

Drosophilidae of Australia
IV.* *Mycodrosophila*
(Insecta : Diptera)

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Abstract

The Australian *Mycodrosophila* fauna comprises 21 species distributed in northern and eastern Australia to southern New South Wales. Only one species, *M. argentifrons* Malloch, is previously described from Australia; the south-east Asian species *M. separata* (de Meijere) is recorded for the first time. The remaining 19 species are new; adequate material has been available to permit the description and naming of 18 of them.

Introduction

The genus *Mycodrosophila* was established by Oldenberg (1914) for the single species *Amiota poecilogastra* Loew, collected in Europe and named after the fungal habitat on which it was found. Since Oldenberg's paper approximately 60 further species have been described from various parts of the world, the majority from Africa (Burla 1954) and Japan (Okada 1956, 1965, 1968). Smaller numbers of species have been described or recorded from Asia (Gupta 1974), Korea (Kang *et al.* 1966), south-east Asia (Duda 1924), Micronesia (Wheeler and Takada 1964) and Pacific islands (Wheeler and Kambyssellis 1966), and from the Americas (Wheeler and Takada 1963; Wheeler 1970). One species only has been described from Australia (Malloch 1927) and no further species have been discovered in Europe. As far as is known, all species of *Mycodrosophila* are fungivorous (Throckmorton 1975), and specimens may often be collected in considerable numbers directly from fungi.

Morphologically the genus is rather uniform, and no subgenera or species-groups have been formally proposed. Sexual dimorphisms are largely unknown, and interspecific differences, apart from structural differences of genitalia, are very largely limited to modifications of the shape and size of the facial carina, and of thoracic, abdominal and wing patterns. Pleural coloration varies from entirely pale tan below the level of the wing articulation, through pale tan with a broad longitudinal stripe at least posteriorly, to entirely more or less dark. (The uppermost parts of the pleura are invariably dark.) The wing almost always possesses a black lappet at the distal costal incision, and may be hyaline or brownish, with or without a dark band behind the lappet; more extensive wing patterning is known in a few species (cf. Burla 1954; Wheeler and Takada 1964; *M. stigma* below). The haltere may be entirely pale tan, or the knob only may be partly or entirely black-

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ened, or there may be blackening on both knob and stalk; these differences are subtle but constant. The abdominal pattern is a mixture of pale tan and black or dark brownish black markings; intraspecific variations in abdominal pattern, where they occur, are very small, at least in the Australian fauna (cf. Discussion).

The following work is based on the Australia-wide collections of the Division of Entomology, CSIRO (Australian National Insect Collection) and the Australian Museum, and the smaller collections of the Department of Genetics and Human Variation, La Trobe University and the Department of Entomology, University of Queensland.

Genus *Mycodrosophila* Oldenberg

Mycodrosophila Oldenberg, 1914, p. 4. Type-species *Amiota poecilogastra* Loew, 1874 [synonym: *Drosophila johni* Pokorny, 1896 (Oldenberg 1914)]; type locality southern Russia.

postnotum
Arista large, plumose, usually with only 1 ventral ray. Carina usually well developed. Vibrissa single. Greatest diameter of eye vertical. Eyes bare. Middle orbital bristle small, fine. Ocellar, vertical and postvertical bristles large. Mesonotum strongly rounded, arched, usually darkly coloured, shining. Scutellum broadly rounded, dark, velvety or subshining. Subscutellum usually dark. Anterior dorso-central bristles very small or absent. Acrostichal hairs in numerous rows; pre-scutellar bristles absent. Basal scutellar bristles short, fine; apical scutellars large, convergent. Apex of costa (at distal costal incision) usually darkened and protruding as a blackened lappet. Front usually strongly silvery, especially centrally, when viewed at very acute angles. Uppermost parts of pleura (above level of wing articulation) dark; pleural coloration changing abruptly to pale tan below in most species.

Species Descriptions

The form of the descriptions given below is that used for the genus *Drosophila* (Bock 1976). Abbreviations of specimen locations are:

AM	Australian Museum, Sydney
ANIC	Division of Entomology, CSIRO, Canberra
LT	Department of Genetics and Human Variation, La Trobe University, Melbourne
SPHTM	School of Public Health and Tropical Medicine, University of Sydney
UQ	Department of Entomology, University of Queensland, Brisbane
Amsterdam	Zoologisch Museum, Universiteit van Amsterdam, Amsterdam, Holland

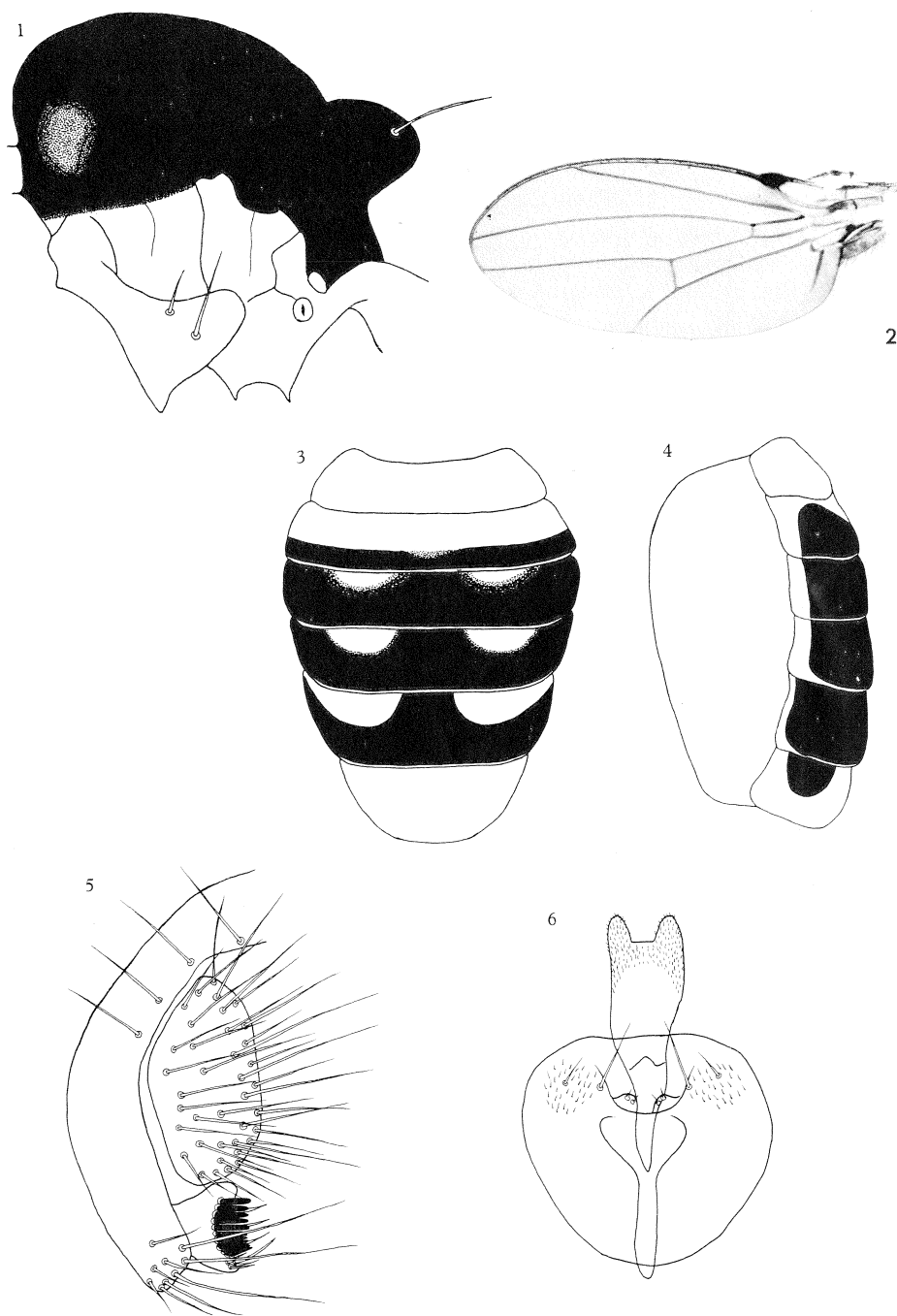
1. *Mycodrosophila argentifrons* Malloch

Mycodrosophila argentifrons Malloch, 1927, p. 1. (Holotype in SPHTM; type locality Coramba, N.S.W.)

Distinguishing features. Carina broad, flat. Pleura entirely pale tan below level of wing articulation. Knob only of haltere black. Abdominal pattern as in Figs 3, 4.

Body length. c. 2.9 mm.

Head. Arista with 4 apically curved rays above and 1 straight ray below plus large terminal fork. Front pale tan anteriorly and medially, darkening to blackish posterolaterally. Ocellar triangle blackened. Periorbits shining. Ratio frontal



Figs 1-6. *M. argentifrons*: 1, thorax; 2, wing; 3, abdomen (dorsal); 4, abdomen (ventrolateral); 5, male external genitalia; 6, male internal genitalia.

breadth : length, 1·5. 2nd and 3rd antennal segments dark tan, slightly dusky. Face dark brown, blackish below. Carina large, narrow above, greatly widened below, flat, lateral and ventral margins almost squared. Palp dusky brown, with several large apical bristles. Cheek linear, pale in posterior corner, otherwise dark. Orbital bristles in ratio 4 : 1 : 4; anterior reclinate orbital very fine; all 3 orbitals almost in line.

Thorax (Fig. 1). Mesonotum dark brown with paler areas anteriorly. Scutellum dark brown centrally, blackening laterally and posteriorly, subshining. Pleura dark above level of wing articulation, entirely pale tan below. Stalk of haltere pale tan; knob black. Legs entirely pale tan.

Wing (Fig. 2). Weak brownish tinge present. *C*-index, *c.* 1·7; 4*V*-index, *c.* 2·2; 5*X*-index, *c.* 2·3; *M*-index, *c.* 0·8. 3rd costal section with heavy setation on basal 0·7. Length, *c.* 2·6 m.

Abdomen (Figs 3, 4). Tergite 1 pale tan. Tergite 2 pale tan anteriorly, in middle region towards posterior border, black posteriorly; incurved portion of tergite black posterolaterally, pale tan medially and anteriorly. Tergite 3 black with oval submedian tan patches reaching anterior margin of tergite; incurved portion black laterally, pale tan medially. Tergite 4 similar to tergite 3, submedian oval patches slightly larger. Tergite 5 black with larger submedian tan patches; incurved portion black, tan only in narrow area medially. Tergite 6 pale tan; incurved tan with large black spot.

Male genitalia (Figs 5, 6). Clasper with *c.* 10 long rounded medial black teeth. Hypandrium with pair of small spines. Aedeagus with apical notch and fine apical sensilla.

Female genitalia. Egg guide slender, apically rounded with a few teeth and a few long hairs.

Distribution. New South Wales.

Specimens Examined

New South Wales (AM unless otherwise noted): Minnamurra Falls, 31.i.1962, D. H. Colless, 1 ♂ (ANIC); Bruxner Park, near Coffs Harbour, 21.ii.1965, D. K. McAlpine, 1 ♂, 1 ♀; Otford, 3.iii.1965, D. K. McAlpine, 6 ♂, 5 ♀; National Park, D. K. McAlpine, 18.xi.1955, 4 ♂, 1 ♀, 28.iv.1956, 1 ♂; Upper Allyn near Eccleston, 27.ii.1970, D. K. McAlpine, 6 ♂, 2 ♀.

2. *Mycodrosophila rayi*, sp. nov.

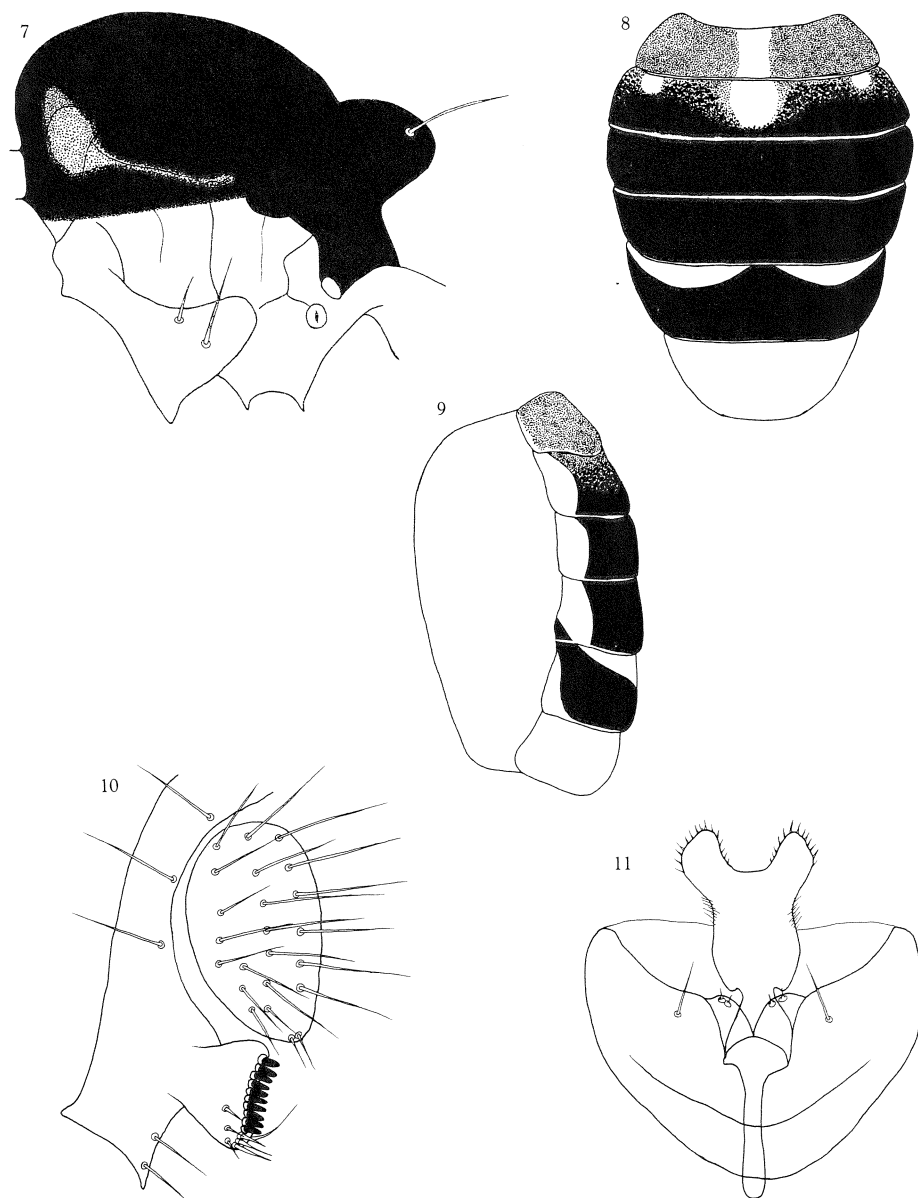
Types

Holotype ♂: Upper Allyn River, New South Wales, 22.iv.1970, D. H. Colless (ANIC). Paratypes: Queensland: Coomera River, Lamington National Park 1200 ft, 28.v.1966, Z. Liepa, 1 ♂ (ANIC); Mapleton Falls National Park, on fungi, 21.iv.1977, P. A. Parsons, 1 ♂, 1 ♀ (LT); New South Wales: Bruxner Park (Site 3), 19.iv.1970, D. H. Colless, 2 ♀ (ANIC); *c.* 2 miles NW. of Bruxner Park, 16.iv.1970, D. H. Colless, 1 ♂ (ANIC); Otford, 3.iii.1962, D. K. McAlpine, 1 ♂ (AM); Minnamurra Falls, under bracket fungus, 31.i.1962, D. H. Colless, 2 ♂ (ANIC); National Park, 18.xi.1955, D. K. McAlpine, 1 ♂, 2 ♀ (AM); Upper Allyn River, 14.ii.1968, D. H. Colless, 1 ♂ (ANIC).

Distinguishing features. Pleura entirely pale below level of wing articulation. Knob only of haltere black. Wings with weak brownish tinge, with trace only of darker band behind lappet. Abdominal pattern as in Figs 8, 9.

Body length. 2.5 mm (holotype); 2.4–3.0 mm (paratype range).

Head. Arista with 4 long apically curved rays above and 1 straight ray below plus large terminal fork. Front blackish brown with pale triangular area anteriorly (apex of this triangle reaching ocellar triangle). Periorbits shiny. Ratio frontal



Figs 7–11. *M. rayi*: 7, thorax; 8, abdomen (dorsal); 9, abdomen (ventrolateral); 10, male external genitalia; 11, male internal genitalia.

breadth : length, 1.3. 2nd and 3rd antennal segments mid-brown. Face mid-brown; clypeal margin blackened. Carina prominent, very narrow above, broadened below, flat, lateral and ventral margins almost squared. Cheek linear,

palpus ?

widened in posterior corner, dark brown anteriorly, pale tan posteriorly. Proclinate and posterior reclinate orbital bristles subequal; anterior reclinate orbital minute, posterolateral to proclinate orbital.

