

# A study of the Tasmanian Psocoptera with Descriptions of New Species

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(With 117 Text Figures)

Prior to the work of Hickman (1934), only isolated references to the Tasmanian members of the Psocoptera appear in the literature. Enderlein (1903, pp. 407-8) describes *Ectopsocus froggatti* from Tasmania. Tillyard (1923) records the presence of *Myopsocus australis* in Tasmania. Badonnel (1943, pp. 149-151) has revised the taxonomy of two species previously described by Hickman.

The present paper deals with 13 species and includes seven new ones and two new varieties. A redescription of six species has been found necessary owing to the incomplete nature of the existing descriptions. An interesting new genus, *Interpsocus*, possessing some of the characters of *Peripsocus* Hagen and of *Ectopsocus* MacLachlan, is described.

Specimens collected are from the east, south-east and north-west areas of Tasmania.

The method of classification of the order by Pearman (1936) has been adopted in this work.

The symbols used in all descriptions of wings in this paper are those used by Badonnel (1943) and are similar to those used by Enderlein (1903); they are shown in fig. 1 while the scales employed in nearly all diagrams are shown in figs 1-3.

Fig. 1—Wings.

Fig. 2—Gonapophyses, subgenital plates, hypandria, paraprocts.

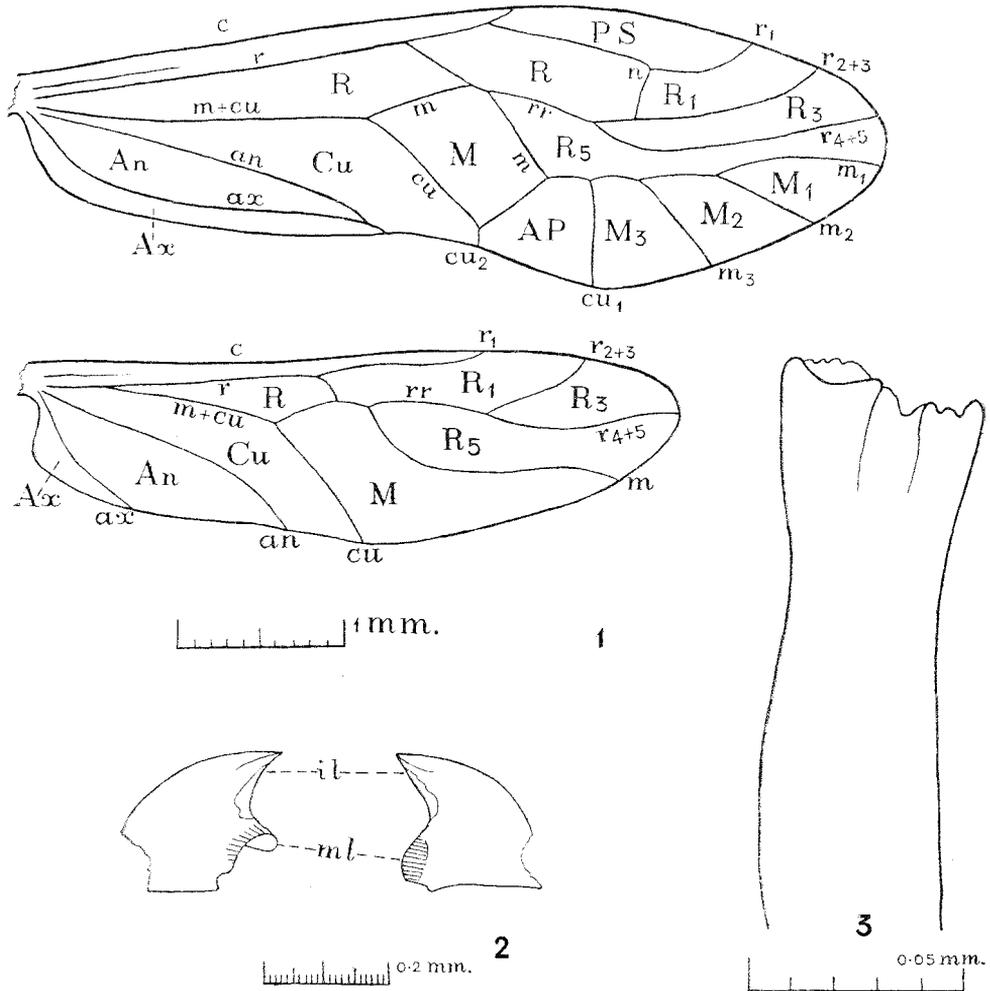
Fig. 3—Lacinia, claws.

Where the scales are not applicable, a separate indication of size is given.

All measurements of the length of the body are taken from specimens preserved in 90 per cent alcohol.

## KEY TO FAMILIES

|  |                       |
|--|-----------------------|
| 1. Tarsi with two segments; antennae with 13 segments                | 2                     |
| Tarsi with three segments in adult insect                            | 5                     |
| 2. Forewing with areola postica (A.P.) free or joined to the media   | 3                     |
| Forewing without A.P.  | <i>Peripsocidae</i>   |
| A.P. joined at its apex to the media                                 | <i>Psocidae</i>       |
| A.P. free  | 4                     |
| 4. Posterior border of hindwings with alternate long and short hairs | <i>Trichopsocidae</i> |
| Posterior border of hindwings without alternate long and short hairs | <i>Cacciliidae</i>    |
| 5. Apex of A.P. fused at a point with the media                      | <i>Myopsocidae</i>    |
| Apex entirely free   | <i>Philotarsidae</i>  |



FIGS 1-3

*Clematostigma tardipes* n.sp. Fig. 1: wings (female) showing venation and cell nomenclature. Fig. 2: mandibles (female); *il*—incisor lobe; *ml*—molar lobe. Fig. 3: lacinia (female).

## Group PSOCETAE Pearman

## Family PSOCIDAE

Two segmented tarsi. Antennae with 13 segments. Wings hairless except for the margin of R3 in the hindwing in some genera; pterostigma thick and not joined to the radius by a transverse vein; areola postica joined to the media at its apex either for a short distance, at a point or, exceptionally, by a short transverse vein. In the hindwing *r* and *m* fused for a moderate distance. Claws with a tooth and with or without an empodium. Gonapophyses complete in the female. Hypandrium of the male may or may not be symmetrical, but is generally ornamented. Eggs deposited singly or in groups, covered by a rough encrustation or, exceptionally, by a web.

In defining the family Psocidae, Badonnel (1943, p. 31) states 'Griffes sans dents et sans empodium'. However, in describing *Psocus zambezianus* (1932a, p. 108) he mentions the claws as being strongly toothed. Moreover, Enderlein (1927, p. 3) describes the family as having 'Klauen gezähnt' and also (1903, pp. 225-6) states that toothed claws and an empodium are present in *Psocus circularis* Hagen and *Psocus quinquepunctatus* MacLachlan. Cope (1940, p. 109) figures the claws of *Psocus confraternus* Banks with a tooth, but states that the claws have no empodium (p. 96).

In the author's collection are three species belonging to this family and in each case the claws are toothed but there is no empodium. Badonnel's statement, therefore, appears to be incorrect and the family should be defined as having toothed claws with or without an empodium.

The family is divided into four sub-families as follows:—

1. Hypandrium of the male symmetrical; parameres free distally, never forming a closed complex:
  - (a) Hypandrium enclosing the eighth sternite ... .. *Amphigerontiinae* Badonnel
  - (b) Hypandrium limited to the ninth sternite ... .. *Clematostigmatinae* n. sub-fam.
2. Hypandrium asymmetrical, limited to the ninth sternite; parameres forming a completely closed complex:
  - (a) Larvae covered with glandular hairs ... .. *Psocinae* Pearman
  - (b) Larvae without glandular hairs ... .. *Cerustipsocinae* Pearman

Sub-family *Clematostigmatinae* n. sub-fam.

Hypandrium of the male symmetrical, limited to the ninth sternite. Parameres of male free distally, never forming a closed complex.

Genus *Clematostigma* Enderlein, 1906

Venation similar to that of *Psocus* Latr. except that there is a rudiment of a transverse vein at the posterior angle of the pterostigma. In the forewing *r* and *m* are fused for a moderate distance.

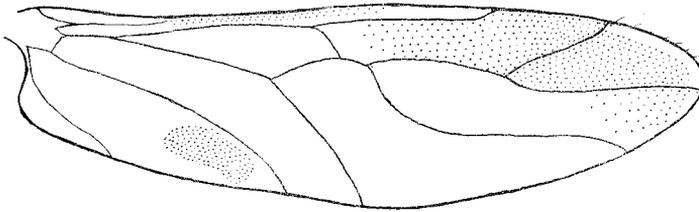
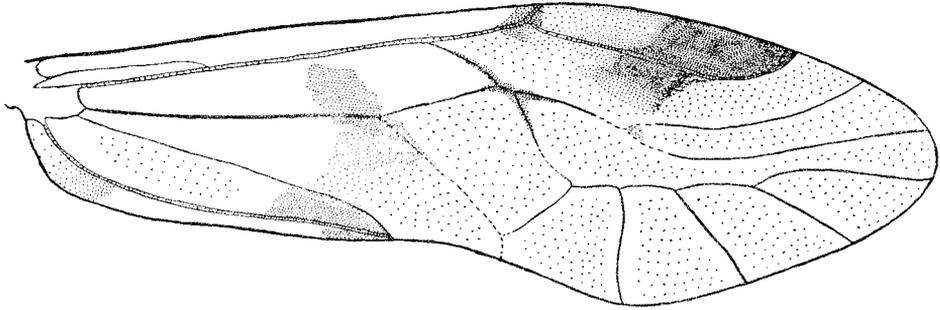
As the author has not seen the type species, *C. maculiceps* Enderlein, 1906, and it has not been fully described, it is impossible to give further characters.

*Clematostigma tardipes* n.sp.

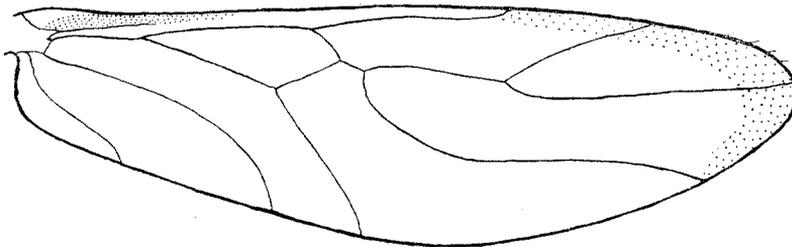
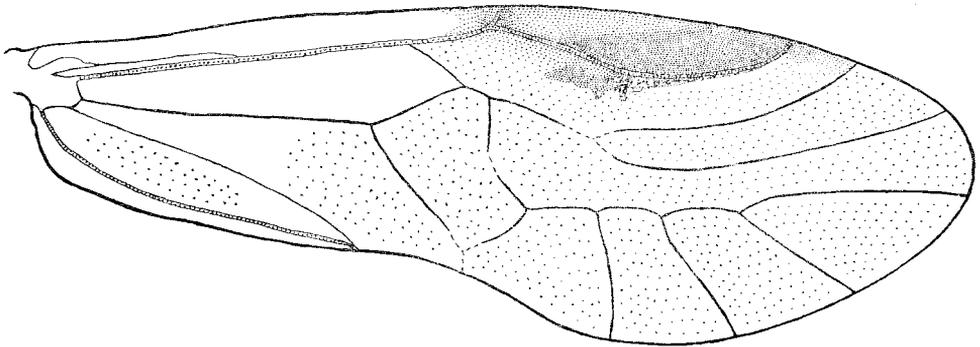
(Figs 4-17)

## FEMALE

*Colour.* Head white with black and brown markings; median epicranial suture edged with black from the middle to the posterior end; from each side of the suture two dotted black lines pass along the posterior border of the epicranial



4



5

FIGS 4-5

*Clematostigma tardipes* n.sp. Fig. 4: wings (female). Fig. 5: wings (male).

plates to the eyes; a series of black dots present around the eyes; frons with a median black circular area, its apex at the median ocellus; clypeus white with median vertical black lines and an anterior white edge; anteclypeus grey; labrum grey with median brown patches; distal end of labium dark brown, proximal end white; jaws white with a brown area below the eyes; ocelli pale yellowish-green, each ocellus encircled by a dark brown ring; maxillary palps with the first, the second and the proximal half of the third segment pale brown and with the distal half of the third segment and the fourth segment dark brown; antennae with the basal halves of the first two segments black, distal halves grey, the third segment reddish-brown and the distal segments dark brown.

Prothorax brown with white lateral edges; mesothorax black with median pale yellowish-green areas in the antedorsum and between the antedorsum and the lateral dorsa; metathorax black with a median pale yellowish-green area in the antedorsum. First leg: coxa pale brown; trochanter pale brown; distal end of femur dark brown, remainder pale brown; tibia light brown with dark brown ends; tarsi and claws dark brown. Second and third legs similar to the first leg except for the dark brown coxae.

Wings (fig. 4) with distal cells pale brown. Forewing with a brown area in the proximal portion of Ax; a dark brown area at the top distal end of R merges into light brown in the middle and again into dark brown in An; pterostigma pale brown with dark brown ends; pigmented area of the pterostigma passing nearly to the fork of *rr* with the distal edge pale yellow; veins dark brown except for the pale brown veins *c*, *r*, *an*, *cu*, *cu2*, part of *m* and the fork of *rr*; membrane with red to green iridescence. Hindwing with a pale brown area in the distal end of An; veins brown except for the paler veins *ax*, *an*, *r* and *r1*; membrane with red iridescence.

Dorsal surface of abdomen white with black markings; ventral surface white; some specimens with a greenish-yellow tinge to the abdomen; apex of abdomen dark brown; external surfaces of gonapophyses dark brown, internal surfaces pale brown.

*Morphology.* Head sub-triangular in front view, semi-circular in side view; median epicranial suture distinct; clypeus large and bulging; ocelli three, slightly separated; eyes small, protruding, interspace three times apparent eye diameter; lacinia (fig. 9) with two large teeth; mandibles normal; maxillary palps long and hairy with the distal segment slightly oval; antennae long with short hairs. Head covered with short hairs.

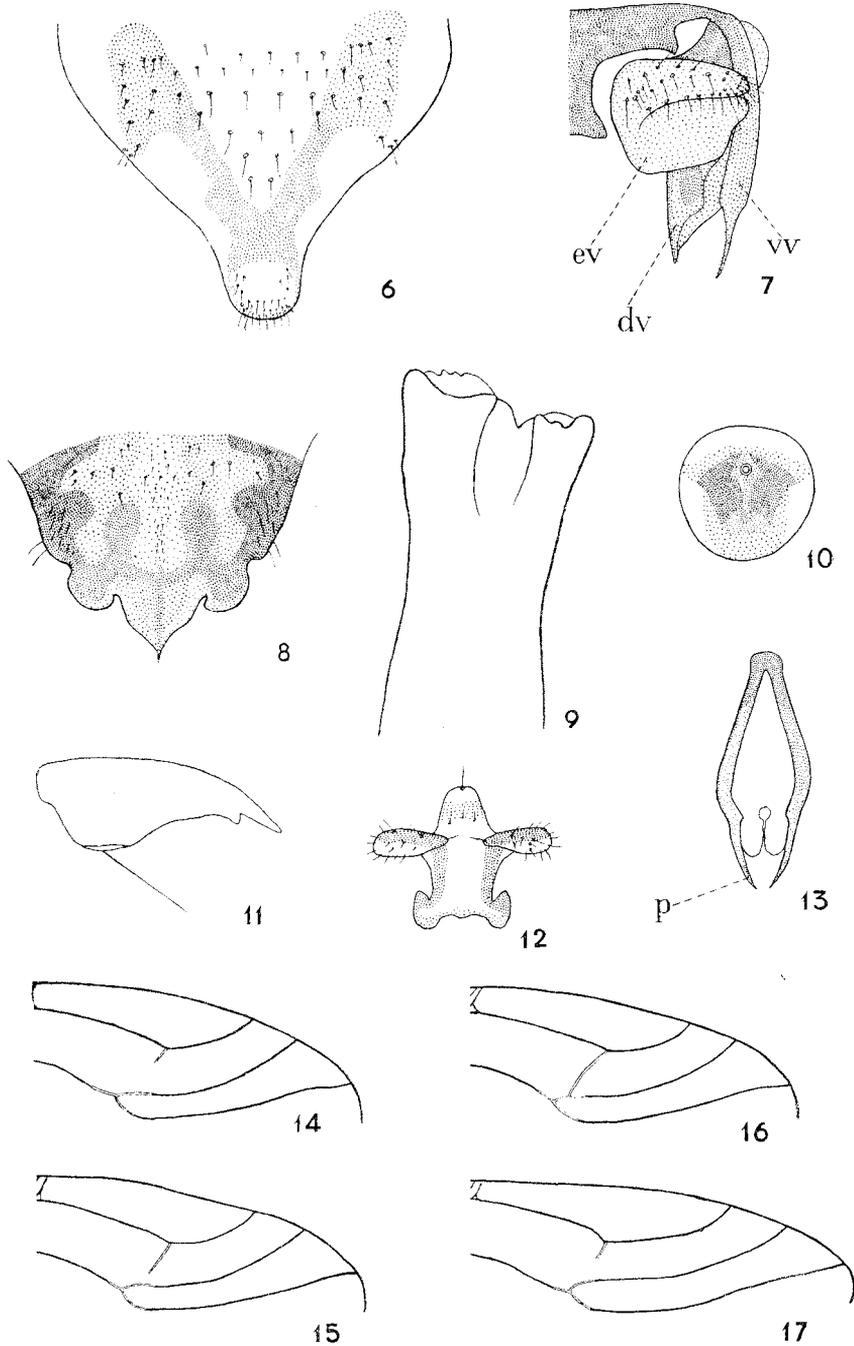
Prothorax small, hairless and almost hidden; mesothorax with a few short scattered hairs, metathorax hairless. Legs hairy; tibia with two apical spurs; claws (fig. 11) with a preapical tooth and a stiff basal bristle; ratio of tarsal segments of the third leg 2 : 1; first segment of posterior tarsus carrying 25 hairs with pectinate bases, the second segment without pectinate hairs.

