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THE PHILOTARSIDAE (Psocoptera) OF NEW CALEDONIA[1]

By I. W. B. Thornton[2] and C. N. Smithers[3]

Abstract: The philotarsid fauna (Psocoptera) of New Caledonia, including some coverage for the Loyalty Islands, is reviewed comprehensively for the first time. Of the 39 species treated, all are described as new. Numerous illustrations of the species are presented.

INTRODUCTION

The island of New Caledonia, about 400 km long by about 50 wide, with mountains reaching a height of 1600 m, lies within the Tropic of Capricorn, approximately 1500 km E of Australia and 1700 km NNW of New Zealand. Together with New Guinea, Norfolk and Lord Howe, and New Zealand, it forms part of the "inner melanesian zone" of Glaessner (1950) (see Smithers & Thornton 1974b, in press).

There are no previous records of Psocoptera from New Caledonia or the Loyalty Islands.

As a result of 48 man-days collecting in February 1970 on the main island (La Grande Terre), the Ile des Pins, and two of the Loyalty Islands (Ouvéa and Maré) (see map), 39 species of philotarsids were collected. New Caledonia is thus by far the richest area in the world, so far as philotarsids are concerned. Some 42 living species of the family are now described from the rest of the world, and are currently placed in the genera *Philotarsus* (12 species), *Aaroniella* (11 species), *Haplophallus* (11 species), *Austropsocus* (5 species) and *Zelandopsocus* (3 species).

In the following systematic treatment, an additional 39 species of New Caledonian philotarsids are described under *Haplophallus* (5 species), *Austropsocus* (7 species) and *Zelandopsocus* (27 species). The generic placements are provisional; it seems clear that family revision will be necessary when the New Guinea and New Zealand philotarsids have been worked through, and in particular the genera *Austropsocus* and *Zelandopsocus* will require redefinition.

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We are also grateful to the Australian Research Grants Committee for financial support of a research programme of which this is a part.

SYSTEMATICS

Specimens reviewed in this treatment are deposited in the Australian Museum, Sydney (symbolized AM) and Bernice P. Bishop Museum, Honolulu (BISHOP).

Unless otherwise noted in the material examined citations, the collectors are C. N. Smithers and I. W. B. Thornton. Other collectors' names and their initials are: J. L. Gressitt (JLG), J. D. Holloway (JDH), C. R. Joyce (CRJ), N. L. Krauss (NLK), R. Straatman (RS), F. X. Williams (FXW), and C. M. Yoshimoto (CMY).

Year of collection is abbreviated to two last digits of current century in citations.

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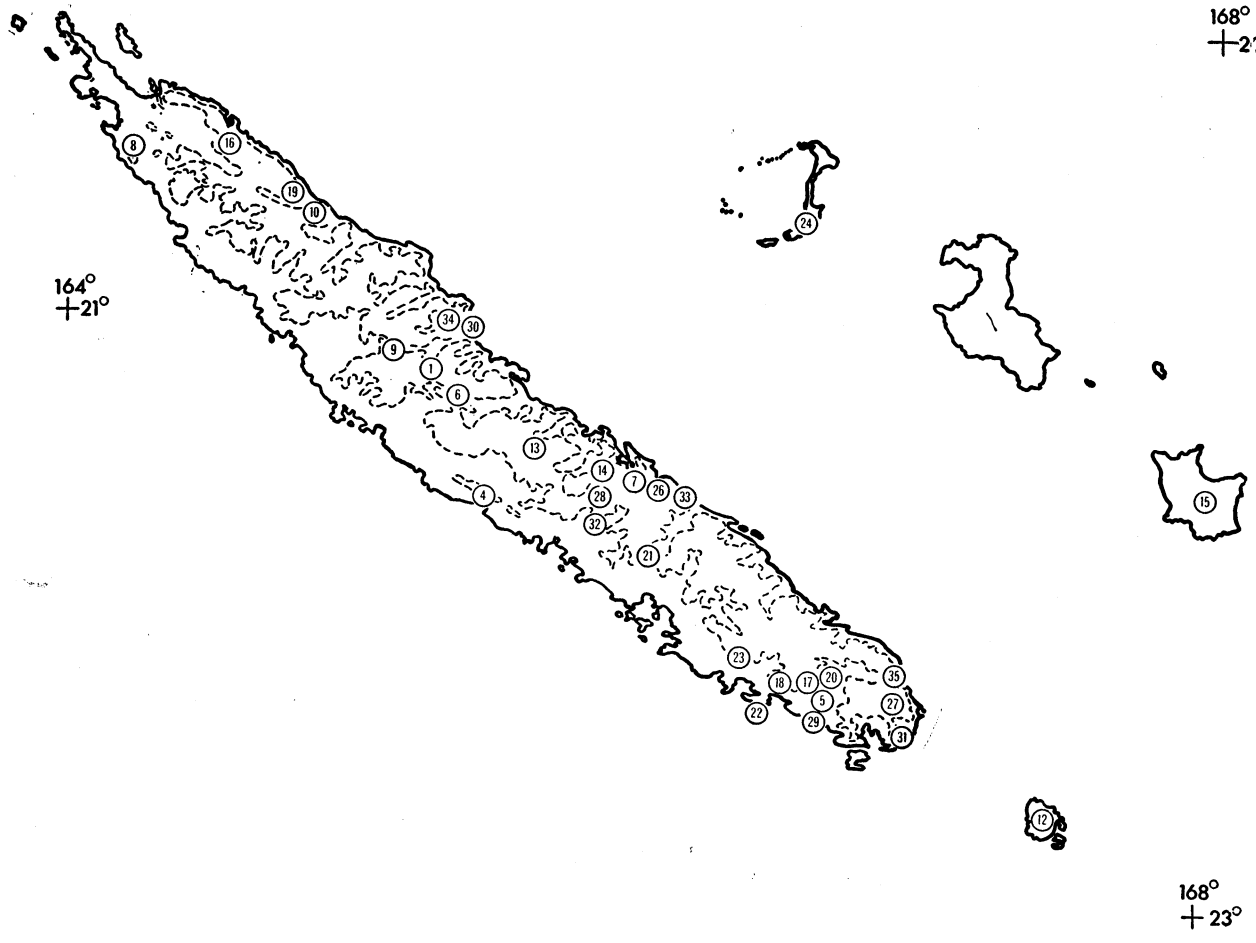


Map of New Caledonia and Loyalty Islands, showing 500 m contour and collecting sites: 1, Aoupinié; 4, Bourail; 5, Col de la Pirogue; 6, Col des Roussettes; 7, Ciu Falls; 8, Dôme de Tiébaghi; 9, Forêt Plat; 10, Hienghène; 12, Ile des Pins; 13, Koh; 14, Le Crouen; 15, Maré; 16, Mt Igambi; 17, Mt Koghi; 18, Mt Mou; 19, Mt Panié; 20, Mt Ponédihi; 21, Nassirah Pass; 22, Nouméa; 23, Ouitchambo; 24, Ouvéa; 26, Petchikara Pass; 27, Plaine des Lacs; 28, Plateau de Dogny; 29, Plum; 30, Ponérihouen; 31, Port Boisé; 32, Sarraméa; 33, Thio Forest; 34, Yahoué Valley; 35. Yaté.

In the descriptions, the following abbreviations are used for certain characters:

B = body length
ct = number of ctenidiobothria on basal hind tarsal segment
F = length of hind femur
f_1 = length of basal flagellar segment
f_2 = length of second flagellar segment
Fw = fore wing length
Hw = hind wing length
I.O.:D = ratio of interocular distance to eye diameter as measured by Badonnel's method (Ball 1943: 27).
rt = ratio of lengths of basal, second and distal hind tarsal segments
t_1 = length of basal hind tarsal segment
t_2 = length of second hind tarsal segment
t_3 = length of distal hind tarsal segment

KEY TO THE PHILOTARSIDAE OF NEW CALEDONIA[3]

1 Hind wing veins setose. 2
Hind wing veins bare. 7

2(1). Phallosome without penial bulb sclerites; hypandrium simple; apical lobe of subgenital plate separated from disc by a suture. 3
Phallosome with discrete penial bulb sclerites; hypandrium lobate; apical lobe of subgenital plate not separated from disc by a suture. ....**Zelandopsocus perilegnes**

3(2). In fore wing, vein *cu*$_2$ bare; in hind wing, vein *cu*$_2$ setose; outer valve of ♀ gonapophyses round, dorsal valve with preapical pointed spine. ....**Haplophallus trepticus**
In fore wing, vein *cu*$_2$ setose; in hind wing, vein *cu*$_1$ bare; outer valve of ♀ gonapophyses oval or triangular, dorsal valve without preapical pointed spine. 4

4(3). Pigment in fore wing largely confined to pterostigma and region of *rs-m* junction, areola postica normal. 5
Fore wing with extensive pigment patches other than in pterostigma and at *rs-m* junction, areola postica distorted. 6

5(4). Fore wing over 3.2 mm long; *rs-m* junction long, part pigmented and part hyaline. ....**Haplophallus acraeus**
Fore wing less than 2.8 mm long; *rs-m* junction wholly dark. ....**Haplophallus virgatus**

6(4). In fore wing, pterostigma shape normal, brown pigment in cell *Cu* of uniform intensity ....**Haplophallus decorus**
In fore wing, pterostigma distorted, apex extending almost to vein *rs*, cell *Cu* with distinct patches of darker brown pigment at proximal angle. ....**Haplophallus novitas**

7(1). Hypandrium usually 5–7 lobed, occasionally 3-lobed, median lobe mushroom-shaped; penial sclerites include a U-shaped ribbon sclerite and a pair of large spinous sclerites; apical lobe of subgenital plate usually with 4 setae; subapical spine of dorsal lobe of ♀ gonapophyses not reaching apex of lobe; ♀ epiproct with dorsal setose flap. 14
Hypandrium not more than 3-lobed, median lobe not mushroom-shaped; no U-shaped or large spinous penial sclerites; apical lobe of subgenital plate with 1 pair of apical setae; subapical spine of dorsal lobe usually projecting beyond apex of lobe, at least reaching apex; ♀ epiproct without dorsal setose flap. 8

3. *Zealandopsocus helvus* is difficult to key at step 15; it has thus been included in the key twice.

8(7). Phallosome with a pair of subtriangular plate-like sclerites, without a pair of narrow pointed rods; apical setae of subgenital plate set on apex of incipient lobes ……9
Phallosome without subtriangular plate-like sclerites, with at least 1 pair of narrow pointed rods; apical setae of subgenital plate set mesial and anterior to apical corners of plate. ……11

9(8). Head and thorax very glossy, brown; legs dark brown; fore wing shining, brown. ……**Austropsocus micans**
Head and thorax not as above; legs pale buff; fore wing pale fuscous. ……10

10(9). Front of head with striking pattern of narrow brown bands. ……**Austropsocus productus**
Front of head uniformly pale yellowish brown. ……**Austropsocus thapsinus**

11(8). Fore wing mostly hyaline, brown pigment only in pterostigma and a discrete patch over basal section of vein *rs*. ……**Austropsocus nitidus**
Fore wing not hyaline, overall pigment light brown or brown, no discrete patches of pigment. ……12

12(11). Head waxy, sculptured; fore wing very broad, short; ……**Austropsocus strabus**
Head highly polished; fore wing of normal proportions. ……13

13(12). Fore wing with basal section of vein *rs* darker than vein *m*+*cu*; some discernible pattern on frons; lateral hypandrial lobes with sclerotised supporting rods. ……**Austropsocus xuthus**
Fore wing with basal section of vein *rs* not darker than vein *m*+*cu*; no discernible pattern on head except on clypeus; lateral hypandrial lobes very small, pointed. ……**Austropsocus baeus**

14(7). Fore wing with extensive brown clouds, veins with obvious short successive dark and hyaline stretches; hypandrium 3-lobed. ……**Zelandopsocus varianus**
Fore wing uniform, or if clouded, veins do not have obvious short successive dark and hyaline stretches; hypandrium with 5 or 7 lobes. ……15

15(14). Fore wing almost uniformly coloured or hyaline, or with distinct patches of darker pigment confined at most to pterostigma, basal section of *rs*, areola postica, and membrane posterior to vein cu_2. ……16
Fore wing generally patterned, i.e. distinct darker areas not confined as above. ……29

16(15). In fore wing, pigment over at least 3/4 of pterostigma very much darker than rest of membrane. ……17
In fore wing, pterostigma lacking such darker brown pigment or this confined to less than 1/2 pterostigma. ……18

17(16). Femora pale buff; 3rd pair of hypandrial lobes low; ♂ paraproct with sclerotised ridge and rugose area. ……**Zelandopsocus translucidus**
Femora dark brown; 3rd pair of hypandrial lobes narrow, fairly long; ♂ paraproct with narrow sclerotised projection. ……**Zelandopsocus perinesus**

18(16). Fore wing very dark brown, hyaline only along posterior margin of cell *Cu* and at basal end of areola postica; head dark brown without discernible pattern; fore wing less than 2.0 mm long. ……**Zelandopsocus humidus**
Fore wing with extensive pale fuscous or hyaline areas, or if fore wing largely brown then longer than 2.5 mm and some head pattern discernible. ……19

19(18). Fore wing largely brown; head brown, but pattern discernible. ……20
Fore wing with extensive pale fuscous or hyaline areas; if head brown, pattern not discernible. ……22

20(19). Areola postica in fore wing noticeably darker than other areas of membrane; ♀ subgenital plate with 4 apical setae. ……21

Areola postica in fore wing not noticeably darker than rest of fore wing membrane; ♀ subgenital plate with 6 apical setae. ····· **Zelandopsocus furfurosus**

21(20). Outer valve of ♀ gonapophyses broad; more mesial pair of hypandrial lobes short, conical. ····· **Zelandopsocus fulvus**

Outer valve of ♀ gonapophyses narrow, ear-shaped; more mesial pair of hypandrial lobes narrow, extending almost as far as median lobe. ····· **Zelandopsocus helvus**

22(19). Head, thorax and legs brown. ····· 23

Head light brown or cream, with or without pattern; thorax and legs (except tarsi) light brown, cream, or pale fuscous. ····· 25

23(22). Fore wing with a small irregular brown cloud in distal angle of anal cell. ····· **Zelandopsocus oropedius**

Fore wing without an irregular brown cloud in distal angle of anal cell. ····· 24

24(23). Fore wing less than 2.0 mm long, areola postica shallow. ····· **Zelandopsocus ochrus**

Fore wing more than 2.5 mm long, areola postica fairly high. ····· **Zelandopsocus diides**

25(22). Basal sectian of *rs* in fore wing darker along a section proximal to vein *r*; areola postica not more than 2.5 × as long as high; basal veins pale, setal sockets obvious as dark spots. ····· 26

Basal section of *rs* in fore wing uniformly pigmented; areola postica shallow, at least 3 × as long as high; basal veins appear as dark as setal sockets. ····· 28

26(25). Fore wing membrane no darker in areola postica and pterostigma than in rest of wing. ····· 27

Areola postica and anterior 1/2 of pterostigma darker than rest of fore wing membrane. ····· **Zelandopsocus gilvus**

27(26). Setae on vein *an* of fore wing not clearly grouped into 2 lines; outer valve of ♀ gonapophyses with short bare posterior lobe; paired lobes of hypandrium not long and narrow. ····· **Zelandopsocus astictus**

Setae on vein *an* of fore wing clearly grouped into 2 lines; outer valve of ♀ gonapophyses with setose posterior lobe; one pair of hypandrial lobes long and narrow. ····· **Zelandopsocus litus**

28(25). Fore wing membrane, including pterostigma and areola postica, hyaline. ····· **Zelandopsocus luridus**

Fore wing membrane, including pterostigma and areola postica, light brown. ····· **Zelandopsocus justus**

29(15). Veins of fore wing with setae sited on distinct brown spots. ····· 30

Veins of fore wing with setae not sited on distinct brown spots. ····· 31

30(29). Fore wing with a broad, interrupted transverse fascia, apical sections of all veins with very wide pigmented borders. ····· **Zelandopsocus poecilus**

Fore wing without a broad, interrupted transverse fascia, apical veins with pigment only at ends. ····· **Zelandopsocus balius**

31(29). Fore wing brown in basal 1/2, hyaline in apical 1/2, pigmented and hyaline areas sharply distinct. ····· **Zelandopsocus hemiptenus**

Fore wing not as above. ····· 32

32(31). Fore wing with brown pigment over anterior 1/4 of wing, including pterostigma, cell R_3, and at least basal section of *rs*; posterior part of wing hyaline or very pale. ····· **Zelandopsocus bifidus**

Fore wing not patterned as above. ····· 33

33(32). Pigment in fore wing confined to pterostigma and a fairly broad interrupted transverse fascia. ····· **Zelandopsocus loxus**

Pigment in fore wing not confined as above. ····34

34(33). Fore wing with distinct hyaline windows in all apical cells. ····35
Fore wing without hyaline windows in cells M_2 and M_3. ····36

35(34). All apical cells of fore wing with rounded hyaline windows adjacent to margin of wing. ····**Zelandopsocus graptus**
Hyaline windows of apical cells of fore wing some distance from margin, the outer windows roughly V-shaped. ···· **Zelandopsocus diargemus**

36(34). Fore wing with areola postica largely hyaline, part of a distinct transverse hyaline band. ···· **Zelandopsocus venustus**
Areola postica in fore wing largely pigmented, not part of a distinct transverse hyaline band. ····37

37(36). Fore wing pigment largely confined to a wide transverse fascia basal to *rs-m* junction and to apical 1/3 of wing; pigment in cell *R* confined to distal 1/4. ····
···· **Zelandopsocus chroicus**
Fore wing with pigment over at least 2/3 of membrane; pigment over at least 1/2 the area of cell *R*. ····38

38(37). In fore wing, apical 1/2 of pterostigma and adjacent area of cell *R* pale, basal 1/2 of pterostigma and adjacent area of cell R_1 dark; an irregular pale band across wing transversely includes basal part of cell R_5. ····**Zelandopsocus marmor**
In fore wing, pterostigma not half pale and half dark; no irregular transverse pale band including part of cell R_5. ····39

39(38). In fore wing an irregular transverse hyaline band across basal cells; an extensive hyaline area each side of apical 1/2 of vein *cu* basal to areola postica; curved section of vein *rs* with setae in 1 row. ····**Zelandopsocus dialecus**
In fore wing no hyaline transverse band in basal 1/3; hyaline area basal to areola postica extending only slightly into cell *M*; curved section of vein *rs* with setae staggered, in 2 rows. ····**Zelandopsocus helvus**

Genus **Haplophallus** Thornton, 1959

The 11 species already assigned to this genus occur in SE Asia (1), Seychelles (1), Tanzania (1), Australia (3), New Zealand (2), Micronesia (2) and Norfolk Island (1).

Of the five species described below, four, *acraeus*, *decorus*, *novitas* and *virgatus*, form a close group which differs from the type-species, *orientalis* (Hong Kong), in the following features: subgenital plate apically with distinct discrete sclerites, hypandrium truncate and incipiently bifid apically, vein cu_2 in fore wing setose, vein cu_1 in hind wing bare. In these features the four New Caledonian species resemble *H. bundoorensis* New, 1971 (Australia), although the hypandrium of *bundoorensis* differs in having unsclerified 'incisions' laterally and basally, as in the other Australian species, *H. capitulatus* Smithers, 1972.

The other New Caledonian species, *trepticus*, has vein cu_2 in the fore wing bare, and setae on vein cu_1 in the hind wing. The subgenital plate is again different from that of the type-species in having distinct apical sclerites, but the hypandrium is much more typical. *H. trepticus* most closely resembles a species from Norfolk Island (Smithers and Thornton 1974a, in press).

All the New Caledonian species and both the Australian species differ from the type species in that the apical segment of the antenna is attenuated at the tip and bears a long stout apical seta. This condition is found in many species of *Aaroniella*. The

Norfolk species of *Haplophallus* is typical in this respect.

Haplophallus trepticus Thornton & Smithers, new species Fig. 1–6

♀ *Coloration* (after 2 years in alcohol): Head cream with brown markings, gena with small brown patch at anterior corner. Eyes black; ocelli pale, ringed with black. Maxillary palp pale brown, apical segment darker, antenna brown. Mesothoracic lobes dark brown, sutures lined cream, median stripe on antedorsum cream. Legs cream, banded brown. Fore wing (Fig. 1) with brown clouds in apical cells, hind wing with faint fuscous areas in anal angle. Abdominal terga: 2 basal segments largely white, terga 3 to 5 largely brown, 6 to 9 largely white with granular brown

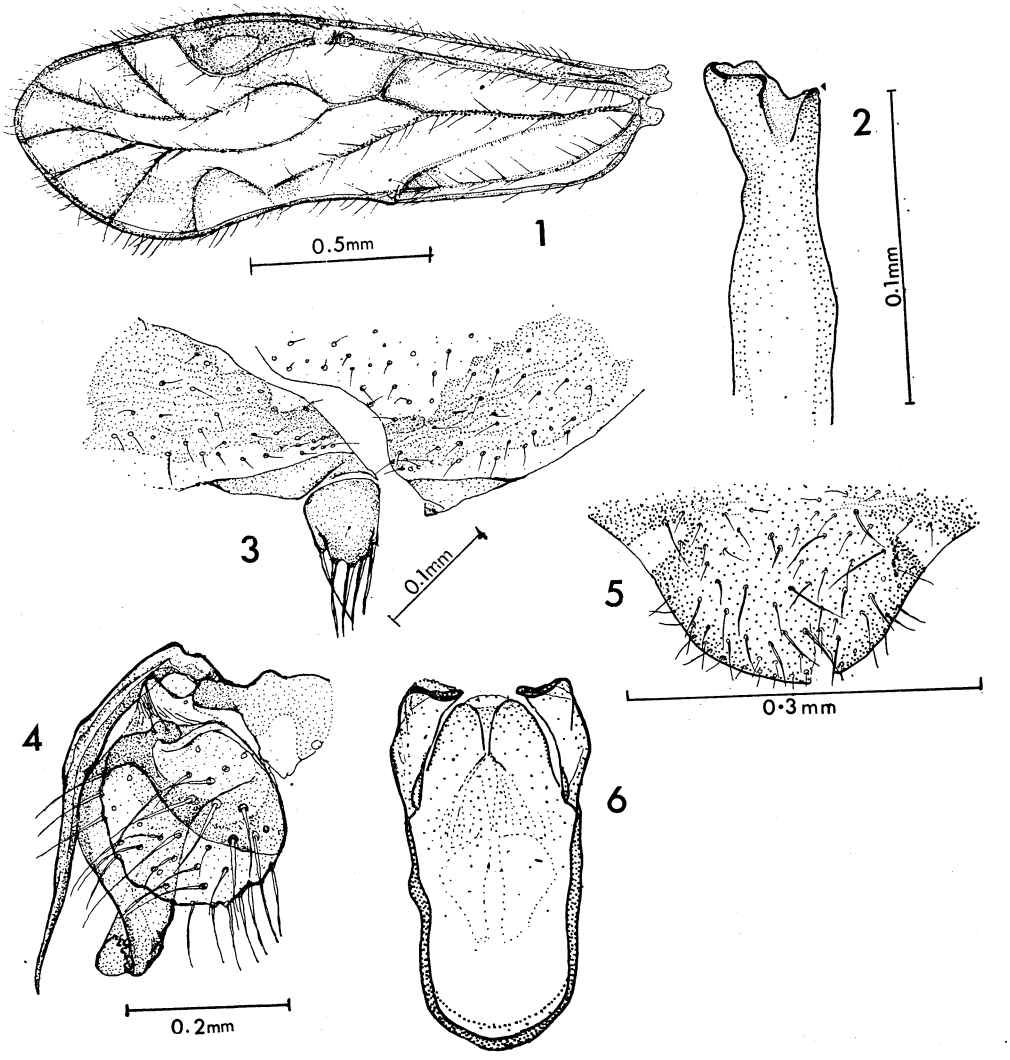


Fig. 1–6. *Haplophallus trepticus* n.sp. ♀: 1, fore wing; 3, subgenital plate; 4, gonapophyses. ♂: 2, lacinial apex; 5, hypandrium; 6, phallosome. Figures 3 and 6 to common scale.

pigment on anterior and posterior margins and 2 dark longitudinal streaks dorsally. Sterna uniformly brown.

Morphology. B = 2.50 mm. I.O. : D = 2.3. Median epicranial suture distinct. Apical antennal segment with single stout apical seta. $f_1 = 0.25$ mm. $f_2 = 0.17$ mm. $f_1 : f_2 = 1.50$. Anterior ocellus smaller than lateral ocelli. Lacinial apex as in Fig. 2. F = 0.27 mm. T = 0.64 mm. $t_1 = 0.25$ mm. $t_2 = 0.03$ mm. $t_3 = 0.05$ mm. rt = 6.7 : 1.0 : 1.3. ct = 16. Fw = 2.03 mm. Vein *rs* in fore wing quite long, cu_2 bare. Hw = 1.56 mm. Setae on hind wing veins: r_1 — 7, rs—0, r_{2+3}—0, r_{4+5} — 15, m—12, cu_1—7. Epiproct rounded apically, scattered setae. Paraproct simple, field of 20 trichobothria, 2 not in rosette sockets. Subgenital plate as in Fig. 3; with 3 or 5 apical setae, 2 distinct apical sclerites bare. Gonapophyses (Fig. 4); outer valve almost circular, dorsal valve with subapical lobe blunt, finely rugose.

♂. *Coloration* (after 2 years in alcohol): As ♀, but markings generally darker and pterostigma sometimes completely filled with pigment.

Morphology: B = 2.90 mm. Antennae thicker, eyes a little larger than in ♀, I.O.:D = 1.8. $f_1 = 0.32$ mm. $f_2 = 0.20$ mm. $f_1 : f_2 = 1.55$ F = 0.34 mm. T = 0.69 mm. $t_1 = 0.24$ mm. $t_2 = 0.03$ mm. $t_3 = 0.04$ mm. rt = 6.8 : 1.0 : 1.3 ct = 15 Fw = 2.00 mm. Fore wing morphology as ♀. Hw = 1.51 mm. Setae on hind wing veins: r_1—9, rs—1, r_{2+3}—0, r_{4+5}—18, m—16, cu_1—5. Epiproct rounded apically, a distinct V-shaped pattern of sclerotization dorsally, setose near apical margin. Paraproct with circular field of 20 trichobothria, 2 not in rosette sockets, hind margin ot paraproct thickened. Hypandrium (Fig. 5) simple. Phallosome (Fig. 6) simple, no distinct penial bulb sclerites, outer parameres blunt and wide apically.

Holotype ♀ (AM), NEW CALEDONIA: Naouitien, near Sarraméa, 130 m, 27.II.70; allotype ♂, same data; paratype ♀, Mt Koghi, 10.II.70; paratype ♂, Nouméa, 28.II.60 (JLG); paratype ♂, W side Petchikara Pass, 16.II.70, 600 m. Other specimens: Thio Forest, 11.II.70; E side Petchikara Pass, 16.II.70, 650 m; Ciu Falls, 17.II.70; Hienghène, 20.II.70; Nouméa, 5-50 m, 28.II.60 (JLG); Plaine des Lacs, swept from *Baeckea cricoides*, maquis E of Pic du Pin, 8.VIII.71 (JDH). Offshore islands: Ile des Pins, 4.III.70; I. of Jouaé, N of New Caledonia, 19.X.58 (CRJ). LOYALTY ISLANDS: Ouvéa, N of St. Joseph, 2.III.70.

Distribution elsewhere: material has been examined from FIJI (Viti Levu, up to 1200 m; Lau Group), and SAMOA (Tutuila, up to 550 m).

Holotype, allotype and paratypes in Australian Museum, paratype ♂ in B. P. Bishop Museum.

Like a species to be described from Norfolk Island (Smithers & Thornton 1974a, in press), this species differs from the species of *Haplophallus* described so far, in that the ♀ subgenital plate has distinct apical and subapical sclerotized bare areas, the outer valve of the ♀ gonapophyses is roughly circular, and the dorsal valve is bluntly pointed with a distinct subapical lobe. The two species are closely similar, and the Norfolk species may have diverged in isolation on the small island of Norfolk.

H. trepticus can be distinguished from the Norfolk species in fore wing pattern (having brown clouds apically), outer valve of ♀ gonapophyses more nearly circular, dorsal valve with subapical projection blunt and finely rugose. The Samoan and Fijian specimens fall within the range of variation of characters observed in the New Caledonia specimens.

This is the only species of *Haplophallus* from New Caledonia that belongs to the widespread section of the genus with cu_2 in the fore wing bare, and cu_1 in the hind wing setose.

Haplophallus acraeus Thornton & Smithers, new species Fig. 7–11

♂. *Coloration* (after *c.* 9 years in alcohol): Dark pigment patches along each side of epicranial suture, mesial to eyes, either side of frons median stirrup-mark, and across anterior part of post-clypeus. Antennae brown. Thoracic terga dark brown, cream along sutures, pleura dark brown. Fore wing with pigment as in Fig. 7, some sections of veins almost invisible. Hind wing vein pigment similarly not uniform (Fig. 8). Legs wholly brown. Abdomen colour not discernible.

Morphology: B not available. I.O.: D = 1.4 Apical antennal segment lost. f_1 = 0.65 mm. f_2 = 0.40 mm. f_1:f_2 = 1.63 Eyes very large. F = 0.60 mm. T = 0.88 mm. t_1 = 0.20 mm. t_2 = 0.03 mm. t_3 = 0.08 mm. rt = 6.6 : 1.0 : 2.6 ct = 0 Fw = 3.50 mm. Vein cu_2 in fore wing with 7 setae. Hw = 2.60 mm. Setae on hind wing veins: r_1—13, rs—2, r_{2+3}—1, r_{4+5}—20, m—26, cu_1—0. Epiproct (Fig.

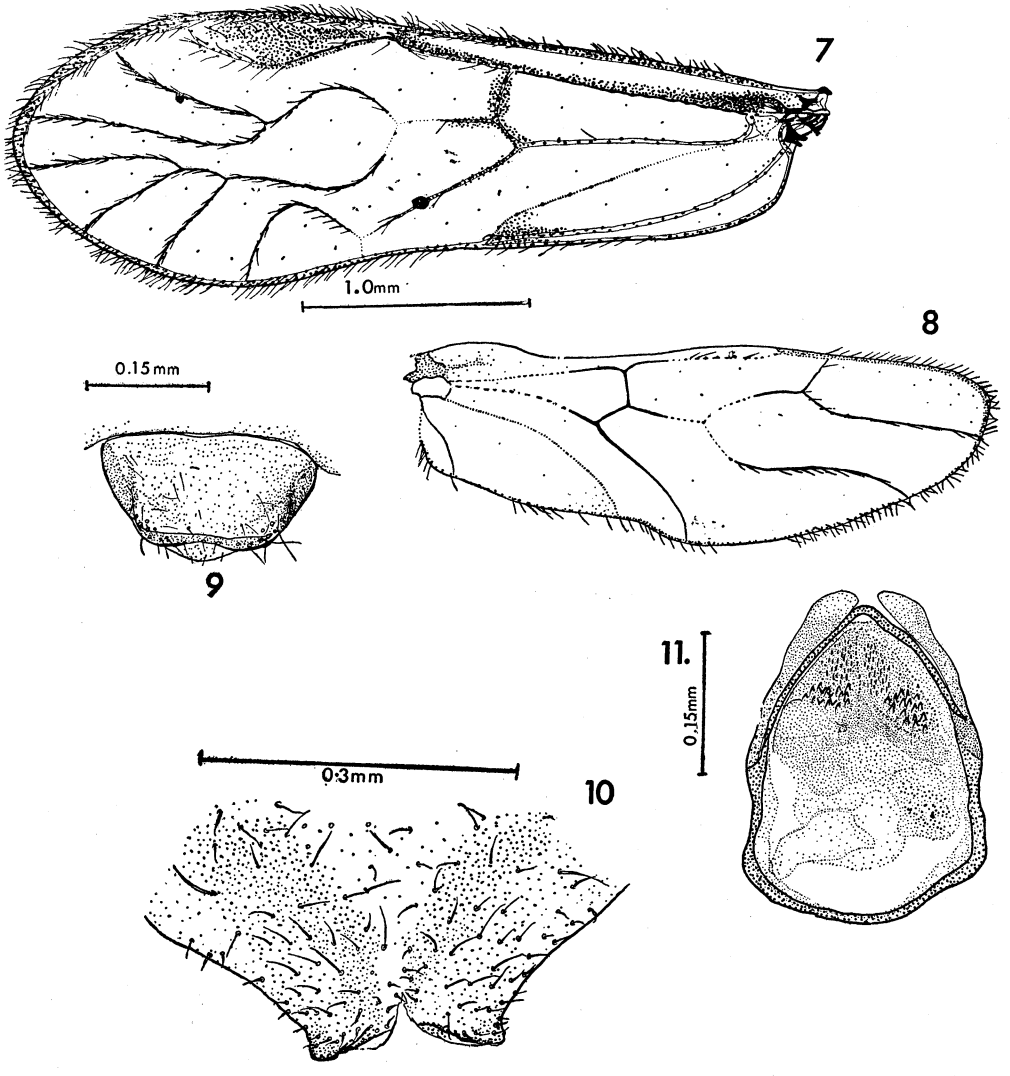


Fig. 7–11. *Haplophallus acraeus* n.sp. ♂: 7, fore wing; 8, hind wing; 9, epiproct; 10, hypandrium; 11, phallosome.

9) rectangular, paraproct with a circular field of 43 trichobothria. Hypandrium (Fig. 10) truncate, very slightly emarginate apically. Phallosome (Fig. 11) angular basally, internally with a pair of sac-like objects covered with faintly sclerotized spines.

♀. Unknown.

Holotype ♂ (BISHOP 10,177), NEW CALEDONIA: Mt Koghi, 600 m, 30.XI.63 (RS). Holotype in B. P. Bishop Museum.

This large species is very similar to *H. virgatus*. It differs in size, in details of wing pattern, and in lacking the white pleural band on the thorax.

