

NEW SPECIES OF AGROMYZIDAE FROM QUEENSLAND

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SUMMARY

New species of Agromyzidae from Queensland are *Melanagromyza wikstroemiae*, *M. pisi*, *M. polyphyta*, *M. indigoferae*, *M. dianellae*, and *Haplomyza caulophaga*. The first four have leaf-mining larvae; the last stem-mining larvae.

The name *Melanagromyza phaseoli* (Tryon) is discussed.

A key is given for the species of *Melanagromyza* in Queensland.

MELANAGROMYZA wikstroemiae sp. nov.

(Figures 1 and 2)

Length 1.5–2.0 mm (dried specimen); entirely dark brown to black excepting calypters and pulvilli, which are pale.

Head.—Outer verticals one to one-and-a-half times length of postverticals; four pairs fronto-orbitals, three superior (dorsally directed), one inferior (inwardly directed), vertical intervals between first and second pairs and second and third approximately equal and at least twice that between third and fourth pairs. Orbital setulae dorsally directed. Vertical triangle pruinose, tapering sharply towards centre of frontal vitta, then gradually to a point extending to lunule. Frontal vitta wide (about half central eye width), dull pruinose. Arista strong, more than four times length of third antennal segment, bearing short setae throughout, and basally thickened for about one-fifth of length (plainly visible at x 100 magnification). Oral vibrissae well developed, incurved, more than twice length of setae of subcranial margin of genae. Depth of genae below eye almost as great as length of oral vibrissa. Occiput pruinose with small white setae arranged in a steep narrow V.

Thorax.—Wing typical of genus, closely resembling that of *M. phaseoli* (Tryon) except in size; length 1.5 mm. Tip of wing beyond distal end of third longitudinal vein; costa reaching M_{1+2} , the section $R_{4+5}-M_{1+2}$ fainter than $R_{2+3}-R_{4+5}$. Length M-m slightly more (one-and-one-quarter times) than distance from M-m to R-m. Basal veins brown; membrane shining green in

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reflected light; halteres mid-brown. Wing indices*: costal, 3·5 (3·1-3·9); fourth vein, 6·5 (5·8-7·0); 4c, 1·9 (1·8-2·2); 5x, 2·1 (1·8-2·4). Legs concolorous with body, covered with short bristles, pulvilli white. Calypters white with brown fringe. Chaetotaxy: arrangement of thoracic bristles typical of genus; two pairs of strong posterior dorsocentrals† (2+0), the hindmost stronger; no thoracic bristles apart from the postalars lying posterior to the hind pair of dorsocentrals; one strong supra-alar, two postalar (inner weak), one intra-alar (weak, less than half the length of longest dorsocentral), two notopleural, one humeral, one strong

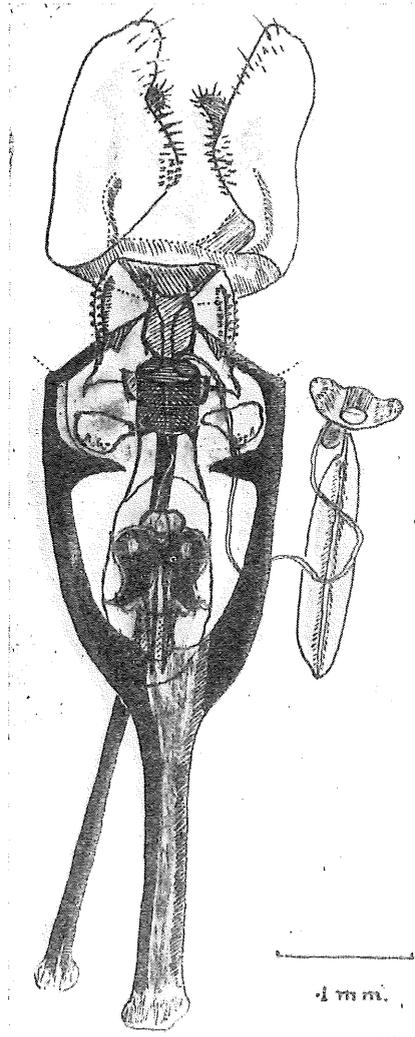


Fig. 1.—Male genitalia of *Melanagromyza wikstroemiae* (ninth tergite out of position).

* As defined by Harrison, R.A. (1959)—Acalypterate Diptera of New Zealand. N.Z. Dep. Sci. Industr. Res., Bull. No. 128.

† Dorsocentral bristles are numbered from the posterior forwards.

