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PSOCOPTERA FROM CENTRAL AND SOUTHERN CHILE

By **T. R. New and I. W. B. Thornton**[1]

Abstract. Collections of Psocoptera from vegetation in many parts of Chile and 1 area of Andean Argentina are enumerated and discussed. Thirty-one species are recorded, of which 10 (*Tapinella,* 1; *Caecilius,* 2; *Trichopsocus,* 1; *Mesopsocus,* 1; *Nothopsocus,* 1; *Drymopsocus,* 1; *Haplophallus,* 1; *Ptycta,* 2) are described as new. The hitherto unknown male of *Eolachesilla chilensis* is described, and the genus is transferred to Elipsocidae. Previously unknown sexes of *Lachesilla ambigua, Drymopsocus carrilloi, D. flavus,* and *Blaste castala* are described. Three species of *Ptenopsila* (*stigmata, hyalina, fasciata*) are synonymized with *P. delicatella, Caecilius crotarus* with *C. ornatipennis,* and *Drymopsocus nigrens* with *D. valdiviensis,* n. comb. Chilean Psocoptera are not clearly related to those of tropical South America, and Elipsocidae, in particular, include a number of taxa with southern affinities. Relationships and distribution of the fauna are discussed.

Much of the published information on the Psocoptera of southern temperate South America deals primarily with species frequenting ground litter and similar edaphic or cryptic habitats (Badonnel 1962, 1963, 1967, 1971), and only Thornton & Lyall (1978) have studied substantial collections from vegetation. This paper is an account of predominantly arboreal Psocoptera, made mainly in 1976, from many parts of central and southern Chile. T. R. New and Mrs Nesta L. New visited Chile from mid-May to mid-June and from October to December (inclusive) and I. W. B. Thornton from mid-November until early January 1977. Altogether, some 180 man-days were spent in active collecting for Psocoptera, excluding time passed traveling between collecting localities, and some 7000 adult psocids were obtained. Most main natural vegetation types were sampled, and a number of introduced trees (such as *Eucalyptus,* Australian acacias, exotic conifers and orchard trees) were also examined. Collections were also made in an area of Andean Argentina adjacent to the Chilean "lake district." In addition, small collections made by colleagues in Chile and the few specimens available from the various institutional collections in Chile are included. The paper thus represents the most comprehensive attempt to date to assess the arboreal psocid fauna of Chile.

Many authors have commented on the biological isolation of Chile. O'Brien (1971), for example, comments, "In essence Chile is a continental island, bounded on all sides by formidable barriers . . . . The flora and fauna show few relationships with the rest of South America, except for occasional examples along the borders with Peru, Bolivia and Argentina." The Atacama Desert is an effective barrier to much dispersal in the northern part of the country, and most of the characteristic forest regions of Chile occur well to the south of it. Kuschel (1960) notes the approximate limits of the "Valdivian" and "Magellanic" forests, the 2 predominant and most

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characteristic forest types of Chile. Valdivian forests are typically dominated by endemic Myrtaceae and generally possess a rich and varied fauna in comparison with other cold temperate areas of Chile. The Magellanic forests are more usually dominated by *Nothofagus,* although several *Nothofagus* species are abundant also in many Valdivian forests (Muñoz 1966), and extend southwards from about 48°S. In general, the fauna of Magellanic forests is impoverished, and includes very few taxa not found in Valdivian forests. FIG. 1 indicates the northward extensions of Valdivian forests on the higher coastal and Andean cordilleras each side of the Chilean central valley. Between the Atacama Desert and about 37°S, most of the central valley is used for cultivation. It contains substantial plantations of exotic trees, although remnants of natural vegetation types occur in parts of the coastal cordillera, the Andean slopes and the few national parks (CONAF 1976) in this area. Most of the more unusual vegetation types of Chile are represented in national parks, and some of the parks are areas of very considerable ecological interest and importance. Some features of several national parks, and of other areas of particular interest for assessing distributions of Psocoptera are noted below. Their positions, together with those of other collecting sites visited during our work, are shown in FIG. 2.

1. *Fray Jorge National Park.* This coastal park is largely dominated by desert flora, including many xerophytic forms, and includes the northernmost parts of the wet Chilean coastal cordillera. Its prime interest is that it contains Valdivian forest, which is maintained by moisture from ocean fogs in small patches at heights of around 500 m above sea level, and the park was established largely to protect these unique disjunctive forest areas. The forest is dominated by *Aextoxicum punctatum* R. et Pavon and *Drimys winteri* Forst; there is no *Nothofagus.* It marks the northernmost limit of distribution of many animal species typical of Chile further south, and some are found only there and in areas 1000 km or more to the south: the forest constitutes a disjunct outlier habitat of the wetter forest types (CONAF 1974).

2. *La Campana National Park.* This area, visited by Charles Darwin in 1835, includes examples of all major vegetation types of central Chile. It is part of the coastal cordillera and is only some 80 km from Santiago. The northernmost *Nothofagus* in South America [*N. obliqua* (Mirb.) var *macrocarpa*] is found at the higher elevations and in hygrophilous forests in the valleys. The hygrophilous forests also include a number of tree species characteristic of Chile further south, and the area is the southern limit of the influence of coastal fogs as a moisture source. Rundel & Weisser (1975) outline features of other vegetation types in the Park and comment that it contains "a microcosm of almost all significant ecological communities of the Mediterranean zone of central Chile." La Campana is the closest National Park to Fray Jorge, which lies some 350 km to the north.

3. *Cerro Nielol,* a small hill park in the city of Temuco, is notable for containing one of the few forest remnants in the central valley of Chile south of Santiago.

4. *Cordillera Pelada.* Part of the Valdivian coastal cordillera, marked by a complex altitudinal zonation of vegetation types, including a zone of a conifer native to south-