Haplophallus decorus Thornton & Smithers, new species Fig. 12–16

♀. *Coloration* (after *c.* 2 years in alcohol): Head damaged, but post-clypeus evidently with

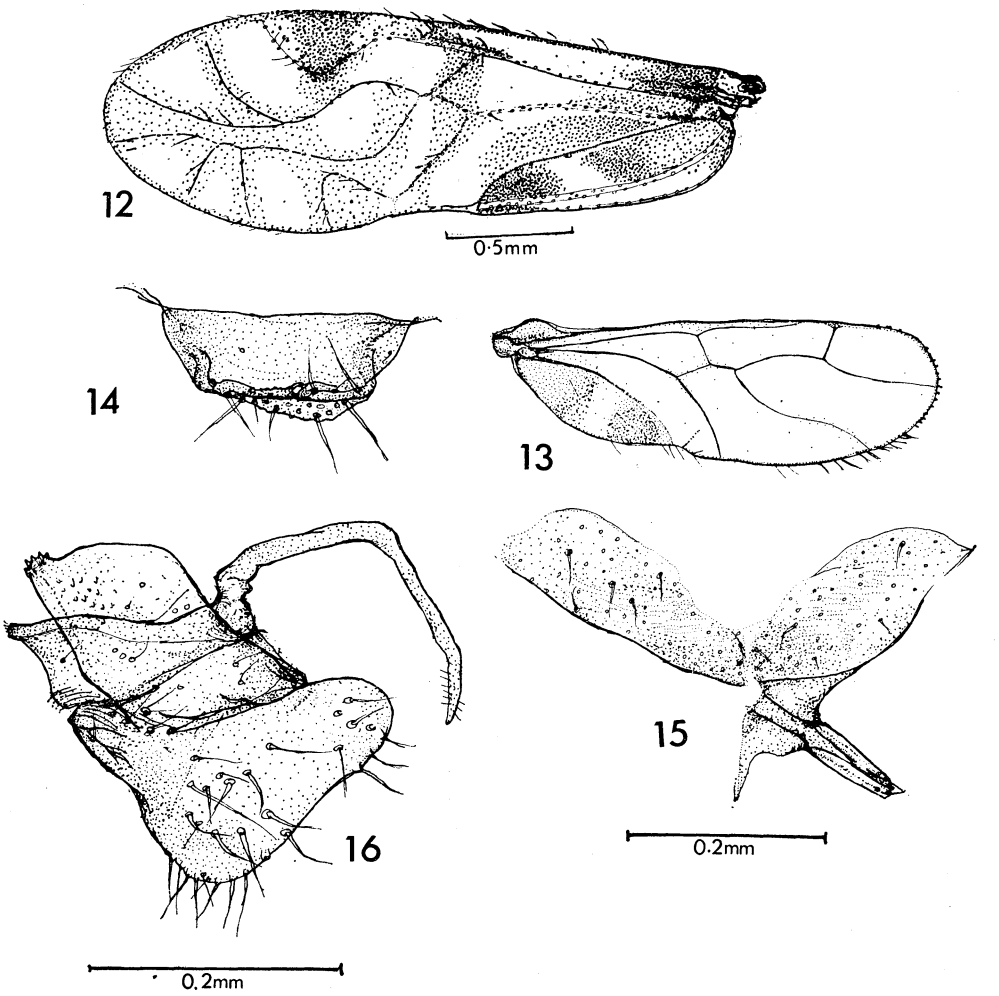


Fig. 12–16. *Haplophallus decorus* n.sp. ♀: 12, fore wing; 13, hind wing; 14, epiproct; 15, subgenital plate; 16, gonapophyses. Figures 12 and 13 to common scale; figures 14 and 15 to common scale.

darker pigment laterally, head patterned, antennae light brown. Fore and hind wings (Fig. 12 and 13) with distinct pattern of dark brown and brown markings. Thoracic terga dark brown, pleura white, with a narrow grey-brown pleural stripe, legs pale except coxae dark brown basally.

Morphology: B = 2.30 mm. I.O.:D = 3.2 Apical antennal segment lost. f_1 = 0.36 mm. f_2 = 0.22 mm. f_1:f_2 = 1.64 F = 0.59 mm. T = 1.04 mm. t_1 = 0.34 mm. t_2 = 0.04 mm. t_3 = 0.08 mm. rt = 8.5 : 1.0 : 2.0 ct = 16 Fw = 2.55 mm. Pterostigma very strongly arched at vertex, areola postica with obtuse distal angle, vein *cu* with 3 setae. Hw = 1.89 mm. Setae on hind wing veins: r_1—5, *rs*—0, r_{2+3}—3, r_{4+5}—7, m_1—3, cu_1—0. Epiproct (Fig. 14) rectangular, paraproct with oval field of 21 trichobothria. Subgenital plate (Fig. 15) with long, narrow apical lobe, bearing 5 apical setae. Gonapophyses (Fig. 16) with triangular outer valve, subrectangular dorsal valve without prominent subapical lobe.

♂. Unknown.

Holotype ♀ (AM), NEW CALEDONIA: Ouitchambo, riverside vegetation, beating, 14.II.70.

Holotype in Australian Museum.

This species is distinctive in colour pattern, venation and structure of subgenital plate, and in these features bears a general resemblance to *H. novitas*. The two species can be distinguished on details of the fore wing pattern.

Haplophallus novitas Thornton & Smithers, new species Fig. 17–23

♀. Coloration (after *c.* 2 years in alcohol): As *H. decorus*, apart from wing pattern (Fig. 17 and 18).

Morphology: B = 2.50 mm. I.O.:D = 3.2. Apical antennal segment with single stout apical seta. f_1 = 0.34 mm. f_2 = 0.22 mm. f_1:f_2 = 1.55. Lacinial apex as in Fig. 19. F = 0.59 mm. T = 1.0⁰ mm. t_1 = 0.36 mm. t_2 = 0.04 mm. t_3 = 0.05 mm. rt = 9.0 : 1.0 : 1.3 ct = 18. Fore wing with pterostigmal loop very large, almost touching *rs*, areola postica very distorted, vein cu_2 with 2 setae. Fw = 2.76 mm. Setae on hind wing veins: r_1 — 8, *rs* — 0, r_{2+3} — 2, r_{4+5} — 10, *m* — 6, cu_1 — 0. Hw = 2.04 mm. Epiproct (Fig. 20) rounded, paraproct (Fig. 21) with field of 22 trichobothria. Subgenital plate (Fig. 22) with 2 apical setae on distinct apical sclerite, which is inserted into a bare subapical sclerite. Gonapophyses (Fig. 23) with outer valve rounded-triangular, dorsal valve subrectangular.

♂. Unknown.

Holotype ♀ (AM), NEW CALEDONIA: Mt Koghi, general beating, 10.II.70.

Holotype in Australian Museum.

See under *H. decorus*; the two species are clearly very closely related.

Haplophallus virgatus Thornton & Smithers, new species Fig. 24–31

♀. *Coloration* (after *c.* 2 years in alcohol): Head pale cream, with a wide continuous greyish band either side of dark brown epicranial suture and mesial to eye, a narrow dark brown line lateral to each of the median bands from about middle of vertex to posterior ocellus, these narrow bands thus delimiting the pattern from the ground colour, a small dark brown square of pigment at anterior end of each supraorbital band. Ocelli brown, eyes black. A narrow dark brown line each side from anterior ocellus along frons-vertex suture, a fainter, grey-brown U-shaped mark in middle of vertex, arms of U pointing anteriorly. Fairly wide dark brown band from antennal socket to eye, and continuing posterior to eye and along posterior edge of head. Post-clypeus dark brown, with wide white median band, labrum dark brown. Genae unpatterned. Antennae pale brown, darkening on apical 2/3. Thoracic terga brown, cream along sutures, pleura with a dorsal dark grey brown band and a more ventral, wider dark grey brown band separated by a broad white band, all 3 lateral bands running along side of thorax and over cervicum to head,

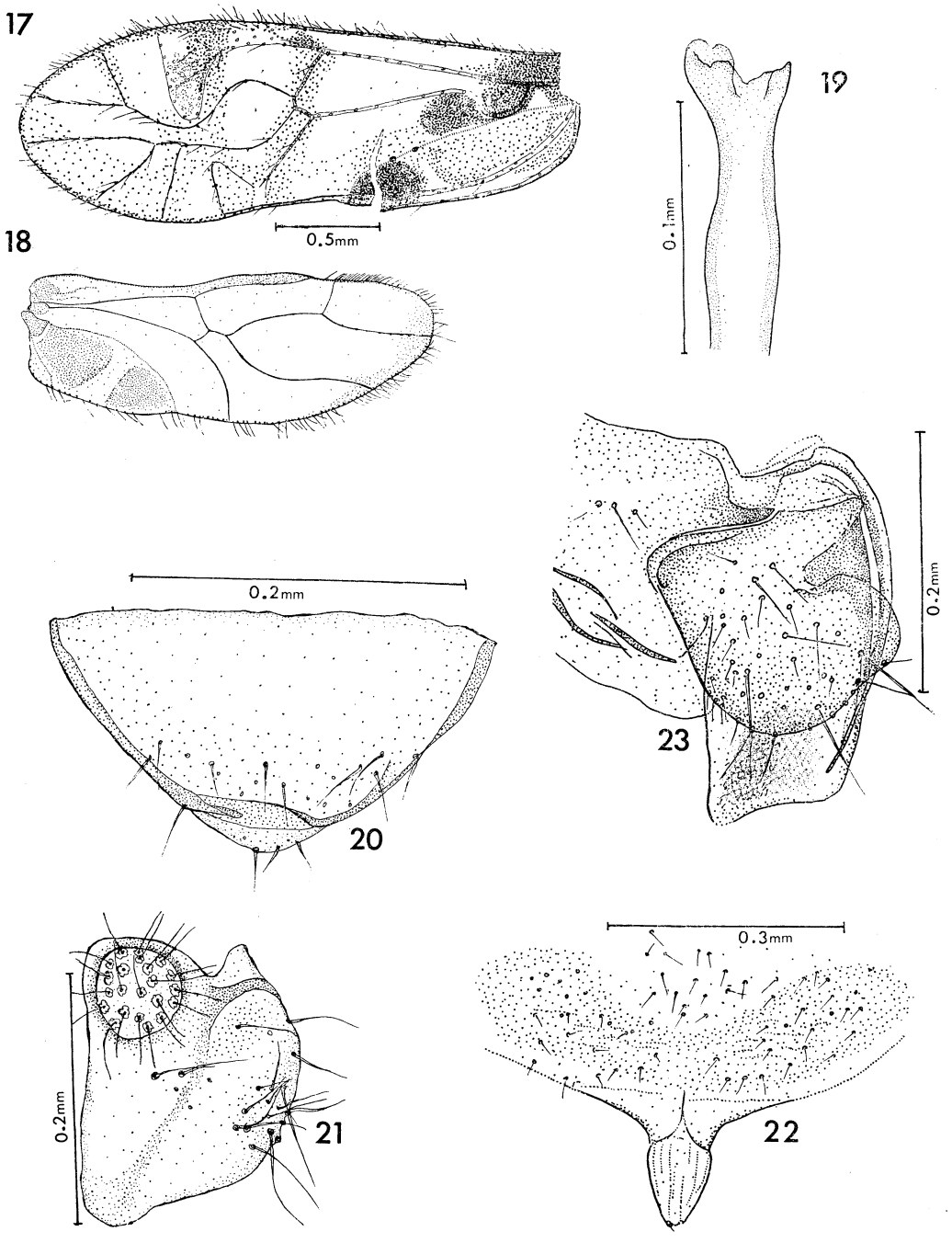


Fig. 17–23. *Haplophallus novitas* n.sp. ♀: 17, fore wing; 18, hind wing; 19, lacinial apex; 20, epiproct; 21, paraproct; 22, subgenital plate; 23, gonapophyses. Figures 17 and 18 to common scale.

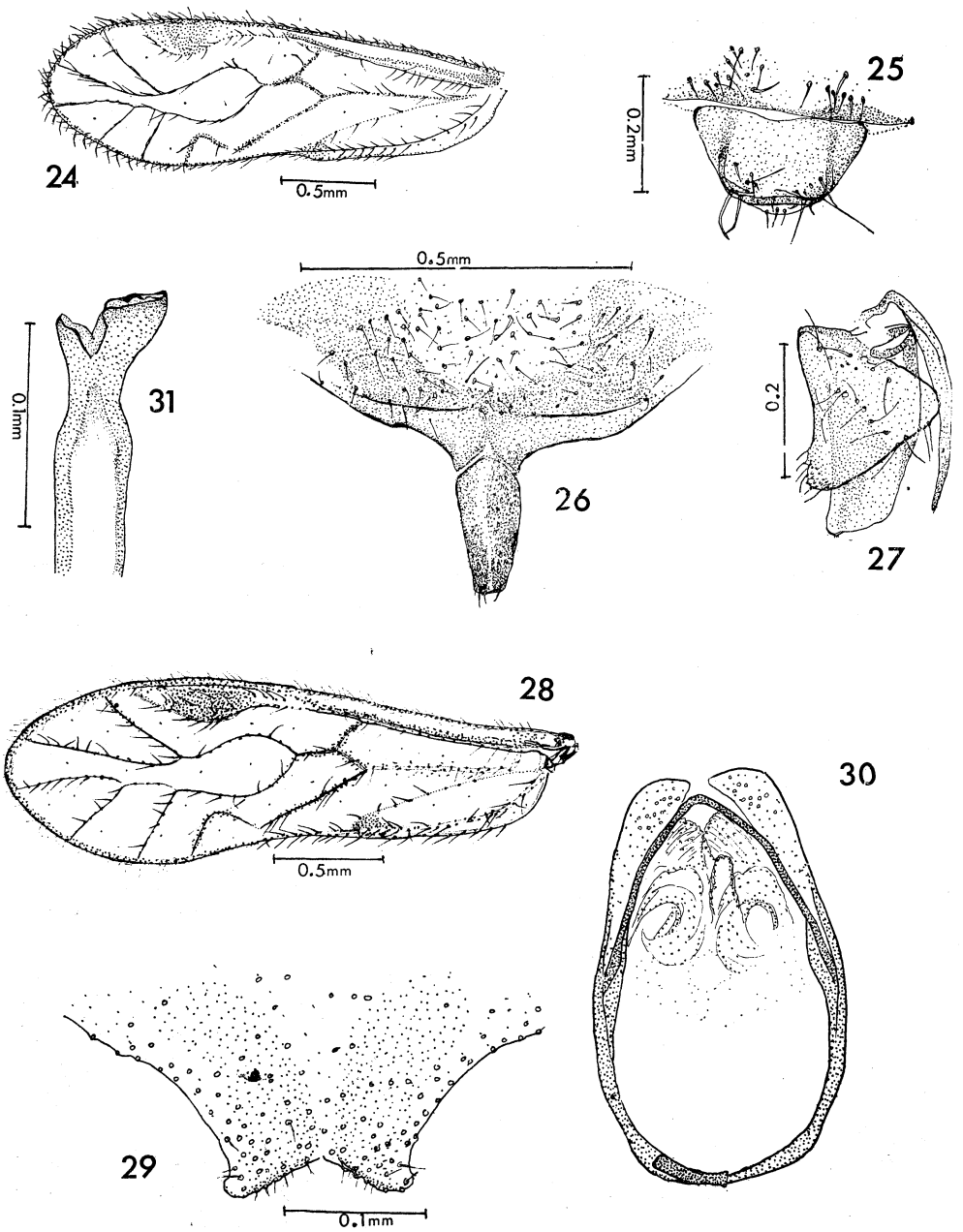


Fig. 24–31. *Haplophallus virgatus* n.sp. ♀: 24, fore wing; 25, epiproct; 26, subgenital plate; 27, gonapophyses; 31, lacinial apex. ♂: 28, fore wing; 29, hypandrium; 30, phallosome. Figures 29 and 30 to common scale.

the lower band including the coxae. Legs: apical half of coxa and femur very pale cream, tibia and tarsus light brown. Fore wing (Fig. 24) with a pattern similar to that of *H. acraeus*; hind wing hyaline. Abdomen pale cream with flecks of grey in a very disrupted annulated pattern, 9th tergite with brown anterior border and median longitudinal brown line, apical sclerites brown.

Morphology: B = 2.70 mm. I.O.:D = 4.0. Anterior ocellus much smaller than lateral ocelli. Apical antennal segment with single stout apical seta. $f_1 = 0.31$ mm. $f_2 = 0.19$ mm. $f_1:f_2 = 1.64$. Lacinial apex as in Fig. 31. F = 0.53 mm. T = 0.96 mm. $t_1 = 0.31$ mm. $t_2 = 0.06$ mm. $t_3 = 0.07$ mm. rt = 5.5 : 1.0 : 1.1 ct = 16 Fw = 2.32 mm. Areola postica very small, vein cu_2 with 5 setae. Hw = 1.75 mm. Setae on hind wing veins: r_1-3, $rs-1$, $r_{2+3}-1$, $r_{4+5}-11$, $m-7$, cu_1-0. Epiproct (Fig. 25) with rectangular sclerotized rim, circular field of 19 trichobothria on paraproct. Subgential plate (Fig. 26) similar to that of *H. novitas*, with 4 apical setae. Gonapophyses (Fig. 27) with rounded-triangular outer valve, narrow subrectangular dorsal valve.

♂. *Coloration* (after *c.* 2 years in alcohol): As ♀.

Morphology: B = 2.50 mm. I.O.:D = 2.3 Antennae thicker, eyes much larger than in female. $f_1 = 0.43$ mm. $f_2 = 0.26$ mm. $f_1:f_2 = 1.62$. F = 0.49 mm. T = 0.96 mm. $t_1 = 0.32$ mm. $t_2 = 0.04$ mm. $t_3 = 0.05$ mm. rt = 6.9 : 1.0 : 1.2 ct = 16. Fore wing larger than that of ♀ Fw = 2.60 mm. Venation as in Fig. 28, vein cu_2 with 10 setae. Hw = 1.90 mm. Setae on hind wing veins: r_1-13, $rs-13$, $r_{2+3}-2$, $r_{4+5}-17$, $m-21$, cu_1-0. Epiproct rectangular, paraproct with oval field of 36 trichobothria. Hypandrium (Fig. 29) and phallosome (Fig. 30) very like those of *H. acraeus* (penis frame broken and overlapping basally).

Holotype ♀ (AM), NEW CALEDONIA: W side Petchikara Pass, 500 m, 16.II.70; allotype ♂, same data as holotype; paratypes 4♂♂, 5♀♀, W side Petchikara Pass, 500–600 m, 16.II.70; 1♀, E side Petchikara Pass, 650 m, 16.II.70; 1♂, 1♀, Naouitien, near Sarraméa, 130 m, 27.II.70.

Holotype, allotype and paratypes in Australian Museum.

This species exhibits clear sex dimorphism, the ♀♀ showing incipient brachyptery. It is clearly closely related to the much larger *H. acraeus*, and can be distinguished by size, details of wing pattern, and by the white pleural stripe.

Genus **Austropsocus** Smithers, 1962

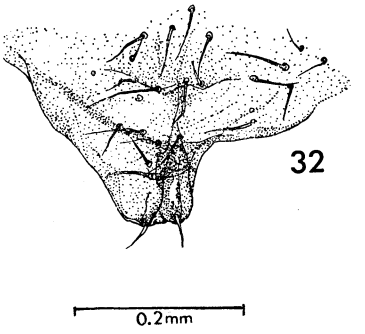
This genus was erected for the micropterous species *insularis*, from Macquarie and Campbell islands (Smithers 1962, 1964). The ♂ hypandrium was not figured, nor was the subgenital plate.

In 1969, Smithers described the New Zealand species *delli*, *salmoni*, *hollowayae* and *townsendi*, all from ♀♀, and assigned them to *Austropsocus* on the basis of micropteryand ♀ characters only. The ♂ of *hollowayae* has now been discovered (Dr S. K. Kong, *in litt.*); it is macropterous, and was described by Tillyard as *Caecilius apicipunctatus* (Tillyard 1923, Smithers 1969). Dr Wong has definitely associated the sexes by laboratory breeding.

We have re-examined paratype material of the type species, *insularis*, in particular the subgenital plate (Fig. 32) and hypandrium (Fig. 33). The hypandrium of the *apicipunctatus* ♂ (the name *hollowayae* falls as a synonym) is of the same type as that of *insularis* — simple, and incipiently trilobed. The subgenital plate has an apical lobe bearing two setae.

Thus *apicipunctatus* can be assigned to *Austropsocus*, and brachyptery can no longer stand as a generic character.

Seven New Caledonian species have provisionally been placed in *Austropsocus*. In the five of which ♂♂ are known, the hypandrium is simple and trilobed or incipiently so, and in the five of which ♀♀ are known the subgenital plate apical lobe bears a pair of setae, and the dorsal valve of the gonapophyses bears a very long subapical spine. Three of the species of which ♀♀ are known have the apical subgenital plate lobe emarginate, as in *apicipunctatus*(=*hollowayae*), and two have the apical lobe more similar to that of *insularis*. In all species the hind wing veins are bare. The complete lack of setae on the veins of the hind wing, and the absence of a preapical tooth on the claw are evidently features separating the *Austropsocus-Zelandopsocus* line from the other philotarsid genera.



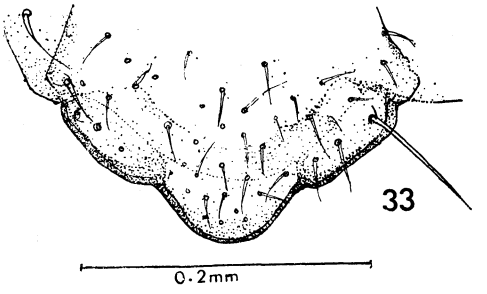


Fig. 32–33. *Austropsocus insularis* ♀: 32, subgenital plate. ♂: 33, hypandrium.

Austropsocus baeus Thornton & Smithers, new species Fig. 34–37

♂. *Coloration* (freshly killed, in alcohol): Head, thorax and legs dark brown. Each side of posterior margin of clypeus a lighter brown area, dark pigment of clypeus thus appears to be pointed posteriorly. Fore wing (Fig. 34) brown, hind wing light brown. Abdomen cream, apical sclerites brown.

Morphology: B = 1.42 mm. I.O. : D = 4.0 f_1 = 0.31 mm. f_2 = 0.20 mm. f_1:f_2 = 1.55 F = 0.28 mm. T = 0.45 mm. t_1 = 0.17 mm. t_2 = 0.02 mm t_3 = 0.03 mm. rt = 8.5 : 1.0 : 1.5 ct = 17 Fw = 1.47 mm. Hw = 1.11 mm. Epiproct and paraproct not remarkable (Fig. 35), an oval field of 13 trichobothria on paraproct. Hypandrium (Fig. 36) 3-lobed, the lateral lobes very small, pointed, apical area bare, sculptured in lines. Phallosome (Fig. 37) with a pair of plate-like sclerites, a pair of sharp hooks, and a pair of L-shaped sclerites.

♀. Unknown.

Holotype ♂ (AM), NEW CALEDONIA: Mt Koghi, general beating, 10.II.70. Holotype in Australian Museum.

Very similar to *A. xuthus*, *baeus* differs in a number of respects (see under *A. xuthus*).

Austropsocus micans Thornton & Smithers, new species Fig. 38–41

♀. *Coloration* (after one month in alcohol): Whole insect dark brown, except eyes and ocellar interval black, abdomen cream with extensive grey-brown granulations. Fore wing (Fig. 38) brown, hind wing light brown.

Morphology: Head, thorax and wings shining. B = 1.60 mm. I.O.:D = 2.3 f_1 = 0.22 mm. f_2 = 0.15 mm. f_1:f_2 = 1.46 F = 0.31 mm. T = 0.51 mm. t_1 = 0.15 mm. t_2 = 0.03 mm. t_3 = 0.04 mm. rt = 5.0 : 1.0 :

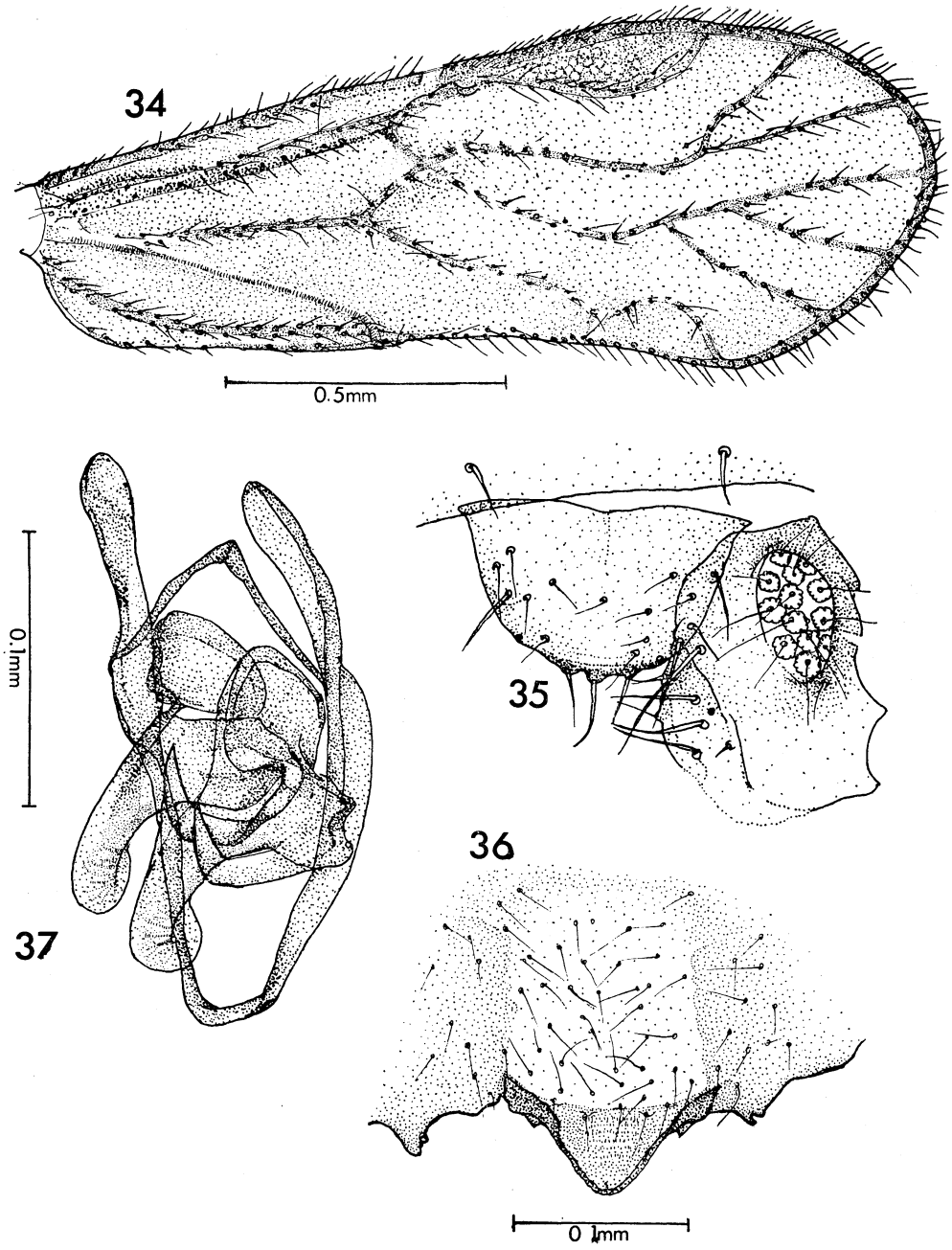


Fig. 34–37. *Austropsocus baeus* n.sp. ♂: 34; fore wing; 35, epiproct and paraproct; 36, hypandrium; 37, phallosome. Figures 35 and 37 to common scale.

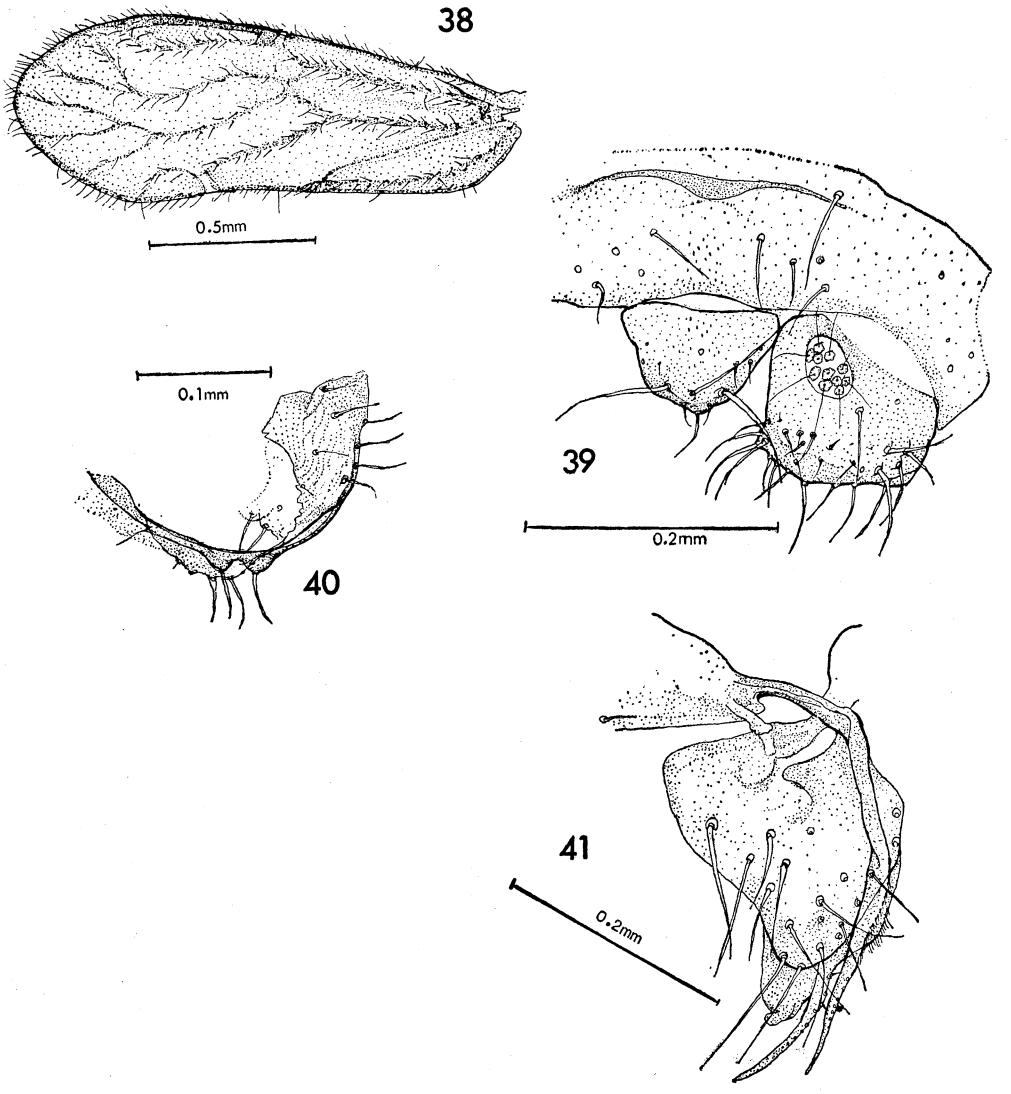


Fig. 38–41. *Austropsocus micans* n.sp. ♀: 38, fore wing; 39, epiproct and paraproct; 40, subgenital plate; 41, gonapophyses.

1.3 ct = 12 Fw = 1.49 mm. Hw = 1.25 mm. Epiproct simple (Fig. 39), paraprocts (Fig. 39) with 11 trichobothria. Subgenital plate incipiently bilobed apically (Fig. 40), a single seta just mesial to base of each lobe. Gonapophyses (Fig. 41) with wedge-shaped outer valve, dorsal valve with very long subapical spine.

♂. Unknown.

Holotype ♀ (AM), NEW CALEDONIA: Aoupinié, 550 m, W of Ponérihouen, swept from undergrowth of primary forest, 30.VII.71 (JDH).

Holotype in Australian Museum.

This species is described from a single ♀ because it is so distinctive in having dark brown head, thorax and legs and uniform brown shining wings. It is also unusual in genitalia, the gonapophyses and subgenital plate being similar to those of *A. productus*, and unlike those of the previous group of species.

Austropsocus nitidus Thornton & Smithers, new species Fig. 42–47

♀. *Coloration* (freshly killed, in alcohol): Head and thoracic terga dark brown, except pedicel and flagellum light brown, femora white, pale brown distally, tibiae and tarsal segments pale brown. Eyes black, ocelli clear, ocellar interval black. In well-pigmented specimens, fore wing (Fig. 42) with brown pigment within pterostigma and a distinct brown cloud over basal section of vein *rs*. Hind wing wholly hyaline. Abdomen light brown.

Morphology: Head and thoracic terga very highly polished. B = 1.84 mm. I.O. :D = 2.6 f_1 = 0.40 mm. f_2 = 0.28 mm. f_1 : f_2: = 1.42 F = 0.43 mm. T = 0.71 mm. t_1 = 0.35 mm. t_2 = 0.04 mm. t_3 = 0.05 mm. rt = 8.7 : 1.0 : 1.2 ct = 18 Fw = 1.82 mm. Hw = 1.48 mm. Epiproct simple, semicircular, setose, paraproct with circular field of 13 trichobothria. Subgenital plate (Fig. 43) apically with

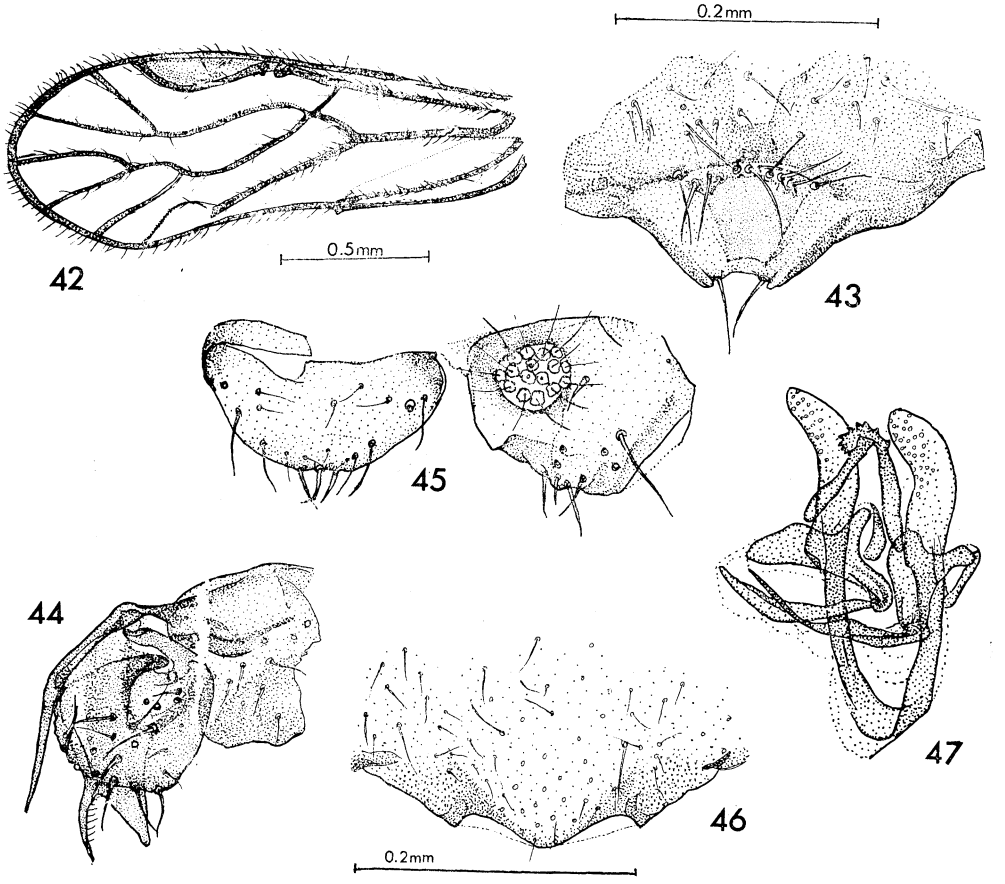


Fig. 42–47. *Austropsocus nitidus* n.sp. ♀: 42, fore wing; 43, subgenital plate; 44, gonapophyses; 45, epiproct and paraproct. ♂: 46, hypandrium; 47, phallosome. Figures 43 and 47 to common scale; figures 44 to 46 to common scale.

an emarginate lobe bearing 1 pair of setae on posterior margin. Gonapophyses (Fig. 44) with relatively large circular outer valve, dorsal valve with subapical spine almost as long as apical lobe, valve thus appearing bifid.