Abdomen large and oval; epiproct large and rectangular; subgenital plate (fig. 6) with a single median lobe; opening of spermatheca (fig. 10) rounded. Gonapophyses (fig. 7): ventral valves dilated preapically and terminating in a long sharp point; dorsal valves with a large fleshy lobe and an acute apex; external valves bilobed transversely.

Length of body, 3.9-4.5 mm.

Length of forewing, 4.8 mm.

Length of antennae, 4.1 mm.



Figs 6-17

*Clematostigma tardipes* n.sp. Fig. 6: subgenital plate (female). Fig. 7: gonapophyses (female), *ev*—external valve; *dv*—dorsal valve; *vv*—ventral valve. Fig. 9: lacinia (female). Fig. 10: opening of spermatheca (female). Fig. 11: claw (female). Fig. 12: epiproct (male). Fig. 13: penial complex (male); *p*—paramere. Figs 14-17: positions of stump vein from the base of the pterostigma.

## MALE

*Colour.* Slightly darker than the female especially in the abdomen; thorax similar to that of the female except for pale yellowish-green lateral edges of the prothorax; abdomen pale yellowish-green with black markings on the dorsal surface.

Forewing (fig. 5) hyaline; pterostigma dark brown; distal ends of anterior cell, cell R1 and apical cells pale brown. Hindwing (fig. 5) hyaline; distal cells pale brown.

Hypandrium (fig. 8) brown.

*Morphology.* Head noticeably smaller than in the female; eyes large and prominent, interspace twice apparent eye diameter; antennae long with thick, moderately long hairs; wings longer than in the female.

Abdomen thin and slender with the posterior end curved upwards; epiproct (fig. 12) trilobed in front and with two small lobes behind; paraprocts with three small lobes.

Hypandrium (fig. 8) symmetrical and trilobed, the median lobe ending in a sharp point. Penial complex (fig. 13): parameres reunited anteriorly by a membranous lamina but free apically.

Length of body, 2.5 mm.

Length of forewing, 5.3 mm.

Length of antennae, 4.9 mm.

The stump vein in the forewing was not present in all the specimens collected. When present in the female the degree of development varied. The following variations occurred:—

Stump vein absent, 7 males, 5 females.

Stump vein very short (figs 14, 17), 4 males, 7 females.

Stump vein passing halfway to  $r_2 + 3$  (fig. 15), 4 females.

Stump vein meeting  $r_2 + 3$  (fig. 16), 1 female.

*Habits.* Most specimens have been found on the leaves and branches of *Pittosporum* spp.; one specimen was obtained from rolled *Eucalyptus* bark and several from the leaves of *Beyeria viscosa*. When disturbed the insects move very sluggishly in contrast to most other Psocids, which move quickly.

*Locality.* Type specimens collected Hobart, May 8, 1949, 1 male, 1 female; Hobart, May 8, 1949, 7 males, 9 females, 3 nymphs; June 7, 1949, 1 female; July 2, 1949, 3 males, 6 females, 1 nymph.

*Types.* Holotype (female) and allotype (male) in the Australian Museum, Sydney.

This species closely resembles *C. maculiceps* Enderlein, but differs from it in size and in the colouring of some parts of the body.

## Family MYOPSOCIDAE

Adults with three segmented tarsi. Antennae with 13 segments. Forewings: venation similar to that of the family Psocidae; entirely glabrous or with short hairs; pigmentation generally in the form of numerous irregular and confluent brown areas. Larvae with glandular hairs. Eggs laid in groups and covered by a rough encrustation.

## KEY TO GENERA

Female genitalia:

|                                       |       |                     |
|---------------------------------------|-------|---------------------|
| External valves rounded (fig. 23)     | ..... | <i>Myopsocus</i>    |
| External valves triangular (fig. 39)  | ..... | <i>Pentacladus</i>  |
| External valves rectangular (fig. 59) | ..... | <i>Tricladellus</i> |

Genus *Myopsocus* Hagen, 1866

Forewing strongly pigmented, the colouring resembling that of certain lichens. Venation like that of *Psocus*. *r* and *m* fused for a moderate distance in the hindwing, but in the forewing this distance is very short and often reduced to a point.

From a consideration of the characters of the two redescribed species, it is proposed to add the following generic characters:—

Hypandrium of the male bilobed and very heavily chitinised; parameres free apically and with a median chitinised plate. Subgenital plate of female with a single median lobe; gonapophyses with reduced ventral valves, long and strongly chitinised dorsal valves and rounded external valves.

*Myopsocus australis* (Brauer, 1866)*Psocus australis* Brauer, 1866.

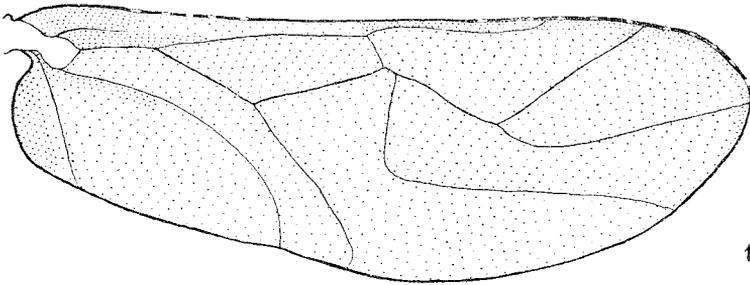
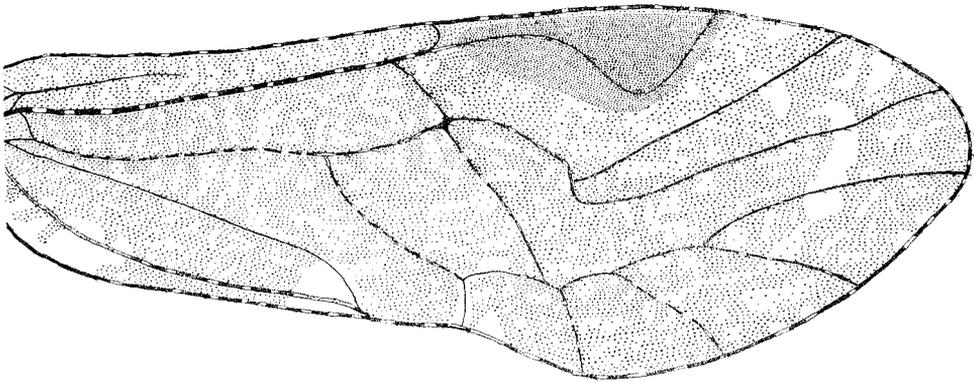
(Figs 18-25)

## FEMALE

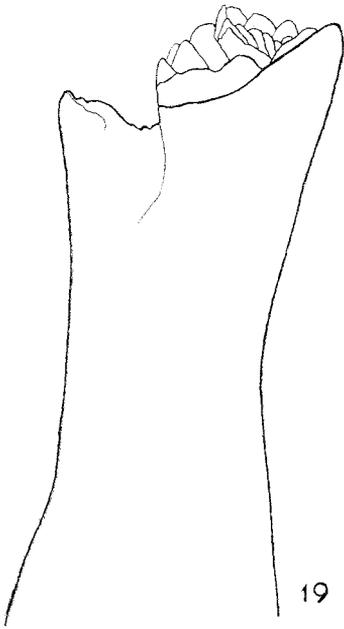
*Colour.* Epicranial plates yellowish-white with brown lines; median epicranial suture brown; frons brown; clypeus pale yellow with vertical brown lines and with anterior edge pale reddish-brown; anteclypeus pale brown; labrum pale brown, the anterior edge being darker; proximal portion of labium grey, distal portion pale brown; jaws white except for a brown area just below the base of the antennae; ocellary tubercle dark brown with pale grey between the ocelli; ocelli pale bluish-grey; eyes dark grey; maxillary palps pale brown except for the dark brown distal half of the fourth segment. First and second segments of antennae pale brown, proximal portions of the third and fourth segments testaceous, distal portions brown; remaining segments dark brown.

Prothorax pale brown. Mesothorax: antedorsum brown with pale brown posterior edges and a median pale yellow line; lateral dorsa brown with pale yellow median and lateral edges; scutellum brown. Methathorax: antedorsum and scutellum pale brown; lateral dorsa pale yellowish-brown with testaceous edges. Legs: coxa pale brown; trochanter white; femur white with brown ends; tibia testaceous with the distal extremity dark brown; proximal half of first tarsal segment testaceous, distal half, together with the second and third tarsal segments and the claws, dark brown.

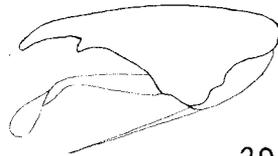
Forewing (fig. 18) pale grey mottled with brown; very pale areas present in cells R1, R3, R5, An and Ax and also in the areola postica; pterostigma dark reddish-brown, the pigmentation extending slightly below the posterior boundary; most of the veins with alternate brown and yellow sections, the exceptions being *r2 + 3*, *r4 + 5*, *m1* and *cu2*, which are brown, and the reddish-brown vein *an*; membrane with gold to green iridescence. Hindwing (fig. 18) pale brown with darker areas in the costal cell, cells An and Ax and in the apical portion of the distal cells; veins pale brown proximally, becoming darker towards the wing apex; margin of the wing near the apex with alternate brown and yellow markings, the remainder being brown; membrane with red to gold iridescence.



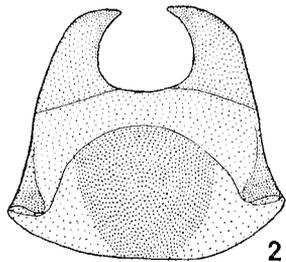
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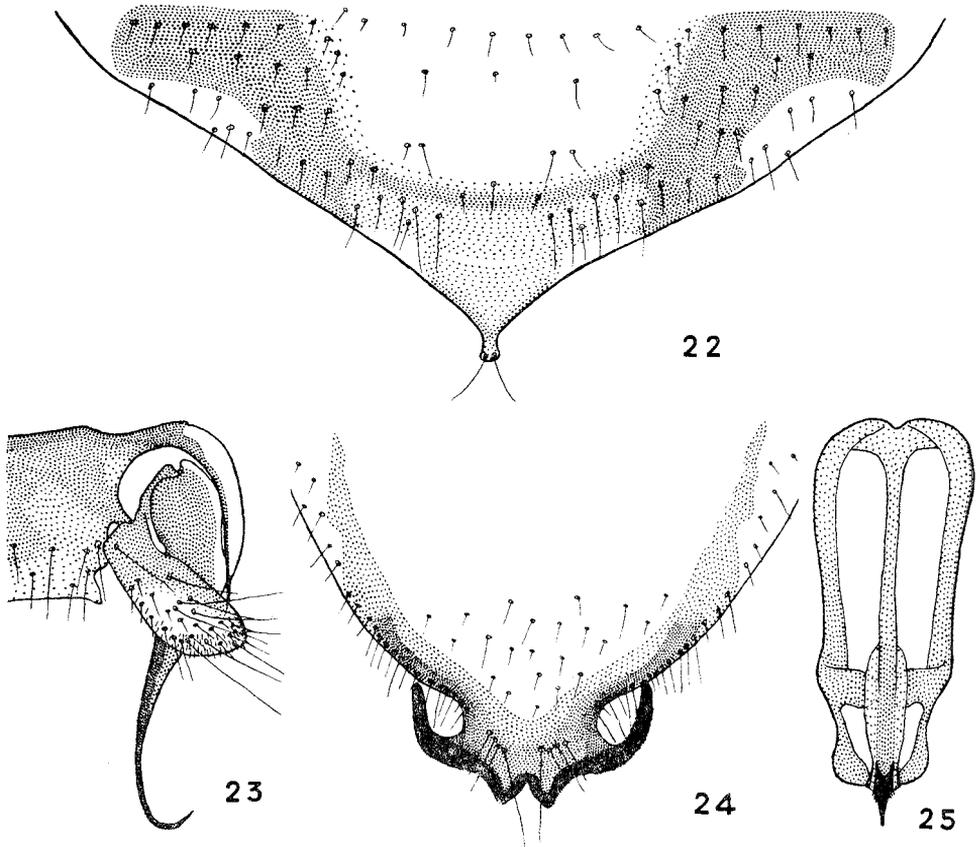
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FIGS 18-21

*Myopsocus australis* (Brauer). Fig. 18: wings (female). Fig. 19: lacinia (female). Fig. 20: claw (female). Fig. 21: epiproct (male).

Dorsal surface of abdomen pale yellow with reddish-brown bands on each segment; ventral surface cream with a few brown areas; apex of abdomen pale brown with the exception of the dorsal valves and the sensory plates, which are nearly black.

*Morphology.* Head large, sub-rectangular in front view, semicircular in side view with the dorsal posterior edge rounded; median epicranial suture distinct; clypeus large and protruding; ocelli three, close together; eyes of moderate size, interspace two-and-a-half times apparent eye diameter; lacinia (fig. 19) possessing two unequal teeth, the larger one with many small teeth; mandibles normal; maxillary palps long and hairy, the distal segment slightly rounded; antennae long, possessing short hairs; head, except the jaws, covered with short hairs.



FIGS 22-25

*Myopsocus australis* (Brauer). Fig. 22: subgenital plate (female). Fig. 23: gonapophyses (female). Fig. 24: hypandrium (male). Fig. 25: penial complex (male).

Prothorax small, hairless and almost hidden; mesothorax with short hairs, metathorax hairless. Legs hairy; tibia with two apical spurs; ratio of tarsal segments of the third leg 4 : 1 : 1; first tarsal segment of the third leg having 21 hairs with pectinate bases, other tarsal segments with one such hair; claws (fig. 20) with a preapical tooth, a well developed pulvillus and a basal bristle.

Wings (fig. 18) large; membranes minutely punctate; greatest width one-third length. Forewing with minute hairs on the wing margin and all the veins except *an*. Hindwing hairless.

Abdomen large and oval; epiproct large and semicircular; subgenital plate (fig. 22) with a single median lobe carrying two long hairs. Gonapophyses (fig. 23): ventral valves reduced; dorsal valves long, strongly chitinised and with an acute apex; external valves rounded.

Length of body, 4.4-4.8 mm.

Length of forewing, 5.0-5.5 mm.

Length of antennae, 4.8 mm.