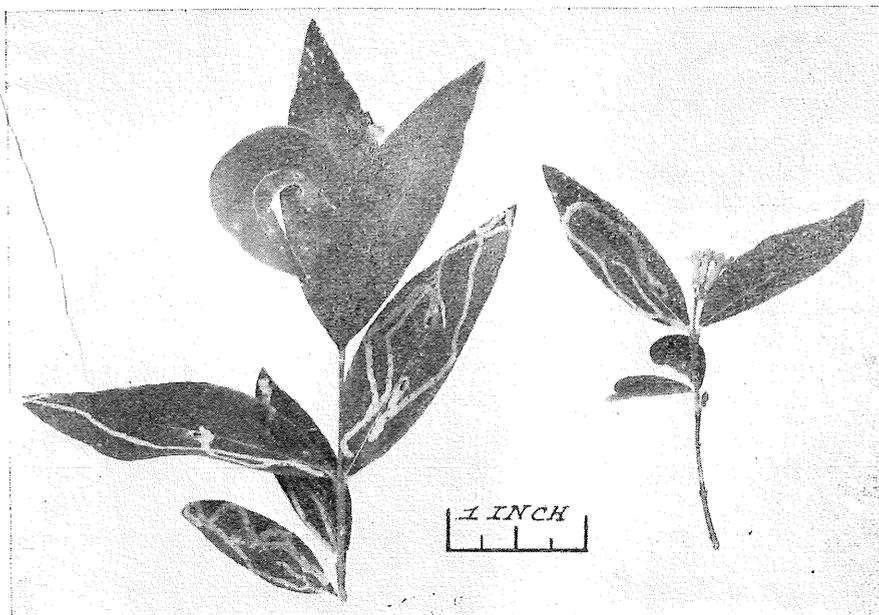


Fig. 2.—Leaves of *Wikstroemia indica* showing mines of *Melanagromyza wikstroemiae* with pupae and excretal pattern.

posthumeral (praesutural), numerous short thoracic bristles dorsally, two scutellar (approximately equal in length, the anterior stronger), one propleural, one strong mesopleural, two or three bristles near posterior margin of mesopleuron, that at centre of margin strongest, a group of smaller bristles (usually five or six) in oblique to vertical line near upper centre of sclerite, one strong sternopleural, group of short bristles (usually three or four) below junction of mesopleuron and sternopleuron, vertical line of short bristles on sternopleuron in front of third coxa; one large bristle on each coxa.

Abdomen.—Abdomen covered with short strong bristles. Sixth and terminal segments glossy black in contrast to others which are dull, brown, pruinose. Male and female similar. *Male genitalia* (Fig. 1) (described from paratype slide mounted material), large in comparison with those of *M. phaseoli*. Ninth tergite a large, elongated sclerite bearing bristles on the posterior ventral surface. Surstyli carry numerous short, thick spines and are antero-ventrally situated. Cerci, situated dorsally, relatively small and bristly. Ninth sternite heavily constructed with paired, dorsally directed posterior arms. Hypandrial apodeme atypically long, reaching a short distance anteriorly to the adeagal apodeme; both are long, straight, stout structures in lateral view, reaching well into the third abdominal segment. Pregonites small, bearing ventrally numerous sensory pores (about six) at the anterior extremity. Epiphallus slightly longer than wide. Adeagal hood a well-developed wide structure; phallosophore broad, produced

along the adeagal apodeme, the posterior section short and wide. Postgonites barely visible from the ventral side, each as a slender sclerite. Ejaculatory apodeme resembles in form that of *M. phaseoli*. Phallus a short broad structure of the form shown in Fig. 1.

Holotype: Male. From leaf of *Wikstroemia indica* Endl. (Fig. 2), Kenmore, February 1954 (R. P. Kleinschmidt).

Allotype: Female. From leaf of *W. indica*, Coolangatta, January 1959 (A. R. Brimblecombe).

Paratypes: From leaves of *W. indica*, Kenmore, February 1954 (4 specimens and slide mount of male genitalia) (R. P. Kleinschmidt); Coolangatta, January 1959 (15 specimens); and Deception Bay, March 1959 (3 specimens) (A. R. Brimblecombe).

Holotype Reg. No. T5800, Allotype Reg. No. T5801 deposited in Queensland Museum.

MELANAGROMYZA pisi sp. nov.

(Figures 3 and 4)

Length 1.0-1.2 mm (dried specimen); dark brown to black.

Head.—Outer verticals about twice length of postverticals; inner verticals longer; four pairs fronto-orbitals, three superior (dorsally directed), one inferior (inwardly directed), vertical intervals between successive fronto-orbitals increasing from above downwards. Orbital setulae dorsally directed except inferiormost seta which is anteriorly or inwardly directed. Vertical triangle very dark brown to black, pruinose, tapering sharply to centre of frontal vitta. Frontal vitta wide (more than half eye width), dull pruinose. Arista strong, about three times length of visible part of terminal antennal segment, bearing short setae throughout, basal third thickened. Oral vibrissae curved inward, at least twice length of longest seta of subcranial margin. Depth of gena approximately equal to length of oral vibrissa. Occiput dull to pruinose, dark brown, bearing above the occipital foramen a small shining rectangular patch of fine white setae (easily visible at x100 magnification).