♂. *Coloration* (freshly killed, in alcohol): As ♀; in allotype ♂ a distinct small brown cloud over basal section of *rs* in fore wing, this cloud much less distinct in paratype.

Morphology: Flagellum thicker than that of ♀, setae longer. Head and thoracic terga very highly polished. B = 1.60 mm. I.O.: D = 1.7 f_1 = 0.37 mm. f_2 = 0.28 mm. f_1: f_2 = 1.3 F = 0.41 mm. T = 0.69 mm. t_1 = 0.22 mm. t_2 = 0.03 mm. t_3 = 0.05 mm. rt = 7.3 : 1.0 : 1.6 ct = 16 Fw = 1.83 mm. Hw = 1.45 mm. Epiproct simple, paraproct with circular field of 15 trichobothria and a raised setose area. Hypandrium (Fig. 46) trilobed, median lobe not mushroom-shaped, lateral lobes conical, lateral to these each side an extensive rugose area. Phallosome (Fig. 47) with 3 pairs of sclerites, one rod-like, one short and simple, one large and 3-pronged, junction of inner parameres serrated.

Holotype ♀ (AM), NEW CALEDONIA: Mt Koghi, 500m, 10.II.70; allotype ♂, same data. Paratypes 4♂♂, 5♀♀, same data as holotype; 1♂, Mt Koghi, from *Marattia attenuata*, 10.II.70; 1♀, Thio Forest, dead branches, 11.II.70; 1♂, 1♀, Petchikara Pass, 600m, 16.II.70; 1♂, Ciu Falls, 17.II.70; 1♂, Hienghène Valley, right bank, 20.II.70; 1♀, Yahoué Valley, 29.VIII.40 (FXW); 2♀♀, Col de la Pirogue, 23.I.62 (NLK); 3♀♀, 7km S of Koh, 31.I.63 (CMY). Offshore islands: Ile des Pins, 1♂, 4.III.70. LOYALTY ISLANDS: 1♀, Maré, 2.III.70.

Holotype, allotype and paratypes in Australian Museum.

This species is quite distinctive in ♂ wing markings and genitalic features from the other New Caledonian *Austropsocus* species.

Austropsocus productus Thornton & Smithers, new species Fig. 48–57

♀. *Coloration* (freshly killed, in alcohol): Generally pale buff, with the following exceptions: eyes black, ocelli clear with thick black centripetal margins; head distinctively patterned (Fig. 48) with discrete brown marks; a wide brown band each side of median epicranial suture, another similar band each side some distance mesial to and parallel to edge of eye, a narrow brown band from eye to antennal socket, from just anterior to ocellar protuberance 2 grey-brown lines diverge at approximately 90° towards lateral anterior edge of clypeus, and from near the end of these lines two thicker grey-brown bands pass near anterior edge of clypeus back towards mid-line but do not meet there. A narrow grey-brown band on each side of body passes over cervicum and along bases of coxae to first abdominal segment. Fore wing (Fig. 49) very pale fuscous, hind wing hyaline. Thoracic terga light brown.

Morphology: B = 1.55mm. I.O.:D = 3.0 f_1 = 0.26mm. f_2 = 0.18mm. f_1:f_2 = 1.4 F = 0.30mm. T = 0.56mm. t_1 = 0.17mm. t_2 = 0.03mm. t_3 = 0.04mm. rt = 5.6 : 1.0 : 1.3 ct = 16 Fw = 1.70mm. Hw = 1.30mm. In fore wing *rs* and *m* usually fused for a distance, sometimes meet at a point. Epiproct (Fig. 50) triangular, without setose dorsal flap, paraproct (Fig. 50) with field of 14 trichobothria. Subgenital plate (Fig. 51) not bilobed apically, a smooth, truncate posterior lobe bearing 2 widely spaced setae and membranous fleshy accessory lobes overlapping the median one. Gonapophyses (Fig. 52) with outer valve small, dorsal valve with very long subapical spine.

♂. *Coloration* (freshly killed, in alcohol): As ♀.

Morphology: B = 1.35mm. I.O.:D = 2.0 f_1 = 0.39mm. f_2 = 0.32mm. f_1: f_2 = 1.2 F = 0.32mm. T = 0.64mm. t_1 = 0.18mm. t_2 = 0.03mm. t_3 = 0.04mm. rt = 6.0 : 1.0 : 1.3 ct = 16 Fw = 1.79mm. Hw = 1.43mm. 9th tergite with a median posterior sclerotized peg (Fig. 53) over epiproct, which is simple (Fig. 54, paratype). Paraproct (Fig. 55, paratype) with an oval field of 15 trichobothria and an apical sclerotised setose band on mesial face. Ninth tergite with a raised rugose area on posterior edge near lateral corner of paraproct. Hypandrium (Fig. 56) trilobed, with striated areas each side between median and lateral lobes. Phallosome (Fig. 57) with 2 large plate-like sclerites each having a

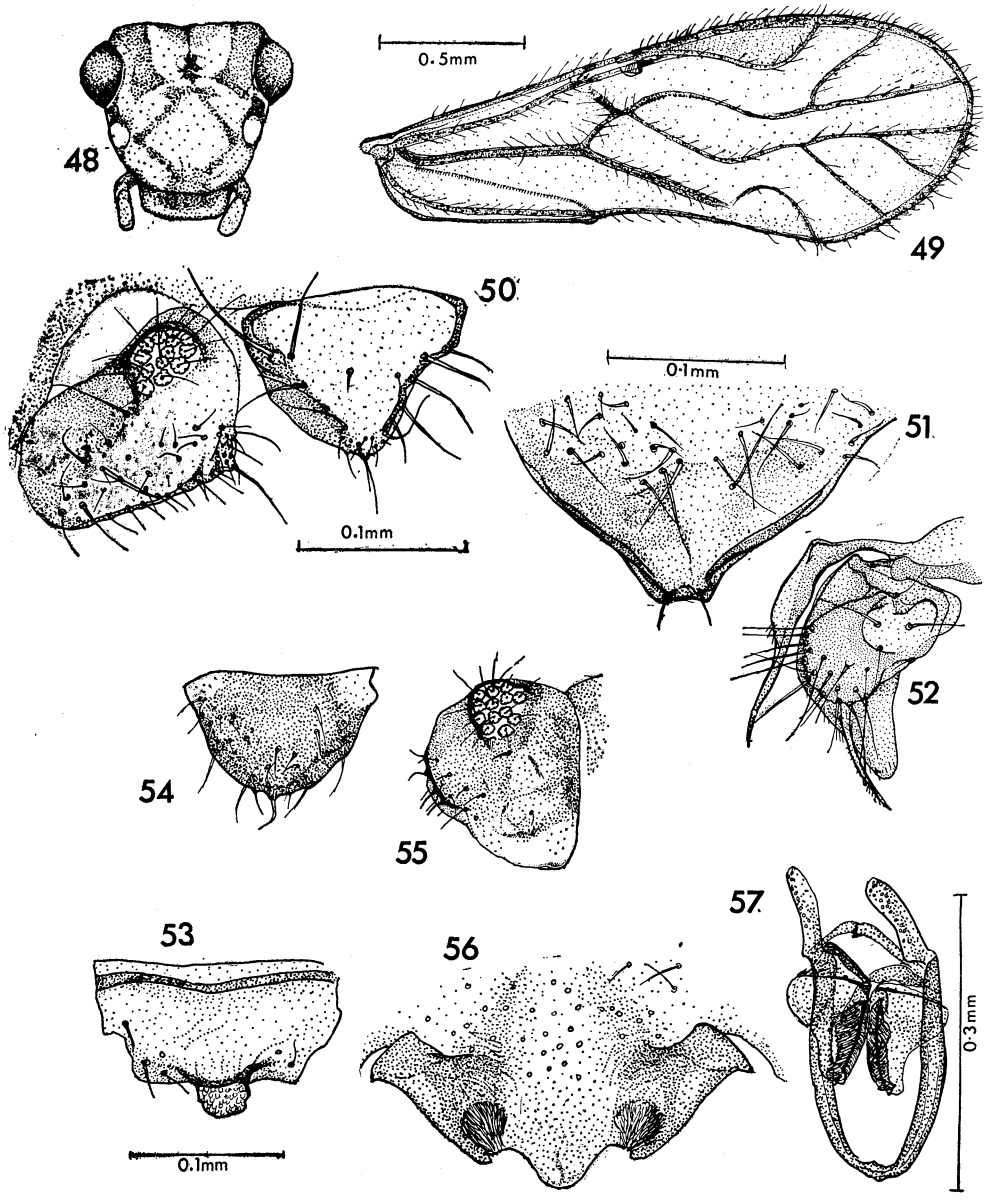


Fig. 48–57. *Austropsocus productus* n.sp. ♀: 48, head; 49, fore wing; 50, epiproct and paraproct; 51, subgenital plate; 52, gonapophyses. ♂: 53, 9th tergite with sclerotized peg; 54, epiproct; 55, paraproct; 56, hypandrium; 57, phallosome. Figure 48 not to scale; figures 50 and 54 to 56 to common scale; figures 51 and 52 to common scale.

scroll-like margin, a pair of small oval sclerites and an anterior pair of flat, slightly hooked plates.

Holotype ♀ (AM), NEW CALEDONIA: Petchikara Pass, 450m, dry bamboo leaves, 15.-II.70; allotype ♂, Mt Koghi, 10.II.70. Paratype ♂, same data as holotype; paratype ♂, same data as allotype; 1♂, 3♀♀ (paratypes), Thio Forest, 11.II.70; paratype ♂, Plaine des Lacs, Pic du Pin, NW slope, *Nothofagus* forest undergrowth, 7.VIII.71 (JDH); paratypes 1♂, 2♀♀, Aoupinié, 550m, W of Ponérihouen, 30.VII.71 (JDH). 2♀♀, same data as holotype; 1♂, Thio Forest stream, 11.II.70; 2♀♀, Hienghène Valley, S ridge, 250m, 21.II.70; 1♂, 2♀♀, Thio Forest, dry banana leaves, 11.II.70; 1♂, 5♀♀, same data as allotype; 1♂, Thio Forest, ferns, 11.II.70; 1♂, 8♀♀, Thio Forest, 11.II.70; 1♀, Petchikara Pass, E side, 600m, 16.II.70; 1♂, 1km W of Yaté, dried vegetation, 12.II.70; 1♂, Le Crouen from *Araucaria*, 17.II.70; 1♂, Mt Koghi, from ferns, 10.II.70; 1♀, Mt Koghi, from palms, 10.II.70.

Holotype, allotype and paratypes in Australian Museum.

This species is one of the commonest philotarsids in New Caledonia, but has not been collected on the Loyalties nor on the Isle of Pines. It is quite distinctive in head markings as well as on genitalic characteristics.

Together with *A. thapsinus*, this species differs from the group of species described above in features of hypandrium and phallosome. The two species are similar to one another in the striated bodies of the hypandrium, the rugose raised areas on the posterior margin of the 9th tergite, and in the untoothed phallosome sclerites and absence of a U-shaped ribbon sclerite.

Austropsocus strabus Thornton & Smithers, new species Fig. 58–62

♀. *Coloration* (freshly killed, in alcohol): Whole of head, thorax and legs dark brown, except antennae pale brown, eyes black. Fore wings (Fig. 58) brown, hind wings light brown. Abdomen light brown.

Morphology: Head waxy, sculptured; wings glossy, shining. Fore legs very short, fore wings not reaching abdominal apex. B = 2.40mm. I.O.:D = 2.5 f_1 = 0.24mm. f_2 = 0.18mm. f_1:f_2 = 1.3 F = 0.35mm. T = 0.68mm. t_1 = 0.18mm. t_2 = 0.03mm. t_3 = 0.04mm. rt = 6.0 : 1.0 : 1.3 ct = 11 Fw = 1.73mm. Hw = 1.47mm. Epiproct (Fig. 59) setose, simple, trapezoid; paraproct (Fig. 60) with circular field of 14 trichobothria and a low setose prominence. Subgenital plate (Fig. 61) with apical lobe emarginate posteriorly, bearing a pair of setae inset at posterior margin of apical crescentic membranous area. Gonapophyses (Fig. 62) with relatively large, strongly setose outer valve, dorsal valve with subapical spine longer than apical lobe.

♂. Unknown.

Holotype ♀ (AM), NEW CALEDONIA: Ile des Pins, 4.III.70; paratype ♀, Ciu Falls, 17.II.70.

Holotype and paratype in Australian Museum.

This dark species may be clearly distinguished from any other New Caledonian philotarsid by the short, brown, squat wings, the texture and colour of the head, and on genitalic features.

Austropsocus thapsinus Thornton & Smithers, new species Fig. 63–65

♂. *Coloration* (freshly killed, in alcohol): Whole insect pale yellowish brown, eyes black, ocelli clear. Fore wing (Fig. 63) pale greyish, almost hyaline, hind wing hyaline.

Morphology: B = 1.60mm. I.O.:D = 3.5 f_1 = 0.34mm. f_2 = 0.22mm. f_1:f_2 = 1.54 F = 0.30mm. T = 0.56mm. t_1 = 0.18mm. t_2 = 0.02mm. t_3 = 0.03mm. rt = 9.0:1.0:1.5 ct = 16 Fw = 1.75mm. Hw = 1.37mm. Epiproct simple, semicircular paraproct with an oval field of 14 trichobothria, mesial edge of field

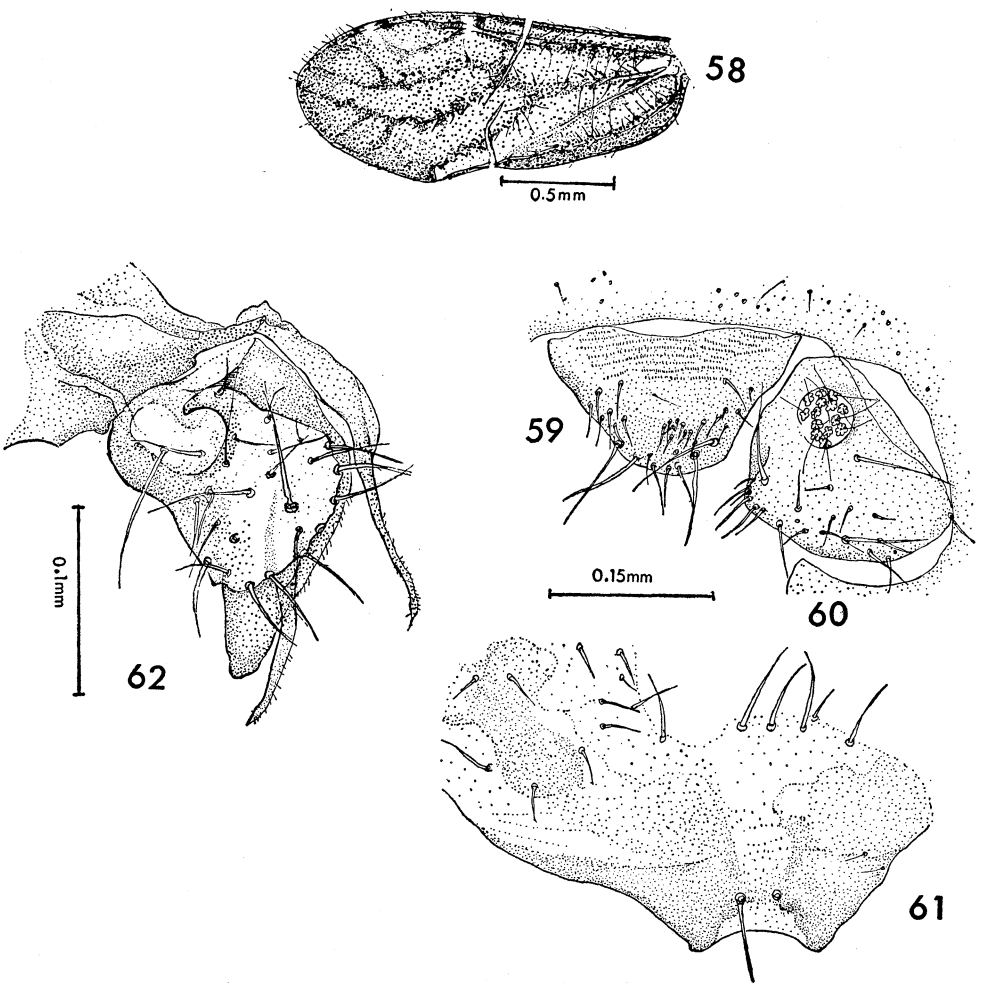


Fig. 58–62. *Austropsocus strabus* n.sp. ♀: 58, fore wing; 59, epiproct; 60, paraproct; 61, subgenital plate; 62, gonapophyses. Figures 61 and 62 to common scale.

sclerotized. Hypandrium (Fig. 64) with median lobe complex, flat posteriorly, a median field of fine spinelets, on each side a small striated area and lateral to this a closely adpressed pointed lobe which is not connected to main disc; lateral to median lobe posterior edge of hypandrium is emarginated and lateral to this on each side is a sclerotized conical projection bearing rows of minute spines. Phallosome with 2 large complex penial sclerites (Fig. 65), no U-shaped ribbon sclerite and no prominent spines on sclerites.

♀. Unknown.

Holotype ♂(AM), NEW CALEDONIA: Mt Koghi, from ferns, 10.II.70; paratype ♂, same data as holotype.

Holotype and paratype in Australian Museum.

This species differs from the group of species described above in hypandrium and

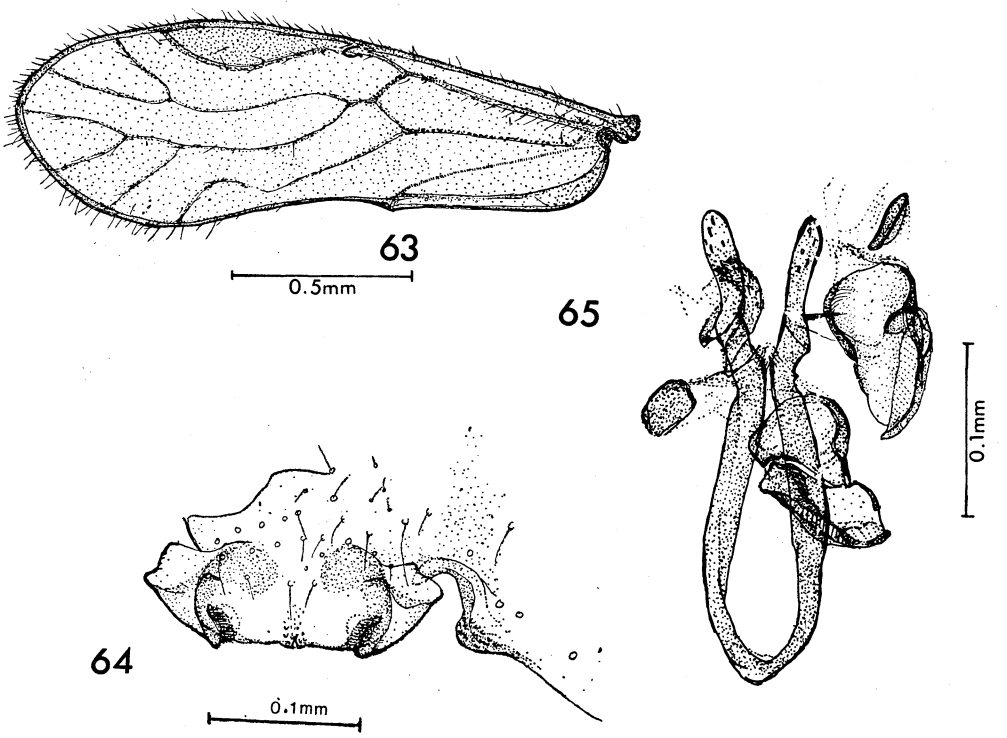


Fig. 63–65. *Austropsocus thapsinus* n.sp. ♂: 63, fore wing; 64, hypandrium; 65, phallosome.

phallosome, neither of which conform to the general pattern of the group.

Austropsocus xuthus Thornton & Smithers, new species Fig. 66–72

♀. *Coloration* (freshly killed, in alcohol): Head brown, a wide, double cream band from ocellar protuberance to antennal sockets; thoracic sclerites and legs brown. Fore wing (Fig. 66) fuscous, darker in cells M_1, M_2, M_3 and areola postica, costa darker at pterostigma, a discrete hyaline area at basal angle of areola postica, basal section of vein *rs* darker for a stretch proximal to vein *r*. Hind wing pale fuscous; abdomen cream, apical sclerites brown.

Morphology: B = 2.10mm. I.O.:D = 2.0 f_1 and f_2 not available. F = 0.33mm. T = 0.66mm. t_1 = 0.17mm. t_2 = 0.03mm. t_3 = 0.06mm. rt = 5.6 : 1.0. : 2.1 ct = 13 Fw = 1.98mm. Hw = 1.60mm. Head and thoracic sclerites shining, fore wings glossy. Epiproct (Fig. 67) simple, rectangular; paraproct (Fig. 67) with circular field of 14 trichobothria. Subgenital plate (Fig. 69), bilobed apically, a pair of setae mesial to lobes. Gonapophyses (Fig. 68): outer valve angular, setose; ventral valve without subapical lobe; dorsal valve with curved subapical spine projecting well beyond bluntly pointed apex of valve.

♂. *Coloration* (freshly killed, in alcohol): As ♀.

Morphology: B = 1.95mm. I.O.:D = 0.9 f_1 = 0.47mm. f_2 = 0.30mm. f_1:f_2 = 1.56 F = 0.36mm. T = 0.75mm. t_1 = 0.23mm. t_2 = 0.03mm. t_3 = 0.04mm. rt = 7.6 : 1.0 : 1.3 ct = 14 Fw = 1.90mm. Hw = 1.54mm. Head and thoracic sclerites shining, fore wings glossy. Epiproct (Fig. 70) simple, semicircular; paraproct with an oval field of 17 trichobothria. Hypandrium (Fig. 71) 3-lobed, lateral lobes with sclerotized supports, apical area bare. Phallosome (Fig. 72) with 2 pairs of rod-shaped sclerites, l

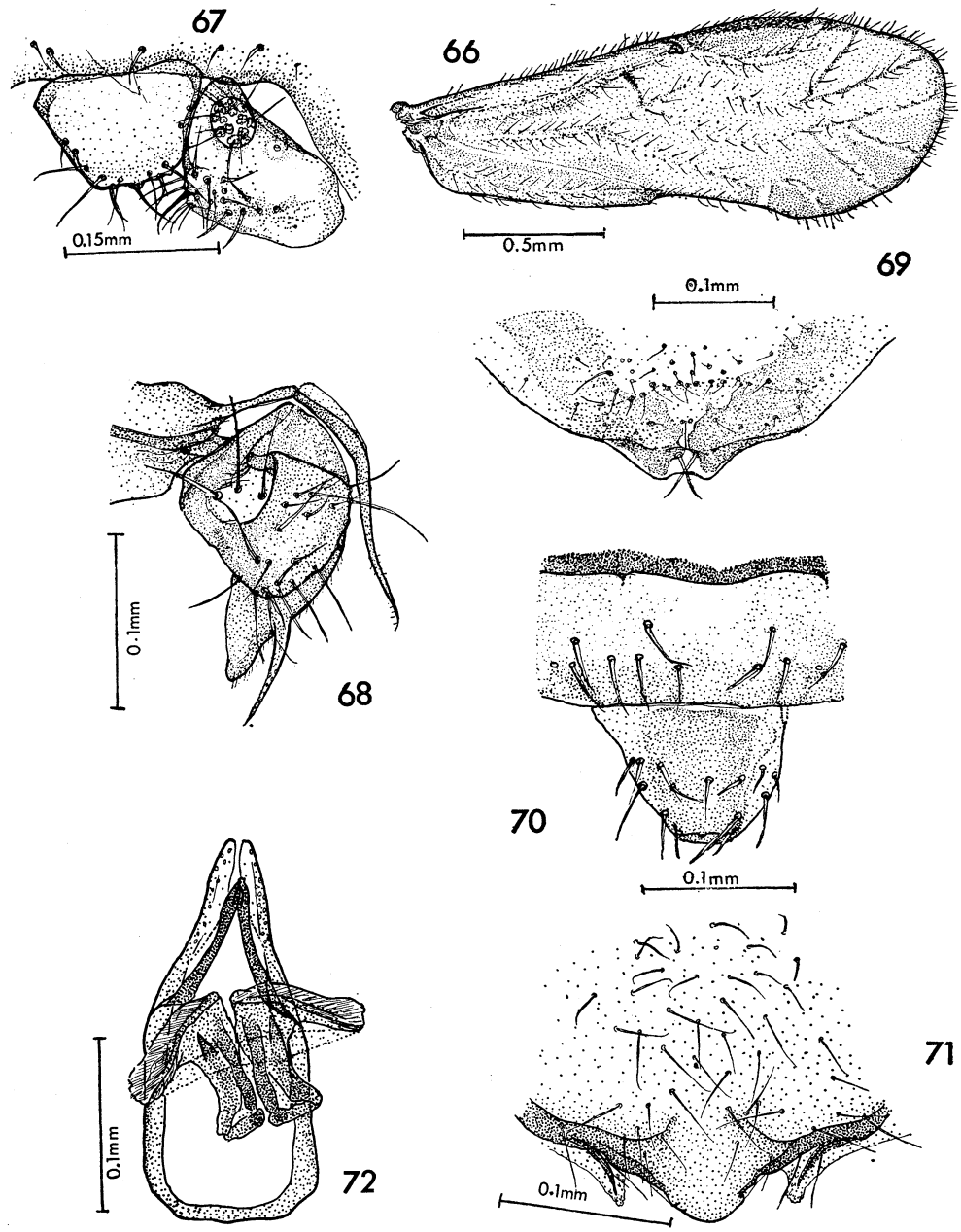


Fig. 66–72. *Austropsocus xuthus* n.sp. ♀: 66, fore wing; 67, epiproct and paraproct; 68, gonapophyses; 69, subgenital plate. ♂: 70, epiproct; 71, hypandrium; 72, phallosome.

pair sharply pointed, and a pair of L-shaped sclerites.

Holotype ♀ (AM), NEW CALEDONIA: Thio Forest stream, 11.II.70; allotype ♂, same data as holotype. Paratype ♀, Ciu Falls area, 17.II.70.

Holotype, allotype and paratype in Australian Museum.

This species is very similar to *A. baeus*, which also has a dark fore wing and brown shiny head and thorax. However, *A. baeus* is a much smaller insect, and there are slight differences in head pattern and in the hypandrium and phallosome sclerites. The hypandrium of *xuthus* has larger lateral lobes, which also appear to have sclerotized supports; the penial sclerites do not include smooth squarish plate-like sclerites, and there is a discernible pattern on the frons. *A. xuthus* may also be distinguished from *A. baeus* by the fact that in the fore wing, the basal section of vein *rs* is dark for that half of the section proximal to vein *r*; in *A. baeus* the basal section of *rs* is uniform.

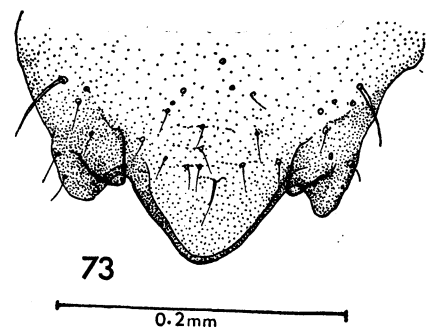
Genus **Zelandopsocus** Tillyard, 1923

Tillyard's generic diagnosis cites the following characters: great distal breadth of the fore wing, vein cu_2 in the fore wing is setose, flagellum with whirls of hairs as long as the individual segments. In the type species *Z. formosellus*, from New Zealand, the fore wings have a characteristic, unusual colour pattern.

Smithers (1969) redescribed *formosellus*, providing figures of subgenital plate, lacinia, ♀ gonapophyses and phallosome, as well as the fore wing, and later (Smithers 1970) redefined the genus. We have now re-examined the subgenital plate and the hypandrium of *formosellus*. The subgenital plate (Fig. 74) is in fact bilobed apically, the lobes overlapping slightly and each bearing a pair of setae, and the ♀ epiproct has a dorsal setose flap basally. The hypandrium is 5-lobed posteriorly (Fig. 73), with the central lobe just discernibly mushroom-shaped. The phallosome sclerites include a U-shaped ribbon-like sclerite, shown faintly in Smithers' figure, and spinous sac-like sclerites.

Z. sinuosus Banks (1939), from Australia, is little-known, and may not be correctly placed.

The only other known species, *angulatus* Smithers, differs in several important respects from the type-species and is more similar to other, as yet undescribed, New Zealand philotarsids.



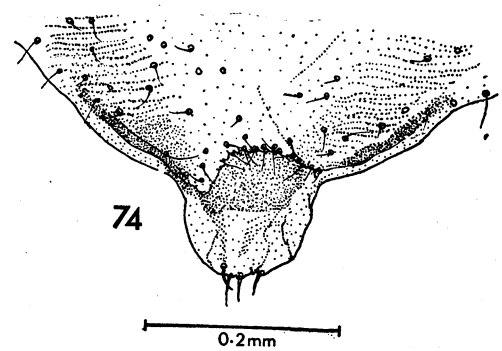


Fig. 73–74. *Zelandopsocus formosellus* ♂: 73, hypandrium. ♀: 74, subgenital plate.

The 27 New Caledonian species provisionally assigned to *Zelandopsocus*, all (except *perilegnes*) have the hind wing veins bare. Of the 20 species in which the ♂ is known, the hypandrium is 5-lobed in 18, 7-lobed in one (*translucidus*), and 3-lobed in one (*varianus*). In all, the phallosome possess a U-shaped ribbon-sclerite and a pair of spinous sac-like sclerites. The ♀ is known in 21 of the species. In 20 of these the subgenital plate could be examined, and in all the apical lobe is composed of a pair of incipiently overlapping lobes; in 13 species each sublobe bears a pair of setae, in 5 each bears one seta, and in 2 each bears 3 setae. The subapical spine of the dorsal lobe of the ♀ gonapophyses is always shorter than the apex of the lobe. All the New Caledonian species agree with the type-species, *formosellus*, and differ from *angulatus* in that the central lobe of the hypandrium is mushroom-shaped and the ♀ epiproct has a dorsal setose flap.

Several of the New Caledonian species are similar in fore wing shape and general pattern to *formosellus*, but many others are not.

Thus a species complex of at least 27 species exists in New Caledonia; the complex is closely related to *formosellus* of New Zealand, but has some attributes not shared with the New Zealand species.

Zelandopsocus astictus Thornton & Smithers, new species Fig. 75–81

♀. *Coloration* (after *c.* 8 years storage): All colour pattern, if any, lost — specimen pale brown. Wings yellowish brown (Fig. 75)

Morphology: B = 2.20mm. I.O.:D = 2.0 f_1 = 0.43mm. f_2 = 0.33mm. f_1: f_2 = 1.30 F = 0.56mm. T = 1.02mm. t_1 = 0.31mm. t_2 = 0.05mm. t_3 = 0.06mm. rt = 6.2 : 1.0 : 1.2 ct = 21 Fw = 2.30mm. Hw = 1.78mm. In fore wing vein *an* with setae almost in single line, *cu* setae also not obviously in double line, even basally. Epiproct (Fig. 76) with well sclerotized anterior rim, setose posteriorly, a dorsal setose flap. Paraproct with field of 14 trichobothria. Subgenital plate (Fig. 77) with 4 apical setae and a pair of bare subsidiary lobes. Gonapophyses (Fig. 78): dorsal valve with subapical spine and large apical lobe; outer valve with fairly short bare posterior lobe; ventral valve relatively short.

♂. *Coloration* (after *c.* 14 years storage): Not discernible except wings as ♀, eyes black.

Morphology: B = 2.10mm. I.O.:D = 1.1 f_1 = 0.90mm. f_2 = 0.54mm. f_1:f_2 = 1.67. Hind legs not available. Fw = 2.07mm. Hw = 2.15mm. Epiproct (Fig. 79) simple, paraproct (torn) with oval field of 21 trichobothria, a narrow sclerotized strip along mesial border of field. Hypandrium (Fig. 80) with 5 lobes, the inner pair triangular, bluntly pointed, outer pair blunt, directed medially. Phallosome (Fig. 81) with sclerotized U-shaped sclerite and a pair of oval sclerites which are toothed on posterior and mesial margins.

Holotype ♀ (BISHOP 10,178), NEW CALEDONIA: Mt Koghi, 500m, 26–30.I.63 (CMY & NLK); allotype ♂, up Boulari River, light trap, 17.XI.58 (CRJ).

Holotype and allotype in B. P. Bishop Museum.