Thorax (Fig. 7). Mesonotum blackish brown with slightly paler areas centrally and laterally; humeral areas significantly paler. Scutellum blackish brown, smoothly rounded, subshining. Pleura dark above level of wing articulation, pale tan below. Stalk of haltere pale tan, knob entirely blackish. Legs pale tan; tibiae and tarsi slightly darker than upper segments.

Wing. Weak brownish tinge present with trace of darker band behind lappet. *C*-index, 1.5; 4*V*-index, 1.7; 5*X*-index, 1.3; *M*-index, 0.4. 3rd costal section with heavy setation on basal 0.6. Length (holotype), 2.4 mm.

Abdomen (Figs 8, 9). Tergite 1 blackish with small central pale patch. Tergite 2 blackish with pale area anteriorly in midline and small pale circles anterolaterally; incurved portion dark, pale at extremity. Tergites 3 and 4 black; incurved portions black, pale at extremities. Tergite 5 blackish with broad pale crescentic areas anterolaterally; incurved portion largely black, pale in posterior corner and anteromedially. Tergite 6 entirely pale tan.

Male genitalia (Figs 10, 11). Clasper with *c.* 10 large medial black teeth and cluster of lower bristles. Aedeagus with large apical notch; apical margin of aedeagus with small spines. Hypandrium with pair of submedian spines.

Female genitalia. Egg guide broadly rounded apically, with marginal teeth apically.

Distribution. Southern Queensland and New South Wales.

Specimens Examined

Types only as above.

3. *Mycodrosophila rosemaryae*, sp. nov.

Types

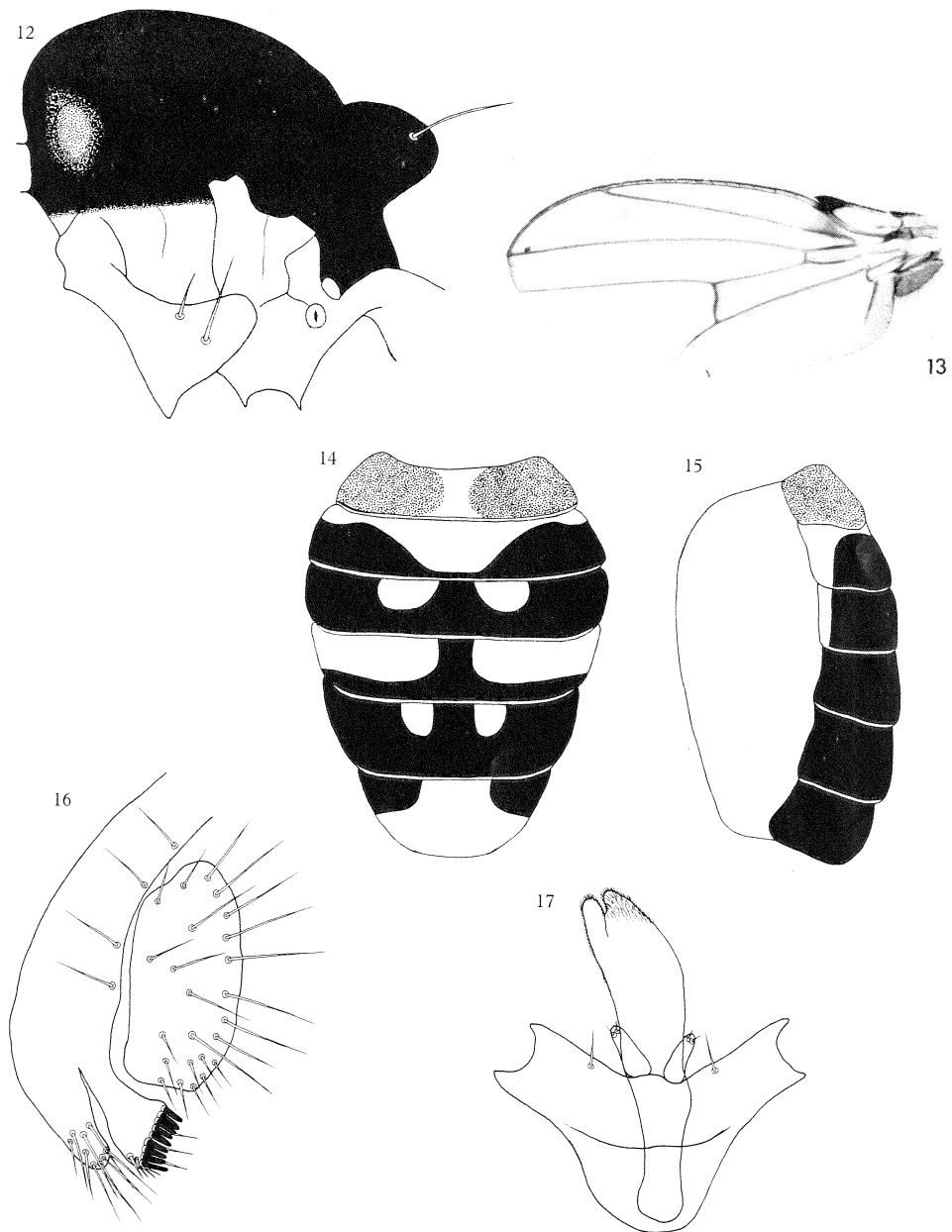
Holotype ♀: National Park, New South Wales, 20.iii.1965, D. K. McAlpine (AM). Paratypes (all AM): National Park, New South Wales, 18.xi.1955, D. K. McAlpine, 6 ♂, 1 ♀; Broken River, Eungella, Queensland, 9.xii.1961, McAlpine and Lossin, 4 ♂; The Crater near Herberton, Queensland, 19.i.1972, D. K. McAlpine and G. A. Holloway, 1 ♀.

Distinguishing features. Pleura entirely pale tan below level of wing articulation. Carina greatly broadened below, flat. Wing with darker band behind lappet and weak browning along posterior crossvein. Knob only of haltere black. Abdominal pattern as in Figs 14, 15.

Body length. 2.9 mm (holotype); 2.6–3.0 mm (paratype range).

Head. Arista with 4 apically curved rays above and 1 straight ray below plus terminal fork. Front tan centrally and narrowly along anterior border, otherwise blackish. Periorbits shining. Ratio frontal width: length, 1.5. 2nd antennal segment dusky dark brown; 3rd dark brown. Face brown, darkening to blackish below. Carina large, prominent, narrow above, greatly broadened below, flat, lateral margins squared, ventral margin rounded. Palp dusky brown, with long and short apical bristles. Cheek linear, tan in posterior corner, otherwise black,

rather broad. Orbital bristles in ratio 4 : 1 : 4; anterior reclinate orbital very fine, midway between proclinate and posterior reclinate orbitals.



Figs 12-17. *M. rosemaryae*: 12, thorax; 13, wing; 14, abdomen (dorsal); 15, abdomen (ventrolateral); 16, male external genitalia; 17, male internal genitalia.

Thorax (Fig. 12). Mesonotum shiny blackish brown, paler anteriorly. Scutellum blackish subshining, somewhat silvery, especially apically, at certain angles of illumination. Pleura tan below level of wing articulation. Stalk of haltere pale tan; knob black. Legs tan.

Wing (Fig. 13). Faintly brownish, with slight darkening along posterior crossvein and brown band behind lappet. Lappet large. *C*-index, 1.6; 4*V*-index, 1.9; 5*X*-index, 1.4; *M*-index, 0.5. 3rd costal section with heavy setation on basal 0.8. Length (holotype), 2.8 mm.

Abdomen (Figs 14, 15). Tergite 1 largely weakly darkened. Tergite 2 tan anteriorly and centrally to or almost to posterior border, black posterolaterally; incurved portion black laterally, tan medially. Tergite 3 black with tan areas anteriorly on either side of midline; incurved portion black, tan at medial extremity. Tergite 4 black with large tan areas extending to lateral margin of tergite on either side of midline; incurved portion black. Tergite 5 black with small tan spots anteriorly on either side of midline; incurved portion black. Tergite 6 tan centrally and posteriorly, black anterolaterally; incurved portion black.

Male genitalia (Figs 16, 17). Clasper with *c.* 9 rounded medial black teeth. Aedeagus with apical notch and fine spines, especially apically. Hypandrium with small submedian spines.

Female genitalia. Egg guide rounded, with a few apical teeth and a few long hairs.

Distribution. North Queensland to central New South Wales.

Specimens Examined

Types only as above.

4. *Mycodrosophila margoae*, sp. nov.

Type

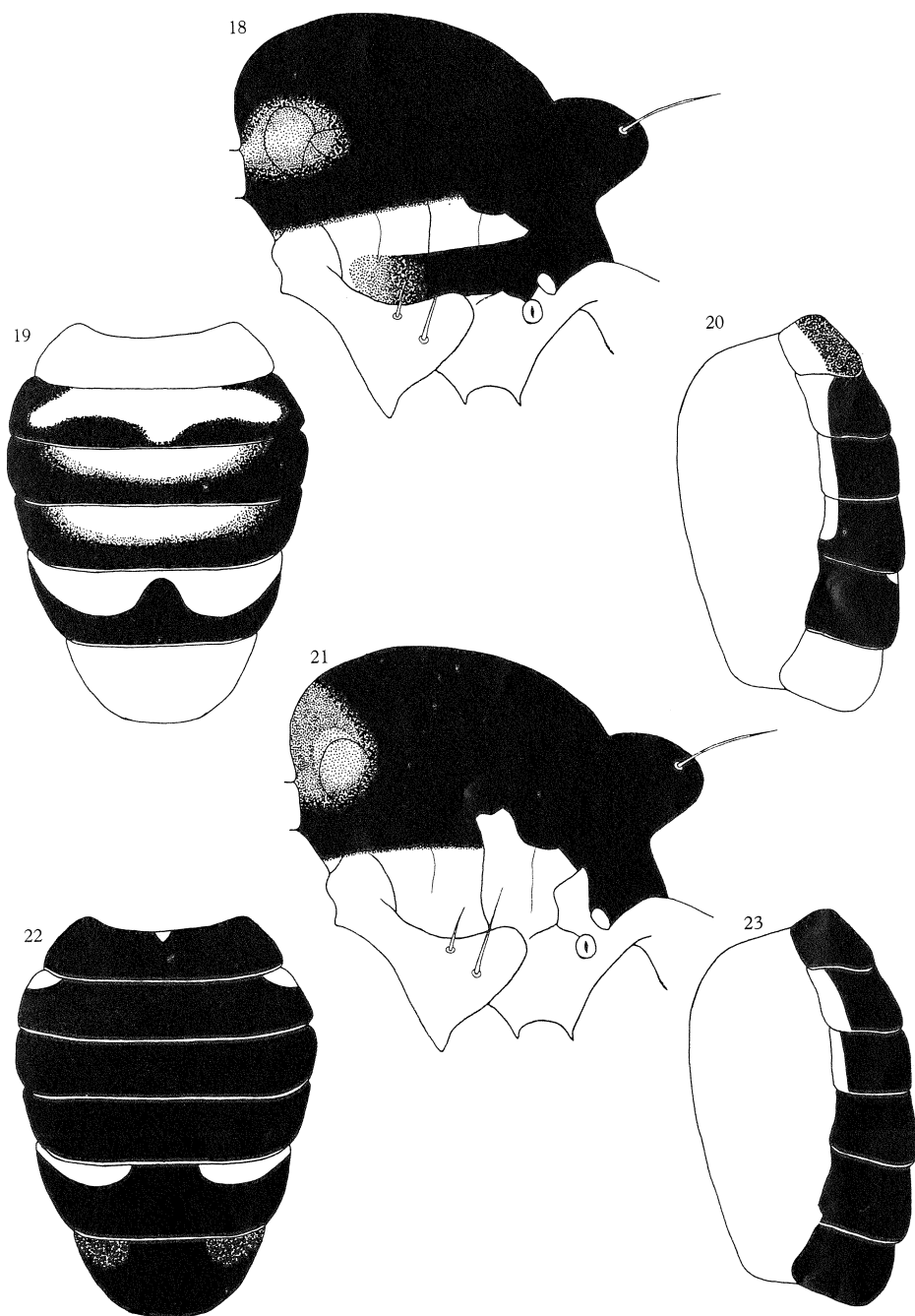
Holotype ♀: Palm Creek, Royal National Park, New South Wales, 22.vii.1963, D. H. Colless (ANIC).

Distinguishing features. Pleura with dark longitudinal band tapering anteriorly. Legs weakly banded. Haltere with blackening on both stalk and knob. Abdominal pattern as in Figs 19, 20.

Body length. 2.6 mm.

Head. Arista with 4 long apically curved rays above and 1 straight ray below plus large terminal fork. Front dark tan, darker laterally. Ocellar triangle blackened. Periorbits shiny. Ratio frontal breadth : length, 1.3. 2nd antennal segment mid-brown; 3rd dusky tan. Carina strongly protuberant, very narrow above, broader below, almost flat, lateral and ventral borders rounded. Face mid-brown. Palp dusky tan, with single large and several small apical bristles. Cheek slightly curved, rather broad, dark brown, widened and pale tan in posterior corner. Orbital bristles in ratio 3 : 1 : 3; anterior reclinate orbital very fine; all 3 orbitals almost in line.

Thorax (Fig. 18). Mesonotum dark brown with blackish traces, slightly paler anteriorly, paler about humeral calli. Scutellum blackish brown, darker about border. Pleura blackish above level of wing articulation, pale tan below with dark longitudinal band covering pleurotergite and lower part of pteropleuron, narrowing anteriorly on lower part of mesopleuron, not quite reaching anterior border of latter. Basal segment of haltere tan; apical segment and knob blackened. Legs pale tan with weakly bordered darker annuli on lower portions of all femora (weak on fore femora) and weak dark annuli on upper portions of all tibiae.



Figs 18-20. *M. margoae*: 18, thorax; 19, abdomen (dorsal); 20, abdomen (ventrolateral).
Figs 21-23. *M. diana*: 21, thorax; 22, abdomen (dorsal); 23, abdomen (ventrolateral).

Wing. Brownish tinge present without trace of darker band behind lappet. Lappet well developed. *C*-index, 1.6; *4V*-index, 3.1; *5X*-index, 2.2; *M*-index, 1.0. 3rd costal section with heavy setation on basal 0.6. Length, 2.7 mm.

Abdomen (Figs 19, 20). Tergite 1 pale tan; incurved portion darkened laterally. Tergite 2 pale on anterior *c.* 0.5, dark brown on posterior *c.* 0.5 (weaker centrally) and laterally; incurved portion black laterally, tan medially (tan coloration wider anteriorly). Tergite 3 tan on anterior *c.* 0.5 in middle region, otherwise dark brown (darker posteriorly); incurved portion black, tan in narrow area at medial extremity. Tergite 4 tan to dark brown, colour weakest anteriorly in middle region, strongest posteriorly; incurved portion blackish, tan medially in anterior part only. Tergite 5 blackish with large pale tan areas anterolaterally; incurved portion black. Tergite 6 entirely pale tan.

Female genitalia. Egg guide without teeth, with a few long hairs.

Distribution. Known only from the holotype.

5. *Mycodrosophila diana*e, sp. nov.

Type

Holotype ♀: *c.* 2 miles NW. of Bruxner Park, New South Wales, 16.iv.1970, D. H. Colless (ANIC).

Distinguishing features. Pleura entirely pale tan below level of wing articulation. Wing with strong dark band behind lappet. Carina narrow. Abdominal pattern as in Figs 22, 23.

Body length. 2.5 mm.

Head. Arista with 4 long apically curved rays above and 1 straight ray below plus large terminal fork. Ocellar triangle black; area of front enclosing orbital and vertical bristles blackish brown; front otherwise tan, paler anteriorly. Ratio frontal breadth : length, 1.2. 2nd antennal segment tan; 3rd dusky brown. Carina prominent, very narrow above, gradually broadening below but still rather narrow at lowermost extremity, lateral and ventral margins rounded. Face mid-brown; clypeal margin blackened. Palp tan, not infuscated, with a few large apical bristles. Cheek almost linear, posterior corner enlarged, pale tan, cheek otherwise blackish. Proclinate and posterior reclinate orbital bristles subequal; anterior reclinate orbital minute, slightly lateral to other 2 orbitals.

Thorax (Fig. 21). Mesonotum blackish brown with paler areas, especially posteriorly in midline, near medial ends of transverse suture and about humeral areas. Scutellum blackish laterally, paler centrally. Pleura blackish above level of wing articulation, entirely pale tan below. Basal segment of haltere pale tan; apical segment and knob blackened. Legs pale tan; tarsi slightly darker.

