

# AUSTRALIAN MUSEUM SCIENTIFIC PUBLICATIONS

McAlpine, David K., 2012. Notes and descriptions of Australian Helosciomyzidae or comb-winged flies (Diptera: Schizophora). *Records of the Australian Museum* 64(1): 51–70. [Published 23 May 2012].

<http://dx.doi.org/10.3853/j.0067-1975.64.2012.1582>

ISSN 0067-1975

Published by the Australian Museum, Sydney

nature culture **discover**

Australian Museum science is freely accessible online at  
<http://publications.australianmuseum.net.au>  
6 College Street, Sydney NSW 2010, Australia



## Notes and Descriptions of Australian Helosciomyzidae or Comb-winged flies (Diptera: Schizophora)

DAVID K. MCALPINE

Australian Museum, 6 College Street, Sydney NSW 2010, Australia

**ABSTRACT.** Notes on morphology, including costal features and sexual dimorphism, are given. Limited information on habitat and biology is noted. The Helosciomyzidae are compared with other families with which they have been sometimes associated (e.g., the Dryomyzidae, Sciomyzidae, and Huttoninidae). The position of the Neotropical genus *Sciogriphoneura* Malloch in the Helosciomyzidae, not the Dryomyzidae, is confirmed from strong morphological evidence; this leaves no evidence of the Dryomyzidae in the Southern Hemisphere. The nomenclature of the Australian taxa of Helosciomyzidae is revised with reference to type specimens of all previously described species. The new genus *Luta* is described. *Luta luteipennis* is a new combination for *Helosciomyza luteipennis* Steyskal. Keys to the Australian genera, species groups, and species are given. *Helosciomyza ferruginea* Hendel is a new junior synonym of *H. fuscinevris* (Macquart). The following new Australian species are described: *Helosciomyza bickeli*, *H. driesseni*, *H. nevoissi*, *H. obliqua*, *H. steyskali*, *H. subacuta*, *Neosciomyza peckorum*.

MCALPINE, DAVID K. 2012. Notes and descriptions of Australian Helosciomyzidae or comb-winged flies (Diptera: Schizophora). *Records of the Australian Museum* 64(1): 51–70.

The family Helosciomyzidae, as most recently reviewed and delimited by Barnes (1981), was formerly included in the Sciomyzidae, though Steyskal (1965) had previously recognized the group at subfamily rank. The present study is needed to clarify the application of some older specific names and to name seven new Australian species.

The following collectors' names are abbreviated to the initials: D.J. Bickel, G.L. Bush, D.H. Colless, I.F. Common, B.J. Day, M.M. Driessen, E.D. Edwards, L.F. Graham, J. Kukalová-Peck, I.M. Mackerras, S.A. Marshall, D.K. McAlpine, I.D. Naumann, A. Neboiss, S.B. Peck, K.T. Richards, M.A. Schneider, W. Smith.

Institutions housing specimens are abbreviated as follows: AM, Australian Museum, Sydney; ANIC, Australian National Insect Collection, CSIRO, Canberra; MV, Museum Victoria, Melbourne; PM, Muséum national d'Histoire naturelle, Paris; QM, Queensland Museum, Brisbane; SAM, South Australian Museum, Adelaide; SPHTM, School of Public Health and

Tropical Medicine, University of Sydney (collection now divided between AM and ANIC); TDPI, Department of Primary Industries, New Town, Tasmania; UQIC, University of Queensland Insect Collection, Brisbane (collection now held in the QM); USNM, National Museum of Natural History, Washington, D.C.; NMW, Natural History Museum, Vienna.

### Habitat and biology

In my experience helosciomyzid flies are generally found in various forest or tall scrub habitats, but some exceptions have been noted. The very widely distributed *Helosciomyza fuscinevris* occurs in the Simpson Desert, Central Australia, as well as in some forest and suburban habitats. Most specimens of *H. driesseni* were collected in button grass moorland in the Tasmanian highlands. *Cobergius vittatus* is apparently restricted to seashore habitats, and some of its morphological features are shared with other shore-inhabiting flies, e.g., the reduced eye area, the predominantly greyish rather than

orange-brown coloration, and the conspicuously hirsute males. The locality data for *C. vittatus* suggest an association with fur seals (*Arctocephalus* spp.), but this is not yet confirmed.

Adult helosciomyzids may be collected by sweeping vegetation, but are generally sparse under field conditions and long series of specimens are rarely obtained. They are sometimes attracted to carrion (author's experience and label data from S.B.P. and J.K.-P.).

Steyskal and Knutson (1979) described the egg of "*Helosciomyza ferruginea*", but this involved a specific misidentification, the dissected female being referable to *H. bickeli*.

The few rearing records for helosciomyzids suggest a wide range of larval habits, but do not include molluscivory, which is typical of true sciomyzids. A series of *Eurotocus australis* was reared from larvae in agaric fungi in South Australia (Steyskal and Knutson, 1979). Barnes (1980a) recorded larvae of *Helosciomyza subalpina* Tonnoir & Malloch in New Zealand as predators of ant larvae and found that they fed on other freshly killed insects in the laboratory. Barnes (1980b) recorded larvae of *Polytocus costatus* Harrison from a seabird carcass in the Snares Islands.

### Morphology and relevant terminology

I follow a traditional terminology with minimal use of terms implying doubtful, unproved, or, for present purposes, irrelevant homologies. Details are given by D. McAlpine (1973), with some additional terms given by D. McAlpine (1985, 2007). Most terms are also explained by Harrison (1959), Crosskey (1973), and Colless and D. McAlpine (1991). Terminology for the costal chaetotaxy follows Hackman and Väisänen (1985), but they omitted mention of the costagium.

I use the term lateral occipital suture for the suture separating the mesocranial plate or median sclerite from the lateral plate of the upper occipital region. With regard to the hind tibia, I distinguish the subapical anterior bristle from the preapical dorsal bristle (see Figs 1, 2), in accord with D. McAlpine (1991a: 32).

The costagium is a partly dilated or thickened setulose

section of the costa (the thick vein on the anterior edge of the wing) near its base. It is particularly characteristic of the Cyclorrhapha, but is distinguishable in numerous other taxa. The term has been confused with basicosta, but I think that the latter term should be restricted to the part of the costal region between the tegula and the costagium. The basicosta is without setulae, though often with fine, pile-like microtrichia (Fig. 4; see also Crampton, 1942: fig. 7I, *bac*). At its distal end the costagium may gradually narrow into the humeral section of the costa, which connects with the humeral crossvein; or it may be separated from the latter section by a costagial break (J. McAlpine, 1981: fig. 69).

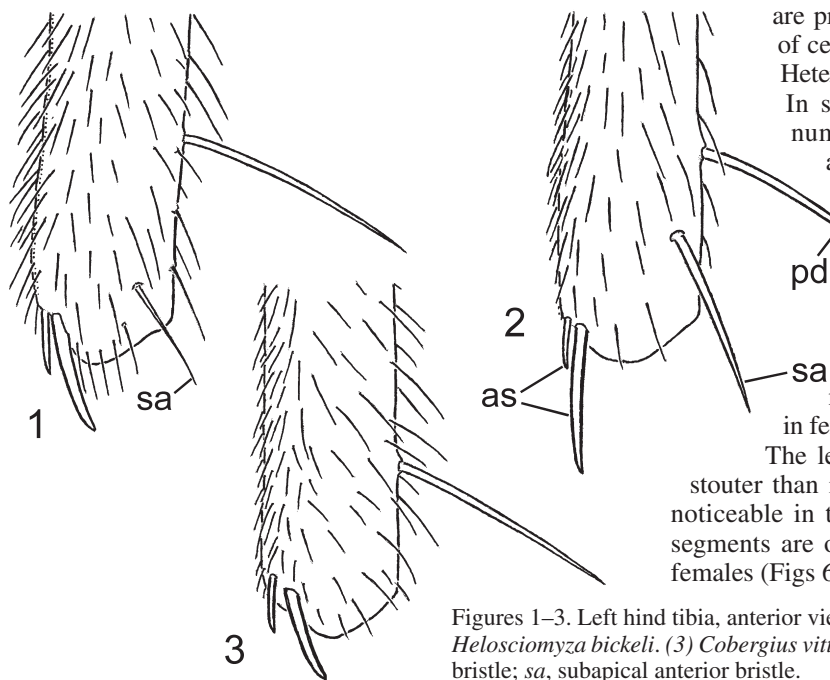
In the Helosciomyzidae, as in related families, there is no costagial break. The costagium bears a large anterodorsal bristle and a large anteroventral bristle, the latter bristle placed more distally (Fig. 4). This condition contrasts with that of the few taxa of Dryomyzidae now available to me, which lack the anterodorsal bristle, but is a common condition in numerous acalyptrate families. The basicosta consists of a short, flat anterodorsal plate and an anteroventral microtrichose tubercle.

### Sexual dimorphism

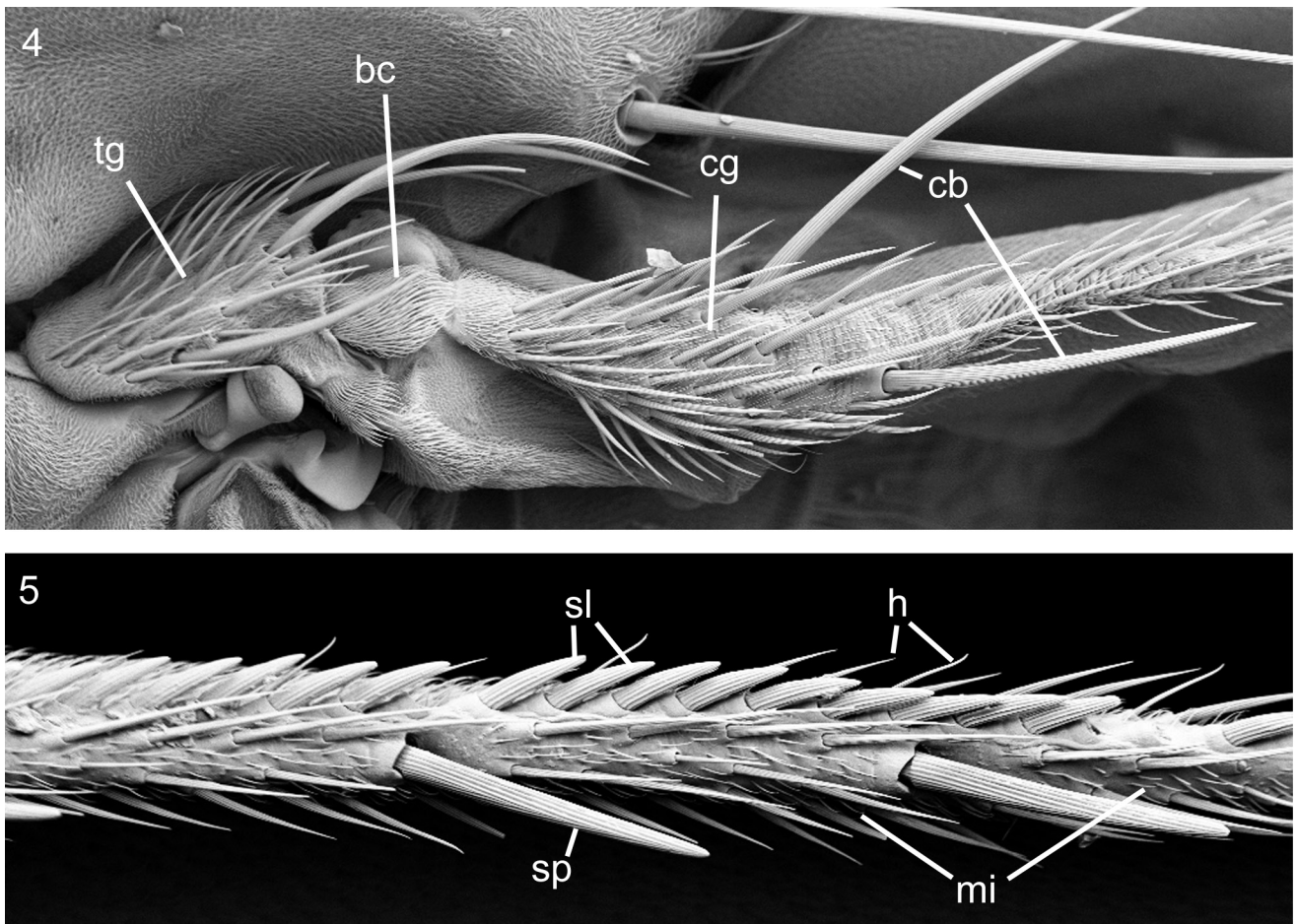
It is important to have some understanding of sexual dimorphism, in addition to that of postabdominal parts, in order to evaluate the taxonomic significance of certain characters, and to distinguish taxonomic differences from sexual differences (see D. McAlpine, 1992 in connection with *Cobergius*). Also, the nature of sexual dimorphism may indicate significant points in the biology of the insects, and may relate to mutual recognition by conspecific individuals (D. McAlpine, 1988).

In flies of several schizophoran families the macrotrichia of some parts of the body are more numerous, longer, and finer in males than in females, and in the former they may have a tendency to be represented by mollisetae. Mollisetae are long macrotrichia (socket-based hair-like structures), which are strongly developed for part of the length, but are relatively thin and soft at their apices (D. McAlpine, 1991a). Mollisetae are present to a conspicuous extent in the males of certain species of Coelopidae, Helcomyzidae, Heteromyzidae, Piophilidae, and Scathophagidae. In some species of Helosciomyzidae larger numbers of mollisetae on the sternopleuron and fore femur of the males tend to replace the major bristles, which, however, remain well differentiated in conspecific females. Specimens of *Helosciomyza* spp. can be sexed solely by reference to the setulae on the ventral surface of the fore and hind femora, which are more numerous, finer, and more erect in males than in females.

The legs of male helosciomyzids are frequently stouter than in conspecific females. This is particularly noticeable in the femora. Also some or all of the tarsal segments are often shorter and broader in males than in females (Figs 6, 7).



Figures 1–3. Left hind tibia, anterior view of apical part. (1) *Neosciomyza peckorum*. (2) *Helosciomyza bickeli*. (3) *Cobergius vittatus*. as, apical ventral spurs; pd, preapical dorsal bristle; sa, subapical anterior bristle.



