of cheek in same axis. Proboscis yellowish-brown; palpi pale yellow.

**THORAX:** Heavily grey dusted. Acrostichal hairs in about 4 to 6 irregular rows; prescutellars about half length of posterior dorsocentrals but often longer in females than in males; a pair of small but distinct acrostichal bristles on line of transverse suture just anterior to anterior dorsocentrals; 3 postsutural dorsocentrals, posterior one very strong; divergent basal scutellars about two-thirds length of cruciate apicals; scutellum bare; 1 humeral; 1 presutural; 2 notopleurals; 2 supraalar, anterior one weaker; 2 postalar, anterior one strong; small propleural hair.

Legs yellowish-brown. Fore femur with 1 or more strong bristles at about apical quarter of postero-ventral surface; mid tibia with ventral apical.

Wings clear; veins light brown. Short stout costal spines fading out before apex of 2nd vein. Wing indices: costal about 9.0-10.0; 4th vein about 3.1-3.4; 4c about 0.5; 5x about 1.3-1.4.

Halteres pale yellow.

**ABDOMEN:** Tergites brown, posterior ones blackish-brown, somewhat shining and dusting not as thick as on thorax.

External male genitalia (Fig. 409): Genital arch narrow dorsally; anal plate with long bristles, largest about 1.5 times width of clasper at base; clasper wide basally, narrow finger-like apically, length about twice width at base, small spines over most of its surface.

**Holotype:** MOKO HINAU ISLANDS: Lizard Island, 23.viii.1955, ♂, (R. A. Harrison), (P.D.D.).

**Paratypes:** Same data as holotype (20 ♂ and 16 ♀ P.D.D., 5 ♂ and 5 ♀ Ak. Mus.).

**Other Specimens:** Same data as holotype, greasy or damaged, 50 ex. (P.D.D.).

**Material Examined:** Holotype, 25 ♂ and 21 ♀ paratypes, and 50 ex.

**Distribution:** Moko Hinau Islands. (August).

**Remarks:** The long hairs on the anal plate of the male are distinctive and often visible *in situ*. This character is important in separating the species from others. Also separated by the three dorsocentrals and the pair of distinct acrostichal bristles near transverse suture.

### **Australimyza macquariensis** (Womersley). (*New Combination*). Fig. 408

*Procanace macquariensis* Womersley, 1937. Rep. Brit. Aust. N.Z. Antarct. Res. Exped. B4 (3) : 78.

A brown or dark brown species with heavy dusting of grey; legs light brown or yellowish-brown. Body length about 2.5 mm., wing length about 2.5 mm.

#### MALE AND FEMALE

**HEAD:** Arista dark brown, bare. Antenna very light brown; 3rd segment with thick matt of hairs; 2nd segment with 2 strong dorsal bristles and short black hairs near apical margin; basal segment with 1 strong hair. Front brown or dark brown, yellowish-brown anteriorly and with thick covering of grey dust; ocellar area light brown. Three fronto-orbitals, the posterior bristle stronger than anterior two; ocellars and verticals strong; postverticals weak; hairs on front and on orbits. Cheeks light brown merging to dark brown posterior to eyes. Two bristles equal

to vibrissa on anterior half of cheek and a pair of smaller bristles at lower posterior corner of cheek. Occiput brown with grey dusting. Eyes haired. Vertical diameter of eye about 4 times width of cheek in same axis. Proboscis pale yellow with thick dusting; palpi with fine black hairs.

**THORAX:** Mesonotum dark brown with thick grey dusting; pleura brown with light dusting. Prescutellars not differentiated from acrostichal hairs; a few enlarged acrostichal hairs about or just posterior to transverse suture; 3 postsutural dorso-centrals, posterior the strongest, and occasionally an enlarged hair in dorso-central line on or anterior to transverse suture; 1 humeral; 1 presutural; 2 notopleurals, anterior the stronger; 2 supraalar, anterior one weak; 2 postalar, posterior one weak; 1 small propleural hair.

Legs light brown or yellowish-brown. Fore femur with strong bristles on postero-dorsal and apical half of postero-ventral surfaces; mid tibia with ventral apical; hind tibia with minute ventral apical.

Wings clear; veins light brown. Small stout costal spines extending about half distance between apices of 2nd and 3rd veins. Wing indices: costal about 12.0; 4th vein about 3.0; 4c about 0.5; 5x about 1.3.

Halteres pale yellow.

**ABDOMEN:** Tergites light brown, darker brown posteriorly.

External male genitalia (Fig. 408): Genital arch brown, about 6 to 8 small bristles on either side; anal plate lightly chitinised with few bristles as long as width of plate, plate usually visible *in situ*; clasper long and narrow with very small spines on apical half.

*Holotype:* MACQUARIE ISLAND: —.xii.1930, (*Anon.*), (S.A.M.).

*Material Examined:* 4 ♂ and 2 ♀ paratypes, and 3 ♂ and 5 ♀.

*New Records:* MACQUARIE ISLAND: Station 81, swampy land near Buckles Bay, 3 ♂, 5 ♀, (*Brit. Aust. N.Z. Antarct. Res. Exped.*), (S.A.M.).

*Distribution:* Macquarie Island. (December).

*Remarks:* Closely related to *A. anisotomae* and most readily separated from it by the absence of prescutellar acrostichal bristles.

### ***Australimyza anisotomae* Harrison. Figs. 403, 404, 405, 407**

*Australimyza anisotomae* Harrison, 1953. *Trans. roy. Soc. N.Z.*  
81: 277.

A small species. Body greyish-black; wings clear; veins of wings and legs light yellow. Body length 2.0 mm., wing length 2.5 mm.

#### MALE AND FEMALE

**HEAD** (Figs. 404, 405): Arista bare, black. Antenna yellowish or light reddish-brown; 3rd segment rounded and covered with thick, brownish pile, arista arising near base of dorsal surface; 2nd segment with 2 dorsal bristles and some few short hairs; basal segment with 2 apical hairs. Front dark grey, dusted; about half width of head at vertex; ocellar area not differentiated in colour and only slightly raised above level of front; frontal orbits a shade lighter than vittae. Pair of divergent proclinate ocellars; 2 verticals, inner pair anterior and convergent, outer pair divergent; 3 fronto-orbital bristles, middle and posterior pairs both divergent and somewhat reclinate, all approximately equal length; middle bristle closer to anterior bristle; about 7 very small hairs on front near orbits; 1 small hair on either side of middle fronto-orbital, directed towards the eye, and 1 similar hair anterior to anterior orbital directed away from the eye. Face yellowish-brown; no carina; oral margin produced slightly but clearly differentiated from face. No hairs on facial orbits. Cheeks yellowish-brown but grey or black posteriorly. Two and sometimes 3 strong bristles between vibrissa and posterior corner of head; 2 bristles near vibrissa and equal to it in length, and third, if present, weaker. Hairs on post-cranium. Occiput, grey or black dusted. Eyes dark red and covered with short, thick hairs. Vertical diameter of eye about 5 times width of cheek in same axis. Proboscis yellowish or light reddish-brown;

palpi lighter coloured, covered with fine white pile and with a few small hairs apically.

**THORAX:** Dark grey or black dusting dorsally and dark brownish-grey laterally and ventrally. Scutellum flat dorsally. Four or 5 irregular rows of acrostichal hairs, those about transverse suture slightly enlarged, and 1 pair of small prescutellar acrostichal bristles about third length of posterior dorsocentrals; 3 pairs of dorsocentrals, all postsutural; anterior scutellars parallel or slightly divergent and shorter than cruciate apicals; 1 strong humeral; 1 strong presutural; 2 notopleurals; 2 supraalars, anterior bristle weaker; 2 postalars, anterior bristle stronger; small propleural hair.

Legs yellow; hind femur brown. One apical bristle on ventral surface of mid tarsus.

Wings (Fig. 403) clear; veins light brown. One dorsal bristle at distal costal break. Short stout costal spines ending at apex of 2nd vein. Wing indices: costal about 10.8; 4th vein about 3.0; 4c about 0.45; 5x about 1.3.

Halteres light yellow.

**ABDOMEN:** Dark brownish-black.

External male genitalia (Fig. 407): Genital arch narrow dorsally; anal plate with bristle as long as width of clasper basally; clasper about 3 times as long as its basal width, small spines over most of anterior surface.

**Holotype:** ANTIPODES ISLAND: Tussock slopes above Ringdove Bay, 7.xi.1950, ♂, (*E. G. Turbott*), (Ak. Mus.).

**Material Examined:** Holotype, 12 ♂ and 13 ♀ paratypes, and 9 ex.

**Distribution:** Antipodes Island, Campbell Island. (November).

**Remarks:** Separated from *A. setigera* by the presence of three postsutural dorsocentrals and from other species by the absence of acrostichal bristles near the transverse suture.

### ***Australimyza salicorniae* sp.n. Fig. 406**

A dark grey dusted species with yellowish-brown legs. Body length about 2.25 mm., wing length about 2.5 mm.

#### **MALE AND FEMALE**

**HEAD:** Arista shining blackish-brown, bare. Antenna light brown; 2nd segment with 2 dorsal bristles and several black hairs; basal segment with 2 apical hairs. Front heavily bluish-grey dusted; orbits brownish-grey; anterior margin yellowish-brown; ocellar area not differentiated in colour. Postverticals parallel and about two-thirds length inner verticals; ocellars divergent; all three fronto-orbitals strong, posterior slightly larger than others; strong hairs in about 2 or 3 rows on either side of front close to orbits; orbits with a hair anterior to each bristle and directed in a similar direction to the respective bristles. Face light brown. Cheeks yellowish-brown merging to dark grey posteriorly. Two or 3 bristles posterior to and equal to vibrissa along cheek. Occiput dark grey dusted. Eyes haired. Vertical diameter of eye about 6 times width of cheek in same axis. Proboscis light brown; palpi yellow.

**THORAX:** Heavily bluish-grey dusted. Acrostichal hairs in about 6 to 8 irregular rows; prescutellars about half length of posterior dorsocentrals; up to 3 pairs of enlarged acrostichal hairs in middle row on or just posterior to transverse suture, the posterior of these pairs often bristle-like and level with or anterior to anterior dorsocentrals; 3 postsutural dorsocentrals, posterior one strongest; divergent basal scutellars about two-thirds length of cruciate apicals; scutellum bare; 1 humeral; 1 presutural; 2 notopleurals; 2 supraalars, anterior weaker; 2 postalars, anterior stronger; small propleural hair.

Legs yellowish-brown, posterior femur and apical segments of all tarsi brown. Fore femur with strong bristle at apical quarter of postero-ventral surface and small bristles on same surface apically and on postero-dorsal surface; mid tibia with strong ventral apical.

Wings clear; veins light brown. Small stout costal spines extending just beyond apex of 2nd vein. Wing indices: costal about 9.5; 4th vein about 3.6; 4c about 0.6; 5x about 1.8.

Halteres yellowish-brown.

ABDOMEN: Tergites brown, dark brown posteriorly, slightly shining but with grey dusting.

External male genitalia (Fig. 406): Genital arch narrow dorsally; anal plate with bristles not quite as long as width of clasper at base; clasper triangular, broad at base, about 1.5 times as long as wide, small spines over most of surface.

*Holotype*: AUCKLAND: Hobson Bay, swept off *Salicornia*, 3.viii.1952, ♂, (K. A. J. Wise), (P.D.D.).

*Paratypes*: Same data as holotype: 27.vii.1952, 1 ♀; 2.viii.1952, 1 ♀, (K. A. J. Wise), (P.D.D.). MANUKAU HARBOUR: Swept ex *Leptocarpus* on beach, 17.viii.1952, 1 ♀, (K. A. J. Wise), (P.D.D.).

*Other Records*: Same data as holotype, 2.viii.1952, 2 ex.; 3.viii.1952, 1 ex.

*Material Examined*: Holotype, 3 ♀ paratypes, and 3 ex.

*Distribution*: Auckland, Manukau Harbour. (July, August).

*Remarks*: Difficult to separate from other species of the genus without examining the male clasper. It is the largest species, has no presutural dorsocentrals and usually a cluster of about three pairs of enlarged acrostichal hairs near transverse suture. The male clasper is very wide basally. Named for its association with *Salicornia*.

## Family CHLOROPIDAE

Small flies; body length 1.25–5.0 mm. Body bare or with very short hairs or sparse covering of hairs. Arista pubescent or bare. Front equally wide in both sexes. Distinct strong fronto-orbitals usually absent; post-vertexals convergent or cruciate. Ocellar triangle large, shining. Vibrissa absent or weak. Prosternum and propleuron with sharp anterior margins. Mesopleural bristles absent. Tibiae without dorsal preapical bristles. Costa broken near apex of first vein. Subcosta rudimentary; anal cell and anal vein absent or very weak; fifth vein with a noticeable flexure or irregularity near middle in many genera; second basal and discal cells united.

A well defined family readily recognised by the irregularity in the fifth vein and the usually large shining ocellar triangle. New Zealand has a fauna of predominantly endemic species but most of the genera occur elsewhere, some being very widespread.

*Subfamilies*: Oscinellinae  
Chloropinae

### KEY TO SUBFAMILIES OF CHLOROPIDAE

Costal vein extending to apex of 4th vein ..... OSCINELLINAE (p. 336)  
Costal vein extending to apex of or little beyond apex of 3rd vein  
..... CHLOROPINAE (p. 354)

### Subfamily OSCINELLINAE

Usually dark species with predominantly black body. Hind tibia with an oval sensory area at middle of postero-ventral surface. Costa extending to apex of fourth vein.

The strongest subfamily in New Zealand and readily separated from the Chloropinae by the costa ending at fourth vein instead of at the third vein.

*Genera Occurring in New Zealand:*

*Apteroscinius* Malloch  
*Apterosoma* Salmon  
*Eutricimba* Malloch  
*Gaurax* Loew  
*Hippelates* Loew  
*Lasiopleura* Becker  
*Oscinosoma* Lioy  
*Tricimba* Lioy

KEY TO GENERA OF OSCINELLINAE IN NEW ZEALAND

- 1 Wings greatly reduced ..... 2  
Wings not reduced ..... 3
- 2 Mesonotum without distinct furrows; eyes bare ..... *APTEROSOMA* (p. 337)  
Mesonotum with distinct furrows; eyes densely haired *APTEROSCINIUS* (p. 338)
- 3 Hind tibia with a strong apical or preapical spur, larger than diameter  
of tibia ..... *HIPPELATES* (p. 339)  
Hind tibia with apical or preapical spur absent or, if present, less than  
diameter of tibia ..... 4
- 4 Ocellar bristles proclinate and divergent ..... *LASIOPLEURA* (p. 340)  
Ocellar bristles erect and convergent or cruciate ..... 5
- 5 Mesonotum with 3 deeply impressed longitudinal sulci ..... 6  
Mesonotum without deeply impressed longitudinal sulci, or at most,  
only shallow depressed longitudinal areas ..... 7
- 6 A cross vein connecting 2nd vein and costa ..... *EUTRICIMBA* (p. 344)  
No cross vein between 2nd vein and costa ..... *TRICIMBA* (p. 345)
- 7 Third antennal segment reniform and distinctly broader than long  
..... *GAURAX* (p. 346)  
Third antennal segment not reniform but disc shaped or spherical and  
approximately as long as broad ..... *OSCINOSOMA* (p. 352)

Genus *APTEROSOMA* Salmon

*Apterosoma* Salmon, 1939. Proc. R. ent. Soc. Lond. B8 : 113.

Three fronto-orbitals; strong ocellars and verticals. Eyes bare, cheeks narrow. One dorsocentral; 2 pairs of scutellars; 2 notopleurals. Wings greatly reduced. Halteres small. Mesonotum without distinct furrows.

Type Species: *Apterosoma moorei* Salmon

Recognised by the greatly reduced wings and small halteres. Closely related to *Apteroscinius* Malloch and in fact Miller (1950) synonymises them and suggests that *Apterosoma moorei* may be the male of *Apteroscinius deansi*. Although this synonymy is a possibility, the distinction between the genera is maintained here and this separation should be kept until both sexes of one or both species are found together.