The wings of this species are very similar to the pale *Z. litus* (below). *Z. astictus* may be distinguished by the outer valve of the ♀ gonapophyses having a short, bare posterior lobe, details of the hypandrium, and by vein *an* in the fore wing having setae not clearly grouped into 2 lines.

Zelandopsocus balius Thornton & Smithers, new species Fig. 82–90

♀. *Coloration* (freshly killed, in alcohol): Head with usual markings on vertex dark brown, ground colour cream; clypeus brown, a pair of half-moon shaped cream areas at posterior border, genae brown, eyes black, ocelli pale with black centripetal margins, antennae brown. Thorax and legs brown, fore wing (Fig. 82) patterned with brown. Abdomen cream, with granular grey-brown

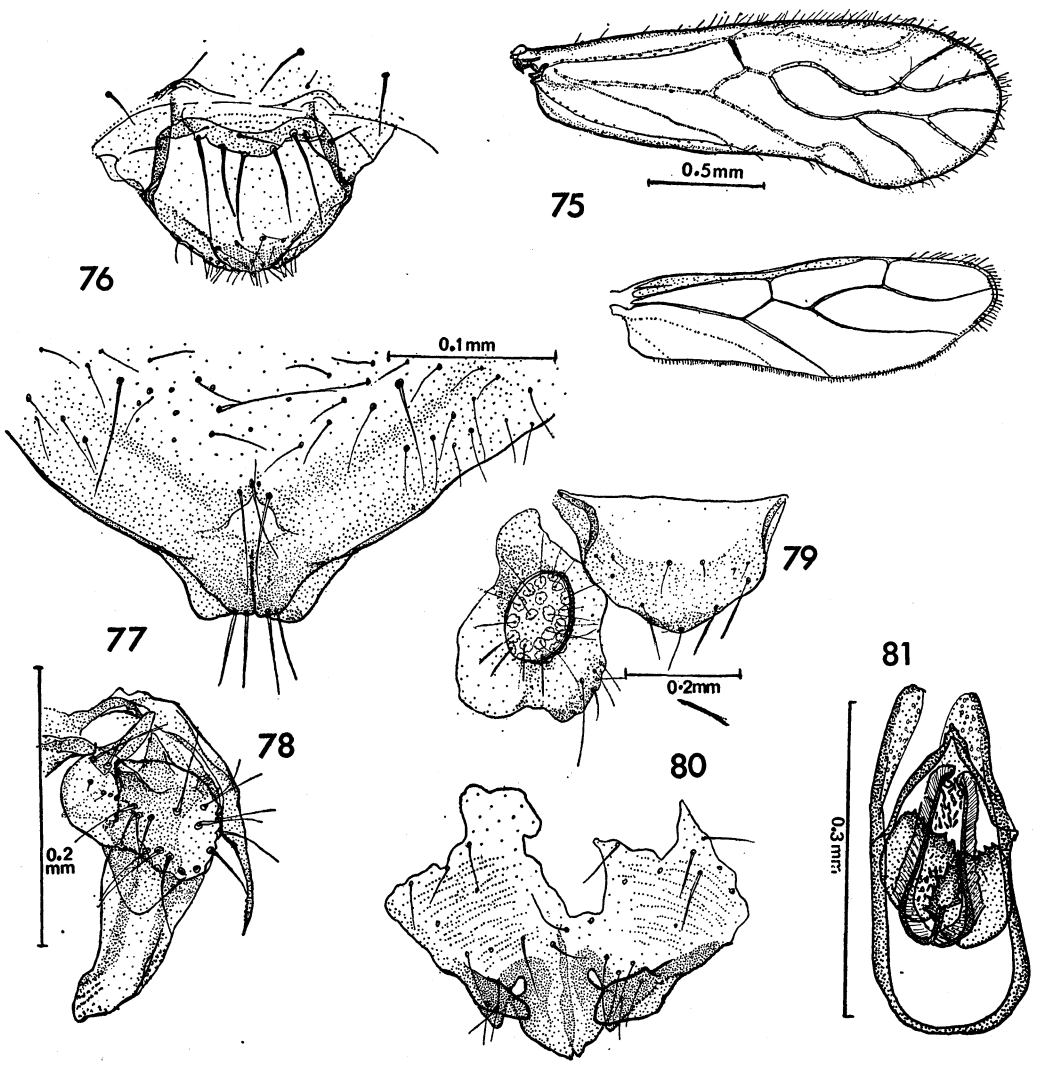


Fig. 75–81. *Zelandopsocus astictus* n. sp. ♀: 75, fore and hind wings; 76, epiproct; 77, subgenital plate; 78, gonapophyses. ♂: 79, epiproct and paraproct; 80, hypandrium; 81, phallosome. Figures 76 and 77 to common scale; figures 78 and 80 to common scale.

transverse bands dorsally and ventrally.

Morphology: B = 1.75mm. I.O.:D = 2.4 f_1 = 0.45mm. f_2 not available. F = 0.45mm. T = 0.91mm. t_1 = 0.33mm. t_2 = 0.03mm. t_3 = 0.04mm. rt = 11.0 : 1.0 : 1.3 ct = 19 Fw = 2.00mm. Hw = 1.63mm. Epiproct (Fig. 83) with a faint sclerotized pattern, a dorsal setose flap; paraproct (Fig. 84) with a field of 13 trichobothria. Subgenital plate (Fig. 85) with short wide apical lobe bearing 4 setae. Gonapophyses (Fig. 86) with rounded setose outer valve, short ventral valve, dorsal valve with subapical spine.

♂. *Coloration* (freshly killed, in alcohol): As ♀.

Morphology: B = 1.40mm. I.O.:D = 2.1 f_1 = 0.41mm. f_2 = 0.23mm. f_1:f_2 = 1.78 F = 0.43mm. T =

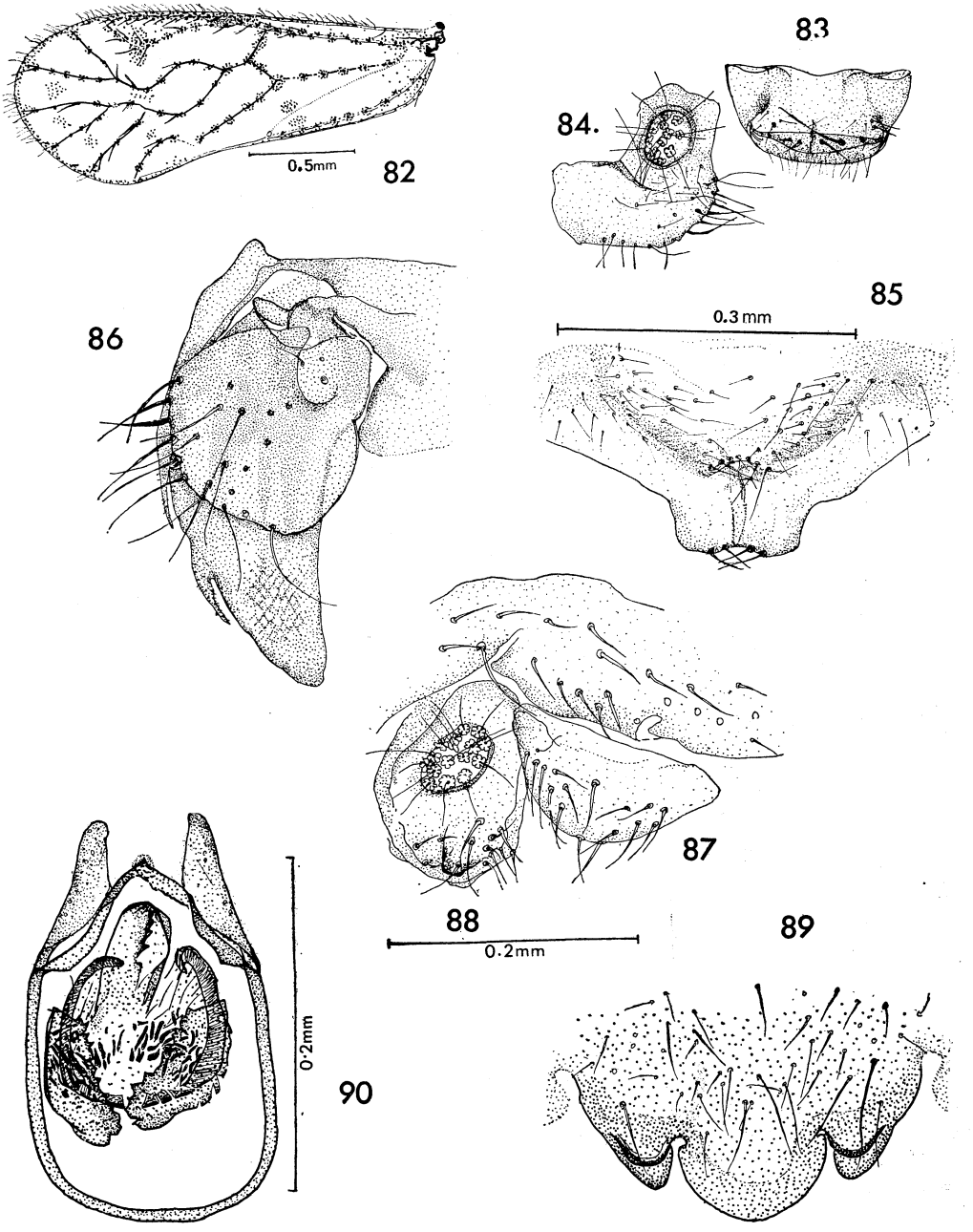


Fig. 82–90. *Zelandopsocus balius* n.sp. ♀: 82, fore wing; 83, epiproct; 84, paraproct; 85, subgenital plate; 86, gonapophyses. ♂: 87, epiproct; 88, paraproct; 89, hypandrium; 90, phallosome. Figures 83 to 85, 86 and 90, 87–89, to common scale.

0.83mm. t =0.30mm. t =0.03mm. t =0.05mm. rt=10.0 : 1.0 : 1.6 ct=15 Fw=1.91mm. Hw=1.50mm. Epiproct (Fig. 87) simple, paraproct (Fig. 88) with short blunt apical projection, oval field of 17 trichobothria with a sclerotized border on mesial margin of field. Hypandrium 5-lobed (Fig. 89), the lateral pairs short and simple. Phallosome (Fig. 90) with sclerotized U-shaped sclerite and a pair of sclerites with toothed mesial margins.

Holotype ♀ (AM), NEW CALEDONIA: Mt Koghi, beating, 10.II.70; allotype ♂, Thio Forest stream, beating living trees, 11.II.70. Paratype ♂, base of W slope Pic du Pin, Plaine des Lacs, *Nothofagus* forest undergrowth, sweeping, 7.VIII.71 (JDH).

Holotype, allotype and paratype in Australian Museum.

This species, like *Z. poecilus* is superficially very like an *Aaroniella.* The wing pattern of both species is typical of that genus. However, the genitalia of both sexes, antennal colour pattern, and lack of hind wing vein setae, preclude their inclusion in *Aaroniella.* In all characters but fore wing pattern they conform to the large group of *Zelandopsocus* species described here.

Zelandopsocus bifidus Thornton & Smithers, new species Fig. 91–99

♂. *Coloration* (freshly killed, in alcohol): Generally white, with the following exceptions: labrum brown, eyes black, ocelli with black centripetal borders, thoracic epimera, prothoracic and mesothoracic episterna, mesothoracic antecoxa, and coxae of all legs brown, hind femur brown, tibia and tarsi of all legs pale brown. Fore wing patterned as in Fig. 91. Insect at rest thus has a dark lower half and light upper half.

Morphology: B=1.75mm. I.O.:D=0.98 f_1=0.59mm. f_2=0.37mm. f_1:f_2=1.59 F=0.54mm. T=0.98mm. t_1=0.32mm. t_2=0.04mm. t_3=0.05mm. rt=8.0 : 1.0 : 1.25 ct=17 Fw=2.15mm. Hw=1.69mm. Fore wing with short *rs–m* junction in holotype. Epiproct (Fig. 92) with apical somewhat sclerotized truncate projection, rugose on apical border; paraproct (Fig. 93) with blunt, well sclerotized rugose subapical prong, an oval field of 18 trichobothria, mesial 2/3 of perimeter of field with sclerotized margin. Hypandrium (Fig. 94) 5-lobed. Phallosome (Fig. 95) similar to previous species, with a U-shaped sclerotised ribbon, and a pair of sclerites which bear large spines on mesial faces, apex of phallosome recurved strongly.

♀. *Coloration* (freshly killed, in alcohol): As ♂, in fore wing (Fig. 96, paratype) pigment round *rs–m* junction extends along veins, *r*, *rs* and *m* for some distance.

Morphology: B=2.20mm. I.O.:D=2.25 f_1=0.59mm. f_2=0.32mm. f_1:f_2=1.8 F=0.55mm. T=1.03mm. t_1=0.34mm. t_2=0.03mm. t_3=0.04 rt=11.3 : 1.0 : 1.3 ct=18 Fw=2.26mm. Hw=1.82mm. Fore wing with *rs* and *m* joined by cross vein. Epiproct (Fig. 97) with sclerotized posterior border and large posterior dorsal setose flap; paraproct with a field of 17 trichobothria, mesial half of field margin sclerotized. Subgenital plate (Fig. 98) with squat double apical lobe, each sublobe bearing 3 setae, and a pair of subsidiary lobes. Gonapophyses (Fig. 99): ventral valve short, with a small subapical lobe; dorsal valve blunt apically, curved subapical spine; outer valve with short, bare posterior lobe.

Holotype ♂ (AM), NEW CALEDONIA: Hienghène Valley, right bank, 3km from ferry, 20.II.70; allotype ♀, W side Petchikara Pass, 540m, general beating, 16.II.70. Paratype ♀, same data as allotype; 2♀♀, Petchikara Pass, E side, 600m, dead branches with lichen, 16.II.70.

Holotype, allotype and paratypes in Australian Museum.

This species is quite distinctive in wing pattern. In all ♀♀ collected, *rs* and *m* in the fore wing are connected by a cross-vein, and the pigment extends over the cross-vein and along the adjacent veins for some distance.

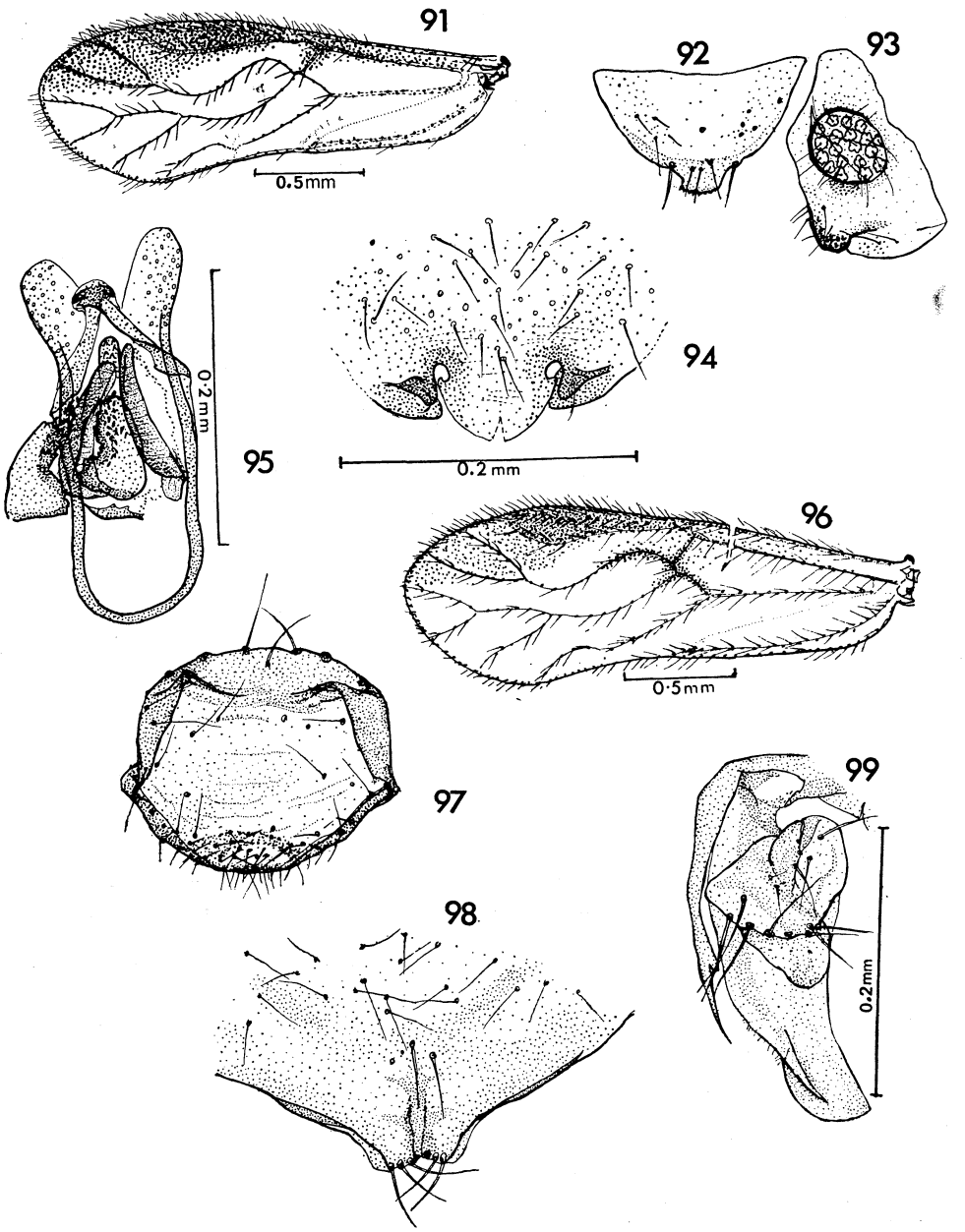


Fig. 91–99. *Zelandopsocus bifidus* n.sp. ♂: 91, fore wing; 92, epiproct; 93, paraproct; 94, hypandrium; 95, phallosome. ♀: 96, fore wing; 97, epiproct; 98, subgenital plate; 99, gonapophyses. Figures 92 to 94; 95 and 97; 98 and 99 to common scales.

Zelandopsocus chroicus Thornton & Smithers, new species. Fig. 100–106

♀. *Coloration* (freshly killed, in alcohol): Head cream, usual brown markings each side of median epicranial suture and mesial to eyes; frons with median brown mark, clypeus with cream semicircle each side posteriorly. A cream cross-shaped area thus appears to be centered over ocellar protuberance, with wider arms of cross anterior. Antennae brown; palps brown, apical segment darker distally. Eyes black, ocelli clear, centripetally bordered black. Thoracic sclerites brown, legs pale buff apart from coxa and apical 2 tarsal segments brown. Fore wing (Fig. 100 from paratype; holotype venation aberrant) with extensive brown and hyaline areas. Hind wing pale fuscous, middle of costal cell and membrane near apex of wing slightly darker. Abdomen cream,

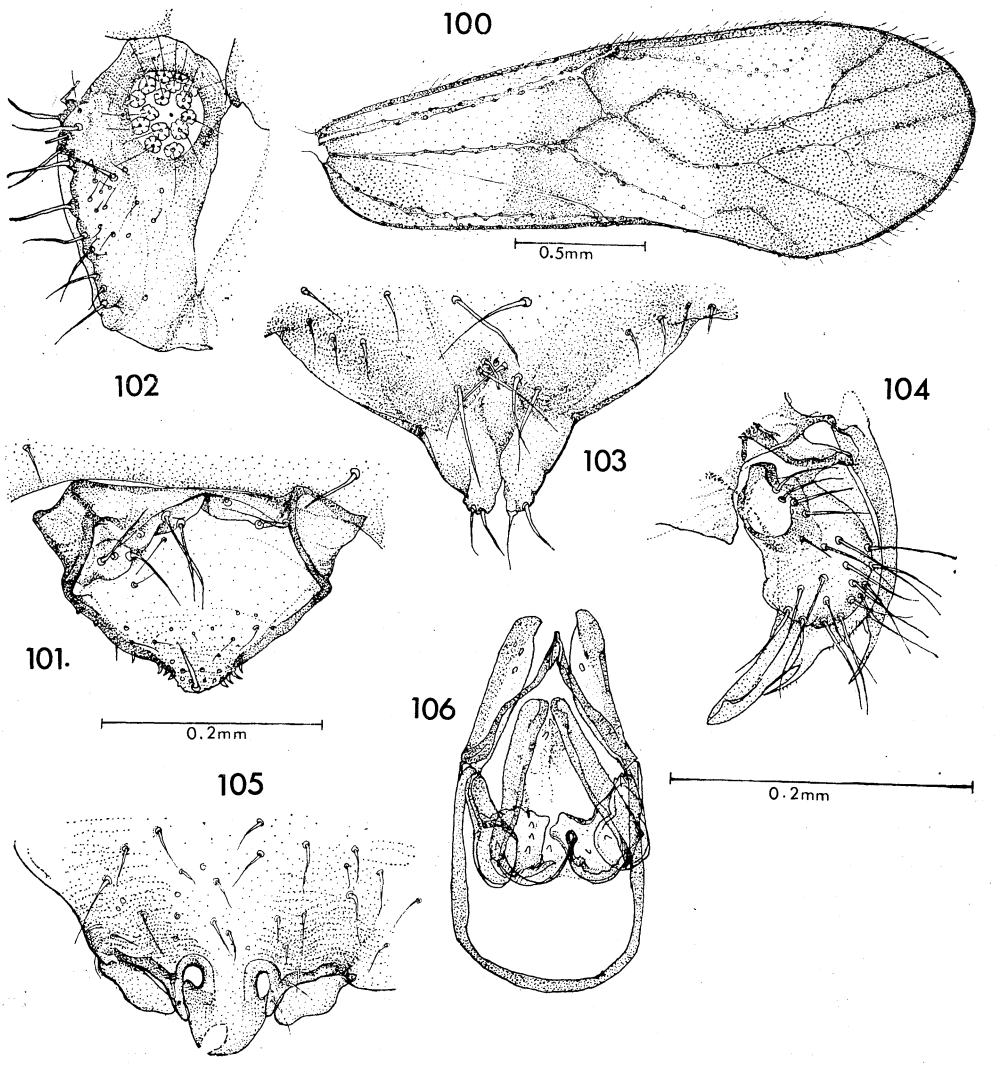


Fig. 100–106. *Zelandopsocus chroicus* n.sp. ♀: 100, fore wing; 101, epiproct; 102, paraproct; 103, subgenital plate; 104, gonapophyses. ♂: 105, hypandrium; 106, phallosome. Figures 102 to 106 to common scale.

apical sclerites brown.

Morphology: B = 2.20mm. I.O.:D = 2.8 f_1 = 0.52mm. f_2 = 0.30mm. f_1:f_2 = 1.7 F = 0.68mm. T = 1.17mm. t_1 = 0.39mm. t_2 = 0.04mm. t_3 = 0.05mm. rt = 8.4 : 1.0 : 1.1 ct = 21 Fw = 2.57mm. Hw = 2.09mm. Epiproct (Fig. 101) with basal setose flap and apical ornamentation; paraproct (Fig. 102) with field of 15 trichobothria. Subgenital plate (Fig. 103) apically bilobed, each lobe bearing a pair of setae. Gonapophyses (Fig. 104) very similar to those of *Z. marmor*, *Z. helvus* and *Z. dialecus*.

♂. *Coloration* (freshly killed, in alcohol): As ♀, pigment on fore wing slightly paler.

Morphology: B = 1.60mm. I.O.:D = 1.2 f_1 = 0.75mm. f_2 = 0.47mm. f_1:f_2 = 1.6 F = 0.64mm. T = 1.22mm. t_1 = 0.44mm. t_2 = 0.04mm. t_3 = 0.07mm. rt = 9.4 : 1.0 : 1.4 ct = 22 Fw = 2.55mm. Hw = 2.06mm. Epiproct simple, triangular; paraproct with oval field of 17 trichobothria. Hypandrium (Fig. 105) like that of *Z. helvus*, but with an additional sclerotized projection at base of paired lobes. Phallosome (Fig. 106) with U-shaped ribbon sclerite and a pair of setose sac-like sclerites.

Holotype ♀ (AM), NEW CALEDONIA: Mt Koghi, 500m, at light, 19.VIII.71 (JDH); allotype ♂, same data. Paratype ♀, Plaine des Lacs, maquis, S of Grand Lac, 9.VIII.71 (JDH).

Holotype, allotype and paratype in Australian Museum.

This species is very similar in both ♂ and ♀ genitalia to *Z. helvus*, and in ♀ genitalia to *Z. marmor* and *Z. dialecus*, of which ♂♂ are unknown. In wing pattern it is most similar to *marmor* and *dialecus*, both of which also occur on Mt Koghi, but the differences in pattern are quite numerous and consistent in all specimens available. *Z. chroicus* has the same head pattern as *marmor* and *dialecus*, but the legs of *dialecus* are brown. The three species are obviously very closely related.

Zelandopsocus dialecus Thornton & Smithers, new species Fig. 107–110

♀. *Coloration* (freshly killed, in alcohol): Head generally reddish-brown, except a pale cream cross, with center at ocellar protuberance, arms passing over vertex and forward to antennal sockets, a pale cream band between eye and antennal socket. Clypeal marking is thus triangular in shape posteriorly. Thorax and legs brown, abdomen cream. Fore wings patterned as in Fig. 107; hind wing hyaline, faint infuscation along anterior and apical margin, and posterior margin apical to vein *cu*.

Morphology: B = 2.20mm. I.O.:D = 2.4 f_1 = 0.49mm. f_2 = 0.25mm. f_1: f_2 = 1.96 F = 0.54mm. T = 1.03mm. t_1 = 0.32mm. t_2 = 0.04mm. t_3 = 0.04mm. rt = 8.0 : 1.0 : 1.0 ct = 18 Fw = 2.10mm. Hw = 1.71mm. Epiproct (Fig. 108) with sclerotized posterior border and dorsal setose flap; paraprocts with field of 14 trichobothria, margin of field sclerotized mesially. Subgenital plate (Fig. 109) evidently bilobed apically, lobes overlapping, each bearing 2 setae (one lobe damaged in preparation). Gonapophyses (Fig. 110) remarkable for shape of the outer valve, posterior part of which bears strong setae.

♂. Unknown.

Holotype ♀ (AM), NEW CALEDONIA: Mt Koghi, general beating, 10.II.70. Holotype in Australian Museum.

Zelandopsocus diargemus Thornton & Smithers, new species Fig. 111–114

♂. *Coloration* (after 8 years dry storage, restored in alcohol): Head generally brown, maxillary palps and area around antennal sockets dark brown, antennae except for scape light brown. Mesothorax dorsally brown, antedorsum dark brown, metathorax light brown, antedorsum pale yellow. Thoracic pleura brown anteriorly, fading to yellow posteriorly, and ventrally fading to yellow. Coxae clear yellow, femora yellow becoming brownish-yellow apically, tibiae pale yellowish brown, tarsi pale brown. Fore wings (Fig. 111) with distinctive markings and hyaline windows; hind wings pale brown, darker along anterior and apical border, and basally. Abdomen in poor

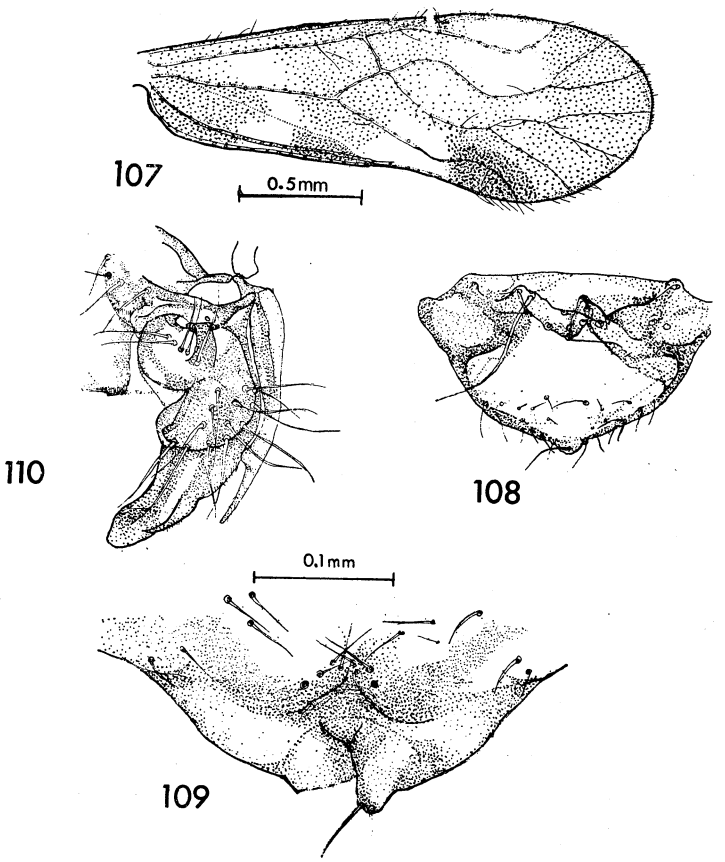


Fig. 107–110. *Zelandopsocus dialecus* n.sp. ♀: 107, fore wing; 108. epiproct; 109, subgenital plate; 110, gonapophyses. Figures 108 to 110 to common scale.

condition due to drying, but generally yellowish-brown, apical sclerites brown.

Morphology: B = 1.80mm. I.O.:D = 0.7 f_1 = 0.85mm. f_2 = 0.52mm. f_1:f_2 = 1.63 F = 0.67mm T = 1.21mm. t_1 = 0.41mm. t_2 = 0.04mm. t_3 = 0.04mm. rt = 10.2:1.0:1.0 ct = 21 Fw = 2.45mm. Hw = 2.00mm. Epiproct triangular, simple (Fig. 112), paraproct with field of 20 trichobothria, field with outer border sclerotized, subapical peg. Hypandrium (Fig. 113) 5-lobed. Phallosome (Fig. 114) with U-shaped ribbon sclerite, 2 sclerotized bodies, apex of penis frame recurved and toothed.

♀. Unknown.

Holotype ♂ (BISHOP 10,179), NEW CALEDONIA: Mt Koghi, Malaise trap, 27.I.68 (CMY & NLK).

Holotype in B. P. Bishop Museum.

This species, like *Z. dialecus*, is represented by but a single specimen. However, in both cases the wing pattern is so distinctive that we see no point in not describing the species.

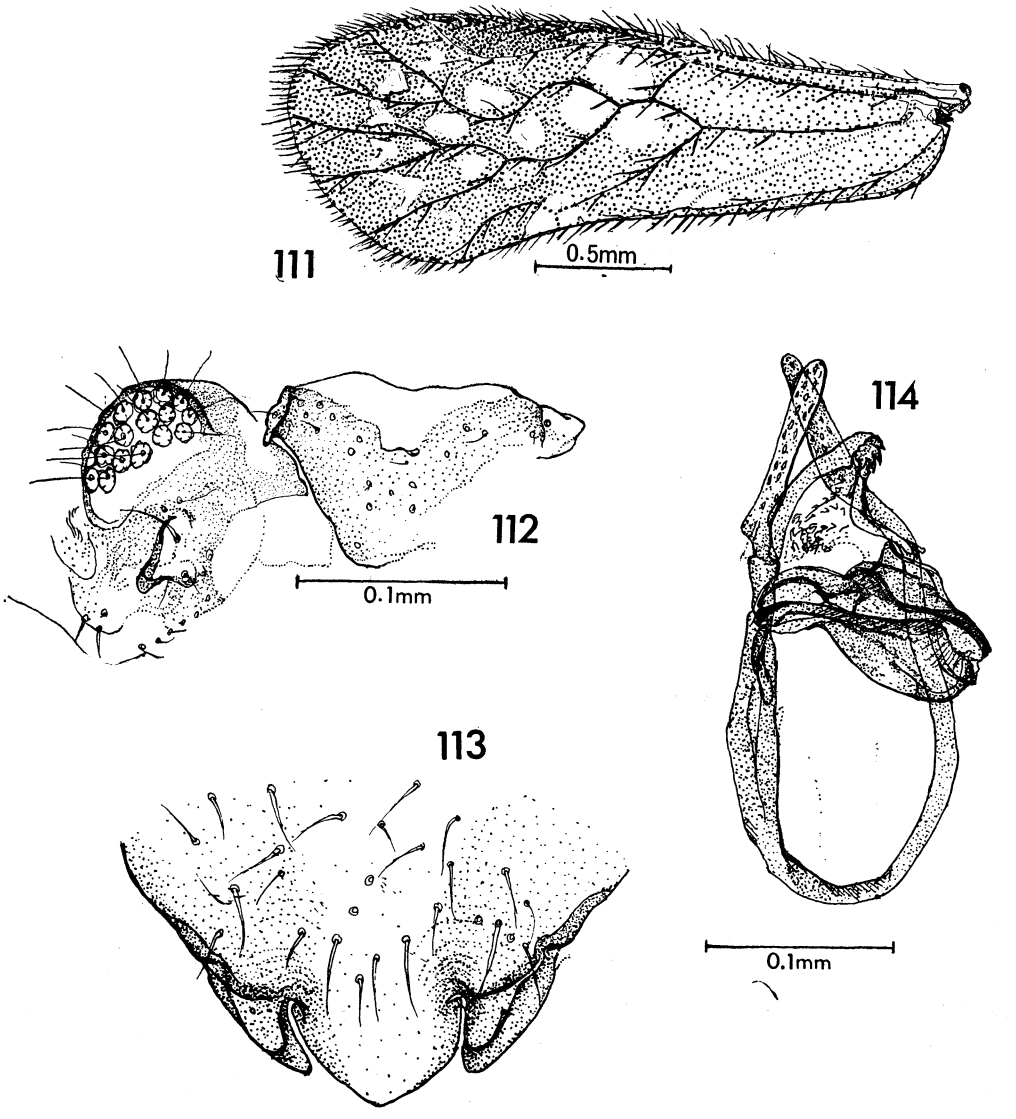


Fig. 111-114. *Zelandopsocus diargemus* n.sp. ♂: 111, fore wing; 112, epiproct; 113, hypandrium; 114, phallosome. Figures 113 and 114 to common scale.

Zelandopsocus diides Thornton & Smithers, new species Fig. 115–118

♂. *Coloration* (after 30 years dry storage, restored in alcohol): Generally brown, eyes black, ocelli bordered dark brown centripetally. Thorax brown, except scutella light brown with dark brown sutures. Legs brown. Fore wing (Fig. 115) hyaline, some light brown pigment in distal angle of pterostigma; hind wing hyaline. Abdomen colour not discernible.