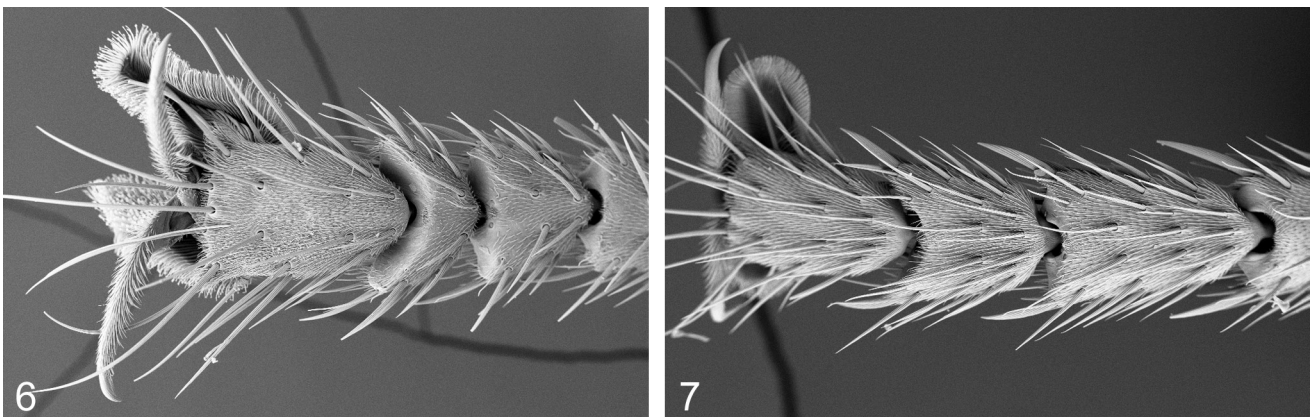
Figures 4, 5. *Luta luteipennis*, left wing. (4) anterior view of basal section. (5) anterior view of part of costa near end of subcosta. *bc*, basicosta; *cb*, costagial bristles; *cg*, costagium; *h*, hairs; *mi*, microtrichia; *sl*, spinules; *sp*, spine; *tg*, tegula.

I use the term scopula (as commonly used in Arachnology) to designate certain pad-like brushes of microtrichia on the ventral surface of some tarsomeres. The microtrichia comprising the scopulae are dense, longer and more erect than those forming the pruinescence of much of the cuticular surface, and are of remarkably even length, giving a velvety appearance (Figs 9, 10). These microtrichia differ from the tenent hairs of the pulvilli in being finely tapered apically, without the terminal adhesive discs.

I find scopulae to be developed to a varying extent on the fore and hind tarsi of males of all Australian genera and species groups of the Helosciomyzidae, also in

the New Zealand genera *Napaeosciomyza* Barnes and *Dasysciomyza* Barnes, but they are probably least developed in *Luta luteipennis* and *Cobergius vittatus*. They reach their maximum development on the hind tarsus of males of *Neosciomyza anhecta* and *N. peckorum*; scopulae are present on all segments, and that on the basitarsus extends for its full length (Figs 8, 9). In females of probably all taxa scopulae are less developed than in males and are often vestigial.

In males of *Helosciomyza australica* and *Dasysciomyza* spp. the hind basitarsi have stout sub-basal ventral spines (strongly thickened black macrotrichia) which are absent in the females. The tarsal claws of male *Helosciomyza* spp.,



Figures 6, 7. *Helosciomyza macalpinei*, distal part of fore tarsus. (6) male. (7) female to same scale.

especially those of the fore-tarsus, are longer and less curved than those of the females (Figs 6, 7).

In males of *Helosciomyza fuscinevris* there is a group of minute setulae on the pleural membrane of the abdomen immediately behind and below spiracle 1. In females of the species these setulae are usually absent, but sometimes a few are present.

In the *fuscinevris* group of *Helosciomyza*, abdominal sternite 5 of the male is partly divided by median desclerotization and bears on each side a zone of particularly dense black setulae. No such division or specialized setulose zones are present in the female.

### Taxonomy of Helosciomyzidae

The Helosciomyzidae are probably most closely related to the Dryomyzidae, which are restricted to the Northern Hemisphere, or perhaps to the Helcomyzidae, represented in both hemispheres but not in Australia (see Meier and Wiegmann, 2002 for probable phylogenetic relationships). The Helosciomyzidae can be separated from these related families by the following combination of characters.

- 1 Costa of wing with a series of large spaced spines near and beyond termination of subcosta (Fig. 5).
- 2 Costagial bristles two, anteroventral one located distad of anterodorsal one (Fig. 4).
- 3 Anal cell (cell cup) less than half as long as second section of vein 4 (between basal and anterior crossveins).
- 4 Anal crossvein (transverse section of CuA2) very strongly recurved.
- 5 Distal section of vein 6 (CuA2+A1) thickened on c. basal third or less, then becoming rather abruptly attenuated, but visibly reaching wing margin.
- 6 Prosternum without precoxal bridges.
- 7 Metasternum without setulae.
- 8 Three postgenal bristles generally differentiated (Fig. 13), except in occasional deviant individuals.
- 9 Tarsi with distal segments depressed.
- 10 Preabdominal spiracles located in pleural membrane.
- 11 In males, fore and hind basitarsi without rounded terminal ventral projection.
- 12 In females, abdominal tergites 3 to 5 without single enlarged lateral marginal bristle, with largest bristles on posterior margin.
- 13 In females, abdominal tergite 7 and sternite 7 separated by pleural membrane.

Most helosciomyzids have a distinct membranous line in the mid-dorsal region partly separating abdominal tergites 1 and 2, and Barnes (1981: table 1) has given this character as a distinction between “Helosciomyzidae sensu stricto” and “Dryomyzidae sensu stricto”, which have this suture indistinct. However, in the helosciomyzid genus *Polytocus* Lamb there is no trace of such a suture, and in *Sciogriphoneura* Malloch it is reduced to a slight groove without desclerotization. The character is therefore omitted from the above list.

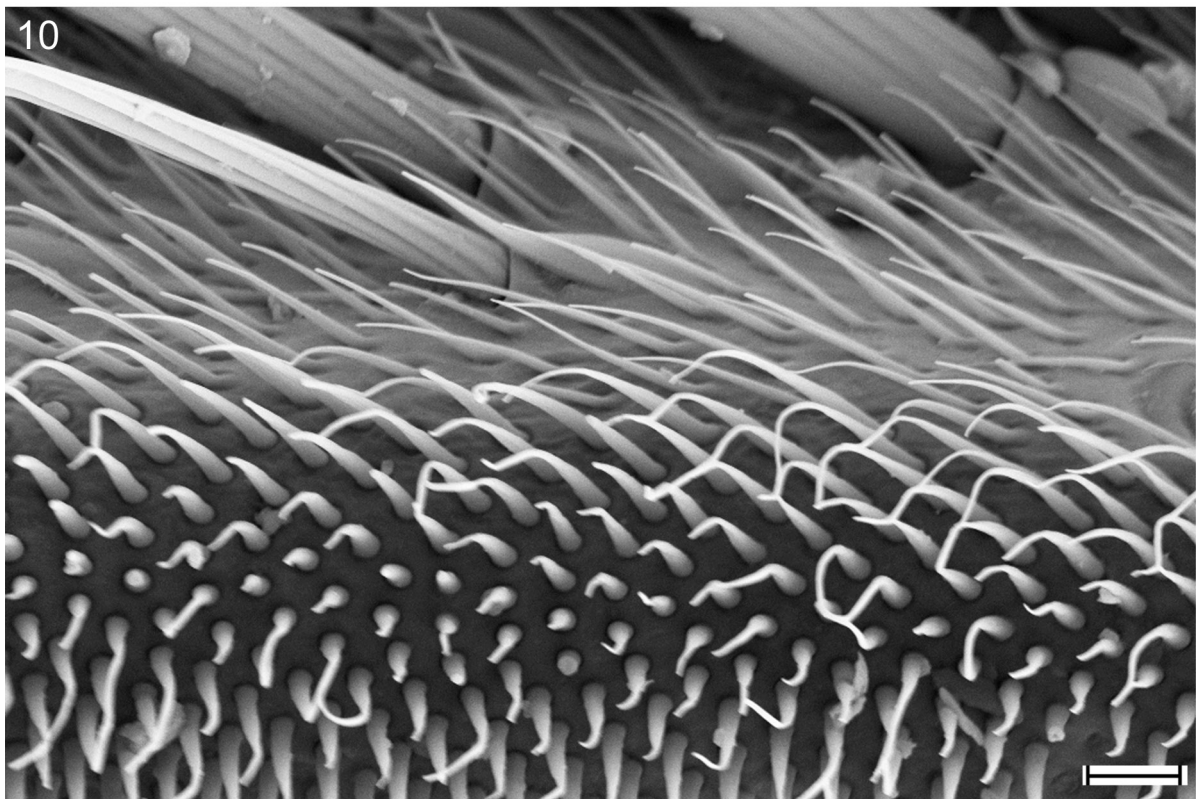
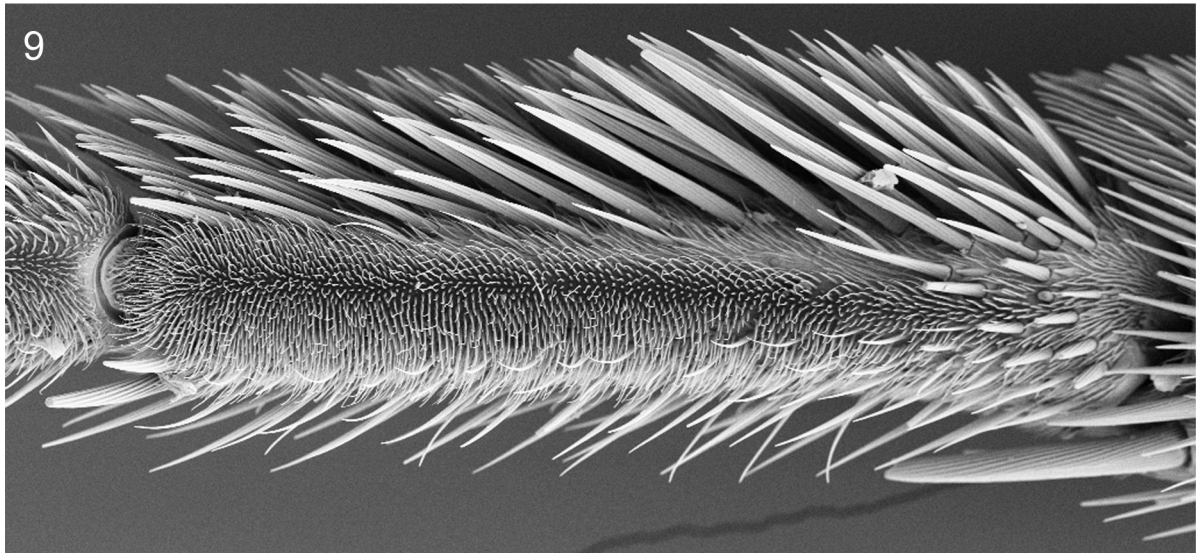
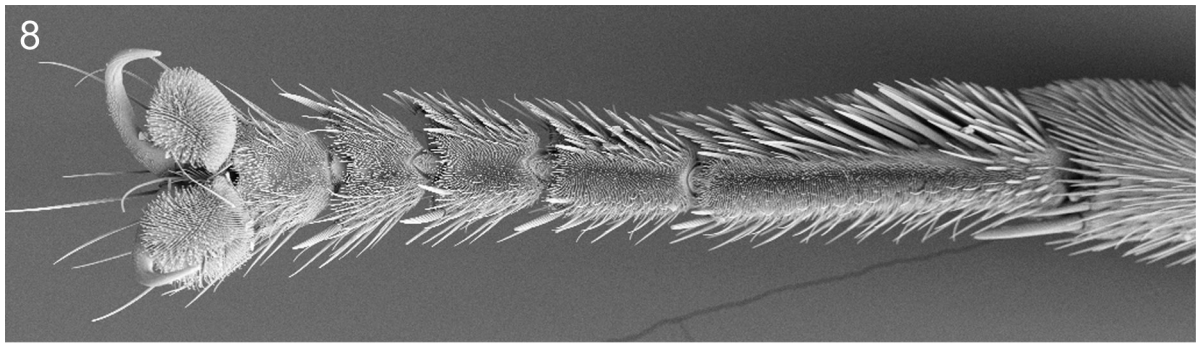
The Neotropical genus *Sciogriphoneura* Malloch was placed in the Dryomyzidae by Steyskal (1977) and in the Helosciomyzidae by Barnes (1981). My study of *S. nigri-ventris* Malloch, shows it to agree with the Helosciomyzidae

in the first twelve of the numbered character states given above, except that one specimen shows asymmetrical variation in the number of postgenal bristles (character 8). In the only available female segment 7 is not visible, so that character 13 cannot be assessed. On the other hand, typical dryomyzids show disagreement in characters 1, 2, 3, 4, 5, 8, 9, 10, 11 (the last character inconsistently); but this assessment does not include the genus *Oedoparena* Curran, which I regard as doubtfully referable to Dryomyzidae. [The larvae of *Dryomyza* Fallén (objective syn. *Neuroctena* Rondani) and *Oedoparena* (see Ozerov, 1998, or, for more detail, Burger *et al.*, 1980, and Barnes, 1984) are so different in external form and structure that discovery of a strong set of synapomorphies is required to justify the inclusion of both taxa in one family]. Barnes (1981: 64) recorded that *Sciogriphoneura* possesses, in the male, both the anterior epandrial process and the basal surstylar process, as in many more plesiomorphic helosciomyzids, but the former is also present in typical dryomyzids.

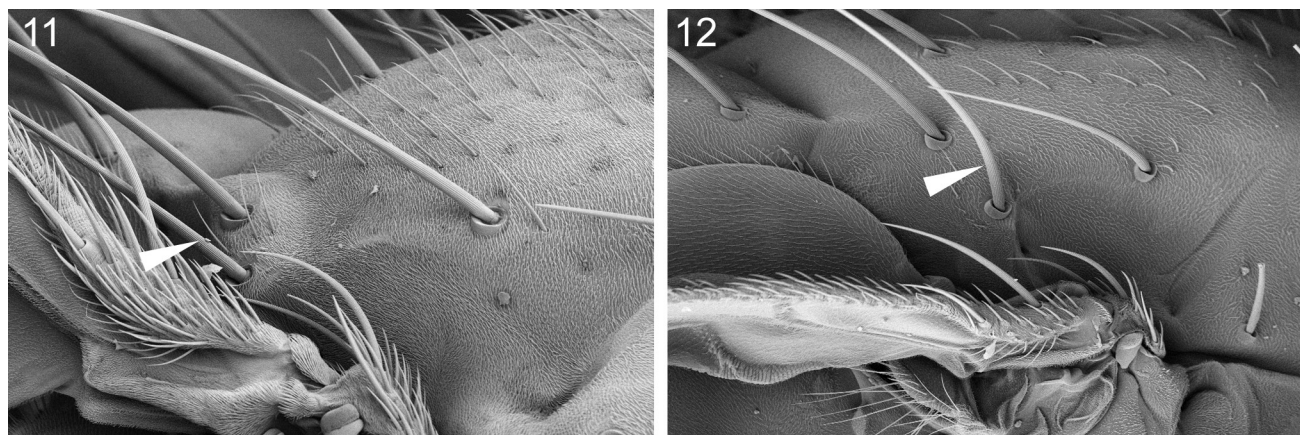
On the above basis I confidently assign *Sciogriphoneura* to the Helosciomyzidae. I believe that this correction, together with others made previously (D. McAlpine, 1995), leaves no valid record of the Dryomyzidae in the Southern Hemisphere.