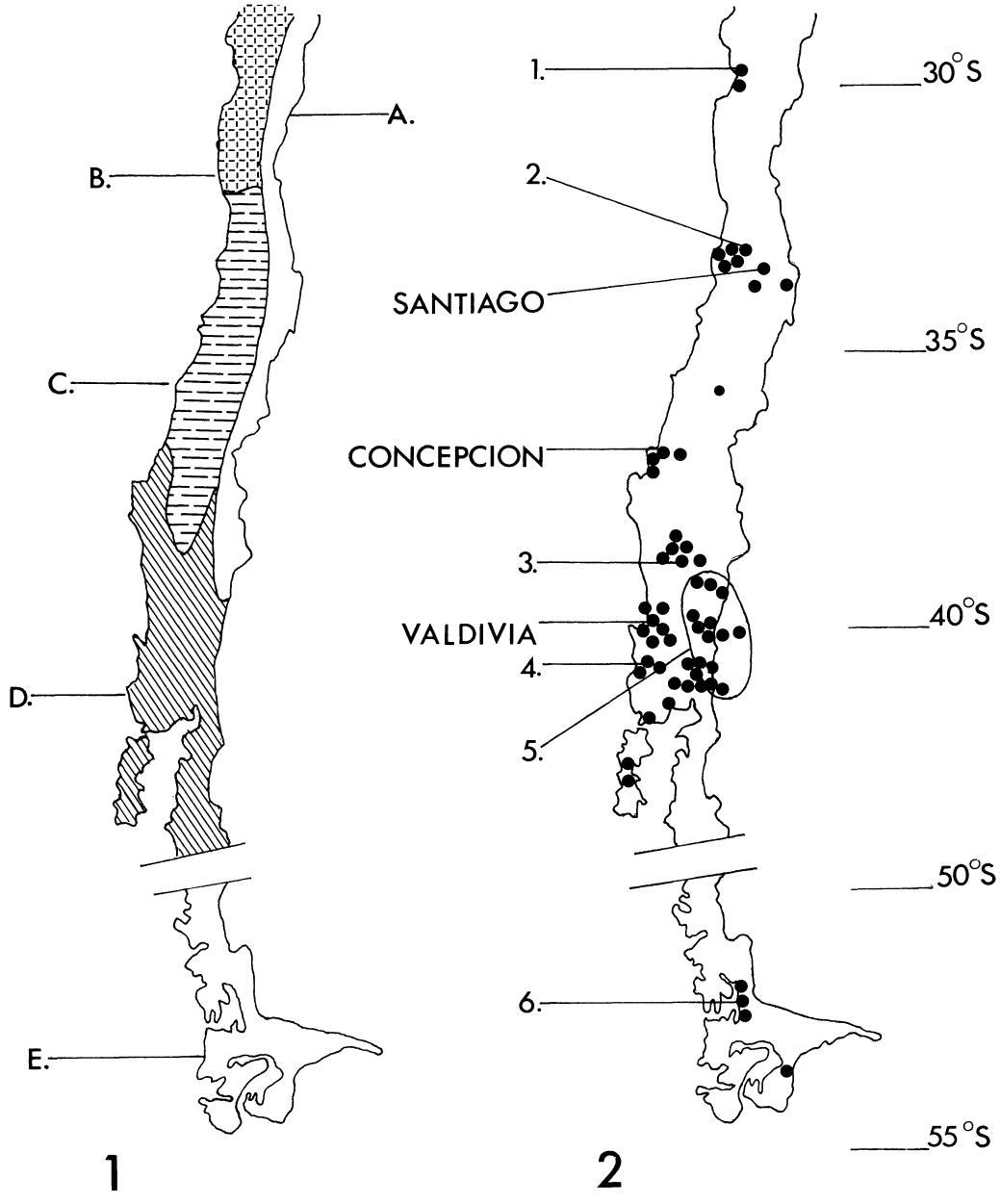

FIG. 1–2. Maps of central and southern Chile. **1.** Major biogeographic regions of Chile (adapted from O'Brien 1971): A, Andean; B, Atacaman; C, Santiagan; D, Valdivian; E, Magellanic. **2.** Localities visited, denoted by black dots. 1, Fray Jorge National Park; 2, La Campana National Park; 3, Temuco: Cerro Nielol; 4, Cordillera Pelada; 5, *Nothofagus* forests across Andes; 6, Torres del Paine National Park, Ultima Esperanza.

ern Chile and Argentina [*Fitzroya cupressoides* (Mol.) Johnston]. Thornton & Lyall (1978) discussed psocids from *Nothofagus* in this area. Further details of the *Fitzroya* site, visited during the present survey, are given by Hermosilla et al. (1976).

5. *A complex of Nothofagus forest areas in the "lake country" in passes across the Andes.* These areas are largely remote and are relatively natural, apart from disturbance immediately beside roads. The Andes in this region are mainly under 6000 ft (1830 m), with some peaks considerably higher [such as Lanin 12,270 ft (3740 m), Tronador 11,270 ft (3435 m)] and, wherever possible, samples were taken on both western and eastern slopes of the Andes in this region. Most of our collecting sites were below 5000 ft (1520 m). The northern part of the area supports *Araucaria* forest across the Chile/Argentine border, and much of the encircled area on FIG. 2 is included in national parks (Villarrica, Pirihueico, Puyehue, and Vicente Perez Rosales, all in Chile; Lanin and Nahuel Huapi in Argentina). The *Nothofagus betuloides* (Mirb.) B.–*N. pumilio* (Poepp. et Endl.) Krasser associations in part of the area are discussed by Veblen et al. (1977).

6. *Torres del Paine National Park.* This spectacular southern area contains Magellanic forests of *N. pumilio* and, in remoter parts, of *N. betuloides* (CONAF 1975). It occurs in "Districto 7" of Markham (1971) and the "Selva Australe" of Cekalovic (1974), who discusses biogeographical subdivision of Magallanes.

In the following taxonomic account, all measurements are given in mm and abbreviations are as follows: B, body length; FW, forewing length; HW, hindwing length; f_1, f_2, 1st and 2nd flagellar segment lengths; F, T, t_1–t_3, lengths of hind femur, tibia and tarsal segments 1 (basal) to 3. Holotypes of new species will be deposited in the Bishop Museum, Honolulu (BISHOP) and (where possible) paratypes in the Australian Museum, Sydney (AMS) and the British Museum (Natural History), London (BMNH).

Family LEPIDOPSOCIDAE

Echmepteryx terricolis Badonnel

Echmepteryx terricolis Badonnel, 1963: 294.

Specimens examined. CHILE: 4♂,5♀, La Campana National Park, nr Olmue, scrub, 26.V.1976, New & New; 1♂,2♀, same locality, 500 m, 19.X.1976; 2♀, Fray Jorge National Park, valley floor vegetation, 14.X.1976, New & New.

This species appears to be widely distributed in Chile and has previously been taken in both the above localities (Badonnel 1963).

Pteroxanium funebris Badonnel

Pteroxanium funebris Badonnel, 1963: 298.

Specimens examined. CHILE: 1♂,2♀, several nymphs, Valdivia, Parque Saval, 25.XII.1976, T.R. New & Thornton; 1♀, Valdivia, garden vegetation, 24.XII.1976, Thornton.

This species is also well-known from Chile, and it has not been reported from elsewhere. It appears to be closely related to the following species, but differs consistently in color pattern.

Pteroxanium kelloggi (Ribaga)

Lepidilla kelloggi Ribaga, 1905: 100.
Pteroxanium kelloggi: Roesler, 1943: 13.

Specimens examined. CHILE: 3♀, Fray Jorge National Park, vegetation on valley floor, 12.X.1976, New & New.

This species, although known from Argentina, has not previously been recorded from Chile.

Family Trogiidae

Lepinotus reticulatus Enderlein

Lepinotus reticulatus Enderlein, 1905: 31.

Specimens examined. CHILE: 1♀, Temuco, 26.IV.1977, L. Espinoza.

This cosmopolitan domestic species was recorded from Chile by Badonnel (1963).

Cerobasis guestfalica (Kolbe)

Hyperetes guestfalicus Kolbe, 1880: 132.
Cerobasis guestfalica: Roesler, 1943: 13.

Specimens examined. CHILE: numerous ♂,♀, Fray Jorge National Park, valley vegetation, 14–16.X.1976, New & New.

This widespread species was first recorded from Chile by Badonnel (1971).

Cerobasis maculiceps Badonnel

Cerobasis maculiceps Badonnel, 1967: 547.

Specimens examined. CHILE: many ♂,♀, Fray Jorge National Park, valley vegetation (mainly dead foliage), 14–16.X.1976, New & New; 4♀, La Campana National Park, dead vegetation, 19.X.1976, New & New.

Records of this species suggest that it is largely limited to the drier regions of Chile.

Nymphs of *Cerobasis* sp. resembling those of *maculiceps* were also taken at Concepcion, Valdivia and Temuco.

Family Liposcelidae

Liposcelis sp.

Single specimens of *Liposcelis* were taken in 4 samples, as follows. Two are immature, and the other 2 are both similar to *L. entomophilus* (Enderlein, 1907), recorded from Chile by Badonnel (1963).