*Apterosoma* is separated from *Apteroscinius* by the absence of furrows on the mesonotum, the absence of hairs on the eyes, and the presence of narrow cheeks.

*Distribution:* New Zealand.

*Species Occurring in New Zealand:* *Apterosoma moorei* Salmon

***Apterosoma moorei* Salmon**

*Apterosoma moorei* Salmon, 1939. Proc. R. ent. Soc. Lond.  
B8 : 114.

A yellowish-brown and dark brown species with greatly reduced wings. Body length about 1.5 mm., wings about length of mesonotum.

#### MALE

**HEAD:** Arista dark brown; rays of pubescence less than diameter of basal segment. Antenna yellowish-brown; 2nd segment with strong dorsal bristle and several short black hairs. Front light greyish-yellow; ocellar triangle extending to anterior margin of front and shining. Three weak fronto-orbitals, the middle one the strongest; ocellars divergent; postverticals weak; black hairs on front except for triangle. Face pale yellow. Cheeks pale yellow. Several hairs on ventral cheek margin about two-thirds length of vibrissa. Occiput yellowish-brown. Vertical diameter of eye about 10 times width of cheek in same axis. Proboscis yellowish-brown; palpi yellow.

**THORAX:** Yellowish-brown. Mesonotum with dark brown central stripe wide anteriorly, narrowing and becoming paler posteriorly, a dark brown presutural spot and a dark brown large postsutural spot on area between dorsocentrals and alar bristles, the latter area divided by a narrow longitudinal yellowish-brown band; scutellum yellowish-brown darker on lateral margins; pleura light yellow with dark brown narrow stripes on mesopleuron, pteropleuron, and sternopleuron. Prescutellars absent; basal scutellar bristles smaller than apicals; 2 humerals; 2 notopleurals; 1 supraalar; 1 postalar; no mesopleurals; no sternopleurals.

Legs yellowish-brown and without distinctive bristles.

Wings greatly reduced. Costa with 2 very strong basal bristles and small hairs to apex of wing. Venation reduced to 2 main longitudinal veins and a distinct cross vein.

Halteres yellowish-brown and minute.

**ABDOMEN:** Light brown.

External genitalia: Genital arch brown, small bristles over most of surface particularly near posterior margin; anal plate very small; claspers about half height of arch without hairs, tapering to narrow incurved apex.

*Holotype:* MOUNT GREY VALLEY: ex nest of *Monomorium integrum* Forel, -ii.1938, ♂, (*W. E. Moor*), (Dom. Mus.).

*Material Examined:* Holotype and 1 ♂.

*Distribution:* Mount Grey. (February).

#### Genus *APTEROSCINIS* Malloch

*Apteroscinis* Malloch, 1931. Rec. Cant. [N.Z.] Mus. 3 : 407.

Eyes densely haired. Cheeks wide. Mesonotum with distinct longitudinal furrows. Wings greatly reduced. Halteres small.

Type Species: *Apteroscinis deansi* Malloch

Most closely related to *Apterosoma* Salmon but separated from it by the presence of distinct furrows on the mesonotum, the presence of hairs on the eyes, and wider cheeks.

*Distribution:* New Zealand.

*Species Occurring in New Zealand:* *Apteroscinis deansi* Malloch

#### *Apteroscinis deansi* Malloch

*Apteroscinis deansi* Malloch, 1931. Rec. Cant. [N.Z.] Mus. 3 : 407.

A brown species with greatly reduced wings. Body length about 1.25 mm.

#### FEMALE

**HEAD:** Arista brown, pubescence minute. Third antennal segment darker brown on outer margin. Front yellowish-brown, darker at vertex and dusted with grey. Short hairs on front. Cheeks yellowish-brown anteriorly, brown or dark brown posteriorly and dusted with grey. Occiput dark brown with grey dusting. Eyes densely haired. Vertical diameter of eye about 4 times width of cheek. Palpi yellow.

THORAX: Brown, mesonotum with a central dark brown area, weak posteriorly, a lateral dark brown area on either side of ventral area, the pair converging posteriorly; deep furrows between these areas. Scutellar bristles weak.

Legs yellowish-brown, all femora and tibiae with a broad central dark brown annulus.

Wings pale yellow with bristles and hairs shining yellow.

Halteres minute.

ABDOMEN: A broad dark brown stripe on each side of each tergite, convergent posteriorly and forming a broad V. Numerous fine hairs on all tergites.

*Holotype*: CHRISTCHURCH: Riccarton, Deans Bush, 21.x.1924, ♀, (*A. Tonnoir*), (U.S.N.M. and Cant. Mus.).

*Distribution*: Christchurch. (October).

*Remarks*: The holotype is at present in the United States National Museum and has not been examined.

### Genus HIPPELATES Loew

*Hippelates* Loew, 1863. Berl. ent. Z. 7 : 35-36.

Ocellars long, proclinate, and widely divergent. Mesonotum haired and with bristles. Hind tibia with a strong apical or preapical spur, longer than diameter of tibia.

Type Species: *Hippelates plebejus* Loew

Recognised and separated from other genera by the tibial spur.

*Distribution*: World wide.

*Species Occurring in New Zealand*: *Hippelates insignificans* (Malloch)

***Hippelates insignificans* (Malloch). (*New Combination*). Figs. 411, 414**

*Cadrema insignificans* Malloch, 1931. Rec. Cant. [N.Z.] Mus.  
3 : 406.

A black, grey dusted species. Body length about 1.5 mm., wing length about 1.75 mm.

#### MALE

HEAD (Fig. 411): Arista brown; rays of pubescence less than diameter of basal segment. Antenna light brown; 3rd segment brown or dark brown on apical half; 2nd segment with 1 small dorsal bristle and minute apical hairs. Front yellowish-brown anteriorly, merging to black posteriorly; all front including ocellar triangle heavily dusted with grey except for a glossy spot lateral to each posterior ocellus and anterior to anterior ocellus. Verticals and postverticals strong; ocellars cruciate and small; orbits with row of strong long reclinate hairs, the posterior three the strongest; inwardly directed hairs on the lateral margins of ocellar triangle and hairs elsewhere on front. Face yellowish-brown and brown. Cheeks pale yellow merging to dark brown posteriorly. Row of hairs near ventral margin of cheek, the anterior one strong and on the slightly produced vibrissal angle. Occiput black with grey dusting. Eyes haired. Vertical diameter of eye about 3.5 times width of cheek in same axis. Proboscis long and slender, dark brown; palpi pale yellow.

THORAX: Shining black or blackish-brown; mesonotum, scutellum and dorsal band across pleura heavily dusted with grey sufficient to hide the shining surface. No prescutellars; 1 dorsocentral; apical scutellars convergent and about twice length of mid marginal scutellars; scutellum haired; 1 humeral; no presutural; 3 notopleurals; 2 small postalaris; mesopleuron bare; sternopleuron haired, no bristles; 1 small propleural.

Legs yellowish-brown; mid and hind coxae shining blackish-brown; all femora brown, anterior one faintly, except extreme apex and base; hind tibia brown on basal half except extreme base. Mid tibia with apical ventral bristle.



Wings (Fig. 414) hyaline; veins brown. Wing indices: costal about 1·8; 4th vein about 3·1; 4c about 1·5; 5x about 3·0.

Halteres yellowish-white apex; light brown stalk.

ABDOMEN: Blackish-brown with heavy grey dusting.

*Holotype*: CHRISTCHURCH: 17.ii.1922, ♀, (*A. L. Tonnoir*), (U.S.N.M. and Cant. Mus.).

*Material Examined*: 1 ♂.

*New Records*: PALMERSTON NORTH: Experimental area, from swedes, -iv.1931, 1 ♂, (*W. Cottier*), (P.D.D.).

*Distribution*: Christchurch, New Brighton, Palmerston North. (February, April).

*Remarks*: The specimen recorded above has been compared with the holotype by C. W. Sabrosky.

### Genus LASIOPLEURA Becker

*Lasiopleura* Becker, 1910. Arch. Zool. Bp. 1: 130.

*Parahippelates* Becker, 1911. Ann. hist.-nat. Mus. Nat. hung. 9: 109.

*Pseudohippelates* Malloch, 1913. Proc. U.S. nat. Mus. 44: 261.

*Omochaeta* Duda, 1930. Folia zool. hydrobiol., Riga, 2: 59.

Ocellars proclinate and divergent. One to 4 dorsocentrals. Two humerals, dorsal one strong and directed centrally; mesopleuron bare; scutellum with 2 or more erect hairs on disc. Sensory area on hind tibia distinct; hind tibia with or without a small but distinct black apical or preapical ventral spur which is always less than diameter of tibia.

Type Species: *Lasiopleura longepilosa* (Strobl.)

Recognised chiefly by the proclinate and divergent ocellars, the presence of two distinct humeral bristles and the bare mesopleuron. New Zealand species have two to four dorsocentral bristles.

*Distribution*: New Zealand, Australia, Europe, Orient, Africa.

*Species Occurring in New Zealand*:

*Lasiopleura quadriseta* sp.n.

*L. tonnoiri* Sabrosky

*L. wisei* sp.n.

The three species are not closely related and are to be regarded as peripheral representatives of the genus which is strongest in the Indo-Australian region.

#### KEY TO SPECIES OF LASIOPLEURA IN NEW ZEALAND

- |   |                            |                   |
|---|----------------------------|-------------------|
| 1 | Legs black .....           | <b>tonnoiri</b>   |
|   | Legs yellowish-brown ..... | 2                 |
| 2 | Two dorsocentrals .....    | <b>wisei</b>      |
|   | Four dorsocentrals .....   | <b>quadriseta</b> |

#### *Lasiopleura tonnoiri* Sabrosky

*Lasiopleura tonnoiri* Sabrosky, 1955. Proc. Linn. Soc. N.S.W. 79: 188, Fig. 5.

A black species with glossy black ocellar triangle and black legs. Body length about 1·75–2·0 mm.

#### FEMALE

HEAD: Arista relatively short with microscopic pubescence. Antenna small; 3rd

segment orange on ventral basal portion, subquadrate, broader than long. Front yellow or reddish-yellow anteriorly, merging to black at vertex; moderately broad, at vertex 2.5 times width of eye and nearly 0.6 times width of head, and approximately as long as broad; ocellar triangle just over half length of front, glossy black; ocellar area, lateral corners of triangle at vertex and lateral margins of triangle, light grey dusting. Three fronto-orbitals, strong and more or less proclinate; ocellars strong; postverticals strong, erect and cruciate; verticals strong. Face pale yellow. Cheeks pale yellow. Vibrissa and fine hairs on cheek pale yellow. Occiput black. Eyes bare. Vertical diameter of eye about 2.5 times width of cheek in same axis. Palpi yellow.

**THORAX:** Bristles usually black, hairs pale yellow. Black with dark grey dusting on mesonotum, metanotum, and dorsal portions of pleura; remaining parts of pleura glossy black; scutellum brown to brownish-grey. Prescutellars small or not differentiated; 3 postsutural dorsocentrals, anterior bristle on or just posterior to transverse suture; apical and subapical marginal scutellar bristles present; scutellum with 2 to 6 long hairs; 2 humerals; 1 presutural; 2 notopleurals; 1 supraalar; 1 postalar.

Legs black, slender. Sensory area on hind tibia short and narrow, less than one-fifth length of tibia; spur on hind tibia black and strong, easily distinguished from hairs, but short and about half greatest diameter of tibia.

Wings clear; veins brown. Costal index about 1.4.

Halteres lemon-yellow.

**ABDOMEN:** Black, densely grey dusted.

**Holotype:** TAHUNA: 27.viii.1922, ♀, (*A. Tonnoir*), (U.S.N.M. and Cant. Mus.).

**Distribution:** Tahuna. (August).

**Remarks:** The types are at present in the United States National Museum and have not been examined. Sabrosky (1955) records an affinity with Oriental and East Indian species such as *L. meigerei* Sabrosky and also discusses colour variations which are mainly seen in the colour of bristles. These may be yellow but are usually black.

Separated from *L. wisei* and *L. quadriseta* by having the legs entirely black.

### ***Lasiopleura wisei* sp.n. Figs. 417, 427**

A black species dusted with grey dorsally, and with yellow legs. Body length about 2.75 mm., wing length about 2.75 mm.

#### **FEMALE**

**HEAD (Fig. 427):** Arista black; rays of pubescence about equal to diameter of basal segments. Antenna light reddish-brown; 3rd segment dark brown extensively around arista insertion. Front yellowish-brown anteriorly merging to dark brown heavily dusted with grey at vertex; ocellar triangle black with grey dusting. Three fronto-orbitals, anterior the smallest and the most proclinate, posterior two more divergent; outer verticals equal to cruciate postverticals; inner verticals strong and equal to ocellars; 1 pair of cruciate frontals at middle of front near margin; a few hairs elsewhere on front but not on triangle. Face pale yellow. Cheeks white dorsally, shining light brown ventrally and merging into the black lower occiput. Black hairs anteriorly, and light coloured hairs posteriorly, near ventral margin of cheek; vibrissa small and pale brown. Occiput black and heavily dusted with grey. Eyes bare. Vertical diameter of eye about 4.6 times width of cheek in same axis. Anterior oral margin shining black. Proboscis light brown; palpi yellow.

**THORAX:** Shining black; mesonotum, scutellum and dorsal band along pleura heavily dusted with grey and having a golden and greenish iridescence. Hairs pale yellow or pale brown; 2 dorsocentrals, anterior just posterior to transverse suture, posterior at prescutellar position; cruciate apical scutellars about twice length of mid lateral parallel scutellars; scutellum haired; strong presutural; 2 notopleurals;

1 supraalar; 1 postalar; mesopleuron bare; sternopleuron haired; 1 small propleuron; prosternum bare.

Legs yellowish-brown; apical segment of tarsi brown; hind femur and tarsus with light brown shading centrally. Hind tibia with ventral apical bristle; hind tibia with very small antero-ventral spine; sensory area small.

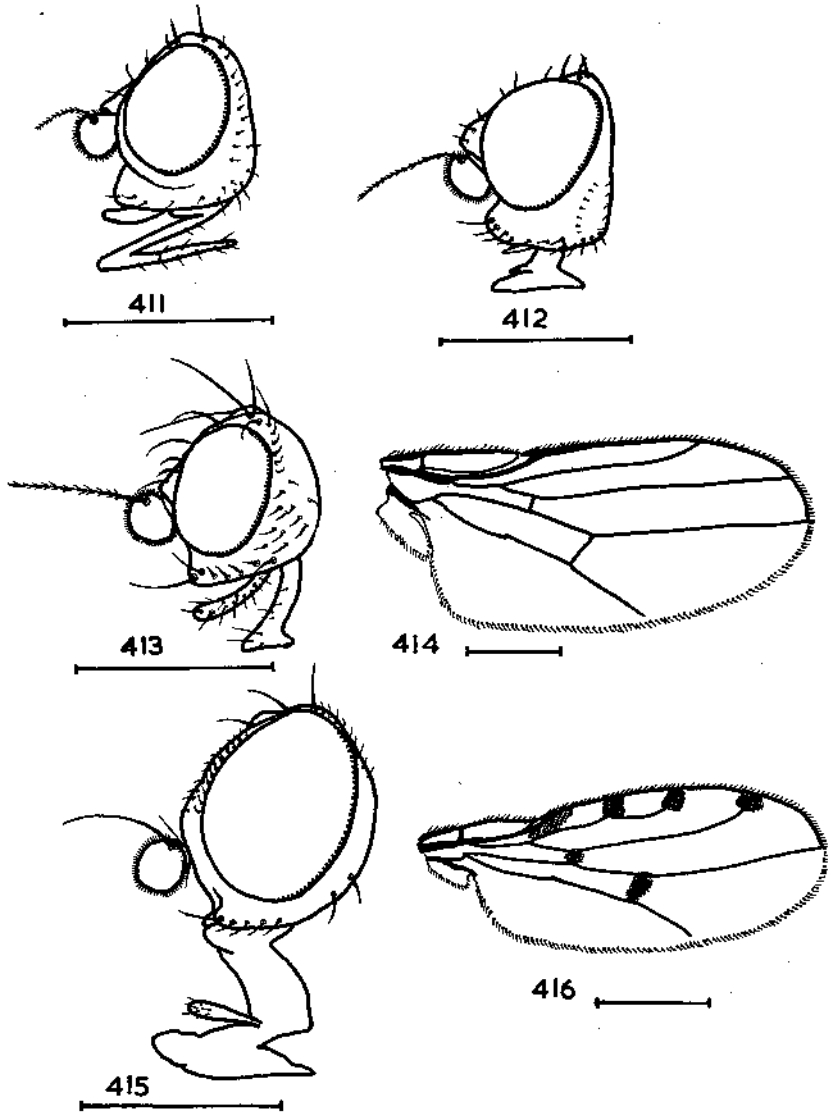


Fig. 411. Head of *Hippelates insignificans*  
 " 412. " " *Eutricimba tinctipennis*  
 " 413. " " *Lasiopleura quadriseta*  
 " 414. Wing of *Hippelates insignificans*  
 " 415. Head of *Melanum neozelandicum*  
 " 416. Wing of *Eutricimba tinctipennis*

Scale: Figs. 411-413, 415, 416, 0.5 mm.; Fig. 414, 0.25 mm.