Griffiths (1972) included the endemic New Zealand group, now called Huttoninidae, in the Helosciomyzidae, but Barnes (1979, 1981) considered that there were no clear synapomorphies to justify combining the two groups. Colless and McAlpine (1991) recognized the Huttoninidae as a separate family. The Huttoninidae are distinguished from the Helosciomyzidae by having: no spaced costal spines; distal section of vein 6 strongly sclerotized, but terminating abruptly at c. three quarters of distance to wing margin; vein 7 not forming a visible crease beyond alula; abdomen of female with tergite 7 and sternite 7 fused. Barnes (1979) also stated that the huttoninids differ in having the aedeagus bilobed, covered with fine scale-like structures. I am not at present in a position to test the consistency of this condition. The huttoninids generally have the ptilinal fissure less developed than in the helosciomyzids, though variable in extent and perhaps not always functional. In the Helosciomyzidae the ptilinal fissure apparently encloses a functional ptilinum, and its lateral arms are moderately long, usually ventrally diverging from the parafacial suture (terminating close to parafacial suture in *Sciogriphoneura*). The Helosciomyzidae, in common with the Dryomyzidae, Helcomyzidae, Coelopidae, and Heterocheilidae, have the postalar callus of the mesoscutum convex, defined by an oblique depression or shallow groove on the anteromedian side, and bearing two large bristles (Fig. 11). In the Huttoninidae, as in the Lauxaniidae, the postalar callus has no separate convexity, and no oblique depression separates it from the general dorsal surface of the mesoscutum (Fig. 12); it bears a typical postalar bristle on its lateral angular prominence and the second, more dorsal bristle occupies the position of a typical posterior intra-alar bristle.

From Australasian taxa of Sciomyzidae, the Helosciomyzidae can generally be distinguished by having the prelabrum (“clypeus” in error) anteriorly prominent and only narrowly separated from the face (more reduced in the New Zealand genera *Napaeosciomyza* Barnes and *Dasysciomyza* Barnes), the costa with prominent spaced spines, and usually two large sternopleural bristles (anterior one sometimes reduced in very hirsute males). I have noted previously (D.



Figures 8–10. *Neosciomyza peckorum*, ventral views of male left hind tarsus. (8) entire tarsus. (9) detail of basitarsus showing scopula. (10) microstructure of scopula; scale = 10  $\mu$ m.



Figures 11, 12. (11) *Luta luteipennis*, part of thorax showing right postalar callus. (12) *Huttonina abrupta* Tonnoir & Malloch, part of thorax showing right postalar region. Postalar bristle indicated.

McAlpine, 1991b) differences between the Helosciomyzidae and Heterocheilidae.

The Helosciomyzidae, in contrast to the Dryomyzidae, are restricted to the Southern Hemisphere. The majority of the 27 or 28 known species live in the temperate zone, but in both Australia and South America one species is recorded

for the tropics. Of the 15 known Australian species, only two widely distributed species are recorded for Queensland, whereas at least eight species live in Tasmania, four of them possibly endemic to the state. Eleven species are recorded for New Zealand (Barnes, 1981), but it is uncertain if one of these is the same as an Australian species.

**Key to Australian genera of Helosciomyzidae**

- 1 Dorsocentral bristles four large pairs; costa near mid-length with spaced dorsal spines in addition to anterior ones; male: surstylus without posterobasal foot, with simple almost horizontal basal articulation with lateral margin of epandrium, and much removed from base of cercus posteriorly ..... *Eurotocus*, p. 57
- Dorsocentral bristles usually two large pairs; costa with an anterior series of spaced spines only; male: surstylus with broad or narrow posterobasal foot, articulating with posterior margin of epandrium, and approaching base of cercus ..... 2
- 2 Anterior bristle of hind femur absent, at least in male, small if present in female; sternopleuron on upper half or more with very generally distributed numerous fine hairs, sometimes forming long mollisetae in males; mesopleuron densely greyish pruinose, without tawny orange zone; subapical anterior bristle of hind tibia absent or much smaller and thinner than preapical dorsal bristle (Figs 1,3) ..... 3
- Anterior bristle of hind femur large (sometimes duplicated); sternopleuron on upper part usually with narrower oblique tract of hairs, leaving bare anterodorsal and posterior zones; mesopleuron generally with tawny orange zone on mid or upper part; subapical anterior bristle of hind tibia present, about as stout as preapical dorsal bristle, though shorter (Fig. 2) ..... 4
- 3 Scutellum concave mid-dorsally; antennal segment 3 short, sub-circular; antennal segment 5 (preapical segment of arista) rounded, not much longer than its maximum diameter; male: hind basitarsus without scopula, with dense ventral setulae ..... *Cobergius*, p. 69
- Scutellum convex dorsally; antennal segment 3 rounded oval, markedly longer than deep; antennal segment 5 cylindrical, c. twice as long as its diameter; male: hind basitarsus with dense ventral scopula for almost whole length (Fig. 9) ..... *Neosciomyza*, p. 68
- 4 Halter with brown capitellum; antennal segment 2 black (dark brown in faded specimens); height of cheek not more than 0.25 of height of eye; wing membrane deep yellow; male postabdomen:

- anterior epandrial process and basal surstylar process present;  
aedeagus without epiphallus ..... *Luta*, p. 57
- Halter entirely yellow; antennal segment 2 tawny-brown;  
height of cheek greater than 0.25 of height of eye; wing  
membrane usually less distinctly pigmented, except sometimes  
for suffusion around cross-veins; male postabdomen: anterior  
epandrial process and basal surstylar process absent; aedeagus  
with elongate epiphallus ..... *Helosciomyza*, p. 58

### Genus *Eurotocus* Steyskal

*Eurotocus* Steyskal, in Steyskal & Knutson, 1979: 728. Type species (original designation) *Eurotocus australis* Steyskal.

This monotypic genus is distinguished as indicated in the key to genera.

#### *Eurotocus australis* Steyskal

Fig. 13

*Eurotocus australis* Steyskal, in Steyskal & Knutson, 1979: 728–730, figs 1, 3–6, 28–33, 38, 39 (not figs 36, 37 as listed by Steyskal); Barnes, 1981: 53–54, figs 7, 8.

**Type material** (re-examined D.K.M.). Holotype ♂. Victoria: Mount Baw Baw, near Tanjilbren, 4400 ft [c. 1340 m], 30.xi.1964, G.L.B.–64132 (AM K264608). Postabdomen in micro-vial on pin. Allotype ♀. Victoria: same data as holotype (AM). Paratypes. South Australia and Victoria: see list of Steyskal and Knutson (1979) (AM, SAM).

**Other material examined** (localities only given). Victoria: Lake Mountain (MV); Mount Donna Buang, near summit (AM). New South Wales: 5.6 km W of Perisher Valley, Kosciuszko National Park (AM).

**Distribution.** Victoria: mainly mountainous areas. South Australia: Adelaide and southeastern districts. New South Wales: Snowy Mountains district.

#### Notes

Steyskal and Knutson (1979) described the puparium of this species, and recorded the larvae as found in agaric fungi at Adelaide by Adolfo Lutz in 1892, perhaps during a brief stop-over by that Brazilian entomologist.

### Genus *Luta* n.gen.

**Type species:** *Helosciomyza luteipennis* Steyskal.

**Description.** Moderately large, robust flies for family, agreeing with *Helosciomyza* s.str. in most characters.

**Head** slightly longer than high; height of cheek generally slightly less than one quarter of height of eye; cheek anteriorly usually with only the one peristomial series of setulae. Antennal segment 2 black (unfaded specimens); segment 3 largely black, rounded-oval; segment 5 subcylindrical, c. twice as long as its diameter.

**Thorax.** Dorsocentral bristles two pairs; scutellum convex dorsally, with two pairs of bristles; upper part of sternopleuron with relatively few hairs (or long setulae) on central section, bare anteriorly and posteriorly. Mid femur with non-seriate anterior bristles of various sizes; hind femur with two or more anterior to anterodorsal bristles; fore tarsus stouter in male than in female, with segment 4 not as short as in *Helosciomyza fuscinevris* group; fore tarsal claws notably longer in male

than in female; hind basitarsus of male without scopula, with an anteroventral series of short stout spinules extending for most of its length, these spinules less developed in female. Wing: costa with anterior spaced spines; dorsal series of spines absent. Halter with yellow pedicel and brown capitellum.

**Male postabdomen.** Anterior epandrial process and basal surstylar process present; epiphallus absent (see Steyskal & Knutson, 1979: figs 19–21).

#### Notes

The genus includes only *Luta luteipennis*.

Barnes (1981) included *L. luteipennis* in the genus *Neosciomyza*, but it appears that the points of resemblance are mainly plesiomorphies, or, in the case of the convex scutellum, also shared with a relatively isolated species in the genus *Helosciomyza*, *H. anaxantha* Steyskal.

*Luta* is further distinguished from *Neosciomyza* by the following characters: the anterolateral margin of the epandrium is flexed inwards on each side to form a well defined crescentic plate lying in a transverse plane, the surstylus is narrowed basally and is without an internal ridge defining the basal plate, the basal surstylar process is short and stout, and the anterior epandrial process has a thick blunt apex with a brush of dense, curved pubescence.

Probably *Luta* is most closely related to *Helosciomyza* as delimited here and by Barnes (1981), but it lacks the apomorphic conditions of the male postabdomen, which help to define the latter genus.

The generic name is derived from the name of the type species and is grammatically feminine.

#### *Luta luteipennis* (Steyskal) n.comb.

Figs 4, 5, 11

*Helosciomyza luteipennis* Steyskal, in Steyskal & Knutson, 1979: 736, figs 19–22.

*Neosciomyza luteipennis* (Steyskal).—Barnes, 1981: 61–63, figs 30, 31.

**Type material** (re-examined D.K.M.). Holotype ♂. New South Wales: Mount Wilson, Blue Mountains, 11.xii.1959 (not 1969 as given by Steyskal), D.K.M. (AM K264312). Double-mounted on micro-pin through polyporus, repaired with glue on thorax. Allotype ♀, same data as holotype. Paratypes. New South Wales: Mount Wilson and Wright's Lookout, as listed by Steyskal (AM, ANIC).

**Distribution.** New South Wales: higher mountains of Northern and Central Tablelands districts.

#### Notes

At Mount Wilson, Blue Mountains, I have repeatedly found *L. luteipennis* in small numbers in shaded areas in the temperate rain forest, altitude c. 900 m, mainly in the months from October to April.



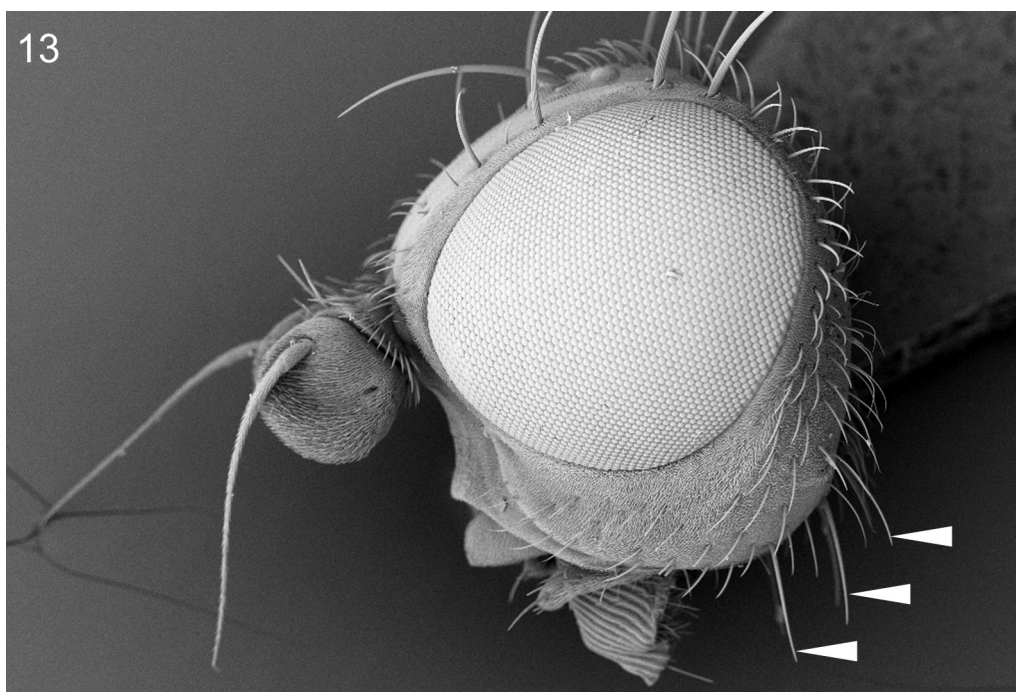


Figure 13. *Eurotocus australis*, head of female. Three postgenal bristles indicated.

### Genus *Helosciomyza* Hendel

*Helosciomyza* Hendel, 1917: 3. Type species (monotypy): *H. ferruginea* Hendel [= *Helosciomyza fuscinevris* (Macquart)].

#### Notes

*Helosciomyza* is characterized as indicated in the above

key, but is particularly justified by the following three apomorphic conditions of the male postabdomen, not simultaneously present in other Australian genera: (1) anterior epandrial process absent; (2) basal surstylar process absent; (3) elongate, freely projecting epiphallus present on aedeagus.

#### Key to species groups in *Helosciomyza*

- 1 Scutellum convex dorsally; anterior (r-m) crossvein without trace of infuscation; palpus dark grey to black on c. distal half; mesoscutum without pattern of grey longitudinal stripes; male: segment 4 of fore tarsus subtriangular and longer than wide; abdominal sternite 5 with setulae not concentrated in two dense patches ..... *anaxantha* group, only species *H. anaxantha*, p. 58
- Scutellum flat dorsally; anterior crossvein infuscated, surrounded by brown mark (in unfaded specimens); palpus usually almost entirely yellow; mesoscutum (in clean, dry specimens) tawny, with pattern of five pale grey-pruinescent longitudinal stripes (two outer ones of each side partly joined), in addition to pale greyish lateral marginal zones; male: segment 4 of fore tarsus very short, its dorsal surface subrescenscent (Fig. 6); abdominal sternite 5 with short dense setulae forming two patches ..... *fuscinevris* group, p. 59

#### *Helosciomyza anaxantha* species group

This group is characterized as indicated in the above key. It resembles the genera *Luta* and *Neosciomyza* in the convex scutellum and less shortened segment 4 of the male fore tarsus, but lacks the anterior epandrial process and the basal surstylar process, both present in the males of those groups. Usually there are just two pairs of dorsocentral bristles but one specimen has three well-developed pairs. Among Australian helosciomyzids, the combination of dorsally convex scutellum with absence (without trace) of the proepimeral bristle occurs only in this group.