Specimens examined. CHILE: 2 nymphs, Fray Jorge National Park, valley floor vege-

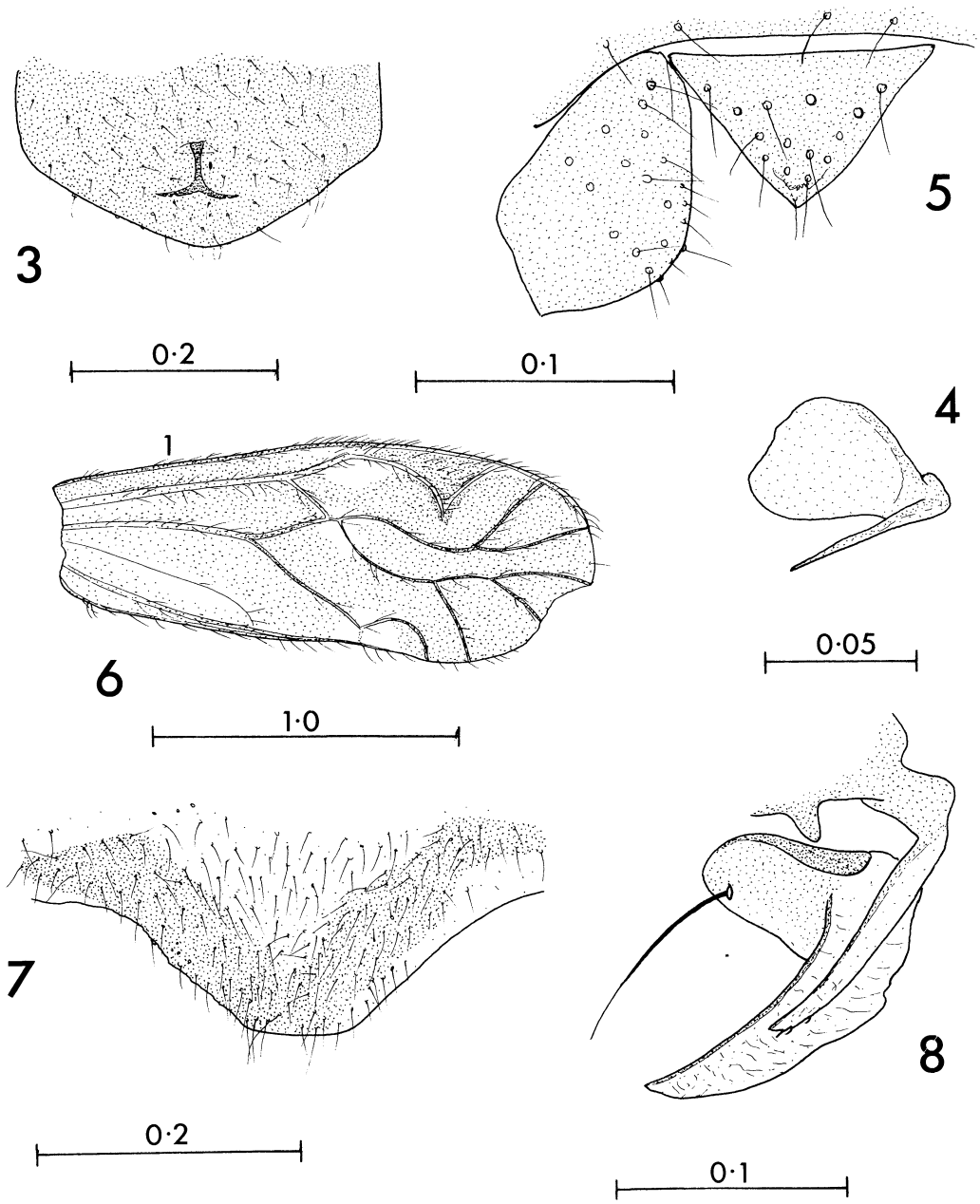

FIG. 3–8. **3–5.** *Tapinella campanensis,* ♀: **3,** subgenital plate; **4,** gonapophyses; **5,** epiproct and paraproct. **6–8.** *Caecilius carrilloi,* ♀: **6,** forewing; **7,** subgenital plate; **8,** gonapophyses. (Scales in mm.)

tation, 15–16.X.1976, New & New; 1♀, Santiago, Cerro San Cristobal, *Acacia melanoxylon,* 10.X.1976, New & New; 1♀, Valdivia, in house, 12.XII.1976, T.R. New.

Family PACHYTROCTIDAE

Tapinella campanensis New & Thornton, **new species** FIG. 3–5

♀. *Coloration.* Dark brown. Eyes black. Vertex slightly darker than rest of head. Tarsi and apical length of flagellum paler. Abdomen with broad grayish brown bands across all tergites.

Morphology. Apterous. Ocelli absent. Flagellar segments with weak annulations. Vertex slightly emarginate medially. Subgenital plate (FIG. 3) with T-sclerite. Gonapophyses (FIG. 4) very lightly sclerotized. Epiproct (FIG. 5) triangular, with slight preapical fold. Paraproct (FIG. 5) rounded, without defined trichobothria. Lacinia with 2 long tines and small intermediate tine. Tarsal claw long, with row of minute teeth.

Dimensions. B 1.35, f_1 0.080, f_2 0.099, f_3 0.106, f_1/f_2 0.808, F 0.280, T 0.379, t_1 0.144, t_2 0.045, t_3 0.049, t_1/t_2 3.200, t_2/t_3 0.918.

♂. Unknown.

Holotype ♀, apterous, CHILE: La Campana National Park, low vegetation, 20.X.1976, New & New (BISHOP 11,549).

No Pachytroctidae have previously been recorded from Chile, and the above specimen is therefore of considerable zoogeographical interest. The species is referred to *Tapinella* in possessing a T-sclerite to the subgenital plate, and rather few species of *Tapinella* are dark brown. The head of *T. curvata* Badonnel (Africa) is distinctly patterned, and the T-sclerite differs from that of *T. squamosa* Badonnel (1955, Angola) and *T. stenomedia* Thornton & Woo (1973, Galapagos).

A further apterous ♀ pachytroctid, somewhat damaged, taken at Valdivia, 20.XII.1976, probably also represents this species.

Family CAECILIIDAE

Caecilius ornatipennis (Blanchard)

Psocus ornatipennis Blanchard, 1851: 95.
Caecilius ornatipennis: Enderlein, 1923: 245.
Caecilius crotarus Thornton & Lyall, 1978. **New synonymy.**

Specimens examined. CHILE: 3♀, Valdivia, 31.V.1976, New & New; 2 ex, Paillaco, 1.VI.1976, New & New; 1♀, Cautin, 6 km N of Temuco, *Pinus,* 2.VI.1976, New & New; 1♀, Concepcion, Parque Equador, dead foliage, 5.VI.1976, New & New; 7♀, Fray Jorge National Park, bosque, 500 m, 12–14.X.1976, New & New; many ex, Concepcion, Parque Ecuador, 24–26.X.1976, New & New; 4♀, San Pedro, 27.X.1976, New & New; many ex, Temuco, Cerro Niehol, 31.X–8.XI.1976, New, New & L. Espinoza; same locality, 17.XI.1976, Thornton; many ex, Valdivia, Parque Saval, 10.XI.1976, New & New; many ex, same locality, 21.XI.1976; many ex, same locality, 20–26.XII.1976, New, New & Thornton; many ex, ca 15 km N of Valdivia, secondary forest, 11.XI.1976, New & New; many ex, same locality, 17.XI.1976; many ex, Valdivia, Isla Teja, *Quercus,* 16.XI.1976, New & New; ca 50 ex, Niebla, coastal vegetation, 12.XI.1976, New & New; many ex, same locality, 18.XI.1976; ca 20 ex,

Piedra Blanca, *Nothofagus,* 20.XI.1976, New & New; ca 15♀, Lago Todos los Santos, Isla Margarita, 27.XI.1976, New, New & Thornton; ca 35 ex, Petrohue, 26.XI.1976, New, New & Thornton; 6♀, Casa Pangue, Chilean customs post, 29.XI.1976, New, New & Thornton; many ex, Peulla, 27–29.XI.1976, New, New & Thornton; many ex, Chiloe I, Castro and Gamboa, 30.XI–1.XII.1976, New, New & Thornton; many ex, Puerto Varas, Parque Phillippi, 24.XI.1976, New, New & Thornton; ca 25 ex, Chosuenco and Puerto Fuy, 6–7.XII.1976, New, New & Thornton; 5♀, Pirihueico, mainly *N. pumilio,* 8.XII.1976, New, New & Thornton; 1♀, Panguipulli, lakeside vegetation, 4.XII.1976, New, New & Thornton; ca 12 ex, Panguipulli, island in lake, 5.XII.1976, New, New & Thornton; many ex, Puesco, 10.XII.1976, New, New & Thornton; many ex, Pucon, 10–11.XII.1976, New, New & Thornton; 8♀, Villarrica, 11.XII.1976, New, New & Thornton; 16 ex, Futa, 14.XII.1976, New & New; many ex, Cordillera Pelada, to 600 m, 14–15.XII.1976, New & New; 4♀, Puyehue, 16.XII.1976, New & New; many ex, Antillanca, 16.XII.1976, New & New; 2♀, Anticura, 16.XII.1976, New & New; 20 ex, road from Anticura to Argentina, ca 20 km from Puyehue, 16.XII.1976, New & New; several ex, SE slopes V. Osorno, Petrohue, ca 900 m, 26.XI.1976, Thornton; many ex, Chol Chol, ca 30 km from Temuco, 18–19.XI.1976, Thornton. ARGENTINA: many ex, Lago los Frias, Nahuel Huapi National Park, 29.XI.1976, New, New & Thornton; 5♀, San Martin de los Andes, Lanin National Park, 9.XII.1976, New, New & Thornton.