Wings (Fig. 417) clear; veins light brown. Wing indices: costal about 1.2; 4th vein about 4.0; 4c about 2.2; 5x about 2.5.

Halteres white with light brown stalks.

ABDOMEN: Blackish-brown with grey dusting.

*Holotype*: LITTLE BARRIER ISLAND: Swept from Boulder Beach, 24.xi.1954, ♀, (K. A. J. Wise), (P.D.D.).

*Paratype*: TRIO ISLAND: 20.xii.1954, 1 ♀, (G. Ramsay), (P.D.D.).

*Material Examined*: Holotype and 1 paratype.

*Distribution*: Little Barrier Island, Trio Island. (November, December).

*Remarks*: Most readily separated from other New Zealand species by having two dorsocentrals. Similar in size and general appearance to *L. seticauda* Malloch, but *seticauda* has a broader cheek, four dorsocentrals, and the pleura are entirely and heavily grey dusted. Named for Mr K. A. J. Wise who has added many interesting Diptera to the collection of the Plant Diseases Division.

### **Lasiopleura quadriseta** sp.n. Figs. 413, 425

A black species with brown or light brown legs. Body length about 2.0 mm., wing length about 2.25 mm.

#### MALE

HEAD (Fig. 413): Arista brown; rays of pubescence equal to diameter of basal segments. Antenna light reddish-brown; 3rd segment brown about aristal insertion; 2nd segment dark brown apically. Front yellowish-brown anteriorly, merging to dark brown on posterior two-thirds, with some grey dusting; ocellar triangle shining black with light dusting of grey. Two strong ocellars and a weak third anterior to them, latter bristle more proclinate than the former two; postverticals cruciate and weak; all verticals strong; pair of cruciate frontals at middle near anterior margin of front; strong hairs elsewhere on front except triangle. Face pale yellow and light brown. Cheeks yellowish-brown bordered ventrally with narrow shining light brown band. Vibrissa strong and black; 2nd oral bristle about two-thirds length of vibrissa and directed dorsally; about 2 black hairs on cheek and a cluster of similar hairs about lower posterior angle of cheek. Occiput black with grey tomentum. Eyes bare. Vertical diameter of eye about 4.5 times width of cheek in same axis. Proboscis black; palpi yellow. Anterior margin of oral opening shining black.

THORAX: Shining black with thick grey tomentum lighter on sternopleuron. Prescutellars about half length of posterior dorsocentrals, enlarged hairs in the 2 median acrostichal lines; 4 dorsocentrals, 1 presutural, posterior the strongest, enlarged hairs in dorsocentral line anterior to bristles; convergent apical scutellars strong and about 1.3 times length of median lateral scutellars; scutellum with a few hairs dorsally; 1 presutural; 2 notopleurals; 1 supraalar; 1 postalar; mesopleuron bare; sternopleuron with long fine hairs, 1 small sternopleural; prosternum bare.

Legs light brown; femora and tibia brown in part. Mid tibia with small ventral apical; hind tibia without clearly differentiated ventral spine.

Wings (Fig. 425) clear; veins light brown. Wing indices: costal about 1.0; 4th vein about 3.8; 4c about 2.4; 5x about 3.0.

Halteres light brown.

ABDOMEN: Blackish-brown. Genital arch broad and deep, dark reddish-brown with fine tomentum and small fine hairs.

*Holotype*: LITTLE BARRIER ISLAND: Kauri Gully and tracks, 24.xi.1954, ♂, (R. A. Harrison), (P.D.D.).

*Material Examined*: Holotype.

*Distribution*: Little Barrier Island. (November).

*Remarks:* The only known New Zealand species with four dorso-centrals, one of them being presutural. Close to *L. tonnoiri* in size, but has a narrower cheek and lighter dusting on front than that species.

#### Genus EUTRICIMBA Malloch

*Eutricimba* Malloch, 1931. Rec. Cant. [N.Z.] Mus. 3 : 408.

Mesonotum with 3 deep longitudinal sulci consisting of contiguous punctures. Cross vein connecting 2nd vein and costa.

Type Species: *Eutricimba tinctipennis* Malloch

Closely related to *Tricimba* and separated from it by the presence of a cross vein between the second vein and the costa.

*Distribution:* New Zealand.

*Species:* *Eutricimba tinctipennis* Malloch

#### ***Eutricimba tinctipennis* Malloch. Figs. 412, 416**

*Eutricimba tinctipennis* Malloch, 1931. Rec. Cant. [N.Z.] Mus. 3 : 408.

A dark brown or blackish species with light grey wings having dark brown spots. All hairs and bristles light brown. Body length about 1.75 mm., wing length about 1.75 mm.

#### FEMALE

**HEAD** (Fig. 412): Arista dark brown, basal segments brown; rays of pubescence less than diameter of basal segments. Antenna light brown; 3rd segment yellowish-brown with dark brown dorsal margin; 2nd segment with minute dorsal hair. Front light yellowish-brown anteriorly merging to dark brown at vertex; ocellar triangle not clearly differentiated from rest of front; all front with thick grey dusting; ocellar area black with grey dusting. Outer verticals and postverticals strong; inner verticals and ocellars weak; ocellars erect and parallel; 2 small posterior fronto-orbitals and short hairs anteriorly on orbits, fine hairs elsewhere on front, except ocellar triangle. Face light yellow. Cheeks light brown merging posteriorly into the blackish-brown lower occiput. Small vibrissa present and small hairs posterior along cheek margin. Occiput blackish-brown with grey dusting. Eyes with a few hairs. Vertical diameter of eye about 4 times width of cheek in same axis. Proboscis brown; palpi light yellow.

**THORAX:** Mesonotum heavily dusted with grey and with fine narrow dark brown dusted, longitudinal areas, somewhat sunken, separating the grey areas, 1 dark brown area on median line, 1 commencing near inner margin of each humerus and uniting with each other posteriorly, 1 lateral to each of these latter areas and only visible posterior to transverse suture, a median anterior spot of mesonotum without dusting and shining black; scutellum heavily dusted dark brown with a lateral basal grey spot on either side; pleura shining brown, ventral margin of mesopleuron, pteropleuron, sternopleuron and hypopleuron shining black; mesopleuron, pteropleuron and sternopleuron, with grey dusting not as thick as on mesonotum. No prescutellars; 1 dorsocentral; convergent apical scutellars about twice length of preapical marginals; scutellum haired; 1 humeral; no presutural; 2 notopleurals; 1 postalar; sternopleuron with a few hairs; 1 small propleural hair.

Legs yellowish-brown; fore coxa, trochanter, and femur pale yellow; mid and hind coxae blackish-brown on basal halves; all femora and tibiae with brown band at middle, all tarsi light brown. Mid tibia with small ventral apical.

Wings (Fig. 416) light grey with brown shading; veins brown. Cross vein between 2nd vein and costa. Wing indices: costal about 1.6; 4th vein about 2.7; 4c about 1.1; 5x about 2.2.

Halteres light yellow.

**ABDOMEN:** Shining brown with light covering of grey dust.

*Holotype:* OHAKUNE: 8.iii.1923, ♀, (*A. L. Tonnoir*), (U.S.N.M. and Cant. Mus.).

*Material Examined:* 1 ♀.

*New Records:* WAITAKERE RANGES: Nihotupu, swept off foliage, 17.ii.1954, 1 ♀, (R. A. Harrison), (P.D.D.).

*Distribution:* Waitakere Ranges. (February, March).

*Remarks:* The holotype has an additional cross vein between the second and third veins in one wing and this would appear to be an aberration as Malloch (1931b) suggests. The specimen recorded above has been compared by C. W. Sabrosky with the holotype which is at present in the United States National Museum.

### Genus TRICIMBA Lioy

*Tricimba* Lioy, 1864. Atti Ist. veneto (3) 9 : 1125.

*Notonaulax* Becker, 1903. Mitt. zool. Mus. Berl. 2 : 153.

*Echimba* Duda, 1935. Stylops 4 : 27.

*Syphonerina* Seguy, 1938. Miss. sci. Omo 4 : (Zool. fasc. 39) : 361.

Arista slender. Ocellar triangle smooth. Postverticals erect and usually convergent; ocellars erect and convergent. Carina absent or low, or narrow and sharply ridged. Mesonotum with 3 deeply impressed longitudinal sulci of contiguous punctures; dorsal surface of scutellum flattened; mesopleuron bare. Wings without cross vein between 2nd vein and costa. Sensory area on hind tibia distinct.

Type Species: *Tricimba lineola* (Fallén)

Recognised by the three sulci on the mesonotum and separated from *Eutricimba* by the absence of a cross vein between the 2nd vein and the costa, and from *Apteroscinis* by the presence of wings.

*Distribution:* North America, Australia, New Zealand.

*Species Occurring in New Zealand:*

*Tricimba flaviseta* Malloch

*T. fuscipes* Malloch

#### KEY TO SPECIES OF TRICIMBA IN NEW ZEALAND

Legs yellow, femora and tibia dark brown or brown ventrally; wings clouded at apex of 1st vein ..... **flaviseta**  
Legs dark brown; wing without cloud at apex of 1st vein ..... **fuscipes**

### *Tricimba flaviseta* Malloch

*Tricimba flaviseta* Malloch, 1931. Rec. Cant. [N.Z.] Mus. 3 : 409.

A dark brown or black species with clear wings and only one shaded spot on wing. Body length about 2.0 mm. Generally similar colouration to *Eutricimba tinctipennis* Malloch. Hairs and bristles pale yellow.

#### MALE AND FEMALE

HEAD: Third antennal segment almost entirely light reddish-brown.

THORAX: Scutellum irregularly rounded at apex. Two pairs of apical scutellar bristles; scutellum haired; 2 fairly strong notopleurals.

Legs yellow; femora and tibiae dark brown centrally, these areas in males smaller than in females.

Wings clear and with a small clouded area about apex of 1st vein.

*Holotype:* NELSON: Maitai Valley, 17.iii.1922, ♂, (A. Tonnoir), (U.S.N.M. and Cant. Mus.).

*Distribution:* Nelson, Waiho. (January, March).

*Remarks:* The types are at present in the United States National Museum and have not been examined.

### **Tricimba fuscipes** Malloch

*Tricimba fuscipes* Malloch, 1931. Rec. Cant. [N.Z.] Mus.  
3 : 410.

Similar to *T. flavisetata* Malloch. Body length about 1.75 mm.

#### FEMALE

**HEAD:** Third antennal segment black-brown, except basally. Palpi dark.

**THORAX:** Legs dark brown with apices of femora and all tarsi slightly yellow.

Wings uniformly greyish-hyaline; without dark cloud at apex of 1st vein.

*Holotype:* NELSON: Maitai Valley. 16.iii.1922, ♀, (*A. Tonnoir*), (U.S.N.M. and Cant. Mus.).

*Distribution:* Nelson, Christchurch. (February, March).

*Remarks:* The types are in the United States National Museum and have not been examined.

### Genus GAURAX Loew

*Gaurax* Loew, 1863. Berl. ent. Z. 7 : 35.

*Botanobia* Lioy, 1866. Atti Ist. veneto (3) 9 : 1125.

*Neogaurax* Malloch, 1914. Canad. Ent. 46 : 119.

Arista pubescent. Third antennal segment reniform, distinctly broader than long. Ocellar bristles erect and cruciate. Eyes haired. Frontal triangle smooth, not pitted. No carina. Postverticals erect and cruciate. Scutellum short and broadly rounded in outline. Apical scutellars usually widely separated. Mesopleuron bare. Wings not narrowed, anal lobe distinct; costal index less than 2.0.

Type Species: *Gaurax festivus* Loew

The short reniform third antennal segment is the most important character which separates *Gaurax* from other genera of Oscinellinae in New Zealand.

*Distribution:* World wide.

*Species Occurring in New Zealand:*

*Gaurax excepta* (Malloch)

*G. flavoapicalis* (Malloch)

*G. mesopleuralis* (Becker)

*G. neozealandica* (Malloch)

The assignment of these four species to the genus *Gaurax* is tentative only. They key to *Lioscinella* Duda, 1929, in the key to Australian genera given by Malloch (1941), but *Gaurax* appears to be a more correct designation. As Sabrosky (1955) suggests, satisfactory generic assignments of *Lioscinella* and closely allied genera may not be possible until these genera have been studied on a world-wide basis.

#### KEY TO SPECIES OF GAURAX IN NEW ZEALAND

- |   |                      |
|---|----------------------|
| 1 Thorax entirely black .....                                 | 2                    |
| Thorax yellow and black .....                                 | 3                    |
| 2 Palpi yellow .....  | <i>flavoapicalis</i> |
| Palpi brown or dark brown .....                               | <i>neozealandica</i> |
| 3 Ocellar triangle mostly black .....                         | <i>mesopleuralis</i> |
| Ocellar triangle yellow; only area between ocelli black ..... | <i>excepta</i>       |

**Gaurax flavoapicalis** (Malloch). (*New Combination*)

*Oscinosoma flavoapicalis* Malloch, 1931. Rec. Cant. [N.Z.] Mus. 3 : 411.

*Oscinosoma diversipes* Malloch, 1931. Rec. Cant. [N.Z.] Mus. 3 : 414.

*Lioscinella nigropolita* Malloch, 1941. Proc. Linn. Soc. N.S.W. 46 : 47.

*Lioscinella flavoapicalis* (Malloch): Sabrosky, 1955. Proc. Linn. Soc. N.S.W. 79 : 192.

A shining black or blackish-brown species. Body length about 2.5 mm., wing length about 2.5 mm.

MALE AND FEMALE

**HEAD:** Arista shining black axis; rays of pubescence about equal to diameter of basal segments. Antenna yellowish-brown; 3rd segment black or blackish-brown about arisal insertion; 2nd segment with long fine dorsal bristle and a few small dorsal black hairs. Front light yellowish-brown anteriorly, merging to black at vertex; light reddish-brown spot about outer vertical bristle; ocellar triangle bare, extending almost across vertex and about three-quarters distance to anterior margin of front, shining black on posterior three-quarters, shining yellowish-brown anteriorly. Verticals and postverticals strong; ocellars weak and cruciate; reclinate hairs on orbits, the posterior the strongest; inwardly directed hairs around ocellar triangle margin and similar hairs on rest of front. Face yellowish-brown, dark brown oral margin. Cheeks shining light brown anteriorly, shining blackish-brown posteriorly. Row of hairs along ventral cheek margin, the anterior one strong. Occiput blackish-brown. Eyes strongly haired. Vertical diameter of eye about 4 times width of cheek in same axis. Proboscis dark brown; palpi light yellow and covered with fine white hairs.

**THORAX:** Shining black or blackish-brown. Hairs on mesonotum long, fine, light coloured, and arranged in longitudinal rows; no prescutellars; 1 dorsocentral; convergent apical scutellars about 1.5 times mid marginal scutellar bristles; disc and margin of scutellum with strong hairs; 1 humeral; no presutural; 3 notopleurals; 2 postalaris; sternopleuron with long fine hairs, no bristles; 1 small propleural.

Legs yellowish-brown; all coxae and all femora and tibiae except apices and bases, shining blackish-brown; apical segments of tarsi brown. Mid tibia with ventral apical bristle.