Thorax.—Wing venation as for *M. phaseoli*, wings smaller, length 1.3 mm. Tip of wing about half-way between R_{4+5} and M_{1+2} ; costa reaching M_{1+2} . Length M-m approximately equal to distance from M-m to R-m. Halteres light to mid-brown. Wing indices: costal, 4.3 (4.0-5.6); fourth vein, 5.9 (5.2-6.8); 4c, 1.4 (1.2-1.8); 5x, 2.8 (2.4-3.0). Legs blackish-brown,

pulvilli paler. Calypters pale grey with dark margin and fringe. Chaetotaxy: thoracic bristles typical of genus: dorsocentrals 2+0 (anterior shorter), postalar only present posterior to hindmost dorsocentrals between which dorsum is bare, one intra-alar (weak, about half length of hind dorsocentral); one supra-alar, two postalar (the inner weak as the dorsal thoracic bristles), two notopleural, one humeral, one posthumeral, two scutellar (anterior three-quarters length of posterior), one propleural, two or three bristles at posterior

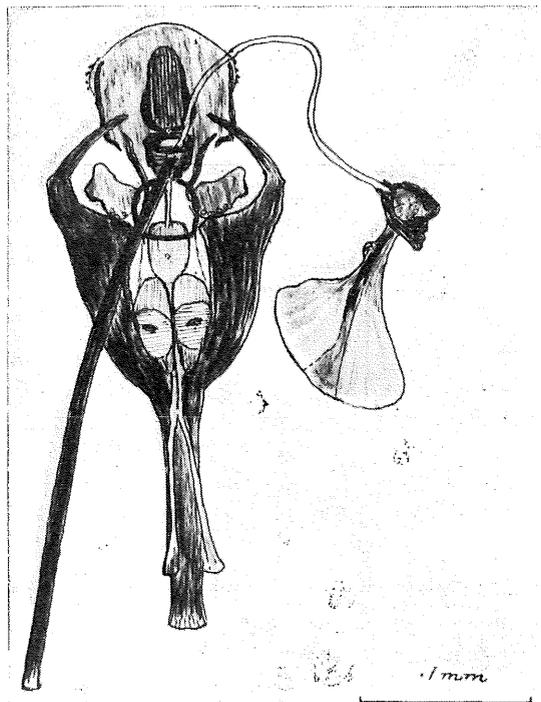


Fig. 3.—Male genitalia of *Melanagromyza pisi* (ninth tergite removed).

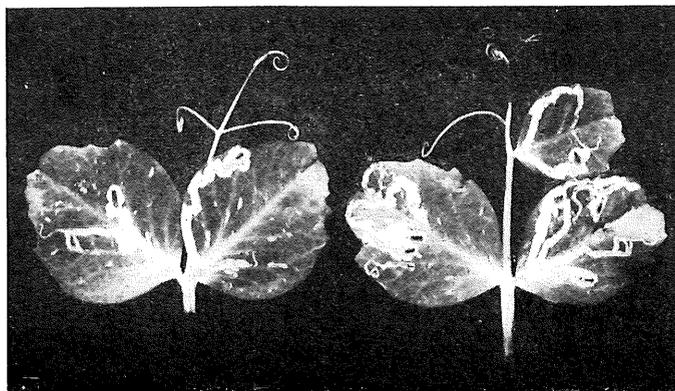


Fig. 4.—Leaves of *Pisum sativum* showing mines of *Melanagromyza pisi* with pupae and excretal pattern.

edge of mesopleuron, that at centre of sclerite strongest, one strong sternopleural (one shorter anterior to the latter may be present also), group of small bristles at apex or sternopleuron; at least one strong bristle on each coxa.

Abdomen.—Abdomen covered with numerous bristles. Segments posterior to fifth shining black. *Male genitalia* (Fig. 3) (described from allotype and paratype slide mounted material). Ninth tergite a broad, bristly structure. Surstyli directed inwards and not visible in ventral view, with numerous short, sharp spines. Ninth sternite a solid structure with broad side-pieces when viewed ventrally; these carry long posterior arms curving dorsally, and broad antero-ventral processes. Ninth sternite anteriorly produced into a long, broad, hypandrial apodeme lying parallel (when viewed laterally) to the rod-shaped adeagal apodeme, which is a narrower structure reaching further anteriorly than the hypandrial apodeme. Pregonites irregularly shaped plates carried posteriorly to the antero-ventral processes of the ninth sternite, with about four sensory pores at this junction. Epiphallus both long and broad, almost oval viewed ventrally. Adeagal hood, viewed ventrally, hexagonal; phallophore broad. Ejaculatory apodeme a large fan-shaped structure. Phallus produced distally (anteriorly) as two long processes.

Holotype: Female. From leaf of *Pisum sativum* L. (Fig. 4), Toowong, October 1957 (A. R. Brimblecombe).

Allotype: Male. From leaf of *P. sativum*, Toowong, November 1957 (slide specimen of genitalia) (A. R. Brimblecombe).

Paratypes: From leaves of *P. sativum*, Toowong, October 1957 (3 specimens) (A. R. Brimblecombe).

MELANAGROMYZA polyphyta sp. nov.

(Figures 5 and 6)

Length 1.4 mm (dried specimen); dark brown.