The only included species is *H. anaxantha* Steyskal.

#### *Helosciomyza anaxantha* Steyskal

*Helosciomyza anaxantha* Steyskal, in Steyskal & Knutson, 1979: 731–733, figs 11, 12; Barnes, 1981: 54–56, figs 9, 10.

**Type material** (re-examined D.K.M.). Holotype ♂. Tasmania: Hellyer Gorge, Waratah Highway, 8.i.1960, D.K.M. (AM K263391). Glued to card point, much damaged and badly repaired. Postabdomen in micro-vial on pin. Paratypes. Tasmania: 1♂, 2 mi. (c. 3.2 km) S of Oonah, Waratah Highway, c. 1300 ft (c. 400 m), 7.i.1960, D.K.M. (AM); 1♂, Russell Falls, Mount Field National Park, 13.i.1960, D.K.M. (AM); 1♂, Hartz Mountains, 800 ft (c. 240 m), 20.i.1960, D.K.M. (AM).

**Other material examined.** Tasmania: 2♂♂, 1♀, Mount Wellington, lower slopes, wet forest, 12.ii.1963, D.H.C. (ANIC).

**Distribution.** Tasmania: apparently widely distributed but endemic to the state. The record for Australian Capital Territory (Black Mountain, in Steyskal & Knutson, 1979: 732) is due to a misidentification (see under *Neosciomyza peckorum*).

### *Helosciomyza fuscinevris* species group

This is a very uniform grouping, except for some minor features of chaetotaxy, and is characterized as in the above key.

Included species are: *Helosciomyza fuscinevris* (Macquart) (synonyms *H. ferruginea* Hendel, *H. aliena* Malloch), *H. subalpina* Tonnoir & Malloch (New Zealand only), *H. bickeli* n.sp., *H. subacuta* n.sp., *H. nevoissi* n.sp., *H. australica* Steyskal, *H. steyskali* n.sp., *H. obliqua* n.sp., *H. driesseni* n.sp., *H. macalpinei* Steyskal.

### Key to Australian species of *fuscinevris* group

- 1 Pteropleuron (anepimeron) setulose; hind tibia without dark zone near base; male: abdominal pleural membrane with group of minute setulae near spiracle 1 (often absent in female); surstyli as in Figs 16, 17 (slightly variable) ..... *fuscinevris*, p. 60
- Pteropleuron bare; hind tibia usually with brown to black sub-basal or basal zone; no setulae present near abdominal spiracle 1 (male, female); male surstylus variable in shape ..... 2
- 2 Hypopleuron (metepisternum) with c. 2–12 small black setulae; abdominal sternite 1 setulose; antennal segment 3 tawny-orange, without or with very indistinct darker zone; male: surstylus as in Fig. 15 ..... *bickeli*, p. 60
- Hypopleuron and sternite 1 without setulae; antennal segment 3 often with darker brown to blackish zone; male: surstylus variable ..... 3
- 3 Fore femur entirely pale tawny-yellow on basal half or more (significantly including the sometimes concealed anterior surface) ..... 4
- Fore femur largely tawny-yellow, anterior surface with distinct brown zone extending to near base (also brown distally) ..... 6
- 4 Antenna 3 brown to blackish on entire distal half or more; male: hind basitarsus with ventrobasal dense, non-linear cluster of short, thick, black suberect spinules; surstylus as in Fig. 22 ..... *australica*, p. 64
- Antenna 3 usually tawny orange at and below apex, more brownish dorsally between apex and arisal insertion and on outer lateral surface; male: hind basitarsus without such cluster of short, black spinules, occasional black setulae in this position sparse and distally inclined; surstylus otherwise ..... 5
- 5 Fore femur with conspicuous dark brown subapical spot on posterior surface; mesoscutum with pruinulent dorsocentral stripe not covering and emphasized by a darker cuticular dorsocentral stripe (pruinulent stripe faded in some preserved specimens); male: surstylus as in Fig. 21 ..... *nevoissi*, p. 63
- Fore femur with only indistinct indication of dark subapical posterior spot (dark subapical anterior spot well developed); grey-pruinulent dorsocentral and other such longitudinal stripes of mesoscutum with underlying dark brown cuticular stripes, which tend to remain when pruinulent stripes are faded; male: surstylus as in Fig. 18 ..... *subacuta*, p. 63
- 6 Antenna 3 tawny-orange, with only limited dorsal reddish brown zone; male: surstylus as in Fig. 23 ..... *steyskali*, p. 64
- Antenna 3 dark brown to blackish on distal half or more, or at least on a substantial dorsal zone (sometimes less, as in *H. driesseni*); male: surstylus otherwise ..... 7
- 7 Occipital region of head with broad supracervical zone of blackish cuticle (seen through paler pruinescence) usually with, on each side, a dorsolateral extension partly bounded medially

- by lateral occipital suture (Fig. 27); male: surstylus somewhat elongate-falcate (Fig. 25) ..... *driesseni*, p. 67
- Supracervical cuticular dark zone less developed, not extending laterad of lateral occipital suture; male: surstylus otherwise ..... 8
- 8 Proepimeral (stigmatal) bristle usually absent (check both sides); fore femur in posterior view usually showing rather diffuse dark greyish sub-basal posterodorsal zone and quite separate less diffuse dark subapical zone, on anterior surface sub-basal and distal brown zones usually separate; male: epandrium, in profile, without angular extension behind and above articulation with surstylus; surstylus as in Fig. 26 ..... *macalpinei*, p. 67
- Proepimeral bristle usually present, small; fore femur usually without two such separate dark zones on posterior surface, on anterior surface sub-basal and distal brown zones touching or fused; male: epandrium, in profile, showing angular prominence behind articulation with surstylus; surstylus as in Fig. 24 ..... *obliqua*, p. 66

### *Helosciomyza fuscinevris* (Macquart)

Figs 16, 17

*Sciomyza fuscinevris* Macquart, 1851: 276–277. Not homonym of *Sciomyza fuscinevris* Zetterstedt, 1838, now in *Tetanocera* Duméril.

*Helosciomyza ferruginea* Hendel, 1917: 33. N.syn. Not *H. ferruginea*: Steyskal, 1979: 736, mixture of other species.

*Helosciomyza aliena* Malloch, 1928: 324–325, synonymized D. McAlpine, 1992: 90.

*Helosciomyza fuscinevris* (Macquart).—D. McAlpine, 1992: 90.

**Type material.** Holotype ♂ of *Sciomyza fuscinevris*, Nouvelle-Hollande [New Holland = continental Australia, east coast added in publication—Macquart, 1851], anon. (PM, examined by D. McAlpine, 1990). Holotype ♂ of *Helosciomyza ferruginea*, Victoria, 1888 (NMW, examined by D. McAlpine 1969, P. Sehnaal 2008). Holotype ♂ of *Helosciomyza aliena*, Broken Hill [western New South Wales], 9.vi.1925, anon. (AM K264571, formerly in SPHTM).

**Other material examined** (localities only given). Northern Territory: Todd River, 9 km NE of Alice Springs (ANIC). Queensland: Eidsvold (ANIC). New South Wales: many specimens seen from many localities (not listed here), ranging from coast to far west of state and including higher ranges, mostly S of 32°S (AM, ANIC). Australian Capital Territory: numerous localities in Canberra district (ANIC). Victoria: Delegate River (AM); Benalla (AM); La Trobe University (AM, MV). Tasmania: Miena (ANIC); Lake Saint Clair (AM). South Australia: Mount Gambier (ANIC); Waite Park (ANIC); Mount Lofty (SAM); Ravine des Casoars, Kangaroo Island (AM); Stockport (ANIC); Maree (ANIC); Old Alton Downs, Simpson Desert (ANIC). Western Australia: Thomas River estuary, Esperance district (ANIC); Meerup Springs Farm, near Northcliffe (AM); near Mount Chudalup (AM); Frankland River (AM); Margaret River (AM).

**Distribution.** Temperate Australia generally, approaching the tropics in Queensland and Northern Territory (near Alice Springs), south to Victoria, Tasmania, and southern coast of Western Australia; including some high-rainfall and arid areas, sea-level to moderate altitudes.

### Notes

*Helosciomyza fuscinevris* is the only Australian species of the genus with pteropleural (anepimeral) setulae. Hypopleural setulae are usually also present, except in a few of the smallest specimens, and abdominal sternite 1 is setulose

except in a small number of females, in which this sternite is more reduced than in males.

According to Barnes (1981) this species is extremely similar to *H. subalpina* Tonnoir & Malloch, the only New Zealand species now retained in *Helosciomyza*. Barnes seems to infer that the c. 80 specimens of *H. subalpina* which he examined lack setulae on the ventral surface of vein 1 (or R1). I have carefully examined 41 Australian specimens of *H. fuscinevris*, of which 40 possess one or more minute ventral setulae on vein 1. Also the dorsal striping of the thorax is less distinct in *H. subalpina*. These data seem to indicate a significant genetic difference between New Zealand and Australian populations, but this needs confirmation by more detailed morphological and molecular studies.

The surstyli are slightly variable in shape, but in most specimens form an asymmetrical pair (Figs 16, 17); the cuticle on much of the posterior surface is thinner than elsewhere, almost membranous; pruinescence may be apparently absent or is present on part of the basal third.

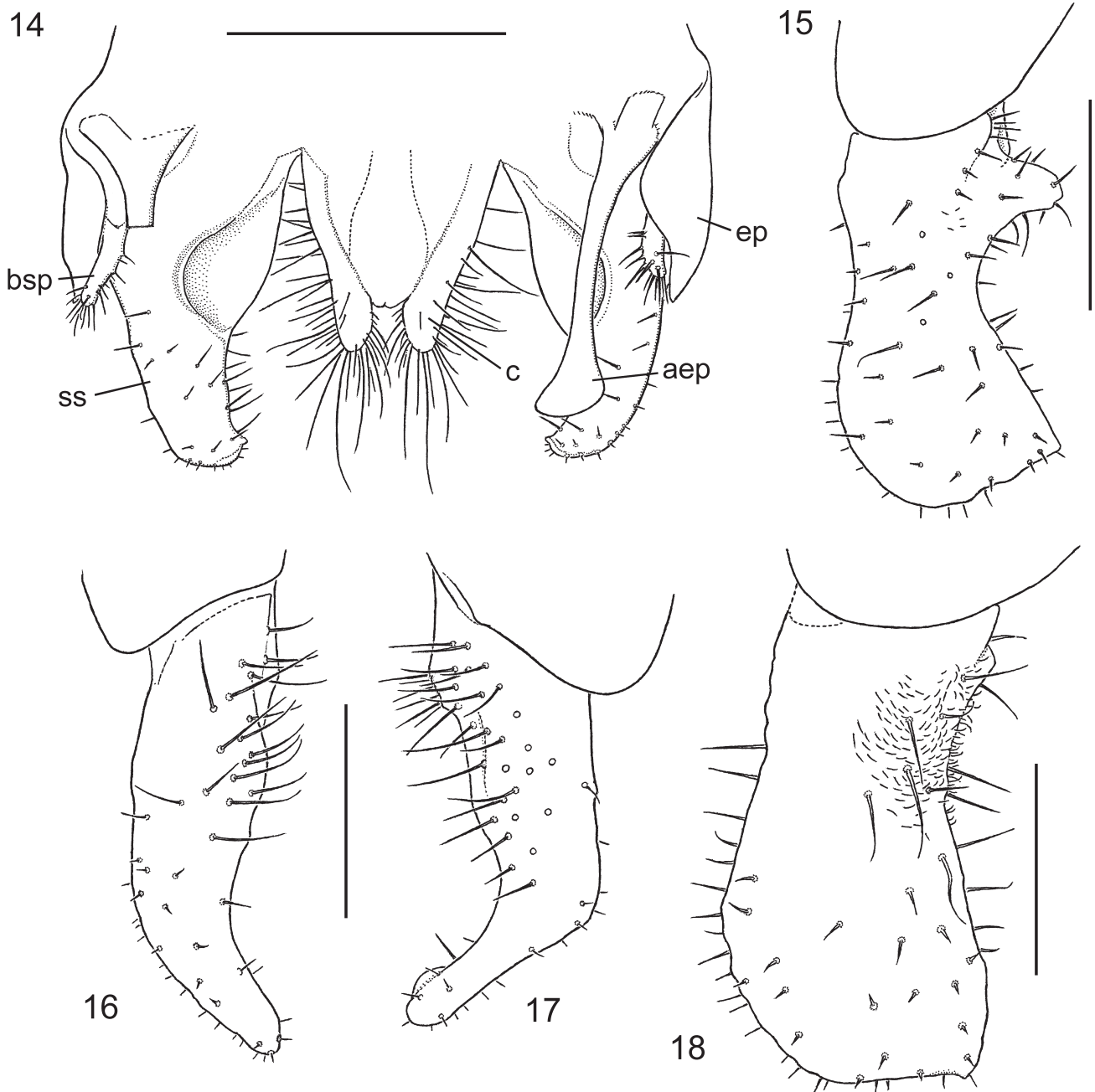
### *Helosciomyza bickeli* n.sp.

Figs 2, 15

*Helosciomyza ferruginea* Hendel.—Steyskal & Knutson, 1979: 734–736 (misidentifications; fig. 16 probably refers to *H. steyskali*, fig. 18 refers to *H. bickeli*); Barnes, 1981: 56–57 (in part, misidentification; fig. 13 does not represent *H. bickeli*).

**Type material.** Holotype ♂. New South Wales: “Mooraback”, Werrikimbe National Park, 31°09'S 152°13'E, 980 m, 6.xii.1986, D.J.B. (AM K264288). Double-mounted on micro-pin through polyporus, postabdomen in micro-vial on pin. Paratypes. New South Wales: 1♂, Gibraltar Range National Park, Feb. 1982, B.J.D. (AM); 9♂♂, Mount Banda Banda, 1200 m, Dec. 1986, D.J.B. (AM, ANIC); 1♂, 2♀♀, Cobcroft Creek, Werrikimbe, Dec. 1986, D.J.B. (AM).