Wing. Faintly brownish with conspicuous band behind lappet and further darkening about anal vein. Lappet well developed. *C*-index, 1.2; *4V*-index, 2.3; *5X*-index, 1.7; *M*-index, 0.7. 3rd costal section with heavy setation on basal 0.6. Length, 2.3 mm.

Abdomen (Figs 22, 23). Tergite 1 blackish. Tergite 2 black, tan in small antero-lateral spots; incurved portion black, tan at extremity. Tergites 3 and 4 each black, slightly paler centrally; incurved portions entirely black (tergite 4), with narrow medial tan band (tergite 3). Tergite 5 black with pale tan areas anterolaterally;

incurved portion black. Tergite 6 black with brown areas anterolaterally; incurved portion black.

Female genitalia. Egg guide with a few weak apical teeth and a few long hairs.

Distribution. Known only from the holotype.

✓ 6. *Mycodrosophila separata* (de Meijere)

Drosophila separata de Meijere, 1911, p. 406. (Holotype in Amsterdam; type locality Semarang, Java, on *Polyporus*.)

Distinguishing features. Apex of scutellum pale. Pleura entirely pale below level of wing articulation. Lappet undeveloped. Abdomen almost entirely black dorsally (Figs 26, 27).

Body length. *c.* 2·6 mm.

Head. Arista with 4 long apically curved rays above and 1 long apically curved ray below plus large terminal fork. Front pale tan anteriorly and centrally, blackened about orbital margins and posteriorly. Ocellar triangle black. Periorbits shiny. Ratio frontal breadth : length, 1·2. 2nd antennal segment pale tan; 3rd dusky brownish. Carina prominent but not greatly broadened below, rather flat, lateral margins acutely rounded, ventral margin broadly rounded. Face brownish, blackening below. Palp dark brown, with a few exceptionally long bristles apically. Cheek linear, black anteriorly, widened and pale tan in posterior corner. Orbital bristles in ratio 3 : 1 : 3; anterior reclinate orbital very fine, posterolateral to proclinate orbital.

Thorax (Fig. 24). Mesonotum dark blackish brown. Scutellum blackish laterally and anteriorly, gradually becoming pale tan at apex. Pleura blackish above level of wing articulation, entirely pale tan below. Basal segment of stalk of haltere pale tan; apical segment with weak darkening; knob with weak darkening basally on dorsal side, otherwise pale tan. Legs pale tan; tarsi slightly darker.

Wing (Fig. 25). Faint brownish tinge present; costa weakly darkened at distal incision; lappet undeveloped. *C*-index, *c.* 1·8; 4*V*-index, *c.* 1·4; 5*X*-index, *c.* 1·2; *M*-index, *c.* 0·3. 3rd costal section with heavy setation on basal 0·35. Length, *c.* 2·3 mm.

Abdomen (Figs 26, 27). Tergite 1 pale tan. Tergite 2 tan anteriorly especially in middle region, otherwise black; incurved portion black posterolaterally, tan medially and anteriorly. Tergites 3–5 each black; incurved portion of each black laterally, tan medially. Tergite 6 black; incurved portion black, tan medially especially in anterior corner.

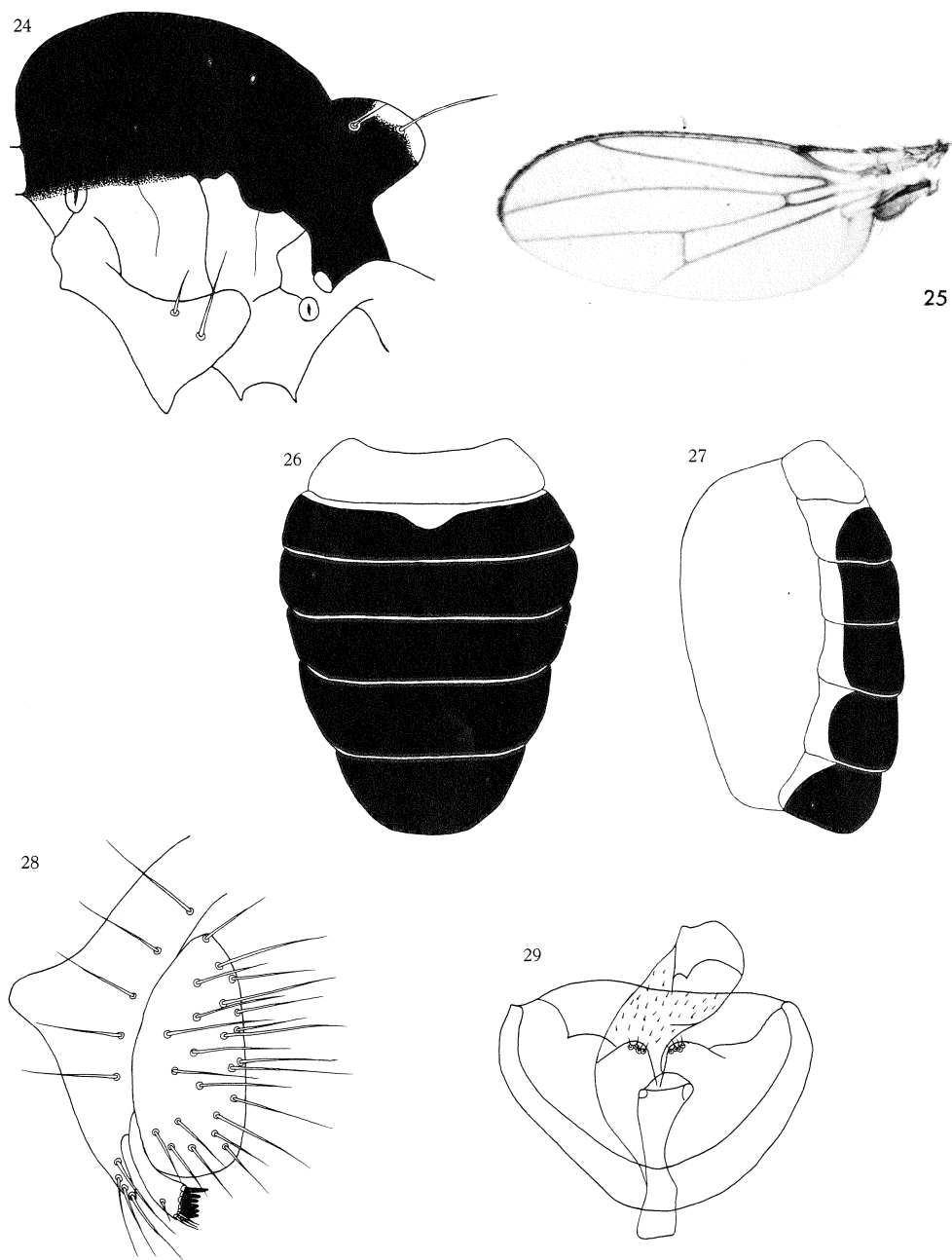
Male genitalia (Figs 28, 29). Clasper small, with *c.* 6 large medial black teeth. Aedeagus large, with very fine subapical hairs.

Female genitalia. Egg guide slender, apically rounded with a few small weak teeth and a few long hairs.

Distribution. Previously known from Java (de Meijere 1911). Australian specimens have been collected from northern and southern Queensland.

Specimens Examined

Queensland: Mossman Gorge, 23.iv.1967, D. H. Colless, 1 ♂, 1 ♀ (ANIC); Mary Cairncross Park, on fungi, 7.xii.1976, P. A. Parsons, 7 ♂, 2 ♀ (LT), 2 ♂, 2 ♀ (AM).



Figs 24-29. *M. separata*: 24, thorax; 25, wing; 26, abdomen (dorsal); 27, abdomen (ventrolateral); 28, male external genitalia; 29, male internal genitalia.

Special Comments

This species is unusual within the genus in lacking the costal lappet and in possessing pale coloration on the scutellum. Wheeler and Takada (1964) described a similar Micronesian species (*M. esakii*), further distinguished by a mesonotum possessing pale tan rather than the usual dark coloration, and listed the following species lacking the lappet: *esakii* Wheeler and Takada, *alienata* Duda (Sumatra), *albicornis* (de Meijere) (Simalur), and *separata* (de Meijere). It was suggested that these species could merit subgeneric status, but that further study of two little-known African species possibly related to them would first be desirable. [The species concerned are *Drosophila aberrans* Lamb (Lamb 1914) and *D. agbo* Burla; Duda (1940) established *Dichaetophora* as a subgenus of *Drosophila* for *D. aberrans* and Burla (1954) described *D. agbo* in this subgenus.] The following species is also distinguished by a barely developed lappet.

7. *Mycodrosophila compacta*, sp. nov.

Type

Holotype ♂: Mary Cairncross Park, Queensland, on fungi, 7.xii.1976, P. A. Parsons (ANIC). Paratypes: same data as holotype, 2 ♂, 1 ♀ (AM), 3 ♂ (LT); Palmerston National Park, 1600 ft, Queensland, 18.iv.1971, D. A. Duckhouse (light trap), 1 ♀ (ANIC).

Distinguishing features. Body small. Wing clear; C-index low; lappet barely developed. Pleura entirely pale tan below level of wing articulation. Abdominal pattern as in Figs 32, 33.

Body length. 1.9 mm (holotype); 1.8–2.2 mm (paratype range).

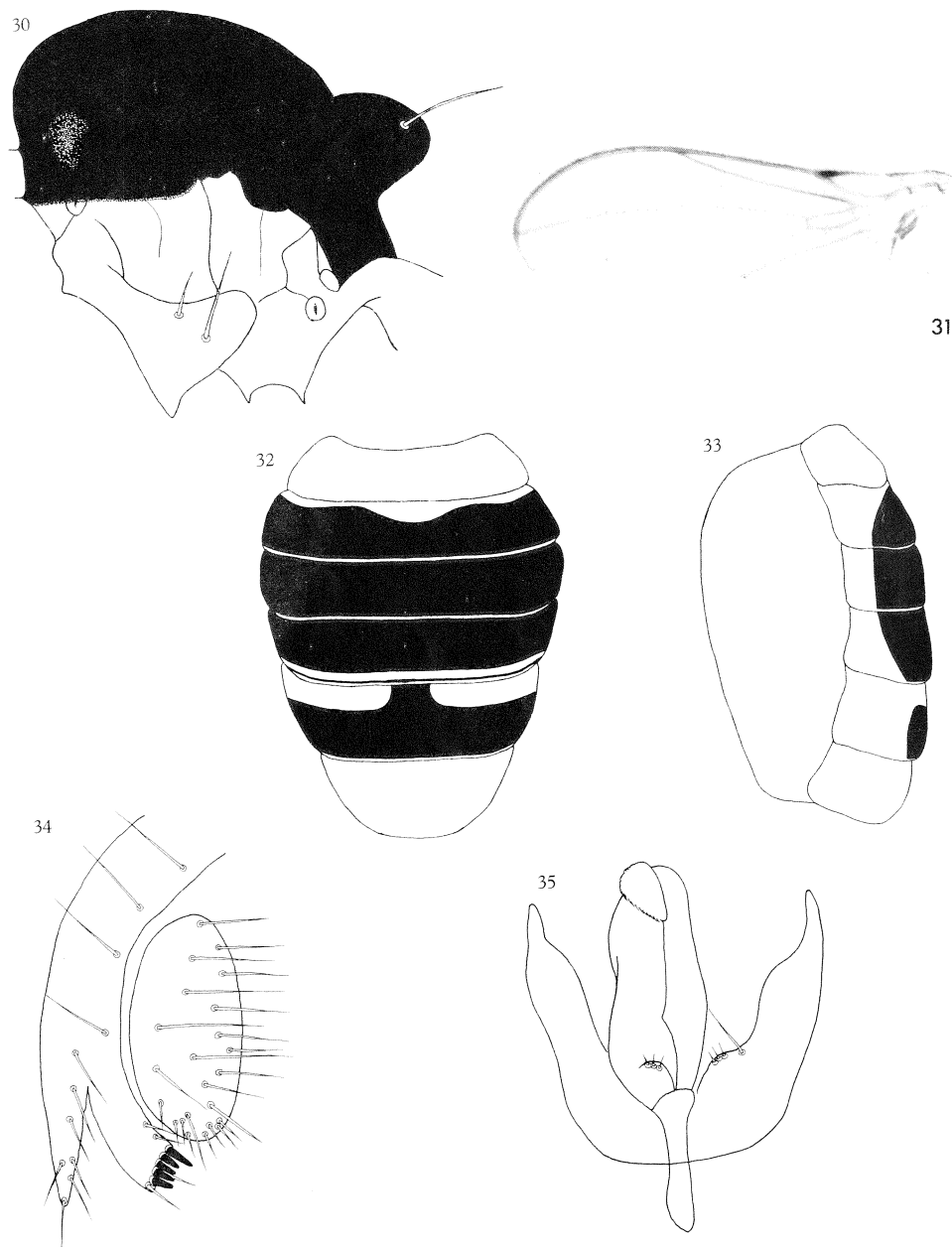
Head. Arista with 4 long apically curved rays above and 1 almost straight ray below plus terminal fork. Front almost entirely very dark velvety brown, a little paler centrally and immediately in front of ocellar triangle, tan in narrow line along anterior margin. Ocellar triangle black. Periorbits shiny. Ratio frontal breadth : length, 1.2. 2nd antennal segment dark tan; 3rd dusky tan. Carina prominent, very narrow above, not greatly broadened below, flat, lateral margins squared, ventral margin rounded and gradually falling away towards clypeus. Face mid-brown, darker below. Palp pale tan with a few apical bristles. Cheek linear, black anteriorly, widened and pale tan in posterior corner. Orbital bristles in ratio 7 : 2 : 7; anterior reclinate orbital extremely fine, midway between proclinate and posterior reclinate orbitals and slightly lateral to them.

Thorax (Fig. 30). Mesonotum dark brownish black, a little paler about humeral calli. Scutellum blackish. Pleura dark above level of wing articulation, entirely pale below. Stalk of haltere pale tan; knob with blackening, stronger basally. Legs pale tan; tarsi slightly darker.

Wing (Fig. 31). Hyaline. Costa darkened at distal incision but lappet barely developed. C-index, 0.7; 4V-index, 2.6; 5X-index, 2.7; M-index, 0.9. 3rd costal section with heavy setation on basal 0.5. Length (holotype), 1.6 mm.

Abdomen (Figs 32, 33). Tergite 1 pale tan. Tergite 2 pale tan anteriorly especially laterally and in middle region, otherwise black; incurved portion black posterolaterally, otherwise pale tan. Tergites 3 and 4 each black; incurved portions black laterally, tan medially. Tergite 5 black with pale tan areas anterolaterally;

incurved portion black posterolaterally, otherwise pale tan. Tergite 6 entirely pale tan.



Figs 30–35. *M. compacta*: 30, thorax; 31, wing; 32, abdomen (dorsal); 33, abdomen (ventrolateral); 34, male external genitalia; 35, male internal genitalia.

Male genitalia (Figs 34, 35). Clasper with *c.* 5 large black medial teeth. Apical margin of aedeagus slightly serrated. Hypandrium with small submedian spines. Parandrites small, with apical sensilla.

Female genitalia. Egg guide narrowly rounded apically, with a few apical teeth and 2 long subterminal hairs.

Distribution. Collected in northern and southern Queensland.

Specimens Examined

Types only as above.

✓ 8. *Mycodrosophila marksae*, sp. nov.

Types

Holotype ♂: Lake Eacham National Park, Queensland, under bracket fungus, 20.viii.1976, P. A. Parsons (ANIC). Paratypes: Whian Whian State Forest near Lismore, New South Wales, 25.ii.1965, D. K. McAlpine, 1 ♂ (AM); Paluma area, Queensland, under bracket fungus, July 1975, I. R. Bock and J. Grossfield, 1 ♀ (LT); Kirrama, Queensland, under bracket fungus, July 1975, I. R. Bock, 1 ♀ (ANIC); Lamington National Park, Queensland, 27.v.1959, E. N. Marks, 2 ♂, 5 ♀ (UQ); Tamborine Mt, Queensland, 16.ii.1960, E. M. Exley, 1 ♀ (UQ).

Distinguishing features. Body large. Pleura with 2 broad dark longitudinal bands. Carina large, flat. Abdominal pattern as in Figs 37, 38.

Body length. 3.2 mm (holotype); 3.2–3.5 mm (paratype range).