#### MALE

*Colour.* Brown markings on the head much darker than in the female; a brown patch present around the median epicranial suture; first three segments of maxillary palps pale brown, distal segment dark brown. First two segments of antennae pale brown, proximal half of the third segment testaceous, distal half dark brown; distal segments dark brown.

Yellow areas on the thorax smaller than in the female. Legs darker. Wings with larger grey areas than in the female.

Abdomen: dorsal surface white with brown bands on each segment; ventral surface white; end of abdomen, except for the dark brown hypandrium, pale brown.

*Morphology.* Head small; ocellary tubercle prominent; eyes large, interspace one-and-a-half times apparent eye diameter; antennae smaller than those of the female, but with longer hairs.

Body small, the abdomen curved upwards posteriorly. Wings smaller than in the female. Epiproct (fig. 21) large and rectangular with a lateral projection from each side passing backwards. Hypandrium (fig. 24) bilobed, very heavily chitinised and with two lateral lobes pointing backwards. Penial complex (fig. 25): parameres free apically and with a median chitinised plate.

Length of body, 2.9-3.1 mm.

Length of forewing, 4.2-4.4 mm.

Length of antennae, 4.2 mm.

*Habits.* The specimens were found under the peeling bark of *Eucalyptus viminalis*. Generally the nymphs occurred in colonies under old loose bark on the bases of the trees, while the adults and also some nymphs were found in the upper branches under bark which had just begun to peel.

*Locality.* Scott's beach (near Ulverstone), N.W. Coast, January 22, 1949, 72 nymphs; February 13, 1949, 17 males, 6 females, 4 nymphs; Ulverstone, N.W. Coast, February 4, 1949, 40 nymphs.

This species has already been recorded from Tasmania by Tillyard (1923, p. 187).

**Myopsocus griseipennis** (MacLachlan, 1866)*Psocus griseipennis* MacLachlan, 1866.

(Figs 26-32)

## FEMALE

*Colour.* Epicranium pale yellow with dark brown lines and a wider pale brown line in the middle of each epicranial plate passing down to the ocellar tubercle; median epicranial suture brown; frons pale yellow with a median brown area; clypeus pale yellow with dark brown converging lines and with the front edge brownish-grey; anteclypeus brown; labrum pale brown except for the pale grey front edge; labium pale grey; jaws pale grey with two brown areas passing forwards from the bases of the eyes; ocellary tubercle grey; ocelli reddish-brown and ringed with black; eyes dark brown; first and third segments of maxillary palps pale brown, second segment grey, distal segment dark brown; first segment of antennae pale brown, second and third segments reddish-brown, distal segments dark brown.

Prothorax brown. Mesothorax: antedorsum dark brown with a median yellow T-shaped area, the column of the T ending anteriorly; lateral dorsa dark brown with the parts in contact with the T of the antedorsum and the posterior lateral edges yellow; scutellum grey. Metathorax: antedorsum grey; lateral dorsa pale brown; scutellum brown. First leg: coxa and trochanter grey; femur grey with pale brown markings in the median and distal regions; tibia pale brown with the distal extremity dark brown; proximal half of first tarsal segment pale brown, the remainder and the claws dark brown. Second and third legs similar except for the dark brown coxal segments.

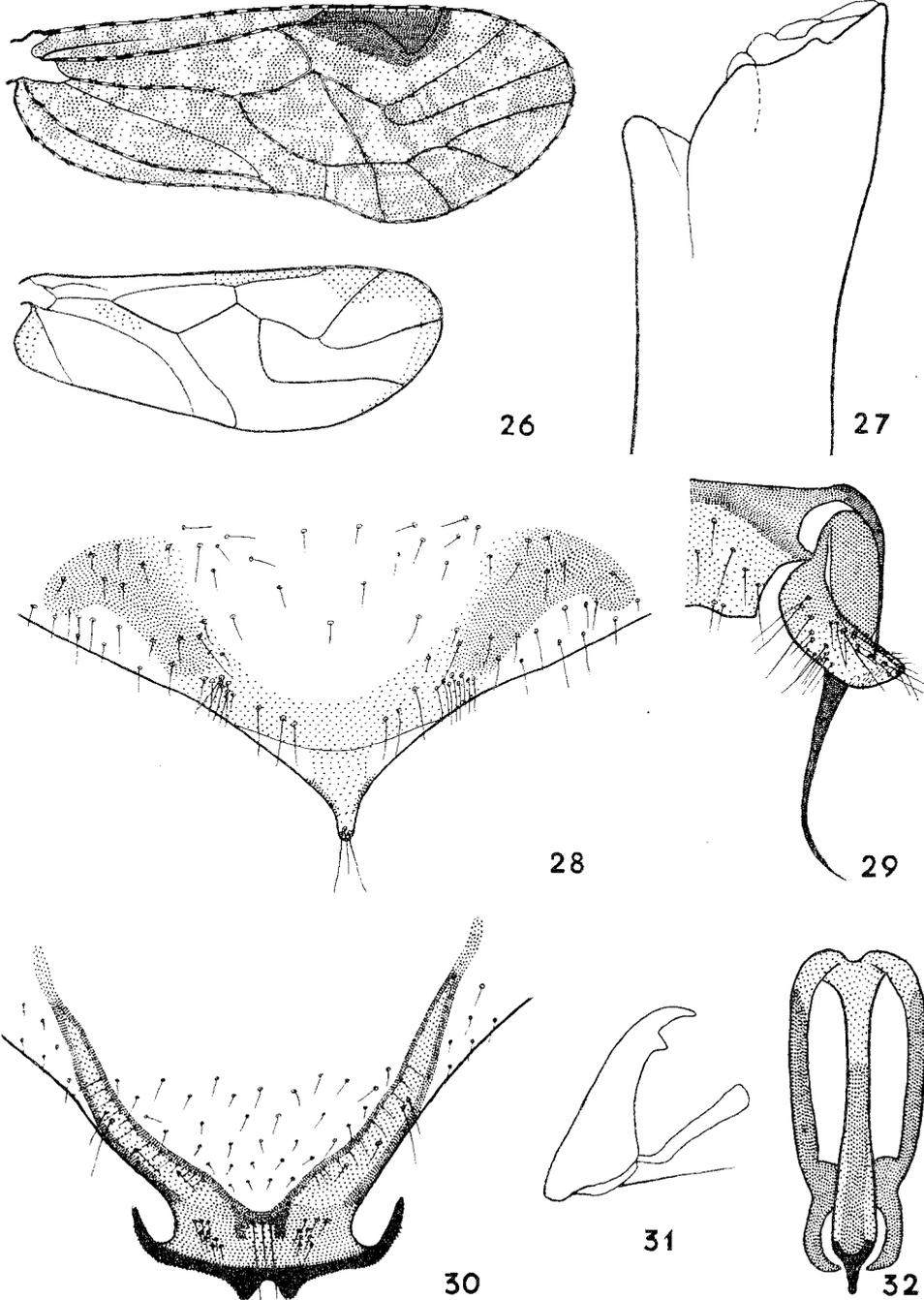
Forewing (fig. 26) brown with darker grey markings over the whole surface; pterostigma dark reddish-brown, the pigmented area extending slightly below the limits of *r*<sub>1</sub>; proximal veins, except for the pale grey vein *an*, with alternating brown and pale yellow regions; distal veins brown; margin with alternating brown and yellow regions; membrane with gold to green iridescence. Hindwing (fig. 26) pale brown, darker at the distal end of the wing and in cells Cu and Ax; veins and margin brown except for the yellow vein *r*<sub>1</sub> and the apical margin, which has alternate pale brown and pale yellow regions; membrane with red to gold iridescence.

Abdomen grey with a reddish-brown band on each segment; apex of abdomen, except for the dark brown genitalia, pale brown.

*Morphology.* Head subtriangular in front view, semicircular in side view; median epicranial suture distinct; clypeus large and overhanging; ocelli three, close together; eyes prominent and of moderate size, interspace three times apparent eye diameter; lacinia (fig. 27) with two teeth, the larger with two rows of smaller teeth; mandibles normal; maxillary palps hairy with the end segment slightly dilated; antennae short with thick, short hairs; head with short hairs.

Prothorax small, almost hidden and hairless; mesothorax with short hairs on the anterior half, the remainder and the metathorax hairless.

Legs hairy; tibia with two apical spurs; claws (fig. 31) with a preapical tooth, a well developed pulvillus and a stiff basal bristle; ratio of tarsal segments of the third leg 7 : 1 : 1; first tarsal segment of the third leg with 21 hairs having pectinate bases, the second segment with one and the third without these hairs.



FIGS 26-32

*Myopsocus griseipennis* (MacLachlan). Fig. 26: wings (female). Fig. 27: lacinia (female).  
 Fig. 28: subgenital plate (female). Fig. 29: gonapophyses (female). Fig. 30: hypandrium (male).  
 Fig. 31: claw (female). Fig. 32: penial complex (male).

Wings (fig. 26) minutely punctate. Forewing with short hairs on the margin and all the veins except *an*; greatest width one-third length. Greatest width of hindwing two-fifths length.

Abdomen large and oval; epiproct rounded, paraprocts pointed; subgenital plate (fig. 28) with a single median lobe carrying three hairs. Gonapophyses (fig. 29): ventral valves small and reduced; dorsal valves large, strongly chitinised and ending in a sharp point; external valves rounded.

Length of body, 3.6-3.8 mm.

Length of forewing, 3.4-3.6 mm.

Length of antennae, 2.8 mm.

#### MALE

*Colour.* Slightly darker than the female especially in the antennae, legs and wings; ventral surface of abdomen white; subgenital plate dark brown.

*Morphology.* Smaller in size and much more fragile than the female. Eyes larger, interspace twice apparent eye diameter; ocellary tubercle prominent.

Epiproct similar to but smaller than that of *M. australis* (fig. 21); semi-circular with two prominent anterior lobes ending in sharp points. Paraprocts long and slender with the distal end curved upwards. Hypandrium (fig. 30), similar to that of *M. australis*, heavily chitinised and possessing two small median lobes and two large lateral lobes directed backwards. Penial complex (fig. 32): parameres free apically and with a median chitinised plate.

Length of body, 2.0-2.1 mm.

Length of forewing, 3.0-3.2 mm.

Length of antennae, 3.0 mm.

*Habits.* Specimens were found in large numbers under stones in dry localities; the insects are colonial. The eggs are laid in masses.

*Locality.* Domain, Hobart, February 28, 1949, 7 males, 22 females, 46 nymphs.

This species has been previously found in Tasmania and recorded as *M. australis* (Brauer) by Hickman (1934, p. 85).

#### Genus *Pentacladus* Enderlein, 1906

Forewing with numerous brown confluent areas; veins and wing margins with short hairs; media three- to five-branched; *r* and *m* fused for a short distance. Hindwing with *r* and *m* fused for a moderate distance; a few hairs present on the anterior margin. Claws with a preapical tooth, a well developed pulvillus and a stiff basal bristle. Hypandrium of male bilobed; parameres closed, but with two apical lobes and a median lamina. Subgenital plate of female ending in a blunt point and bearing hairs; gonapophyses with long and sharp ventral valves, small and thin dorsal valves and triangular external valves.

#### *Pentacladus eucalypti* Enderlein, 1906

(Figs 33-51)

#### FEMALE

*Colour.* Epicranium dark brown, each segment with a dark red streak passing from the top of the head down between the eyes, alongside the lateral ocelli and through the frons to the upper border of the clypeus; frons dark brown with a pale brown area around the base of the antennae; clypeus brown, lateral edges

becoming paler; anteclypeus white; labrum brown with pale brown lateral borders; proximal portion of labium white, distal portion deep purple; jaws dark brown; ocelli pale pink; eyes brick red; first two segments of maxillary palps pale brown, distal segments nearly black; first two segments of antennae white, third segment testaceous, distal segments brown.

Prothorax pale brown. Mesothorax: posterior border of the antedorsum red; a red area present on each lateral dorsum on the outer and posterior border; posterior borders of the lateral dorsa dark brown; scutellum dark brown; remainder of mesothorax brown. Metathorax dark brown. First leg: coxa white with a pale red area on the outer posterior border; trochanter white; femur white becoming brown distally; tibia testaceous; first tarsal segment brown, other segments and claws dark brown. Second and third legs similar to the first except for the dark brown coxae.

Forewing hyaline; shaded areas brown except as follows:—anterior two-thirds of areola postica yellowish-red; a reddish-brown spot posterior to the joining of *r* and *m*; posterior half of pterostigma yellow, the colouring continuing down to *rr*; posterior border of pterostigma red; anterior halves of cells M1, M2, M3 and M4 pale yellowish-brown. Veins: proximal portion of *m* + *cu* red, middle portion yellow, distal end red; proximal halves of *r*, *an* and *ax* yellow, distal halves of *r* and *ax* brown, that of *an* red; *m* and *cu* red, other distal veins and borders of the wing brown except for the small distal yellow portions of *r* + *m*, *m* and *rr*; membrane hyaline with deep blue to violet iridescence. Hindwing (fig. 33): basal half of wing pale brown with darker brown patches in cells Cu and An; apex of the wing pale brown; all veins brown except the reddish-brown veins *an* and *ax*; membrane hyaline with red to gold iridescence.

Abdomen: dorsal surface brown with red bands in the middle of each segment; ventral surface white marked with brown; upper surface of epiproct red, lower surface white; paraprocts white on the inside, reddish-brown on the external surfaces, the sensory plates being dark brown. Valves of gonapophyses dark brown proximally becoming paler distally.

Two specimens collected were of a much paler colour than that given in the above description; both the red and the brown areas were paler in each case.

*Morphology.* Head sub-rectangular in front view, oblong in side view; median epicranial suture fine; clypeus slightly protruding; ocelli three, close together; eyes of moderate size, interspace two-and-a-half times apparent eye diameter; lacinia (fig. 36) with two teeth; mandibles normal; maxillary palps hairy with the distal segment slightly oval; antennae long with thick, short hairs and a few long hairs on each segment; head with long hairs on the epicranium, otherwise covered with short hairs.

Prothorax small, hairless and almost hidden; meso- and meta-thorax hairy. Legs hairy; tibia with three apical spurs; claws (fig. 37) with a small rather flat preapical tooth, a large pulvillus and a basal hair; ratio of the tarsal segments of the third leg 6 : 1 : 1½; first tarsal segment of the third leg with 21 hairs possessing pectinate bases, second and third segments without pectinate hairs.

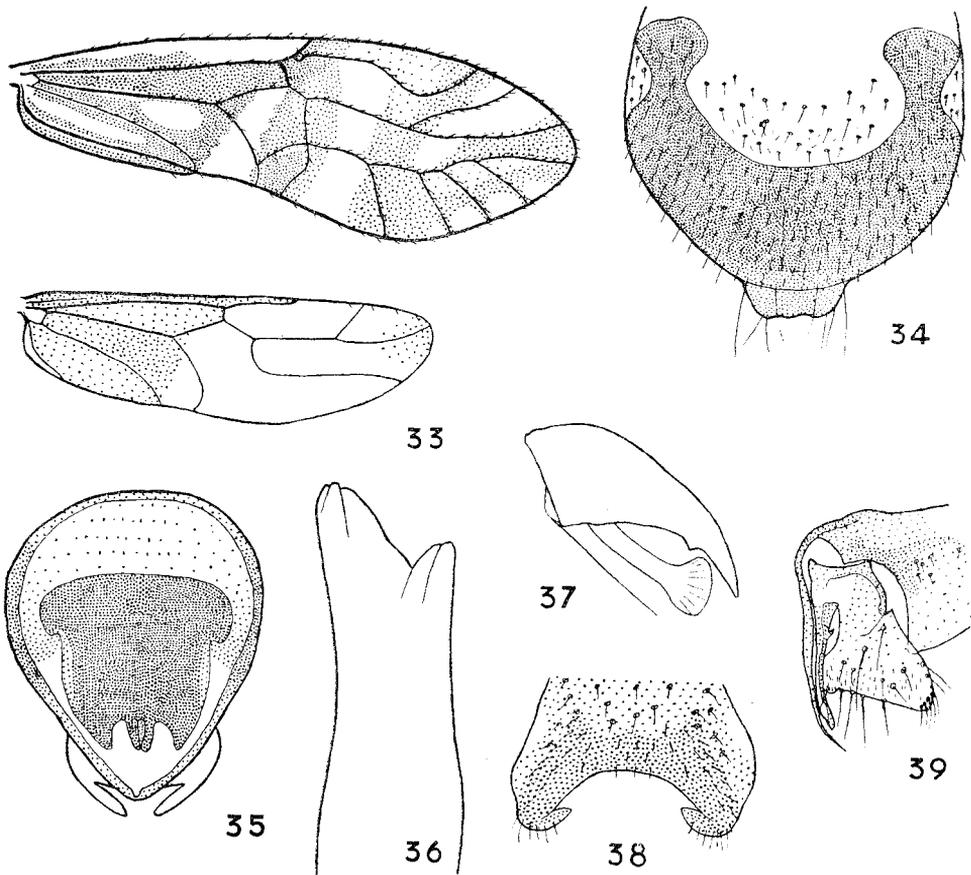
Wings (fig. 33) just reaching beyond the end of the abdomen; greatest width one-third length. Forewing with the margin and all the veins except *ax* possessing short hairs; pterostigma with two or three short hairs. Veins of hindwing hairless; margin near  $r_2 + \beta$  with three or four short hairs.