Wings clear; veins brown. Wing indices: costal about 1.7; 4th vein about 3.2; 4c about 1.4; 5x about 3.1.

Halteres light brown with brown stalk.

**ABDOMEN:** Shining blackish-brown or brown.

*Holotype:* WANGANUI: no date, ♀, (M. Watt), (U.S.N.M.).

*Material Examined:* 24 ♂ and 28 ♀.

*New Records:* BAY OF ISLANDS: Paihia, 1.i.1953, 1 ♂, (K. P. Lamb). AUCKLAND: Avondale, 20.viii.1950, 1 ♂, (R. A. Harrison); Green Lane, -viii.1949, 1 ♀, (K. P. Lamb); Owairaka, -vi.1940, 4 ♂, 6 ♀, (D. Spiller); bred ex passion vine, 24.xi.1942, 4 ♂, 2 ♀, (W. Cottier); ex maize, 17.vi.1946, 2 ♂, 3 ♀, (Anon.); Browns Bay, 30.iv.1948, 1 ♀, (R. A. Harrison). PUKEKOHE: swept off carrots, 18.viii.1952, 3 ♀, (R. A. Harrison). WAIUKU: swept off carrots, 29.ix.1952, 1 ♀, (R. A. Harrison). PALMERSTON NORTH: swedes 16.x.1930, 1 ♂ : bred ex rotting swedes, -iv.1931, 6 ♂, 5 ♀; 25.iii.1931, 2 ♂, 2 ♀; -iv.1931, 1 ♀; -xi.1930, 1 ♀, (W. Cottier). DANNEVIRKE: bred ex rotting swede, 16.iii.1940, 3 ♂, 2 ♀, (Anon.), (P.D.D.).

*Distribution:* Australia. New Zealand: Paihia, Auckland, Pukekohe, Waiuku, Palmerston North, Wanganui, Dannevirke, Nelson. (June to November, January, March, April).



*Remarks:* The Palmerston North record above (—iv.1931) is similar to the records given for paratype females by Malloch (1941) for *L. nigropolita*. Sabrosky (1955) comments on Malloch's misinterpretation of Palmerston North, New Zealand, for Northern Territory, Darwin, (Palmerston), Australia. Specimens recorded above have been compared with the holotype in the United States National Museum by C. W. Sabrosky.

**Gaurax neozealandica** (Malloch). (*New Combination*). Figs. 418, 429

*Oscinosoma neozealandica* Malloch, 1931. Rec. Cant. [N.Z.]

Mus. 3 : 414.

A shining black and blackish-brown species with light yellow and blackish-brown legs. Body length about 1.75 mm., wing length about 2.0 mm.

#### MALE AND FEMALE

**HEAD** (Fig. 429): Arista dark brown; rays of pubescence longer than diameter of basal segments. Antenna light brown; 3rd segment dark brown on apical half; 2nd segment with long fine dorsal bristle and few very short black apical hairs. Front yellowish-brown anterior to ocellar triangle, black or blackish-brown elsewhere; ocellar triangle all shining black. Verticals and postverticals long and thin; ocellars short and cruciate; row of long reclinate hairs on orbits, the posterior one the strongest; lateral margins of ocellar triangle with long inwardly directed hairs; few long hairs elsewhere on front. Face light brown. Cheeks light brown with shining dark brown ventral margin. Long hairs on ventral cheek margin the anterior one very strong. Occiput black with some dusting. Eyes strongly haired. Vertical diameter of eye about 10 times width of cheek in same axis. Proboscis dark brown; palpi brown or dark brown.

**THORAX:** Shining black or blackish-brown. Long fine light brown hairs on mesonotum arranged into a longitudinal herringbone pattern; no prescutellars; 1 weak dorsocentral; apical scutellars cruciate and about 1.3 times length of mid marginal scutellars; scutellum with long fine hairs on disc and margin; 1 fine humeral; no presutural; 3 fine notopleurals; 1 long fine and 1 short postalar; sternopleuron with long fine hairs, no sternopleural bristles; 1 minute propleural hair.

Legs light yellow; males with coxae, fore and mid femora except at base and apex, hind femur except extreme base and apex, and basal half of hind tibia except base, blackish-brown; females similar to males except fore coxa and femur light yellow.

**Wings** (Fig. 418) clear; veins brown. Wing indices: costal about 1.6; 4th vein about 3.4; 4c about 1.5; 5x about 3.0.

Halteres light yellow with light brown stalk.

**ABDOMEN:** Black or dark reddish-brown, with light dusting.

*Holotype:* NELSON: —.1922, ♂, (*A. Tonnoir*), (U.S.N.M. and Cant. Mus.).

*Material Examined:* 19 ♂ and 33 ♀.

*New Records:* LITTLE BARRIER ISLAND: 22.xi.1954, 1 ♂, 4 ♀, (*R. A. Harrison*). WAITAKERE RANGES: Nihotupu, swept off foliage, 17.ii.1954, 1 ♂, 3 ♀; 23.ii.1955, 1 ♂, 2 ♀; 9.iii.1955, 4 ♂, (*R. A. Harrison*): Oratia, 4.xii.1949, 1 ♀; 8.vii.1950, 1 ♀; 9.xi.1952, 1 ♀, (*R. A. Harrison*): 9–26.ii.1950, 4 ♂, 6 ♀; —.iii.1950, 1 ♀, (*M. Knight*): Titirangi, ex light trap, 28.xi.1952, 1 ♂, 1 ♀; 4.xii.1952, 1 ♂; 22.xii.1952, 1 ♀; 28.xii.1952, 1 ♀, (*C. R. Thomas*). AUCKLAND: Avondale, 6.iii.1949, 1 ♀; 12.iii.1949, 1 ♂, 1 ♀; 20.viii.1950, 1 ♀; Browns Bay, —.ix.1949, 1 ♀; 23.vii.1950, 1 ♀; 12.viii.1950, 2 ♂, (*R. A. Harrison*): Mt. Eden, indoors, 7.iv.1947, 1 ♀; 2.iii.1948, 1 ♂, (*R. A. Harrison*): Mt. Albert, 16.x.1948, 1 ♀, (*W. Barnard*): Remuera, 21.v.1949, 1 ♀,

(S. A. Ramsay): Green Lane, 28.iii.1949, 1 ♂; 26.vi.1949, 1 ♂, 1 ♀; 31.vii.1949, 1 ♀, (K. P. Lamb), (P.D.D.). STEPHENS ISLAND: 14-28.i.1933, 1 ♀, (E. S. Gourlay), (Cawt. Inst.).

*Distribution:* Little Barrier Island, Waitakere Ranges, Auckland, Wanganui, Stephens Island, Nelson, Aniseed Valley, Waiho, Kaikoura. (All the year).

*Remarks:* Specimens recorded above have been compared with the holotype in the United States National Museum by C. W. Sabrosky.

### **Gaurax mesopleuralis** (Becker). (*New Combination*)

*Oscinella mesopleuralis* Becker, 1911. Ann. hist.-nat. Mus. hung. 9: 150.

*Lioscinella mesopleuralis* (Becker): Malloch, 1941. Proc. Linn. Soc. N.S.W. 66: 53.

A shining black and yellow species. Body length about 2.25 mm., wing length about 2.25 mm.

#### MALE AND FEMALE

**HEAD:** Arista black; rays of pubescence about equal to diameter of basal segments. Antenna light reddish-brown, 3rd segment reniform, dark brown about arisal insertion; 2nd segment with 1 long fine dorsal bristle and long hairs elsewhere on apical margin. Front yellow merging to yellowish-brown at vertex; ocellar triangle glossy blackish-brown margined with yellow and a large yellowish-brown area on either side at vertex. Outer verticals and postverticals long but fine; inner verticals and ocellars weak; long hairs on orbits, posterior one the strongest; few hairs on front apart from triangle, a pair at middle near anterior margin of front convergent and strong. Face yellowish-white. Cheeks yellowish-white. Fine hairs on ventral cheek margin and a weak vibrissa. Occiput dorsally and laterally shining dark brown. Eyes thickly haired. Vertical diameter of eye about 10 times width of cheek in same axis. Proboscis light brown; palpi yellow.

**THORAX:** Mesonotum shining black, bordered broadly with yellowish-brown anterior to transverse suture and light brown posteriorly, narrow light brown area penetrating the black area on line of transverse suture; scutellum light brown, yellowish-white at apex; pleura shining yellowish-brown with black areas on ventral mesopleuron and pteropleuron; post-scutellum black with a light dusting. One dorsocentral; apical scutellars parallel and about 1.5 times length of mid lateral parallel bristles; scutellum haired; 1 humeral; 3 notopleurals; 1 postalar; sternopleuron haired and with a small postero-dorsal bristle; 1 small propleural; prosternum bare.

Legs yellowish-brown. Mid tibia with light coloured ventral apical bristle.

Wings clear; veins light brown. Wing indices: costal about 1.6; 4th vein about 3.6; 4c about 1.5; 5x about 3.6.

Halteres pale yellow with light brown stalk.

**ABDOMEN:** Basal two segments shining light brown, other segments shining brown or dark brown; 2nd tergite with small brown area on anterior margin near each lateral margin.

*Holotype:* Australia.

*Material Examined:* 14 ♂ and 23 ♀.

*New Records:* KAITAIA: bred ex diseased turnips, -ii.1953, 1 ♂, 1 ♀, (Dep. Agric.). BAY OF ISLANDS: Paihia, 1.i.1953, 1 ♀, (K. P. Lamb). AUCKLAND: Avondale, 26.viii.1940, 1 ♀, (D. Spiller): 20.viii.1950, 6 ♂, 7 ♀, (R. A. Harrison): Green Lane, -iii.1949, 1 ♂, 1 ♀; 11.vi.1949, 1 ♀; 26.vi.1949, 1 ♀, (K. P. Lamb): Owairaka, swept off weeds, 16.ix.1952, 3 ♂, 4 ♀; 21.ix.1954, 1 ♂, 1 ♀, (R. A. Harrison): Mangere, 30.vii.1950, 1 ♀; 25.iii.1951, 1 ♀, (K. P. Lamb): Sandringham, on potato foliage, 25.x.1941, 2 ♂, (G. Chamberlain): Remuera,

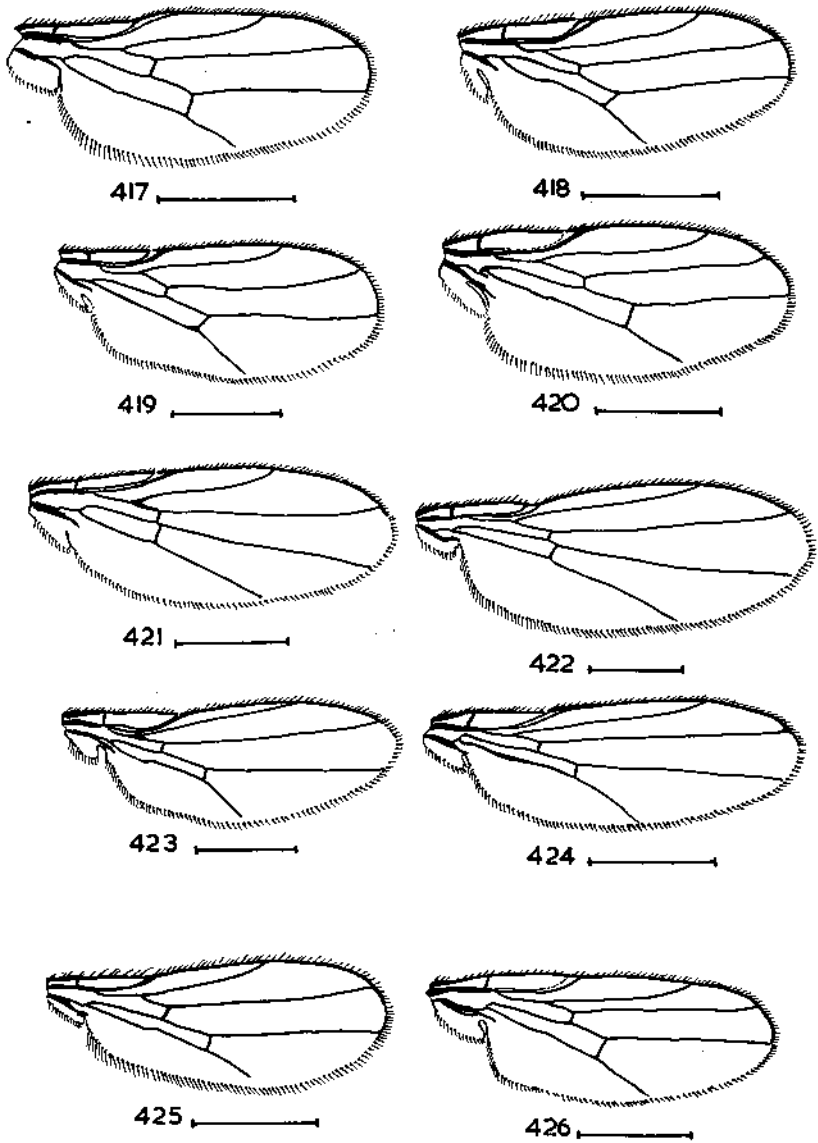


Fig. 417. Wing of *Lasiopleura wisei*  
 " 418. " " *Gaurax neozelandica*  
 " 419. " " *Oscinosoma huttoni*  
 " 420. " " *O. badia*  
 " 421. " " *Diptotoxa orbitalis*  
 " 422. " " *D. neozelandica*  
 " 423. " " *Melanum neozelandicum*  
 " 424. " " *Chlorops occipitalis*  
 " 425. " " *Lasiopleura quadriseta*  
 " 426. " " *Gaurax excepta*

Scale: Figs. 417, 418, 420, 421, 424-426, 1.0 mm.; Figs. 419, 422, 423, 0.5 mm.

21.v.1949, 2 ♀, (*S. Rumsey*): Browns Bay, 14.i.1950, 1 ♀, (*R. A. Harrison*), (P.D.D.).

*Distribution*: Australia. New Zealand: Kaitaia, Bay of Islands, Auckland. (July to October, January to March, May, June).

*Remarks*: Compared with material from Australia by C. W. Sabrosky of the United States National Museum. Regarded as an immigrant species from Australia and here recorded from New Zealand for the first time.

***Gaurax excepta* (Malloch). (*New Combination*). Figs. 426, 428**

*Lioscinella excepta* Malloch, 1941. Proc. Linn. Soc. N.S.W.  
66: 50.

A shining light reddish-brown and yellowish-brown species. Body length about 3.0 mm., wing length about 3.0 mm.

FEMALE

**HEAD** (Fig. 428): Arista dark reddish-brown; rays of pubescence less than diameter of basal segment. Antenna light brown; 3rd segment reniform, brown about arisal insertion; 2nd segment with fine apical dorsal bristle and small hairs elsewhere. Front yellowish-brown; ocellar triangle shining yellowish-brown, reddish-brown mostly anterior to ocelli; ocellar area dark reddish-brown. Four small bristles on posterior half of fronto-orbits, all reclinate; ocellars small, erect and cruciate; outer verticals and cruciate postverticals stronger than ocellars; inner verticals weak; fine long hairs on front except triangle, those bordering triangle directed inwards. Face yellowish-brown. Cheeks shining yellow. Vibrissa short; fine pale coloured hairs along ventral cheek margin, those at posterior corner longer. Occiput yellowish-brown; brown about foramen and in a wide band extending dorsally on each side towards vertical bristles. Eyes haired. Vertical diameter of eye about 3 times width of cheek in same axis. Proboscis brown; palpi strong, rod shaped, and yellowish-brown.

**THORAX**: Shining light reddish-brown; mesonotum yellow on lateral margin anterior to transverse suture and including posterior of humerus, and with 6 reddish-brown longitudinal vittae, 1 on either side of median line, 1 lateral to dorsocentral line and a short postsutural one dorsal to wing base; pleura reddish-brown on ventral mesopleuron, pteropleuron and sternopleuron, and posterior of hypopleuron; scutellum yellow on apical two-thirds, elsewhere dark reddish-brown. No prescutellars; 1 dorsocentral; cruciate apical scutellars about 1.5 times length of preapical marginal scutellars; scutellum haired; 1 humeral; no presutural; 3 notopleurals; 1 supraalar; 1 weak postalar; sternopleuron with pale fine hairs; 1 small propleural hair; prosternum bare.