This species was found abundantly on foliage of many types of vegetation in many parts of Chile, but is apparently absent from the far south of the country and was not found in the La Campana Park. Males appear to be extremely rare: none was found in a sample of 300 specimens drawn from the above, or noticed in counts of the whole series.

Dr Badonnel has kindly sent a figure of the forewing of Blanchard's type of *Psocus ornatipennis,* which leaves no doubt that *C. crotarus* Thornton & Lyall is a synonym. No similar species are known from Chile and, indeed, Mockford (pers. commun. 1977) considers that the species may be relatively isolated in the "*Caecilius* complex."

Caecilius carrilloi New & Thornton, **new species** FIG. 6–8

♀. Brachypterous, forewings scarcely reaching to abdominal apex.

Coloration. Grayish brown. Eyes black. Ocelli small, pale. Head glossy, very dark brown except for large grayish-brown patch each side of midline of vertex; whole of face dark. Apical segment of maxillary palpi very dark. Antennae dark brown. Thorax dark brown. Legs with trochanters and apices of tibiae pale, otherwise dark brown. Forewing strongly marked with grayish brown as in FIG. 6. Hindwing paler, grayish brown. Abdomen with diffuse dark gray pigment dorsally, paler ventrally.

Morphology. Forewing as in FIG. 6: pterostigma strongly angled posteriorly. Subgenital plate (FIG. 7) bluntly rounded. Gonapophyses (FIG. 8): external valve remnant with single strong seta. Epiproct rounded. Paraproct with small field of 11 trichobothria and 1 seta without a basal rosette; margin with single small divided hyaline cone.

Dimensions. B 2.00, FW 1.77, HW 1.44, f_1 0.480, f_2 0.345, f_1/f_2 1.391, F 0.690, T 0.720, t_1 0.285, t_2 0.120, t_1/t_2 2.375.

♂. Unknown.

Holotype ♀, CHILE: Valdivia, Isla Teja, beaten *Quercus,* 16.XI.1976, New & New (BISHOP 11,550). Paratypes: 2♀, same data as holotype (AMS).

Several species of *Caecilius* recorded from Chile and Argentina have been inadequately characterized. The present species somewhat resembles *C. umbratus* Navás (1922) from Valparaiso and the Argentinian *C. canei* Williner (1944). Both of these are known only from macropterous individuals. *C. umbratus* was not figured by Navás, but appears to resemble *C. carrilloi* closely, whereas *C. canei* has a less angled pterostigma. Pending examination of the types of *C. umbratus,* the present specimens are designated as a new species, named in appreciation of the extensive help given to us by Sr Roberto Carrillo L., Director, Instituto de Defensa de las Plantas, Universidad Austral de Chile.

Caecilius nestae New & Thornton, **new species** FIG. 9–15

♂. Macropterous. ♀: macropterous or brachypterous.

♂♀. *Coloration.* Buff. Eyes black. Ocelli on small dark brown tubercle. Much of vertex shaded with dark brown, almost black in midline. Postclypeus and frons dark brown. Gena and ventral regions of head pale yellow/ivory. Antennae and palpi pale. Dorsum of thorax very dark brown, almost black in some specimens; dorsal ½ of pleura dark. Ventral ½ of thorax and whole of legs pale. Forewing strongly marked with dark brown as in FIG. 9 (macropterous): pterostigma pale, cells R_1 and R_3 mainly pale, more posterior cells with hyaline marginal lunules; posterior ½ of cell $M+Cu_1$ pale. Hindwing with grayish brown shading behind R, extended along wing. Abdomen yellowish buff, with irregular dark brown pigment dorsally, most pronounced in brachypterous specimens.

Morphology. Forewing as in FIG. 9, 10: M and radial fork abnormal in macropterous specimen figured; pterostigma broadened apically. Brachypterous hindwing as FIG. 11.

♀. Subgenital plate (FIG. 12) incipiently bilobed. Gonapophyses (FIG. 13) bluntly tapered; no seta on remnant of external valve. Epiproct rounded. Paraproct with field of about 12 trichobothria.

♂. Hypandrium transverse. Phallosome frame (FIG. 14) broad anteriorly, tapered to rounded posterior apex; outer parameres relatively narrow. Epiproct (FIG. 15) small, triangular, unornamented. Paraproct with outer spiculate area. Basal hind tarsal segment with 22 ctenidia.

Dimensions. ♂ (macropterous): B 2.65, FW 2.30, f_1 0.735, f_2 0.660, f_1/f_2 1.114, F 0.720, T 1.230, t_1 0.420, t_2 0.120, t_1/t_2 3.500. ♀ (brachypterous): B 2.55, FW 1.44, HW 1.05, f_1 0.660, f_2 0.570, f_1/f_2 1.158, F 0.765, T 1.245, t_1 0.405, t_2 0.135, t_1/t_2 3.000.

Holotype ♂, CHILE: Pucon, 10.XII.1976, New & New (BISHOP 11,551). Paratypes: CHILE: 1♂, same data as holotype (AMS); 1♀, Puerto Varas, Parque Phillippi, 24.XI.1976, New & New; 1♀, Chiloe I, Gamboa, 1.XII.1976, New & New; 2♀, Temuco, Cerro Nielol, 6.XI.1976, New & New (AMS); 1♀, Niebla, coastal secondary vegetation, 12.XI.1976, New & New (AMS); 2♀, Choshuenco, E of L. Panguipulli, 8.XII.1976, Thornton (BMNH).

The wing markings of this species immediately separate it from all other Chilean or Argentinian *Caecilius.* It most resembles *C. descolei* Williner (Argentina), which has cell R_3 dark and no marginal lunules to the median cells, and *C. latistigma* Navás (Argentina), which has the apical ½ of the pterostigma dark.

The species appears to be widely distributed, although uncommon, in central Chile.