Abdomen large and oval, covered with short hairs; paraprocts large and rectangular; epiprocts wing-like; subgenital plate (fig. 34) bilobed. Gonapophyses (fig. 39): dorsal valves slender and short; external valves large, triangular and bearing long hairs; ventral valves long and slender.

Length of body, 3.5 mm.

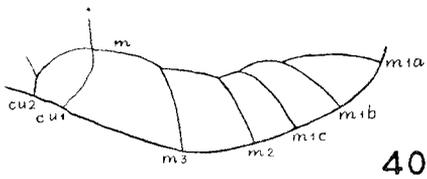
Length of forewing, 3.3 mm.

Length of antennae, 3.8 mm.

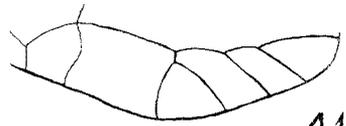


FIGS 33-39

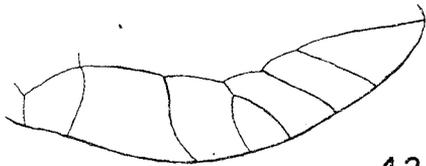
*Pentacladus eucalypti* Enderlein. Fig. 33: wings (female). Fig. 34: subgenital plate (female). Fig. 35: penial complex (male). Fig. 36: lacinia (female). Fig. 37: claw (female). Fig. 38: hypandrium (male). Fig. 39: gonapophyses (female).



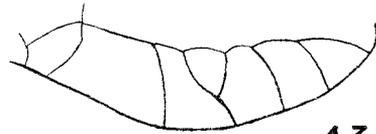
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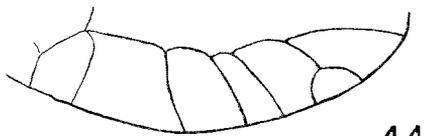
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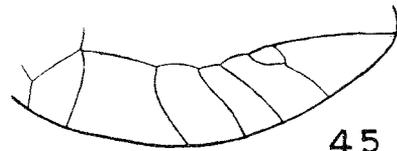
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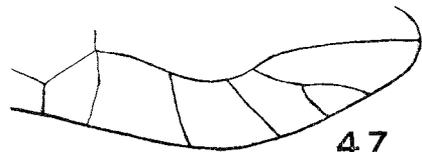
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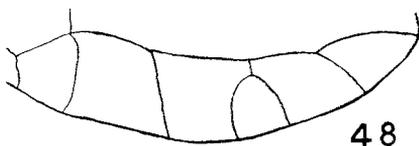
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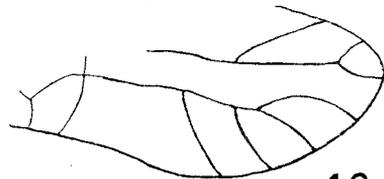
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FIGS 40-51

*Pentaclyadus eucalypti* Enderlein. Fig. 40: naming of the branches of the media. Figs 41-51: variations in the branching of the media.

## MALE

*Colour.* Very similar to that of the female; hypandrium (fig. 38) nearly black.

*Morphology.* Eyes larger and more prominent than in the female, interspace twice apparent eye diameter. Wings and antennae of greater length than those of the female. Body small, the abdomen oval and curved upwards posteriorly.

Hypandrium (fig. 38) bilobed, the lobes curving inwards at their extremities. Penial complex (fig. 35): parameres joining apically and with two free apical lobes.

Length of body, 2.6 mm.

Length of forewing, 3.5 mm.

Length of antennae, 4.2 mm.

## VARIATIONS IN THE BRANCHING OF THE MEDIA IN BOTH SEXES

In 91 (54 males, 37 females) of the 174 adult specimens examined, the branching of the media was found to be different from the normal type (fig. 40). This indicates that the wing venation of this species is not constant and that the generic character based on the five branches of the media as stated by Enderlein (1906) does not hold in all cases.

The different variations found are as follows:—

*m3* branched posteriorly, 10 males, 2 females (fig. 41).

*m2* branched posteriorly, 11 males, 5 females (fig. 42).

*m2* branched anteriorly, — males, 1 female (fig. 43).

*m1b* branched posteriorly, 6 males, 1 female (fig. 44).

*m1b* branched anteriorly, 3 males, 1 female (fig. 45).

*m1a* branched posteriorly, 2 males, 8 females (fig. 46).

Media 4 branched, *m1b* branched posteriorly, 8 males, 3 females (fig. 47).

Media 4 branched, *m2* branched posteriorly, 2 males, 2 females (fig. 48).

Media 4 branched, *m3 + 4* branched posteriorly, 3 males, 2 females (fig. 51).

Media 4 branched, *r4 + 5* branched distally, 8 males, 10 females (fig. 49).

Media 4 branched, — males, 1 female (fig. 50).

Media 3 branched, 1 male, 1 female.

*Habits.* The insects were found on thick, dead *Eucalyptus* leaves. They occur singly.

*Locality.* Rheban, E. Coast, May 25, 1949, 3 males, 3 females; May 27, 1949, 4 males, 5 females; Riffe Range, Hobart, May 1, 1949, 1 female; June 5, 1949, 5 males, 3 females; June 6, 1949, 10 males, 6 females; August 2, 1949, 4 males, 3 females; August 31, 1949, 9 males, 14 females, 2 nymphs; September 4, 1949, 22 males, 17 females; September 13, 1949, 25 males, 11 females; September 28, 1949, 24 males, 5 females.

Genus *Tricladellus* Enderlein, 1906

Forewing with numerous brown confluent areas; veins and wing margin with short hairs; venation similar to that of the genus *Psocus* with the areola postica joined to the media at a point or by a short transverse vein. *r* and *m* meeting at a point in the forewing, fused for a moderate distance in the hindwing. Claws with a small flat preapical tooth, a thin pulvillus and a basal hair. Hypandrium of the male lobed; parameres free apically and with a median chitinised plate. Subgenital plate of female bilobed, the lobes with long hairs; dorsal and ventral valves long and slender; external valves large and rectangular.

Brachypterism common.

*Tricladellus froggatti* Enderlein, 1906

(Figs 52, 54-59)

## FEMALE

*Colour.* Head dark brown, shining; front edge of labrum pale brown; anterior edge of labium reddish-brown, proximal portion white; region of ocellary tubercle darker than the surrounding surface; ocelli pale pink; eyes dark reddish-brown; proximal segments of maxillary palps dark brown, distal end of fourth segment black; first segment of antennae pale brown, second segment brown, third segment testaceous, the remaining segments dark brown.

Prothorax brown; mesothorax black and shining; metathorax similar to the mesothorax except for the brown antedorsum. First leg: coxa white, trochanter pale brown; tibia testaceous; first tarsal segment brown, other segments dark brown; claws black. Second and third legs similar to the first except for the dark brown coxae.

Wings (fig. 52) hyaline. Forewing: basal third deep brown except for the colourless anterior part of the costal cell and colourless areas in the middle of cells Cu and An; a narrow oblique greyish-brown band stretches from the proximal end of the pterostigma to the areola postica; a small greyish-brown area is situated near the most posterior part of the pterostigma, stretching to vein *m* and enclosing within it a large yellow spot just anterior to the branching of *r*<sub>1</sub>; another band of similar colour stretches from the anterior end of *r*<sub>4</sub> + *5* to a position slightly proximal to the end of *m*<sub>3</sub>, passing through the distal part of R<sub>5</sub>, through cells M<sub>1</sub> and M<sub>2</sub> and leaving hyaline mid-distal areas in the latter two cells; pterostigma with proximal and distal dark brown markings; basal halves of veins *r*, *m* + *cu*, *an* and *ax* together with *cu*<sub>2</sub> pale yellow; distal half of *an* reddish-brown; all other veins and parts of veins dark brown; membrane with green to violet iridescence. Hindwing hyaline; costal cell brown; cell An with a median grey-brown area; veins pale brown except for the reddish-brown veins *an* and *ax*; margin of wing pale brown; membrane with red to gold iridescence.

Abdomen white with a brownish-red band around each segment becoming fainter on the ventral side; terga of the eighth and ninth segments dark brown; subgenital plate dark brown; external surfaces of epiproct and paraprocts pale brown, internal surfaces pale yellow; sensory plates of paraprocts ringed with dark brown. Gonapophyses pale brown on the outside, white on the inside surfaces.

*Morphology.* Head sub-rectangular in front view, semicircular in side view; median epicranial suture distinct; clypeus rounded, protruding; ocelli three, close together; eyes of moderate size, interspace two-and-a-half times apparent eye diameter; lacinia (fig. 54) with two teeth; mandibles normal; maxillary palps long and hairy, distal segment slightly oval; antennae long with thick, short hairs and a few long hairs on each segment. Head, except for the jaws, covered with long hairs.

Mesothorax with a few long hairs, pro- and meta-thorax hairless. Legs hairy; tibia with three apical spurs; claws (fig. 56) long and slender, with a very small flat preapical tooth, a well developed pulvillus and a basal hair; ratio of the tarsal segments of the third leg 4 : 1 : 1½; first tarsal segment of the third leg with 17 hairs with pectinate bases, the second and third segments without these hairs.

Forewing (fig. 52) with a few very short hairs on the margin and all the veins except *an*; pterostigma with a few short hairs; greatest width two-fifths length. Hindwing (fig. 52) hairless; greatest width one-third length.

Abdomen large and oval; epiproct rounded; subgenital plate (fig. 58) with two short lobes carrying long hairs. Gonapophyses (fig. 59): ventral and dorsal valves long and slender with acute apices; external valves large and rectangular.

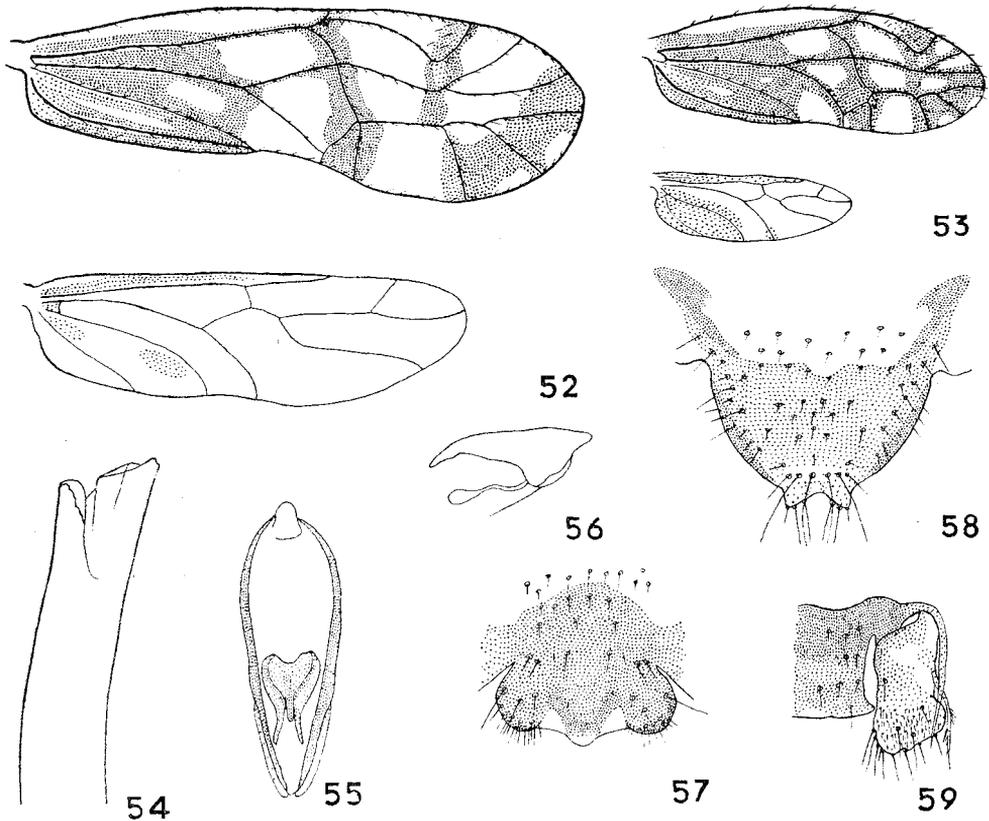
Length of body, 2.9 mm.

Length of forewing, 2.8-3.0 mm.

Length of antennae, 3.05 mm.

#### MALE

*Colour.* Maxillary palps black, antennae dark brown; hypandrium dark brown; colour of remainder similar to the female.



FIGS 52-59

*Tricladellus froygatti* Enderlein. Fig. 52: wings (female). Fig. 53: brachypterous wings (female). Fig. 54: lacinia (female). Fig. 55: penial complex (male). Fig. 56: claw (female). Fig. 57: hypandrium (male). Fig. 58: subgenital plate (female). Fig. 59: gonapophyses (female).

*Morphology.* Body small; abdomen short and slender and curved upwards posteriorly; hypandrium (fig. 57) trilobed. Penial complex (fig. 55): parameres free apically and with a median chitinised plate.

Length of body, 2.0 mm.

Length of forewing, 2.5-2.7 mm.

Length of antennae, 3.05 mm.

*Habits.* The insects have been found singly on the leaves of dead *Eucalyptus* trees.

*Locality.* Rheban, E. Coast, May 25, 1949, 6 males, 5 females, 15 nymphs; Rifle Range, Hobart, June 6, 1949, 4 males, 2 females.

#### *Tricladellus froggatti* var. *brachypterus* n. var.

(Fig. 53)

In most specimens this variety does not differ from the macropterous form except in the development and pigmentation of the wings. Nine specimens (4 males, 5 females) were paler in colour than the normal forms.

#### FEMALE

*Colour of Wings.* Forewing (fig. 53) with markings similar to those of the macropterous form but larger in area and darker in colour; veins surrounded by dark brown. Hindwing (fig. 53) with costal cell, cells An and Ax and the posterior portion of cell Cu marked with brown; a small brown area present at the extremity of vein *cu*; all veins dark brown.

*Morphology of Wings.* Forewing: veins, margin and the distal part of the pterostigma with a few short hairs; greatest width two-fifths length. Hindwing hairless; greatest width one-third length.

Length of forewing, 1.8-1.9 mm.

#### MALE

Wings very similar to those of the female except in size.

Length of forewing, 1.6-1.7 mm.

*Habits.* The specimens were found in association with the macropterous form on the dry leaves of dead *Eucalyptus* trees.

*Locality.* Rheban, E. Coast, May 25, 1949, 25 males, 28 females; Rifle Range, Hobart, June 6, 1949, 2 males, 2 females.