Head.—Outer and inner verticals approximately equal in length, the inner slightly longer, about one-quarter their length longer than postverticals; four pairs fronto-orbitals, three superior (dorsally directed), one inferior (inwardly directed), vertical intervals between successive fronto-orbitals decreasing from above downward, the first two intervals approximately equal. Upper superior fronto-orbital longest and strongest. Vertical triangle dark brown to black, dull, tapering below as far as lunule. Frontal vitta wide (more than half eye width), dull black pruinose. Arista about six times length of visible section of

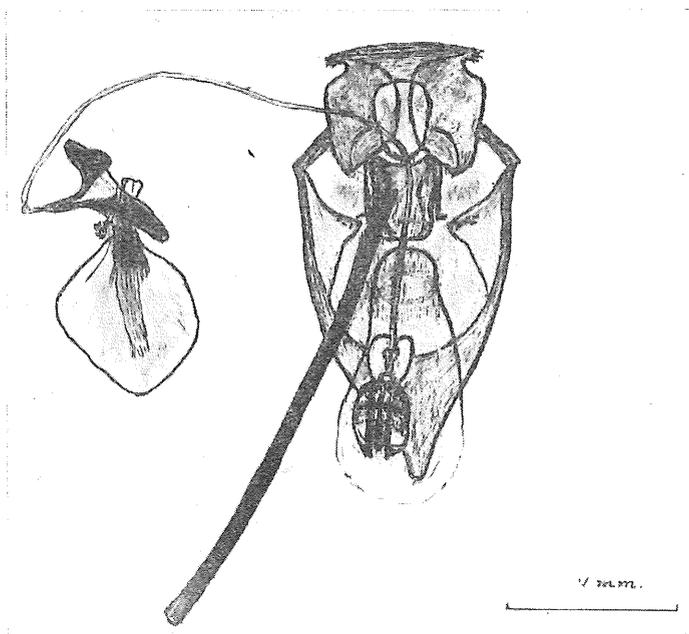


Fig. 5.—Male genitalia of *Melanagromyza polyphyta* (ninth tergite removed).

third antennal segment, bearing short setae throughout; basally thickened. Oral vibrissae about twice length of setae on subcranial margin. Genae narrow; eyes bare. Occipital region dull pruinose, with patch of white hairs long, narrow, centrally placed above occipital foramen (easily visible at x100 magnification).

Thorax.—Mean wing length 1.4 mm. but widely variable. Tip of wing halfway between distal ends of R_{4+5} and M_{1+2} ; costa reaching M_{1+2} but section R_{4+5} – M_{1+2} scarcely strengthened. Length M – m greater (one-and-a-third times) than distance from M – m to R – m . Halteres dark brown. Wing indices: costal, 4.2 (3.7–5.1); fourth vein, 8.0 (6.4–9.0; 4c, + 2.2 (1.7–2.7); 5x, 2.0 (1.8–2.6). Legs concolorous with body, pulvilli pale. Calypters grey with black edge and fringe. Chaetotaxy: dorsocentrals 2+0, posterior longer; one supra-alar, two postalar (inner short), one intra-alar (fine, short, longer than inner postalar), two notopleural, one humeral (with numerous short bristles anterior to it), one posthumeral, two scutellar (anterior longer), one propleural, one mesopleural (numerous short bristles surrounding its base), two sternopleural at apex (apical longer), a group of short bristles on the anterior edge of the sternopleuron, several bristles below junction of mesopleuron and sternopleuron, including one long bristle posteriormost; several bristles on coxae.

Abdomen.—Male genitalia (Fig. 5) (described from paratype slide mounted material). Ninth sternite viewed ventrally with narrow sidepieces bearing dorsally curved posterior arms and very broad antero-ventral processes;

anteriorly produced into a short, blunt hypandrial apodeme. Adeagal apodeme a long, slender rod reaching considerably further anteriorly, to the anterior edge of the fourth sternite. Pregonites not visible in preparations as separate structures, but several pores present at the posterior edges of the antero-ventral processes; (these may constitute a modification of the two combined structures).