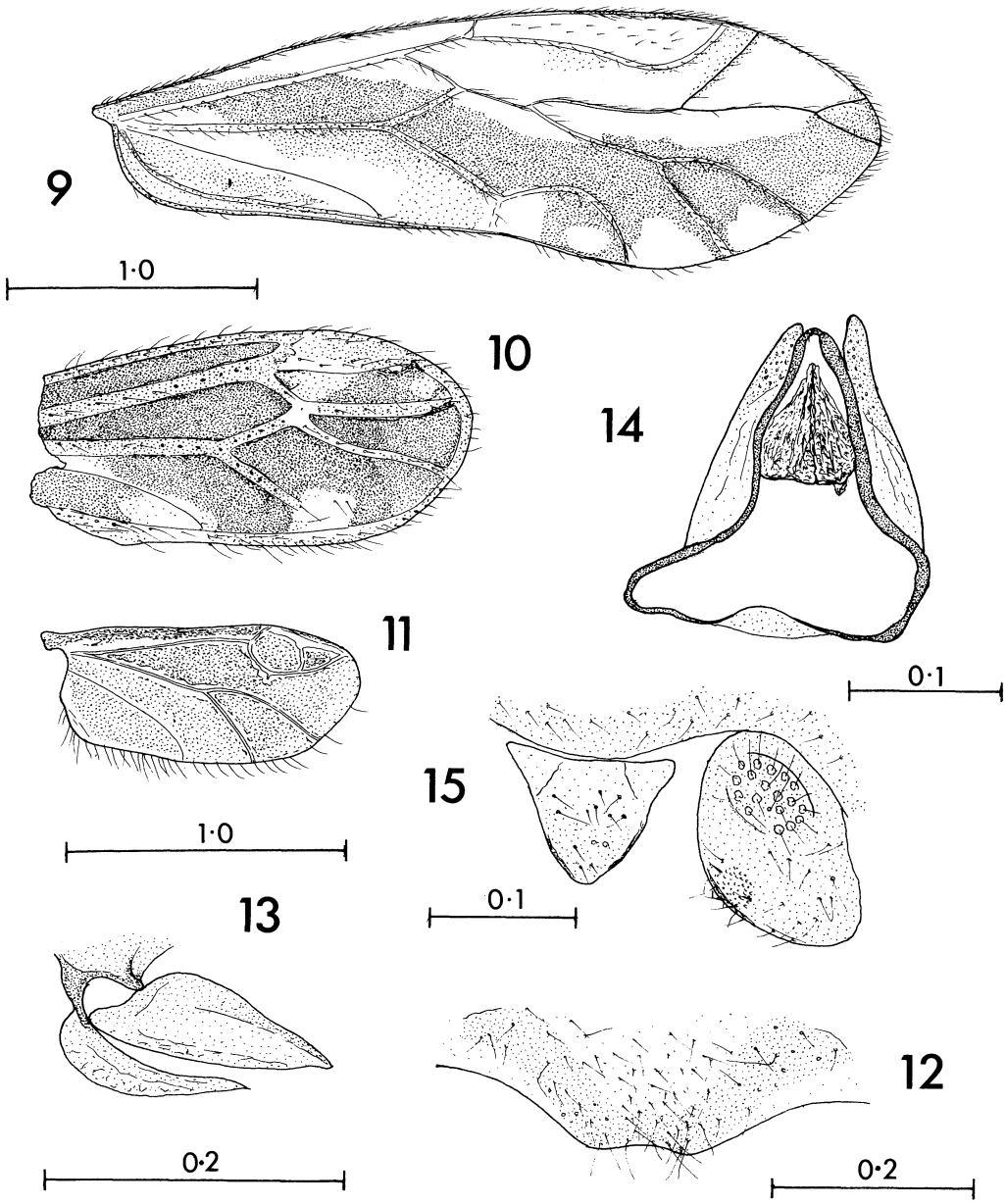

FIG. 9–15. *Caecilius nestae:* **9,** ♀ forewing, macropterous; **10,** ♀ forewing, brachypterous; **11,** ♀ hindwing, brachypterous; **12,** subgenital plate; **13,** gonapophyses; **14,** phallosome; **15,** ♂ epiproct and paraproct. (Scales in mm.)

Ptenopsila delicatella (Blanchard)

Psocus delicatellus Blanchard, 1851: 94.
Psocus costalis Blanchard, 1851: 94.
Caecilius altus Navás, 1922: 444.
Ptenopsila delicatella: Enderlein, 1923: 247.—New, 1973: 60.
Ptenopsila stigmata Thornton & Lyall, 1978: 3. **New synonymy.**
Ptenopsila hyalina Thornton & Lyall, 1978: 3. **New synonymy.**
Ptenopsila fasciata Thornton & Lyall, 1978: 6. **New synonymy.**

Specimens examined. CHILE: 7 ex, Malleco, nr Pailahueque, dead *Pinus* foliage, 2.VI.1976, New & New; 3 ex, nr La Campana National Park, Granizo Road, 26.V.1976, New & New; 2♂, Piedra Blanca, 1.VI.1976, New & New; 5 ex, 6 km N of Valdivia, *Nothofagus,* 1.VI.1976, New & New; 3 ex, Concepcion, Parque Equador, 3–5.VI.1976, New & New; ca 30 ex, Santiago, Cerro San Cristobal, 8.X.1976, New & New; 4♂,5♀, La Campana National Park, 18.X.1976, New & New; 7 ex, same locality but 300–600 m, 19.X.1976, New & New; 6 ex, Concepcion, Cerro Carocol, 24.X.1976, New & New; 6♀, Concepcion, Cerro de la Virgen, 26.X.1976, New & New; ca 20 ex, San Pedro, 27.X.1976, New & New, 3 ex, Lota, 28.X.1976, New & New; 25 ex, Concepcion, Parque Equador, 29.X.1976, New & New; 12 ex, Temuco, Cerro Nielol, 31.X–8.XI.1976, New & New; ca 30 ex, Valdivia, 15 km N, secondary forest, 11.XI.1976, New & New; 2 ♂, Las Mulatas, *Quercus,* 12.XI.1976, New & New; 9 ex, Niebla, coastal secondary vegetation, 12.XI.1976, New & New; 5 ex, same locality, 18.XI.1976; ca 140 ex, Valdivia, Parque Saval, 16.XI.1976, New & New; 20 ex (1 brachypterous ♀), Valdivia, Isla Teja, 17.XI.1976, New & New; 25 ex, same locality and Parque Saval, 19.XI.1976, New & New; ca 30 ex, same locality, 21.XI.1976; 15 ex, same locality, 22.XI.1976; many ex, same locality, 10–13.XII.1976, New, New & Thornton; many ex, same locality, 19–25.XII.1976, New, New & Thornton; ca 60 ex (including 8 brachypterous ♀), Petrohue, 25–26.XI.1976, New, New & Thornton; 1♀, Lago Todos los Santos, Isla Margarita, 27.XI.1976, Thornton; 20 ex, Peulla, 28.XI.1976, New, New & Thornton; 14 ex, Casa Pangue, Chilean customs post, 29.XI.1976, New, New & Thornton; ca 70 ex (13 brachypterous), Chiloe I, Castro and Gamboa, 30.XI–1.XII.1976, New, New & Thornton, ca 60 ex, Puerto Varas, Parque Phillippi, 24.XI.1976, New, New & Thornton; 5 ex, Panguipulli, lakeside vegetation, 4.XII.1976, New, New & Thornton; 20 ex, Panguipulli, island in lake, 5.XII.1976, New, New & Thornton; 3♀ (1 brachypterous), Chosuenco, 7.XII.1976, New, New & Thornton; ca 30 ex, Pirihueico, *N. pumilio,* 8.XII.1976, New, New & Thornton; ca 20 ex, Puesco, 10.XII.1976, New, New & Thornton; 8 ex, Pucon, 10–11.XII.1976, New, New & Thornton; 4 ex, Futa, 14.XII.1976, New & New; 14 ex, Cordillera Pelada, to 500 m, 14–15.XII.1976, New & New; 6 ex, Puyehue, 16.XII.1976, New & New; 1♂,1♀, Antillanca, *N. pumilio,* 16.XII.1976, New, New & R. Carrillo; 7 ex, road to Anticura, ca 20 km from Puyehue, 16.XII.1976, New & New; 13 ex (2 brachypterous ♀), Santiago, Cerro San Cristobal, 28.XII.1976, Thornton; 13 ex (including 1 brachypterous), Melipeuco, below V. Llaima, 20.XI.1976,

Thornton; 1♀, near Cunco, 20.XI.1976, Thornton; ca 50 ex, Chol Chol, 30 km W of Temuco, 18–19.XI.1976, Thornton; 24 macropterous, 28 brachypterous ex, Punta Arenas, 15–16.XII.1976, Thornton; 20 brachypterous ex, same locality, 22.XII.1976; ca 40 macropterous, 20 brachypterous ex, Puerto Natales, Ultima Esperanza, 17.XII.1976, Thornton; ca 10 macropterous, 8 brachypterous ex, Ultima Esperanza, Cuevo Milodon, *N. pumilio,* 18.XII.1976, Thornton; 7 macropterous, 1 brachypterous ♀, Torres del Paine National Park, island in Lago Pehoe, 19.XII.1976, Thornton; 25 macropterous, 11 brachypterous, same locality but shore of Lago Pehoe, 19.XII.1976; 13 macropterous, 2 brachypterous, Puerto Esbora, 16.XII.1977, D. Lanfranco & J. Petersen; 3 macropterous, 2 brachypterous, Chorrillo Mateo, 6.I.1963, T. Cekalovic; 3 ex, Frutillar, 31.I.1977, L. Espinoza. ARGENTINA: 150 ex, Lago Los Frias, Nahuel Huapi Park, 29.XI.1976, New, New & Thornton; many ex, including brachypterous ♀, San Martin de los Andes, 9.XII.1976, New, New & Thornton.