#### *Tricladellus nitens* (Hickman, 1934)

(Figs 60-65, 67)

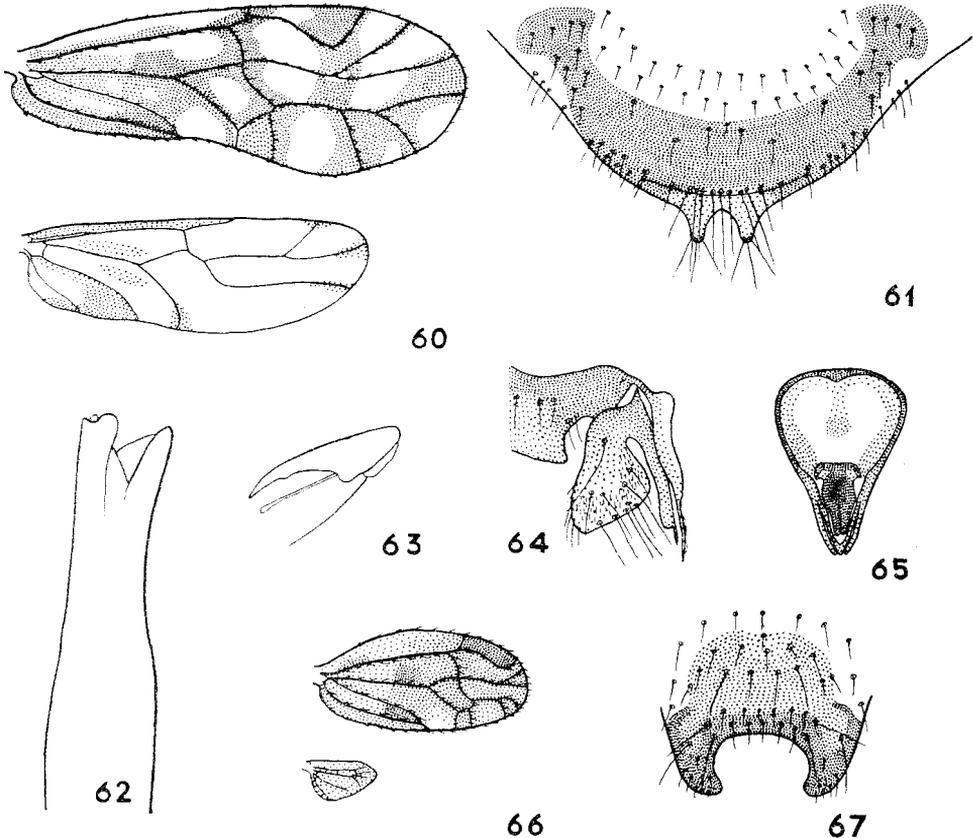
*Myopsocus nitens* Hickman (1934, p. 85).

#### FEMALE

*Colour.* Head dark brown and shining with a lighter brown area immediately above the eyes; median epicranial suture black; anteclypeus white; labrum brown with the anterior edge pale reddish-brown; proximal portion of labium pale brown, distal portion pale reddish-brown; ocelli pale red; eyes dark reddish-brown; first three segments of maxillary palps dark brown, distal segment nearly black; first segment and the basal halves of the second and third segments of the antennae pale brown, distal halves of the second and third segments and all the remaining segments dark brown.

Prothorax pale brown; meso- and meta-thorax dark brown and shining. Segments of first leg brown except for the dark brown tarsal segments and the black claws. Coxae of the second and third legs dark brown, other segments similar to those of the first leg.

Wings (fig. 60) hyaline. Forewing: basal third brown with colourless areas in cells Cu and An; a brown band extends from the proximal end of the pterostigma to the areola postica, joining up with proximal markings around veins *m* and *cu* and with distal markings around vein *m*; another brown band extends from the most posterior portion of the pterostigma down to the forking of *m3*, along *m* to the forking of *m2* and continuing to finish just anterior to the end of vein *r2 + 3*; proximal end and the distal third of the pterostigma dark brown; basal halves of *r*, *m + cu*, *an* and *ax* and the fork of *rr* pale yellow; distal half of *an* and *r1* and *cu2* reddish-brown; other veins dark brown; membrane with green to violet iridescence. Hindwing: anterior cell pale brown; pale brown areas at the extremities of the veins and in cells Cu and An; proximal veins pale brown, distal veins dark brown; membrane with red to gold iridescence.



FIGS 60-67

*Tricladellus nitens* (Hickman). Fig. 60: wings (female). Fig. 61: subgenital plate (female). Fig. 62: lacinia (female). Fig. 63: claw (female). Fig. 64: gonapophyses (female). Fig. 65: penial complex (male). Fig. 66: brachypterous wings (female). Fig. 67: hypandrium (male).

Abdomen pale brown dorsally with dark brown lateral and ventral surfaces; a white area present anterior to the subgenital plate; subgenital plate dark brown; apex of the abdomen pale brown except for the dark brown outer surfaces of the epiproct and paraprocts.

*Morphology.* Head triangular in front view, semicircular in side view; median epicranial suture distinct; clypeus large and bulging; ocelli three, close together; eyes small and protruding, interspace three times apparent eye diameter; lacinia (fig. 62) with two teeth; mandibles normal; maxillary palps hairy, the end segment slightly oval; antennae long, covered with short hairs and with several long hairs on each segment; hairs on the epicranium long, the remainder of the head with short hairs.

Prothorax small, hairless and nearly hidden; mesothorax hairy, metathorax hairless. Legs hairy; tibia with three apical spurs; claws (fig. 63) with a small preapical tooth, a well developed pulvillus and a basal hair; ratio of tarsal segments of the third leg 6 : 1 : 2; first tarsal segment of the third leg with 17 hairs having pectinate bases, other tarsal segments without pectinate hairs.

Wings (fig. 60) minutely punctate; greatest width one-third length. Forewing with very short hairs on the veins and wing margin. Hindwing hairless.

Abdomen oval and covered with short hairs; paraprocts large and rounded; subgenital plate (fig. 61) bilobed. Gonapophyses (fig. 64): ventral and dorsal valves long and slender with acute apices; external valves large and rectangular.

Length of body, 3.0 mm.

Length of forewing, 2.8 mm.

Length of antennae, 2.5 mm.

#### MALE

*Colour.* Differs from the female in having head and thorax slightly darker; abdomen brown dorsally, pale brown ventrally; hypandrium dark brown.

*Morphology.* Body short; antennae longer than in the female; abdomen short and oval, curved upwards posteriorly; hypandrium (fig. 67) bilobed, the lobes curving inwards distally. Penial complex (fig. 65): parameres free apically and with a median chitinised plate.

Length of body, 2.1 mm.

Length of forewing, 2.8 mm.

Length of antennae, 3.0 mm.

*Habits.* Specimens were found in large numbers in heaps of dry grass. The eggs are laid in groups on the larger grass stems and are covered by a dark grey encrustation.

Size of eggs, 0.49 x 0.26 mm.

*Locality.* Hobart, March 26, 1949, 3 males, 3 females, 8 nymphs; June 6, 1949, 3 males, 4 females; June 26, 1949, 8 males, 7 females, 6 nymphs.

#### *Tricladellus nitens* var. *brachypterus* n. var.

(Fig. 66)

Similar to the macropterous form in all characters except in the reduction and pigmentation of the wings.

#### FEMALE

*Colour of Wings.* Forewing (fig. 66) with the distal third pale brown and the proximal two-thirds dark brown except for an almost colourless area at the distal end of cell Cu; pterostigma very dark brown; basal halves of veins

*r*, *m* + *cu*, *an* and *ax* and the posterior border of cell Cu pale yellowish-brown; other veins and the remainder of the margin dark brown. Hindwing (fig. 66) a uniform pale brown colour with the veins slightly darker.

*Morphology of Wings.* Forewing: veins and wing margin with longer hairs than in the normal form; greatest width two-fifths length. Hindwing with veins greatly reduced and not reaching to the wing margin; veins and wing margin hairless; greatest width one-half length.

Length of forewing, 1.4 mm.

#### MALE

Wings very similar in colour and morphology to those of the female.

Length of forewing, 1.2 mm.

*Habits.* This variety was found, together with the macropterous form, in dry grass heaps. At the times collected, it occurred in larger numbers than the macropterous form.

*Locality.* Hobart, March 26, 1949, 12 males, 10 females; June 6, 1949, 15 males, 16 females; June 26, 1949, 23 males, 19 females.

#### Group HOMILOPSOCIDEA Pearman

#### Family PHILOTARSIDAE Pearman

Adults: tarsi with three segments; antennae with 13 segments; claws with a preapical tooth, a small thin pulvillus and a stiff basal bristle; margin and veins of wings hairy, the two rows of hairs on the posterior distal margins crossing over each other; pterostigma not joined to the radial fork; areola postica free.

Larvae possessing glandular hairs.

#### Genus *Philotarsus* Kolbe, 1880

Pterostigma convex posteriorly; *r* and *m* fused for a moderate distance in both wings; *rr* strongly arched in the forewing; *r* and *ax* with two rows of hairs; areola postica high. Subgenital plate of female with a tongue-like lobe; gonapophyses complete; dorsal valves in the form of conical lobes. Hypandrium of male with tubercles; parameres dilated; paraprocts with very long trichobothria.

Eggs ovoid, deposited singly and covered with a granular layer.

#### *Philotarsus greyi* n.sp.

(Figs 68-75)

#### FEMALE

*Colour.* Epicranial plates white with longitudinal black markings and a median brown area in each; frons white with brown markings; clypeus white with black nearly longitudinal lines; anteclypeus pale brown; labrum black with the anterior edge pale grey; proximal portion of labium pale grey, distal portion brown; lower half of jaws white, upper half brown; ocellary tubercle black; ocelli pale brown; upper half of eyes grey, lower half black; first three segments of maxillary palps white, distal segment black; proximal segments of antennae brown, distal segments dark brown.

Prothorax dark brown; mesothorax with the scutellum, the posterior edges of the lateral dorsa and the edges and dividing lines between the segments brown, the remaining areas black; metathorax with the scutellum and antedorsum brown,

the lateral dorsa black and the dividing lines between the segments brown. First leg: coxa white with a dark brown proximal edge; trochanter testaceous; femur testaceous with dark brown markings; tibia brown, tarsal segments and claws black. Second and third legs similar to the first leg except for the dark brown coxae.

Forewing (fig. 68) with greyish areas in every cell, the membrane otherwise being hyaline; pterostigma pale brown with darker areas around the hairs and with a band of pale orange around its posterior boundary; veins grey becoming darker distally; membrane with green to gold iridescence. Hindwing (fig. 68) hyaline except for the grey anterior cell and the grey distal portion of cell An; proximal veins brown, becoming black in the middle of the wing and grey distally; membrane with red to gold iridescence.

Dorsal surface of abdomen white with numerous large brown areas; ventral surface white with pale brown lines between the segments; subgenital plate dark brown with a very pale brown median lobe; paraprocts white with a black sensory field; epiproct white below, pale brown above; tergum of ninth segment dark brown. External valves white on the outside, dark brown on the inside surfaces; dorsal valves dark brown; ventral valves white.

*Morphology.* Head sub-rectangular in front view, semicircular in side view; median epicranial suture fine; clypeus slightly bulging; eyes rather small, interspace three times apparent eye diameter; ocelli three, close together; end segment of the hairy maxillary palps slightly oval; lacinia (fig. 73) with three main teeth; mandibles normal; antennae of moderate length, covered with short hairs and with a very long hair at the extremity of the distal segment. Head covered with short hairs, those on the epicranium being longer.

Prothorax small, hairless and nearly hidden; mesothorax with, metathorax without, hairs. Legs hairy; tibia with two apical spurs; claws (fig. 72) with a preapical tooth, a thin pulvillus and a basal hair; ratio of tarsal segments of the third leg 8 : 1 : 14; 21 hairs with pectinate bases on the first tarsal segment of the third leg, one on the second segment, the third segment without pectinate hairs.

Wings hardly passing beyond the end of the abdomen; greatest width one-third length. Forewing (fig. 68): veins, margin and pterostigma hairy. Hindwing (fig. 68) with hairs on the distal portions of  $r_4 + 5$  and  $m$  and along the margin from the end of  $r_1$  around the apex of the wing to the proximal end.

Abdomen large and oval with very short hairs on each segment; subgenital plate (fig. 75) with a median conical lobe which narrows at its posterior end. Gonapophyses (fig. 74): dorsal valves large and sub-rectangular; ventral valves long and slender with acute apices; external valves semi-circular.

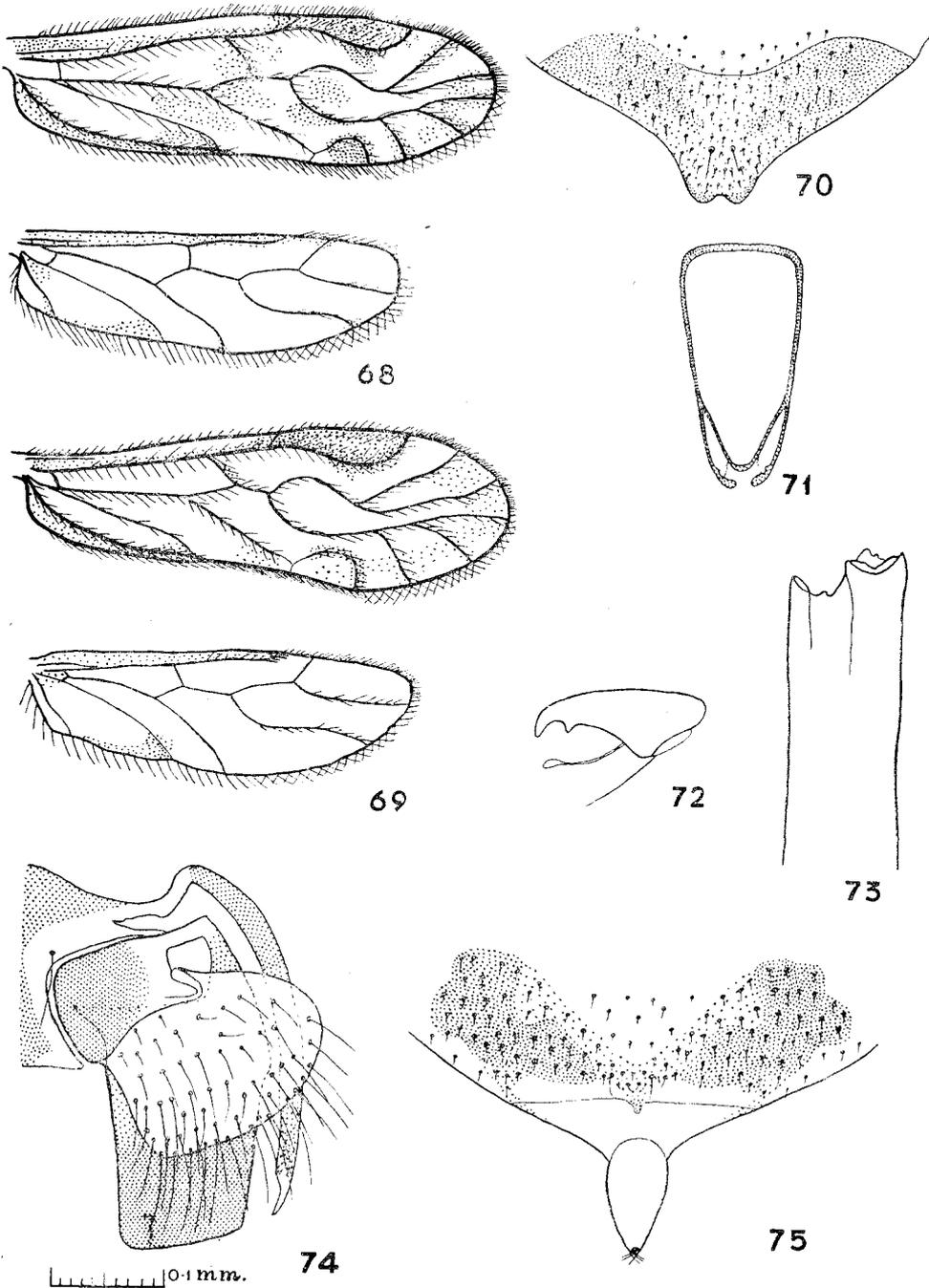
Length of body, 3.2 mm.

Length of forewing, 2.9 mm.

Length of antennae, 1.7 mm.

#### MALE

*Colour.* Differs from the female in the following: proximal segments of maxillary palps brown, end segment dark brown; tarsi brown; wings (fig. 69) much less darkly pigmented; pterostigma with orange and dark brown around its posterior boundary; hypandrium pale brown.