Morphology: B = 2.40mm. I.O.:D = 2.2 f_1 = 0.71mm. f_2 = 0.46mm. f_1:f_2 = 1.54 F = 0.85mm. T = 1.30mm. t_1 = 0.37mm. t_2 = 0.06mm. t_3 = 0.07mm. rt = 6.1 : 1.0 : 1.1 ct = 23 Fw = 2.91mm. Hw = 2.34mm.

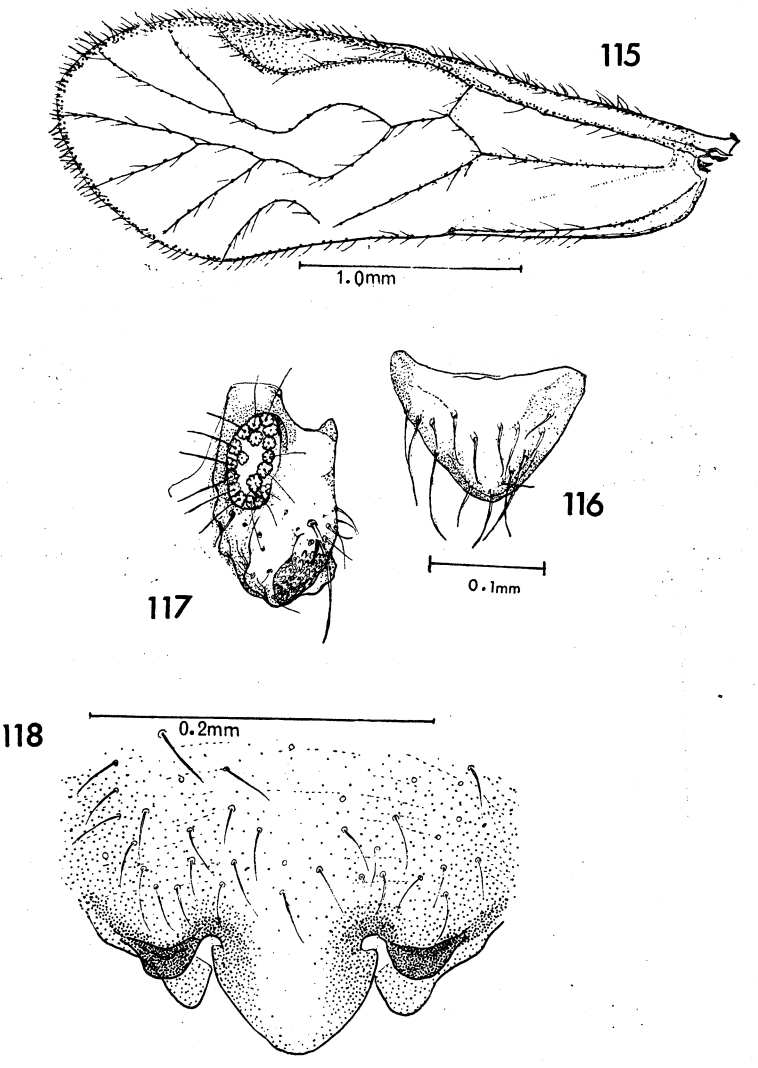


Fig. 115–118. *Zelandopsocus diides* n.sp. ♂: 115, fore wing; 116, epiproct; 117, paraproct; 118, hypandrium. Figures 116 and 117 to common scale.

Fore wing with long *rs-m* junction. Epiproct (Fig. 116) triangular, simple; paraproct with a field of 17 trichobothria with sclerotized rim round mesial border as in Fig. 117 (orientation altered in drawing). Hypandrium (Fig. 118) 5-lobed. Phallosome with usual U-shaped ribbon sclerite, pair of sclerites with spinous mesial margins, and a 4th medial sclerite with a spinous sclerotized ridge.

♀. Unknown.

Holotype ♂ (BISHOP 10,180), NEW CALEDONIA: summit of Mt Mou, 1200m, 21.VIII.40 (FXW).

Holotype in B. P. Bishop Museum.

Zelandopsocus fulvus Thornton & Smithers, new species Fig. 119–125

♀. *Coloration* (freshly killed, in alcohol): Whole insect tawny brown, usual markings on head darker brown, ocelli pale, very fine dark lines centripetally. Fore wing tawny brown, darker within areola postica (Fig. 119). Hind wing paler, unpatterned.

Morphology: B = 2.75mm. I.O.:D = 3.5 f_1 = 0.68mm. f_2 = 0.37mm. f_1:f_2 = 1.83 F = 0.71mm. T =

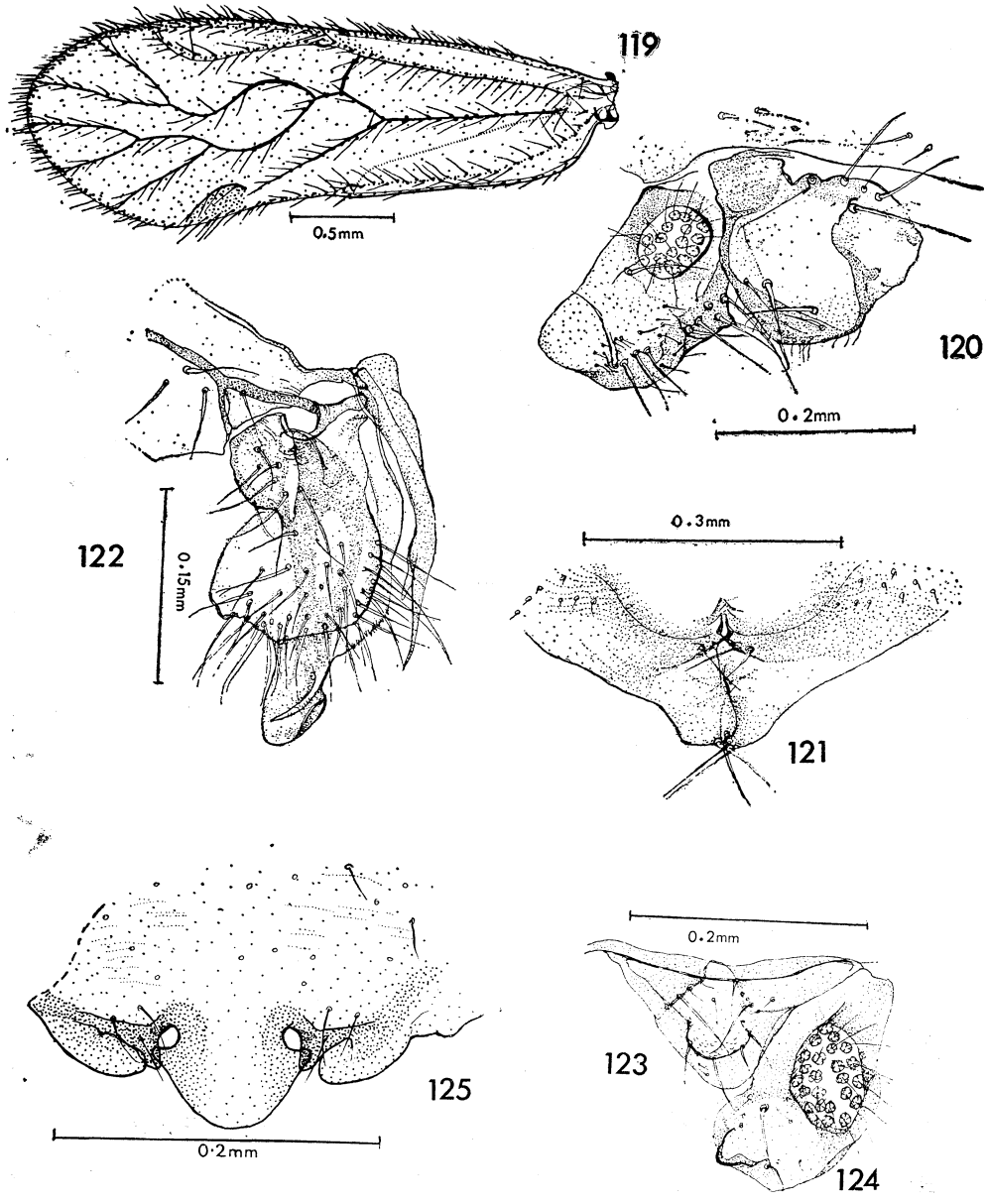


Fig. 119–125. *Zelandopsocus fulvus* n.sp. ♀: 119, fore wing; 120, epiproct; 121, subgenital plate; 122, gonapophyses. ♂: 123, epiproct; 124, paraproct; 125, hypandrium.

1.24mm. t_1 = 0.46mm. t_2 = 0.05mm. t_3 = 0.05mm. rt = 9.2 : 1.0 : 1.0 ct = 22 Fw = 2.70mm. Hw = 2.17mm. Epiproct (Fig. 120) with sclerotized posterior margin and apex, dorsal setose flap; paraproct with a field of 18 trichobothria, mesial rim of field sclerotized. Subgenital plate (Fig. 121, paratype) apical lobe apprently consists of 2 overlapping lobes, 4 apical setae. Gonapophyses (Fig. 122): outer valve with large posterior lobe carrying long stout setae except dorsally.

♂. *Coloration* (freshly killed, in alcohol): As ♀.

Morphology: B = 2.30mm. I.O.:D = 1.9 f_1 = 0.85mm. f_2 = 0.47mm. f_1:f_2 = 1.8 F = 0.69mm. T = 1.26mm. t_1 = 0.45mm. t_2 = 0.05mm. t_3 = 0.05mm. rt = 9.0 : 1.0 : 1.0 ct = 19 Fw = 2.60mm. Hw = 1.96mm. Epiproct (Fig. 123) triangular, simple; paraproct with oval field of 23 trichobothria, mesial rim of field sclerotized (Fig. 124). Hypandrium (Fig. 125) 5-lobed. Phallosome with usual U-shaped ribbon sclerite, pair of spinous sclerites, median sclerite with spinous axis.

Holotype ♀ (AM), NEW CALEDONIA: Hienghène Valley, S ridge, 240m, 21.II.70; allotype ♂, same data. Paratype ♀, same data as holotype; paratype ♂, Forêt Plat, summit, 26.II.70. Also: 7♂♂, 4♀♀, same data as holotype; ♂, Mt Koghi, general beating, 10.II.70; ♂, Nassirah Pass, E side, 390m, 15.II.70; ♀, Petchikara Pass, W side, 540m, 16.II.70; ♀, Le Crouen, 2km above hot springs, *ex Araucaria*, 17.II.70; 4♀♀, 2♂♂, Forêt Plat, summit, 26.II.70; ♂, Naouitien, near Sarraméa, 120m, 27.II.70.

Holotype, allotype and paratypes in Australian Museum.

Zelandopsocus furfurosus Thornton & Smithers, new species Fig. 126–129

♀. *Coloration* (freshly killed, in alcohol): Head, antennae, maxillary palps brown, a lighter brown cross centered over ocellar protuberance resulting in an inverted V-shaped margin to brown pigment on clypeus, as in *Z. dialecus*. Eyes black, ocelli pale with dark brown centripetal crescents.

Thoracic sclerites, legs, and abdomen brown. Fore wing (Fig. 126) brown, broad darker border to veins, pale areas near nodulus and areola postica. Hind wing faint brown, darker along anterior and distal margin.

Morphology: Head and thoracic sclerites shining, head with 8 prominent long stout setae each side mesial to eyes, mesothoracic antedorsum with a pair of long stout backwardly directed setae and several shorter ones. B = 2.45mm. I.O.:D = 3.0 f_1 = 0.76mm. f_2 = 0.43mm. f_1:f_2 = 1.76 F = 0.74mm. T = 1.37mm. t_1 = 0.53mm. t_2 = 0.05mm. t_3 = 0.06mm. rt = 10.1 : 1.0 : 1.2 ct = 25 Fw = 2.62mm. Hw = 2.43mm. Epiproct (Fig. 127) with sclerotized posterior border, with anterior dorsal setose flap; paraproct with a field of 20 trichobothria, edge of field sclerotized in 2 separate arcs. Subgenital plate (Fig. 128) apical lobe of 2 overlapping lobes, both bearing 3 setae. Gonapophyses (Fig. 129) with outer valve somewhat ear-shaped.

♂. Unknown.

Holotype ♀ (AM), NEW CALEDONIA: Plateau de Dogny, 800–1000m, 28.II.70.

Holotype in Australian Museum.

This species is similar to *Z. fulvus* in general colour, and in other respects. It differs in wing pattern, shape of outer valve of the gonapophyses, and sclerotization of trichobothrial field margin. The two species are nevertheless very similar and the material may prove to be conspecific if intermediate specimens are found.

Zelandopsocus gilvus Thornton & Smithers, new species. Fig. 130–133

♀. *Coloration* (freshly killed, in alcohol): Whole insect light brown, with following exceptions: apical 2 tarsal segments dark brown, eyes black, ocelli clear with dark centripetal borders, abdomen cream. Fore wing with darker cloud in areola postica and along anterior margin of pterostigma (Fig. 130).

Morphology: B = 2.35mm. I.O.:D = 3.0 f_1 = 0.51mm. f_2 = 0.22mm. f_1:f_2 = 2.3 F = 0.56mm. T = 1.00mm. t_1 = 0.22mm. t_2 = 0.05mm. t_3 = 0.06mm. rt = 4.0 : 1.0 : 1.1 ct = 21 Fw = 2.26mm. Hw = 1.81mm.

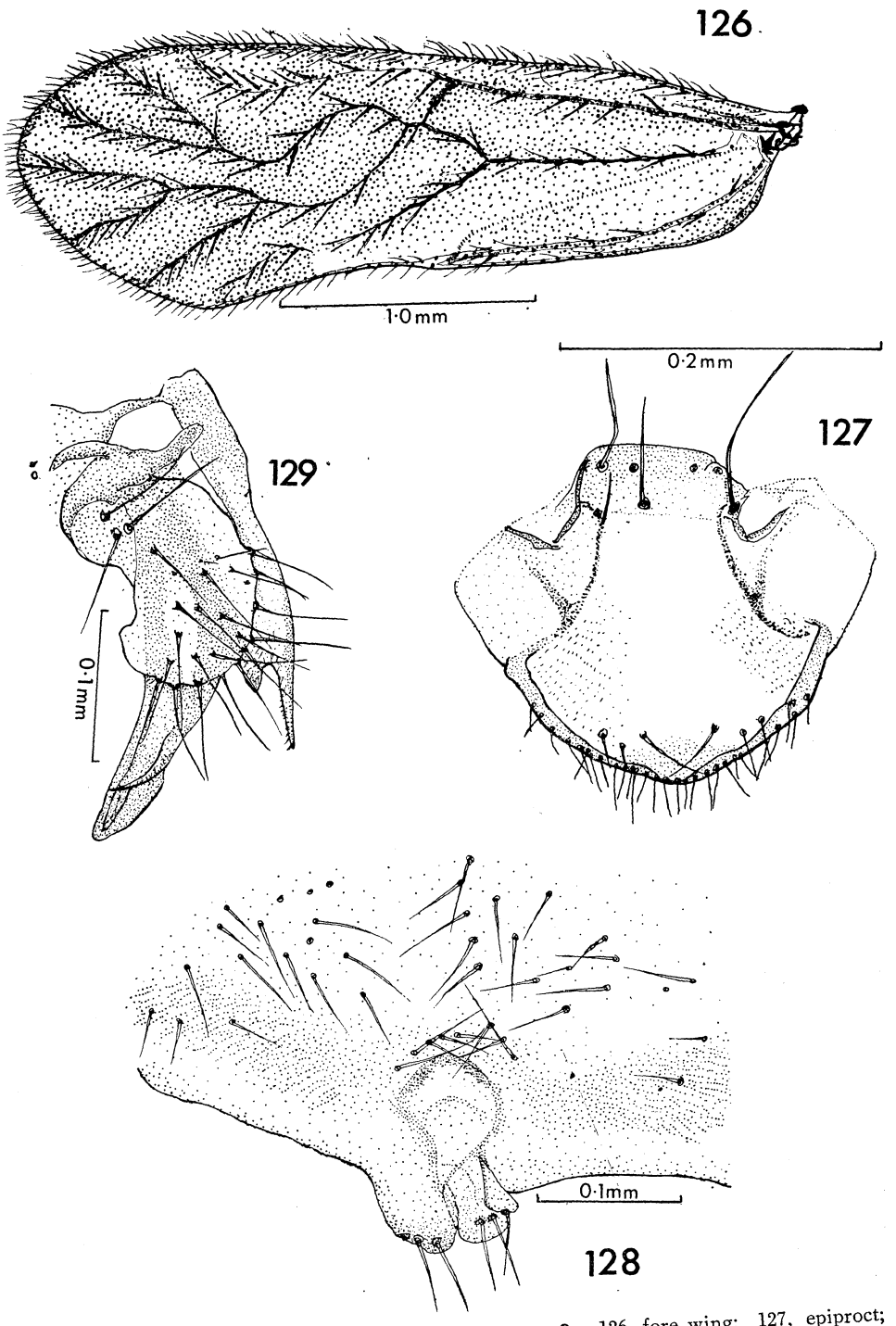


Fig. 126–129. *Zelandopsocus furfurosus* n.sp. ♀: 126, fore wing; 127, epiproct; 128, subgenital plate; 129, gonapophyses.

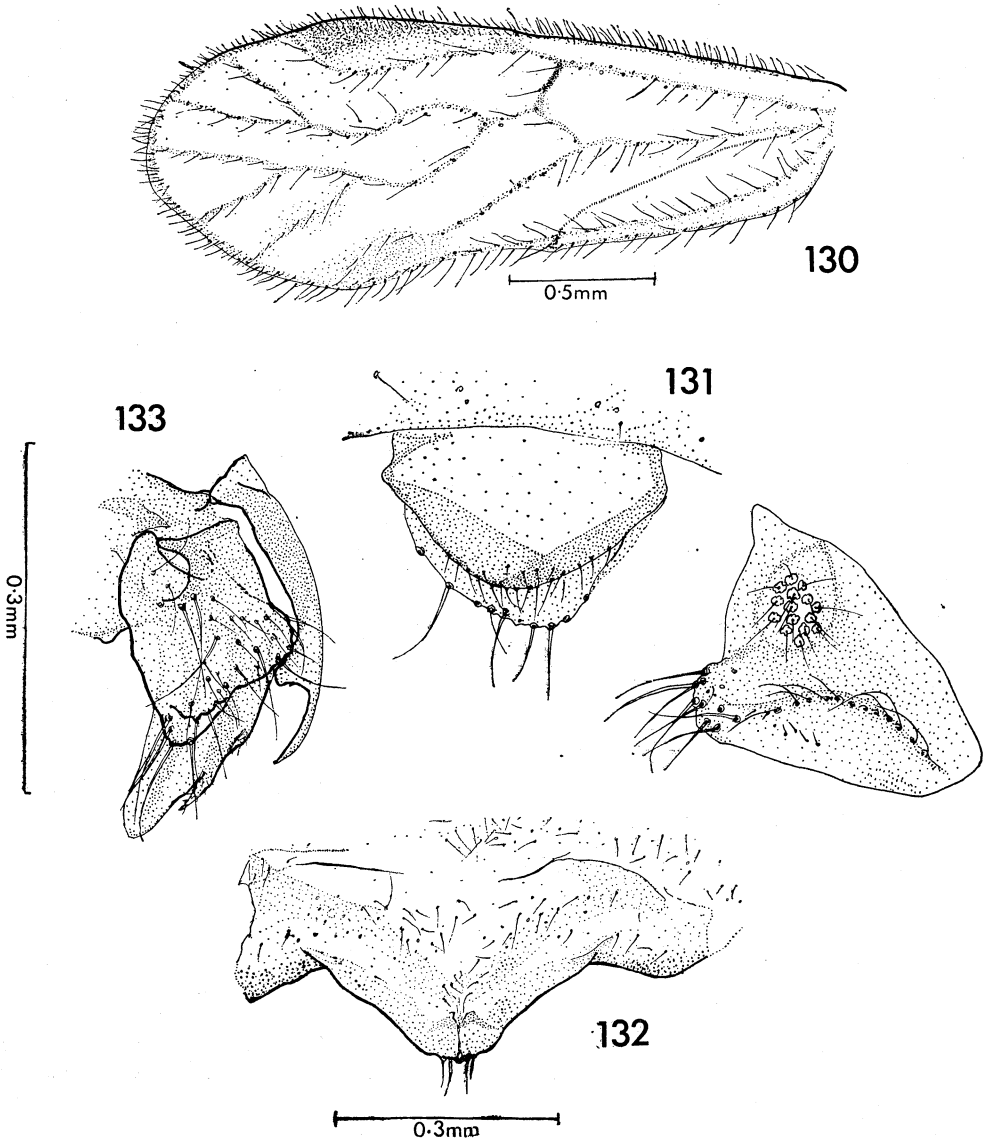


Fig. 130–133. *Zelandopsocus gilvus* n.sp. ♀: 130, fore wing; 131, epiproct; 132, subgenital plate; 133, gonapophyses. Figures 131 and 133 to common scale.

Epiproct (Fig. 131) with sclerotized, setose posterior margin, anteriorly a dorsal setose flap (folded posteriorly in preparation); paraproct with a field of 15 trichobothria without marginal sclerotization at rim of field. Subgenital plate (Fig. 132) with apical lobe apparently bilobed, 2 setae on each lobe. Gonapophyses (Fig. 133): ventral valve with prominent subapical lobe, outer valve with setose posterior lobe.

♂. Unknown.

Holotype ♀ (AM), NEW CALEDONIA: Sarraméa, *ex Araucaria columnaris*, 28.II.70;

paratype ♀, Thio Forest stream, *Araucaria,* 11.II.70.

Holotype and paratype in Australian Museum.

Very similar to *Z. justus,* this species may be distinguished by the pterostigma marking and the shape and ciliation of the outer valve of the ♀ gonapophyses.

Zelandopsocus graptus Thornton & Smithers, new species Fig. 134–143

♀. *Coloration* (after *c.* 30 years storage): Whole insect brown, including legs, abdominal colour not discernible. Fore wing (Fig. 134) with distinctive brown pattern, the brown being of uniform colour, hind wing hyaline.

Morphology: B = 2.30mm. I.O.:D = 1.7 f_1 = 0.60mm. f_2 = 0.52mm. f_1:f_2 = 1.15 F = 0.62mm. T = 1.19mm. t_1 = 0.37mm. t_2 = 0.04mm. t_3 = 0.08mm. rt = 9.2 : 1.0 : 2.0 ct = 20 Fw = 2.96mm. Hw = 2.24mm. Epiproct (Fig. 135) with large dorsal setose flap anteriorly, apical borders sclerotized, an apical field of minute spines. Paraproct (Fig. 136) with field of 16 trichobothria, a row of long setae and small setose peg. Subgenital plate (Fig. 137) with 2 apical overlapping lobes, each bearing 2 setae. Gonapophyses (Fig. 138) outer valve ear-shaped, dorsal valve with fairly long subapical spine.

♂. *Coloration* (after *c.* 30 years storage): As ♀ except in fore wing hyaline areas more extensive basally, no wide transverse band in basal half of wing (Fig. 139).

Morphology: B = 2.10mm. I.O.:D not measurable. f_1 and f_2 not available. F = 0.66mm. T = 1.24mm. t_1 = 0.41mm. t_2 = 0.04mm. t_3 = 0.05mm. rt = 10.2:1.0:1.25 ct = 18 Fw = 2.95mm. Hw = 2.20mm. Epiproct (Fig. 140) simple, triangular, sclerotized at apical border; paraproct (Fig. 141) with a field of 18 trichobothria and a sclerotized conical projection. Hypandrium (Fig. 142) 5-lobed, and a suggestion of an additional pair of low sclerotized lobes. Phallosome (Fig. 143) with usual sclerites.

Holotype ♀ (BISHOP 10,181), NEW CALEDONIA: Mt Mou, summit, 1200m, 21.VIII.40 (FXW); allotype ♂, same data as holotype. Paratypes ♂, ♀, Sarraméa, Malaise trap, 12.II.63 (CMY & NLK).

Holotype, allotype and paratypes in B. P. Bishop Museum.

This picture-winged species has a distinctive wing pattern, and, like *Z. venustus,* the pattern is different in the ♂ and ♀ fore wings.

Zelandopsocus helvus Thornton & Smithers, new species Fig. 144–149

♀. *Coloration* (freshly killed, in alcohol): Whole insect light brown, usual head markings hardly discernible. Fore wing (Fig. 144) with pterostigma paler, areola postica darker than rest of wing membrane. Eyes black, ocelli clear with narrow black centripetal borders.

Morphology: B = 2.10mm. I.O.:D = 2.3 f_1 = 0.33mm. f_2 = 0.19mm. f_1:f_2 = 1.7 F = 0.45mm. T = 0.85mm. t_1 = 0.29mm. t_2 = 0.03mm. t_3 = 0.04mm. rt = 9.6 : 1.0 : 1.3 ct = 18 Fw = 1.93mm. Hw = 1.60mm. Areola postica in fore wing very shallow (Fig. 144). Epiproct (Fig. 145) sclerotized on lateral margins, apically triangular, a dorsal anterior setose flap. Paraproct with field of 13 trichobothria, 1 seta not in rosette socket. Subgenital plate (Fig. 146) apically with 2 sublobes, each bearing a pair of apical setae. Gonapophyses (Fig. 147) with ear-shaped outer valve, posterior lobe fairly large.

♂. *Coloration* (freshly killed, in alcohol): As ♀.

Morphology: B = 1.90mm. I.O.:D = 0.8 f_1 = 0.60mm. f_2 = 0.39mm. f :f_2 = 1.5 F = 0.53mm. T = 1.03mm. t_1 = 0.36mm. t_2 = 0.03mm. t_3 = 0.06mm. rt = 12.0 : 1.0 : 2.0 ct = 19 Fw = 2.28mm. Hw = 1.86mm. Areola postica in fore wing very shallow, as ♀. Epiproct simple, triangular; paraproct with a field of 17 trichobothria and 1 seta not in rosette socket, mesial edge of field sclerotized. Hypandrium (Fig. 148) 5-lobed. Phallosome (Fig. 149) with usual sclerites for this group of species.

Holotype ♀ (AM), NEW CALEDONIA: Naouritien, near Sarraméa, 27.II.70; allotype ♂, Plateau de Dogny, 1000m, 1.III.70.

Holotype and allotype in Australian Museum.

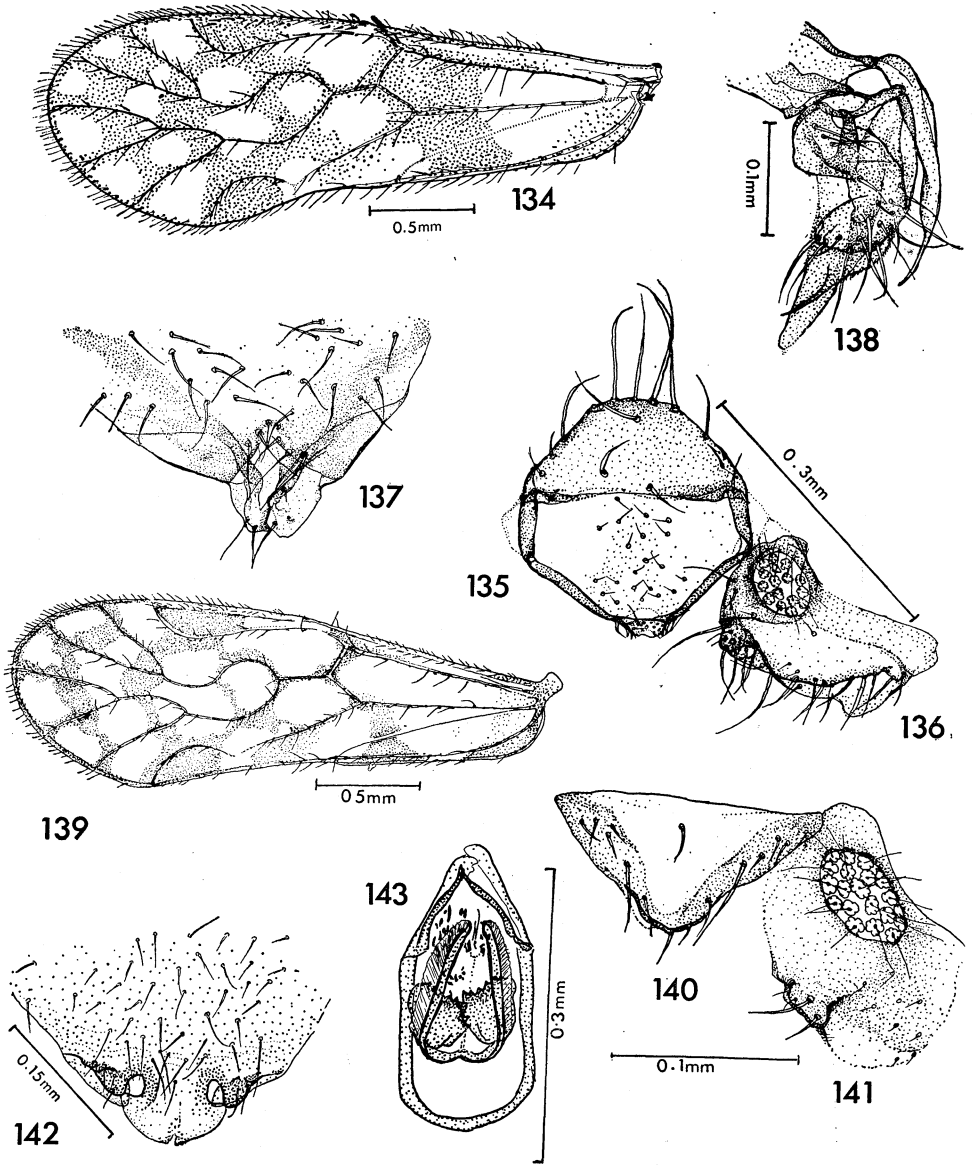


Fig. 134–143. *Zelandopsocus graptus* n.sp. ♀: 134, fore wing; 135, epiproct; 136, paraproct; 137, subgenital plate; 138, gonapophyses. ♂: 139, fore wing; 140, epiproct; 141, paraproct; 142, hypandrium; 143, phallosome. Figures 135 to 137; 140 and 141 to common scales.

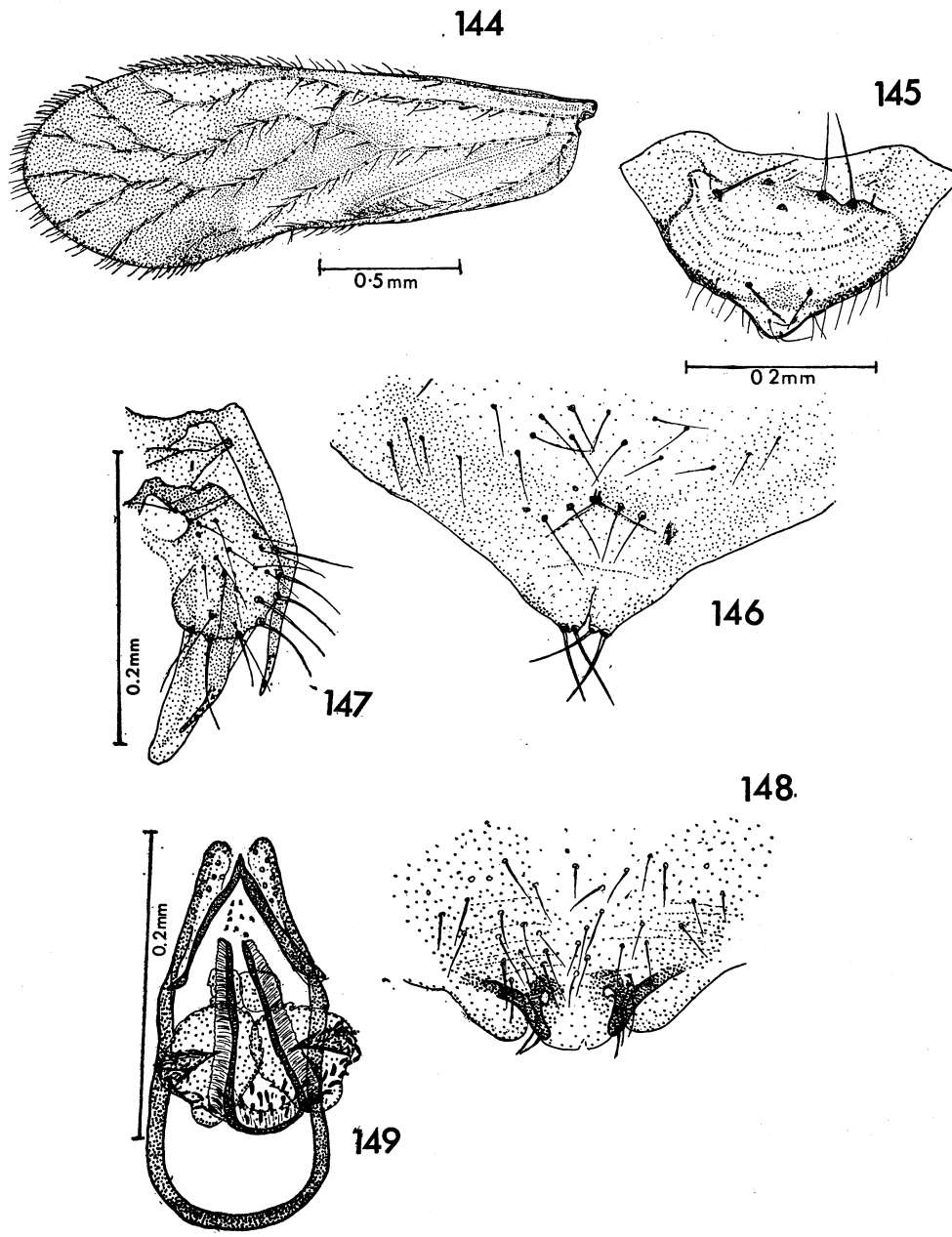


Fig. 144–149. *Zelandopsocus helvus* n.sp. ♀: 144, fore wing; 145, epiproct; 146, subgenital plate; 147, gonapophyses. ♂: 148, hypandrium; 149, phallosome. Figures 146 and 147; 148 and 149 to common scales.