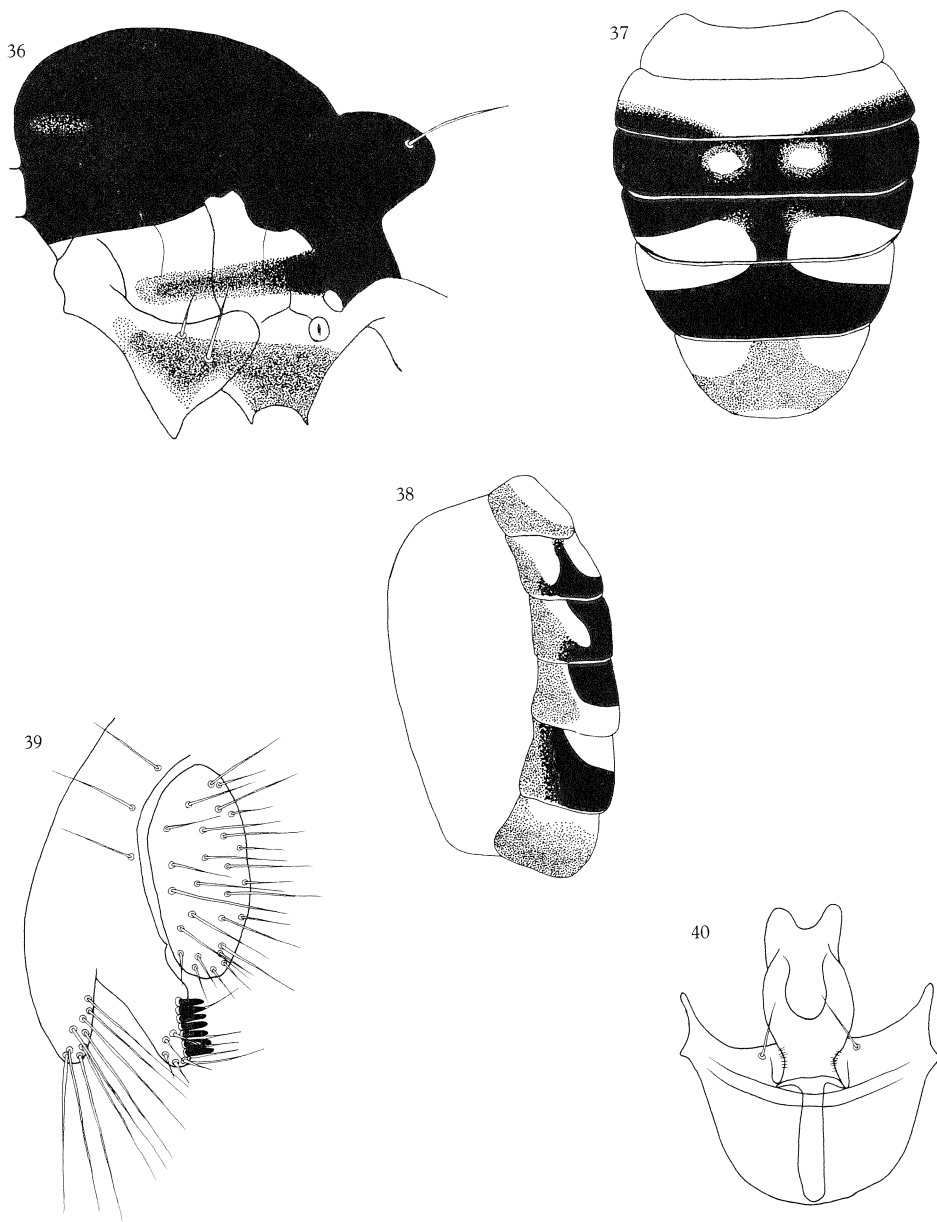
Head. Arista with 4 long apically curved rays above and 1 long straight ray below plus large terminal fork. Front deep tan anteriorly and centrally, blackening laterally and posteriorly. Ocellar triangle black. Periorbits shiny. Ratio frontal breadth : length, 1.3. Antennal segments 2 and 3 dusky brown. Carina large, prominent, triangular in frontal aspect, very narrow above, broad below, flat, lateral and ventral margins almost squared. Face dark brown, darker below. Palp dark dusky brown with a few apical bristles. Cheek linear, shiny black except in posterior corner, pale in posterior corner, rather broad. Orbital bristles in ratio 7 : 2 : 7; anterior reclinate orbital very fine, closer to proclinate than to posterior reclinate orbital; all 3 orbital bristles in line.

Thorax (Fig. 36). Mesonotum shiny black, slightly paler anteriorly and about humeral calli, very slightly paler in midline. Scutellum blackish, subshining. Pleura black above level of wing articulation, pale tan below with 2 broad dark diffusely demarcated longitudinal bands, upper band including lower portion of mesopleuron, lower across sternopleuron. Stalk of haltere weakly brownish; knob pale tan. Legs tan; femora slightly darker below.

Wing. Weak brownish tinge present. Lappet small. *C*-index, 2.0; 4*V*-index, 2.2; 5*X*-index, 1.8; *M*-index, 0.6. 3rd costal section with heavy setation on basal 0.7. Length (holotype), 3.4 mm.

Abdomen (Figs 37, 38). Tergite 1 pale tan; incurved portion tan, weakly black at medial extremity. Tergite 2 pale tan anteriorly, blackish posteriorly (weak in middle region); incurved portion with black band on posterior half produced forwards in middle region, dusky medially. Tergite 3 blackish anterolaterally and centrally, merging into tan on either side of midline; incurved portion largely dusky. Tergite 4 black on anterior half and centrally to posterior border, otherwise tan; incurved portion largely dusky. Tergite 5 black with narrow tan areas anterolaterally; incurved portion largely black laterally, dusky medially. Tergite

6 black with small tan areas anterolaterally and posteriorly in midline; incurved portion largely blackish.



Figs 36–40. *M. marksae*: 36, thorax; 37, abdomen (dorsal); 38, abdomen (ventrolateral); 39, male external genitalia; 40, male internal genitalia.

Male genitalia (Figs 39, 40). Clasper small, with cluster of medial teeth. Aedeagus apically notched, bare. Hypandrium with small submedian spines.

Female genitalia. Egg guide narrow, rounded, with marginal teeth (strong apically) and a few long hairs.

Distribution. Collected from north Queensland to northern New South Wales.

Specimens Examined

Types as above. **New South Wales:** Whian Whian State Forest near Lismore, 25.ii.1965, D. K. McAlpine, 1 ♂ [headless] (AM).

9. *Mycodrosophila variata*, sp. nov.

Types

Holotype ♂: Lake Eacham National Park, Queensland, under bracket fungus, 20.viii.1976, P. A. Parsons (ANIC). Paratypes: Queensland: same data as holotype, 4 ♂, 1 ♀ (AM), 5 ♂, 2 ♀ (LT); Lake Eacham National Park, bracket fungus, 23.iv.1977, P. A. Parsons, 2 ♂, 2 ♀ (LT); Lake Barrine, 13.xii.1961, D. K. McAlpine and R. Lossin, 1 ♀ (AM); Lake Barrine, Dec. 1974, on bracket fungus, I. R. Bock, 1 ♂ (ANIC); Mt Edith Forest Rd, 1½ miles off Danbulla Rd, 6.v.1967, D. H. Colless, 1 ♂ (ANIC); Palmerston National Park, 1600 ft, 18.iv.1971, D. A. Duckhouse (light trap), 1 ♂, 2 ♀ (ANIC); Mt Spec, bracket fungus, Aug. 1975, I. R. Bock, 1 ♀ (LT); Kirrama, bracket fungus, July 1975, I. R. Bock, 1 ♂ (LT); Mapleton Falls National Park, on fungi, 21.iv.1977, P. A. Parsons, 2 ♂, 1 ♀ (AM), 2 ♂, 1 ♀ (LT); Mary Cairncross Park, on fungi, 23.iv.1977, P. A. Parsons, 2 ♂, 2 ♀ (ANIC), 1 ♂, 2 ♀ (LT).

Distinguishing features. Pleura with dark longitudinal band posteriorly only. Wing with distinct band behind lappet. Lappet large. Abdomen almost entirely black (Figs 43, 44).

Body length. 2.4 mm (holotype); 2.2–2.6 mm (paratype range).

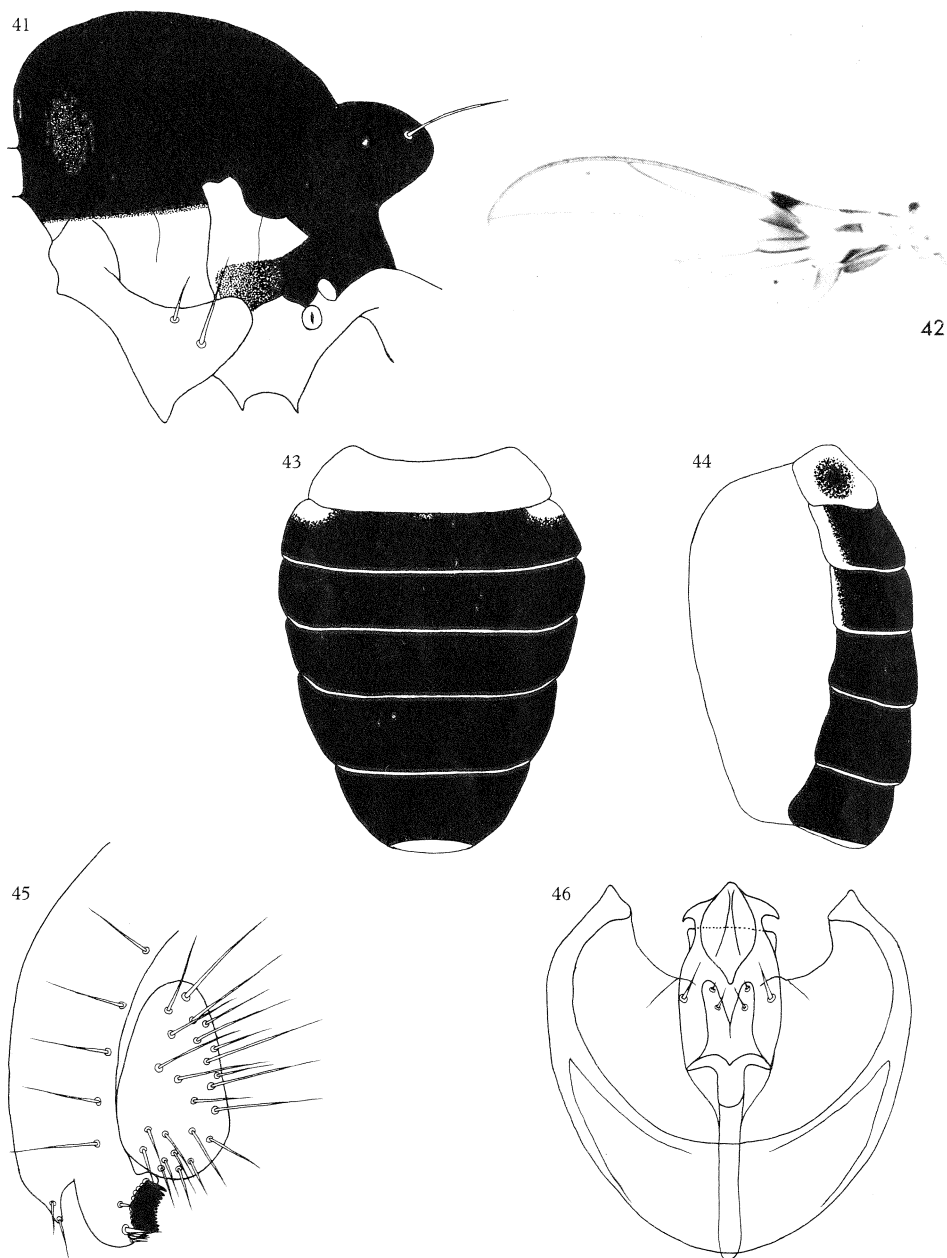
Head. Arista with 4 long apically curved rays above and 1 long straight ray below plus large terminal fork. Front pale tan anteriorly and in narrowing band posteriorly, darkening laterally and posteriorly through rufous brown to blackish. Ocellar triangle black. Periorbits shiny dark brown. Ratio frontal breadth : length, 1.0. 2nd and 3rd antennal segments tan. Carina prominent, nose-like, not greatly broadened below, smoothly rounded. Face tan, blackish brown below. Palp dusky with a few large apical bristles. Cheek rather narrow, broad posteriorly, very pale in posterior corner, otherwise blackish brown. Proclinate and posterior reclinate orbital bristles subequal; anterior reclinate orbital minute, midway between proclinate and posterior reclinate orbitals.

Thorax (Fig. 41). Mesonotum blackish brown, slightly paler anteriorly and about humeral calli. Pleura blackish above level of wing articulation; dark band present covering pleurotergite and lower half of pteropleuron (weakening anteriorly); pleura otherwise pale tan. Stalk of haltere pale tan; knob blackish, pale at apex. Legs pale tan; tarsi slightly darker.

Wing (Fig. 42). Faint brownish tinge present in addition to band behind lappet. C-index, 1.1; 4V-index, 2.6; 5X-index, 2.0; M-index, 0.7. 3rd costal section with heavy setation on basal 0.5. Length (holotype), 1.9 mm.

Abdomen (Figs 43, 44). Tergite 1 tan, slightly darker centrally; incurved portion with some darkening. Tergite 2 blackish with small anterolateral pale areas; incurved portion pale tan at medial border. Tergites 3 and 4 each blackish; incurved

portion paler towards medial border in tergite 3. Tergite 5 blackish; weak small pale crescents present anterolaterally in several specimens; incurved portion black-



Figs 41–46. *M. variata*: 41, thorax; 42, wing; 43, abdomen (dorsal); 44, abdomen (ventrolateral); 45, male external genitalia; 46, male internal genitalia.

ish. Tergite 6 blackish with pale tan line at apical border; incurved portion as in tergites 4–5.

Male genitalia (Figs 45, 46). Clasper with *c.* 12 large black medial teeth.

Aedeagus large, bare, with subapical lateral processes. Parandrites finger-like. Hypandrium with pair of submedian spines.

Female genitalia. Egg guide rounded apically with apical teeth and a few long hairs.

Distribution. Collected in northern and southern Queensland.

Specimens Examined

Types only as above.

10. *Mycodrosophila helenae*, sp. nov.

Types

Holotype ♂: Lake Eacham National Park, Queensland, under bracket fungus, 20.viii.1976, P. A. Parsons (ANIC). Paratypes: Queensland: same data as holotype, 2 ♂, 2 ♀ (LT); Claudie River, 2 miles S. Mt Lamond, 4.i.1972, m.v. light, D. K. McAlpine and G. A. Holloway, 8 ♂, 2 ♀ (AM); Lake Barrine National Park, on bracket fungus, Dec. 1974, I. R. Bock, 1 ♂ (ANIC); Lake Barrine, 15.xii. 1961, D. K. McAlpine and R. Lossin, 13 ♂, 3 ♀ (AM); Paluma, 17.i.1967, D. K. McAlpine and G. Holloway, 1 ♀ (AM); Mulgrave River, 4 miles W. of Gordonvale, 12.i.1967, D. K. McAlpine and G. Holloway, 3 ♂, 1 ♀ (AM); Gheerulla Creek, on fungi, 21.iv.1977, P. A. Parsons, 2 ♂ (LT).

Distinguishing features. Carina large. Wing with brownish tinge and trace of dark band behind lappet. Pleura entirely pale below level of wing articulation. Abdominal pattern as in Figs 49, 50.

Body length. 3.3 mm (holotype); 3.2–3.7 mm (paratype range).

Head. Arista with 4 slightly curved rays above and 1 straight ray below plus very large terminal fork. Front rufous tan centrally to anterior border, widely blackened laterally and posteriorly. Ocellar triangle black. Periorbits shiny. Ratio frontal breadth : length, 1.3. 2nd and 3rd antennal segments dark dusky tan. Carina very prominent, narrow above, greatly widened below, flat, lateral and ventral margins narrowly rounded. Face dusky, darker below. Cheek linear, dusky brown anteriorly, widened and pale tan in posterior corner. Orbital bristles in ratio 3 : 1 : 3; anterior reclinate orbital very slender, posterior and slightly lateral to proclinate orbital.