FIGS 68-75

*Philotarsus greyi* n.sp. Fig. 68: wings (female). Fig. 69: wings (male). Fig. 70: hypandrium (male). Fig. 71: penial complex (male). Fig. 72: claw (female). Fig. 73: lacinia (female). Fig. 74: gonapophyses (female). Fig. 75: subgenital plate (female).

*Morphology.* Head very much smaller than in the female; ocellary tubercle prominent; eyes large, interspace twice apparent eye diameter; antennae longer than in the female and covered with long dense hairs; wings longer than those of the female; hindwing with hairs on *r1* and hairs for a greater distance along *m1* and *r4 + 5* than in the female; body short with the abdomen curved upwards posteriorly; epiproct small; hypandrium (fig. 70) bilobed. Penial complex (fig. 71): parameres dilated.

Length of body, 2.4 mm.

Length of forewing, 3.1 mm.

Length of antennae, 2.1 mm.

*Habits.* Specimens were found on the underside of leaves of a large number of different trees. Three specimens were also obtained from under the loose bark of *Eucalyptus regnans*. The insects occur singly.

*Locality.* Type specimens collected New Town creek, March 11, 1949, 1 male, 1 female; Clayton creek, N.W. Coast, February 5, 1949, 1 male, 1 female, 1 nymph (Dr. Grey Edwards); Domain, Hobart, February 28, 1949, 1 female, 3 nymphs; April 7, 1949, 8 females, 12 nymphs; Bellerive beach, March 11, 1949, 17 males, 13 females, 54 nymphs; New Town creek, March 3, 1949, 2 males, 3 females, 22 nymphs; Rifle Range, Hobart, April 26, 1949, 4 males, 4 females, 1 nymph.

*Type.* Holotype (female) and allotype (male) in the Australian Museum, Sydney.

This species is named after the author's brother (Dr. Grey Edwards). The species differs from other Philotarsids in the pigmentation of the wings, the shape of the egg-guide and the sub-rectangular form of the dorsal valves.

#### Family TRICHOPSOCIDAE Pearman

Adults: tarsi with two segments; antennae with 13 segments; claws without teeth, with a dilated pulvillus and a basal hair; veins of forewings with long hairs; areola postica free; pterostigma not joined to the radial fork; *r* and *m* fused for a moderate distance in both wings. Hypandrium of the male simple; gonapophyses of the female with three pairs of well developed valves; subgenital plate simple.

Eggs covered by an encrustation and without a web.

#### Genus *Trichopsocus* Kolbe, 1882

Forewing: pterostigma sub-rectangular; areola postica flattened; *an* without hairs; *ax* with two rows of long hairs. Hindwing: one row of hairs on the margin from the end of *r1* to *r4 + 5*; posterior margin with alternate long and short hairs. Penial bulb of male with a variable chitination. Gonapophyses of female with conical dorsal valves ending in a sharp point; external valves nearly circular and with long hairs, the exterior hairs with recurved points; epiproct with two large hairs on each side of a short median hair and, situated below the latter on the posterior edge, two thick hairs; border of paraprocts with a large and a smaller hair, the two enclosing a small very fine hair.

#### *Trichopsocus australis* n.sp.

(Figs 76-82)

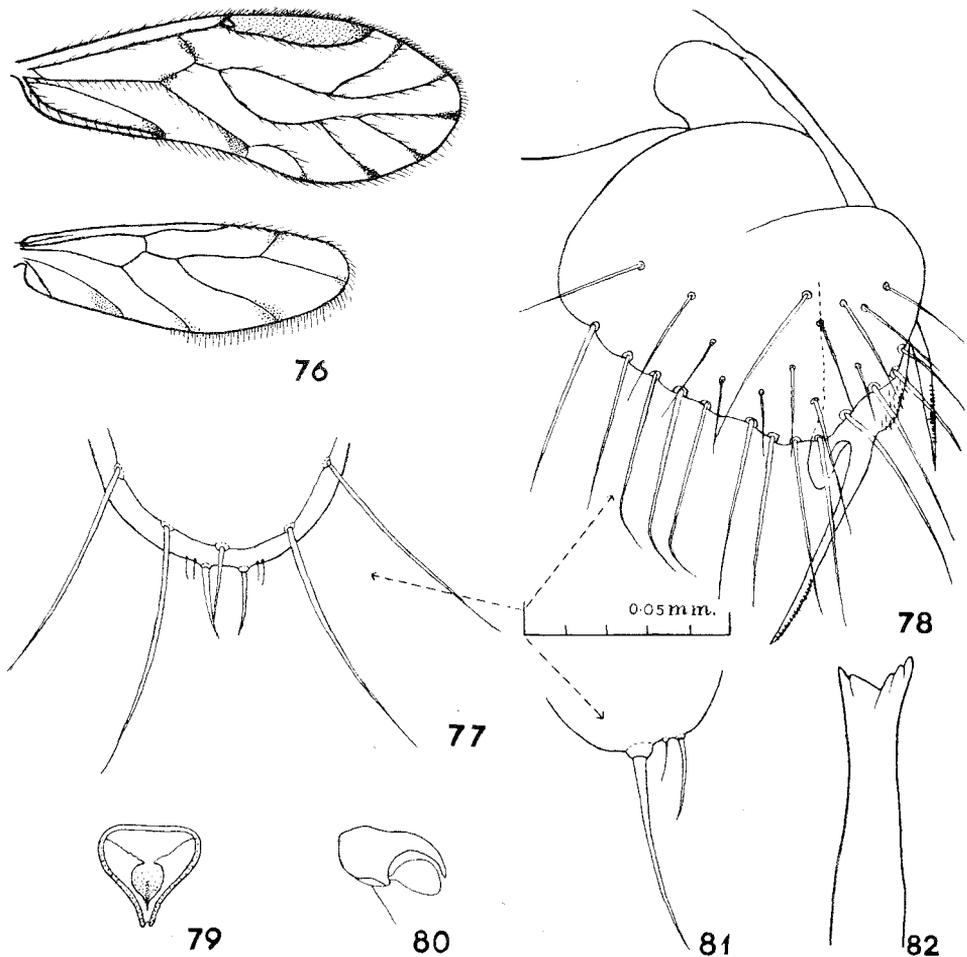
#### FEMALE

*Colour.* Head pale yellowish-white; a brown spot present between the eyes and the base of the antennae; front edges of labrum and labium pale brown; ocellary tubercle brown; ocelli pale brown; eyes greyish-green; basal segments of maxillary palps testaceous, distal segment pale brown; antennae testaceous becoming darker distally.

Prothorax pale yellow. Mesothorax pale yellow except for the pale brown lateral dorsa, which have brown posterior edges. Metathorax: antedorsum and anterior halves of the lateral dorsa pale yellow; posterior halves of lateral dorsa pale brown; scutellum brown. Legs testaceous with the distal tarsal segment and the claws dark brown.

Wings (fig. 76) hyaline. Forewing with brown areas at the ends of all the veins and in the distal portion of the pterostigma; *r* and *m* marked with brown proximal to their fusion; veins, except for the yellow vein *r*1, pale brown becoming darker towards the wing apex; pterostigma pale yellow with the distal portion brown; membrane with reddish-brown iridescence. Hindwing: brown areas present at the end of veins *an*, *m* and *r*2 + 3; pale brown at the end of *cu*; membrane with golden iridescence.

The abdomen, its apex and the gonapophyses pale yellow.



FIGS 76-82

*Trichopsocus australis* n.sp. Fig. 76: wings (female). Fig. 77: epiproct (female). Fig. 78: gonapophyses (female). Fig. 79: penial complex (male). Fig. 80: claw (female). Fig. 81: paraproct (female). Fig. 82: lacinia (female).

*Morphology.* Head triangular in front view, semicircular in side view; median epicranial suture very fine and indistinct; clypeus slightly bulging; ocelli three, close together; eyes of moderate size, protruding, interspace three-and-a-half times apparent eye diameter; lacinia (fig. 82) with two teeth; mandibles normal; maxillary palps hairy, end segment slightly oval; antennae of moderate length, covered with long hairs. Epicranium covered with long hairs, the rest of the head with short hairs.

Prothorax small, hairless and nearly hidden; mesothorax with a few long hairs, metathorax hairless. Legs hairy; tibia with two apical spurs; claws (fig. 80) without a preapical tooth, but with a dilated pulvillus and a basal hair; ratio of tarsal segments of the third leg 3 : 1; first tarsal segment of the third leg with 18 hairs having pectinate bases, second segment without pectinate hairs.

Forewing (fig. 76): veins, except *an*, and the margin hairy; *av* with two rows of long hairs; pterostigma hairless; greatest width two-fifths length. Hindwing (fig. 76): veins hairless; margin hairy, the posterior apical portion with alternate long and short hairs; greatest width one-third length.

Abdomen oval and covered with short hairs; epiproct (fig. 77) and paraprocts (fig. 81) conforming to generic characters; subgenital plate simple. Gonapophyses (fig. 78): ventral valves long and slender and ending in a sharp point; dorsal and external valves normal.

Length of body, 1.55 mm.

Length of forewing, 2.0-2.6 mm.

Length of antennae, 1.6 mm.

#### MALE

*Colour.* Antennae much darker than in the female. Wings with brown areas paler and smaller in size than in the female.

*Morphology.* Antennae long with very long hairs; eyes larger than in the female, interspace three times apparent eye diameter; wings more constant in length than in the female.

Abdomen slender and curved upwards posteriorly; hypandrium simple. Penial complex (fig. 79): penial bulb weakly chitinised.

Length of body, 1.45 mm.

Length of forewing, 2.3-2.5 mm.

Length of antennae, 1.8 mm.

*Habits.* The insects were found singly on the underside of leaves of *Pittosporum* spp. and *Prunus* spp.

*Locality.* Type specimens collected Hobart, June 5, 1949, 1 male, 1 female; Hobart, May 30, 1949, 13 males, 5 females, 2 nymphs; June 5, 1949, 101 males, 66 females, 93 nymphs.

*Type.* Holotype (female) and allotype (male) in the Australian Museum, Sydney.

This species is very similar to *T. dali* MacLachlan, 1867, but differs in the paler overall colour and in the markings of the forewing.

#### Family PERIPSOCIDAE Pearman, 1936

Adults: tarsi with two segments; antennae with 13 segments; forewing without areola postica.

## KEY TO GENERA

1. Forewing: *r* and *m* fused for a moderate distance; pterostigma rounded at the apex ..... *Peripsocus* Hagen  
 Forewing: *r* and *m* meeting at a point or fused for a short distance; pterostigma rectangular ..... 2
2. Hindwing: *r* and *m* fused for a moderate distance ..... *Interpsocus* n.gen.  
 Hindwing: *r* and *m* joined by a transverse vein ..... *Ectopsocus* MacLachlan

Genus *Peripsocus* Hagen, 1865

*r* and *m* fused for a moderate distance in both wings. Forewing; pterostigma tapering at the apex and with a pronounced rounded posterior angle. Claws with a preapical tooth, a filamentous pulvillus and a basal hair. Parameres of male joined anteriorly into a large thin plate and reunited apically at a point; penial bulb reinforced by thick chitin. Gonapophyses of female complete; ventral valves rather thick; dorsal valves short lobes with a dilated basal region and a tuft of large terminal hairs; external valves reduced.

Eggs deposited singly, engraved, with the apex slightly pointed; covered by a dark grey encrustation.

*Peripsocus eucalypti* n.sp.

(Figs 83-88)

Described as *Peripsocopsis milleri* Tillyard, 1923, by Hickman (1934, p. 87).

## FEMALE

*Colour.* Head pale brown except for white areas around the eyes, in the middle of each epicranial plate and on the jaws; median epicranial suture dark brown; anteclypeus white; labrum dark brown; front edge of labium brown; ocellary tubercle dark brown, ocelli pale pink; eyes black; first three segments of maxillary palps brown, distal segment dark brown; antennae pale brown becoming darker distally.

Prothorax pale brown, meso- and meta-thorax brown. Legs pale brown with the last tarsal segment and the claws brown.

Forewing (fig. 83): membrane semi-transparent; pale brown areas in the proximal halves of cells R1 and M; pale brown shading around some of the distal veins; veins pale brown becoming darker distally. Hindwing (fig. 83): cells pale brown; anterior cell slightly darker; veins pale brown except for the brown vein *cu*. Wing membranes with red iridescence.

Abdomen testaceous; a dark brown line along the mid-dorsal surface; segments ringed with dark brown. Gonapophyses brown except for the transparent ventral valves.

Specimens found in Southern Tasmania were slightly darker in colour than those from Northern Tasmania.

*Morphology.* Head sub-rectangular in both front and side views; median epicranial suture distinct; clypeus slightly protruding; ocelli three, close together; eyes small, interspace four times apparent eye diameter; lacinia (fig. 85) with two teeth; mandibles normal; maxillary palps hairy, distal segment long and slightly oval; antennae short with short hairs. Head with short hairs.

Prothorax small, hairless and nearly hidden; mesothorax with a few sparse, short hairs; metathorax hairless. Legs hairy, tibia with two apical spurs; claws (fig. 88) with a large preapical tooth, a thin pulvillus and a basal hair; first tarsal

segment of the third leg carrying 18 hairs with pectinate bases, second segment without pectinate hairs; ratio of tarsal segments of the third leg 2 : 1.

Wings with very short, sparse hairs; greatest width one-third length.

Abdomen large and oval, covered with short hairs; epiproct a large rectangular projection; subgenital plate (fig. 87) with a long median lobe slightly notched at its extremity. Gonapophyses (fig. 86) with external valves feebly developed, dorsal valves sub-rectangular and ventral valves pointed at the apex.

Length of body, 2.0 mm.

Length of forewing, 2.3 mm.

Length of antennae, 1.5 mm.

#### MALE

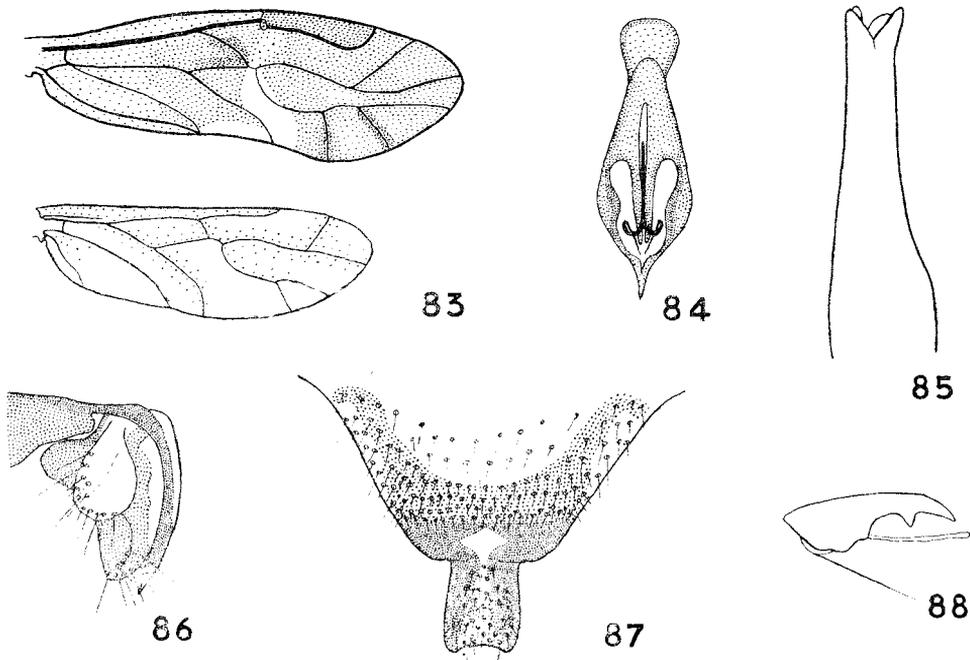
*Colour.* Slightly darker than the female in most areas.

*Morphology.* Eyes large, interspace three times apparent eye diameter; antennae longer than in the female. Thorax very thick dorso-ventrally. Abdomen curved upwards posteriorly; epiproct small and V-shaped; hypandrium simple and unlobed. Penial complex (fig. 84) normal for the genus.

Length of body, 1.5 mm.

Length of forewing, 2.3 mm.

Length of antennae, 1.7 mm.