Zelandopsocus hemiptenus Thornton & Smithers, new species Fig. 150–153

♀. *Coloration* (freshly killed, in alcohol): Head light brown, usual pattern very faint, palps very pale cream, scape, pedicel and basal flagellar segment pale cream, rest of flagellum dark brown, eyes black, ocelli clear with black centripetal margins. Fore wing (Fig. 150) pigmented in basal 1/2, hyaline in apical 1/2; hind wing fuscous basally, fading gradually to almost hyaline apically. Thoracic dorsa and pleura dark brown. Legs: coxa dark brown, femur cream, tibia and basal tarsal segment brown, apical tarsal segments dark brown. Abdomen grey-brown dorsally, pale cream

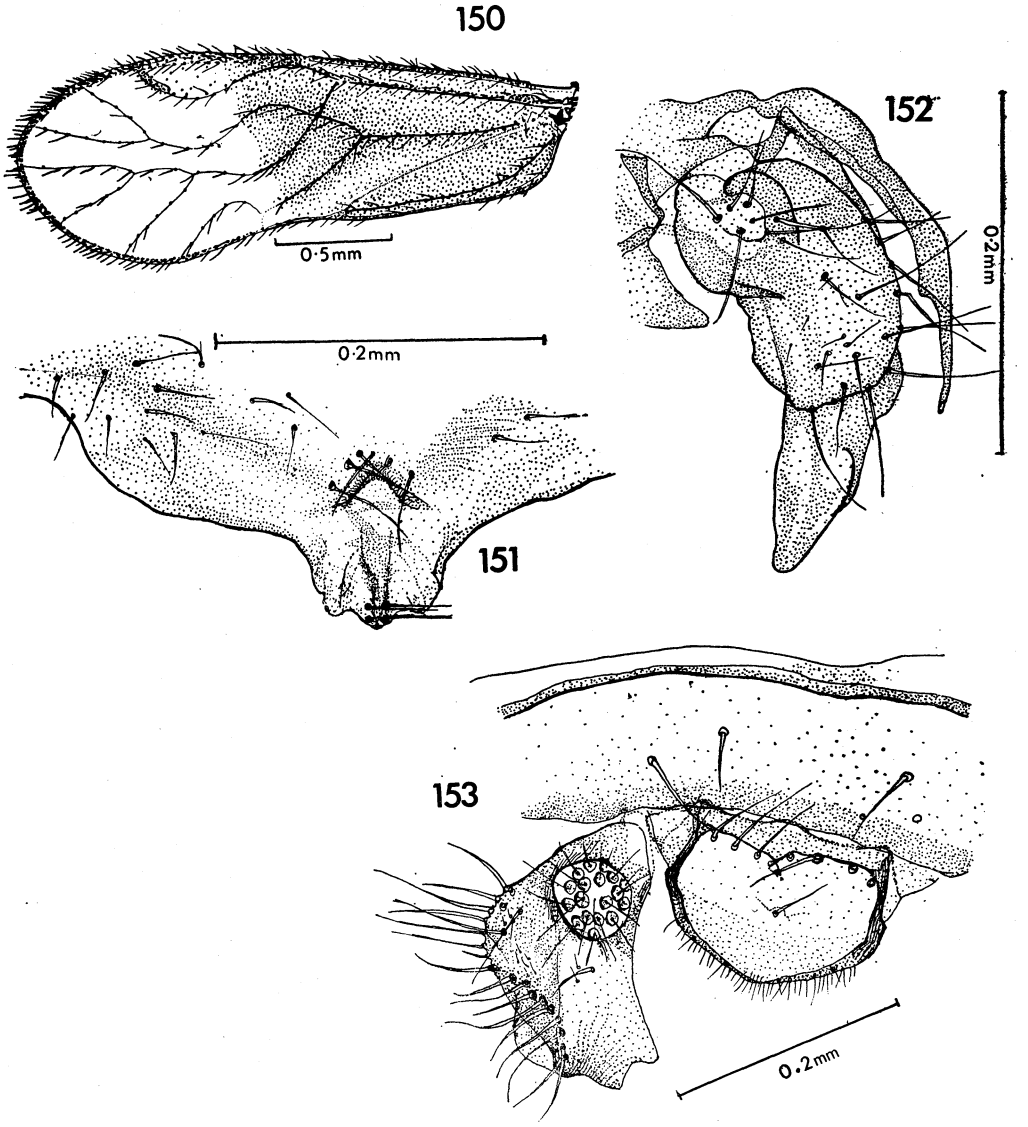


Fig. 150–153. *Zelandopsocus hemiptenus* n.sp. ♀: 150, fore wing; 151, subgenital plate; 152, gonapophyses; 153, epiproct and paraproct.

ventrally.

Morphology: B = 1.96mm. I.O.:D = 2.0 f_1 = 0.61mm. f_2 = 0.26mm. f_1:f_2 = 2.3 F = 0.57mm. T = 1.11mm. t_1 = 0.41mm. t_2 = 0.03mm. t_3 = 0.03mm. rt = 13.0 : 1.0 : 1.0 ct = 21 Fw = 2.39mm. Hw = 1.87mm. Sclerites of head and thorax shining, pigmented area of fore wing glossy. Epiproct very similar to that of *Z. helvus*; paraprocts with a field of 15 trichobothria and 1 seta not in a rosette socket (Fig. 153). Subgenital plate (Fig. 151) with distinct apical lobe, possibly consisting of 2 overlapping lobes, 4 setae (2 in paratype) set on a rounded apical prominence. Gonapophyses (Fig. 152) with elongate setose outer valve.

♂. Unknown.

Holotype ♀ (AM), NEW CALEDONIA: Plateau de Dogny, 1000m, 1.III.70. Paratypes: 2♀♀, 10km S of Koh, 31.I.63 (CMY); ♀, Bambou Valley, Koumac-Ouegoa road, 12.II.71 (JDH); ♀, Col des Roussettes, 550m, 4-6.II.63 (JLG).

Holotype and paratype in Australian Museum. Other paratypes in B. P. Bishop Museum.

This distinctive species is evidently variable; in a number of the paratypes the femora are dark brown, and in all specimens except the holotype the distal section of the peterostigma is bordered with a line of brown pigment, as shown in Fig. 150.

Zelandopsocus humidus Thornton & Smithers, new species Fig. 154–157

♀. *Coloration* (freshly killed, in alcohol): Head sclerites uniformly very dark brown, eyes black, ocelli clear, interocellar area black, median epicranial suture black, antennae light brown. Mesothoracic terga dark brown, metathoracic terga, thoracic pleura, and legs brown, except basal 2 tarsal segments pale brown. Fore wing (Fig. 154) dark brown, with vague patterning and some hyaline areas. Hind wing pale brown. Abdomen cream.

Morphology: B = 2.80mm. I.O.:D = 2.0 f_1 = 0.80mm. f_2 = 0.45mm. f_1:f = 1.7 F = 0.40mm. T = 0.76mm. t_1 = 0.36mm. t_2 = 0.03mm. t_3 = 0.04mm. rt = 12.0:1.0:1.3 ct = 19 Fw = 1.64mm. Hw = 1.41mm. Sclerites of head and thorax shining. Epiproct (Fig. 155) with short fine setae and 1 long seta apically, a basal dorsal setose flap narrower than the epiproct proper. Paraproct (Fig. 155) with circular field of 16 trichobothria and a median row of setae. Subgenital plate (Fig. 156) apparently bilobed, each lobe bearing a stout long seta. Gonapophyses (Fig. 157) outer valve fairly long, ear-shaped, with long prominent setae.

♂. Unknown.

Holotype ♀ (AM), NEW CALEDONIA: Nassirah Pass, E side, 390m, 15.II.70. Paratype ♀, same data as holotype; paratype ♀, Ouitchambo, along river, 14.II.70.

Holotype and paratypes in Australian Museum.

This small sombre species is distinguishable by its body coloration and fore wing pattern.

Zelandopsocus justus Thornton & Smithers, new species Fig. 158–164

♀. *Coloration* (from paratype, freshly killed, in alcohol): Whole insect light brown, with following exceptions: area round ocellar protuberance and a wide diagonal band each side to antennal socket pale cream, eyes and centripetal borders of ocelli black, ocelli clear. Coxa, trochanter and femur of legs very pale fuscous, abdomen pale brownish-cream. Fore wing (Fig. 158) without pterostigma markings, areola postica no darker than rest of membrane; veins brown. Hind wing faint brown.

Morphology: B = 2.00mm. I.O.:D = 2.25 f_1 = 0.73mm. f_2 = 0.39mm. f_1:f_2 = 1.8 F = 0.70mm. T = 1.30mm. t_1 = 0.20mm. t_2 = 0.03mm. t_3 = 0.06mm. rt = 6.6 : 1.0 : 2.0 ct = 20 Fw = 2.70mm. Hw = 2.12mm. Epiproct (Fig. 159) with semicircular setose basal flap; paraproct with field of 15 trichobothria, without obvious marginal sclerotization of field. Gonapophyses (Fig. 160): outer valve ear-shaped,

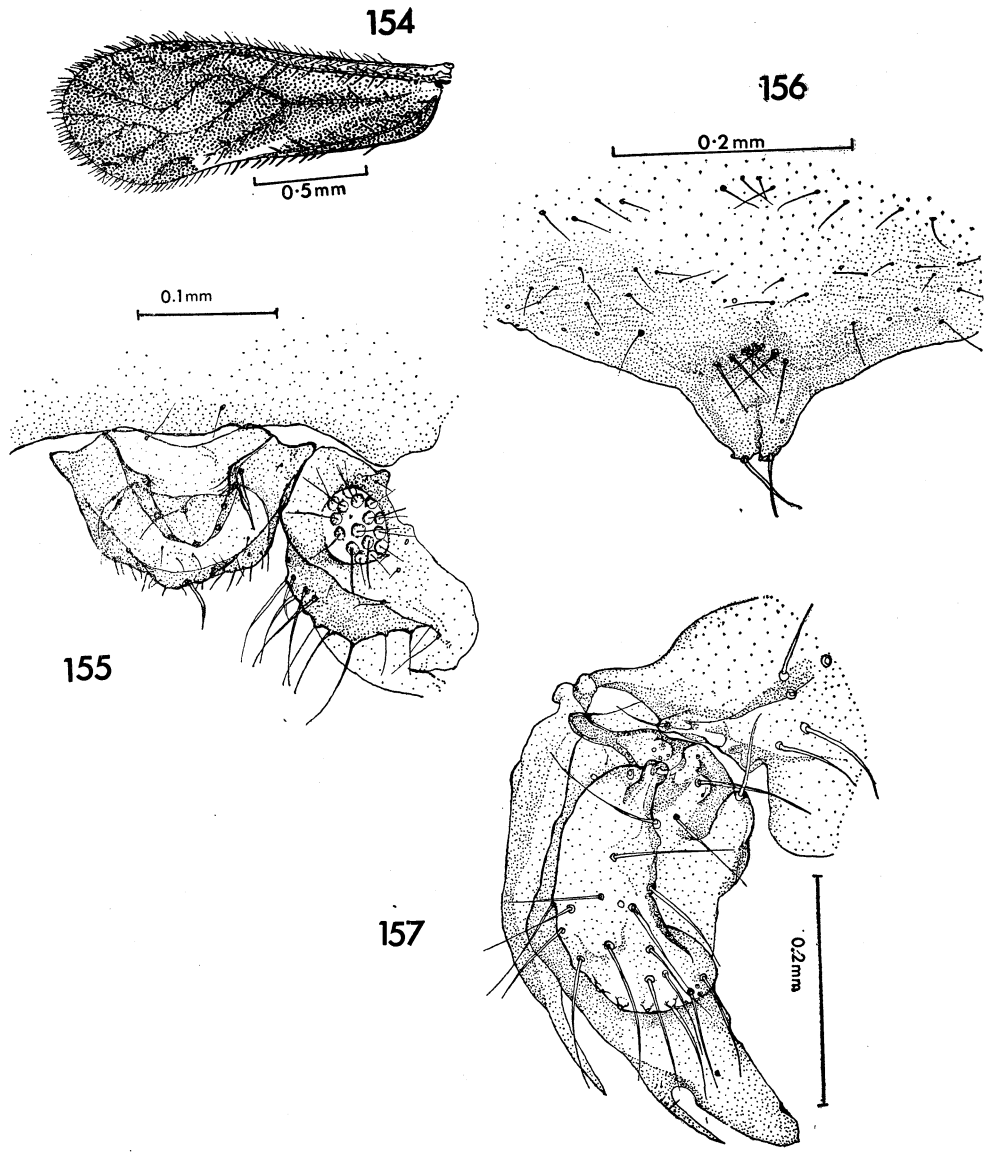


Fig. 154–157. *Zelandopsocus humidus* n.sp. ♀: 154, fore wing; 155, epiproct and paraproct; 156, subgenital plate; 157, gonapophyses.

ventral valve without subapical lobe, dorsal valve with very long, narrow subapical spine. Subgenital plate (Fig. 161) apical lobe shallow, evidently double, each lobe bearing a single seta.

♂. *Coloration* (after *c.* 12 years storage): As ♀.

Morphology: B = 2.15mm. I.O.:D = 1.16 f_1 = 0.89mm. f_2 = 0.51mm. f_1:f_2 = 1.75 F = 0.72mm. T = 1.39mm. t_1 = 0.49mm. t_2 = 0.03mm. t_3 = 0.04mm. rt = 16.3 : 1.0 : 1.3 ct = 19 Fw = 2.62mm. Hw = 2.09mm. Epiproct (Fig. 162) triangular, simple; paraproct with field of 19 trichobothria and 1 seta not in

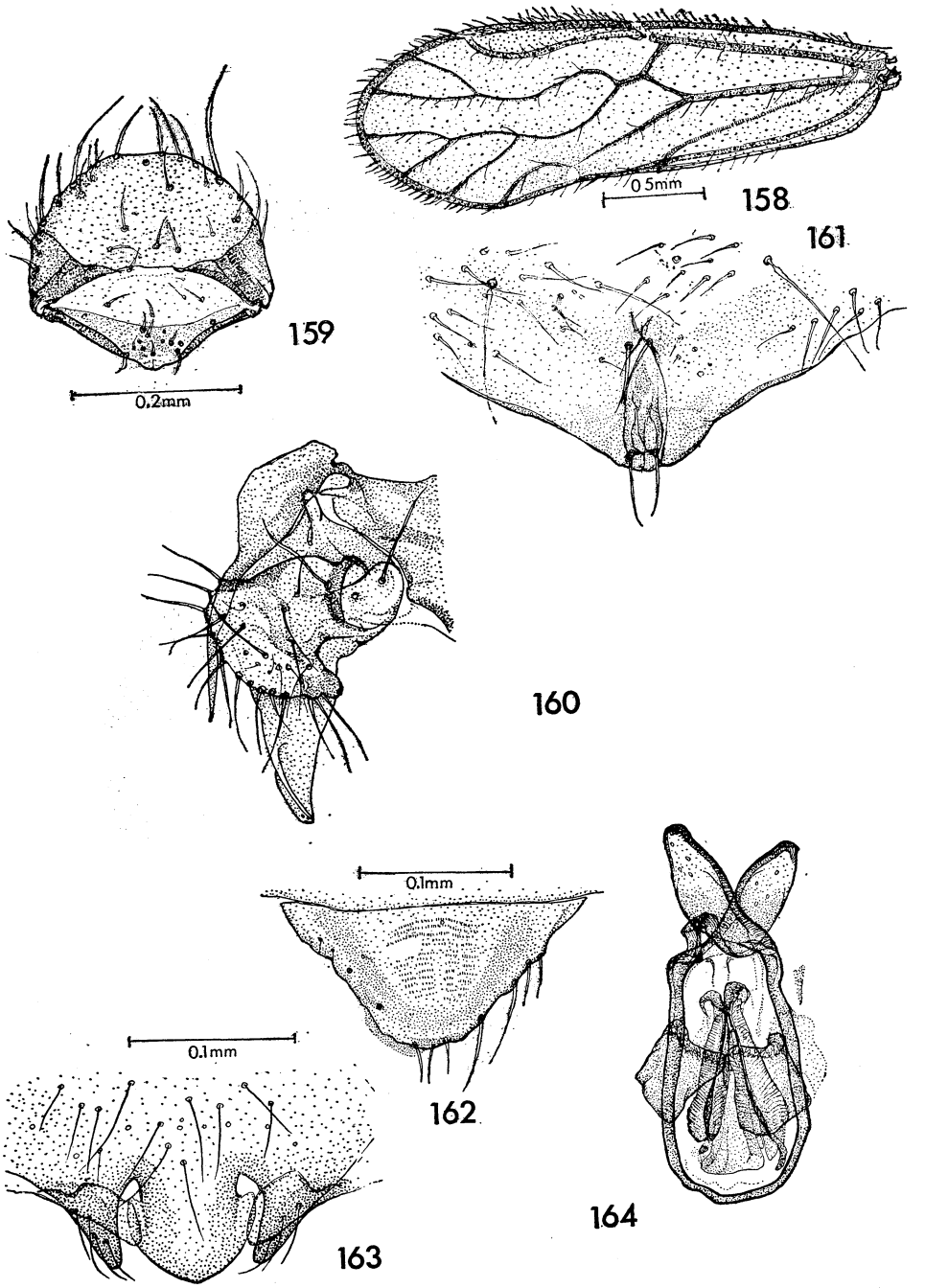


Fig. 158–164. *Zelandopsocus justus* n.sp. ♀: 158, fore wing; 159, epiproct; 160, gonapophyses; 161, subgenital plate. ♂: 162, epiproct; 163, hypandrium; 164, phallosome. Figures 159 and 161; 160, 162 and 164 to common scales.

rosette socket, oval field with sclerotized margin on lateral circumference, rugose peg bearing long seta basally. Hypandrium (Fig. 163) 5-lobed, conical pair of lateral lobes with 3 or 4 long setae on each lobe. Phallosome (Fig. 164) with usual penial sclerites for this group of species.

Holotype ♀ (BISHOP 10,182), NEW CALEDONIA: Mt Koghi, light trap, 28.I.63 (CMY & NLK); allotype ♂, Plaine des Lacs, light trap, 5.XI.58 (CRJ). Paratypes: ♀, Thio Forest stream, dead branches, 11.II.70; 3 ♂♂, Mt Koghi, light trap, 28.I.63 (CMY & NLK); 3♀♀, Thio, 2–11.XI.58 (CRJ); ♂, Plateau de Dogny, at light, 20.XI.58 (CRJ); 3♂♂, 4♀♀, Mt Koghi, 500–600m, at light, 26–30.I.63 (CMY & NLK); 2♂♂, Boulari River, at light, 17.XI.58 (CRJ); ♂, Sarraméa, 12.II.63 (NLK).

Holotype, allotype and paratypes in B. P. Bishop Museum. Other paratype in Australian Museum.

This species is superficially similar to *Z. gilvus* but can be distinguished on pterostigma marking (lacking in *Z. justus*), and by the smaller, ear-shaped outer valve of the ♀ gonapophyses. It is remarkable that most specimens were collected at light.

Zelandopsocus litus Thornton & Smithers, new species Fig. 165–173

♂. *Coloration* (freshly killed, in alcohol): Whole insect pale cream, except: eyes black; a lighter cream wide cross on front of head, center of cross at ocellar protuberance; apical 2 tarsal segments brown; fore wing (Fig. 165) faint yellowish-brown, veins hardly discernible between setal sockets except basal section of *rs* for some distance from its separation from *r* is brown; ocelli clear, without any dark centripetal borders.

Morphology: B = 1.75mm. I.O.:D = 0.6 f_1 = 0.54mm. f_2 = 0.32mm. f_1:f_2 = 1.7 F = 0.54mm. T = 1.00mm. t_1 = 0.35mm. t_2 = 0.03mm. t_3 = 0.05mm. rt = 11.8 : 1.0 : 1.6 ct = 18 Fw = 2.23mm. Hw = 1.85mm. Epiproct (Fig. 166) simple, triangular. Paraproct (Fig. 167) with field of 20 trichobothria and a slightly prominent setose area. Hypandrium (Fig. 168) 5-lobed, narrow inner lobes each bearing 2 setae. Phallosome (Fig. 169) with usual sclerites for this group of species.

♀. *Coloration* (freshly killed, in alcohol): As ♂.

Morphology: B = 2.00mm. I.O.:D = 2.4 f_1 = 0.50mm. f_2 = 0.26mm. f_1:f_2 = 1.9 F = 0.52mm. T = 0.93mm. t_1 = 0.34mm. t_2 = 0.03mm. t_3 = 0.05mm. rt = 11.3 : 1.0 : 1.6 ct = 20 Fw = 2.24mm. Hw = 1.79mm. Epiproct (Fig. 170, paratype, Mt Koghi) sclerotized on posterior margin with about 20 short fine setae on truncate apex, posteriorly a membranous semicircular flap bearing long stout setae at intervals along its margin. Paraproct (Fig. 171) with a row of setae and a setose prominence, a field of 16 trichobothria. Subgenital plate (Fig. 172, paratype, Madeleine) apparently bilobed apically, each lobe bearing a stout and a fine seta. Gonapophyses (Fig. 173) with outer valve having long, setose posterior lobe.

Holotype ♂ (AM), NEW CALEDONIA: Thio Forest stream, *ex Araucaria*, 11.II.70; allotype ♀, Le Crouen, *ex Casuarina*, 17.II.70. Paratypes: 2♀♀, 2♂♂, same data as holotype; ♀, La Madeleine, Bay of Kauris, dry scrub, 12.II.70; ♂, Bourail, 4.II.63 (JLG); ♀, Mt Koghi, 10.II.70. 1♂, 5♀♀, Bay of Kauris, Plaine des Lacs, *ex Baeckia*, 12.II.70; 8♂♂, 23♀♀, Le Crouen, *ex Casuarina*, 17.II.70; 13♂♂, 14♀♀, Le Crouen, 2km above hot springs, *ex Araucaria*, 17.II.70; 1♀, Ciu Falls, 17.II.70; 6♂♂, 3♀♀, Plateau de Dogny, 1000m, 1.III.70; 1♂, 2♀♀, Thio Forest stream, *Araucaria*, 11.II.70; 1♂, Mt Koghi, 550m, swept from primary forest undergrowth, 22.VIII.71 (JDH); 1♀, Dome de Tiebaghi, *ex Acacia spinorbis*, 10.VII.71 (JDH); 5♂♂, 5♀♀, 3 nymphs, Plaine des Lacs, Pic du Pin, *ex Baeckia ericoides*, 8.VIII.71 (JDH); 3♀♀, La Madeleine, Plaine des Lacs, near Bay of Kauris, dry scrub, 12.II.70; 2♀♀, W side of Petchikara Pass, 600m, 16.II.70; 1♀, 4♂♂, Mt Koghi, 600m, light trap, 26.I.63 (CMY & NLK); 1♀, Plum, 23.I.63 (CMY); 1♂, 1♀, on heights between Thio and Nakety, 12.XI.58, at light (CRJ);

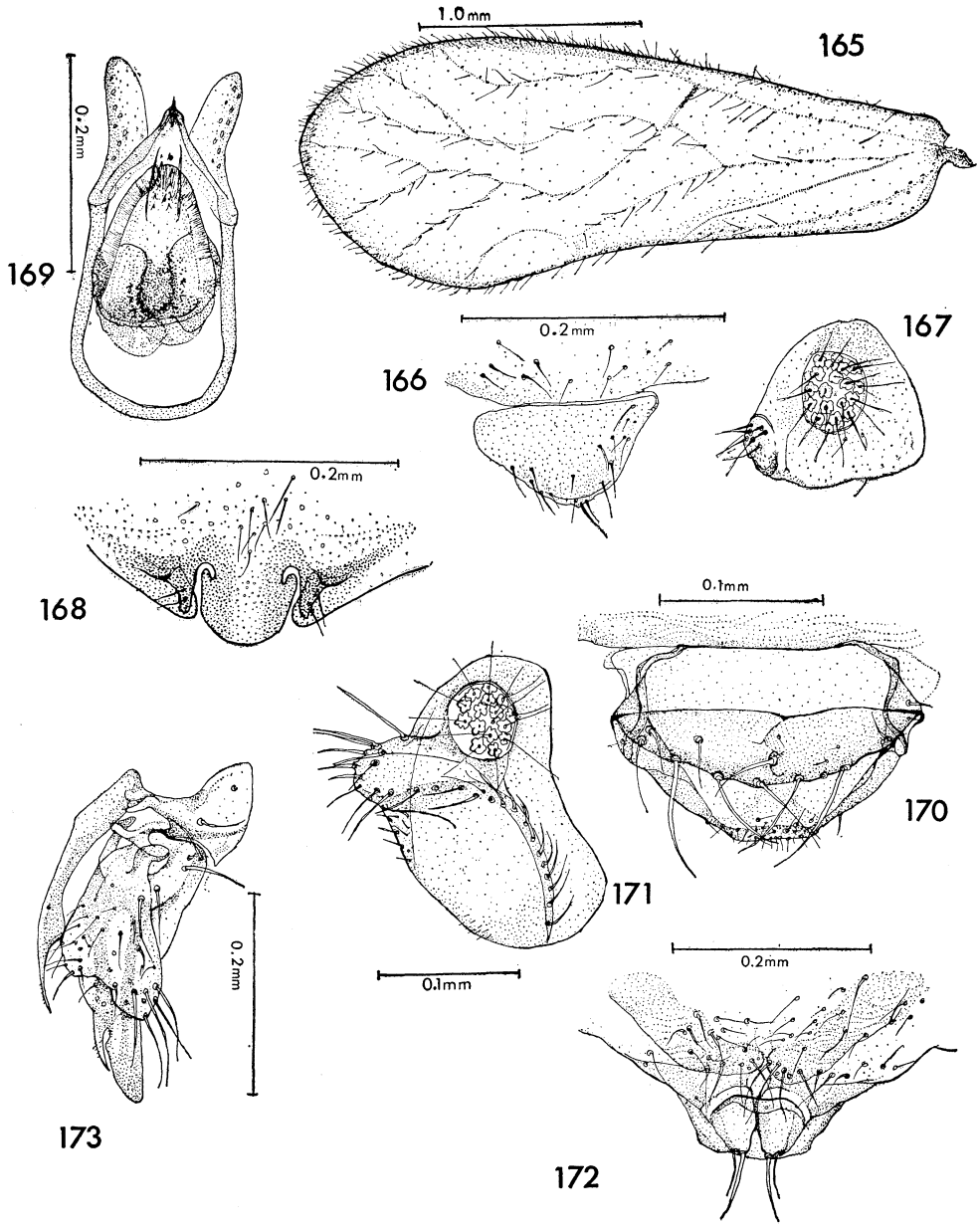


Fig. 165–173. *Zelandopsocus litus* n.sp. ♂: 165, fore wing; 166, epiproct; 167, paraproct; 168, hypandrium; 169, phallosome. ♀: 170, epiproct; 171, paraproct; 172, subgenital plate; 173, gonapophyses.

1♀, Yahoué, 28.VIII.40 (FXW); 1♂, Anse Vata, Noumea, 23.X.58 (CRJ); 1♀, Mt Igambi, primary forest, gneiss, 100m, 16.VII.71 (JDH).

Holotype, allotype and paratypes in Australian Museum. Other paratype in B. P. Bishop Museum.

This common pale species is similar to *Z. gilvus* and *Z. justus*, which are also generally pale and uniformly coloured. It differs from both in that the ocelli have no dark centripetal borders, and the fore wing veins are very pale except for the basal stretch of *rs*. It differs from *gilvus* in lacking the patterned pterostigma, and from *justus* in the shape and chaetotaxy of the outer valve of the ♀ gonapophyses.

Zelandopsocus loxus Thornton & Smithers, new species Fig. 174–177.

♀. *Coloration* (freshly killed, in alcohol): Head uniformly very dark brown, almost black; eyes black, ocelli clear, interocellar area black. Fore wing (Fig. 174) hyaline with distinct brown markings, hind wing hyaline. Thoracic sclerites and coxae of legs very dark brown. Prothoracic and mesothoracic legs with trochanter and femur cream, tibia brown, darkening distally, tarsal segments very dark brown. Metathoracic leg as above but femur brown. Abdomen white, with distinct narrow dark brown transverse lines at junction of terga, these fused each side into wide longitudinal bands, apical sclerites dark brown; abdomen ventrally whitish cream.

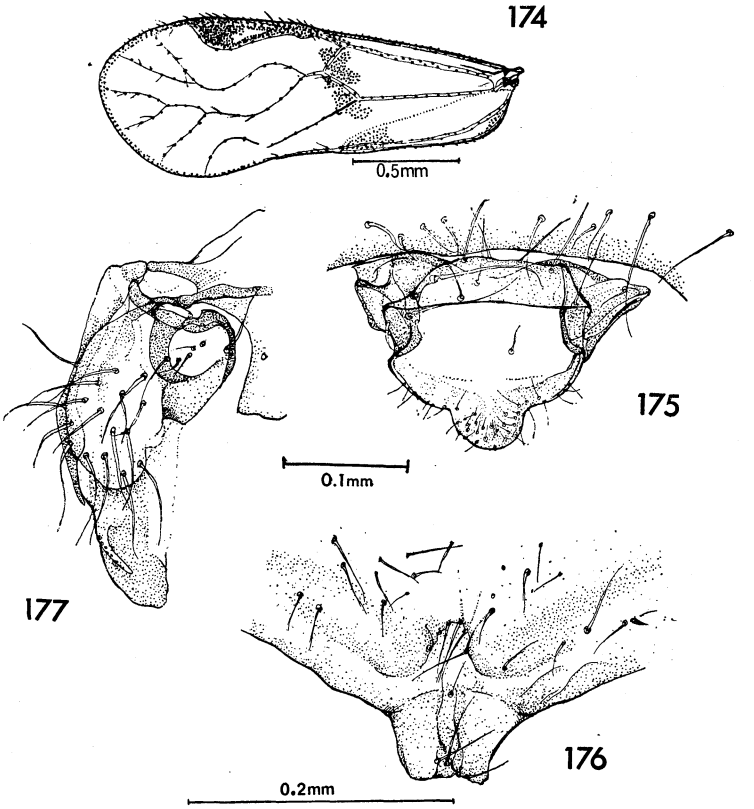


Fig. 174–177. *Zelandopsocus loxus* n.sp. ♀: 174, fore wing; 175, epiproct; 176, subgenital plate; 177, gonapophyses. Figures 175 and 177 to common scale.

Morphology: Head and thoracic sclerites very glossy, several long setae mesial to eye each side, a pair of long setae on mesothoracic pronotum. B = 1.80mm. I.O.:D = 2.2 f_1 = 0.47mm. f_2 = 0.27mm. f_1:f_2 = 1.74 F = 0.53mm. T = 1.00mm. t_1 = 0.33mm. t_2 = 0.03mm. t_3 = 0.05mm. rt = 11.0 : 1.0 : 1.6 ct = 18 Fw = 2.04mm. Hw = 1.64mm. Epiproct (Fig. 175) somewhat collapsed, but evidently triangular apically with a dorsal setose flap; paraproct with field of 15 trichobothria and 1 seta not in rosette socket, part of field margin sclerotized. Subgenital plate (Fig. 176) apparently bilobed apically, lobes overlapping, each bearing a pair of setae. Gonapophyses as in Fig. 177.

♂. Unknown.

Holotype ♀ (AM), NEW CALEDONIA: W side Petchikara Pass, 550m, 16.II.70. Paratype: ♀, Mt Koghi, 500m, primary forest, 19.VIII.71 (JDH); ♀, E side Petchikara Pass, 600m, 16.II.70. 1♀, Mt Mou, 1200m, 21.VIII.40 (FXW).

Holotype and paratypes in Australian Museum.

This species is quite distinctive in wing markings.

Zelandopsocus luridus Thornton & Smithers, new species Fig. 178–184

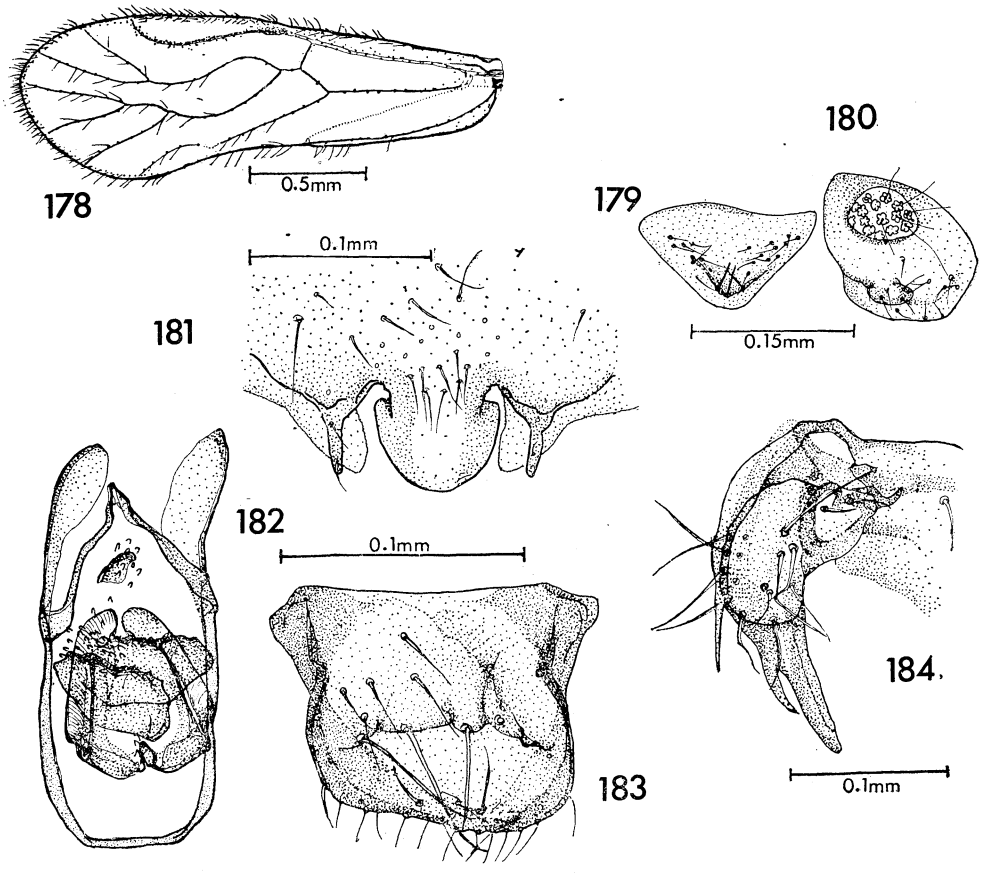


Fig. 178–184. *Zelandopsocus luridus* n.sp. ♂: 178, fore wing; 179, epiproct; 180, paraproct; 181, hypandrium; 182, phallosome. ♀: 183, epiproct; 184, gonapophyses. Figures 179 and 180; 182 and 184 to common scales.