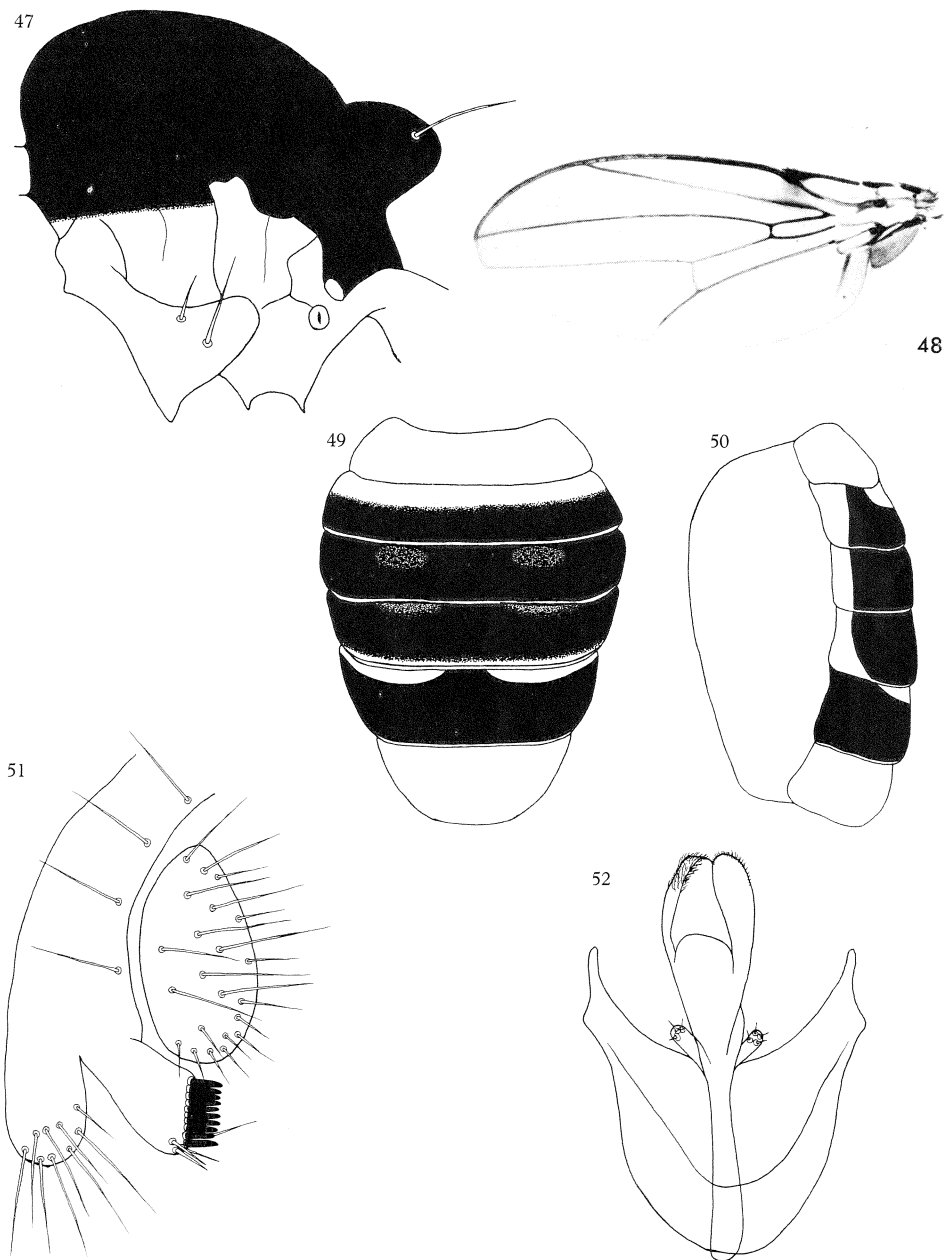
Thorax (Fig. 47). Mesonotum dark brownish black, slightly paler anteriorly. Scutellum subshining black. Pleura concolorous with mesonotum above level of wing articulation, entirely pale tan below. Stalk of haltere pale tan; knob black. Legs pale tan; tarsi darker.

Wing (Fig. 48). Brownish tinge present with trace of darker band behind lappet. C-index, 1.8; 4V-index, 2.5; 5X-index, 2.1; M-index, 0.8. 3rd costal section with heavy setation on basal 0.65. Length (holotype), 3.2 mm.

Abdomen (Figs 49, 50). Tergite 1 pale tan. Tergite 2 pale tan on anterior c. half; incurved portion largely black, tan medially and anterolaterally. Tergites 3 and 4 with traces of submedian dark brown patches; incurved portions black laterally, tan medially. Tergite 5 black with pale tan patches anterolaterally; incurved portion largely black. Tergite 6 pale tan; incurved portion pale tan, blackish in a few specimens.

Male genitalia (Figs 51, 52). Clasper with c. 10 large black medial teeth and

lower cluster of medial bristles. Aedeagus with small apical notch and very fine apical hairs. Parandrites very small, with apical sensilla.



Figs 47-52. *M. helenae*: 47, thorax; 48, wing; 49, abdomen (dorsal); 50, abdomen (ventrolateral); 51, male external genitalia; 52, male internal genitalia.

Female genitalia. Egg guide rounded apically with a few teeth and a few long hairs.

Distribution. Collected from northern and southern Queensland.

Specimens Examined

Types only as above.

11. *Mycodrosophila stigma*, sp. nov.*Types*

Holotype ♂: Broken River, Eungella, Queensland, 9.xii.1961, D. K. McAlpine and R. Lossin (AM). Paratypes: Claudie River, 2 miles S. Mt Lamond, Queensland, 5.i.1972, m.v. light, D. K. McAlpine and G. A. Holloway, 1 ♂ (AM); Upper Broken River, Eungella, Queensland, 12.xii.1961, D. K. McAlpine and R. Lossin, 1 ♂, 1 ? (AM); 10 miles S. of Daintree, Queensland, 25.iv.1967, D. H. Colless, 1 ♀ (ANIC); Whian Whian State Forest near Lismore, New South Wales, 26.ii.1965, D. K. McAlpine, 2 ♀ (AM).

Distinguishing features. Wing with apical infuscation. Pleura entirely pale tan below level of wing articulation. Carina large. Abdominal pattern as in Figs 55, 56.

Body length. 2.9 mm (holotype); 2.6–2.9 mm (paratype range).

Head. Arista with 4 long apically curved rays above and 1 long straight ray below plus very large terminal fork. Front tan anteriorly and in narrowing band posteriorly to ocellar triangle, blackish brown laterally and posteriorly. Ocellar triangle black. Periorbits shiny. Ratio frontal breadth : length, 1.2. 2nd antennal segments mid-brown, dusky anterolaterally; 3rd dusky brown. Carina very prominent, narrow above, broad below, flat, lateral and ventral margins slightly rounded. Face mid-brown. Palp mid-brown, slightly dusky, with a few apical bristles. Cheek linear, wider and pale tan in posterior corner, otherwise blackish brown. Orbital bristles in ratio 3 : 1 : 3; anterior reclinate orbital slightly lateral to proclinate and posterior reclinate orbitals.

Thorax (Fig. 53). Mesonotum dark to blackish brown, with slightly paler areas longitudinally in middle region, laterally and about humeral calli. Scutellum blackish, subshining. Pleura blackish above level of wing articulation, otherwise pale tan. Basal segment of stalk of haltere pale tan; apical segment and knob pale tan posteriorly, darkened anteriorly. Legs pale tan; tarsi slightly darker.

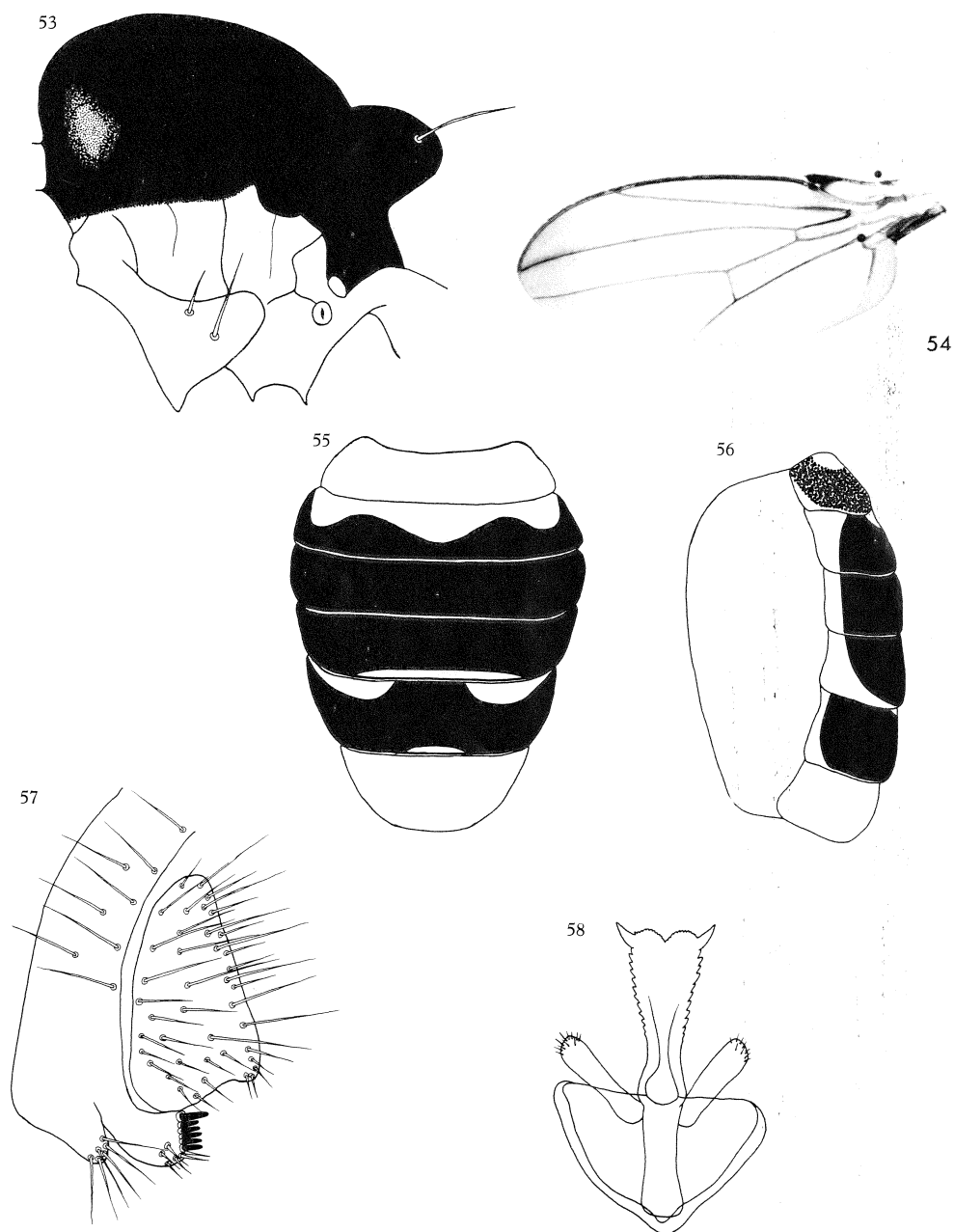
Wing (Fig. 54). Slightly brownish, distinctly darkened apically; somewhat darkened posterior to lappet. Lappet large. C-index, 1.6; 4V-index, 2.2; 5X-index, 2.0; M-index, 0.6. 3rd costal section with heavy setation on basal 0.7. Length (holotype), 2.9 mm.

Abdomen (Figs 55, 56). Tergite 1 pale tan, darkened on incurved portion. Tergite 2 black posteriorly extending slightly forwards on either side of midline, dorsum otherwise pale tan; incurved portion black laterally, tan medially. Tergites 3 and 4 black, 4 tan at apical border, incurved portions black laterally, tan medially (widening posteriorly in tergite 4). Tergite 5 black with small pale tan areas anterolaterally; incurved portion black except for narrow band of pale tan at medial extremity. Tergite 6 entirely pale tan.

Male genitalia (Figs 57, 58). Clasper with c. 6 large black medial teeth, uppermost larger than lower ones. Aedeagus apically expanded, with small lateral horns; dorsal surface with fine serrations. Parandrites finger-like.

Female genitalia. Egg guide with apical and subapical hairs and a few long bristles.

Distribution. Collected from northern Queensland to northern New South Wales.



Figs 53-58. *M. stigma*: 53, thorax; 54, wing; 55, abdomen (dorsal); 56, abdomen (ventrolateral); 57, male external genitalia; 58, male internal genitalia.

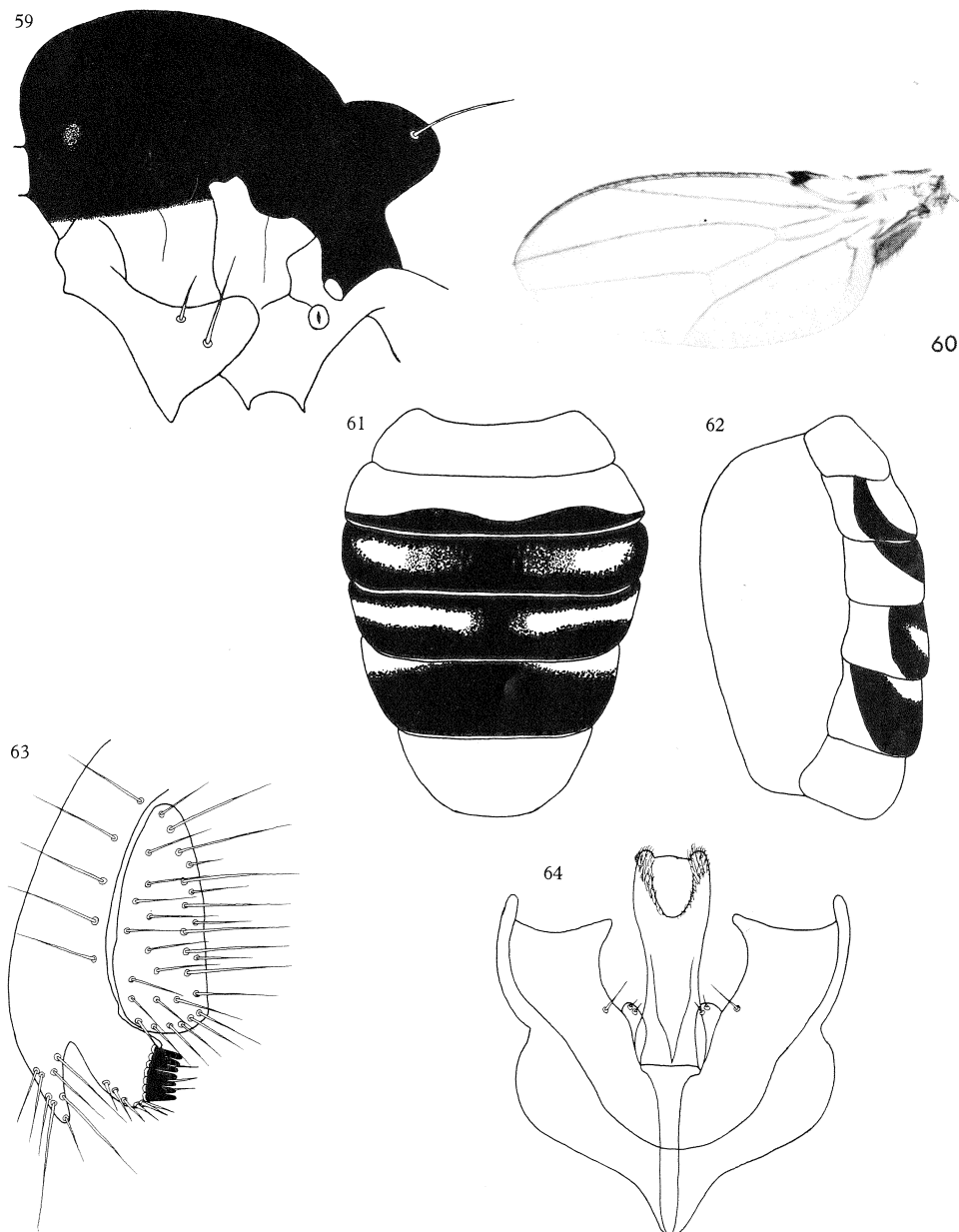
Specimens Examined

Types only as above.

12. *Mycodrosophila mulgravensis*, sp. nov.*Types*

Holotype ♀: Gillies Highway 2 miles W. of Little Mulgrave, Queensland, 18.iv.1967, D. H. Colless (ANIC). Paratypes: same data as holotype, 1 ♂ (ANIC);

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Figs 59-64. *M. mulgravensis*: 59, thorax; 60, wing; 61, abdomen (dorsal); 62, abdomen (ventrolateral); 63, male external genitalia; 64, male internal genitalia.

Mulgrave River 4 miles W. of Gordonvale, Queensland, 4.i.1959, D. K. McAlpine, 1 ♀, 21.i.1967, D. K. McAlpine and G. Holloway, 1 ♀ (AM).

Distinguishing features. Carina large. Pleura entirely pale below level of wing articulation. Knob of haltere pale tan with blackening at apex only. Abdominal pattern as in Figs 61, 62.

Body length. 3.6 mm (holotype); 3.4–3.7 mm (paratype range).

Head. Arista with 4 long curved rays above and 1 long slightly curved ray below plus very large terminal fork. Front tan anteriorly and in narrowing band posteriorly to ocellar triangle, blackish laterally and posteriorly. Ocellar triangle black. Periorbits shiny. Ratio frontal breadth : length, 1.3. 2nd antennal segments tan, dusky anterolaterally; 3rd tan with slight duskiness. Carina extremely prominent, broader below, almost flat, lateral margins squared, ventral margin slightly rounded. Face mid-brown. Palp dusky tan with large apical bristle. Cheek linear, rather wide, blackish, widened and pale tan in posterior corner. Orbital bristles in ratio 3 : 1 : 3; anterior reclinate orbital very fine, slightly lateral to proclinate and posterior reclinate orbitals.