Legs light reddish-brown; hind legs longer than others; hind femur distinctly thicker than other femora, hind tibia curved. Mid tibia with ventral apical bristle.

**Wings** (Fig. 426) clear; veins brown. Wing indices: costal about 1.6; 4th vein about 4.0; 4c about 1.7; 5x about 2.7.

Halteres pale yellow with light brown stalk.

**ABDOMEN**: Tergites reddish-brown with yellowish-brown anterior and posterior margins, dark area often extending to anterior margin in middle; apical tergites all yellow.

*Holotype*: Australia.

*Material Examined*: 2 ♀.

*New Records*: AUCKLAND: Hobson Bay, swept off Mangroves, 2.viii.1952, 1 ♀, (*K. A. J. Wise*), (P.D.D.). OHAKUNE: 1923, 1 ♀, (*T. R. Harris*), (Cawt. Inst.).

*Distribution*: Australia. New Zealand: Auckland, Ohakune. (August).

*Remarks*: Specimens recorded above have been compared with types in the United States National Museum by C. W. Sabrosky. Recorded here for the first time from New Zealand.

## Genus OSCINOSOMA Lioy

*Oscinosoma* Lioy, 1864. Atti. Ist. veneto (3) 9 : 1126.

Third antennal segment not reniform but disc shaped and about as long as wide. Ocellar bristles erect and convergent. Mesonotum without deeply impressed sulci and only rarely with slight shallow depressed areas. Hind tibia without a curved apical ventral bristle.

Type Species: *Oscinosoma cognata* (Meigen)

The important distinguishing character is the absence of deep sulci on the mesonotum. Separated from *Gaurax* by having a circular disc-shaped third antennal segment.

*Distribution*: World wide.

*Species Occurring in New Zealand*:

*Oscinosoma badia* (Hutton)

*O. huttoni* Malloch

*O. speighti* Malloch

### KEY TO SPECIES OF OSCINOSOMA IN NEW ZEALAND

- |   |                 |
|---|-----------------|
| 1 Mesonotum yellow with 3 brown longitudinal vittae ..... | <b>huttoni</b>  |
| Mesonotum black .....                                     | 2               |
| 2 Mesonotum without shining vittae .....                  | <b>badia</b>    |
| Mesonotum with 4 broad shining vittae .....               | <b>speighti</b> |

### *Oscinosoma huttoni* Malloch. Figs. 419, 430

*Oscinosoma huttoni* Malloch, 1931. Rec. Cant. [N.Z.] Mus.  
3 : 411.

A yellowish-brown species. Body length about 1.75 mm., wing length about 1.5 mm.

#### MALE AND FEMALE

**HEAD** (Fig. 430): Arista dark brown, short main axis thick especially at base, rays of pubescence minute and much less than diameter of basal segments. Antenna yellowish-brown; 3rd segment brown on dorsal margin; 2nd segment with a small dorsal bristle and minute apical hairs. Front yellowish-brown; ocellar area blackish-brown. Outer verticals strong, other bristles weak; row of hairs on orbits; the posterior one the strongest; small light coloured hairs on most of front. Face yellowish-brown. Cheeks yellowish-brown. Light brown hairs on ventral half of cheek. Occiput yellowish-brown with a broad brown stripe from vertical bristles. Eyes with very short hairs. Vertical diameter of eye about 2.5 times width of cheek in same axis. Proboscis brown; palpi light yellow with short fine hairs.

**THORAX**: Light brown; mesonotum with 3 wide brown to dark blackish-brown longitudinal vittae narrowed posteriorly, 1 median and 1 on dorsocentral line, the area between these vittae suken; scutellum flat; mesopleuron brown ventrally; pteropleuron brown anteriorly; sternopleuron brown on ventral half. No pre-scutellars; 1 strong dorsocentral; 1 small bristle on anterior margin of mesonotum just median to humeral margin; apical scutellars strong and cruciate, 2 weak bristles anterior to each apical on margin of scutellum; hairs on disc of scutellum; 1 humeral; no presutural; 3 notopleurals; 2 postalars; mesopleuron bare; sternopleuron with few light coloured hairs; 1 small propleural; prosternum bare.

Legs yellowish-brown; apical segments of tarsi light brown.

Wings (Fig. 419) clear; veins light brown. Wing indices: costal about 1.6; 4th vein about 3.7; 4c about 1.7; 5x about 2.6.

Halteres yellowish-brown.

**ABDOMEN**: Light brown.

*Holotype*: NELSON: 18.xii.1921, ♂, (*A. Tonnoir*), (U.S.N.M. and Cant. Mus.).

*Material Examined*: 3 ♂ and 16 ♀.

*New Records*: WAITAKERE RANGES: 9-25.ii.1950, 5 ♀, (*M. Knight*): Titirangi, 26.iii.1950, 1 ♂, (*R. A. Harrison*): Titirangi, ex light trap, 16.i.1953, 1 ♂; 8.ii.1953, 1 ♀, (*C. R. Thomas*): Dreamlands, in house, 27.xii.1950, 1 ♀, (*K. P. Lamb*), (P.D.D.). WELLINGTON: Kaiwārā Gorge, [Ngaio Gorge, Kaiwharawhara], 16.xi.1932, 1 ♂, 1 ♀, (*A. Plank*): Terawhiti, on *Aciphylla squarrosa*, 4 ♀, (*J. A. Healy*), (Dom. Mus.). OTAGO: McKerrow Hut, 23.i.1955, 4 ♀, (*R. R. Forster*), (Cant. Mus.).

*Distribution*: Waitakere Ranges, Wanganui, Wellington, Nelson, McKerrow. (November to March).

*Remarks*: Specimens recorded above have been compared with the holotype at present in the United States National Museum by C. W. Sabrosky. Separated from *O. badia* by the distinct yellow colour of the thorax.

### ***Oscinosoma badia* (Hutton). Fig. 420**

*Oscinia badia* Hutton, 1901. Trans. N.Z. Inst. 33 : 92.

*Oscinosoma badia* (Hutton): Malloch, 1931. Rec. Cant. [N.Z.] Mus. 3 : 412.

A dull black species. Body length about 2.75 mm., wing length about 2.75 mm.

#### MALE AND FEMALE

**HEAD**: Arista brown, basal segments thick; rays of pubescence about two-thirds diameter of basal segment. Antenna light reddish-yellow; 3rd segment brown dorsally and apically; 2nd segment with 1 weak dorsal bristle and small apical hairs; basal segment minute. Front yellowish-brown anteriorly, merging to dark brown at vertex; ocellar triangle large, extending almost width of vertex and two-thirds way to anterior margin of front, blackish-brown not shining. Ocellars weak; verticals and postverticals strong; row of strong reclinate hairs on orbits, the posterior one the strongest and anterior the weakest; black hairs elsewhere on front except triangle, with those on triangle border directed inwards. Face white at middle, yellowish-white posteriorly and ventrally. Cheeks yellowish-brown anteriorly, merging to black at lower occiput. Hairs on ventral half of cheek, the anterior one strong. Occiput black. Eyes thickly haired. Vertical diameter of eye about 5 or 6 times width of cheek in same axis. Proboscis dark brown; palpi brown with fine hairs.

**THORAX**: Black; mesonotum, scutellum and a dorsal band along pleura dusted with blackish-grey; ventral pleura not dusted nor glossy. No prescutellars; 1 dorsocentral; cruciate apical scutellars about 1.25 times length of preapicals; strong hairs on margin of scutellum and short hairs on disc; 1 humeral; no presutural; 3 notopleurals; 2 postalars; sternopleuron with light hairs dorsally, no bristle; small propleural.

Legs dark reddish or blackish-brown; apices of all femora, bases and apices of tibiae mostly yellowish-brown with only a trace of dark brown at the middle, all tarsi yellowish-brown; the dark areas may be much reduced to give legs general yellow appearance.

Wings (Fig. 420) clear; veins light brown. Wing indices: costal about 1.6; 4th vein about 3.2; 4c about 1.4; 5x about 2.3.

Halteres yellowish-brown, brown stalk.

**ABDOMEN**: Shining black with only a light dusting.

*Holotype*: QUEENSTOWN: no date, ♀, (*F. W. Hutton*), (Cant. Mus.).

*Material Examined*: Holotype, 1 ♂, and 7 ♀.

*New Records:* WAITAKERE RANGES: Titirangi, 24.iii.1950, 1 ♀, (R. A. Harrison); ex light trap, 19.xii.1952, 2 ♀; 30.i.1953, 1 ♀; 19.ii.1953, 1 ♀; 14.vii.1953, 1 ♀, (C. R. Thomas); 29.ii.1950, 1 ♂, (M. Knight), (P.D.D.). TARARUA RANGES: Fields Hut, 8.xii.1952, 1 ♀, (B. A. Holloway), (Dom. Mus.).

*Distribution:* Waitakere Ranges, Tararua Ranges, Nelson, Dun Mt., Mt. Arthur, Otira, Christchurch, Queenstown. (July, December to March).

*Remarks:* Readily separated from *O. huttoni* by the black thorax.

### **Oscinosoma speighti** Malloch

*Oscinosoma speighti* Malloch, 1931. Rec. Cant. [N.Z.] Mus.  
3 : 413.

A dull black species. Body length about 2.5–3.0 mm.

#### FEMALE

**HEAD:** Similar to *O. badia*.

**THORAX:** Mesonotum with 4 shining black vittae showing through the grey dusting of the mesonotum, the central pair shortened behind; disc of scutellum distinctly shining.

**Legs:** Mid tibia usually entirely yellow; hind tibia usually with faint dark central mark. Hind femur thicker than *O. badia*.

*Holotype:* NELSON: Aniseed Valley, 22.iii.1922, ♀, (A. Tonnoir), (U.S.N.M. and Cant. Mus.).

*Distribution:* Nelson, Christchurch. (February, March).

*Remarks:* The holotype has been examined by C. W. Sabrosky who considers it congeneric with *O. badia*. Specimens have not been seen and the description above is from Malloch (1931b).

### Subfamily CHLOROPINAE

Usually yellow or reddish-yellow and black spotted or striped species. Costa extending to third vein or short distance beyond. Hind tibia normally without sensory area.

Readily separated from Oscinellinae by the costa ending at or slightly beyond the third vein.

*Genera Occurring in New Zealand:*

*Chlorops* Meigen  
*Diplotoxa* Loew  
*Melanum* Becker

Genera occurring in New Zealand are widespread but the species are endemic.

#### KEY TO GENERA OF CHLOROPINAE IN NEW ZEALAND

- 1 Cross veins very close together ..... *DIPLOTOXA* (p. 355)
- 1 Cross veins well separated ..... 2
- 2 Vibrissal angle distinct, sharp and slightly produced. Proboscis slender and geniculate ..... *MELANUM* (p. 358)
- 2 Vibrissal angle not distinct, sharp or produced. Proboscis stout and not geniculate ..... *CHLOROPS* (p. 360)

## Genus DIPLOTOXA Loew

*Diplotoxa* Loew, 1863. Berl. ent. Z. 7 : 54.

*Anthobia* Liroy, 1864. Atti. Ist. veneto (3) 9 : 1124.

Wings clear, without pattern. Third vein noticeably directed anteriorly; cross veins very close together, separated by a length less than that of posterior cross vein.

Type Species: *Diplotoxa versicolor* Loew

Readily recognised and separated from other genera in New Zealand by the cross veins being close together.

*Distribution*: Europe, North America, Australia, New Zealand.

*Species Occurring in New Zealand*:

*Diplotoxa anorbitalis* Malloch

*D. lineata* Malloch

*D. neozelandica* sp.n.

*D. orbitalis* Malloch

### KEY TO SPECIES OF DIPLOTOXA IN NEW ZEALAND

- 1 Strong hairs on frontal orbits. Cheeks with hairs on ventral half ..... 2  
No strong hairs on frontal orbits. Cheeks without hairs ..... 3
- 2 Legs all yellowish-brown ..... **orbitalis**  
Femora and tibiae mostly dark brown ..... **neozelandica**
- 3 Frontal triangle blackish-brown, highly polished, with a longitudinal shallow and rather wide sulcus extending from anterior ocellus to anterior margin, and no distinct impressed lines on either side ... **anorbitalis**  
Frontal triangle brown to blackish-brown, with a narrow and rather deep longitudinal central sulcus anteriorly and 3 or 4 very fine impressed lines or furrows on each side which run parallel to the lateral margins ..... **lineata**

### *Diplotoxa anorbitalis* Malloch

*Diplotoxa anorbitalis* Malloch, 1931. Rec. Cant. [N.Z.] Mus. 3 : 416.

A black and yellow species. Body length about 3.0 mm.

#### FEMALE

**HEAD**: Arista black; pubescent, rays small. Antenna black. Front yellowish-brown; ocellar triangle shining brown or blackish-brown; produced narrowly anteriorly, almost reaching anterior margin of front and with a central groove and very weak grooves parallel to lateral margin of triangle; at vertex half head width; lateral margins convergent anteriorly. Frontal bristles small. Cheeks bare. Vertical diameter of eye about four times width of cheek in same axis. Anterior margin of oral opening black. Palpi yellow.

**THORAX**: Yellowish-brown; mesonotum with 3 or 5 black vittae (outer pair may be fused with thin inner adjacent vittae); scutellum black on sides sometimes broadly so; humerus with small black area; black areas below anterior spiracle and, on mesopleuron, pteropleuron, sternopleuron and hypopleuron; hairs and bristles black; mesonotum grey dusted. Scutellum haired and with 1 or 2 pairs of stronger apical hairs; no humeral bristle; notopleurals short, anterior one very small.

Legs yellow; fore coxa brown basally; all femora black except at apices; hind tibia black centrally; fore and mid tarsi with apical, and hind tarsus with 2 apical segments, brown. Hind femur thicker than other two.

Wings greyish hyaline; veins brown. Outer cross vein rudimentary and about its own length from inner cross vein. Costal index just over 1.0.

Halteres yellow.

**ABDOMEN**: Tergites broadly brown basally.

*Holotype*: WAIHO: 18.i.1922, ♀, (*A. Tonnoir*), (U.S.N.M. and Cant. Mus.).



*Distribution:* Waiho. (January).

*Remarks:* The holotype is at present in the United States National Museum and has not been examined.

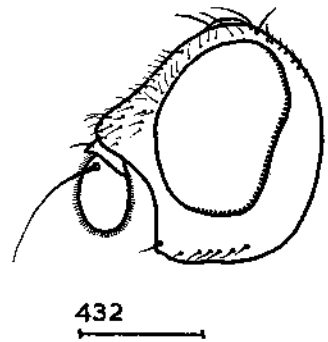
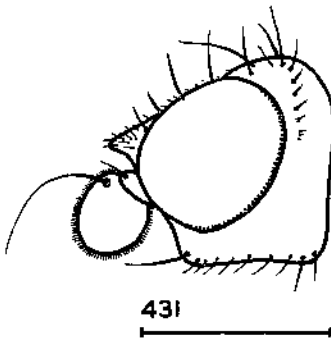
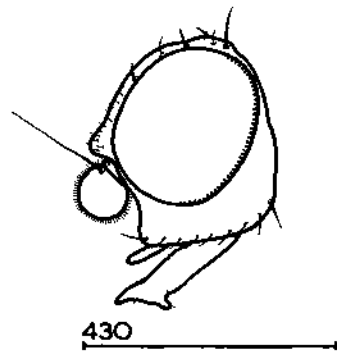
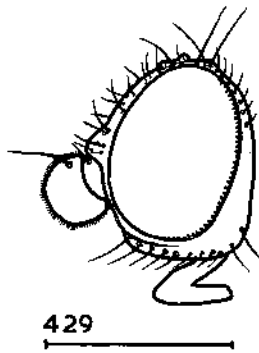
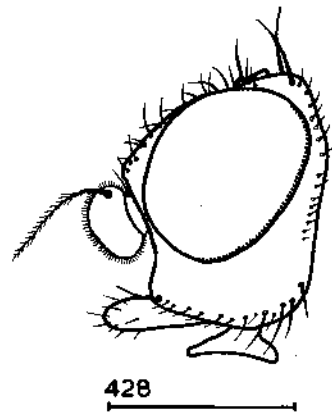
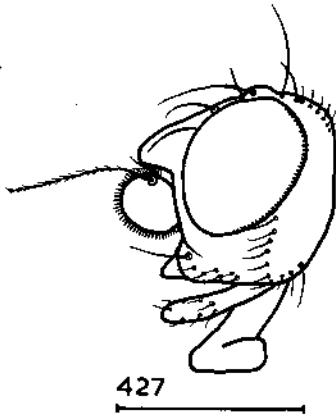


Fig. 427. Head of *Lasiopleura wisei*  
" 428. " " *Gaurax excepta*  
" 429. " " *G. neozelandica*  
" 430. " " *Oscinosoma huttoni*  
" 431. " " *Diploptoxa orbitalis*  
" 432. " " *Chlorops multisulcata*

Scale: 0.5 mm.