**Other material examined** (localities only given). Queensland: 7 miles (c. 11 km) up Mount Lewis Road, Julatten district (ANIC); Mount Edith, N of Tinaroo Dam (ANIC); Sluice Creek, near Millaa Millaa (ANIC); Paluma (AM); Eurimbula, Miriam Vale district (AM, QM); Summer Creek, near Kenilworth (AM); Mount Tenison Woods, near Mount Glorious (AM); Bundaroo Creek, Conondale Range (AM); Killarney (UQIC); Binna Burra, Lamington National Park (AM). New South Wales: Mount Warning, near Murwillumbah (AM); Falbrook, 30 km NNE of Singleton (AM); Barrington River, W of Gloucester (ANIC); Wallaroo State Forest, N of Raymond Terrace (ANIC); Myall Lakes (AM); Myall River (AM); Mount



Figures 14–18. (14) *Neosciomyza peckorum* (Boyd River), terminal part of epandrium and associated structures, anterior view, right anterior epandrial process cut away for clarity, scale = 0.5 mm. (15) *Helosciomyza bickeli* (Cobcroft Creek), left surstylus, outer view, scale = 0.2 mm. (16) *H. fuscinevris* (Clarence, near Lithgow), left surstylus, outer view. (17) same specimen, right surstylus, outer view. (18) *H. subacuta* (Wannon River), left surstylus, outer view. Figs 15–18 all same scale. *aep*, anterior epandrial process; *bsp*, basal surstylar process; *c*, cercus; *ep*, epandrium; *ss*, surstylus.

Wilson (AM); 8 km S of Mount Wilson (AM); Roberts Creek, near East Kurrajong (AM); Narrabeen, near Sydney (AM); Willoughby, near Sydney (AM); Oxford Falls, near Sydney (AM, ANIC); Sydney (AM); Royal National Park (AM); Otford (AM). Tasmania: Frodshams Pass, near Mount Wedge (AM).

**Description** (male, female). Medium-sized brownish-variegated fly of medium build, with almost unmarked wing; most parts pruinescent and non-shining.

**Coloration** (dry, clean, non-greasy specimens). Head rufous to pale tawny dorsally with pale grey pruinescence on median zone enclosing postvertical and ocellar bristles and extending narrowly well in front of anterior ocellus and usually more than half distance from ocellus to ptilinal

suture; fronto-orbital plates greyish pruinescent; fronto-orbital margins narrowly more silvery pruinescent; upper occiput extensively grey-pruinescent, usually with tawny spot between each outer vertical bristle and eye margin; face and cheeks pale tawny-yellow with whitish pruinescence. Antenna largely tawny; segment 3 tawny-orange with at most very faint brown suffusion not forming distinct dorsal or distal zone; arista largely brown, tawny at extreme base. Prelabrum and palpus tawny-yellow, latter with black setulae and bristles. Mesoscutum orange-tawny, with broadly creamy-grey lateral margins and five additional pale grey longitudinal stripes—median and paired dorso-central and sublateral; sublateral stripe narrow, not extending in front of suture and usually

connected to dorsocentral stripe anteriorly and posteriorly; scutellum orange-tawny with pale pruinescent zone on each side dorsally and usually pale pruinescent anterior margin; humeral callus whitish-pruinescent dorsally, tawny ventrally; pleura extensively whitish-pruinescent; upper proepimeron (behind spiracle) tawny, the tawny zone extending broadly and obliquely across upper mesopleuron to membranous cleft, but leaving small posterodorsal whitish zone on mesopleuron; remainder of pleura largely orange-tawny with whitish pruinescence, changing in appearance with angle of view. Legs mainly orange-tawny; fore femur with subapical brown mark, often more distinct on anterior than on posterior surface, with no brown zone on basal half; other femora with more distinct subapical brown to blackish mark; tibiae usually with brown to blackish distal zone, usually least developed on mid tibia; hind tibia usually with sub-basal brown zone, sometimes indistinguishable; fore and hind tarsi with segments 4 and 5 brown, segment 3 usually partly brown; mid tarsus with at least segment 5 brown. Wing: largely hyaline, with diffuse brown spot in subcostal cell, small brown spot on anterior crossvein, and indistinct brownish suffusion on discal crossvein. Halter pale yellow. Abdomen tawny-brown to yellowish, not showing consistent pattern in dried specimens; all tergites thinly pruinescent, tergite 5 not less so than preceding tergites.

*Head* slightly higher than long; cheek c. 0.29–0.34 as high as eye, with scattered small setulae often tending to form a single peristomial series anteriorly; face with rather narrow, rounded median carina; the following bristles present: inner and outer vertical, long subparallel to slightly convergent postverticals, ocellar, two fronto-orbitals, anterior one shorter, usually three postgenals, posterior one situated higher than anterior one. Antenna: segment 6 pubescent on whole length, with many hairs almost as long as its basal diameter. Palpus moderately large, setulose, with some distal setulae enlarged or thickened.

*Thorax.* Mesoscutum with many non-seriate setulae, generally distributed except towards lateral margins; humeral callus with few setulae; scutellum approximately flat dorsally, without setulae; mesopleuron bare; sternopleuron ventrally in male with many long coarse setulae, in female these much less developed, leaving irregularly transverse series of major bristles well differentiated in front of coxae; pteropleuron (anepimeron) without setulae; hypopleuron (metepisternum) with minute downwardly directed setulae, varying in precise distribution and in number (two to twelve in examined specimens); the following, mostly large, thoracic bristles present: two dorsocentrals, prescutellar acrostichal, presutural, intra-alar, postalar, humeral, 1 + 1 notopleurals, proepisternal (propleural), small proepimeral (stigmatal), two upper sternopleurals. Fore femur with a series of large dorsal bristles, and on distal half, with posteroventral bristles better developed in female than in male, often with many fine almost erect ventral setulae, often including mollisetae, in male, these setulae fewer and shorter in female; mid femur with irregularly placed group of enlarged anterior setulae just beyond mid-length, one large posterior preapical bristle and, in male only, a comb-like series of posteroventral setulae just before apex; hind femur with one or two anterodorsal bristles near distal quarter, in male with many fine erect ventral setulae, in female these shorter and fewer; fore tibia with one preapical dorsal bristle; mid tibia with one preapical dorsal bristle and c. five terminal spurs of various sizes; hind tibia with long typical preapical dorsal bristle, one equally stout anterodorsal bristle between this and apex, and two

apical ventral spurs of different sizes; hind basitarsus shorter and broader in male than in female, with many setulae, but lacking basal ventral cluster of short back setulae as seen in *H. australica*; fore and hind tarsal segments 2, 3 and 4 of male with median ventral scopulae (pads of very fine, dense pubescence), these undeveloped in female; segment 4 of each tarsus in male very short and relatively broad, almost crescentic, in female little longer, subtriangular. Wing: costa with large, well spaced anterior spines (*sensu* Hackman & Väisänen, 1985), progressively smaller distally, bordering second costal, subcostal, and marginal cells; separate series of anterodorsal spaced spines absent; vein 1 consistently without setulae on ventral surface; distal section of vein 6 extending to margin, thick and well sclerotized on c. basal quarter of length, abruptly narrowed and weakened beyond.

*Abdomen.* Pleural membrane without setulae in region of spiracle 1; sternite 1 somewhat sclerotized, divided medially, setulose, better developed in male than in female; sternite 5 of male with compact zone of dense short, rather stout setulae on each side of bare median zone, setulae elsewhere on sternite 5 sparse and longer; sternite 5 of female without such differentiated zones, with scattered setulae slightly larger laterally than centrally. Male postabdomen: posterior margin of epandrium almost straight in profile, bordered by elongate basal plate of surstylus (visible in posterior view), internally without anterior process; surstylus (Fig. 15) slightly broadened basally, with almost transverse basal articular margin and prominent setulose posterior marginal tubercle arising distinctly beyond base, main distal part almost hatchet-blade shaped, rather narrowed before distal expansion, which is broadly rounded anteriorly, subacutely angular postero-apically, with narrowly inflexed distal margin, patch of microtrichia on outer surface (present in *H. steyskali*, *H. subacuta* and related species) virtually absent; basal surstylar process absent; aedeagus complex, with elongate obtuse epiphallus (spinus); aedeagal apodeme large, deep, bilaterally compressed; cerci elongate ovate, leaf-like, joined by membrane for c. half length of each. Female abdomen: spiracles 1 to 7 located in pleural membrane and distinctly removed from margins of tergites; tergite 5 and sternite 5 large and unmodified; postabdomen simple, not very extensile; tergite 6 and sternite 6 smaller than preceding sclerites; segment 7 narrower, with sternite divided longitudinally into two setulose plates; tergite 8 forming compact sclerite; sternite 8 elongate, setulose; apparent tergite 9 and sternite 9 small but distinct, setulose; cerci separate, subcylindrical with some apical setulae long and fine; spermathecae three, subspherical, with black cuticular lining, two of them attached to end of a common duct.

*Dimensions.* Total length, ♂ 5.4–5.9 mm, ♀ 6.4–6.5 mm; length of thorax, ♂ 2.6–3.0 mm, ♀ 3.1–3.2 mm; length of wing, ♂ 5.5–6.0 mm, ♀ 6.2–6.3 mm.

**Distribution.** Queensland: east coast and nearby ranges as far north as Julatten district. New South Wales: coast and nearby ranges. Tasmania: mountainous areas of south—single record. This is the only helosciomyzid species known from the Australian tropics.

## Notes

*Helosciomyza bickeli* and *H. fuscinevris* are the only Australian helosciomyzids with a setulose sternite 1. They also share the presence of minute hypopleural setulae. *Helosciomyza bickeli* differs from *H. fuscinevris* in the

absence of a brown zone on antennal segment 3, the absence of pteropleural setulae, and the differently shaped surstylus. The shape of the surstylus of *H. bickeli* somewhat resembles that of *H. steyskali* (compare Figs 15, 23), but is narrower than in that species, with much less pubescence on the outer surface. *Helosciomyza steyskali* further differs from *H. bickeli* in the absence of setulae on the hypopleuron and on the more reduced sternite 1, also the extensive brown zone on the anterior surface of the fore femur, which extends on to the basal third. The status of the little known Tasmanian population needs further investigation in view of its wide isolation from northern populations.

The specific epithet refers to Daniel J. Bickel, who collected significant material and has supported this study.

### *Helosciomyza subacuta* n.sp.

Fig. 18

**Type material.** Holotype ♂. Victoria: Wannon River, near Jimmy's [Jimmy] Creek, Grampians, 10.xii.1977, D.K.M., M.A.S. (MV). Double-mounted on micro-pin through polyporus, postabdomen in micro-vial on pin. Paratypes. Victoria: 4♂♂, 1♀ same data as holotype (AM); 1♂, Reedy Creek, 5 km E of Cann River, June 1989, D.K.M. (AM).

**Other material** (doubtfully determined specimens). New South Wales: 1♂, Kunama [near Batlow], Aug. 1961, D.H.C. (ANIC); 1♀, Boyd River crossing, Kanangra-Boyd National Park, April 2002, B.J.D., D.K.M. (AM).

**Description** (male, female). Somewhat resembling *H. bickeli*, *H. steyskali* etc.; agreeing with description of first species, except as indicated.

**Coloration.** Antennal segment 3 orange-tawny with rather extensive dorsal tawny-brown zone distad from about vicinity of arisal insertion to apex, not forming a sharply defined zone on medial surface. Mesopleuron with orange-tawny zone usually diffuse and indistinct. Fore femur, on posterior surface, tawny-yellow, with whitish pruinescence and generally no darker zones, except sometimes for a relatively small subapical grey-brown spot, on anterior surface with the usual distal brown zone but no basal or sub-basal brown zone; fore tarsus with segment 3 suffused with brown except at base; hind tibia with basal to sub-basal brownish zone. Wing: brown spot in subcostal cell absent or represented by slight yellow-brown suffusion; mark on anterior crossvein slight, that on discal crossvein obsolete.

**Head.** Height of cheek 0.36–0.39 of height of eye; scattered small setulae of cheek region usually not uniseriate anteriorly; face in profile usually less receding below than in related species.

**Thorax.** Pteropleuron and hypopleuron without setulae; proepimeral bristle absent or small.

**Abdomen.** Sternite 1 vestigial, without setulae. Male postabdomen: surstylus without posterior sub-basal tubercle or process, but shortly explanate on extreme base of posterior surface, with basal articular margin almost transverse in lateral view, with general outline slightly expanded distally or almost parallel-sided, postero-apically with short but acute prominence, distal margin in front of prominence narrowly inflexed.

**Dimensions.** Total length, ♂ 5.9–6.0 mm, ♀ 6.3 mm; length of thorax, ♂ 3.0–3.3 mm, ♀ 3.2 mm; length of wing, ♂ 6.5–7.0 mm, ♀ 6.8 mm.

**Distribution.** Victoria: lowlands or near-lowlands in both east and west of state. New South Wales: only doubtfully determined specimens from central and southern highlands (see note below).

### Notes

Together with *Helosciomyza steyskali*, typical populations of *H. subacuta* are distinguished from other species of the *fuscinevris* group by having the pteropleuron and abdominal sternite 1 without setulae, the infuscation on antennal segment 3 not very intense and more or less restricted to the dorsal half, and, apparently, no hypopleural setulae. The fore femur lacks any brown zone on the basal half, in contrast to *H. steyskali*, *H. obliqua*, and *H. macalpinei*. The shape of the surstylus is distinctive (Fig. 18), as it is somewhat elongate, lacks a sub-basal posterior process, but has an acute, slightly distally inclined posterodistal angle. Segment 3 of the fore tarsus is less strongly browned distally than in *H. steyskali*, but, as the pigment fades slightly in old specimens, this character must be interpreted with care and the placement of females is difficult.

Two specimens listed above from localities in New South Wales are doubtfully referred to *H. subacuta* until their respective local populations are better known. The male from Kunama generally resembles specimens from Victoria but has hypopleural setulae, a condition otherwise only known for Australian *Helosciomyza* species in *H. fuscinevris* and *H. bickeli*, but this Kunama specimen lacks the setulae on sternite 1, normally present in those species; its surstylus is typical of *H. subacuta* in shape, but has setulae on the very slightly prominent posterobasal tubercle. The specimen from Boyd River is typical of *H. subacuta* in all features known for the female, but it is desirable that local males be examined for more decisive identification of the population.

The specific epithet is a Latin adjective, in reference to the subacute posterodistal angle of the surstylus.

### *Helosciomyza nevoissi* n.sp.

Fig. 21

**Type material.** Holotype ♂. Tasmania: Pelion [probably Pelion Hut vicinity, c. 41°50'S 146°03'E, c. 870 m—E.D.E. pers. comm.], 9.i.1991, I.D.N., E.D.E. (ANIC). Impaled on long pin after preservation in ethanol; genitalia extended and exposed. Paratypes. Tasmania: 1♂, 1♀, same data as holotype (AM, ANIC); 1♂, 1♀, Bluff Hill, 12 km S of Marrakesh, near Arthur River, Nov. 1974, A.N. (MV).