Thorax (Fig. 59). Mesonotum dark chocolatey brown, slightly paler centrally and laterally. Scutellum blackish, subshining; subscutellum tan. Pleura blackish above level of wing articulation, entirely pale tan below. Stalk of haltere pale tan; knob with blackening on outer (anterior) portion. Legs pale tan; tarsi slightly darker.

Wing (Fig. 60). Faintly brownish. *C*-index, 1.4; 4*V*-index, 2.1; 5*X*-index, 1.7; *M*-index, 0.6. 3rd costal section with heavy setation on basal 0.8. Length (holotype), 3.0 mm.

Abdomen (Figs 61, 62). Tergite 1 pale tan. Tergite 2 pale tan on anterior *c.* $\frac{2}{3}$, blackish on posterior *c.* $\frac{1}{3}$ (coloration weaker centrally); incurved portion tan with black band. Tergites 3 and 4 each blackish with elongate tan areas in middle on either side of midline; incurved portions largely tan. Tergite 5 pale tan anterolaterally, otherwise blackish; incurved portion with broad black band. Tergite 6 entirely pale tan.

Male genitalia (Figs 63, 64). Clasper with *c.* 7 large black medial teeth. Aedeagus with apical notch and fine apical ornamentation. Hypandrium with pair of very small spines. Parandrites with apical sensilla.

Female genitalia. Egg guide with numerous marginal teeth and a few long hairs.

Distribution. Collected only in the region of the Mulgrave River, north Queensland.

Specimens Examined

Types only as above.

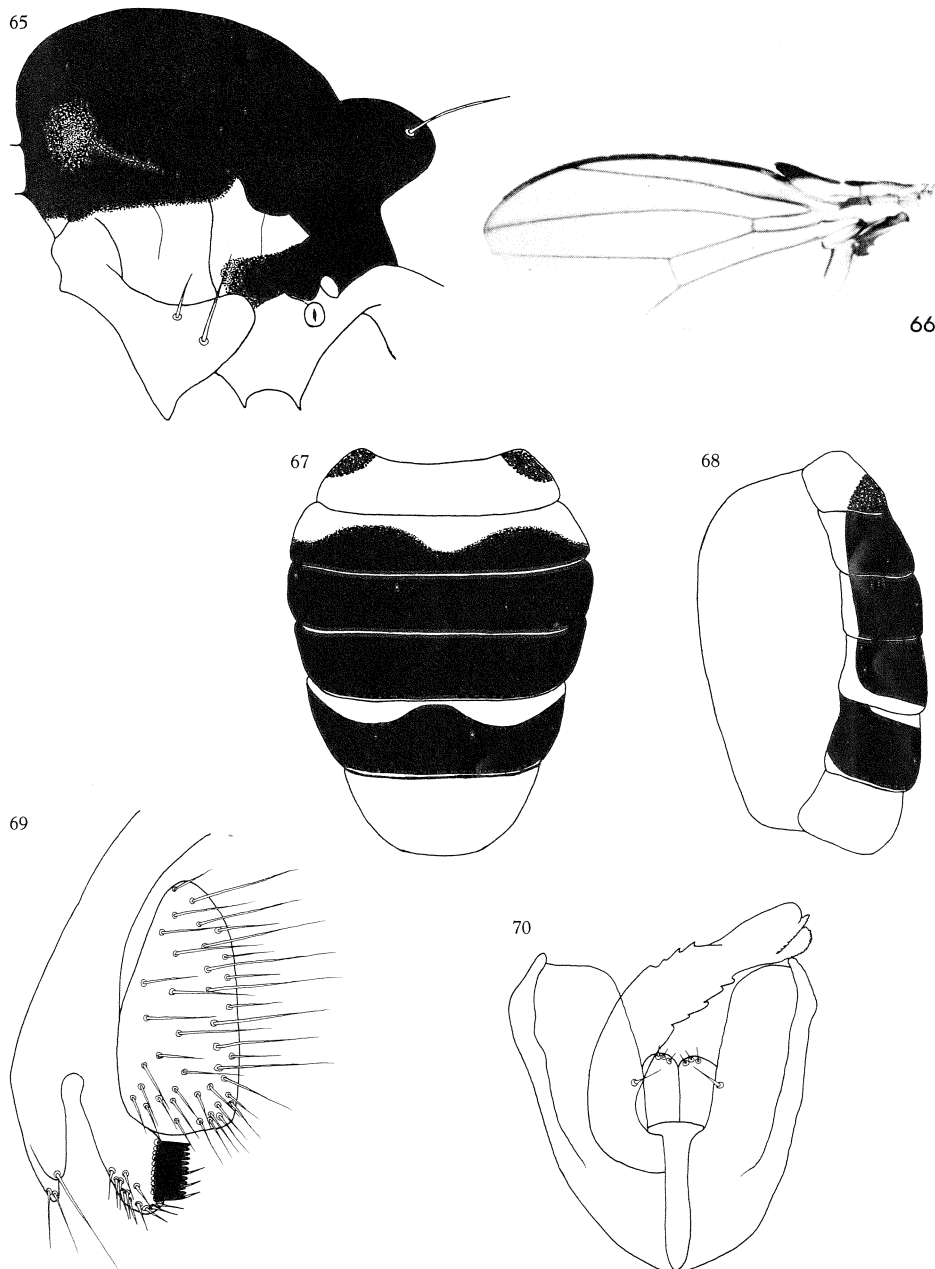
✓ 13. *Mycodrosophila diversa*, sp. nov.

Types

Holotype ♂: Mossman Gorge, Queensland, 24.iv.1967, D. H. Colless (ANIC). Paratypes: Palmerston National Park, 1600 ft, Queensland, 18.iv.1971, D. A. Duckhouse (light trap), 1 ♂ (ANIC); Lake Barrine, Queensland, 19.xii.1958, D. K. McAlpine, 1 ♀ (AM).

Distinguishing features. Carina large. Wings brownish, lappet well developed. Pleura with dark band posteriorly only. Abdominal pattern as in Figs 67, 68.

Body length. 3.2 mm (holotype); 3.1 mm (δ paratype) and 3.0 mm (ϕ paratype).



Figs 65–70. *M. diversa*: 65, thorax; 66, wing; 67, abdomen (dorsal); 68, abdomen (ventrolateral); 69, male external genitalia; 70, male internal genitalia.

Head. Arista with 4 long apically curved rays above and 1 long straight ray below plus very large terminal fork. Front broadly tan anteriorly and centrally

to ocellar triangle, blackish laterally and posteriorly. Ocellar triangle black. Peri-orbits shiny. Ratio frontal breadth : length, 1·2. 2nd antennal segments tan; 3rd dusky tan. Carina very prominent, considerably broader and more protuberant below, almost flat; lateral and ventral margins squared. Face mid-brown, darkening below. Palp blackish, with short bristles. Cheek slightly curved, blackish, widened and pale tan in posterior corner. Orbital bristles in ratio 5 : 2 : 5; anterior reclinate orbital very fine; all 3 orbitals almost in line.

Thorax (Fig. 65). Mesonotum blackish, with faintly paler longitudinal areas in midline and laterally. Scutellum blackish. Pleura blackish brown above level of wing articulation, also on pleurotergite and lower posterior part of pteropleuron weakening anteriorly, otherwise pale tan (cf. *M. variata*). Stalk and knob of haltere blackish brown. Legs pale tan.

Wing (Fig. 66). General brownish tinge present with trace of darkening behind lappet (cf. *M. variata*). *C*-index, 2·1; 4*V*-index, 1·9; 5*X*-index, 2·0; *M*-index, 0·6. 3rd costal section with heavy setation on basal 0·7. Length (holotype), 2·9 mm.

Abdomen (Figs 67, 68). Tergite 1 pale tan with some darkening anterolaterally and on incurved portion. Tergite 2 pale tan on anterior *c.* half, black on posterior *c.* half; incurved portion black laterally, tan medially. Tergites 3 and 4 black; incurved portions black laterally, tan medially (broadened in posterior corner in tergite 4). Tergite 5 black with small pale tan areas anterolaterally; incurved part black, tan anterolaterally and in posterior corner. Tergite 6 entirely pale tan.

Male genitalia (Figs 69, 70). Clasper with *c.* 12 large black medial teeth and numerous lateral and ventral bristles. Aedeagus with large serrations and apical pubescence. Hypandrium V-shaped, with small submedium spines. Parandrites mound-shaped, with apical sensilla.

Female genitalia. Egg guide with sparse marginal teeth ventrally and apically and a few long bristles.

Distribution. Collected only in north Queensland.

Specimens Examined

Types only as above.

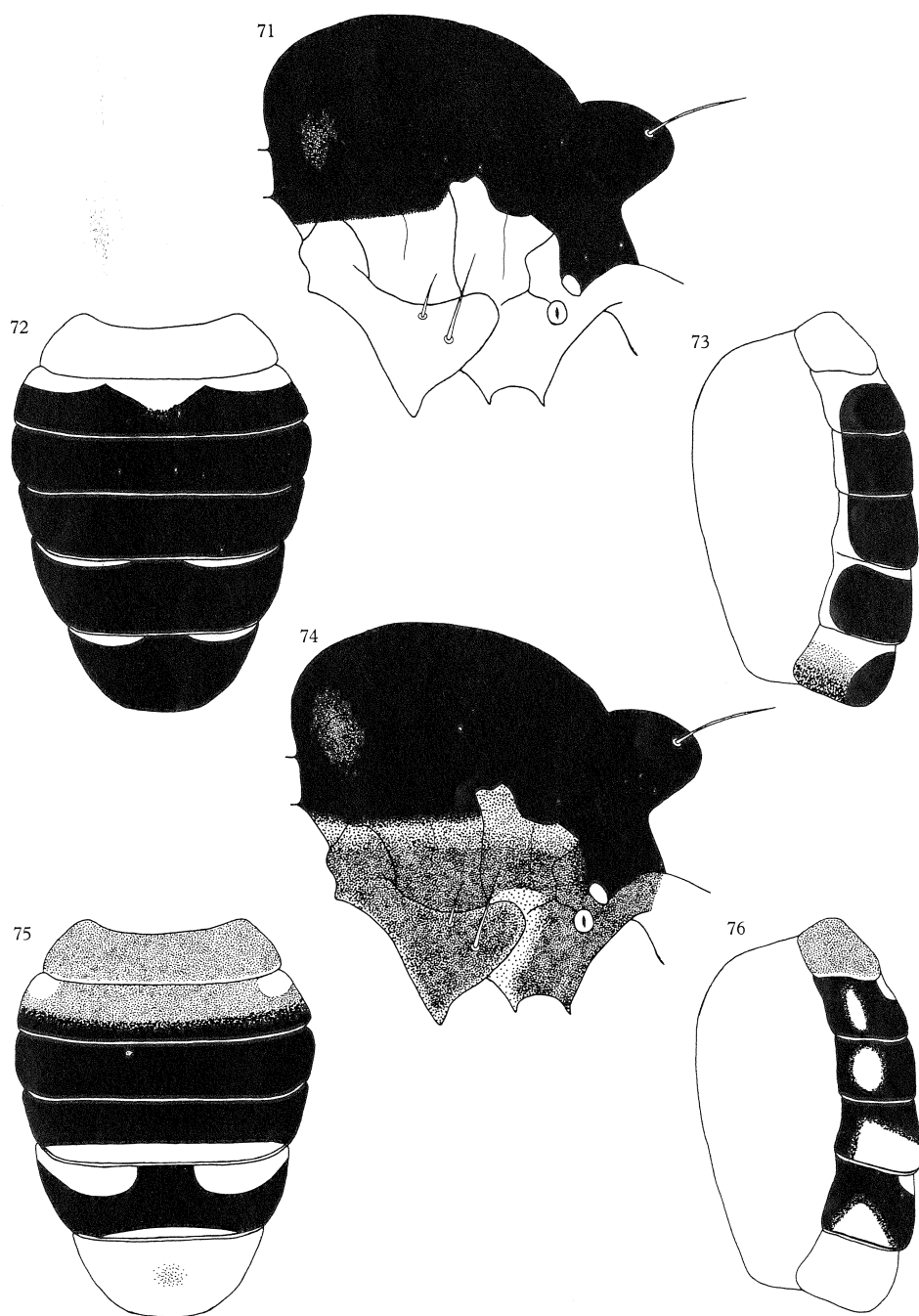
14. *Mycodrosophila* sp. cf. *diversa*

A single female specimen in bad condition [Lamington National Park, Queensland, 27.v.1959, E. N. Marks (UQ)] resembles the preceding species in general coloration and abdominal pattern (including the pleural band on pleurotergite and lower portion of pteropleuron), but differs in possessing smaller body size, smaller carina, lower *C*-index (0·9) and less extensive heavy setation on the third costal section.

✓ 15. *Mycodrosophila carinata*, sp. nov.

Types

Holotype ♂: Mossman Gorge, Queensland, 23.iv.1967, D. H. Colless (ANIC). Paratypes: same data as holotype, 1 ♀ (ANIC); Mossman Gorge, Queensland, on soft fungi, 17.iv.1977, P. A. Parsons, 1 ♂ (AM).



Figs 71-73. *M. carinataff*: 71, thorax; 72, abdomen (dorsal); 73, abdomen (ventrolateral).
 Figs 74-76. *M. scotos*: 74, thorax; 75, abdomen (dorsal); 76, abdomen (ventrolateral).

Distinguishing features. Carina large, with bulbous protuberance below. Pleura entirely pale tan below level of wing articulation. Knob of haltere pale tan with weak basal blackening. Abdominal pattern as in Figs 72, 73.

Body length. 2.7 mm (holotype); 2.7 mm (δ paratype); 3.3 mm (φ paratype).

Head. Arista with 3–4 long apically curved rays above and 1 straight ray below plus large terminal fork. Front pale tan anteriorly and in narrowing band posteriorly to ocellar triangle, becoming via rufous tan to blackish laterally and posteriorly. Ocellar triangle black. Periorbits shiny. Ratio frontal breadth : length, 1.4. 2nd and 3rd antennal segments dusky tan. Carina very prominent, narrow above, broader below, with knob-like protuberance at lowermost extremity, otherwise almost flat, lateral margins almost squared. Face mid-brown, darker below. Palp dusky tan, with few bristles. Cheek linear, of appreciable width, widened and pale tan in posterior corner, otherwise blackish brown. Orbital bristles in ratio 3 : 1 : 3; anterior reclinate orbital very fine, slightly lateral to proclinate and posterior reclinate orbitals.

Thorax (Fig. 71). Mesonotum blackish, faintly paler centrally and laterally. Scutellum blackish. Pleura blackish above level of wing articulation, entirely pale tan below. Stalk of haltere pale tan; knob tan with very weak darkening especially at base. Legs pale tan; lowermost portions of tibiae, and tarsi, darker.

Wing. Hyaline with very faint darkening about 2nd longitudinal vein behind lappet. C-index, 1.6; 4V-index, 2.6; 5X-index, 2.8; M-index, 0.8. 3rd costal section with heavy setation on basal 0.6. Length (holotype), 2.4 mm.

Abdomen (Figs 72, 73). Tergite 1 pale tan. Tergite 2 pale tan anteriorly in central region and on anterior $c. \frac{1}{5}$, otherwise black; incurved portion pale tan medially and anteriorly, otherwise black. Tergite 3 black; incurved portion black, pale tan in narrow medial band. Tergite 4 black; incurved portion black, pale tan medially in narrow band widening in posterior corner. Tergite 5 black with very narrow pale tan bands anteriorly on either side of midline; incurved portion black laterally, tan medially and anteriorly. Tergite 6 weakly black centrally becoming rufous tan laterally; incurved portion largely tan.

Female genitalia. Egg guide with a few large apical teeth and a few long hairs.

Distribution. Known only from Mossman Gorge, north Queensland.

Specimens Examined

Types only as above.

16. *Mycodrosophila scotos*, sp. nov.

Type

Holotype δ : Mossman Gorge, Queensland, 23.iv.1967, D. H. Colless (ANIC).

Distinguishing features. Pleura and legs mid to dark brown. Knob of haltere pale tan with some basal darkening. Abdominal pattern as in Figs 75, 76.

Body length. 2.1 mm.

Head. Arista with 4 long apically curved rays above and 1 long straight ray below plus very large terminal fork. Front tan anteriorly, darkening posteriorly and laterally. Ocellar triangle black. Periorbits shiny. Ratio frontal

breadth : length, 1·3. 2nd and 3rd antennal segments tan, slightly dusky. Carina very prominent, narrow above, only slightly widened below, smoothly rounded. Face tan, darkening below. Palp brown with a few apical bristles. Cheek almost linear, dark anteriorly, widened and pale posteriorly. Proclinate and posterior reclinate orbital bristles subequal; anterior reclinate orbital minute.