♂. *Coloration* (after *c.* 14 years dry storage): Pattern not discernible, whole insect probably pale. Eyes black, ocelli with dark centripetal borders. Wings very faint, almost hyaline, veins distinct, pterostigma particularly prominent (Fig. 178).

Morphology: B = 1.40mm. I.O.:D = 0.9 f_1 = 0.55mm. f_2 = 0.28mm. f_1:f_2 = 1.96 F = 0.45mm. T = 0.89mm. t_1 = 0.30mm. t_2 = 0.04mm. t_3 = 0.05mm. rt = 7.5 : 1.0 : 1.25 ct = 15 Fw = 2.04mm. Hw = 1.64mm. Epiproct (Fig. 179) simple, triangular; paraproct (Fig. 180) with low sclerotized prominence and a field of 15 trichobothria. Hypandrium (Fig. 181) 5-lobed, 1 pair of lateral lobes long, narrow, each bearing 2 setae. Phallosome (Fig. 182).

♀. *Coloration* (freshly killed, in alcohol): Whole insect, including legs and abdomen, very pale brown, otherwise as ♂.

Morphology: B = 1.90mm. I.O.:D = 2.0 f_1 = 0.62mm. f_2 not available F = 0.35mm. T = 0.51mm. t_1 = 0.11mm. t_2 = 0.02mm. t_3 = 0.03mm. rt = 5.5 : 1.0 : 1.5 ct = 0 Fw = 2.22mm. Hw = 1.81mm. Epiproct (Fig. 183) with a row of short setae on posterior border, a dorsal flap bearing more widely spaced longer setae. Paraproct with a circular field of 13 trichobothria and longitudinal row of setae. Subgenital plate destroyed. Gonapophyses (Fig. 184) with outer valve setose, subrectangular.

Holotype ♂ (BISHOP 10,183), NEW CALEDONIA: Plaine des Lacs area, at light, 5.XI.58 (CRJ); allotype ♀, Mt Pouédihi, 560m, Rivière Blanche, primary forest undergrowth, 4.VIII.71 (JDH). Paratype ♂, same data as allotype (damaged).

Holotype in B. P. Bishop Museum. Allotype and paratype in Australian Museum.

This species is distinguishable from the other concolorous pale species by the relatively hyaline fore wing, the hypandrium, the shape of the outer valve of the ♀ gonapophyses, and the absence of ctenidiobothria on the ♀ tarsus.

Zelandopsocus marmor Thornton & Smithers, new species. Fig. 185–188

♀. *Coloration* (freshly killed, in alcohol): Head greyish-brown, a pale cream cross centered on ocellar protuberance, posterior arms narrower than anterior, eyes black, ocelli with black centripetal borders, frons with a central brown mark, scape, pedicel and basal flagellar segment pale brown. Thoracic sclerites brown, legs with coxa brown, femur pale fuscous, tibia basally brown fading to light brown distally, basal tarsal segment light brown, apical segments brown. Fore wing (Fig. 185) patterned in shades of brown; hind wing pale fuscous, darker towards anterior margin. Abdomen pale fawn, apical sclerites brown.

Morphology: B = 2.65mm. I.O.:D = 2.5 f_1 = 0.54mm. f_2 = 0.35mm. f_1:f_2 = 1.54 F = 0.71mm. T = 1.35mm. t_1 = 0.45mm. t_2 = 0.04mm. t_3 = 0.05mm. rt = 11.25 : 1.0 : 1.25 ct = 20 Fw = 2.86mm. Hw = 2.36mm. Epiproct (Fig. 186) sclerotized along posterior border, with a strong apical seta and numerous small fine ones, a posterior dorsal flap with long setae regularly arranged along its border. Paraproct with a circular field of 15 trichobothria. Subgenital plate (Fig. 187) bilobed, each lobe with a pair of setae. Gonapophyses (Fig. 188) with oval outer valve.

♂. Unknown.

Holotype ♀ (AM), NEW CALEDONIA: Plateau de Dogny, 1000m, 1.III.70. Paratype ♀, Valley of Bambou, Koumac-Ouegoa Rd., 12.VII.71 (JDH).

Holotype and paratype in Australian Museum.

This species is quite distinctive in wing pattern.

Zelandopsocus ochrus Thornton & Smithers, new species Fig. 189–192

♂. *Coloration* (freshly killed, in alcohol): Head very dark brown, eyes and ocellar interval black. Thorax and legs dark brown except prothorax and mesothoracic femora pale brown. Fore wing (Fig. 189) largely hyaline, pterostigma very distinctly outlined in dark brown, anal angle of wing fuscous. Hind wing hyaline, costal cell brown. Abdomen cream, apical sclerites dark brown.

Morphology: B = 1.73mm. I.O.:D = 2.0 f_1 = 0.34mm. f_2 = 0.21mm. f_1:f_2 = 1.62 F = 0.53mm. T =

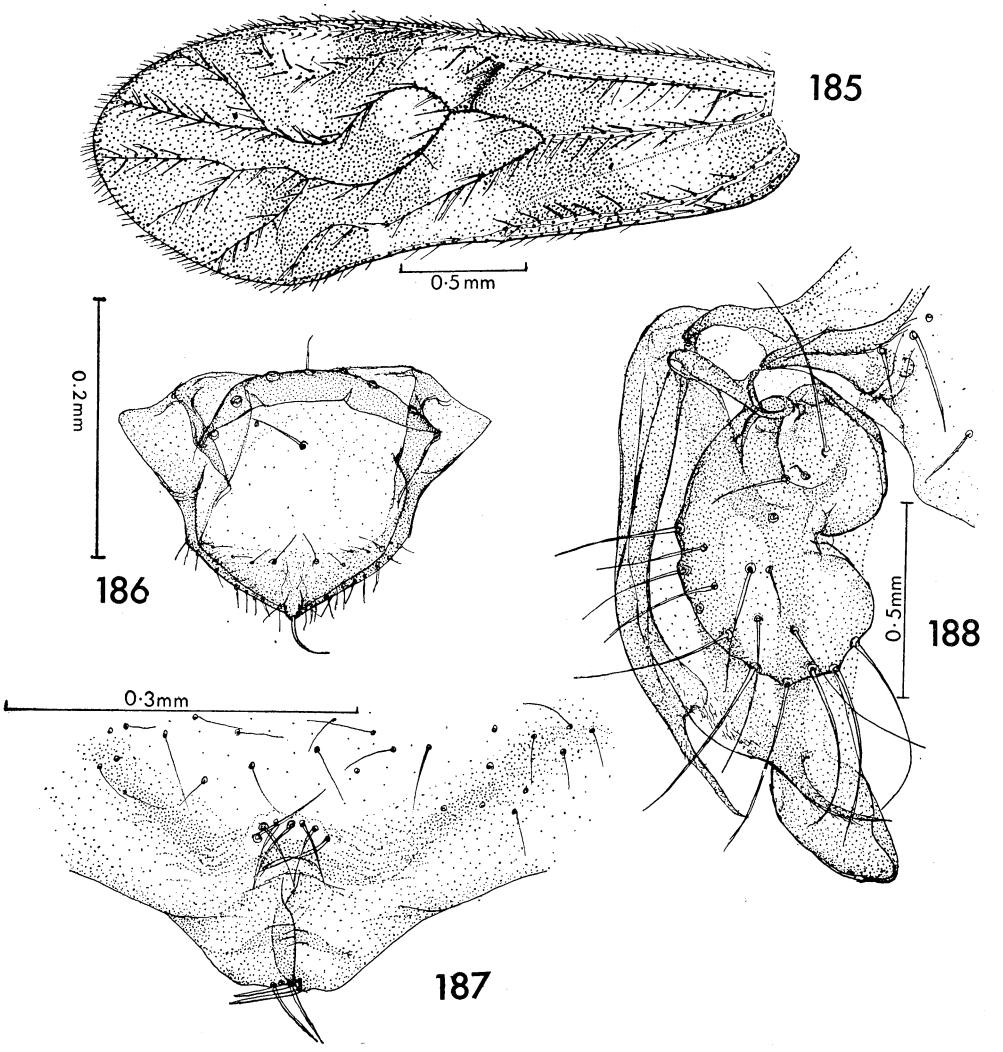


Fig. 185–188. *Zelandopsocus marmor* n.sp. ♀: 185, fore wing; 186, epiproct; 187, subgenital plate; 188, gonapophyses.

0.98mm. t_1 = 0.34mm. t_2 = 0.04mm. t_3 = 0.06mm. rt = 8.5 : 1.0 : 1.5 ct = 21 Fw = 1.70mm. Hw = 1.19mm. Head and thoracic sclerites glossy. Epiproct simple, paraproct (Fig. 190) with oval field of 17 trichobothria and a prominent curved peg with low surface projections and 2 or 3 long setae at its base. Hypandrium (Fig. 191) 5-lobed, central lobe slightly pointed and bearing a field of very fine microtrichia. Phallosome (Fig. 192) with usual sclerites.

♀. Unknown.

Holotype ♂ (BISHOP 10,184), NEW CALEDONIA: New Caledonia, Malaise trap, 1963 (CMY & NLK). Paratype ♂, Mt Koghi, 500m, at light, 19.VIII.71 (JDH).

Holotype in B. P. Bishop Museum. Paratype in Australian Museum.

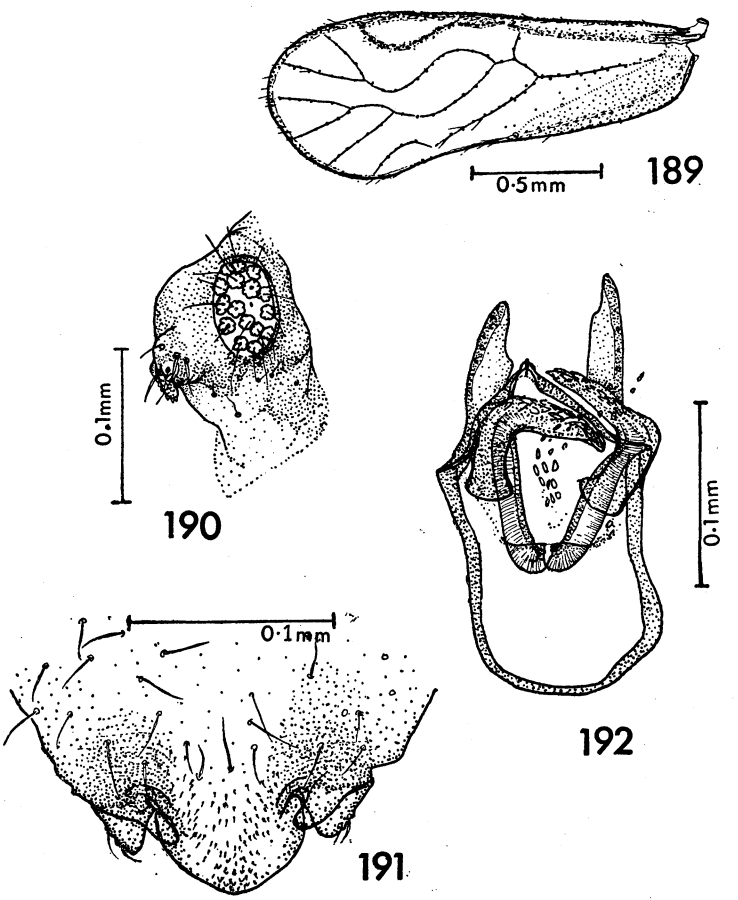


Fig. 189–192. *Zelandopsocus ochrus* n.sp. ♂: 189, fore wing; 190, paraproct; 191, hypandrium; 192, phallosome.

This dark-bodied species with hyaline fore wings may be distinguished from others with a similar appearance by the fuscous anal area of the fore wing.

Zelandopsocus oropedius Thornton & Smithers, new species Fig. 193–197

♂. *Coloration* (freshly killed, in alcohol): Head completely dark brown, including antennae and palps, eyes black, ocellar interval black. Thoracic sclerites and whole of legs brown, only slightly lighter than head. Fore wing (Fig. 193) with pigment patches in pterostigma, in angle of anal cell, and basal to *rs–m* junction; setae on veins in basal half of wing sited on very small pigmented spots. Hind wing hyaline. Abdomen creamy-white, apical sclerites dark brown.

Morphology: B = 2.30mm. I.O.:D = 1.8 f_1 = 0.46mm. f_2 = 0.26mm. f_1:f_2 = 1.77 F = 0.45mm. T = 0.93mm. t_1 = 0.32mm. t_2 = 0.03mm. t_3 = 0.05mm. rt = 10.67 : 1.0 : 1.67 ct = 20 Fw = 2.12mm. Hw = 1.71mm. Head and thoracic sclerites dull. Epiproct (Fig. 194) simple; paraproct (Fig. 195) with oval field of 20 trichobothria and an apical area bearing minute spines and a group of setae. Hypandrium (Fig. 196) 5-lobed. Phallosome (Fig. 197) with 2 sac-like spinous sclerites and possible remnants of a ribbon-sclerite.

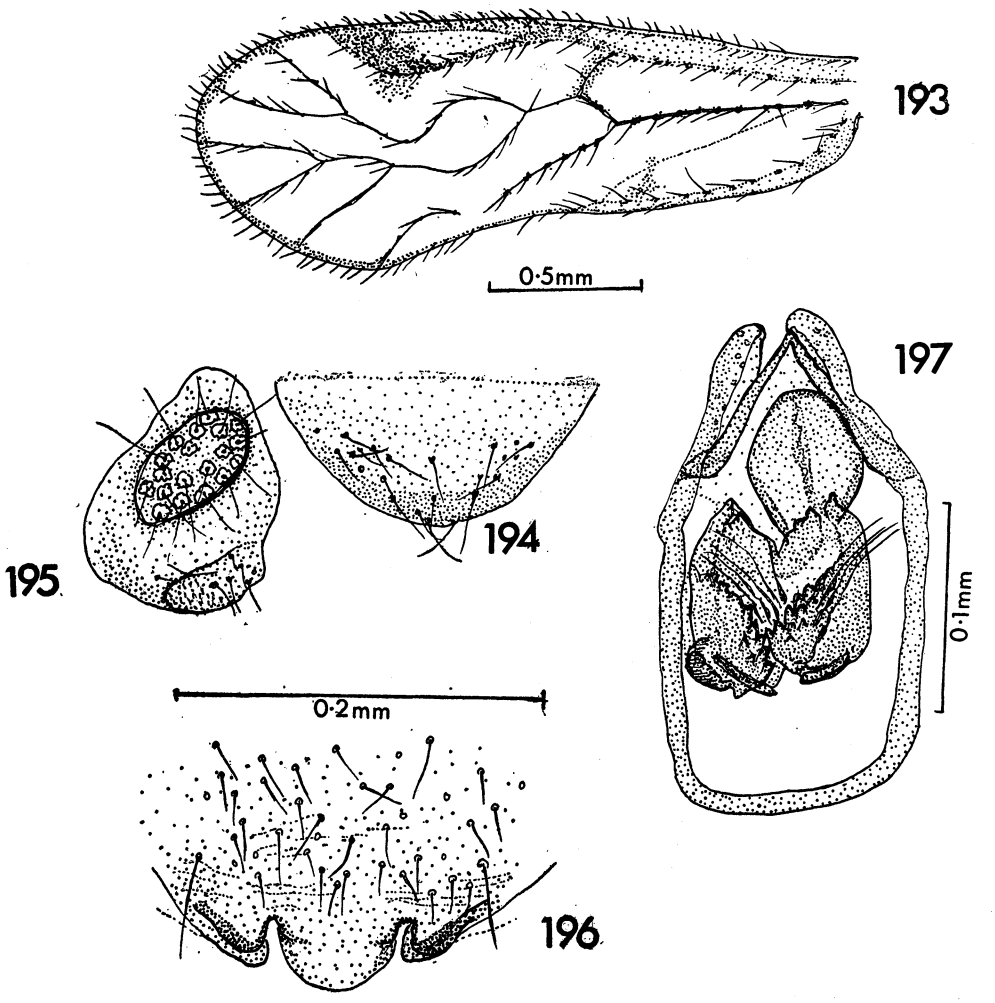


Fig. 193-197. *Zelandopsocus oropedius* n.sp. ♂: 193, fore wing; 194, epiproct; 195, paraproct; 196, hypandrium; 197, phallosome. Figures 194 to 196 to common scale.

♀. Unknown.

Holotype ♂(AM), NEW CALEDONIA: Plateau de Dogny, 1000m, 1.III.70. Paratype ♂, Mt Koghi, 500m, primary forest, 19.VIII.71 (JDH).

Holotype and paratype in Australian Museum.

This species is quite distinctive on fore wing pattern.

Zelandopsocus perilegnes Thornton & Smithers, new species Fig. 198–207

♀. *Coloration* (freshly killed, in alcohol): Whole insect pale yellowish-brown, except a distinct cream wide cross-shaped mark on head, centered at ocellar protuberance, eyes and centripetal ocellar borders black. Fore wing (Fig. 198) membrane faintly smoky, hyaline along most veins and between ends of vein forks at apical margin, ends of veins with triangular grey-brown pigment, vertex of

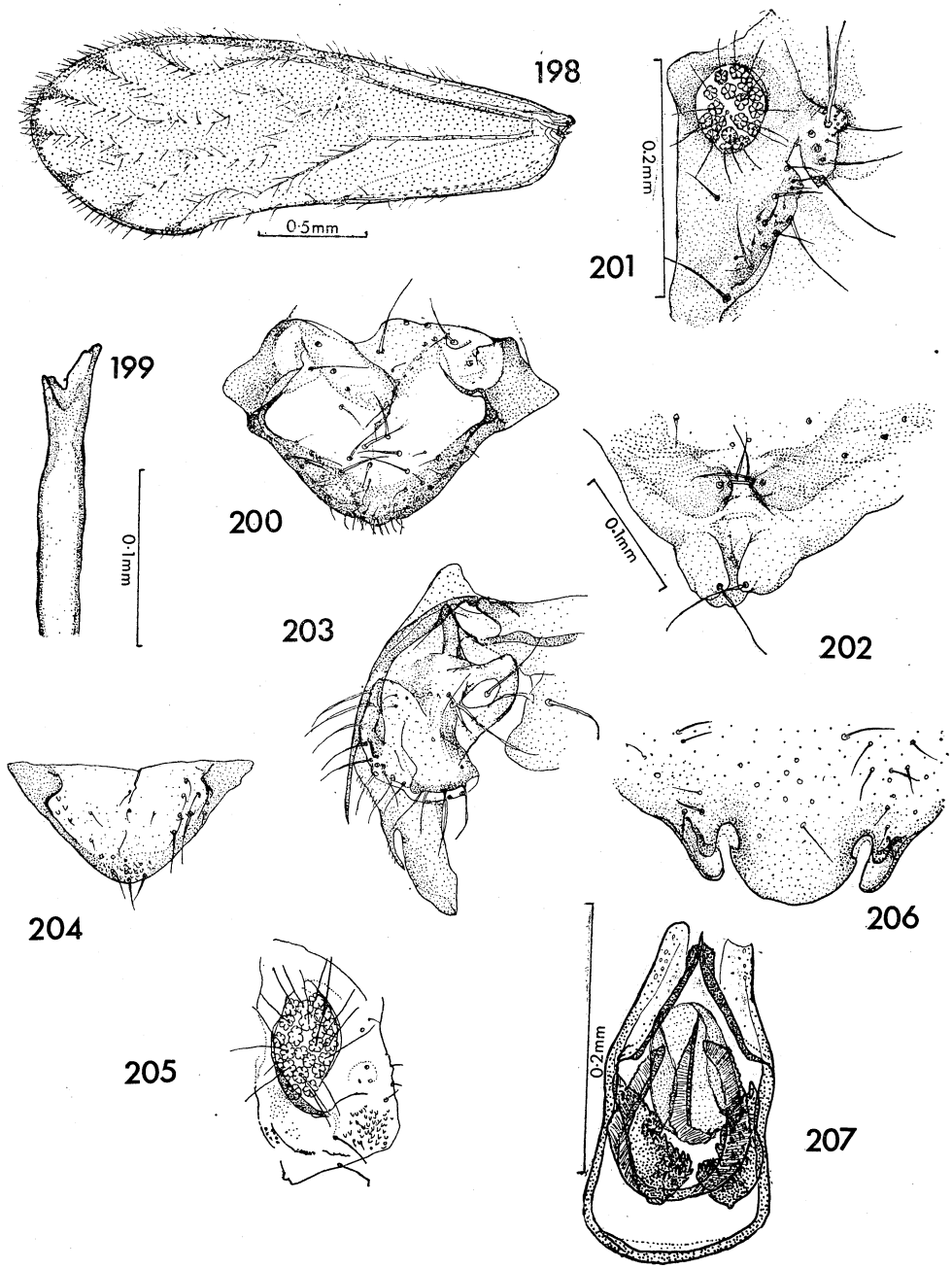


Fig. 198–207. *Zelandopsocus perilegnes* n.sp. ♀: 198, fore wing; 199, lacinial apex; 200, epiproct; 201, paraproct; 202, subgenital plate; 203, gonapophyses. ♂: 204, epiproct; 205, paraproct; 206, hypandrium; 207, phallosome. Figures 200 and 203 to 207 to common scale.

pterostigma faint. Hind wing hyaline, veins distinct. Abdomen cream.

Morphology: Lacinia (Fig. 199, Mt Koghi paratype) with 2 major teeth. Hind wing veins setose: r_1—0, *rs*—0, r_{2+3}—0, r_{4+5}—6, *m*—6, *cu*—0. B = 1.85mm. I.O.:D = 2.6 f_1 = 0.76mm. f_2 = 0.45mm. f_1:f_2 = 1.69 F = 0.66mm. T = 1.14mm. t_1 = 0.38mm. t_2 = 0.05mm. t_3 = 0.05mm. rt = 7.6 : 1.0 : 1.0 ct = 22 Fw = 2.55mm. Hw = 1.93mm. Epiproct (Fig. 200) apical border sclerotized, apex with short, fine setae, a dorsal setose flap; paraproct (Fig. 201) (damaged) with a field of 17 trichobothria and a setose prominence. Subgenital plate (Fig. 202) apparently bilobed, each lobe bearing an apical seta. Gonapophyses (Fig. 203) with semicircular outer valve, dorsal valve bluntly pointed apically.

♂. *Coloration* (freshly killed, in alcohol): As ♀.

Morphology: Hind wing veins setose: r_1—0, *rs*—0, r_{2+3}—1, r_{4+5}—15, *m*—8, *cu*—0. B = 1.75mm. I.O.:D = 1.1 f_1 = 0.91mm. f_2 = 0.65mm. f_1:f_2 = 1.40 F = 0.62mm. T = 1.17mm. t_1 = 0.40mm. t_2 = 0.04mm. t = 0.06mm. rt = 10.0 : 1.0 : 1.5 ct = 23 Fw = 2.45mm. Hw = 1.97mm. Epiproct (Fig. 204) simple, triangular; paraproct (Fig. 205) with an oval field of 22 trichobothria, margin of field sclerotized on 2 long sides, a large hemispherical rugose prominence apically. Hypandrium (Fig. 206) 5-lobed, 1 pair of lobes heavily sclerotized apically. Phallosome (Fig. 207) with usual sclerites and a central sclerite apparently bipartite.

Holotype ♀ (AM), NEW CALEDONIA: Mt Koghi, *ex Marattia attenuata,* 10.II.70; allotype ♂, same data as holotype. Paratypes: 1♀, Mt Koghi, 500m, light trap, 26.I.63 (CMY & NLK); 1♀, 1km from mouth of River Faosse, Yaté, undergrowth, 5.VIII.71 (JDH); 1♂, 1♀, W slope Pic du Pin, Plaine des Lacs, *Nothofagus* forest undergrowth, 7.VII.71 (JDH); 2♀♀, Mt Koghi, 500m, at light, 19.VIII.71 (JDH); 1♂, Mt Panié, 800m, open gymnosperm and broadleaf forest, 28.VII.71 (JDH); 1♀, undergrowth of primary forest Point Boisé, 13.VIII.71 (JDH); 1♂, 1♀, Nassirah Pass, E side, 400m, 15.II.70; 1♀, Col des Pirogues, 14.II.63 (NLK).

Holotype, allotype and paratypes in Australian Museum. Other paratype in B. P. Bishop Museum.

This species has a quite distinctive wing pattern, recalling that of some species of *Pseudocaecilius* in the SW Pacific. It is unusual in this group of philotarsids in having the veins of the hind wing setose.

Zelandopsocus perinesus Thornton & Smithers, new species Fig. 208–212

♂. *Coloration* (after *c.* 9 years dry storage): Head uniformly dark brown, eyes and ocellar interval black, palps and flagella missing, scape and pedicel brown. Thoracic sclerites dark brown, legs with coxa and femur dark brown, tibia and tarsal segments brown. Fore wing (Fig. 208) with margin and pterostigma pigmented purplish-brown, membrane posterior to *cu* slightly fuscous, otherwise hyaline. Hind wing faintly fuscous. Colour of abdomen not discernible.

Morphology: B = 2.00mm. I.O.:D = 1.75 f_1 and f_2 not available. F = 0.57mm. T = 1.05mm. t_1 = 0.36mm. t_2 = 0.04mm. t_3 = 0.06mm. rt = 9.0 : 1.0 : 1.5 ct = 20 Fw = 2.13mm. Hw = 1.78mm. Head and thoracic sclerites shining. Epiproct (Fig. 209) triangular, sclerotized at apex; paraproct (Fig. 210) with oval field of 19 trichobothria and 1 seta not in rosette socket, a subapical stout sclerotized prong. Hypandrium (Fig. 211) 7-lobed, none of the paired lobes very low. Phallosome (Fig. 212) with usual U-shaped sclerite and spinous bodies.

♀. Unknown.

Holotype ♂ (BISHOP 10,185), NEW CALEDONIA: Mt Koghi, 600m, 30.IX.63 (RS). Holotype in B. P. Bishop Museum.

This species is superficially similar to *Z. translucidus,* which is also known only from the ♂. It may be distinguished by the purplish pigment on the fore wing, the much smaller eyes, the dark femora, and details of hypandrial, epiproct and paraproct structure.

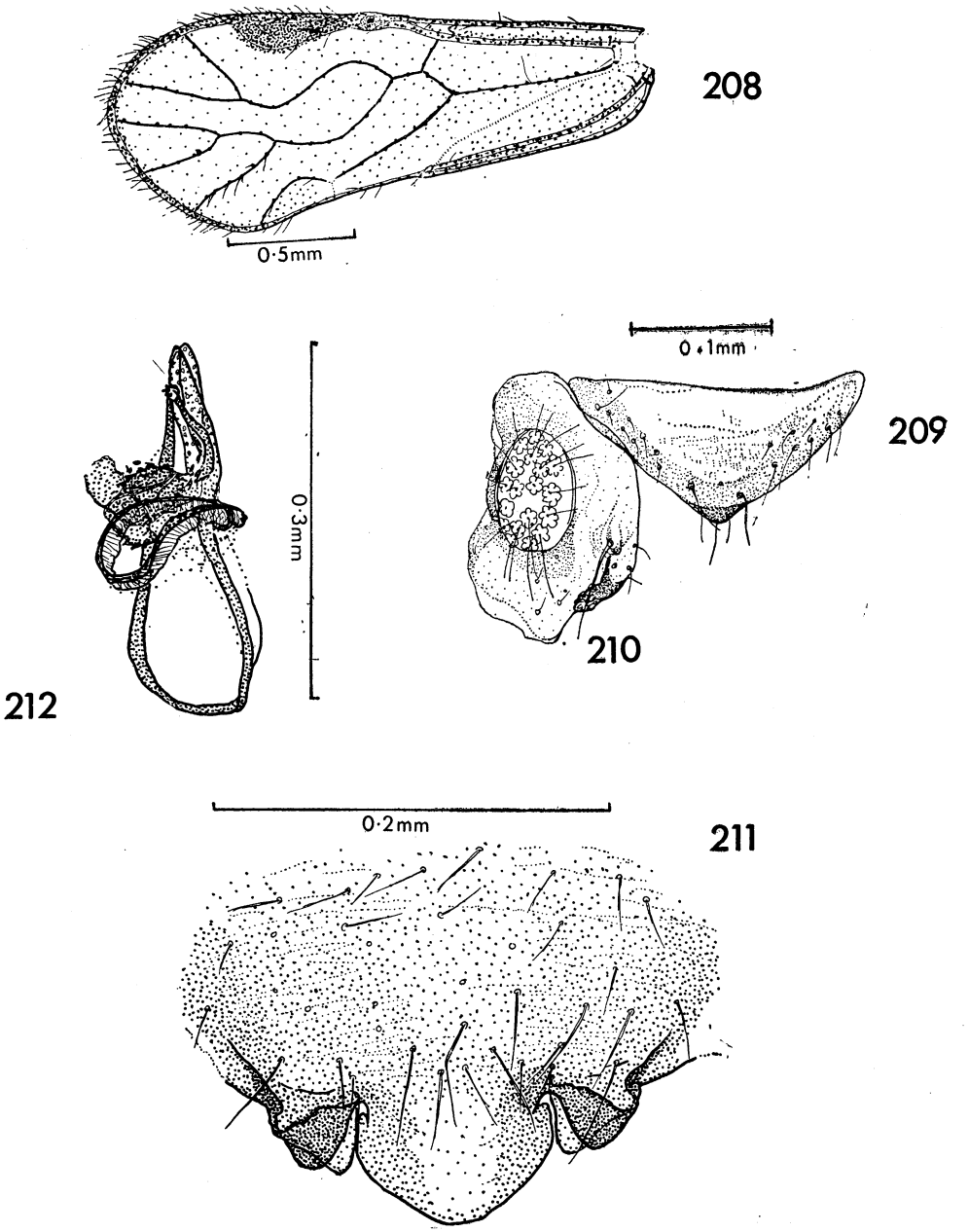


Fig. 208–212. *Zelandopsocus perinesus* n.sp. ♂: 208, fore wing; 209, epiproct; 210, paraproct; 211, hypandrium; 212, phallosome.

Zelandopsocus poecilus Thornton & Smithers, new species Fig. 213–221

♀. *Coloration* (freshly killed, in alcohol): Head cream, with usual markings on vertex brown, a median mark on frons, clypeus with transverse brown bands (horizontal) each side, not meeting in mid-line, genae brown. Eyes black, ocelli clear with dark brown centripetal margins. Antennae

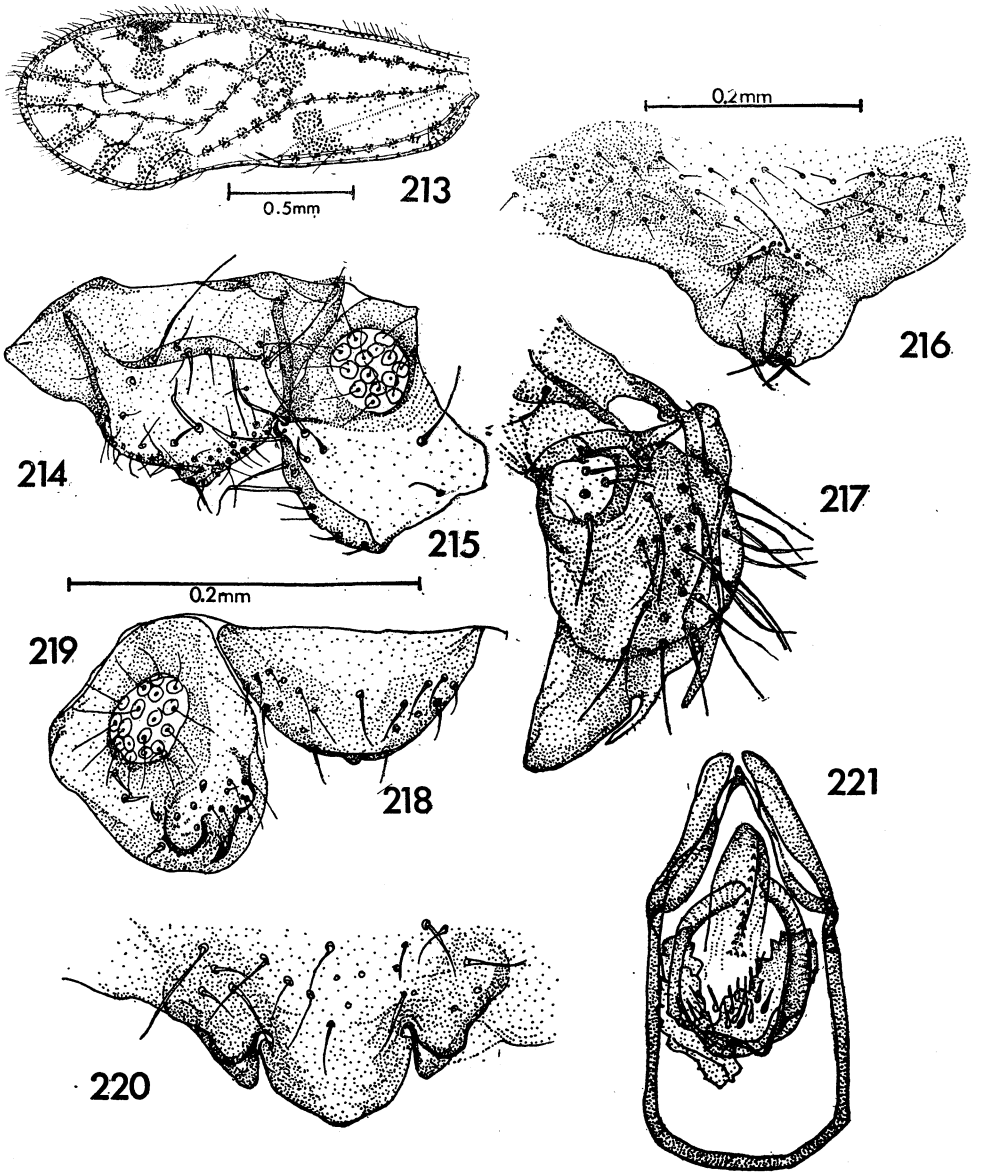


Fig. 213–221. *Zelandopsocus poecilus* n.sp. ♀: 213, fore wing; 214, epiproct; 215, paraproct; 216, subgenital plate; 217, gonapophyses. ♂: 218, epiproct; 219, paraproct; 220, hypandrium; 221, phallosome. Figures 215 and 217 to 221 to common scale.

brown, palps dark brown. Thoracic sclerites brown except antedorsa largely pale buff, scutella dark, with dark brown sutures. Legs brown, except trochanter colourless. Fore wing (Fig. 213) with *Aaroniella*-like brown spots at base of vein setae and brown markings; hind wing hyaline. Abdomen cream dorsally, grey-brown ventrally, darker towards sides; apical sclerites brown.