Ptenopsila is one of the most widely distributed psocid genera in central and southern Chile but was not collected in the Fray Jorge National Park; it appears to be a characteristically Valdivian/Magellanic form. Brachypterous females are numerous in Magallanes and more sporadic at higher altitudes elsewhere; they were recorded from Tierra del Fuego by New (1973).

Thornton & Lyall (1978) described 3 new species of *Ptenopsila* from the Cordillera Pelada/La Union area of Chile. These were differentiated mainly on details of wing pigmentation and head pattern. Examination of large series of specimens indicates that these and other patterns are part of a range of continuous variation (cf *Haplophallus chilensis* Thornton & Lyall). "*P. fasciata*" is the relatively rare female form for males corresponding to "*P. stigmata,*" and all gradations from "*P. hyalina*" to these darker forms often occur together. Females do not have the completely pigmented pterostigma of the "*stigmata*" type, and range from "*fasciata*" to "*hyalina.*" Some males have a pterostigma of the "*fasciata*" type but lack the wing fascia; others are clearly "*stigmata*" and "*hyalina*" types, and there are intermediaries. Blanchard's specimens have pale wings, as in Enderlein's (1923) figure (Badonnel, pers. commun. to T.R.N. 1977), and both sexes of the types are macropterous. "*P. hyalina*" appears to be very similar to the species noted by Enderlein, and southern specimens from the present work closely resemble the specimens studied by New (1973). It thus appears that there is only 1 species of *Ptenopsila* in Chile, and that this is very variable in intensity of body and wing pigmentation.

Family Lachesillidae

Lachesilla ambigua Badonnel Fig. 16–18

Lachesilla ambigua Badonnel, 1971: 34.

Specimens examined. CHILE: 2♂,1♀, La Campana National Park, nr Olmue, 26.V.1976, New & New (Bishop).

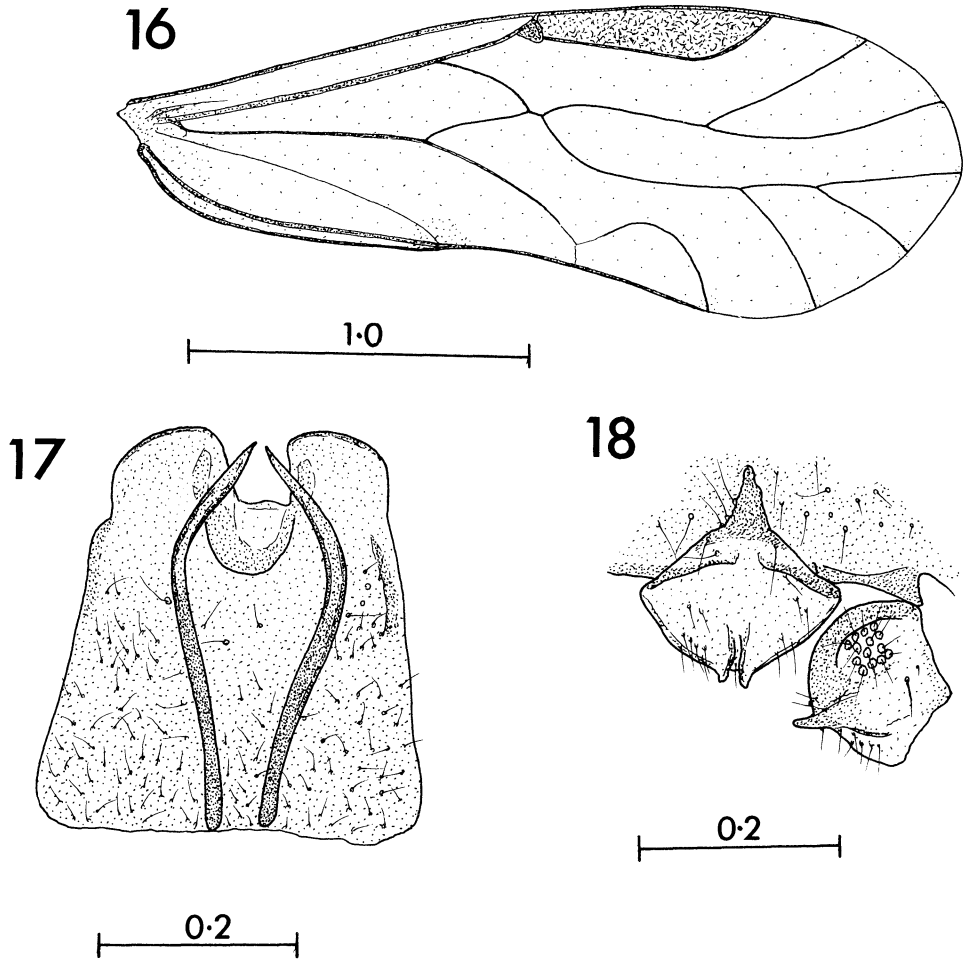

FIG. 16–18. *Lachesilla ambigua,* ♂: **16,** forewing; **17,** hypandrium and parameres; **18,** epiproct and paraproct. (Scales in mm.)

This species was described from a single female from Ovalle; the present female closely resembles that figured by Badonnel in genitalic features and, in particular, the form of the subgenital plate apex differentiates it from *L. castrii* Badonnel (1963). In the present specimens, the wing pigmentation is even lighter than that of *L. castrii,* and it appears that this feature is unreliable for specific separation. The male is described below.

♂. *Coloration.* Pale brown. Eyes black. Postclypeus somewhat darkened, not striate. Antennae and palpi undarkened. Thoracic nota slightly darkened. Legs uniform grayish brown. Forewing almost hyaline, with very slight shading at apices of veins (FIG. 16). Abdomen with narrow darker bands across all tergites.

Morphology. Hypandrium (FIG. 17) deep, convex, broadly bilobed at apex, and with central depression rimmed. Parameres (FIG. 17) strongly associated with hypandrium, slender, sinuous, separate throughout their length and unornamented. Epiproct (FIG. 18) membranous, apically bilobed, and with tapered anterodorsal projection. Paraproct (FIG. 18) with short apical spine and a field of 14 small trichobothria. Basal hind tarsal segment with 17 ctenidia.

Dimensions. B 2.30, FW 2.40, HW 1.82, f_1 0.270, f_2 0.225, f_1/f_2 1.200, F 0.420, T 0.825, t_1 0.240, t_2 0.105, t_1/t_2 2.286.

Family ECTOPSOCIDAE

Ectopsocus vachoni Badonnel

Ectopsocus vachoni Badonnel, 1945: 44.
Ectopsocus dimorphus Mockford & Gurney, 1956: 363.

Specimens examined. CHILE: 1♀, Fray Jorge National Park, dead vegetation along creek bed, valley floor, 15.X.1976, New & New.

This species, recorded from Chile (Badonnel 1963), is found in many parts of the world. Its rarity in the present survey is unexpected.

Ectopsocus briggsi McLachlan

Ectopsocus briggsi McLachlan, 1899: 277.