FIGS 83-88

*Peripsocus eucalypti* n.sp. Fig. 83: wings (female). Fig. 84: penial complex (male). Fig. 85: lacinia (female). Fig. 86: gonapophyses (female). Fig. 87: subgenital plate (female). Fig. 88: claw (female).

*Habits.* Specimens have been found living under the loose bark of *Eucalyptus viminalis* and *Platanus orientalis*. The insects occur in colonies. The eggs are laid singly under loose bark on the trees and are covered by a dark grey encrustation.

*Locality.* Type specimens collected Ulverstone, N.W. Coast, January 24, 1949, 1 male, 1 female; Ulverstone, N.W. Coast, January 24, 1949; 6 males, 26 females, 54 nymphs; February 4, 1949, 5 females, 24 nymphs; Domain, Hobart, April 7, 1949, 8 males, 18 females, 14 nymphs.

*Type.* Holotype (female) and allotype (male) in the Australian Museum, Sydney.

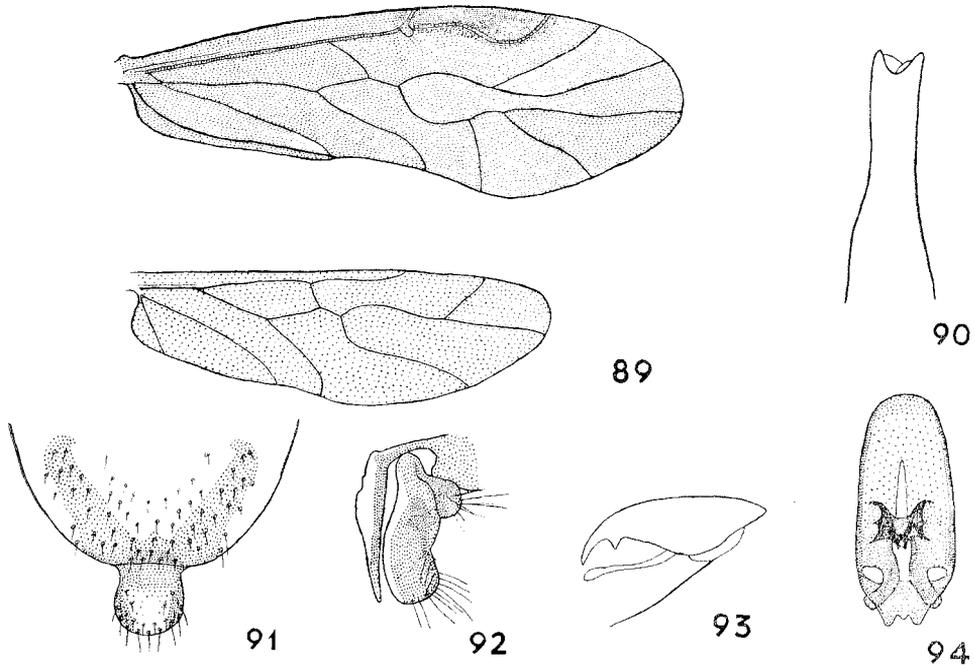
This species differs from other members of the genus in the colouring of the wings, the form of the penial complex and of the subgenital plate.

*Peripsocus macropterus* n.sp.

(Figs 89-94)

FEMALE

*Colour.* Epicranium white with pale brown around the edges of the epicranial plates; clypeus white, the posterior three-quarters marked with pale brown curved lines passing from front to rear; anteclypeus white; labrum dark brown; labium pale brown; ocellary tubercle dark brown; ocelli pale white; first segment of maxillary palps white, second and third segments pale brown, distal segment brown; antennae testaceous.



FIGS 89-94

*Peripsocus macropterus* n.sp. Fig. 89: wings (female). Fig. 90: lacinia (female). Fig. 91: subgenital plate (female). Fig. 92: gonapophyses (female). Fig. 93: claw (female). Fig. 94: penial complex (male).

Prothorax pale brown. Mesothorax: anterior half of antedorsum dark brown, posterior half pale brown; anterior two-thirds of lateral dorsa dark brown, remainder pale brown; scutellum pale brown. Metathorax: antedorsum white; lateral dorsa brown; scutellum very pale brown. Legs: coxa pale brown; trochanter and proximal half of femur white; distal half of femur, the tibia and the first tarsal segment pale brown; second tarsal segment and claws brown.

Wings (fig. 89) semi-transparent and pale brown; proximal veins testaceous, distal ones dark brown. Forewing: pterostigma and distal portion of anterior cell brown; membrane with red to gold iridescence. Hindwing: membrane with golden iridescence.

Abdomen brown with lemon-yellow to white areas on the anterior edges of the segments; dorsal surface with a median brown line along its length; subgenital plate and gonapophyses brown.

*Morphology.* Head sub-rectangular in front view; median epicranial suture distinct; clypeus slightly bulging; ocelli three, close together; eyes small, interspace three times apparent eye diameter; lacinia (fig. 90) with two teeth, the shaft enlarged distally; mandibles normal; maxillary palps long and hairy, end segment slightly oval; antennae short, covered with hairs. Head covered with short hairs.

Prothorax small, hairless and almost hidden. Mesothorax and metathorax hairless. Legs hairy, tibia with two apical spurs; claws (fig. 93) with a large preapical tooth, a thin pulvillus and a basal hair; ratio of tarsal segments of the third leg  $2\frac{1}{2} : 1$ ; first tarsal segment of the third leg with 20 hairs with pectinate bases, other segment without these hairs.

Wings (fig. 89): veins and wing margin with short, sparse hairs; greatest width one-third length. Forewing with the posterior margin waved.

Abdomen large and oval with a few short hairs on each segment; subgenital plate (fig. 91) with a long median lobe; epiproct large and rectangular. Gonapophyses (fig. 92) rather small; external valves very feebly developed.

Length of body, 2.4 mm.

Length of forewing, 3.1-3.2 mm.

Length of antennae, 1.6 mm.

#### MALE

*Colour.* Generally much darker than the female, especially the head, thorax and legs.

*Morphology.* Eyes very large, interspace twice apparent eye diameter; ocellary tubercle prominent; antennae covered with long thick hairs; wings longer than in the female. Abdomen short, with short hairs and curved upwards posteriorly; epiproct rounded. Penial complex (fig. 94): parameres lobed at the apex, the lobes directed outwards and with a chitinised median plate.

Length of body, 2.1 mm.

Length of forewing, 3.5-3.6 mm.

Length of antennae, 2.4 mm.

*Habits.* The insects have been found singly on the leaves of a large number of trees.

*Locality.* Type specimens collected New Town creek, March 13, 1949, 1 male, 1 female; New Town creek, March 3, 1949, 2 males, 4 females; March 13, 1949, 5 males, 4 females, 19 nymphs; Waterworks Rd., Hobart, March 6, 1949, 5 males, 6 females, 12 nymphs; Hobart, May 30, 1949, 3 males, 2 females, 4 nymphs; June 5, 1949, 1 male, 1 female.

*Type.* Holotype (female) and allotype (male) in the Australian Museum, Sydney.

This species differs from other members of the genus in the large size of the wings, in the reduction of the external valves and in the distinctive form of the penial complex.

Genus **Interpsocus** n. gen.

Forewing: *r* and *m* meeting at a point; pterostigma rectangular; the three rami of the media close to each other; veins and margin hairy. Hindwing: *r* and *m* fused for a moderate distance; hairs on the distal anterior margin. Claws without a preapical tooth, with a dilated pulvillus and a basal hair. Parameres of male free apically and joined anteriorly into a large plate; penial bulb reinforced by thick, very dark chitin. Gonapophyses of female complete; ventral valves thick; dorsal valves dilated and without hairs; external valves dilated apically and with a tuft of large, terminal hairs.

The eggs are laid in groups and are covered by a dark encrustation. The web is formed of a few irregular strands which are overlaid with excrement.

The genus is separated from *Peripsocus* by the following: *r* and *m* meeting at a point in the forewing; pterostigma rectangular; form of claws and of subgenital plate of the female.

It differs from *Ectopsocus* in that *r* and *m* are fused in the hindwing and in the form of the male and female gonapophyses.

*Genotype.* Type species *Interpsocus brunneus* n.sp.

**Interpsocus brunneus** n.sp.

(Figs 95-102)

FEMALE

*Colour.* Epicranial plates dark brown; median epicranial suture black; frons and clypeus dark brown; anteclypeus white; labrum dark brown with a pale brown distal border; labium pale brown with a white anterior edge; ocellary tubercle black; ocelli dark reddish-brown; eyes nearly black; all segments of maxillary palps brown; first two segments of antennae dark brown, the remainder, except the two distal testaceous segments, brown.

Prothorax brown. Mesothorax dark brown with a reddish tinge on the anterior surface of the lateral dorsa. Antedorsum of metathorax brown, remainder dark brown. Legs: coxa brown; trochanter and femur testaceous; tibia pale brown with a distinct reddish tinge; tarsus and claws brown.

Wings (fig. 95): membranes with green to gold iridescence. Forewing: membrane pale brown with darker areas at the ends of all the veins and at both ends of the pterostigma; veins brown becoming darker distally. Hindwing: paler than the forewing except for the pale brown costal cell; veins dark brown proximally, becoming pale brown towards the wing apex.

Abdomen: dorsal surface pale brown with dark reddish-brown bands on each segment; ventral surface white; apex brown.

*Morphology.* Head sub-rectangular in front view, semi-circular in side view; clypeus of moderate size, slightly bulging; median epicranial suture distinct; ocelli three, close together; eyes small, interspace three times apparent eye diameter; lacinia (fig. 98) with two unequal teeth, the longer tooth of smaller width; mandibles normal; maxillary palps large and hairy with a slightly enlarged terminal segment; antennae short, covered with short hairs. Labrum and labium with short hairs, the rest of the head with long hairs.

Prothorax and metathorax hairless. Mesothorax covered with long hairs. Legs hairy; tibia with three apical spurs; claws (fig. 100) without a preapical tooth, but with a well developed pulvillus and a basal hair; ratio of tarsal segments of the third leg 2 : 1; first tarsal segment of the third leg with 16 hairs having pectinate bases, second segment without pectinate hairs.

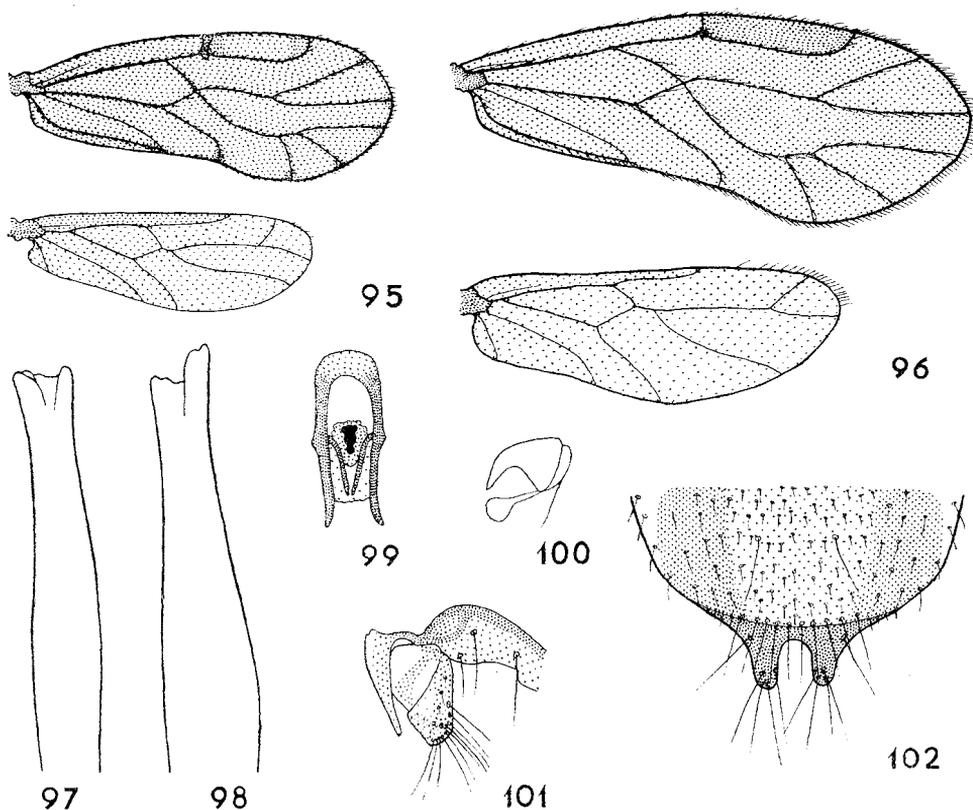
Wings (fig. 95) with membranes minutely punctate. Forewing rounded at the apex and possessing short hairs on the margin and all the veins except *an*; greatest width two-fifths length. Hindwing with short hairs on the margin of cell R3; greatest width one-third length.

Abdomen large and oval; paraprocts rounded; epiproct triangular; subgenital plate (fig. 102) with two lobes each bearing four or five hairs. Gonapophyses (fig. 101): ventral valves well developed; dorsal valves large and bearing apical spines; external valves lobe-like with long hairs.

Length of body, 2.4-2.6 mm.

Length of forewing, 2.3-2.4 mm.

Length of antennae, 1.6 mm.



FIGS 95-102

*Interpsocus brunneus* n.sp. Fig. 95: wings (female). Fig. 96: wings (male). Fig. 97: lacinia (male). Fig. 98: lacinia (female). Fig. 99: penial complex (male). Fig. 100: claw (female). Fig. 101: gonapophyses (female). Fig. 102: subgenital plate (female).

## MALE

*Colour.* Head similar to that of the female except for the darker maxillary palps and antennae. Thorax, legs and abdomen lighter in colour than in the female. Genitalia dark brown.

*Wings* (fig. 96). Forewing pale brown; pterostigma slightly darker; veins dark brown proximally, becoming paler towards the wing apex. Hindwing very pale brown, the costal cell darker; veins paler than those of the forewing.

*Morphology.* Head small; lacinia (fig. 97) with teeth approximately equal in length; eyes large, interspace twice apparent eye diameter; antennae of moderate size and covered with long hairs; ocellary tubercle prominent.

Forewing (fig. 96) with the margin bulged posteriorly; hairs on the veins and margin longer than in the female; greatest width two-fifths length. Hindwing (fig. 96) with hairs on the anterior distal margin; greatest width one-third length.

Abdomen short, slender and curved upwards posteriorly. Penial complex (fig. 99): parameres free apically and joined anteriorly into a large thin plate; penial bulb reinforced by thick, very dark chitin.

Length of body, 1.7-1.9 mm.

Length of forewing, 2.3-3.0 mm.

Length of antennae, 2.1 mm.

*Habits.* The insects were found in groups of from six to eight in rolled *Eucalyptus* spp. bark. Single specimens have been taken from dry *Eucalyptus* leaves.

*Locality.* Type specimens collected Hobart, September 29, 1949, 1 male, 1 female; Swansea, E. Coast, May 28, 1949, 3 males, 1 female, 6 nymphs; Rifle Range, Hobart, June 1, 1949, 2 males; August 15, 1949, 12 females; September 29, 1949, 5 males, 6 females, 3 nymphs.

*Type.* Holotype (female) and allotype (male) in the Australian Museum, Sydney.

Genus *Ectopsocus* MacLachlan, 1894

Forewing: rounded at the apex and without accentuated curving of its posterior border; pterostigma rectangular; *r* and *m* often meeting at a point or fused for a short distance; veins generally straight, the three rami of the media close to one another. Hindwing with *r* and *m* joined by a transverse vein. Claws without preapical teeth, with a well developed pulvillus as an enlarged distal lamina and with a basal hair. Border of epiproct of male with a row of very serrated chitinous spurs; paraprocts chitinised apically. Gonapophyses of female variable, often with some valves reduced or absent.

Eggs deposited in groups, without an encrustation but covered by a web.