Morphology: B = 1.70mm. I.O.:D = 2.0 f_1 = 0.21mm. f_2 = 0.38mm. f_1:f_2 = 1.81 F = 0.41mm. T = 0.81mm. t_1 = 0.32mm. t_2 = 0.03mm. t_3 = 0.05mm. rt = 10.6 : 1.0 : 1.6 ct = 17 Fw = 1.86mm. Hw = 1.51mm. Epiproct (Fig. 214) with sclerotized bars each side, a dorsal membranous setose flap basally, apically a conical projection bearing fine setae. Paraproct (Fig. 215) with a field of 14 trichobothria and a line of setae. Subgenital plate (Fig. 216) apically bilobed, lobes overlapping, each bearing a pair of setae. Gonapophyses (Fig. 217) with large rounded outer valve, dorsal valve incised at distal base of subapical spine.

♂. *Coloration* (freshly killed, in alcohol): As ♀.

Morphology: B = 1.50mm. I.O.:D = 1.5 f = 0.37mm. f = 0.20mm. f :f = 1.85 F = 0.43mm. T = 0.82mm. t_1 = 0.28mm. t_2 = 0.04mm. t_3 missing. rt = 7.1 : 1.0 : ? ct = 13 Fw = 1.89mm. Hw = 1.60mm. Epiproct (Fig. 218) rounded, simple; paraproct with an oval field of 17 trichobothria and a rugose rounded knob having a sclerotized curved hook close to its base (Fig. 219). Hypandrium (Fig. 220) 5-lobed. Phallosome (Fig. 221) with usual sclerites and a field of long sharp spines.

Holotype ♀ (AM), NEW CALEDONIA: Thio Forest stream, dead branches, 11.II.70; allotype ♂, same data as holotype. Paratypes: 2♀ ♀, same data as holotype; 1♀, Aoupinié, W of Ponérihouen, 550m, at light, 31.VII.71 (JDH).

Holotype, allotype and paratypes in Australian Museum.

In this species, as in *Z. balius*, the fore wings are quite *Aaroniella*-like in both shape and pattern. However, the antennal segments do not have white apices, the hind wing veins are bare, and the genitalia of both sexes conform to the *Zelandopsocus* group of species.

Zelandopsocus translucidus Thornton & Smithers, new species Fig. 222–226

♂. *Coloration* (freshly killed, in alcohol): Head uniformly very dark brown, except scape, pedicel, and maxillary palps apart from apical segment, light brown. Eyes and ocellar interval black, ocelli clear. Thoracic terga and coxae dark brown, femora very pale buff, tibiae and tarsal segments light brown. Fore wing (Fig. 222) quite hyaline apart from dark brown pigment in pterostigma, veins brown. Hind wing hyaline, veins brown. Abdomen cream with fairly sparse grey-brown granulations dorsally.

Morphology: B = 1.90mm. I.O.:D = 1.2 f_1 = 0.66mm. f_2 = 0.43mm. f_1:f_2 = 1.5 F = 0.57mm. T = 1.08mm. t_1 = 0.35mm. t_2 = 0.04mm. t_3 = 0.06mm. rt = 8.7 : 1.0 : 1.5 ct = 19 Fw = 1.81mm. Hw = 1.39mm. Head and thoracic sclerites shining. Epiproct (Fig. 223) subtriangular, simple; paraproct (Fig. 224) with oval field of 15 trichobothria and an apical spinous area bearing a sclerotized spinous ridge. Hypandrium (Fig. 225) 7-lobed, 1 pair of lobes very low and well sclerotized. Phallosome (Fig. 226) with U-shaped sclerite and a pair of sac-like spinous sclerites.

♀. Unknown.

Holotype ♂ (AM), NEW CALEDONIA: Le Crouen, 2km above hot springs, *Araucaria*, 17.II.70.

Holotype in Australian Museum.

This species is very similar in wing pattern to *Z. perinesus*, and, like that species, has a 7-lobed hypandrium. *Z. translucidus* may be distinguished by the much larger eyes of the ♂, as well as by the colour of the pterostigma (dark brown, not purplish), the pale femora, and details of the structure of the apex of the ♂ paraproct and hypandrium.

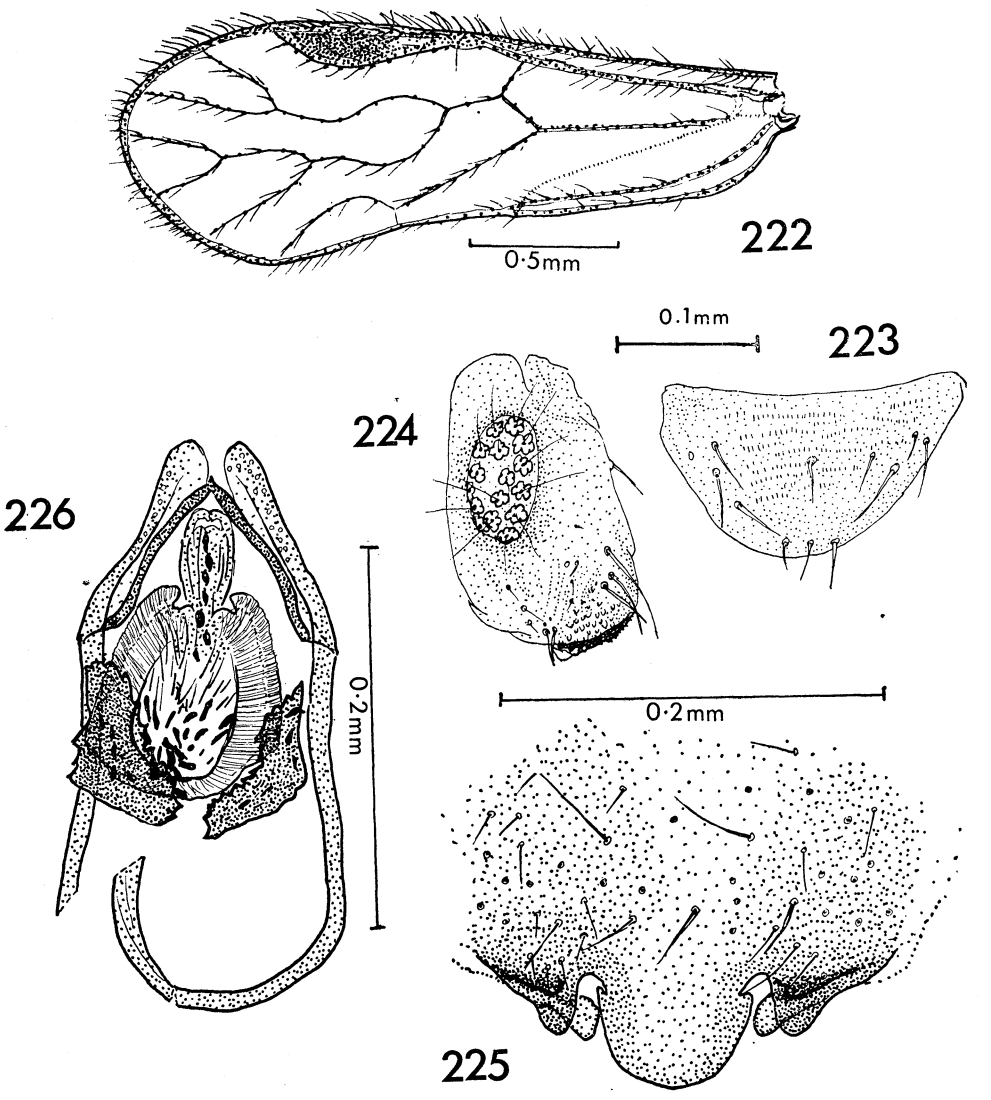


Fig. 222–226. *Zelandopsocus translucidus* n.sp. ♂: 222, fore wing; 223, epiproct; 224, paraproct; 225, hypandrium; 226, phallosome.

Zelandopsocus varianus Thornton & Smithers, new species Fig. 227–237

♀. *Coloration* (freshly killed, in alcohol): Head generally cream, usual brown markings on either side of median epicranial suture and mesial to eyes, these markings darker anteriorly, medial epicranial suture dark brown. Eyes black, ocelli clear with black centripetal borders. A wide area from just posterior to ocellar protuberance to clypeus cream, with only a small brown median frons mark and small brown marks mesial to antennal socket. Clypeus striations almost horizontal posteriorly, becoming V-shaped anteriorly. Genae with a brown line from below posterior margin of eye to antennal socket, and a wider brown band on ventral end of gena. Scape and pedicel cream, flagellum

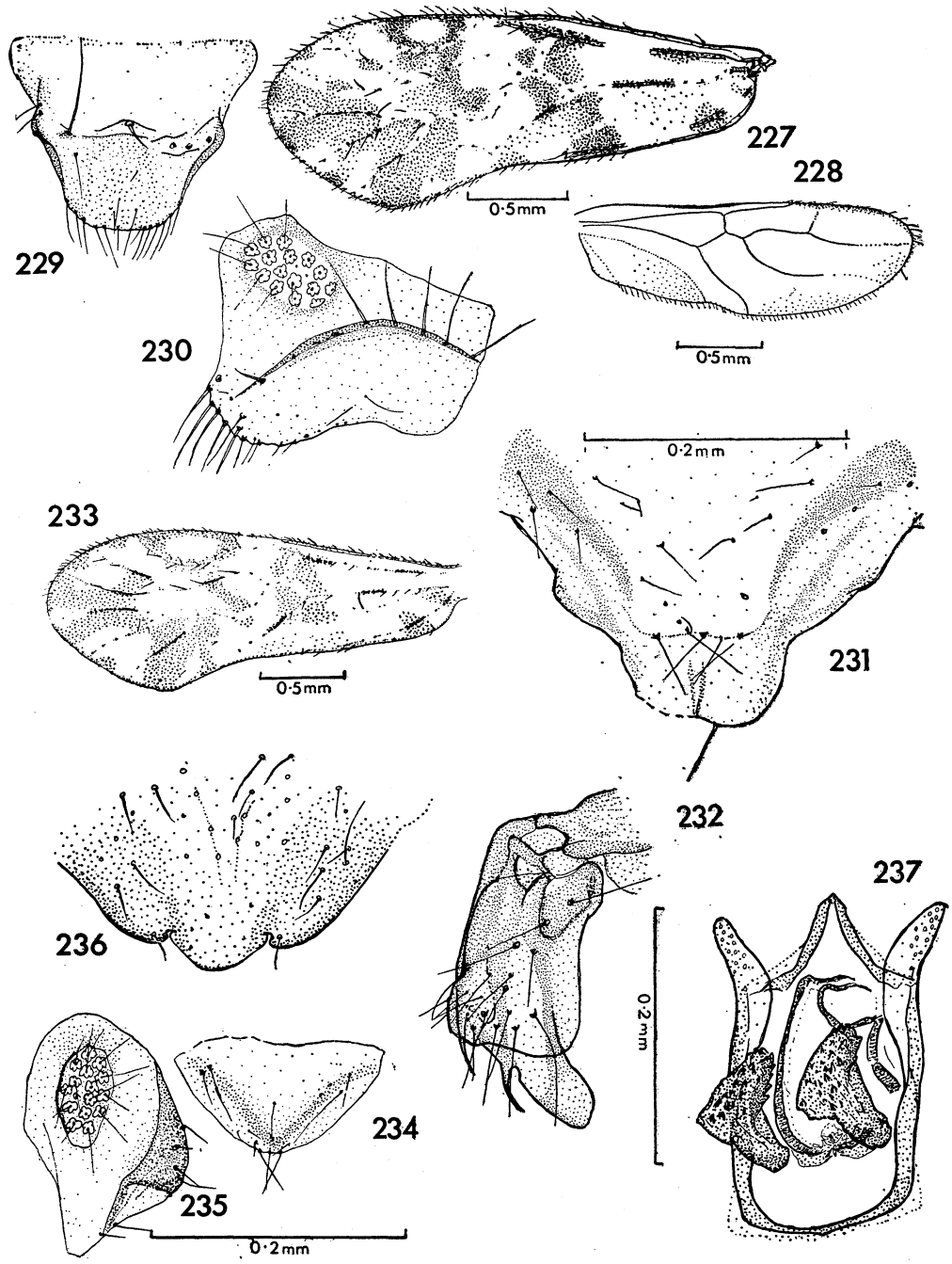


Fig. 227–237. *Zelandopsocus varianus* n.sp. ♀: 227, fore wing; 228, hind wing; 229, epiproct; 230, paraproct; 231, subgenital plate; 232, gonapophyses. ♂: 233, fore wing; 234, epiproct; 235, paraproct; 236, hypandrium; 237, phallosome. Figures 229 to 231; 232 and 237; 234 and 236 to common scales.

brown. Palps cream, apical segment brown. Thoracic terga cream, except anterior margin of mesothorax brown. Pleura cream except those of prothorax and mesothoracic episternum brown. Legs: coxa brown basally, fading to cream, trochanter cream, femur cream but with a distinct brown band on middle 1/3, tibia and tarsal segments pale buff. Fore wing (Fig. 227) mottled with brown, veins with dark and hyaline stretches. Hind wing (Fig. 228) with fuscous shading along anterior and posterior margins. Abdomen whitish-cream dorsally, grey-brown ventrally.

Morphology: B = 2.20mm. I.O.:D = 2.4 f_1 = 0.83mm. f_2 = 0.42mm. f_1:f_2 = 1.9 F = 0.62mm. T = 1.13mm. t_1 = 0.36mm. t_2 = 0.04mm. t_3 = 0.06mm. rt = 9.0 : 1.0 : 1.5 ct = 18 Fw = 2.48mm. Hw = 1.91mm. Epiproct (Fig. 229) trapezoid, sclerotized along lateral margins, a low dorsal ridge bearing long setae; paraproct (Fig. 230) with a field of 16 trichobothria. Subgenital plate (Fig. 231, torn on one side in holotype) apically bilobed, lobes evidently overlapping, each with a single long seta. Gonapophyses (Fig. 232) with axe-shaped outer valve, dorsal valve with fairly short subapical spine and an incision just distal to base of spine.

♂. *Coloration* (freshly killed, in alcohol): As ♀, but fore wing lighter, with dark stretches of veins rather more prominent and hyaline areas rather more extensive (Fig. 233).

Morphology: B = 2.05mm. I.O.:D = 0.7 f_1 = 0.84mm. f_2 = 0.55mm. f_1:f_2 = 1.41 F = 0.56mm. T = 1.06mm. t_1 = 0.40mm. t_2 = 0.03mm. t_3 = 0.05mm. rt = 13.3 : 1.0 : 1.6 ct = 21 Fw = 2.42mm. Hw = 1.89mm. Epiproct (Fig. 234) triangular, with sclerotized V-shaped band; paraproct (Fig. 235) with a rounded setose prominence and an oval field of 15 trichobothria, edge of field sclerotized on one side. Hypandrium (Fig. 236) 3-lobed, "mushroom" shape of median lobe just discernible. Phallosome (Fig. 237) with a pair of spinous sac-like sclerites and a U-shaped ribbon sclerite.

Holotype ♀ (AM), NEW CALEDONIA: Mt Koghi, 500m, 10.II.70; allotype ♂, same data. Paratypes 4♀♀, 6♂♂, same data. 1♂, Petchikara Pass, E side, 600m, from *Murraya exotica* dead branches with lichen, 16.II.70; 1♂, Mt Koghi, 600m, 1.XII.63 (RS); 1♀, 1♂, Col des Roussettes, 6.II.63 (NLK); 1♀, Mt Koghi, 19.II.63 (NLK); 2♀♀, 1♂, Mt Koghi, 500m, Malaise trap, 27.I.63 (CMY & NLK); 2♀♀, Mt Koghi, 500m, 21.VIII.71 (JDH); 1♂, Plaine des Lacs, Pic du Pin base of W slope, *Nothofagus* forest undergrowth, 7.VIII.71 (JDH); 1♀, Port Boisé, 13.XI.71 (JDH).

Holotype, allotype and paratypes in Australian Museum.

This distinctively patterned species differs from the majority of New Caledonian *Zelandopsocus* species in having the hypandrium with only 3 lobes. The median lobe, however, is incipiently mushroom-shaped, and the penial sclerites and gonapophyses are more similar to New Caledonian species placed in *Zelandopsocus* than to those placed in *Austropsocus*. Nevertheless, apart from being fully winged, the species is similar in subgenital plate, gonapophyses and hypandrium (but not in penial sclerites) to *Austropsocus insularis* (the type-species of *Austropsocus*) now known from Campbell, Macquarie, Auckland, Antipodes and Snares islands, and its generic placing must be regarded as tentative.

Zelandopsocus venustus Thornton & Smithers, new species Fig. 238–247

♀. *Coloration* (freshly killed, in alcohol): Head pale buff, light brown areas each side median epicranial suture and lighter brown markings mesial to eyes. Frons with a median light brown patch, a rectangular light brown patch on gena below eye. Scape and pedicel pale buff, basal flagellar segment light brown, shading to brown distally, rest of flagellum brown. Eyes black, ocelli clear with dark brown centripetal margins. Thoracic terga light brown, legs pale buff except coxae light brown and apical 2 tarsal segments brown. Fore wing (Fig. 238) with distinctive pattern of browns. Hind wing (Fig. 239) with brown shading basally. Abdomen pale buff.

Morphology: B = 2.55mm. I.O.:D = 2.1 f_1 = 1.06mm. f_2 = 0.68mm. f_1:f_2 = 1.5 F = 0.77mm. T = 1.36mm. t_1 = 0.46mm. t_2 = 0.05mm. t_3 = 0.06mm. rt = 9.2 : 1.0 : 1.2 ct = 25 Fw = 2.96mm. Hw = 2.20mm. Epiproct (Fig. 240) with short fine setae along apical margin, a row of much longer setae on margin

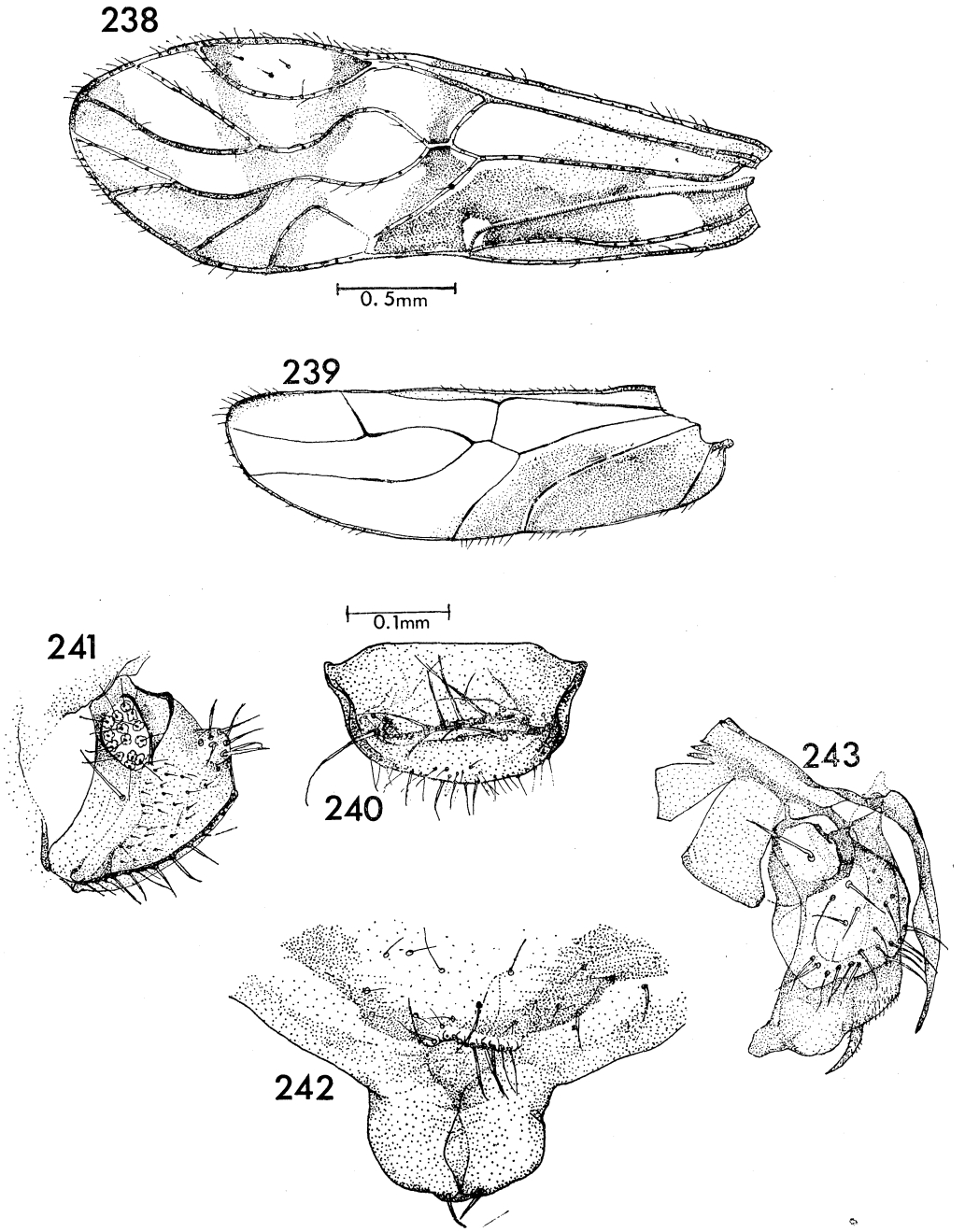


Fig. 238–243. *Zelandopsocus venustus* n.sp. ♀: 238, fore wing; 239, hind wing; 240, epiproct; 241, paraproct; 242, subgenital plate; 243, gonapophyses. Figures 238 and 239; 240 to 243 to common scales.

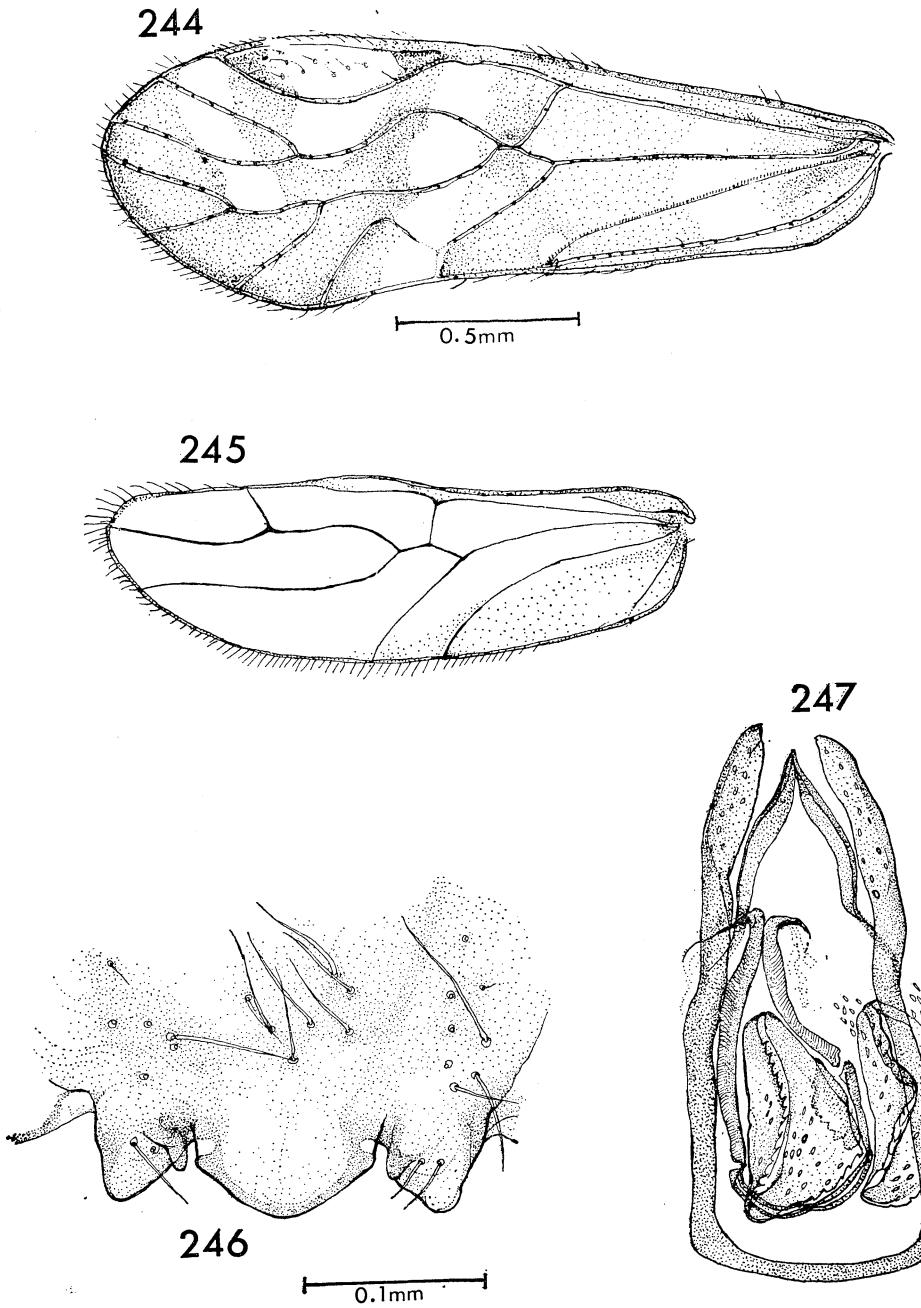


Fig. 244–247. *Zelandopsocus venustus* n.sp. ♂: 244, fore wing; 245, hind wing; 246, hypandrium; 247, phallosome. Figures 244 and 245; 246 and 247 to common scales.

of dorsal flap. Paraproct (Fig. 241) with a field of 15 trichobothria, mesial edge of field sclerotized. Subgenital plate (Fig. 242) apically bilobed, lobes overlapping, each bearing a stout seta. Gonapophyses (Fig. 243) with outer valve squarish, dorsal valve widening posteriorly with strongly curved spine.

♂. *Coloration* (freshly killed, in alcohol): As ♀ except for wing patterns (Fig. 244 and 245).

Morphology: B = 2.15mm. I.O.:D = 0.8 f_1 = 1.04mm. f_2 = 0.76mm. f_1:f_2 = 1.37 F = 0.74mm. T = 1.31mm. t_1 = 0.49mm. t_2 = 0.05mm. t_3 = 0.06mm. rt = 9.8 : 1.0 : 1.2 ct = 26 Fw = 2.83mm. Hw = 2.17mm. Epiproct simple, triangular, rounded apically, setose; paraproct with oval field of 20 trichobothria and 2 setae not in rosette sockets, mesial margin of field sclerotized. Hypandrium (Fig. 246) 5-lobed, 1 pair of lobes broad, truncate, each lobe bearing 2 setae. Phallosome (Fig. 247) with usual sclerites for this group of species.

Holotype ♀ (AM), NEW CALEDONIA: Mt Koghi, 500m, 10,II.70; allotype ♂, same data. Paratypes: 5♂♂, 3♀♀, same data as holotype; 4♀♀, 1♂, Hienghène Valley, S ridge 240m, 21.II.70. 1♂, Col de la Pirogue, VIII.50 (data incomplete); 1♂, Mt Panié trail, 8.II.63 (NLK); 2♂♂, Mt Koghi, 700m, Malaise trap, 1.XII.63 (RS); 1♂, Mt Koghi, 500m, 15.II.63 (CMY & NLK); 2♂♂, Col de la Pirogue, 360m, 14.II.63 (CMY & NLK); 2♀♀, 1♂, Mt Koghi, Malaise trap, 19–27.I.63 (CMY & NLK); 2♂♂, Mt Koghi, 600m, 30.XI.63 (RS); 1♀, Col de Mouinarge, on Yaté road, maquis, 3.VIII.71 (JDH); 4♀♀, 3♂♂, Mt Pouédihi, 560m, Rivière Blanche, 4.VIII.71 (JDH); 1♀, Mt Panié, 800m, 28.VII.71 (JDH); 1♀, 17♂♂, Mt Koghi, 500m, 22.VIII.71 (JDH); 4♀♀, 9♂♂, Plaine des Lacs, base of W slope Pic du Pin, *Nothofagus* forest undergrowth, 7.VIII.71 (JDH); 3♀♀, 4♂♂, Aoupinié, W of Ponérihouen, 550m, 30.VII.71 (JDH). LOYALTY ISLANDS; 1♀, Maré, 2.III.70; 2♀♀, 1♂, Lifou, from *Sapium*, 28.III.68 (JLG); 1♀, 1♂, Maré, la Roche, III.59 (NLK).

Holotype, allotype and paratypes in Australian Museum.

An unusual ♂, with wing pattern very like that of a ♀, was collected by Holloway from undergrowth of primary forest at Port Boisé, 13.VIII.71. The darkly pigmented areas in cell Cu_2 with hyaline circular area and pigment in the apical half of cell Cu_1 is present, but the pigmented area in cell Cu_1 does not extend so far anteriorly into the cell.

This interesting and distinctive species is apparently widespread in New Caledonia and the Loyalty Islands; most of the collections have been from upland areas in native vegetation. The sexual dimorphism in wing pattern holds for 45 ♀♀ and 51 ♂♂ collected, with the one exceptional ♂ mentioned above.

The species is quite easily distinguished by the fore wing pattern, which recalls that of *Zelandopsocus formosellus* from New Zealand.

DISCUSSION

The *Haplophallus* species described above include representatives of two generic sublines. *H. trepticus*, which is known to occur also in Fiji and Samoa, is most similar to a Norfolk Island species. The other four New Caledonian species, *acraeus*, *decorus*, *novitas* and *virgatus*, belong to a group of species which, as far as is presently known, is confined to Australia and New Caledonia.

From a consideration of all species now known, it is clear that the *Austropsocus–Zelandopsocus* line of philotarsids is characterized by a complex lobed hypandrium, few or no setae on the veins of the hind wing and the lack of a preapical tooth on the claw. The distinction between *Austropsocus* and *Zelandopsocus* has been somewhat obscured by the discovery of 34 New Caledonian species of these hitherto little-known genera; for example, brachyptery no longer stands as a generic criterion of *Austropsocus*.

The 12 species so far assigned to *Austropsocus* (7 of them New Caledonian, 4 from New Zealand and 1 (*insularis*) from Campbell, Macquarie, Auckland, Antipodes and Snares islands) have the following features in common: lack of setae on hind wing veins; hypandrium 3-lobed; apical lobe of subgenital plate with a pair of setae. At present, apart from the New Caledonian species, ♂♂ are known only of *apicipunctatus* (=*hollowayae*) from New Zealand, and *insularis*. The 7 New Caledonian species are similar to *apicipunctatus*, and differ from *insularis*, the type-species, in possessing distinct, large penial sclerites. They also differ from the 5 species with a more southerly distribution in possessing, on the dorsal valve of the ♀ gonapophyses, a sub-apical spine which extends at least to the apex of the valve, usually beyond it. Microptery is not a feature of the New Caledonian group, although one species, *strabus*, is brachypterous. There is thus considerable evidence of relationship between the New Caledonian and New Zealand representatives of *Austropsocus* and some evidence of divergence.

A re-examination of the type-species of *Zelandopsocus*, *Z. formosellus*, reveals that the ♀ epiproct has a dorsal, setose flap, and the hypandrium is 5-lobed, the central lobe being incipiently mushroom-shaped. This will be reported upon in more detail in a later paper covering the New Zealand philotarsids. Of the 30 species now assigned to *Zelandopsocus*, 27 are from New Caledonia (described above), 2 are from New Zealand (*formosellus* and *angulatus*), and one, a doubtful placing, from Australia (*simuosus*). Males are known for 20 New Caledonian species; all but two are similar to the type-species, *formosellus*, and differ from the other New Zealand species, *angulatus*, in having a 5-lobed hypandrium with the central lobe mushroom-shaped, and a U-shaped ribbon sclerite and spinous sac-like sclerites within the penis frame. The two exceptions have 3-lobed (*varianus*) and 7-lobed (*translucidus*) hypandria, but in each case the central lobe is mushroom-shaped. *Z. varianus* is difficult to place in the present state of knowledge of *Austropsocus* and *Zelandopsocus*; it has some features of both genera, and on balance we have placed it in *Zelandopsocus*. Thus the 27 New Caledonian species of *Zelandopsocus* share the following features of *formosellus* that are not found in *angulatus:* a posterior, setose dorsal flap on the ♀ epiproct, a mushroom-shaped central lobe of the hypandrium (which is usually 5-lobed), and the form of the penis sclerites. The New Caledonian species thus conform to the type-species of *Zelandopsocus* very much more closely than does *angulatus*, which stands well apart from the rest of the genus as now known. The position of *angulatus* will be considered in more detail when the New Zealand fauna is examined. *Zelandopsocus* in this new restricted sense thus has 27 representatives in New Caledonia and 1 in New Zealand, suggesting that colonization may have taken place from New Caledonia to New Zealand rather than in the opposite direction.

Of the 39 species of Philotarsidae described above, 4 species of *Haplophallus* have affinities with Australia, one species of *Haplophallus* with Norfolk Island, and 7 species of *Austropsocus* and 27 species of *Zelandopsocus* with New Zealand.

The predominantly New Zealand relationships of the New Caledonian philotarsids are in agreement with the findings of Gressitt (1956) for cerambycid and cryptocephaline beetles. Gressitt (1958) states that there appear to be relationships between New Guinea and New Zealand, through New Caledonia, which do not include Australia. The philotarsids of New Guinea have not yet been examined.

Gressitt (1961) believes that the affinities of New Caledonia's hispine beetle fauna suggest that the island separated early from an "Inner Melanesian Arc," allowing the

fauna to evolve and speciate in isolation for a long period. This view is supported by Darlington (1965), who suggests that New Zealand and New Caledonia have been isolated from New Guinea and Australia "at least through post-Mesozoic time and probably longer," and that New Zealand and New Caledonia have been isolated from one another for "a long time." The very unusual representation of *Zelandopsocus*, in which no less than 27 species have evolved, presumably on New Caledonia, is supporting evidence for these views.

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