Specimens examined. CHILE: 2 ex, La Campana National Park, nr Olmue, 26.V.1976, New & New; 1 ex, Melipilla, dead palm foliage, 28.V.1976, New & New; many ex, 6 km N of Valdivia, *Nothofagus,* 1.VI.1976, New & New; ca 20 ex, Malleco, nr Pailahueque, 2.VI.1976, New & New; 1 ex, Florida, dead *Pinus,* 3.VI.1976, New & New; ca 25 ex, Concepcion, Parque Equador, dead foliage, 5.VI.1976, New & New; 3 ex, Fray Jorge National Park, bosque, 500 m, 15.X.1976, New & New; 8 ex, same locality, 16.X.1976; many ex, La Campana National Park, 18.X.1976, New & New; many ex, same locality, to 600 m, 19–20.X.1976; many ex, Cajon Grande, ca 3 km E of Granizo, 20.X.1976, New & New; 1 ex, Santiago, Cerro San Cristobal, *Acacia melanoxylon,* 22.X.1976, New & New; many ex, Concepcion, Parque Equador, 25–26,29.X.1976, New & New; many ex, San Pedro, 27.X.1976, New & New; many ex, Lota, 28.X.1976, New & New; many ex, Temuco, Cerro Nielol, 31.X–8.XI.1976, New & New, 5 ex, same locality, 16.XI.1976, Thornton; 1 ex, Valdivia, Parque Saval, 10.XI.1976, New & New; 1 ex, 15 km N of Valdivia, native forest, 11.XI.1976, New & New; many ex, same locality, 18.XI.1976, ca 10 ex, Niebla, coastal secondary forest, 12.XI.1976, New & New; 3 ex, same locality, 18.XI.1976; 2 ex, Valdivia, Isla Teja, 14.XI.1976, New & New; many ex, same locality, 16.XI.1976–19.XI.1976; many ex, same locality, 20–26.XII.1976, New, New & Thornton; 6 ex, Piedra Blanca, 20.XI.1976, New & New; 1♂, Petrohue, 26.XI.1976, native vegetation, New & New; ca 20 ex, Chiloe I, lower Gamboa, 1.XII.1976, New, New & Thornton; 2 ex, Puerto Varas, Parque Phillippi, 24.XI.1976, New, New & Thornton; 1 ex, Peulla, 27.XI.1976, New & New; 4 ex, Panguipulli, 4.XII.1976, New & New; ca 10 ex, Panguipulli, island ca 3 km in lake, 5.XII.1976, New, New & Thornton; 5 ex, Chosuenco, 7.XII.1976, New, New & Thornton; many ex, Pucon, 10–11.XII.1976, New, New & Thornton;

5 ex, Villarrica, 11.XII.1976, New, New & Thornton; 2 ex, Futa, 14.XII.1976, New & New; 10 ex, Cordillera Pelada, Cerro Mirador, 14–15.XII.1976, New & New; 7 ex, Puyehue (Termas), 16.XII.1976, New & New; 1 ex, Antillanca, ca 3 km down from summit, *Nothofagus pumilio,* 16.XII.1976, New & New; ca 30 ex, Chol Chol, 30 km W of Temuco, *N. obliqua,* 18.XI.1976, Thornton; 8 ex, same locality, on *Araucaria,* 18.XI.1976; ca 20 ex, same locality, 19.XI.1976; 1 ex, Santiago, Cerro San Cristobal, 28.XII.1976, Thornton; 3 ex, Frutillar, 31.I.1977, L. Espinoza; 1 ex, Rupanco, 27.I.1977, Espinoza.

This cosmopolitan species was first reported from Chile by Mockford (1959) and was subsequently recorded by Badonnel (1963). In our survey, it was found commonly on dead foliage (its most typical habitat in many parts of its range) of a wide range of vegetation. The closely related parthenogenetic species *E. meridionalis* Ribaga (1905) was recorded from Chile by Badonnel (1963), but was not found in our collections.

Family Peripsocidae

Peripsocus nitens Thornton & Wong — Fig. 19–25

Peripsocus nitens Thornton & Wong, 1968: 129 (♂♀, Hawaii, New Zealand).

Specimens examined. CHILE: 1♀, La Campana National Park, 26.V.1976, New & New; 1♂, 10 km N of Los Angeles, roadside vegetation, 30.V.1976, New & New; 4♂,10♀, Fray Jorge National Park, bosque, 500 m, 12.X.1976, New & New; 1♀, same locality, 13.X.1976; 1♂,9♀, same locality, 14.X.1976; 6♂,44♀, same locality, 15–16.X.1976; many ex, La Campana National Park, 18.X.1976, New & New; 8♀, same locality, 19.X.1976; 1♀, Concepcion, Parque Equador, 24.X.1976, New & New; 2♂,3♀, same locality, 25.X.1976; 1♀, Concepcion, Cerro de la Virgen, 29.X.1976, New & New; 1♂, Lota, 28.X.1976, New & New; many ex, Temuco, Cerro Nielol, 31.X–5.XI.1976, New & New; many ex, Valdivia, Parque Saval, 10.XI–21.XI.1976, New & New; many ex, same locality, 4,12,19–26.XII.1976, New, New & Thornton; 11 ex, 15 km N of Valdivia, secondary forest, 17.XI.1976, New & New; 19 ex, Peulla, 27–28.XI.1976, New, New & Thornton; 1♀, Petrohue, 26.XI.1976, New & New; several ♀, Pucon, 10.XII.1976, New, New & Thornton; 3♀, Villarrica, 11.XII.1976, New & New; several ex, Chol Chol, 30 km W of Temuco, 18.XI.1976, Thornton; 2 ex, W shore of Lago Panguipulli, 4.XII.1976, Thornton; 2 ex, Chosuenco, 8.XII.1976, Thornton; 1 ex, Frutillar, 31.I.1977, L. Espinoza.

The Chilean specimens, and also those from Robinson Crusoe I (Thornton & New 1981), closely resemble the figures of *P. nitens* given in the original description. Because of the considerable range extension and small differences in the form of the subgenital plate, features of Chilean specimens are shown in Fig. 19–25. No other *Peripsocus* have been recorded from Chile. Males appear to be much scarcer than females, and many females are brachypterous, with wings extending about to the end