**Description** (male, female). Resembling *H. bickeli* and especially *H. subacuta*; agreeing with description of former species, except as indicated below.

**Coloration** (all specimens with pruinescence of head and thorax somewhat discoloured through initial immersion in liquid or retention in a humidified container, but cuticular pigment apparently unfaded). Upper occiput apparently without tawny spot between each outer vertical bristle and eye margin. Antennal segment 3 tawny, with only slightly darker tawny dorsal zone. Mesoscutum without dark cuticular stripes underlying pruinescent longitudinal stripes. Fore femur pale orange-tawny, with dark brown subapical spot on posterior surface narrowly connected dorsally to larger subapical brown mark on anterior surface, but usually without brown zones on basal three-quarters of length; other femora with dark brown apical to subapical zones; tibiae

with brown apical zones, hind tibia with additional sub-basal brown zone; segment 3 of fore tarsus largely brown. Wing with slight brown markings as in *H. bickeli* etc.

*Head.* Cheek 0.34–0.35 as high as eye.

*Thorax.* Pteropleuron and hypopleuron without setulae; proepimeral bristle minute or absent. Legs and wing much as in *H. bickeli*.

*Abdomen.* Sternite 1 almost completely desclerotized, without setulae. Male postabdomen: surstylus approximately transverse at basal articulation, shaped somewhat like that of *H. subacuta* but broader, more broadly truncate apically, with rather large posterobasal setulose tubercle (inconspicuous from some angles), numerous but not dense long setulae or mollisetae near middle of outer surface, and posterior sub-basal patch of microtrichia (Fig. 21). Female: postabdominal sclerites apparently as described for *H. bickeli*.

*Dimensions.* Total length, ♂ 5.7–7.7 mm, ♀ 7.0–7.7 mm; length of thorax, ♂ 2.6–3.7 mm, ♀ 3.3–3.4 mm; length of wing, ♂ 6.3–7.7 mm, ♀ 7.4 mm.

**Distribution.** Tasmania: north-western districts, including elevations of c. 870 m or more.

### Notes

*Helosciomyza neboissi* is most similar to *H. subacuta*, which it resembles in the absence of setulae on sternite 1, in coloration of the antenna, and in the usual absence of any brown zone on the anterior surface of the fore femur other than the subapical zone (but one specimen shows some brown suffusion on the more basal part of the anterior surface of both fore femora). It differs from *H. subacuta* in the characters indicated in the key and, in the male, in the broader surstylus with setulose basal tubercle. Also, the two species are perhaps geographically isolated as indicated by presently available data.

The specific epithet refers to Arturs Neboiss, formerly of the Museum of Victoria, who first collected the species, and is remembered for his helpfulness and hospitality.

### *Helosciomyza australica* Steyskal

Figs 20, 22

*Helosciomyza australica* Steyskal, in Steyskal & Knutson, 1979: 735, figs 14, 15, 25–27, 34–37; Barnes, 1981: 56, figs 11, 12.

**Type material** (re-examined D.K.M.). Holotype ♂. New South Wales: Picton Lakes [Thirlmere Lakes], “Bred larva”, 2.xi.1936, anon. (AM K264619). Cleared abdomen in micro-vial on same pin. Allotype ♀. Similar data to holotype, “#5”, 8.xi.1936; puparium (also “#5”) in capsule on separate pin (AM). Paratypes. 2♂♂, 3♀♀, similar data to holotype, apparent emergence dates 1.xi.1936 and 2.xi.1936 (AM).

**Other material** (identification confirmed D.K.M.). New South Wales: Careel Bay, Avalon (*Casuarina* swamp, land now cleared and reclaimed), June 1962, D.K.M. (AM); 1♂, Otford (area now a residential zone), Nov. 1962, D.K.M. (AM).

Female specimens from more southern localities (whence no confirmatory males). New South Wales: Swan Lakes, near Sussex Inlet (AM); Tantawangalo Mountain, near Candelo (AM). Victoria: Mount Donna Buang, near summit, Warburton district (AM). Tasmania: near Russell Falls, Mount Field National Park (AM).

**Distribution.** New South Wales: lowlands of Sydney district, between c. 33°39'S and 34°14'S. I have seen no specimens from the Sydney district collected after 1962. Possibly also more southern districts of New South Wales, Victoria, and Tasmania.

### Notes

The male has the surstylus distinctively shaped and quite without pruinescence in the two specimens viewed under high magnification (Fig. 22), and a distinctive dense, non-linear cluster of short, thick black setulae ventrally at the base of the hind basitarsus, but no such diagnostic structures have been found in the female. Among the species with extensively infuscated antennal segment 3 and no setulae on the hypopleuron and abdominal sternite 1, *H. australica* differs from *H. obliqua* and *H. macalpinei* in having the fore femur entirely tawny-yellow on both anterior and posterior surfaces, except for the subapical brown mark, and fore-tarsal segment 3 is only slightly browned distally. These conditions alone may be inadequate as a reliable diagnostic indicator, especially as only females have been obtained in the apparent southern part of the species' range, and there could be other somewhat similar undocumented species in these areas. These females generally show a slight apical browning of the palpus which may be decurrent along its ventral margin, but the type specimens and the two additional males are apparently too old and faded to show this condition distinctly. In *H. subacuta*, with similarly coloured fore femur to *H. australica*, the palpus is consistently pale yellow to the apex and antenna 3 has relatively little infuscation. The small proepimeral bristle may be present or absent in *H. australica*.

Unfortunately the reared type specimens from Picton Lakes carry no information on larval habitat or habits.

### *Helosciomyza steyskali* n.sp.

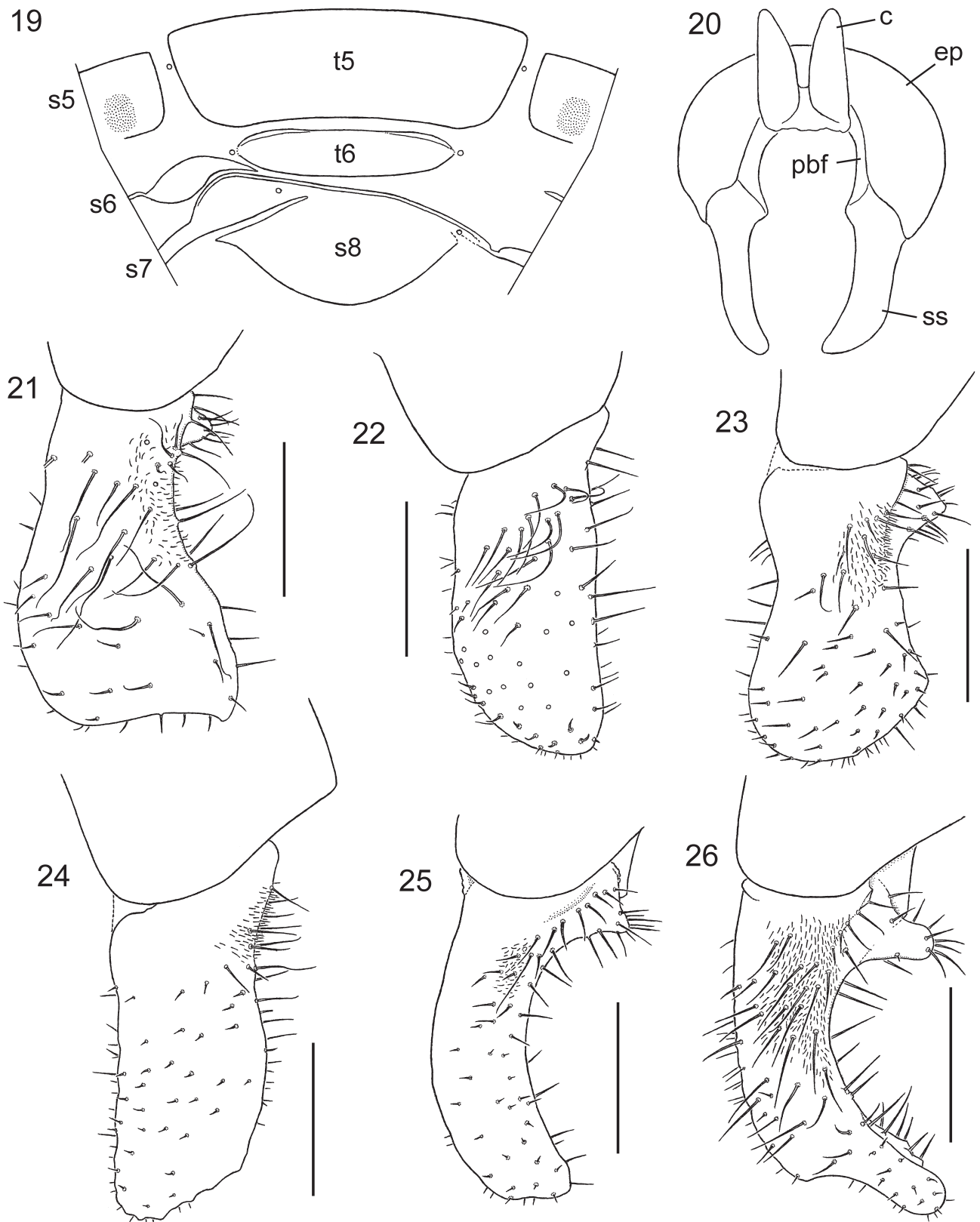
Figs 19, 23

*Helosciomyza ferruginea* Hendel.–Steyskal & Knutson, 1979: 736 (in part, misidentifications; fig. 16 represents *H. steyskali*, fig. 2 apparently not); Barnes, 1981: 56–57 (in part, misidentifications; figs 13, 14 apply to *H. steyskali*; Queensland record probably applies to *H. bickeli*).

**Type material.** Holotype ♂. New South Wales: Boyd River [Morong Creek] crossing, Kanangra-Boyd National Park [c. 1200 m], 2–4.iv.2002, B.J.D., D.K.M. (AM K264479). Double-mounted on micro-pin through polyporus, postabdomen in micro-vial on pin. Paratypes. New South Wales: 1♂, same data as holotype (AM); 1♂, same locality, April 2002, B.J.D. (AM); 3♂♂, 1 km N of Boyd River bridge, Kanangra-Boyd National Park, Oct. 2005, D.K.M. (AM). Australian Capital Territory: 1♂, Uriarra State Forest, Oct. 1960, D.H.C. (ANIC); 2♂♂, Blundell's Farm, Jan. 1930, March 1930, L.F.G., I.M.M. (ANIC).

**Other material examined** (localities only given). New South Wales: Alpine Creek, Snowy Mountains Highway (ANIC). Victoria: 12 km SE of Merrijig, Mansfield district (MV); Mount Donna Buang, near summit (AM); Mulgrave, near Melbourne (MV); Cape Otway (MV). Tasmania: Flowerdale River, near Meunna (MV); Hellyer Gorge, Waratah Highway (AM); Lyell Highway, near Clarence River (ANIC); Mount Field National Park (AM).

Because certainty of identification is difficult for females, only males are included in the type series.



Figures 19–26. (19) *Helosciomyza steyskali*, protandrogram. (20) *H. australica*, epandrium and associated structures, posterior view, semi diagrammatic, setulae omitted. (21) *H. neboissi* (Pelion), left surstylus, outer view, scale = 0.2 mm. (22) *H. australica* (Picton Lakes), left surstylus, outer view. (23) *H. steyskali* (Boyd River), left surstylus, outer view. (24) *H. obliqua* (Mount Donna Buang), left surstylus, outer view. (25) *H. driesseni* (holotype), left surstylus, outer view. (26) *H. macalpinei* (holotype), left surstylus, outer view. Figs 21–26 all to same scale. *c*, cercus; *ep*, epandrium; *pbf*, posterobasal foot of surstylus; *ss*, surstylus; *s5*–*s8*, sternites 5 to 8; *t5*, *t6*, tergites 5 and 6.



**Description** (male). Resembling *H. bickeli* in most characters except as indicated below. Females may agree in general characters, which may not be absolutely diagnostic.

**Coloration.** Antennal segment 3 orange-tawny, with small, diffuse brown dorsal zone not extending to apex, more developed than in *H. bickeli*, less so than in *H. obliqua* and *H. macalpinei*. Fore femur with largely tawny-orange ground colour, its anterior surface with large dark brown apical zone and broad brown sub-basal zone usually incompletely separated from apical zone, posterior surface with variable coverage of grey pruinescence and usually only indistinct brownish apical spot; fore tarsus with segment 3 dark brown on at least distal half, segments 4 and 5 entirely dark brown; hind tibia with sub-basal slightly diffuse brown zone.

**Head.** Height of cheek c. 0.26–0.35 of height of eye.

**Thorax.** Pteropleuron and hypopleuron without setulae. Wing essentially as described for *H. bickeli*.

**Abdomen.** Pleural membrane without setulae in region of spiracle 1; sternite 1 vestigial, without setulae; sternite 5 resembling that of *H. bickeli*; surstylus shaped somewhat as in *H. bickeli*, but broader, less strongly narrowed near mid-length, more rounded distally, with similar sub-basal posterior marginal tubercle more deeply inset from outer surface of surstylus.

**Dimensions.** Total length 4.8–5.9 mm; length of thorax 2.3–3.2 mm; length of wing, 5.0–6.9 mm.

**Distribution.** New South Wales: highlands from Boyd Plateau southwards. Australian Capital Territory: Canberra district. Victoria: perhaps widely distributed (few records). Tasmania: apparently widely distributed.

### Notes

*Helosciomyza steyskali* is one of those species of the *fuscinevris* group having no setulae on the pteropleuron, hypopleuron, and abdominal sternite 1. Within this category, it differs rather markedly from *H. obliqua*, *H. macalpinei* and *H. australica* in the only slightly developed dark zone on antennal segment 3, but is less clearly differentiated from *H. subacuta*. *Helosciomyza steyskali* can usually be distinguished from *H. subacuta* by the broad brown sub-basal zone on the anterior surface of the fore femur, but the sharpest difference is in the shape of the surstylus of the male (Fig. 23). *Helosciomyza steyskali* differs from *H. bickeli* (with which it has been confused under the erroneous name *H. ferruginea*) in the absence of setulae on the hypopleuron and sternite 1, in the broad brown anterior zone extending near the base on the fore femur, and in the broader surstylus with an extensive tract of microtrichia.

Three of the paratypes from Boyd River vicinity are labelled “Nr dead chook” (i.e. domestic fowl).

The specific epithet refers to George C. Steyskal, who first accurately characterized and delimited the *helosciomyzids* (at subfamily level, 1965) and made the first review of the Australian species (1979, with L. Knutson).