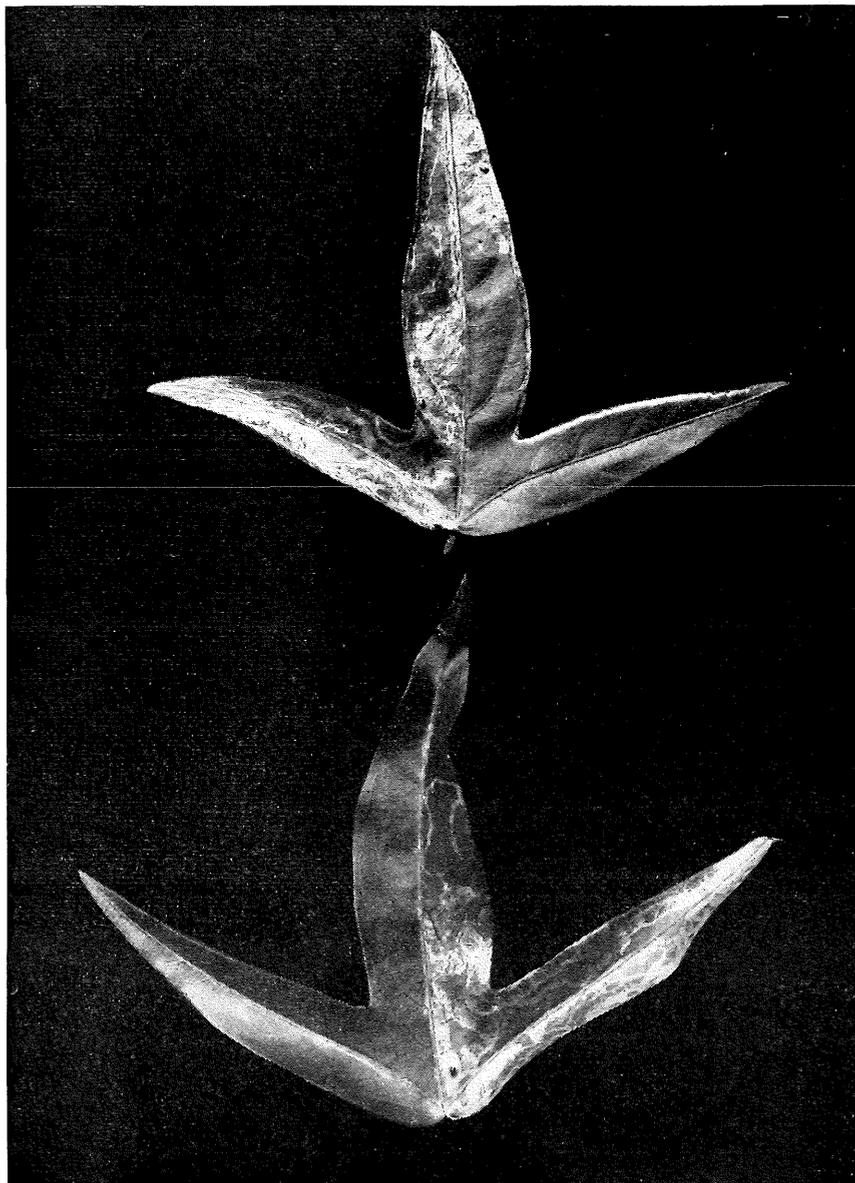


Fig. 6.—Leaves of *Passiflora suberosa* showing mines and pupae of *Melanagromyza polyphyta*.

Surstyli broad, sclerotized structures with several short, sharp spines, scattered over their surface and long bristles on the inner edge. Epiphallus oval, widest posteriorly. Adeagal hood a wide structure, anterior to which is the broad phallopore. Ejaculatory apodeme a large, roughly fan-shaped structure with a broad, angular base. Phallus short compared with other species of the genus.

Holotype: Female. From leaf of *Passiflora suberosa* L. (Fig. 6), Kenmore, February 1957 (R. P. Kleinschmidt).

Allotype: Male. Data as for holotype.

Paratypes: From *P. suberosa* as for holotype (1 specimen); Kenmore, April 1953 (3 specimens) (R. P. Kleinschmidt); Kenmore, February 1956 (slide specimen of male genitalia) (R. P. Kleinschmidt); Kenmore, February 1959 (2 specimens) (R. P. Kleinschmidt).

Holotype Reg. No. T5802, Allotype Reg. No. T5803 deposited in Queensland Museum.

MELANAGROMYZA indigoferae sp. nov.

(Figure 7)

Length 1.0 mm (dried specimen); dark brown.

Head.—Outer verticals shorter than inner verticals, equal in length to postverticals; four pairs fronto-orbitals, three superior (dorsally directed), one inferior (inwardly directed), first and second bristles longer and coarser. Vertical triangle concolorous with head, tapering to a point at lunule. Frontal vitta almost as wide as eye. Antennae divergent distally, contiguous basally. Arista about twice length of segment from which it arises, bearing fine setae and basally thickened. Oral vibrissae longer than depth of genae, about one-sixth eye height. Occipital region dull pruinose, with no distinct pattern visible on specimens examined although setae present.

Thorax.—Wing venation dark, especially at wing base. Wings with metallic lustre, length 1.2 mm. Costa reaching M_{1+2} the last section ($R_{4+5}-M_{1+2}$) scarcely thickened; length of M-m slightly less than distance from M-m to R-m. Halteres brown. Wing indices: costal, 3.4 (3.0–3.6); fourth vein, 6.6 (6.2–7.2); 4c, 2.0 (1.9–2.0); 5x, 2.6 (2.1–3.2). Legs concolorous with body. Calypters grey with black edge and fringe. Chaetotaxy: dorsocentrals 2+0 (posterior shorter), one supra-alar, two postalar (the inner short and