## **Diptotoxa lineata** Malloch

*Diptotoxa lineata* Malloch, 1931. Rec. Cant. [N.Z.] Mus.  
3 : 417.

Very similar to *D. anorbitalis* Malloch. Body length about 3.0 mm.

### MALE AND FEMALE

**HEAD:** Longer than high. Eye elongate. Ocellar triangle brown to blackish-brown with a narrow deep longitudinal central groove anteriorly and 3 or 4 very fine impressed lines or furrows on each side parallel to lateral margins.

**THORAX:** Male with mesonotum mostly black and central yellow area of scutellum distinct. Female with mesonotal vittae well separated.

**Holotype:** BOTTLE LAKE: 22.xi.1924, ♀, (*J. W. Campbell*), (U.S.N.M.).

**Distribution:** Bottle Lake, Horseshoe Lake. (November).

**Remarks:** The types are in the United States National Museum and have not been examined.

## **Diptotoxa orbitalis** Malloch. Figs. 421, 431

*Diptotoxa orbitalis* Malloch, 1931. Rec. Cant. [N.Z.] Mus.  
3 : 417.

A black and yellow species. Body length about 3.0 mm., wing length about 3.0 mm.

### FEMALE

**HEAD** (Fig. 431): Arista dark brown; rays of pubescence smaller than diameter of basal segments. Antenna brown; 3rd segment blackish-brown apically and dorsally; 2nd segment with 1 dorsal bristle and very fine hairs elsewhere. Front yellowish-brown, light brown at vertex; ocellar triangle dark reddish-brown, mostly glossy, extending narrowly to anterior margin of front. About 4 posterior fronto-orbitals; inner verticals, ocellars and postverticals about equal to fronto-orbitals; outer verticals strong; hairs over front except triangle. Face pale yellow. Cheeks pale yellow. Light coloured hairs near ventral margin of cheek, vibrissa present but weak. Occiput dark reddish-brown centrally merging to light brown laterally, area posterior to posterior margin of eye brown. Eyes with few hairs. Vertical diameter of eye about 4 times width of cheek in same axis. Proboscis light brown; palpi yellow.

**THORAX:** Mesonotum blackish-brown with yellowish-brown lateral margins; humerus yellowish-brown with central dark brown spot; scutellum blackish-brown; pleura yellow or yellowish-brown with shining black or blackish-brown areas on ventral mesopleuron and pteropleuron and centre of sternopleuron and hypopleuron. One dorsocentral; apical scutellars about 1.5 times length of preapical marginal scutellars; scutellum haired; 3 notopleurals; 1 postalar; sternopleuron bare; 1 small light coloured propleuron bristle; prosternum bare.

Legs yellowish-brown; femora and tibiae especially of fore and hind legs darkened centrally; mid tibia with ventral apical bristle just beyond apex of 3rd vein.

Wings (Fig. 421) clear; veins brown. Wing indices: costal about 1.0; 5x about 8.0.

Halteres pale yellow.

**ABDOMEN:** Brown to dark brown.

**Holotype:** WAIHO: 16.i.1922, ♂, (*A. Tonnoir*), (U.S.N.M. and Cant. Mus.).

**Material Examined:** 2 ♀.

**New Records:** TARARUA RANGES: above Fields Hut, 3.xii.1952, 2 ♀, (*B. A. Holloway*), (Dom. Mus.).

*Distribution:* Tatarua Ranges, Nelson, Kumara, Waiho. (October, December, January, March).

*Remarks:* The specimens recorded above have been compared with the holotype at present in the United States National Museum by C. W. Sabrosky. Separated from *D. neozelandica* most readily by the yellowish-brown legs.

***Diplotoxa neozelandica* sp.n. Fig. 422**

A dark brown or black and yellow species. Body length about 2.25 mm., wing length about 1.75 mm.

MALE AND FEMALE

**HEAD:** Arista dark brown; rays of pubescence less than diameter of basal segment. Antenna light brown; 3rd segment dark brown along dorsal and apical margins, about as long as wide; 2nd segment with short black apical dorsal hair and a few minute hairs elsewhere. Front yellowish-brown; ocellar triangle dark brown, produced narrowly to anterior margin of front from about middle of front, this produced stripe and a small area lateral to each lateral ocellus, shining brown. Outer verticals strong, all other frontal bristles weak; ocellars divergent; post-verticals very small and convergent; inner verticals very small; fronto-orbitals represented by about 3 strong reclinate hairs; proclinate hairs over rest of front except triangle. Face pale yellow, no carina. Cheeks pale yellow, vibrissal angle not produced. Vibrissa not differentiated, few fine pale hairs along ventral half of cheek. Occiput brown bordered laterally by wide yellowish-brown band. Eyes bare. Vertical diameter of eye about 5 times width of cheek in same axis. Anterior margin of oral opening black. Proboscis light brown; palpi yellow.

**THORAX:** Mesonotum heavily dusted blackish-brown, bordered laterally and anteriorly with yellowish-brown and posteriorly with brown, this latter brown area extending anteriorly along dorsocentral line; scutellum yellowish-brown, antero-ventral corners black; postscutellum black; pleura shining yellow with shining black areas on ventral regions of mesopleuron, pteropleuron, hypopleuron, and over most of central area of sternopleuron. No prescuteliars; 1 dorsocentral; apical scutellars cruciate and about twice length of mid lateral scutellars; small humeral; no presutural; 2 notopleurals; 1 supraalar; no postalar; mesopleuron bare; sternopleuron with few fine light hairs; no strong propleuron; prosternum bare.

Legs light brown; all femora dark brown except at base of apex; tibiae dark brown centrally. Mid tibia with small ventral apical.

Wings (Fig. 422) clear; veins light brown. Wing indices: costal about 1.5; 5x about 8.0.

Halteres almost white, with light brown stalks.

**ABDOMEN:** Greyish-brown.

*Holotype:* MARTINS BAY: 1-4.ii.1955, ♂, (*R. R. Forster*), (Cant. Mus.).

*Paratype:* AUCKLAND: Browns Bay, swept off garden plants, 19.xii.1949, 1 ♀, (*R. A. Harrison*), (P.D.D.).

*Material Examined:* Holotype and 1 paratype.

*Distribution:* Auckland, Martins Bay. (December, February).

*Remarks:* Separated from *D. orbitalis* by having dark brown femora and tibiae.

Genus MELANUM Becker

*Melanum* Becker, 1910. Arch. zool. Bp. 1: 50.

Vibrissal angle produced. Proboscis elongate and geniculate. Third and 4th veins parallel or nearly so. Cross veins not closely approximated.

Type Species: *Melanum laterale* (Haliday)

Recognised and separated from *Chlorops* by the long thin geniculate proboscis, and the prominent vibrissal angle, and separated from *Diplo-toxa* by the well separated cross veins.

*Distribution*: World wide.

*Species Occurring in New Zealand*: *Melanum neozelandicum* Malloch

**Melanum neozelandicum** Malloch. Figs. 415, 423

*Melanum neozelandicum* Malloch, 1931. Rec. Cant. [N.Z.]  
Mus. 3 : 418.

A black, blackish-brown, and yellow species. Body length about 2.0 mm., wing length about 2.0 mm.

MALE AND FEMALE

**HEAD** (Fig. 415): Arista dark brown, basal segments thick; rays of pubescence less than diameter of basal segment. Third segment of antenna black with white pile; 2nd segment dark brown with 1 minute dorsal hair, small hairs on apex and long ventral hairs. Front convergent anteriorly, about half width of vertex at anterior margin; yellow anteriorly merging to brown or dark brown posteriorly; ocellar triangle shining black, merging with occiput and the vertex, and with a narrow anterior prolongation reaching nearly to anterior margin of front. Verticals, postverticals, and ocellars weak; no fronto-orbitals but hairs on orbits and similar hairs on lateral margins of ocellar triangle and on most of front except triangle. Face whitish-yellow. Cheeks pale yellow; vibrissal angle distinct. Fine hairs near ventral cheek margin, the anterior one black and stronger than other hairs. Occiput shining black. Eyes with few hairs. Vertical diameter of eye about 6 times width of cheek in same axis. Proboscis yellow, long and slender; palpi pale yellow with fine hairs.

**THORAX**: Mesonotum shining black except for yellow areas on ventral half of humerus, a large spot just dorsal to notopleural suture and between humerus and transverse suture and a small region about postalar bristles; scutellum shining black except most of dorsal surface yellow; pleura shining pale yellow except shining black propleuron, ventral half mesopleuron, antero-ventral sector of pteropleuron, ventral three-quarters of sternopleuron and central patch of hypopleuron. All thoracic bristles small; no prescutellars; 1 dorsocentral; cruciate apical scutellars about twice length of preapical marginals; scutellum haired; no humeral; no presutural; 3 notopleurals, anterior one weak; 2 postalar; sternopleuron with a few fine hairs.

Legs shining brown or dark brown; all femora-tibiae and tibiae-tarsi joints yellowish-brown; coxae and trochanters yellow or pale yellow; basal segments of tarsi light brown. Mid tibia with apical ventral bristle.

**Wings** (Fig. 423) clear; veins brown. Costa ending at or just beyond apex of 3rd vein; costal break just basal of apex of 1st vein and distinct. Wing indices: costal about 1.2; 4th vein about 3.3; 4c about 1.7; 5x about 5.0.

Halteres pale yellow apical bulb, light brown stalk.

**ABDOMEN**: Shining blackish-brown with some grey dusting; yellowish-brown area on posterior margin of tergites on either side close to lateral margin, this area reaching lateral margin in 2nd tergite and the two regions uniting in middle of posterior margin on 5th tergite and sometimes on 4th tergite.

*Holotype*: LAKE BRUNNER: 4.ii.1922, ♂, (*A. Tonnoir*), (U.S.N.M. and Cant. Mus.).

*Material Examined*: 7 ♂ and 5 ♀.

*New Records*: WAITAKERE RANGES: Oratia, 2.iv.1949, 2 ♂, 2 ♀, (*R. A. Harrison*): Swanson, near stream, 11.xii.1949, 2 ♂, 1 ♀, (*K. P. Lamb*). AUCKLAND: Avondale, 6.iii.1949, 1 ♀; 12.iii.1949, 1 ♂; caught in *Araujia*, 4.iv.1949, 1 ♀, (*R. A. Harrison*): Owairaka, swept off chrysanthemum, 17.xii.1953, 1 ♂, (*K. A. J. Wise*), (P.D.D.). OTAGO: McKerrow Hut, 6.ii.1955, 1 ♂, (*R. R. Forster*), (Cant. Mus.).

*Distribution:* Waitakere Ranges, Auckland, Lake Brunner, McKerrrow. (December, February to April).

*Remarks:* Specimens recorded above have been compared with the holotype at present in the United States National Museum by C. W. Sabrosky.

### Genus CHLOROPS Meigen

*Chlorops* Meigen, 1803. Mag. Insektenk. 11 : 278.

Fronto-orbitals weak and hair-like, not much longer than hairs on front. Third antennal segment usually about as long as wide.

Vibrissal angle not produced. Proboscis stout, not geniculated. Apical scutellars usually well separated. Wings clear without pattern. Third and 4th veins parallel or nearly so. Cross veins not closely approximated.

Type Species: *Chlorops pumilionis* (Bjerkander)

The shape of the head and the normal stout non-geniculate proboscis separates this genus from *Melanum*, and the well separated cross veins separate it from *Diplotoxa*.

*Distribution:* World wide.

*Species Occurring in New Zealand:*

*Chlorops multisulcata* Malloch

*C. occipitalis* Malloch

#### KEY TO SPECIES OF CHLOROPS IN NEW ZEALAND

Occiput black centrally ..... **multisulcata**  
Occiput yellow with a lateral broad brown band from behind eye to  
foramen ..... **occipitalis**

### **Chlorops multisulcata** Malloch. Fig. 432

*Chlorops multisulcata* Malloch, 1931. Rec. Cant. [N.Z.] Mus.  
3 : 420.

A yellow species with distinctive blackish-brown markings. Body length about 4.5 mm., wing length about 4.0 mm.

#### MALE AND FEMALE

**HEAD** (Fig. 432): Arista dark brown, basal segments thick; rays of pubescence much less than diameter of basal segments. Antenna light reddish-brown; 3rd segment dark brown dorsally, particularly about aristal insertion; 2nd segment with small apical hairs particularly on outer margin, a cluster of them on dorsal surface, one of these strong and several strong hairs ventrally. Front yellow or yellowish-brown; frontal triangle shining reddish-black, continued on to middle of occiput, produced narrowly to anterior margin of front where it is yellowish-brown, median longitudinal pitted groove from ocelli anteriorly to near frontal margin, oblique smooth narrow grooves parallel to lateral margins of triangle leading from vertex to the median groove. Outer verticals and postverticals small; other frontal bristles not differentiated; black hairs on front except triangle. Face pale yellow. Cheeks pale yellow, vibrissal angle rounded and not produced. Fine short hairs near ventral cheek margin. Occiput yellow laterally, blackish-brown in middle with a V-shaped brown mark from the vertex to foramen. Eyes sparsely haired. Vertical diameter of eye about 3.75 times width of cheek in same axis. Proboscis short, light brown; palpi yellowish-brown with fine light yellow hairs.

**THORAX:** Mesonotum yellow; a broad median longitudinal dark brown vitta from foramen to scutellum, widening slightly posteriorly; a broad dark brown vitta from level with posterior margin of humerus to a position anterior to

postalar bristles, a brown stripe included in and close to lateral margin of this vitta commencing at transverse suture; scutellum yellow with light brown margins; postscutellum dark brown; pleura shining yellow, brown areas on antero-ventral sector of mesopleuron, pteropleuron and hypopleuron and middle area of ventral two-thirds of sternopleuron. No prescutellars; 1 small dorsocentral; apical scutellars about 1.25 times length of preapical marginal scutellars; scutellum haired; no clearly differentiated humeral bristle; 1 weak anterior and 2 strong posterior notopleurals; 2 postalar, inner one weak; sternopleuron with a few hairs. Legs yellow; hind tibia with band of light brown at middle. Mid tibia with a ventral apical spine.

Wings clear; veins light brown. Costa ending at or immediately beyond apex of 3rd vein; costal break near apex of 1st vein distinct. Wing indices: costal about 2.2; 4th vein about 4.0; 4c about 1.5; 5x about 2.3.

Halteres yellow with light brown stalk.

ABDOMEN: Tergites yellow with wide brown bands anteriorly not reaching lateral margins, on 2nd tergite band reaching to posterior margin, on 3rd tergite band reaching posterior margin only at middle; lateral margins of tergites narrowly brown.

*Holotype*: WAIHO: 18-20.i.1922, ♂, (*A. Tonnoir*), (U.S.N.M. and Cant. Mus.).

*Material Examined*: 10 ♂, 6 ♀, and 5 ex.

*New Records*: OHAKUNE: -.1923, (*T. R. Harris*), (1 ♂, 3 ♀, 3 ex., Cawt. Inst., 4 ♂, 3 ♀, 2 ex., B.M.). KAPITI ISLAND: -.i.1928, 4 ♂, (*Anon.*), (Dom. Mus.). DUN MT.: 2,000 ft., 18.x.1925, 1 ♂, (*W. Heighway*), (Cawt. Inst.).