### *Helosciomyza obliqua* n.sp.

Fig. 24

**Type material.** Holotype ♂. New South Wales: Boyd River [Morong Creek] crossing, Kanangra-Boyd National Park, 2–4.iv.2002, B.J.D., D.K.M. (AM K263399); mounted on micro-pin through polyporus, postabdomen in micro-vial

on main pin. Paratypes. New South Wales: 1♀, same data as holotype (AM); 1♂, Wright’s Lookout, New England National Park, March 1961, D.K.M. (AM); 1♂, Wentworth Falls, Blue Mountains, Jan. 1963, D.K.M. (AM, erroneously determined as paratype of *H. macalpinei* by G. Steyskal). Victoria: 2♂♂, Mount Donna Buang, near summit, Warburton district, April 2003, B.J.D., D.K.M. (AM, MV).

**Description** (male, female). Resembling *H. macalpinei* and *H. bickeli*, agreeing with description of latter except as indicated below.

**Coloration.** Antennal segment 3 in large part dark brown to blackish (unfaded specimens), on outer lateral surface with ventrobasal tawny-orange zone, on medial surface with tawny-orange zone restricted to c. basal third. Mesopleuron with tawny-orange mark of very variable extent. Fore femur on anterior surface with extensive sub-basal brown zone, distally narrowly or incompletely separated from apical brown zone, on posterior surface largely mid-grey (colour resulting from pale grey pruinescence over darker brown cuticle), darker just before apex, or with posterior surface paler yellow grey with darker subapical zone, or, in one specimen with nebulous mid grey zone on basal half separated from distal grey zone by yellow-grey zone, approximately as in typical specimens of *H. macalpinei*; fore tarsus with segment 3 dark brown on distal part.

**Head.** Cheek c. 0.28–0.37 as high as eye.

**Thorax.** Hypopleuron without setulae; proepimeral bristle present, minute, in all available males. Mid femur with comb of posteroventral setulae weakly developed; hind basitarsus lacking basal ventral cluster of short black setulae.

**Abdomen.** Sternite 1 much reduced, without setulae; sternite 5 of male with paired zones of dense, thick setulae broader than in *H. bickeli* and *H. macalpinei*, often more or less meeting on median line. Male postabdomen: epandrium with posterior margin broadly subangularly prominent above and behind articulation with surstylus; surstylus (Fig. 24) with oblique basal articular margin, without sub-basal posterior process and noticeable excision of inner basal margin, almost parallel-sided beyond base, distal margin indistinctly toothed, oblique so as to be more prominent (though rounded) anterodistally (in contrast to *H. subacuta*), not or very obtusely angular posterodistally.

**Dimensions.** Total length, ♂—no available measurement (all males having abdomen dissected), ♀ 5.1 mm; length of thorax, ♂ 2.2–3.0 mm, ♀ 2.7 mm; length of wing, ♂ 5.4–6.6 mm, ♀ 5.8 mm.

**Distribution.** New South Wales and Victoria: cooler areas from New England National Park to Warburton district. Records few and scattered.

### Notes

Among the species of the *fuscinevris* group with extensively darkened antennal segment 3, males of *H. obliqua* are most readily distinguished by the shape of the epandrium and surstylus (see details above and Fig. 24). Also *H. obliqua* generally has a proepimeral bristle or setula (often minute), which is usually absent in *H. macalpinei* but may be present or absent in *H. australica*. Coloration of the posterior surface of the fore femur is variable in *H. obliqua*, but the separate distinct posterodorsal dark grey mark generally present in *H. macalpinei* is usually less distinct or absent in *H. obliqua*; on the often concealed anterior surface the extensive brown

zone, extending near the base, contrasts particularly with the condition in *H. australica*, less so with that in *H. macalpinei*. Separation of the females of *H. obliqua* from those of related species is often a matter of uncertainty.

The specific epithet is a Latin adjective meaning oblique, in reference to the outline of the surstylus.

### *Helosciomyza driesseni* n.sp.

Figs 25, 27

**Type material.** Holotype ♂. Tasmania: Flood Creek, near Lake Saint Clair, 42.102°S 146.113°E, button grass moorland, 16–17.ii.2004, M.M.D. (AM K264371). Double-mounted on micro-pin through polyporus after preservation in ethanol, postabdomen in micro-vial on pin. Paratypes. Tasmania: 2♂♂, 2♀♀, same data as holotype (AM, ANIC); 2♀♀, Rufus Canal Road East, 42.10°S 146.75–146.86°E, Feb. 2004, M.M.D. (AM); 1♀, “Bedlam”, 42.73°S 146.10°E, Feb. 2004, M.M.D. (AM); 2♂♂, Dove Lake, Cradle Mountain National Park, Dec. 2003, S.A.M. (AM, TDPI).

**Description** (male, female). Resembling other species of the *fuscinevris* group in most characters; agreeing approximately with description of *H. bickeli* except as indicated below, but because most specimens have been immersed in ethanol for five years before drying and mounting, some details of coloration are imperfectly preserved.

**Coloration.** Occipital region with broad dark cuticular mark of characteristic shape (Fig. 27). Antennal segment 3 with large brown zone between arisal insertion and apex, tawny-orange basally and ventrally. Palpus tawny-yellow, sometimes faintly browned apically. Fore femur tawny-orange, on anterior surface with broad brown zone extending from near apex almost to base, on posterior surface with posterodorsal dark grey-pruinose diffuse zone of variable length, usually becoming narrower and more distally restricted or fading distally, but without separate dark brownish subapical mark centred on posterior surface as in *H. macalpinei*.

**Head.** Cheek c. 0.39 as high as eye.

**Thorax.** Pteropleuron and hypopleuron without setulae; proepimeral bristle minute or absent. Fore tarsal segment 4 often shorter and broader than in corresponding sex of *H. macalpinei*.

**Abdomen.** Sternite 1 vestigial, without setulae. Male postabdomen: surstylus (Fig. 25) relatively slender, curved, not distally broadened, with large, setulose posterobasal tubercle and moderately developed setulae posteriorly and on medial surface.

**Dimensions** (most specimens not accurately measurable). Total length, ♂ 5.2 mm, ♀ 5.7 mm; length of thorax, ♂ 2.6 mm, ♀ 2.6 mm; length of wing, ♂ 6.2 mm, ♀ 6.4 mm.

**Distribution.** Tasmania: northern to south-central highlands.

### Notes

*Helosciomyza driesseni*, together with *H. macalpinei* and *H. obliqua*, belongs with those species of the *fuscinevris* group having no pteropleural setulae, antenna 3 strongly infuscated in part, and the fore femur with brown zone on anterior surface extending near base. *Helosciomyza driesseni* differs from related species in having a broad dark mark of characteristic shape just above the occipital foramen (Fig.

27). This mark is due to dark cuticular pigment and, though partly obscured by pale pruinescence, is demonstrably present in nine of the ten available specimens of *H. driesseni*. Other species of the *fuscinevris* group have at most a more restricted dark zone, more or less surrounding the supracerical setulae. In the male of *H. driesseni* the form of the surstylus is distinct from that of *H. obliqua* and *H. macalpinei* (compare Fig. 25 with Figs 24, 26). The two latter species are only known from mainland Australia, whereas *H. driesseni* is from the Tasmanian highlands, but it is possible that the distributions are incompletely known.

Michael Driessen indicates that his material of *H. driesseni* was collected by sweeping vegetation on button grass moorland. This is a low vegetation community dominated by the sedge *Gymnoschoenus sphaerocephalus*, and is characteristic of certain parts of the Tasmanian highlands.

The specific epithet refers to Michael M. Driessen, who collected type material.

### *Helosciomyza macalpinei* Steyskal

Figs 6, 7, 26

*Helosciomyza macalpinei* Steyskal, in Steyskal & Knutson, 1979: 737–738, fig. 23, ?fig. 24; Barnes, 1981: 57, figs 15, 16.

**Type material** (re-examined D.K.M.). Holotype ♂. New South Wales: Clyde Mountain, near Braidwood, 2400 ft. [c. 730 m], 25.ii.1961, D.K.M. (AM K264247). Allotype ♀. Same data as holotype (AM). Paratypes. 3♂♂, 2♀♀, same data as holotype.

The above specimens have been correctly determined and listed by Steyskal (1979: 738). Otherwise the published list is unreliable, as some given localities do not apply to *H. macalpinei* (e.g., Careel Bay and Otford), and specimens from Mount Wilson, appropriately labelled by Steyskal as paratypes of *H. macalpinei*, are not mentioned.

**Other material** (all checked by D.K.M.; localities only given). New South Wales: Wright’s Lookout, New England National Park (AM); Mount Wilson (AM); below Govett’s Leap, near Blackheath (AM); Katoomba (AM); Wentworth Falls (AM); Deep Creek, near Narrabeen (ANIC); Rutherford Creek, Brown Mountain, Nimmitabel district (ANIC).

**Distribution.** New South Wales: mainly cool, mountainous localities in north and south; single authentic record for coastal lowlands (Deep Creek).

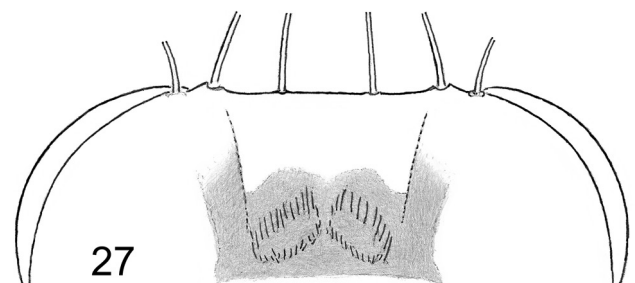


Figure 27. *Helosciomyza driesseni*, upper part of occiput, showing characteristic dark mark, most setulae omitted.

## Notes

Males of *H. macalpinei* are distinguishable from those of other species of the *fuscinevris* group with largely infuscated antennal segment 3 and no hypopleural setulae by the shape of the surstylus (Fig. 26). Usually the proepimeral bristle is absent, but in the holotype of *H. macalpinei* a very small such bristle is present on the left side only. Usually the fore femur has an elongate dark grey posterodorsal mark before mid-length which is well separated from the subapical posterior dark mark, and the often concealed anterior surface has a broad brown basal zone, which is generally separate from the brown distal zone. *Helosciomyza australica* appears to be consistently without any brown zone on the basal half of the fore femur. Coloration of the fore femur in *H. obliqua* is variable; some specimens approach the condition seen in *H. macalpinei*, but the two dark marks on the fore femur, as seen in posterior view, are generally less strongly differentiated, and a small proepisternal bristle is generally present, at least in the limited available material. However, certain identification of some female specimens is not achievable.

Genus *Neosciomyza* Barnes

*Neosciomyza* Barnes, 1981: 61. Type species (original designation): *Helosciomyza anhecta* Steyskal.

## Notes

This genus is distinguished as indicated in the key to genera. Reasons are given under the genus *Luta* for the exclusion of *L. luteipennis* from *Neosciomyza*.

*Neosciomyza anhecta* (Steyskal)

*Helosciomyza anhecta* Steyskal, in Steyskal & Knutson, 1979: 733–734, fig. 13.

*Neosciomyza anhecta* (Steyskal).—Barnes, 1981: 61, figs 28, 29.

**Type material** (re-examined D.K.M.). Holotype ♂. Tasmania: Mount Barrow, 3000 ft. [c. 1040 m, Launceston district] 25.i.1960, D.K.M. (AM K264502). Glued to card point. Paratype. Tasmania: 1♂, 16 mi. [c. 26 km] NE of Cradle Mountain, 5.i.1960, D.K.M. (AM). On card point, now much damaged, postabdomen in micro-vial on pin.

*Dimensions* of holotype. Total length 5.8 mm; length of thorax 2.8 mm; length of wing 7.3 mm.

**Distribution.** Tasmania: northern districts.

## Notes

*Neosciomyza anhecta* is very similar to *N. peckorum* and is distinguished as indicated under that species. I have seen no specimens additional to the type specimens collected in 1960.

*Neosciomyza peckorum* n.sp.

Figs 1, 8–10, 14, 28

**Type material.** Holotype ♂. Australian Capital Territory: Picadilly Circus [road junction], Brindabella Range, c. 800 m, 29.iv.1972, D.K.M., K.T.R. (AM K264387). Double-mounted on micro-pin through polyporus. Paratypes. Australian Capital Territory: 1♂, Picadilly Circus, April 1978, S.B.P., J.K.-P. (ANIC); 1♀, Black Mountain, Canberra, July 1960, I.F.C. (ANIC). New South Wales: 1♂, Kanangra-Boyd National Park, 1 km N of Boyd River bridge, c. 1200 m, Oct. 2005, D.K.M. (AM).

**Other material examined.** Victoria: 3♂♂, Acheron Gap, near Warburton, 750 m, April 1978, S.B.P., J.K.-P. (ANIC).

**Description** (male, female). Rather large, slightly elongate, predominantly dull tawny fly, with almost unmarked wing; most parts pruinescent and non-shining.

*Coloration* (clean specimens which have not passed through alcohol). Head, in large part, tawny-orange; postfrons with darker tawny-brown ocellar region, largely covered with greyish pruinescence, and paler grey to yellowish-pruinescent orbital margin; face and cheeks paler than rest of head, yellowish with whitish pruinescence. Antenna largely dark brown; more basal parts of segment 3 tawny. Prelabrum yellow to grey-brown; palpus tawny-yellow basally, grey-brown on distal third or more. Thorax dorsally tawny-orange; mesoscutum broadly creamy grey-pruinescent on lateral margins, with narrower pale-pruinescent dorsocentral stripe interrupted at suture and between the two dorsocentral bristles, and very narrow less distinct median pale-pruinescent stripe; humeral callus pale-pruinescent, except on ventral margin near spiracle; scutellum without pale-pruinescent margins; pleura tawny-orange, very generally covered with dense pale greyish to yellowish pruinescence, mesopleuron thus without any exposed tawny areas. Legs largely pale tawny-orange; all femora broadly brown-black at apices; tibiae all brown-black apically, mid and hind tibiae also with brown basal zone; tarsal segment 3 partly brown, segments 4 and 5 usually darker brown. Wing: membrane slightly tinged with yellow-brown, less intensely so than in *Luta luteipennis*; subcostal cell with broad yellow-brown blotch restricted to part of cell near end of subcosta; veins tawny; anterior and discal crossveins without trace of darker pigmentation. Halter yellow. Abdomen tawny, without distinct darker markings; tergites 1 to 4 covered with fine rather dense greyish pruinescence; tergite 5, in contrast, smooth and glossy, pruinescent only near lateral margins; in male sternite 8 and in female tergite 6 glossy like tergite 5.