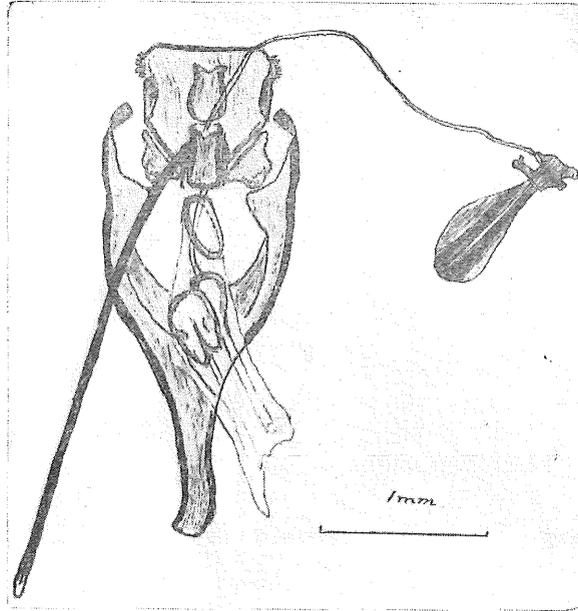


Fig. 7.—Male genitalia of *Melanagromyza indigoferae* (ninth tergite removed).

resembling the short thoracic bristles, one intra-alar (very short, not easily distinguishable from short thoracic bristles), two notopleural (not as strong as some of the thoracic bristles, e.g. humeral, posthumeral), one humeral (anterior to which numerous small bristles are present), one posthumeral, two scutellar (posterior more than twice length of anterior), one propleural, one mesopleural (centrally placed on posterior edge of sclerite; other bristles may be present on this sclerite, near the mesopleural bristle or at the dorsal edge), two sternopleural (posterior longest, situated just beneath junction with mesopleuron; at least one long bristle on the coxa).

Abdomen.—Male genitalia (Fig. 7) (described from paratype slide mounted material). Ninth sternite broad, with side-pieces extended into wide antero-ventral processes and short posterior arms. Hypandrial apodeme long, broad and curved ventrally at distal end. Adeagal apodeme long, narrow, rodlike, reaching anteriorly beyond hypandrial apodeme. Phallosophore long, slender at posterior end.

This species is smaller than most others in the genus and the male genitalia are correspondingly small. In general the form of the genitalia resembles that of *M. pisi*.

Holotype: Male: From leaves of *Indigofera suffruticosa* Mill., Eight Mile Plains, May 1955 (R. C. Colbran).

Allotype: Female. Data as for holotype.

Paratypes: From *I. suffruticosa* as for holotype (3 specimens and two slides of male genitalia).

Holotype Reg. No. T5806, Allotype Reg. No. T5807 deposited in Queensland Museum.

MELANAGROMYZA dianellae sp. nov.

(Figures 8 and 9)

Length 1.5 mm (dried specimen); shining black, calypters shining white with pale brown margin and white fringe.

Head.—Outer verticals about twice length of postverticals and stronger, approximately same length as inner verticals; four pairs fronto-orbitals (three superior, one inferior), vertical intervals between successive fronto-orbitals increasing from above downwards; orbital setulae directed dorsally except lowermost which is directed forwards. Vertical triangle tapering to centre of frontal vitta opposite second pair of fronto-orbitals. Frontal vitta wide (more than half eye width), dull pruinose. Antennae close together at base, arista basally thickened, covered with very short setae for entire length. Genae narrow, about equal in depth to half length of oral vibrissae, margin rounded. Occipital setae forming a V (visible at x100 magnification) of width subequal to the distance between the hindmost ocelli.

Thorax.—Wing length 1.4 mm. Costa reaching M_{1+2} strongly; length of M-m only slightly greater than distance from M-m to R-m. Halteres mid-brown. Wing indices: costal, 3.9; fourth vein, 6.5; 4c, 1.75; 5x, 3.0. Legs black. Chaetotaxy: dorsocentrals 2+0 (anterior slightly more than half length of posterior), one supra-alar, two postalar (inner weak), one intra-alar, two notopleurals, one humeral, one posthumeral, two scutellar (hind pair longer and stronger), one propleural, one mesopleural (situated centrally on hind margin of sclerite, with small bristles on hind margin also), one strong sternopleural (a weaker bristle is usually present anterior to this), postalars almost in line with hindmost dorsocentrals but may be slightly posterior. The bristles are not noticeably thickened at the base.

Abdomen.—Male genitalia (Fig. 8) (described from paratype slide mounted material). Ninth sternite well developed. Hypandrial apodeme very long and broad, reaching as far forward as the adeagal apodeme. Surstyli not visible from ventral view. Pregonites broad, bearing about six pores anteriorly. Epiphallus long and moderately narrow. Adeagal hood broad, long and rectangular; phallophore very short. Ejaculatory apodeme shaped similarly to an isosceles triangle, the bulb small. Phallus bearing two very long processes distally.

Holotype: Female. From leaf of *Dianella caerulea* Sims (Fig. 9), Coolangatta, April 1956 (A. R. Brimblecombe).