*Distribution*: Ohakune, Kapiti Island, Dun Mt., Kumara, Lake Brunner, Waiho. (October, January, February).

*Remarks*: Specimens recorded above have been compared with the holotype at present in the United States National Museum by C. W. Sabrosky. Separated from *C. occipitalis* by having the occiput black at centre.

### ***Chlorops occipitalis* Malloch. Fig. 424**

*Chlorops occipitalis* Malloch, 1931. Rec. Cant. [N.Z.] Mus. 3: 421.

A yellow or pale yellow species with dark brown markings. Body length about 3.5 mm., wing length about 3.75 mm.

#### MALE AND FEMALE

HEAD: Arista dark brown, basal segments thick, rays of pubescence equal to diameter of basal segment. Antenna brown; 3rd segment dark brown except basally; 2nd segment with fine light brown hairs, 1 longer one dorsally and several ventrally. Front yellow or pale yellow; ocellar triangle shining brown with narrow yellow margins, extending to anterior margin of front and with a smooth longitudinal central groove from anterior ocellus to anterior margin of front. Bristles of front weak and, except for weak verticals and postverticals and ocellars, not differentiated from hairs of front. Face receding, pale yellow. Cheeks pale yellow, vibrissal angle not produced. Fine long hairs on lower cheek margin. Occiput yellow in middle and a broad brown band from behind postero-dorsal angle of eye to side of foramen. Eyes with few hairs. Vertical diameter of eye about 4 times width of cheek in same axis. Proboscis pale yellow; palpi yellow with short dark hairs.

THORAX: Mesonotum dark brown on the broad lateral band, yellowish-brown between these bands and a narrower brown band in centre of this yellowish-brown band anteriorly; scutellum yellowish-brown, brown basally on lateral margins; pleura shining light yellow. No prescutellars; 1 small dorsocentral; apical scutellars just longer than preapical marginal scutellars; scutellum haired; humeral not differentiated from hairs; 4 notopleurals; 2 postalar; sternopleuron haired.

Legs yellowish-brown; mid tibia with apical ventral spines.

Wings (Fig. 424) clear; veins light brown. Costa ending beyond apex of 3rd vein; subcosta short, but clear almost hairless line continuing to costa; costal break near apex of 1st vein distinct. Wing indices: costal about 1.6; 4th vein about 4.4; 4c about 2.0; 5x about 4.5.

Halteres yellow, stalk light brown.

ABDOMEN: Tergites brown with yellow areas near lateral margins.

*Holotype*: NELSON: 20.i.1921, ♂, (*A. Philpott*), (U.S.N.M. and Cant. Mus.).

*Material Examined*: 6 ♂ and 1 ♀.

*New Records*: LITTLE BARRIER ISLAND: Thumb and Summit tracks, 23.xi.1954, 3 ♂, 1 ♀, (*R. A. Harrison*), (P.D.D.). WAITAKERE RANGES: Nihotupu, 2.i.1950, 1 ♂, (*R. A. Harrison*); Dreamlands, in house, 27.xii.1950, 1 ♂, (*K. P. Lamb*), (P.D.D.). NELSON: 9.i.1925, 1 ♂, (*A. Philpott*), (Cawt. Inst.).

*Distribution*: Little Barrier Island, Waitakere Ranges, Nelson, Ani-seed Valley, Lake Rotoroa. (November to January).

*Remarks*: Specimens recorded above have been compared with the types at present in the United States National Museum by C. W. Sabrosky. Separated from *C. multisulcata* by having the occiput yellow in central areas.

## Affinities

The New Zealand acalypterate fauna is now known to consist of 76 genera, 28 of which are endemic, 37 indigenous, and 11 recent immigrants. Of the 37 indigenous genera, 8 are also represented by species which are recent immigrants; 3 are confined to Australia and New Zealand; 2 to South America and New Zealand, while 32 occur naturally over a much wider range, often throughout the world. A total of 233 species are now known from New Zealand; of these, 38 are regarded as recent immigrants and the remaining 195 species are endemic. As all the species are either immigrant or endemic the discussion of affinities must be confined to the relationship of the genera.

There are clear indications that the New Zealand acalypterate fauna is derived from the fauna of the Australian region. Three genera are found only in Australia and New Zealand while most of the more widespread are indigenous to Australia. *Allophylopsis*, *Allophylina*, *Helosciomyza*, *Trypaneoides*, *Poecilohetaerus*, *Poecilohetaerella*, *Scatella*, *Hydrellia*, *Lasiopleura*, *Diplotoxa* and *Gaurax* are all either indigenous to Australia or obviously derived from Australian genera. Some families e.g. Sphaeroceridae and Coelopidae are composed of widespread genera the affinities of the New Zealand components of which are not so clear.

Besides this Australian relationship there are several important cases of close affinity with the South American fauna; Malloch (1933d) studied both New Zealand and South American faunas and came to the conclusion that there were great similarities. *Heloclusia* and *Teratomyza* are two genera found in New Zealand and South America only, and contain closely related species. These are the closest elements in both faunas but some other sections e.g. helomyzids, helcomyzids and pallopterids show definite resemblances.

The similarities between the New Zealand and South American faunas can be explained by their being peripheral faunas derived from faunas originating in the Northern Hemisphere. The New Zealand elements are best considered to have arrived in New Zealand from the north and west by way of the Australian region.

There are several archaic and aberrant forms in the New Zealand fauna e.g. *Huttonina*, *Protoborborus*, and *Teratomyza*. This, together with the fact that all naturally occurring species in New Zealand are endemic, shows that New Zealand has been geographically isolated from other land masses that could serve as centres for dispersal of fly species for a long period.

Indeed the New Zealand acalypterate fauna as a whole can be regarded as generally archaic. As will be seen from the text, many genera occurring in New Zealand do not fit readily into the present day concepts



of families. Family definitions have been constructed mainly on Northern Hemisphere faunas and many of these definitions must be broadened if the New Zealand faunas are to be included.

This archaism is of great interest as it can show in no small measure possible relationship between the recognised family segregates. The New Zealand helomyzids are shown to be related to the trichoscelid section of the family more than to the helomyzid section and when account is taken of the New Zealand fauna the distinctions between the two sections are reduced considerably. The sciomyzids and sapromyzids are regarded as being closely related, and this relationship is enhanced by the genus *Huttonina* which could be placed satisfactorily in either family. Likewise *Neomaorina*, here placed in the Pallopteridae, shows that the relationships between the pallopterids and lonchaeids is very close. *Australimyza* is regarded as being closest to the Milichiidae but having as it does some non-milichiid characters and being comparable in some respects to the Agromyzidae it strengthens the relationships within the large milichiid-agromyzid complex.

## *Distribution*

The complete endemism of the species in New Zealand shows that speciation has occurred actively within New Zealand. Genera either endemic or indigenous, containing only endemic New Zealand species, have almost certainly arisen from geographically isolated races, while genera containing more than one endemic species have usually had their New Zealand members evolve within New Zealand.

Data on distribution of species is unfortunately far from complete. The greatest need for a better understanding of the Acalypterae of New Zealand is a more complete record of distribution of species. Relatively few areas in New Zealand have been well explored. These include Auckland, Waitakere Ranges, Nelson, and Arthurs Pass regions. Until many more distribution records are available it is not possible to arrive at conclusions as to how speciation has occurred.

Flies, by their very means of dispersal, are naturally widespread, and barriers such as water or altitude are not as important in restricting their dispersal as is the case with more sedentary insects such as Collembola. The evolution of species within genera is discussed under the genera.

No zonation is apparent in the New Zealand region. Some species appear restricted to the North Island and others to the South Island but this would appear to be due to temperature preferences rather than the existence of physical barriers to dispersal.

Glaciation has undoubtedly been a factor in speciation. The natural forest cover was greatly reduced during the periods of maximum glaciation in the Pleistocene, and in the South Island and the southern part of the North Island it existed only in isolated areas or was reduced to low bush areas. Isolation of populations in such areas could have allowed new species to develop. Glaciation and reduction of natural habitats may also have been responsible for development of species adapted to alpine or subalpine habitats. Some forest species may have been destroyed, but on the decline of glaciation and reforestation it is conceivable that surviving species, whether those subalpine adapted species or remnants of previous forest faunas, would give rise to other species which would inhabit the new types of habitats.

Two varieties were proposed by Tonnoir and Malloch (1926a, 1928). These are not recognised as subspecies in this study because they belong to sympatric populations, and distinctions, mainly of colouration, are best regarded as variations within the one population.

## Glossary

- Acrostichals.* Hairs or bristles lying between the dorsocentrals. (Figs. 435 and 436)
- Aedeagus.* The internal male genitalia including the penis and associated median or lateral processes.
- Alula.* A lobe of the wing membrane near the base posteriorly. (Fig. 437)
- Anal cell.* A cell enclosed by the fifth and sixth longitudinal veins. (Fig. 437)
- Anal lobe.* The basal part of the wing posterior to the anal cell bearing the axillary vein when present. (Fig. 437)
- Anal plate (=cercus).* Reduced 10th tergite in males.
- Anal vein.* The sixth longitudinal vein posterior to the fifth longitudinal. (Fig. 437)
- Antennal foveae.* Depressions in face, accommodating the antennae, united in middle unless separated by a carina.
- Antenna (ae).* The paired sensory organs inserted anteriorly on the head between the front and face, composed of three segments, the terminal or third segment usually bearing the arista.
- Antennal index.* Length of third antennal segment divided by width just distal to insertion of arista.
- Anterior cross vein.* A short cross vein between veins three and four, usually near middle of wing or on basal half. (Fig. 437)
- Arista (ae).* A bristle-like structure arising usually from a sub-basal and dorsal position on the third antennal segment. May be bare or carry a fine short pubescence or longer hairs. (Fig. 434)
- Auxiliary vein.* See Subcosta.
- Axillary vein.* The seventh longitudinal vein behind the anal vein; usually absent or vestigial. (Fig. 437)
- Basal cells.* Cells near base of wing; first basal cell bounded by veins three and four; second basal cell bounded by veins four and five. (Fig. 437)
- Callus.* A prominence or swelling.
- Calypter.* See squama.
- Carina.* An elevated ridge or keel, e.g. facial carina. May be sulcate. (Fig. 433)
- Cercus.* See Anal plate.
- Cheeks.* The area ventral to the eyes. (Fig. 434)
- Claspers.* Modified ventral portions of 9th tergite in males.
- Claws.* The curved spines on the apex of the apical tarsal segments.

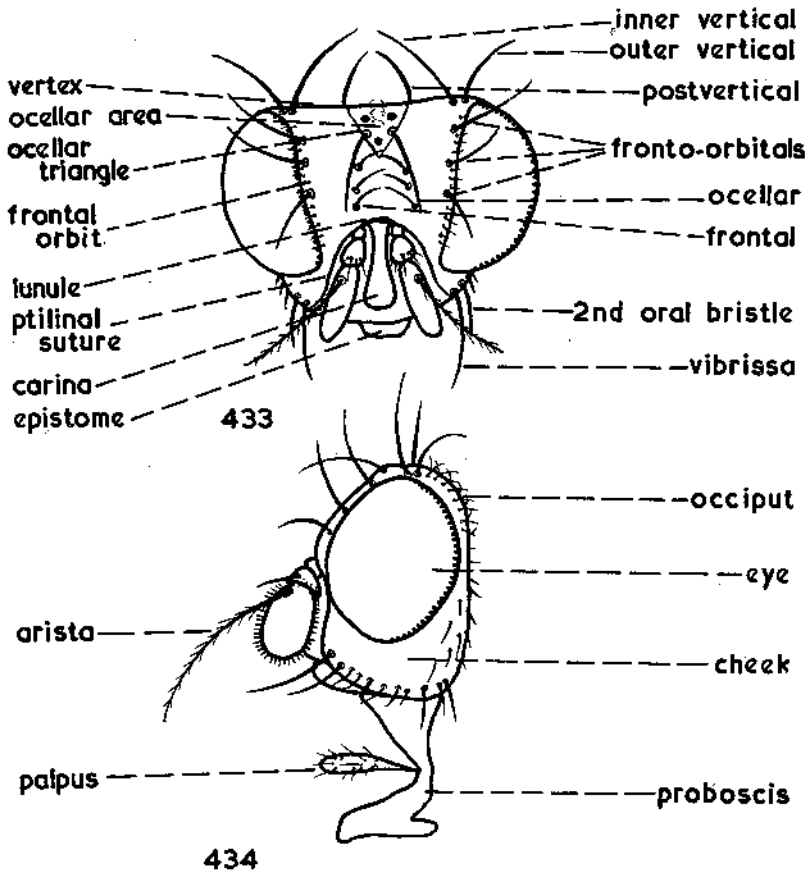


Fig. 433. Head (anterior) of a typical acalypterate Diptera  
 Fig. 434. Head (lateral) " " " " " "

- Clypeus.** A distinct sclerite or plate at the base of the proboscis adjacent to the oral opening and often extending anteriorly beyond the subcranial cavity.
- Costa.** The vein extending along the anterior margin of the wing. (Fig. 437)
- Costal break.** Interruptions in the continuity of the costa. If present, occurring near humeral cross vein and at or basal to the apex of the first vein at the point where the subcosta meets or would be expected to meet the costa. (Fig. 437)
- Costal spines.** 1. Distinct bristles or hairs, present or absent usually longer than the normal hairs and spaced at regular intervals on *antero-dorsal* surface, becoming weaker towards apex of wing, present or absent basal to first vein; often present only at distal costal break; may be paired.  
 2. Short stout spines on anterior surface, less than length of normal hairs, contiguous, occurring on most of length of costa and ending either suddenly or fading out near apex of wing.

- Discal cell.* A cell bounded by the fourth and fifth longitudinal veins usually enclosed by the outer cross vein and vein enclosing second basal cell. (Fig. 437)
- Dorsocentral bristles.* A row of bristles on each side of the acrostichals. (Figs. 435, 436)
- Empodium.* A bristle or hair borne on the apical tarsal segments between the pulvilli.
- Epistoma.* The anterior part of the subcranial cavity and as such the ventral area of the middle part of the face. (Fig. 433)
- Face.* The anterior region of the head between the antenna and the oral opening and bounded by the eyes.
- Front.* The region of the head between the antennae and the vertex and bounded by the eyes.
- Frontal bristles.* Occurring on the ventral portion of the front. (Fig. 433)
- Fronto-orbital bristles.* Occurring on the frontal orbits. (Fig. 433)
- Frontal orbits.* The space contiguous to the eyes on the front, often clearly differentiated. (Fig. 433)
- Frontal vitta.* The space between the frontal orbits.
- Gena.* The dorsal portion of the cheek, being a continuation of the parafacials and either distinct or indistinct.
- Genital arch.* Modified 9th tergite in males. (Fig. 438)
- Haltere.* An appendage with stalk and apical knob arising from the posterior lateral region of the thorax.
- Haustellum.* The median portion of the proboscis.