*Ectopsocus froggatti* Enderlein, 1906

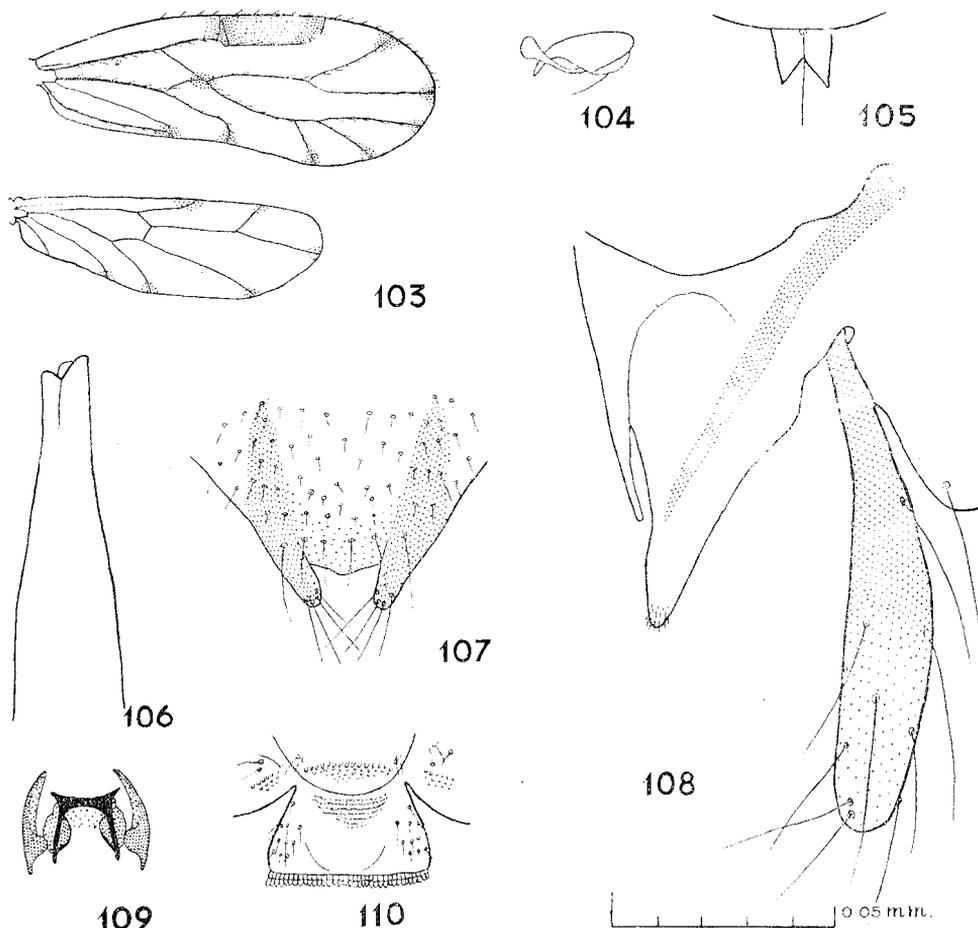
(Figs 103-110)

## FEMALE

*Colour.* Epicranial plates pale brown with brown posterior edges and brown spots near the median epicranial suture and around the eyes; frons pale brown with brown anterior areas; clypeus brown with paler spots near the posterior boundary and with a pale brown anterior edge; anteclypeus pale grey; labrum brown with the anterior edge pale brown; labium pale grey with the distal edge brown; upper third of jaws brown, remainder white; ocellary tubercle pale brown; ocelli pale reddish-brown, inner boundaries dark reddish-brown; lower half of

eyes brown, upper half grey; first three segments of maxillary palps white, distal segment grey, darker towards the apex; antennae with first and the proximal half of the second segment dark brown, distal half of the second segment and the third segment grey, the remaining segments very dark brown.

Prothorax pale brown. Mesothorax: antedorsum dark brown with paler posterior edges; lateral dorsa brown with dark brown median areas; anterior half of scutellum dark brown, posterior half pale brown. Metathorax dark brown with the dividing lines between the segments pale brown. First leg: coxa, trochanter and femur white; tibia pale grey; tarsus grey; claws black. Second and third legs similar except for the greyish-brown proximal half of the coxae.



FIGS 103-110

*Ectopsocus froggatti* Enderlein. Fig. 103: wings (female). Fig. 104: claw (female). Fig. 105: border of paraprot (female). Fig. 106: lacinia (female). Fig. 107: subgenital plate (female). Fig. 108: gonapophyses (female). Fig. 109: apex of penial complex (male). Fig. 110: apex of ninth tergite and epiproct (male).

Wings (fig. 103): membranes with green to gold iridescence. Forewing very pale brown with darker areas at the ends of all the veins and at the junction of *r* and *m*; pterostigma white with dark brown proximal and distal ends; anterior proximal veins pale brown, posterior distal veins dark brown except for the reddish-brown vein *r*<sub>1</sub>. Hindwing paler than the forewing; vein endings with slightly darker areas; veins brown.

Abdomen: dorsal surface white with a dark brown band on each segment; ventral surface white; apex pale brown to white.

The colour of this species varies to a great degree; the most common pigmentation has been found to be the one described above, but some specimens have been found with a much paler overall colour and a few without brown spots on the wings and of a very pale body colour. The latter were found to be more common on leaves while the darker specimens were more common in less exposed situations such as under loose bark.

*Morphology.* Head triangular in front view, oblong in side view; median epicranial suture fine; clypeus prominent, bulging; ocelli three, close together; eyes small and prominent, interspace four times apparent eye diameter; lacinia (fig. 106) with two teeth; mandibles normal; maxillary palps hairy and with the end segment slightly oval; antennae of moderate length, covered with short hairs. Epicranium, frons and clypeus with long hairs, rest of the head with short hairs.

Prothorax small, hairless and nearly hidden. Anterior half of mesothorax with hairs, the rest hairless. Metathorax hairless. Legs hairy; tibia with two apical spurs; claws (fig. 104) without a preapical tooth, with a dilated pulvillus and a basal hair; ratio of tarsal segments of the third leg  $2\frac{1}{2} : 1$ ; first tarsal segment of the third leg having 17 hairs with pectinate bases, second segment without such hairs.

Wings (fig. 103) minutely punctate. Forewing with short hairs on all the veins except *an*, *m* and *r*; anterior apical portion of the margin with short hairs; greatest width one-third length. Hindwing: veins hairless; a few short hairs present on the apex of the wing margin; greatest width one-third length.

Abdomen large and oval; apical border of paraproct (fig. 105) with a pair of sharp tubercles enclosing a hair; subgenital plate (fig. 107) bilobed, each lobe with three or four hairs of length 50-55  $\mu$ . Gonapophyses (fig. 108) reduced; ventral valves small and joined to the eighth sternite; dorsal valves in the form of small membranous lobes with toothed apices; external valves as long lobes with long hairs.

Length of body, 2.0 mm.

Length of forewing, 2.2-2.4 mm.

Length of antennae, 2.2 mm.

#### MALE

*Colour.* Slightly darker than the female. Darker areas on the wings larger. Gonapophyses (fig. 109) brown.

*Morphology.* Head much smaller than in the female; eyes large, interspace two-and-a-half times apparent eye diameter; ocellary tubercle prominent; wings longer than in the female, antennae shorter.

Abdomen short, slender and curved upwards posteriorly; epiproct and the end of the ninth tergite (fig. 110) with spines on their posterior edges. Penial complex (fig. 109): parameres forming a double arc.

Length of body, 1.5 mm.

Length of forewing, 2.6-2.9 mm.

Length of antennae, 2.1 mm.

*Habits.* This species is one of the most common in Tasmania. It occurs all the year round in many situations, e.g., under loose bark, on leaves of a large number of trees and on dry debris. The insects occur singly or occasionally, under loose bark, in groups of from two to four.

*Locality.* N.W. Coast, January-February, 1949, 7 males, 21 females, 37 nymphs; E. Coast, May, 1949, 14 males, 25 females, 33 nymphs; Hobart, March-April-May, 1949, 12 males, 55 females, 21 nymphs; September-October, 1949, 10 males, 28 females, 30 nymphs.

#### Group CAECILIETAE

#### Family CAECILIIDAE

Adults: tarsi with two segments; antennae with 13 segments; claws without a preapical tooth, with a pulvillus which is well developed as a thin lamina and with a basal hair. Veins of the wings with hairs in one or two rows; hairs on the margins always in several rows; areola postica always free; pterostigma not joined to the radial fork and without a transverse vein at its posterior angle. Gonapophyses of female reduced; hypandrium of male simple, parameres enclosed.

Eggs deposited in groups, without an encrustation but covered by a web.

#### Genus *Caecilius* Curtis, 1837

Wings rounded at the apex; margin of the forewing with very long, thick hairs; veins with a single row of hairs; pterostigma with a large posterior angle and often strongly bulged posteriorly; peduncle of the radial fork curved. Claws with large and dilated pulvilli. Gonapophyses of the female very constant; dorsal valves as long, regularly acute lobes, which are often chitinised on the outer surface; external valves reduced to feeble chitinous plates, situated at the base of the dorsal valves and carrying a hair (rarely two or three, the extra ones being shorter). Epiproct and paraprocts of the male ornamented externally; papillae chitinous, those on the epiproct carried on a swelling; chitinous tubercles of the paraprocts often variable.

#### *Caecilius quercus* n.sp.

(Figs 111-117)

#### FEMALE

*Colour.* Head testaceous with a faint yellowish tinge except for the following: epicranium and frons pale yellowish-brown; a brown area present around the posterior edge of the base of the antennae; anterior edges of labrum and labium pale brown; ocellary tubercle brown; ocelli pale brown; eyes brown; maxillary palps with the three proximal segments pale yellow, distal segment brown; first two segments of antennae pale brown, third and fourth testaceous, distal segments brown.

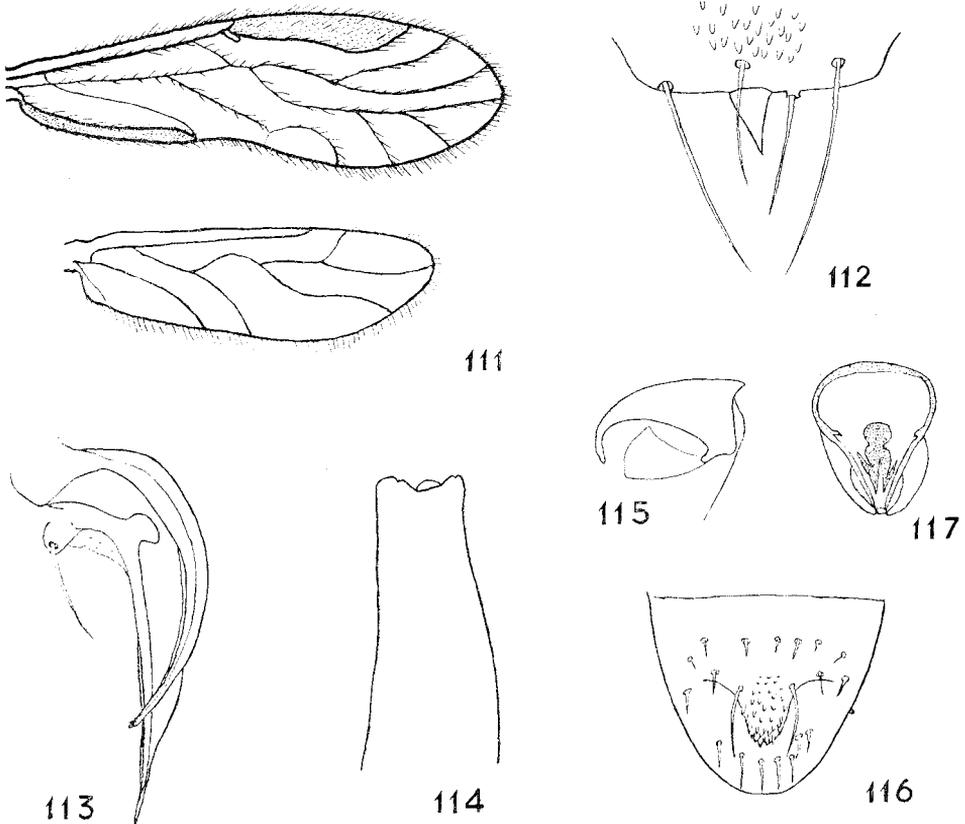
Prothorax pale brown; meso- and meta-thorax yellow with the anterior edge of the antedorsum and the boundaries between the antedorsum and the lateral dorsa brown in both cases. Legs testaceous with the distal extremity of the tibia, the second tarsal segment and the claws dark brown.

Forewing (fig. 111): pterostigma yellowish-brown; membrane pale yellowish-brown; cell Ax brown; veins pale yellow proximally, brown distally; membrane with green to gold iridescence. Hindwing (fig. 111) pale brown; veins pale yellow proximally, pale brown distally; membrane with a golden iridescence.

Abdomen and gonapophyses pale lemon-yellow.

*Morphology.* Head sub-rectangular in front view, semicircular in side view; median epicranial suture very fine; clypeus large and bulging; ocelli three, close together; eyes protruding, interspace two-and-a-half times apparent eye diameter; lacinia (fig. 114) with a blunt head, the teeth not clearly defined; mandibles normal; maxillary palps hairy, the distal segment slightly oval; antennae with thick, short hairs. Head covered with very short hairs.

Prothorax small, hairless and almost hidden; mesothorax well developed, covered with short hairs; metathorax with a few short hairs on the scutellum, otherwise hairless. Legs hairy; tibia with two apical spurs; claws (fig. 115) without a preapical tooth, with a dilated pulvillus and a basal hair; ratio of tarsal segments of the third leg  $2\frac{1}{2} : 1$ ; first tarsal segment of the third leg with 21 hairs having pectinate bases, second segment without these hairs.



Figs 111-117

*Cacilius quercus* n.sp. Fig. 111: wings (female). Fig. 112: border of paraproct (male). Fig. 113: gonapophyses (female). Fig. 114: lacinia (female). Fig. 115: claw (female). Fig. 116: epiproct (male). Fig. 117: penial complex (male).

Forewing (fig. 111) with all the veins except *an* hairy; pterostigma with small hairs on the anterior half and equal to one-third the length of the wing. Hindwing (fig. 111) without hairs on the veins; hairs on the margin from *r1* around the apex of the wing and along the posterior margin. Membranes of both wings minutely punctate; greatest width one-third length.

Abdomen large and oval with short hairs on each segment. Gonapophyses (fig. 113): dorsal valves long and slender; external valves with one basal hair.

Length of body, 2.9 mm.

Length of forewing, 3.1 mm.

Length of antennae, 3.1 mm.

#### MALE

*Colour.* Slightly darker than the female; eyes dark brown; segments of the antennae dark brown; edges of thorax dark brown enclosing a yellow, median, oblong area.

*Morphology.* Antennae and wings longer than in the female, the body much shorter and smaller; eyes large and prominent, interspace equal to the apparent eye diameter.

Abdomen slender, curved upwards posteriorly; epiproct (fig. 116) with tubercles carried on a swelling; border of paraprocts (fig. 112) with a triangular tubercle; hypandrium simple. Penial complex (fig. 117) normal.

Length of body, 2.1 mm.

Length of forewing, 3.3 mm.

Length of antennae, 3.2 mm.

*Habits.* Specimens have been found singly on the underside of leaves of a large number of trees.

The eggs are laid in groups of from six to twelve along the veins of the leaves, only one group being found on each leaf in the majority of cases. The eggs are covered by a circular web when laid on the outside veins and by a semicircular web when laid on the midrib. The eggs are oval in shape, white when first laid, later becoming dark brown on the exposed surface.

Size of eggs, 0.47 x 0.23 mm.

*Locality.* Type specimens collected Hobart, March 1, 1949, 1 male, 1 female; Hobart, March 1, 1949, 7 males, 13 females; March 30, 1949, 7 males, 1 female, 7 nymphs; May 30, 1949, 8 males, 1 female; June 5, 1949, 5 males, 10 females; Bicheno, E. Coast, May 25, 1949, 1 male, 2 nymphs; Swansea, E. Coast, May 26, 1949, 1 female, 4 nymphs; Ulverstone, N.W. Coast, June 18, 1949, 2 males, 1 female.

*Type.* Holotype (female) and allotype (male) in the Australian Museum, Sydney.

This species closely resembles *C. flavistigma* Tillyard, 1923, but differs in the colouring of the eyes, ocellar tubercle and antennae and in that *cu2* is without hairs in the forewing.

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