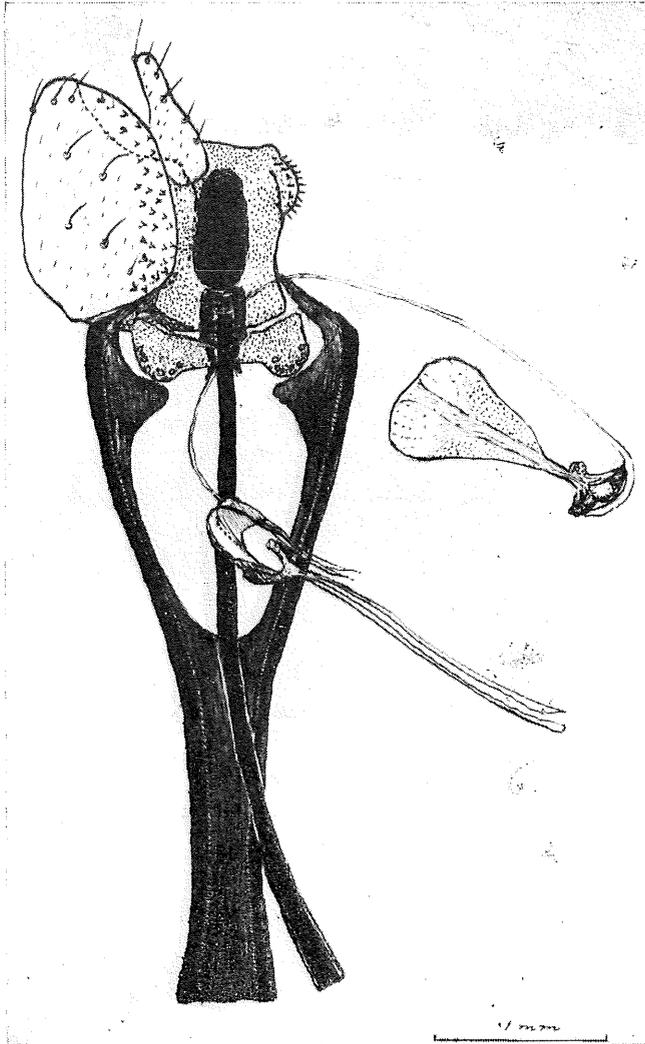


Fig. 8.—Male genitalia (ventral view) of *Melanagromyza dianellae* (with half ninth tergite removed).



Fig. 9.—Leaves of *Dianella caerulea* showing mines, pupae and excretal pattern of *Melanagromyza dianellae*.

Allotype: Male. From leaf of *D. caerulea*, Coolangatta, June 1960 (A. R. Brimblecombe).

Paratypes: From leaves of *D. caerulea*, Coolangatta, April 1956 (two specimens); January 1959 (slide specimen of male genitalia); June 1960 (seven specimens) (A. R. Brimblecombe).

Holotype Reg. No. T5808, Allotype Reg. No. T5809 deposited in Queensland Museum.

HAPLOMYZA caulophaga sp. nov.

(Figure 10)

The species agrees closely with *H. imitans* Malloch in external characters, with the following exceptions:

Abdominal segments widely clear yellow on hind margins, rest of segments black, disc of thorax mid-grey; four fronto-orbitals (occasionally five); orbital setulae situated below level of superior fronto-orbitals; four pairs dorsocentrals, the front two pairs weaker but still strong; fourth vein reaching a point at central margin of wing-tip but in front of the widest part of the wing.

Head.—Head yellow, ocellar triangle and occiput black, arista, bristles and hairs black. Four fronto-orbitals (five in one male specimen), upper two superior, lower two inferior, orbital setulae very few and situated near inferior fronto-orbitals.

Thorax.—Thorax greyish dorsally, not glossy, yellow laterally, scutellum yellow with lateral anterior corner black, extending to include hindmost pair bristles; mesopleuron with black spot on lower anterior angle, sternopleuron black except at upper margin, squamae whitish with pale fringe. Dorsocentrals 3+1, the front two weaker than the hind two, but well-developed, the third pair almost in line with the suture, the intradorsocentral hairs continuing forward from a position slightly posterior to the second pair of dorsocentrals. Small hairs in dorsocentral line in front of the bristles. Fourth vein ending exactly at centre of wing-tip but wing reaching slightly further laterally behind distal end of this vein.

Abdomen.—Ovipositor shining black with last abdominal segment chiefly yellow; abdomen brownish-black except for hind margins of tergites, which are clear yellow. *Male genitalia* (Fig. 10) (described from allotype). Ninth tergite very broad, bearing one short tooth at anteroventral angle; near this the surstylus on each side is separated from the tergite by a suture; surstyli bearing about six strong bristles; cerci short and fairly broad, carrying numerous bristles. Ninth sternite long, V-shaped, anterior end rounded, posterior end widened, very little dorso-ventral curvature, side-pieces posteriorly thickened and curved first forwards and then backwards. Pregonites united to this process, approximated at the centre. Adeagal apodeme long, reaching posteriorly to the anterior margin of the ninth tergite. Epiphallus concave anteriorly. Adeagal hood very broad, bearing ventrally two short processes; phallosophore long. Postgonites long and irregularly shaped. Distal end of phallus brush-like.