Thorax (Fig. 74). Mesonotum dark brown, paler anteriorly. Scutellum blackish, slightly paler centrally. Pleura entirely mid to dark brown. Stalk of haltere dark brown; knob darkened basally, pale apically. Legs entirely brown, slightly paler below; trochanters paler.

Wing. Weak brownish tinge present with trace of dark band behind lappet. Lappet large. *C*-index, 1·2; 4*V*-index, 2·4; 5*X*-index, 2·1; *M*-index, 0·8. 3rd costal section with heavy setation on basal 0·5.

Abdomen (Figs 75, 76). Tergite 1 dark brown. Tergite 2 dark brown with small pale spots anterolaterally; incurved portion largely blackish. Tergite 3 blackish; incurved portion blackish with large pale spot near medial extremity. Tergite 4 blackish on anterior *c.* $\frac{2}{3}$, pale tan on posterior *c.* $\frac{1}{3}$; incurved portion blackish anterolaterally and medially, otherwise pale tan. Tergite 5 pale tan in wide bands anterolaterally and in thin line on posterior border, otherwise blackish; incurved portion blackish with pale spot posteriorly in middle region. Tergite 6 pale tan, very weakly blackish centrally; incurved portion tan.

Distribution. Known only from the holotype, Mossman Gorge in north Queensland.

17. *Mycodrosophila annulata*, sp. nov.

Types

Holotype ♀ : Kuranda, Queensland, 21.v.1958, D. K. McAlpine (AM). Paratype ♀ : Mossman Gorge, Queensland, 21.iv.1967, D. H. Colless (ANIC).

Distinguishing features. Pleura with longitudinal band. Legs banded. Haltere dark. Abdominal pattern as in Figs 78, 79.

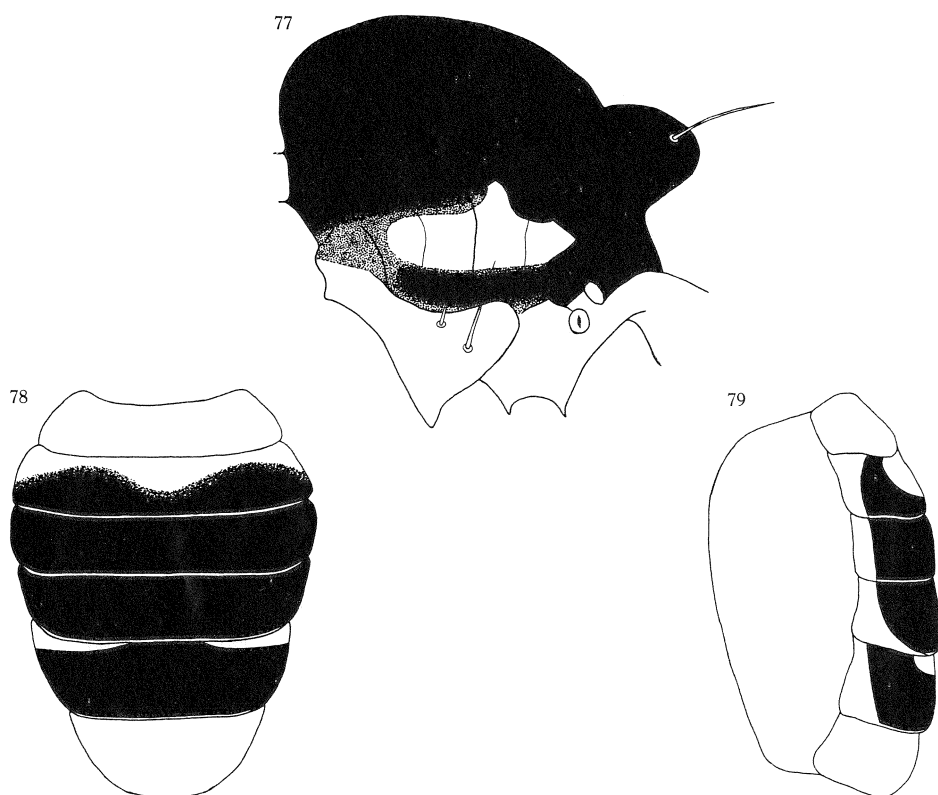
Body length. 2·2 mm (holotype); 2·2 mm (paratype).

Head. Arista with 4 long apically curved rays above and 1 long straight ray below plus large terminal fork. Front tan anteriorly, blackening posteriorly. Ocellar triangle black. Periorbits shining brownish. Ratio frontal breadth : length, 1·4. 2nd and 3rd antennal segments tan, 3rd slightly dusky. Carina very prominent, narrow above, broad below, flat, lateral margins almost squared. Face brown. Cheek linear, widened in posterior corner, brown to blackish with only slight paleness posteriorly. Palp dusky tan. Orbital bristles in ratio 3 : 1 : 3; anterior reclinate orbital very fine, slightly lateral to proclinate and posterior reclinate orbitals.

Thorax (Fig. 77). Mesonotum and scutellum blackish. Pleura blackish above level of wing articulation, with dark longitudinal band on pleurotergite, pteropleuron and lower half of mesopleuron to upper part of 1st coxa, otherwise tan. Stalk and knob of haltere blackish brown. Legs tan; all legs with broad dark annuli apically on femora and (narrower) proximally on tibiae (weakest on foreleg).

Wing. Faint brownish tinge present. *C*-index, 1·5; 4*V*-index, 2·9; 5*X*-index, 2·7; *M*-index, 1·2. 3rd costal section with heavy setation on basal 0·7. Length (holotype), 2·0 mm.

Abdomen (Figs 78, 79). Tergite 1 pale tan. Tergite 2 pale tan anteriorly especially centrally and laterally, blackish posteriorly; incurved portion pale tan anterolaterally and medially, otherwise black. Tergites 3 and 4 blackish; incurved portion of tergite 3 black laterally, tan medially; incurved portion of tergite 4 tan medially and posteriorly, otherwise blackish. Tergite 5 blackish, narrowly tan anterolaterally; incurved portion tan anterolaterally and medially, otherwise blackish. Tergite 6 entirely pale tan.



Figs 77-79. *M. annulata*: 77, thorax; 78, abdomen (dorsal); 79, abdomen (ventrolateral).

Female genitalia. Egg guide with row of strong teeth along ventral border to apex plus a few weak hairs.

Distribution. Collected only in north Queensland.

Specimens Examined

Types only as above.

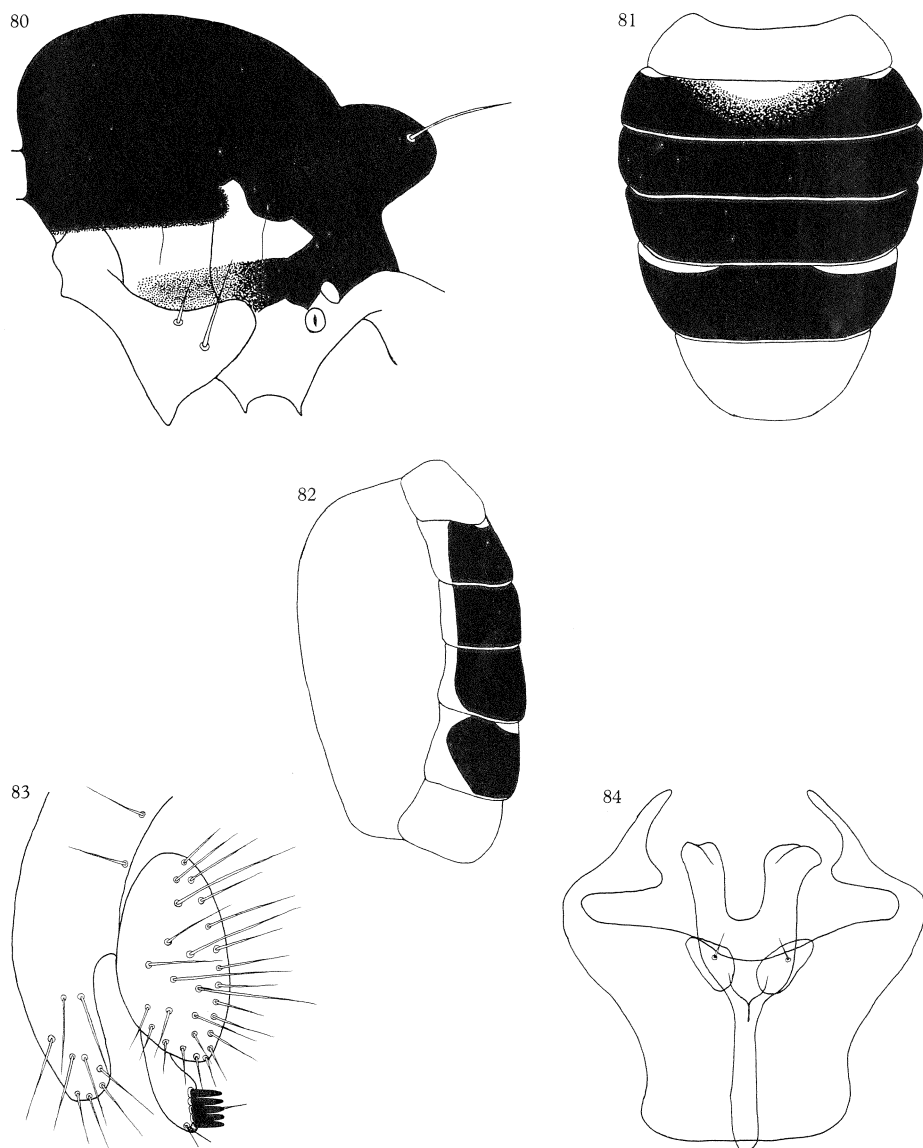
18. *Mycodrosophila minor*, sp. nov.

Types

Holotype ♂: 10 miles S. of Daintree, Queensland, 25.iv.1967, D. H. Colless

(ANIC). Paratype ♂: Kuranda Range State Forest, 7-8 miles Black Mountain Road, north Queensland, 20.iv.1967, D. H. Colless (ANIC).

Distinguishing features. Body small. Pleura with longitudinal band. Haltere with blackening on stalk and knob. Wing clear; 4V, 5X and M indices unusually high. Abdominal pattern as in Figs 81, 82.



Figs 80-84. *M. minor*: 80, thorax; 81, abdomen (dorsal); 82, abdomen (ventrolateral); 83, male external genitalia; 84, male internal genitalia.

Body length. 1.7 mm (holotype); 1.6 mm (paratype).

Head. Arista with 4 apically curved rays above and 1 straight ray below plus terminal fork. Front tan on anterior c. $\frac{1}{3}$, brownish black on posterior c. $\frac{2}{3}$; sil-

veriness weak. Periorbits shiny. Ratio frontal breadth : length, 1·2. 2nd and 3rd antennal segments dusky tan. Carina large, narrow above, considerably broadened below, flat, lateral margins almost squared, ventral margin curved towards clypeus, acutely rounded. Face mid-brown. Palp dusky tan, with prominent apical bristle. Cheek broad, slightly curved, not greatly widened in posterior corner, dark brown, pale tan about posterior corner. Orbital bristles in ratio 3 : 1 : 3; anterior reclinate orbital posterior to proclinate orbital.

Thorax (Fig. 80). Mesonotum blackish brown. Scutellum black. Pleura darkened from slightly below level of wing articulation to mesonotum, with additional dark brown longitudinal band covering pleurotergite, lower part of pteropleuron and lowermost part of mesopleuron, weakening anteriorly; pleura otherwise pale tan. Haltere with blackening on both stalk and knob, weaker posteriorly on stalk. Legs entirely pale tan.

Wing. Hyaline, lappet well developed. *C*-index, 0·8; 4*V*-index, 4·4; 5*X*-index, 5·4; *M*-index, 1·9. 3rd costal section with heavy setation on basal 0·5. Length (holotype), 1·5 mm.

Abdomen (Figs 81, 82). Tergite 1 pale tan. Tergite 2 with anterior V-shaped pale tan area centrally and very small tan areas anterolaterally, otherwise black; incurved portion black laterally, tan at medial border. Tergites 3 and 4 each black; incurved portions black laterally, tan medially. Tergite 5 black with very narrow pale tan areas anterolaterally; incurved portion largely black, with tan areas at medial border especially posteriorly, and anterolaterally. Tergite 6 entirely pale tan.

Male genitalia (Figs 83, 84). Clasper with *c.* 6 large black medial teeth. Aedeagus with apical bifurcation. Hypandrium with pair of small spines.

Distribution. Collected only in north Queensland.

Specimens Examined

Types only as above.

19. *Mycodrosophila claudensis*, sp. nov.

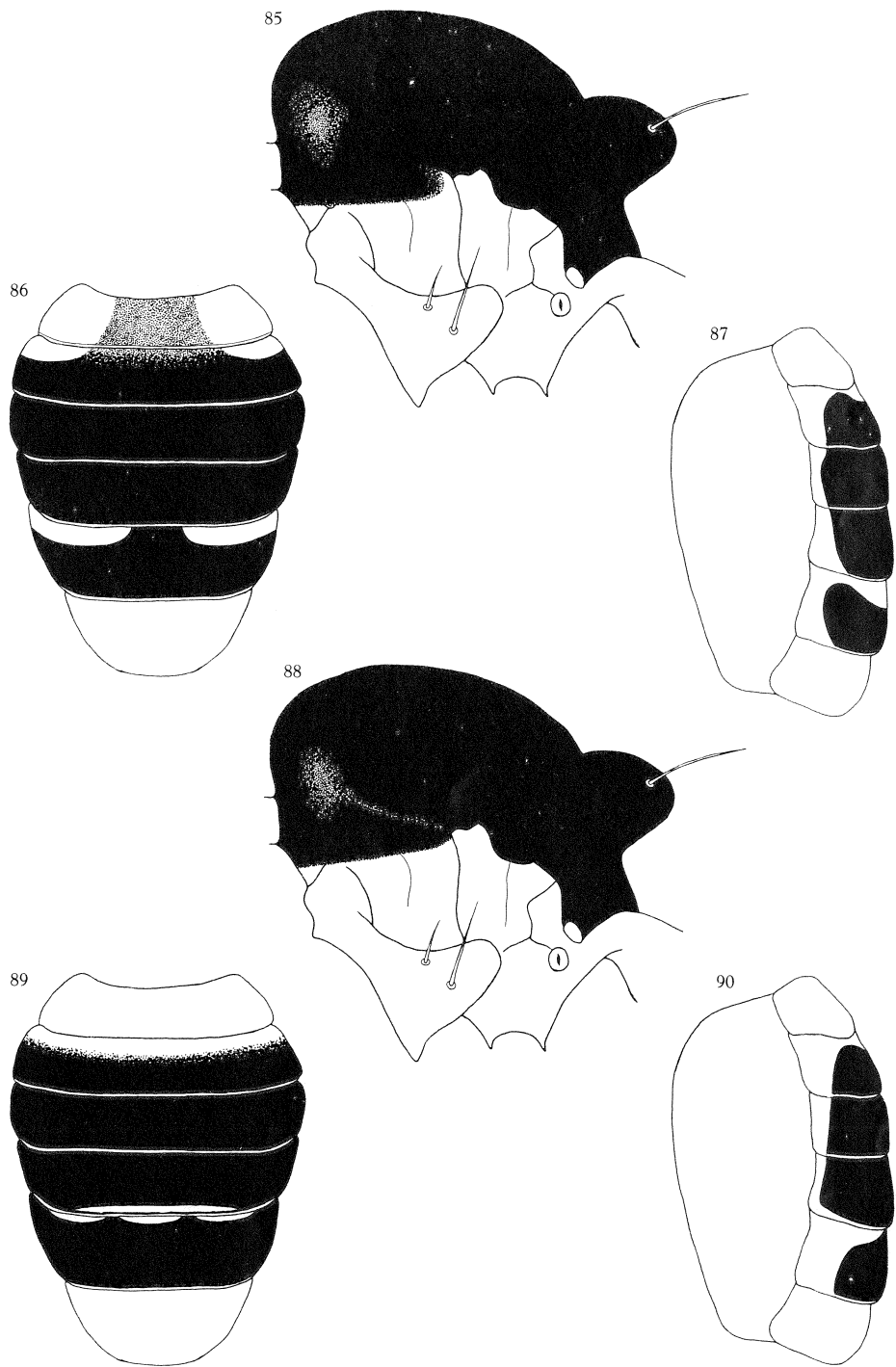
Type

Holotype ♀: Claudie River, 2 miles S. Mt Lamond, Queensland, 5.i.1972, m.v. light, D. K. McAlpine and G. A. Holloway (AM). Paratype ♀: same data as holotype (AM).

Distinguishing features. Body small. Wing with dark band behind lappet. Pleura entirely pale below level of wing articulation. Knob of haltere black basally, pale apically. Abdominal pattern as in Figs 85, 86.