*Head* slightly higher than long, slightly angularly produced anteriorly so that face is oblique in profile; cheek 0.43–0.50 as high as eye, with numerous fine setulae not reduced to single series anteriorly; face with very slightly

Key to species of *Neosciomyza*

- 1 Palpus entirely yellow; tergites 3 to 5 thinly pruinescent, subshining ..... *anhecta*, p. 68  
 — Palpus grey-brown distally, yellow basally; tergites 3 and 4 densely pruinescent, tergite 5 largely smooth and glossy, pruinescent only towards lateral margins ..... *peckorum*, p. 68

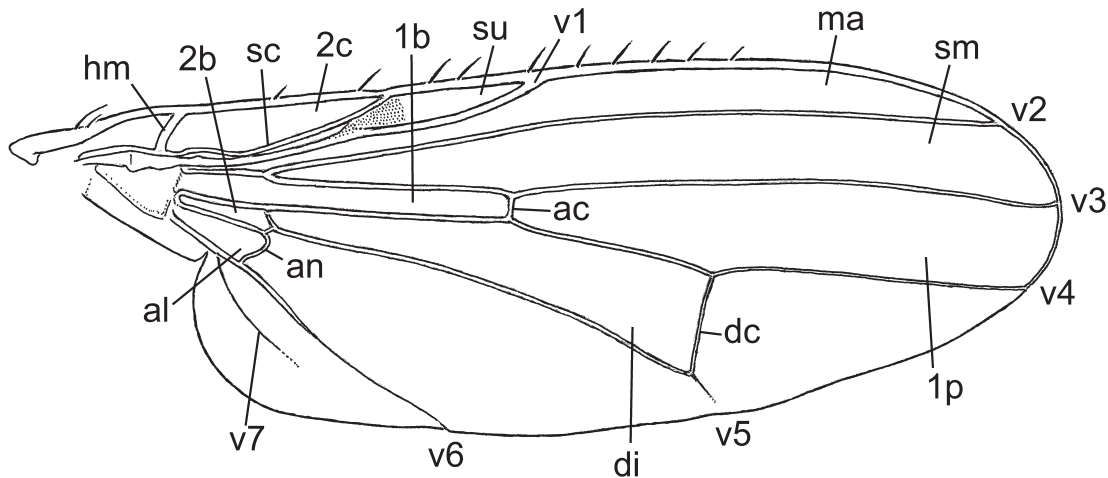


Figure 28. *Neosciomyza peckorum*, left wing of holotype. Longitudinal veins: *sc*, subcosta; *v1–v7*, veins 1 to 7. Crossveins: *ac*, anterior crossvein; *an*, anal crossvein; *dc*, discal crossvein; *hm*, humeral crossvein. Cells: *al*, anal cell; *di*, discal cell; *ma*, marginal cell; *sm*, submarginal cell; *su*, subcostal cell; *lb*, first basal cell; *1p*, first posterior cell; *2b*, second basal cell; *2c*, second costal cell.

raised and rounded medial carina for whole length; cephalic bristles as described for *Helosciomyza bickeli*. Antenna: segment 2 with ventral setulae not as long as in *H. bickeli*, *H. macalpinei*, and related species, more as in *N. anhecta*; pubescence on segment 6 very minute but extending for whole length. Palpus with some distal setulae thickened.

**Thorax** generally as described for *H. bickeli*; scutellum strongly convex; sternopleuron laterally with very extensively distributed fine setulae (compared with *L. luteipennis*, *H. bickeli*, etc., much as in *N. anhecta*), ventrally with bristles/setulae less strongly developed than in *H. bickeli*; pteropleuron and hypopleuron without setulae. Fore femur with bristles as described for *H. bickeli*; mid femur with subapical posterior bristle, no anterior bristles in male, but few short anterior bristles in female; hind femur of male with many moderately long fine setulae but no bristles, that of female with less development of setulae, but with one or two short, slightly differentiated anterior bristles beyond mid-length; hind tibia with long preapical dorsal bristle, but subapical anterior bristle much finer and more nearly terminal than in most other helosciomyzid species (*N. anhecta* excepted); basitarsi of males with well-developed ventral scopulae (brushes of dense, fine pubescence on plantar surface), that of hind basitarsus extending for most of its length; basitarsi of female apparently without scopulae; fore tarsal segment 4 of male subquadrate, slightly broader than long, that of female distinctly longer than broad. Wing resembling that of *Helosciomyza* spp.; vein 1 terminating in costa slightly beyond level of anterior crossvein.

**Abdomen.** Sternite 1 vestigial, without setulae; sternite 5 with numerous setulae, posterior ones longer, but none forming pair of dense patches as in males of *H. fuscinevris* group. Male postabdomen: surstylus broad basally, tapered distally, with very small incurved apical tooth, with posterior plate broad, but tapered to upper base, on inner surface partly defined by a raised, curved ridge; basal surstylar process slender, setulose; anterior epandrial process long, without pubescence, apically expanded and compressed, its terminal margin sharp, chisel-like; aedeagus without spine-like epiphallus, with preapical sclerotized segment broadly inflated; cerci joined to proctiger for c. 0.8 of length of each, narrowed distally, relatively broad basally on posterior exposure, with numerous long and short setulae.

**Dimensions.** Total length, ♂ 6.9–7.3 mm, ♀ 6.7 mm; length of thorax, ♂ 3.1–3.5 mm, ♀ 3.4 mm; length of wing, ♂ 7.8–8.5 mm, ♀ 8.4 mm.

**Distribution.** Highlands of Australian Capital Territory, Victoria, and New South Wales, as far north as Kanangra-Boyd National Park.

#### Notes

*Neosciomyza peckorum* is closely related to *N. anhecta*, from which it is most readily distinguished by having the palpus grey-brown distally (instead of entirely yellow) and abdominal tergite 5 largely smooth and glossy in contrast to the preceding pruinose tergites (instead of having all preabdominal tergites thinly pruinose). In the male the anterior epandrial process is more strongly expanded apically, the surstylus is somewhat differently shaped from that of *N. anhecta*, and the preapical segment of the aedeagus is much more inflated than in that species.

All or most specimens were collected in cool highland forest. Most specimens were taken on or near carrion, including a much decayed domestic fowl.

The specific epithet is a noun in the genitive case, plural number, and refers to the collectors Jarmila Kukalová-Peck and Stewart B. Peck.

#### Genus *Cobergius* Barnes

*Cobergius* Barnes, 1981: 49–50. Type species (original designation): *C. canus* Barnes [= *Cobergius vittatus* (Macquart)].

#### Notes

This genus is distinguished by the characters given in the above key. Barnes has emphasized the concave scutellum of *Cobergius*. While the median dorsal concavity of the scutellum is an apparently consistent feature of *C. vittatus*, a similar condition is present in a few dried specimens of *Napaeosciomyza* and *Helosciomyza* spp., probably because of collapse when drying. In the female the sternopleuron is very extensively setulose, as in *Neosciomyza*, but in the male the sternopleuron is long-hirsute with many mollisetiae, as is

also the fore femur. The hind femur lacks the anterior bristle in both sexes, a condition approached in *Neosciomyza* (absent in male, reduced in female). The abdominal coloration is distinctive, the tergites being densely ashy grey-pruinose with distinct dark brown zones.

As previously indicated (D. McAlpine, 1992), *Cobergius* includes a single known species.

### *Cobergius vittatus* (Macquart)

Fig. 3

*Helomyza vittata* Macquart, 1851: 279, pl. 25, fig. 6.

*Cobergius canus* Barnes, 1981: 50–51, figs 1, 2.

*Cobergius hirsutus* Barnes, 1981: 52.

*Cobergius vittatus* (Macquart).—D. McAlpine, 1992: 90–91.

**Type material.** See list in D. McAlpine (1992: 91).

**Other material examined.** Victoria: 3 ♀♀, Lady Julia Percy Island, W of Port Fairy, Jan. 1936, W.S. (AM, MV).

**Distribution.** Kangaroo Island to Bass Strait Islands—apparently restricted to island shores.

### Notes

Evidence for the above synonymy was discussed by D. McAlpine (1992). Barnes stated, with regard to *C. hirsutus*, “The holotype female has two pairs of fine, black setae on the prosternum, hence the Latin name.” In fact, the holotype has one anterior setula on the left side of the prosternum only and two setulae on the membrane near the right side of the prosternum. Other specimens in which the prosternum is exposed have no setulae in this region.

The possibility of an association with fur seal colonies is mentioned above.

ACKNOWLEDGMENTS. Nicole Fisher (ANIC), Ken Walker, and Catriona McPhee (MV) loaned significant collections under their care. Peter Sehna (NMW) and Ted Edwards (ANIC) provided information on specimens. Stephen Marshall, Michael Driessen, and Günther Theischinger provided important Tasmanian specimens. Suzanne Lindsay carried out electron microscopy. Dan Bickel, Shane McEvey, and Helen Smith made helpful comments on the manuscript.

### References

- Barnes, J. K. 1979. The taxonomic position of the New Zealand genus *Prosochaeta* Malloch (Diptera: Sciomyzidae). *Proceedings of the Entomological Society of Washington* 81: 285–297.
- Barnes, J. K. 1980a. Biology and immature stages of *Helosciomyza subalpina* (Diptera: Helosciomyzidae), an ant-killing fly from New Zealand. *New Zealand Journal of Zoology* 7: 221–229. <http://dx.doi.org/10.1080/03014223.1980.10423779>
- Barnes, J. K. 1980b. Immature stages of *Polytocus costatus* (Diptera: Helosciomyzidae) from the Snares Islands, New Zealand. *New Zealand Journal of Zoology* 7: 231–233. <http://dx.doi.org/10.1080/03014223.1980.10423780>
- Barnes, J. K. 1981. Revision of the Helosciomyzidae (Diptera). *Journal of the Royal Society of New Zealand* 11: 45–72. <http://dx.doi.org/10.1080/03036758.1981.10419451>
- Barnes, J. K. 1984. Biology and immature stages of *Dryomyza anilis* Fallén (Diptera: Dryomyzidae). *Proceedings of the Entomological Society of Washington* 86: 43–52.
- Burger, J. F., J. R. Anderson, and M. F. Knudsen. 1980. The habits and life history of *Oedoparena glauca* (Diptera: Dryomyzidae), a predator of barnacles. *Proceedings of the Entomological Society*

*of Washington* 82: 360–377.

Colless, D. H., and D. K. McAlpine. 1991. Chapter 39. Diptera (flies). *The Insects of Australia*, second edition, pp. 717–786. Carlton: Melbourne University Press.

Crosskey, R. W. 1973. A conspectus of the Tachinidae (Diptera) of Australia, including keys to the supraspecific taxa and taxonomic and host catalogues. *Bulletin of the British Museum (Natural History) Entomology supplement* 21: 221 pp.

Griffiths, G. C. D. 1972. *The phylogenetic classification of the Diptera Cyclorrhapha with special reference to the structure of the male postabdomen*. 340 pp. The Hague: W. Junk.

Hackman, W., and R. Väisänen. 1985. The evolution and phylogenetic significance of the costal chaetotaxy in the Diptera. *Annales Zoologici Fennici* 22: 169–203.

Harrison, R. A. 1959. Acalypterate Diptera of New Zealand. *New Zealand Department of Scientific and Industrial Research, Bulletin* 128: 382 + vii pp.

Hendel, F. 1917. Beiträge zur Kenntnis der acalyptraten Musciden. *Deutsche Entomologische Zeitschrift* 1917: 33–47.

Macquart, P. J. M. 1851. Diptères exotiques, suppl. 4 (second part): 161–364, pls 15–28.

Malloch, J. R. 1928. Notes on Australian Diptera, No. xv. *Proceedings of the Linnean Society of New South Wales* 53: 319–335.

McAlpine, D. K. [1973]. The Australian Platystomatidae (Diptera, Schizophora) with a revision of five genera. *Australian Museum Memoir* 15: 1–256 (dated 1972, published 1973).

<http://dx.doi.org/10.3853/j.0067-1967.15.1972.454>

McAlpine, D. K. 1985. The Australian genera of Heleomyzidae (Diptera: Schizophora) and a reclassification of the family into tribes. *Records of the Australian Museum* 36: 203–251.

<http://dx.doi.org/10.3853/j.0067-1975.36.1985.346>

McAlpine, D. K. 1988. Studies in upside-down flies (Diptera: Neurochaetidae). Part II. Biology, adaptations, and specific mating mechanisms. *Proceedings of the Linnean Society of New South Wales* 110: 59–82.

McAlpine, D. K. 1991a. Review of the Australian kelp flies (Diptera: Coelopidae). *Systematic Entomology* 16: 29–84.

<http://dx.doi.org/10.1111/j.1365-3113.1991.tb00573.x>

McAlpine, D. K. 1991b. Relationships of the genus *Heterocheila* (Diptera: Sciomyzoidea) with description of a new family. *Tijdschrift voor Entomologie* 134: 193–199.

McAlpine, D. K. 1992. The earliest described species of Helosciomyzidae (Diptera: Schizophora). *Australian Entomological Magazine* 19: 89–92.

McAlpine, D. K. 1995. Critical review of Australasian records of dryomyzid flies and resultant new combinations and synonymy in Lauxaniidae and Platystomatidae (Diptera: Schizophora). *General and Applied Entomology* 26: 41–43.

McAlpine, D. K. 2007. The surge flies (Diptera: Canacidae: Zaleinae) of Australasia and notes on tethinid-canacid morphology and relationships. *Records of the Australian Museum* 59: 27–64.

<http://dx.doi.org/10.3853/j.0067-1975.59.2007.1468>

McAlpine, J. F. 1981. Chapter 2. Morphology and terminology — adults. In *Manual of Nearctic Diptera I*, ed. J. F. McAlpine et al., pp. 9–63. Hull, Quebec: Canadian Government Publishing Centre.

Meier, R., and B. M. Wiegmann. 2002. A phylogenetic analysis of Coelopidae (Diptera) based on morphological and DNA sequence data. *Molecular Phylogenetics and Evolution* 25: 393–407.

[http://dx.doi.org/10.1016/S1055-7903\(02\)00276-2](http://dx.doi.org/10.1016/S1055-7903(02)00276-2)

Ozerov, A. L. 1998. Family Dryomyzidae. *Contributions to a Manual of Palaearctic Diptera* 3: 349–355. Budapest: Science Herald.

Steyskal, G. C. 1965. The subfamilies of the Sciomyzidae of the world (Diptera, Acalyptratae). *Annals of the Entomological Society of America* 58: 593–594.

Steyskal, G. C. 1977. Family Dryomyzidae. *A catalogue of the Diptera of the Americas south of the United States* 62: 2 pp.

Steyskal, G. C., and L. Knutson. [1979]. Helosciomyzinae in Australia (Diptera: Sciomyzidae). *Australian Journal of Zoology* 26: 727–743.

<http://dx.doi.org/10.1071/ZO9780727>