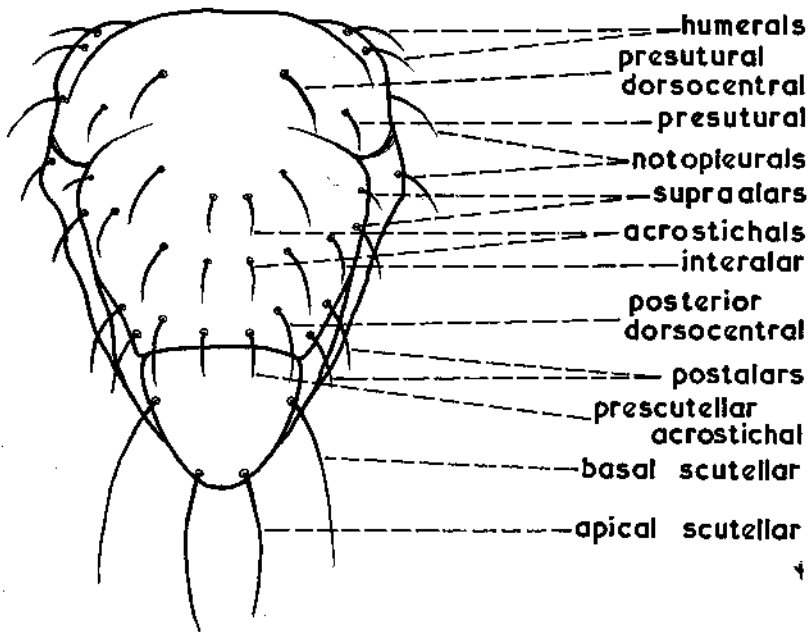


Fig. 435. Dorsal thorax of a typical acalypterate Diptera

- Humeral bristle.* A bristle occurring on the humerus. (Figs. 435 and 436)
- Humeral cross vein.* A vein between the first vein and the costa. (Fig. 437)
- Humerus (i).* The antero-lateral region of the mesonotum usually in the form of a callus or prominence. (Fig. 436)
- Hypopleuron (a).* A pleurite dorsal to hind coxa and posterior to sternopleuron. (Fig. 436)
- Interalar bristles.* On mesonotum between supraalars and dorsocentrals, usually restricted to postsutural bristles. (Figs. 435, 436)
- Labellum.* The lobe-like structure at the apex of the proboscis.
- Lunule.* The usually crescent-shaped area dorsal to the base of the antennae. (Fig. 433)
- Mesonotum.* The dorsal surface of the thorax bounded laterally by the notopleuron and wings. In its widest sense includes humeri, scutellum and postscutellum. (Fig. 436)
- Mesopleural bristles.* Bristles on the mesopleuron. (Fig. 436)
- Mesopleuron.* A pleurite bounded by the notopleuron, propleuron, sternopleuron and pteropleuron. (Fig. 436)
- Metapleuron.* A pleurite dorsal to the hypopleuron. (Fig. 436)
- Notopleural bristles.* Bristles on the notopleuron. (Figs. 435, 436)
- Notopleuron.* A small pleurite lateral to the mesonotum, posterior to the humerus.
- Occipital foramen.* The opening in the occiput, the neck insertion.
- Occiput.* The posterior region of the head. In a restricted sense the area between the eyes bounded by the vertex and the occipital foramen. In the widest sense the whole posterior region of the head behind the eyes. (Fig. 434)
- Ocellar area.* The area between and immediately surrounding the ocelli; often raised in a prominence above general level of front. (Fig. 433)
- Ocellar bristles.* Bristles arising usually close to and on either side of the anterior ocellus. (Fig. 433)
- Ocellar triangle.* The usually well marked triangle surrounding the ocelli with base on vertex and apex directed anteriorly; often very large with the apex reaching ptilinal suture. Sometimes called the frontal triangle. (Fig. 433)
- Ocellus (i).* Simple eye consisting of one bead-like lens. Three ocelli in a group situated near middle of vertex.
- Orbit.* The eye margin; often a differentiated strip, e.g. frontal orbits.
- Palpus (i).* Appendages of the proboscis. (Fig. 434)
- Parameres.* Paired structures at base of penis (=gonapophyses).
- Pleurite.* Lateral sclerites usually of the thorax.
- Postalar bristles.* Bristles on the postero-lateral corner of the mesonotum. (Figs. 435, 436)
- Posterior callus.* A callus at the postero-lateral corner of the mesonotum; not distinctly differentiated in Acalypterae.
- Posterior cross vein.* A cross vein between the fourth and fifth longitudinal veins closing the discal cell apically, lateral to the anterior cross vein and often in apical half of wing. (Fig. 437)

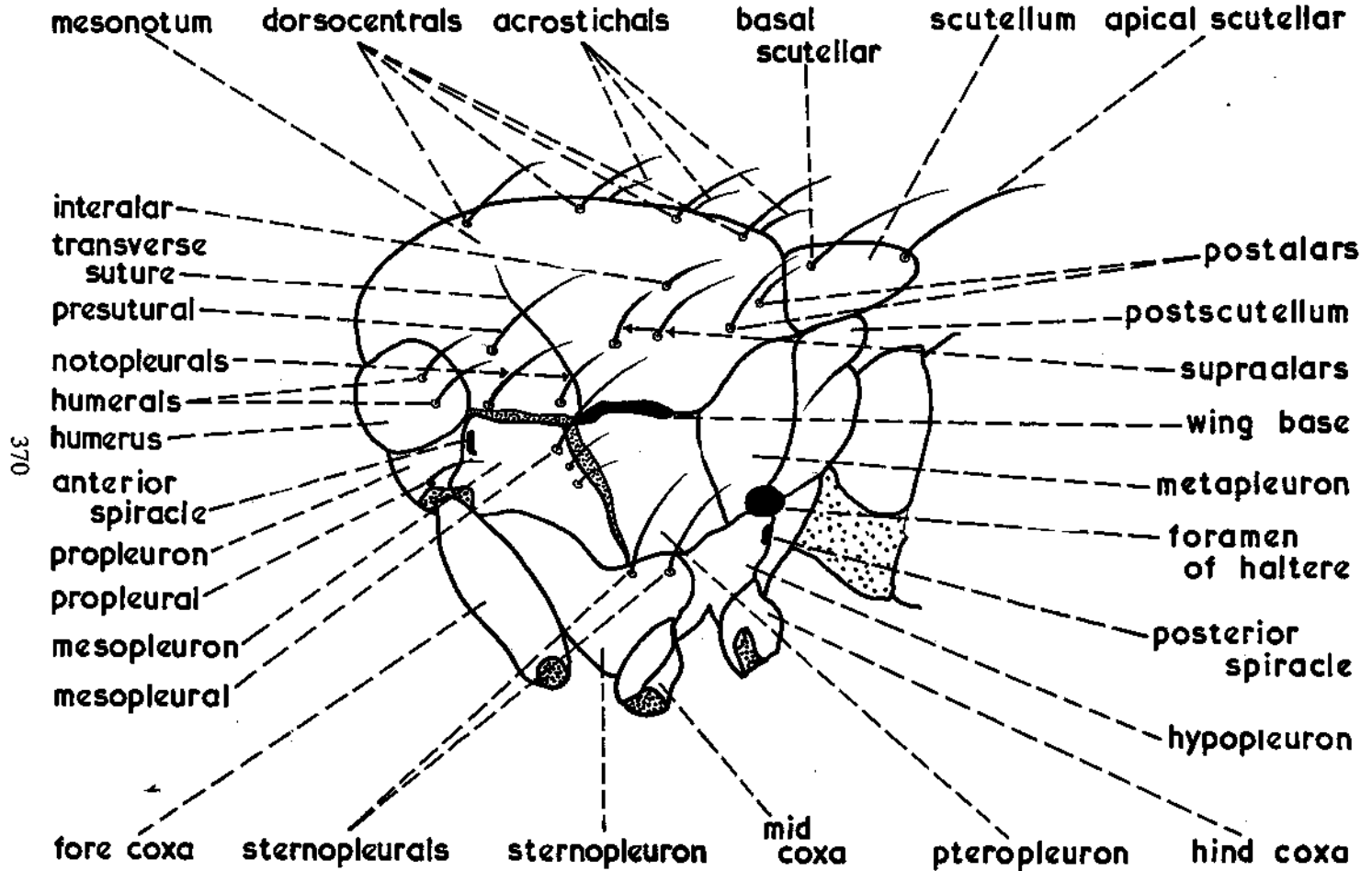


Fig. 436. Lateral thorax of a typical acalypterate Diptera

- Postscutellum*. A convex transverse swelling under the scutellum; rarely prominent in Acalypterae. (Fig. 436)
- Postvertical bristles*. A pair or more of bristles arising just below the vertex on the occiput posterior to the ocellar area. (Fig. 433)
- Prescutellar bristles*. The posterior acrostichal bristles situated just anterior to the scutellum. (Fig. 435)
- Presutural bristle*. A bristle anterior to the transverse suture laterally on mesonotum. (Figs. 435, 436)
- Propleural bristles*. Bristles on propleuron. (Fig. 436)
- Propleuron (a)*. The pleurite ventral to humerus and anterior to mesopleuron. (Fig. 436)
- Prosternum*. Paired sternites on anterior portion of thorax between fore coxae.
- Pteropleural bristles*. Bristles on pteropleuron.
- Pteropleuron*. A pleurite ventral to wing base. (Fig. 436)
- Ptilinal suture*. The crescentic groove or suture across the front above the antennae and extending down the side of the face marking the position when the ptilinum was everted and the face pushed forward. (Fig. 433)
- Ptilinum*. The inflatable organ used at emergence from pupa to rupture the puparium and to escape from the pupation-medium.
- Pulvilli*. Pair of pads on the apical tarsal segments between and ventral to the claws.
- Sclerite*. A chitinised or sclerotised plate.
- Scutellum*. A shield or sclerite posterior to the mesonotum. (Fig. 436)
- Second oral bristle*. The bristle next behind the vibrissa. (Fig. 433)
- Spiracles*. The external openings of the trachea. (Fig. 436)
- Squama (ae) (calypters)*. The pair of flap-like lobes connecting the wings basally with the thorax. The lower lobe the larger of the two. (Fig. 437)
- Stem vein*. The common basal portions of second and third longitudinal veins.
- Sternite*. The ventral sclerite of a segment.
- Sterno-index*. Length anterior sternopleural bristle/length posterior
- Sternopleural bristles*. Bristles on the sternopleuron. (Fig. 436)
- Sternopleuron (a)*. A pleural sclerite above the middle coxa. (Fig. 436)
- Stigma*. The area between apices of subcosta and first vein.
- Subcosta*. The vein between the costa and the first vein and arising from the junction of the humeral cross vein with the first vein. (Fig. 437)
- Subcranial cavity*. The large concavity of the ventral region of the head from which the proboscis is protruding.
- Supraalar bristles*. Bristles near lateral margins of mesonotum, dorsal to wing base and posterior to transverse suture. (Figs. 435, 436)
- Tergite*. The dorsal sclerite of a segment.
- Transverse suture (of mesonotum)*. A transverse groove or suture, incomplete in Acalypterae, near middle of mesonotum. (Fig. 436)
- Vertex*. The posterior edge of the front. (Fig. 433)



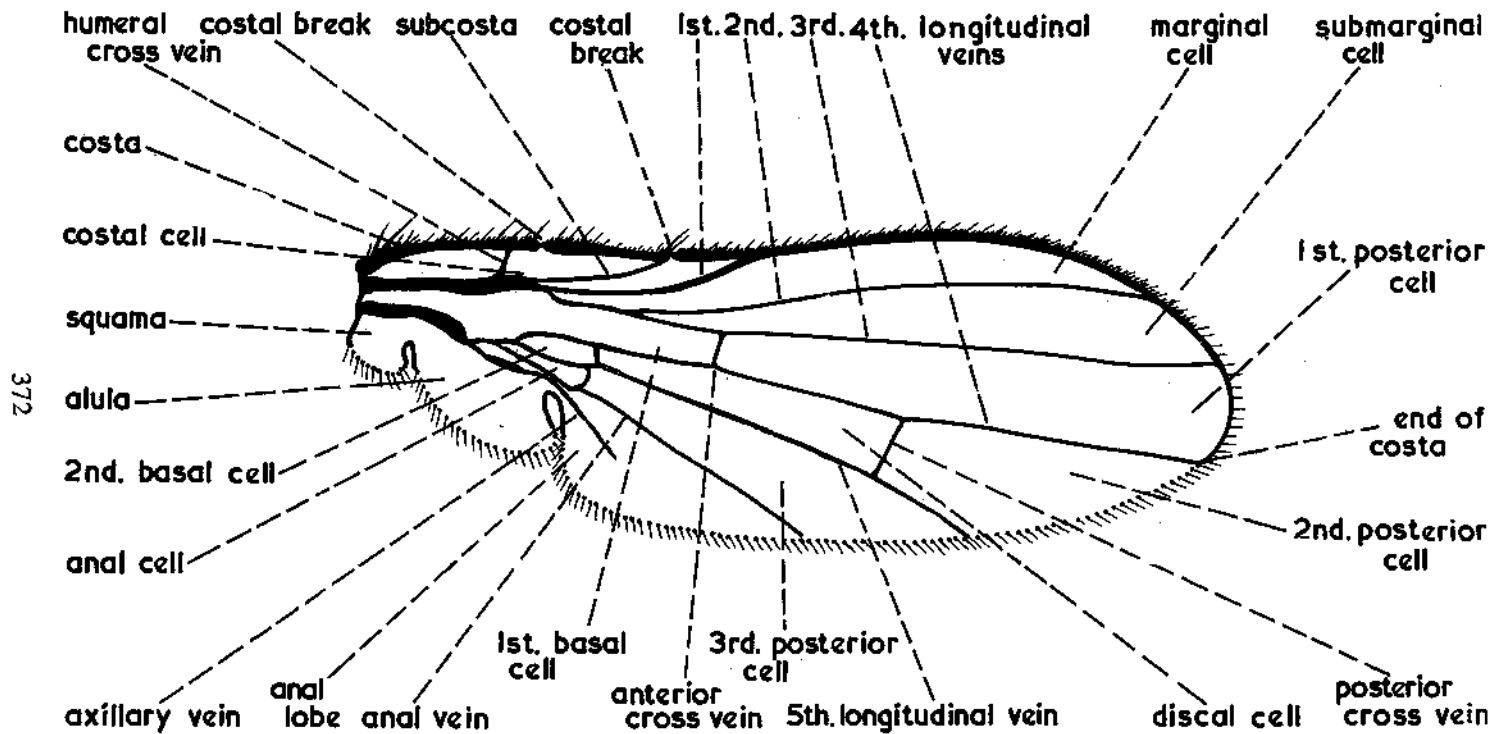


Fig. 437. Wing of a typical acalypterate Diptera

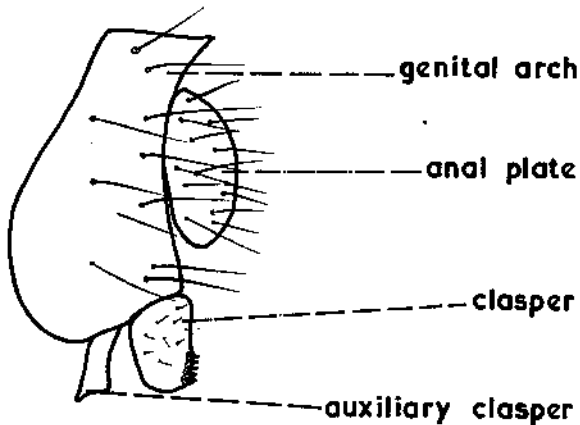


Fig. 438. External male genitalia (lateral view) of a typical Diptera

**Vertical bristles.** Bristles occurring lateral to ocellar area on vertex. (Fig. 433)

**Vibrissa.** The large anterior bristle on the cheek arising from the vibrissal angle. (Fig. 433)

**Vibrissal angle.** The anterior ventral corner of the cheek.

**Wing indices.** Costal index: length of costa between apices of 1st and 2nd veins/length of costa between apices of 2nd and 3rd veins.

4th vein index: length of distal (i.e. 4th) section of 4th vein/length of 3rd section of 4th vein.

4c index: length of costa between apices of 2nd and 3rd veins/length of 3rd section of 4th vein.

5x index: length of distal section of 5th vein/length posterior cross vein.

**Wings veins.** Only minor variations in venation occur in the Acalyptratae and the notation used for the veins is the simplest for this type of wing. It is Schiner's notation with minor alterations and is compared below with Tillyard's modification of the Comstock-Needham system. (Fig. 437)

<i>Present Notation</i>	<i>Tillyard's Modification of Comstock-Needham</i>	
Costa	Costa	C
Subcosta	Subcosta	.Sc
First longitudinal	Radius (main stem)	R1
Second longitudinal	Radial sector (1st branch)	R2
	" (2nd " )	R3
Third longitudinal	Radial sector (3rd " )	R4
	" (4th " )	R5
Fourth longitudinal	Media (1st branch)	M1
	" (2nd " )	M2
Fifth longitudinal	Media (3rd " )	M3
(distal part)	" (4th " )	M4
(proximal part)	Cubitus (1st branch)	Cu1
Anal vein	First anal	1A
Axillary vein	Second anal	2A

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