Holotype: Female. From stalk of silver-beet (*Beta vulgaris* L. var. *cicla* L.) Nudgee, October 1951 (R. P. Kleinschmidt).

Allotype: Male. Data as for holotype (slide specimen of genitalia).

Holotype Reg. No. T5810, Allotype Reg. No. T5811 deposited in Queensland Museum.

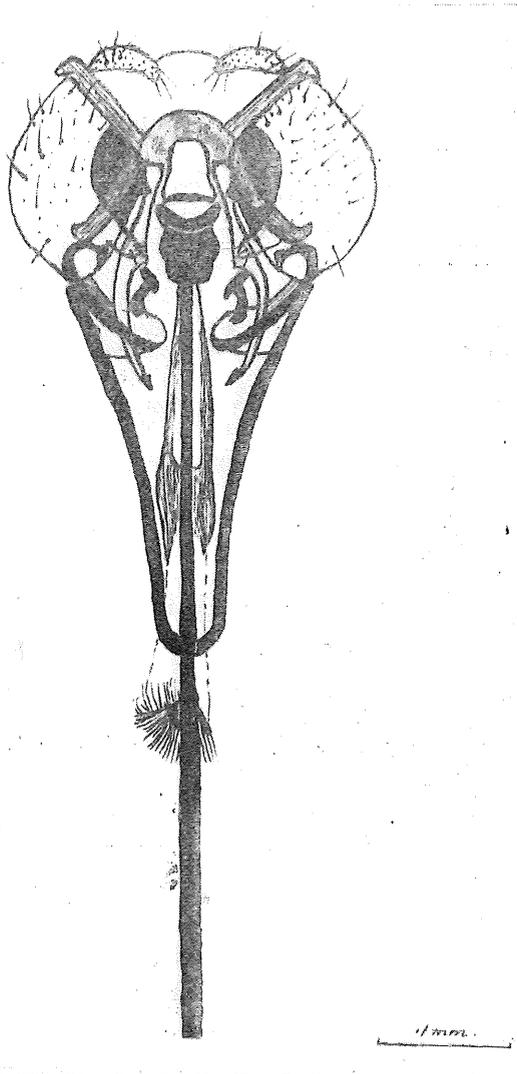


Fig. 10.—Male genitalia of *Haplomyza caulophaga*.

MELANAGROMYZA phaseoli (Tryon).*Synonymy:*

Oscinis phaseoli Tryon, 1895.

Oscinis fabae Tryon, 1897 (Nomen nudum).

Agromyza phaseoli Coquillett, 1899.

Agromyza (Melanagromyza) phaseoli Coquillett; Malloch, 1927.

Melanagromyza phaseoli (Coquillett); Greenwood, 1929.

Coquillett has formerly been credited as the authority for this species.

Although Tryon stated that the name *Oscinis phaseoli* was provisional, the description provided is considered adequate. An extract from his article "The Bean Maggot," dealing with the descriptive aspect is given below.

"The living insects . . . are small, black, two-winged flies which are provisionally named *Oscinis phaseoli* . . . The maggot is a translucent, yellowish, elongate, cylindrical, twelve-jointed grub, obtuse at each extremity, and rather broad towards the head; it measures $1\frac{1}{4}$ to $1\frac{1}{2}$ lines in length . . . The puparium is a parallel-sided object rounded at each end and about 1 line in length . . . The fly, which is quite a small though conspicuous insect, with its wings directed obliquely backwards, is black, but its eyes present beautiful copper-coloured and green reflections, and its wings have an opalescent glimmer when viewed in certain positions . . . The pest is assisted in its progress through the plant-tissue by a large and stout hook-shaped toothed apparatus in front of the mouth, and by rows of sharp papillae just behind the head, and at the joints separating each body segment."

KEY TO SPECIES

Seven species in the genus *Melanagromyza* are known from Queensland. These may be determined as follows.

Key to Queensland Species of MELANAGROMYZA

- | | |
|---|-----------------------------|
| 1. Fronto-orbitals 2 + 2 | 2 |
| Fronto-orbitals 3 + 1 | 3 |
| 2 (1) Calypters white | <i>albisquama</i> (Malloch) |
| Calypters grey | <i>phaseoli</i> |
| 3 (1) Anterior scutellar bristles shorter than posterior | 4 |
| Anterior scutellar bristles longer than posterior | <i>polyphyta</i> |
| Anterior scutellar bristles approximately equal in length to posterior..... | <i>wikstroemiae</i> |

4. (3) Body black, calypters white *dianellae*
 Body dark brown; calypters grey 5
5. (4) Anterior scutellar $\frac{1}{2}$ or less than $\frac{1}{2}$ length posterior scutellar
 bristles *indigoferae*
 Anterior scutellar $\frac{3}{4}$ length posterior scutellar bristles *pisi*

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