Body length. 1·8 mm (holotype); 1·8 mm (paratype).

Head. Arista with 4 apically curved rays above and 1 slightly curved ray below plus larger terminal fork. Front tan anteriorly and centrally, black laterally and posteriorly. Ocellar triangle black. Periorbits shiny dark brown. Ratio frontal breadth : length, 1·3. 2nd antennal segments dark tan, dusky anterolaterally; 3rd dusky. Face mid-brown. Palp dark tan, with large apical bristle. Carina narrow, only slightly broader below, smoothly rounded. Cheek linear, wider and pale tan in posterior corner, otherwise dark brown. Orbital bristles in ratio 7 : 2 : 7; anterior reclinate orbital very fine, posterior to proclinate orbital.



Figs 85-87. *M. claudensis*: 85, thorax; 86, abdomen (dorsal); 87, abdomen (ventrolateral).
Figs 88-90. *M. simplex*: 88, thorax; 89, abdomen (dorsal); 90, abdomen (ventrolateral).

Thorax (Fig. 85). Mesonotum brownish black, paler about humeral calli. Scutellum subshining blackish. Pleura blackish above level of wing articulation, entirely pale tan below. Stalk of haltere tan, knob blackened, pale apically. Legs pale tan; tarsi darker.

Wing. Faintly brownish with darker band behind lappet. *C*-index, 1.1; *4V*-index, 2.3; *5X*-index, 2.4; *M*-index, 0.7. 3rd costal section with heavy setation on basal 0.6. Length, 1.8 mm.

Abdomen (Figs 86, 87). Tergite 1 weakly blackish centrally, tan laterally. Tergite 2 mainly black, paler centrally, with small pale tan areas anterolaterally; incurved portion black laterally, tan medially. Tergites 3 and 4 each black; incurved portions black laterally, tan medially (more extensively on tergite 4). Tergite 5 black with pale tan areas anterolaterally; incurved portion black posterolaterally, tan medially and anteriorly. Tergite 6 entirely pale tan.

Female genitalia. Egg guide with a few apical teeth and a few long hairs.

Distribution. Collected only in north Queensland.

Specimens Examined

Types as above. **Queensland**: Mossman Gorge, 23.iv.1967, D. H. Colless, 1 ♀ [headless] (ANIC).

20. *Mycodrosophila simplex*, sp. nov.

Type

Holotype ♂: Wongabel State Forest, Queensland, 7.v.1967, D. H. Colless (ANIC).

Distinguishing features. Body large. Carina very large. Pleura entirely pale below level of wing articulation. Haltere with weak blackening at base of knob only. Abdominal pattern as in Figs 89, 90.

Body length. 3.5 mm.

Head. Arista with 4 long curved rays above and 1 straight ray below plus very large terminal fork. Front tan to rufous tan anteriorly and in narrowing area posteriorly to ocellar triangle, blackish laterally. Ocellar triangle black. Periorbits shiny dark brown. Ratio frontal breadth : length, 1.3. 2nd and 3rd antennal segments dusky tan. Carina very large, narrow above, greatly broadened below, flat, lateral margins almost squared, ventral margin acutely rounded in middle region only, gradually rounded laterally. Face mid-brown. Palp dusky tan, darker apically, with a few strong apical bristles. Cheek linear, dark brown, widened and pale tan in posterior corner. Orbital bristles in ratio 3 : 1 : 3; anterior reclinate orbital posterior, slightly lateral and close to proclinate orbital.

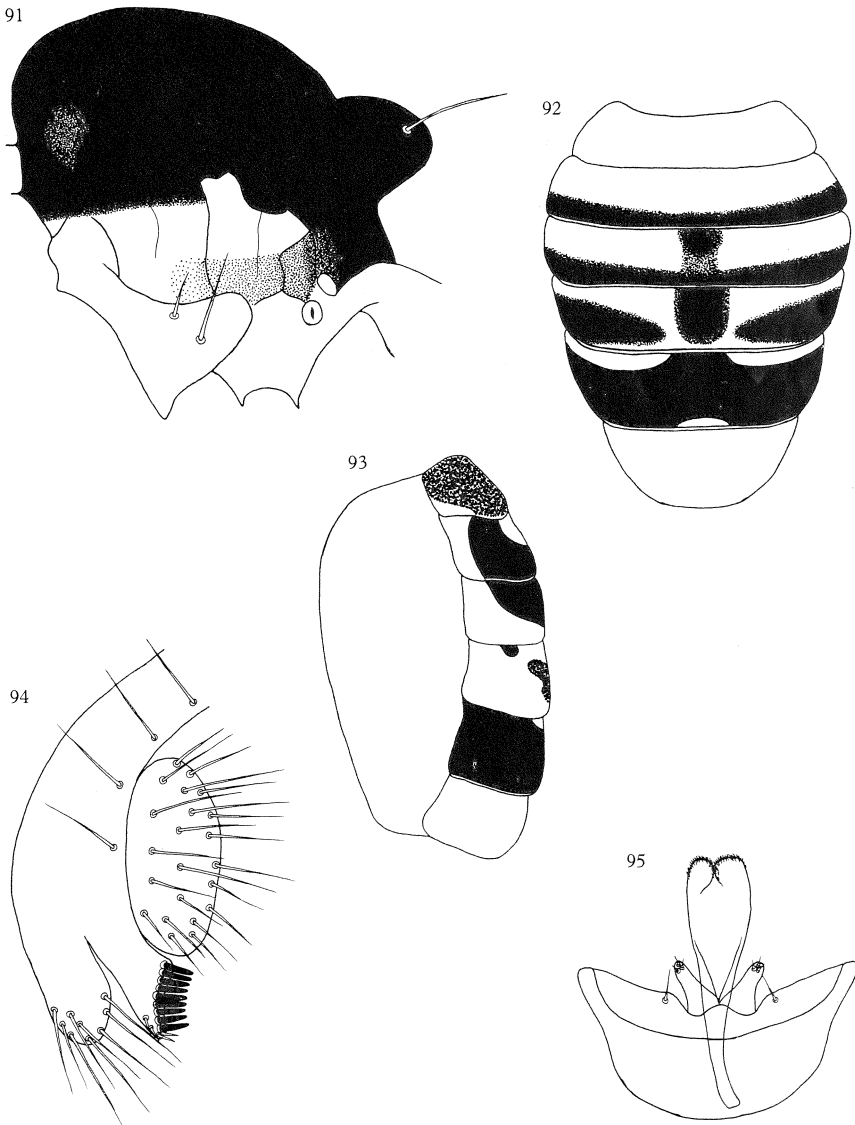
Thorax (Fig. 88). Blackish brown, a little paler centrally, laterally and about humeral calli. Scutellum blackish, subshining. Pleura darkened above level of wing articulation, entirely pale tan below. Stalk of haltere pale tan; knob weakly darkened basally, pale tan apically. Legs pale tan; tarsi darker.

Wing. Faintly brownish, with weak trace of darker band behind lappet. Lappet small. *C*-index, 1.5; *4V*-index, 2.1; *5X*-index, 1.7; *M*-index, 0.6. 3rd costal section with heavy setation on basal 0.85. Length 2.9 mm.

Abdomen (Figs 89, 90). Tergite 1 pale tan. Tergite 2 pale tan anteriorly, black posteriorly; incurved portion black laterally, tan medially. Tergite 3 black; incurved portion black laterally, tan medially. Tergite 4 largely black, narrowly pale

tan posteriorly; incurved portion largely black, pale tan medially and posteriorly. Tergite 5 black with very narrow pale tan areas anteriorly; incurved portion largely tan to dark tan, black laterally. Tergite 6 entirely tan.

Distribution. Known only from the holotype.



Figs 91-95. *M. aqua*: 91, thorax; 92, abdomen (dorsal); 93, abdomen (ventrolateral); 94, male external genitalia; 95, male internal genitalia.

21. *Mycodrosophila aqua*, sp. nov.

Types

Holotype ♂: McArthur River, 48 km SW. by S. of Borroloola, Northern Territory, malaise trap, 14.iv.1976, D. H. Colless (ANIC). Paratypes: same data as holo-

type, 4 ♂, 1 ♀, 1 ? (ANIC); Caranbirini waterhole, 33 km SW. of Borroloola, Northern Territory, malaise trap, 22.iv.1976, D. H. Colless, 1 ♂ (ANIC).

Distinguishing features. Carina large. Pleura pale below level of wing articulation with weak darkening on pleurotergite and pteropleuron just extending on to mesopleuron. Abdominal pattern as in Figs 91, 92.

Body length. 1.7 mm (holotype); 2.5–2.8 mm (paratype range).

Head. Arista with 4 long curved rays above and 1 long straight ray below plus large terminal fork. Front rufous tan anteriorly and centrally narrowing towards ocellar triangle, black laterally and posteriorly. Periorbits shiny blackish brown. Ratio frontal breadth : length, 1.4. 2nd and 3rd antennal segments dusky brown. Carina very large, narrow above, greatly broadened below, flat, lateral and ventral margins acutely rounded. Face dark brown. Palp dusky dark brown, with 1–2 apical bristles. Cheek broad, linear, blackish brown, wider and pale in posterior corner. Orbital bristles in ratio 5 : 2 : 5; anterior reclinate orbital posterior, slightly lateral and very close to proclinate orbital.

Thorax (Fig. 91). Mesonotum black, slightly paler anteriorly. Pleura dark above level of wing articulation, pale below with weak darkening on pleurotergite and lower part of pteropleuron just extending on to mesopleuron. Stalk of haltere pale tan; knob darkened. Legs pale tan; tarsi slightly darker.

Wing. Faintly brownish with trace of darkening behind lappet. *C*-index, 1.6; 4*V*-index, 2.1; 5*X*-index, 2.0; *M*-index, 0.7. 3rd costal section with heavy setation on basal 0.6. Length (holotype), 2.3 mm.

Abdomen (Figs 92, 93). Tergite 1 pale tan; incurved portion darker. Tergite 2 pale tan on anterior *c.* $\frac{2}{3}$, black on posterior *c.* $\frac{1}{3}$; incurved portion tan medially and anterolaterally, otherwise black. Tergite 3 with posterior black band extended forwards in midline, otherwise tan; incurved portion black laterally, tan medially and posteriorly. Tergite 4 with posterior black band just in front of apical margin, band extended forwards in midline but broken about extension in several specimens; incurved portion largely tan. Tergite 5 largely black, with narrow tan areas anterolaterally and posteriorly at centre; incurved portion black. Tergite 6 entirely tan.

Male genitalia (Figs 94, 95). Clasper with *c.* 9 large black medial teeth. Aedeagus with small apical bifurcation and apical ornamentation. Parandrites small, finger-like, with apical sensilla. Hypandrium with pair of small submedian spines.

Female genitalia. Egg guide with apical teeth and a few long hairs.

Distribution. Northern Territory.

Specimens Examined

Types only as above.

Discussion

The 21 species described or discussed above establish *Mycodrosophila* as the third largest drosophilid genus in Australia after *Drosophila* (with over 100 species) and *Leucophenga* [26 species described or discussed by Bock (1979)]. Further species of *Mycodrosophila* may, of course, be discovered; the fact that several species are known from only one or a few specimens clearly suggests that collections to date have been less than comprehensive for this group.

Only one species of *Mycodrosophila* has been recorded from New Guinea, and very few species have been noted in south-east Asia. There can be very little doubt, however, that this apparent paucity merely reflects lack of collecting or processing of material already available; species of *Mycodrosophila* are certainly abundant in New Guinea (Bock and Parsons, unpublished data). The lack of information on the *Mycodrosophila* faunas of several regions is probably related to the highly specific habitat in which the larvae live and on which the adults are most readily collected, that is to say, little attention has been devoted in the past to the systematic collection and description of drosophilid flies from fungi. Few, or very few, specimens of *Mycodrosophila* are recovered by general sweeping of rain forest foliage, but large numbers may be found on bracket or fleshy fungi. An obvious avenue for further study is the distribution of *Mycodrosophila* species in relation to the fungi on which members of the genus are collected, i.e. whether particular species of *Mycodrosophila* are associated exclusively with particular species of fungi.

As already noted, the genus *Mycodrosophila* is rather uniform morphologically, and reports of variation within species have been few. Okada (1971) summarized previous reports of considerable geographic variation in the abdominal pattern of *M. gratio*sa (de Meijere) ranging from almost completely black (Okinawa) to tan with weak black banding (New Guinea). Further study of the specimens concerned (carina, wing indices, genitalia) is highly desirable; it seems probable that the (sometimes considerably) different abdominal patterns described for '*M. gratio*sa' from areas ranging from the Ivory Coast to New Guinea represent a series of different species. Duda (1926) also described a sexual dimorphism in the abdominal banding pattern of *M. parallelinervis* Duda (a Sumatran species described on the basis of two males and one female). Again, there is a clear possibility that different species were involved.

In summary, the genus *Mycodrosophila* is a little-known group of world-wide distribution with greatest numbers of species occurring in the Ethiopian, Oriental, eastern Palaearctic and Australian biogeographic zones. Members of the genus appear to be strictly fungivorous and hence collectable only in localities where fungi grow, in Australia usually rain forests. Morphologically the genus is rather uniform; previously reported cases of substantial intraspecific variation (geographic or sexual dimorphism) should be regarded with scepticism pending a reexamination of the specimens involved. It is likely that the genus will ultimately be demonstrated to possess many more species than are presently known.

Key to Australian species of *Mycodrosophila*

1. Pleura with some darkening below level of wing articulation, at least on pleurotergite and lower part of pteropleuron2
- Pleura uniform pale tan below level of wing articulation10
- 2(1). Pleura and legs entirely dark*scotos*3
- Pleura and legs not entirely dark3
- 3(2). Pleura with 2 broad longitudinal bands*marksae*4
- Pleura with single band or darkening4
- 4(3). Pleural darkening confined to pleurotergite and pteropleuron, or just extending on to lower posterior part of mesopleuron5
- Pleural band more extensive, clearly extending across lower part of mesopleuron8
- 5(4). Wing with distinct dark band behind lappet*variata*
- Wing with at most slight darkening behind lappet6

6(5).	Abdominal tergites 3 and 4 entirely black dorsally.....	7
	Abdominal tergites 3 and 4 tan anteriorly, with posterior and central blackening.....	<i>aqua</i>
7(6).	C-index c. 2·1.....	<i>diversa</i>
	C-index c. 0·9.....	Sp. cf. <i>diversa</i>
8(4).	Legs banded.....	9
	Legs entirely tan.....	<i>minor</i>
9(8).	Pleural band not reaching 1st coxa; cheek pale in posterior corner.....	<i>margoae</i>
	Pleural band extending on to 1st coxa; cheek barely paler in posterior corner.....	<i>annulata</i>
10(1).	Costa protruding as a distinct enlarged black lappet at distal incision.....	12
	Costa not protruding as an enlarged lappet at distal incision.....	11
11(10).	Apex of scutellum pale; costa barely blackened at distal incision.....	<i>separata</i>
	Apex of scutellum not pale; costa appreciably blackened at distal incision.....	<i>compacta</i>
12(10).	Wing darkened apically.....	<i>stigma</i>
	Wing not darkened apically.....	13
13(12).	Abdominal tergites 3 and 4 entirely black dorsally or with traces only of paler coloration.....	14
	Abdominal tergites 3 and 4 black dorsally with distinct pale tan spots or markings.....	16
14(13).	Abdominal tergites 3 and 5 with small pale tan submedian spots; tergite 4 with much larger pale markings.....	<i>rosemaryae</i>
	Abdominal tergites 3-5 with markings not as above.....	15
15(14).	Abdominal tergites 3-5 with large pale tan submedian spots.....	<i>argentifrons</i>
	Abdominal tergites 3-5 with transversely elongate pale tan markings.....	<i>mulgravensis</i>
16(13).	Wing with distinct dark band behind lappet.....	17
	Wing with at most trace of darkening behind lappet.....	18
17(16).	6th abdominal tergite largely black; apical segment of stalk of haltere, and knob, blackened.....	<i>dianae</i>
	6th abdominal tergite pale tan; apical segment of stalk of haltere tan, knob blackened basally only.....	<i>claudensis</i>
18(16).	Facial carina broad, flat with bulbous protuberance below.....	<i>carinata</i>
	Facial carina narrow or broad, without bulbous protuberance below.....	19
19(18).	Carina greatly broadened below, flat; 2nd abdominal tergite pale tan anteriorly.....	20
	Carina not greatly broadened below; 2nd abdominal tergite pale tan anteriorly in central and lateral spots only.....	<i>rayi</i>
20(19).	Knob of haltere black; incurved portion of 5th abdominal tergite almost entirely black.....	<i>helenae</i>
	Knob of haltere with weak blackening basally only; incurved portion of 5th abdominal tergite largely tan.....	<i>simplex</i>

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