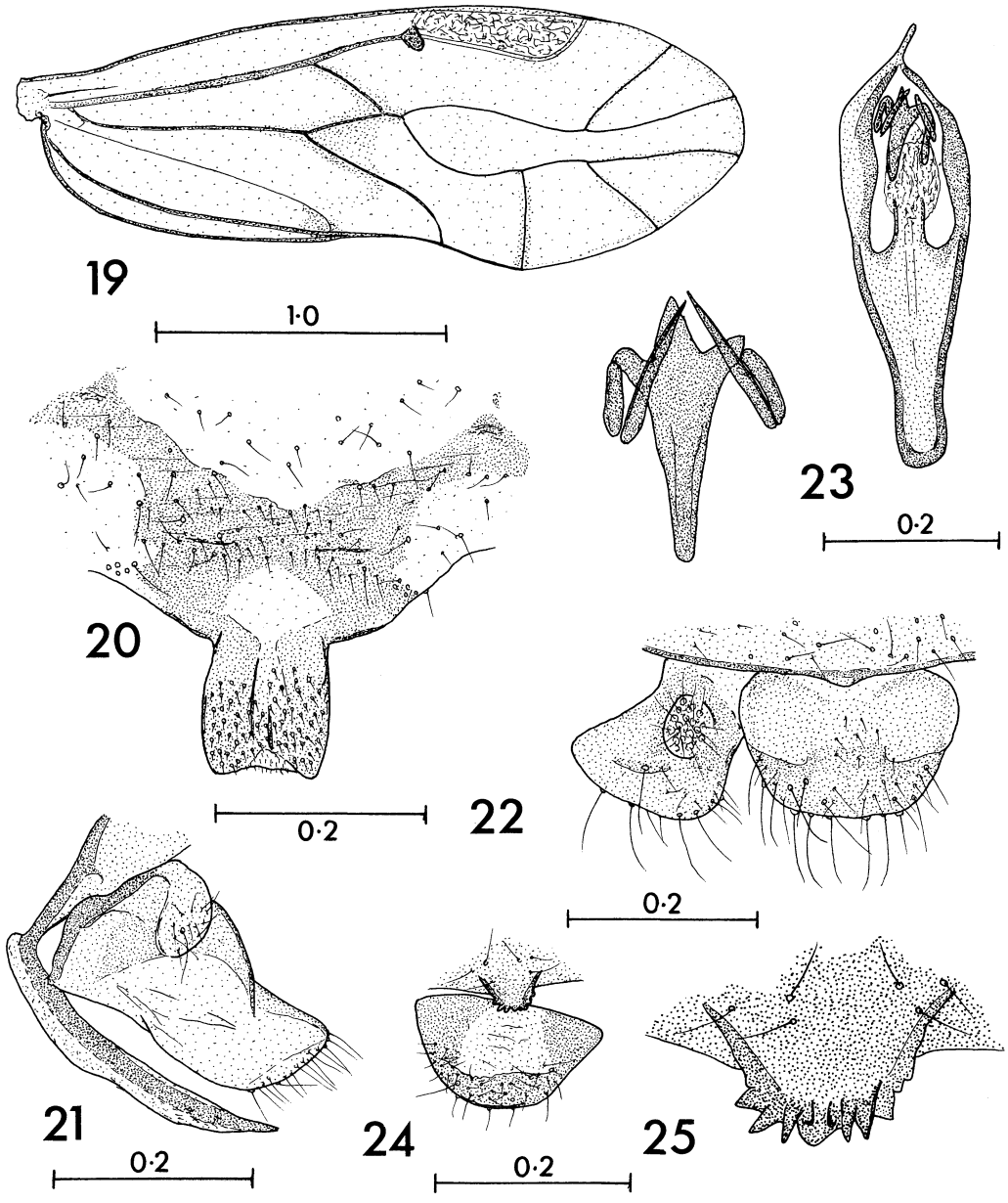

FIG. 19–25. *Peripsocus nitens:* **19,** ♀ forewing; **20,** subgenital plate; **21,** gonapophyes; **22,** ♀ epiproct and paraproct; **23,** phallosome, with insert of radular sclerites; **24,** ♂ clunium and epiproct; **25,** ♂ clunium, enlarged. (Scales in mm.)

of the abdomen. The species was found commonly on bark and fence posts, often in large colonies.

Family Trichopsocidae

Trichopsocus chilensis New & Thornton, **new species** Fig. 26–28

♀. *Coloration.* Pale ivory. Eyes dark gray. Head and thorax unmarked, except for narrow castaneous pleural stripe above coxae, extending on head behind eye and from eye to antennal socket. Antennae and palpi pale. Legs pale, except for darkening of extreme apex of tarsi. Abdomen with interrupted narrow pleural stripe, most evident on anterior ½. Wings pale. Forewing with very slight darkening at apex of all veins. Hindwing with slight darkening at apex of Cu_1 and of Cu_2.

Morphology. Forewing as in Fig. 26. Subgenital plate (Fig. 27) with apex slightly bilobed, each lobe with 3 short setae. Gonapophyses as in Fig. 28. Epiproct rounded, without long lateral setae. Paraproct with field of 9–11 trichobothria. Basal hind tarsal segment with 13 ctenidia.

Dimensions. B 2.20, FW 2.40, HW 1.82, f_2 0.240, F 0.450, T 0.795, t_1 0.255, t_2 0.105, t_1/t_2 2.429.

♂. Unknown.

Holotype ♀, CHILE: 2 km S of La Retuca, 25.V.1976, New & New (Bishop 11,552). Paratype, 1♀, CHILE: Concepcion, Parque Equador, dead foliage, 29.X.1976, New & New (AMS).

Badonnel (1976) noted the presence of *Trichopsocus* in Chile, the first record of the genus from South America. The few species of *Trichopsocus* are all of the same general appearance, being pale with slight darkening of apices of forewing veins and traces of a pleural stripe. The forewing of the present species is considerably paler than *T. dalii* McLachlan and *T. acuminatus* Badonnel (Europe), and the lack of conspicuous hindwing darkening together with the form of the epiproct separates it also from *T. australis* Edwards (Tasmania). It is distinct on form of gonapophyses from all described species of the genus.

Family Elipsocidae

The family contains a number of characteristic southern elements, and several genera are known only from Chile. *Eolachesilla* Badonnel is transferred to Elipsocidae below, and the genera recorded from Chile may be separated as follows in the key below.

Key to genera of Elipsocidae found in Chile

1. Areola postica joined to media (forewing with strongly contrasted dark pattern) ..... **Propsocus** McLachlan
   Areola postica free 2
2. Pulvillus broad 3
   Pulvillus slender or, at most, slightly dilated at apex 4
3. Genitalia: ♀ with ventral valve of gonapophyses broad, dorsal valve without slender process, subgenital plate simply rounded; ♂ phallosome with strongly developed radular sclerites with numerous discrete sclerotized areas ..... **Eolachesilla** Badonnel
   Genitalia: ♀ with ventral valve of gonapophyses slender, dorsal valve with long slender process, subgenital plate incipiently bilobed; ♂ phallosome without strong radular sclerites ..... **Drymopsocus** Smithers

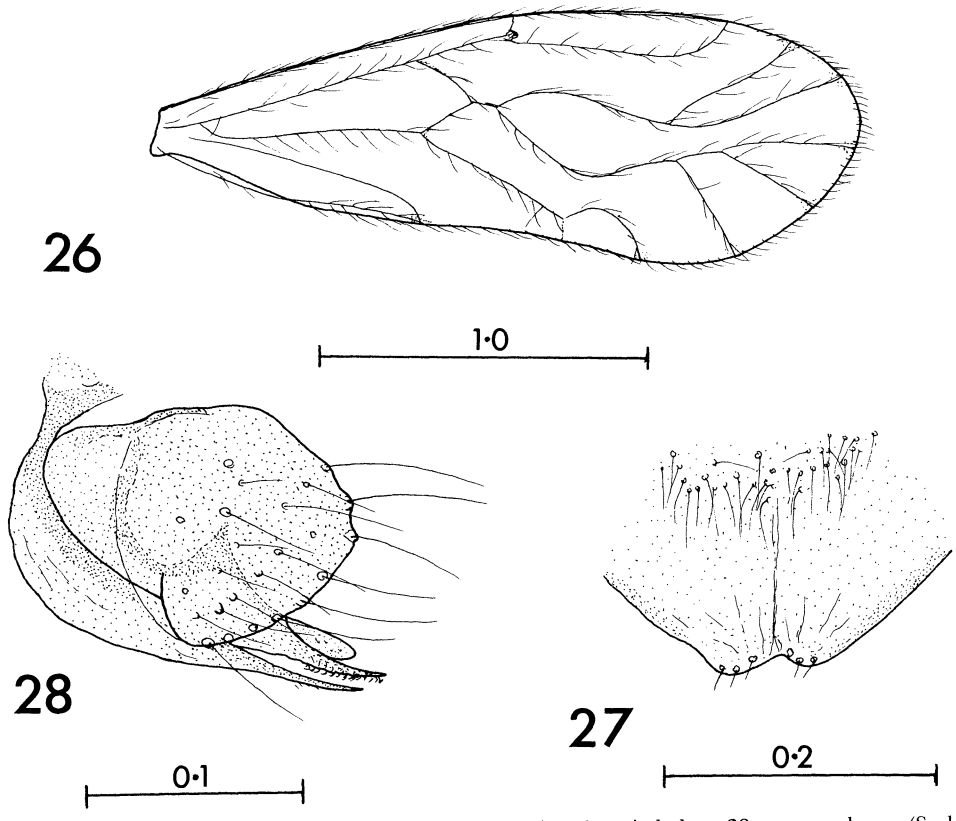

FIG. 26–28. *Trichopsocus chilensis*, ♀: **26,** forewing; **27,** subgenital plate; **28,** gonapophyses. (Scales in mm.)

4. Genitalia: ♀ with ventral valve of gonapophyses strongly reduced, dorsal valve short, subgenital plate incipiently bilobed; ♂ phallosome slender, ♂ macropterous, ♀ apterous .... **Roesleria** Badonnel
5. Genitalia: ♀ with ventral valve of gonapophyses slender, dorsal valve long with slender process, subgenital plate transverse or bilobed; ♂ phallosome broad, with complex radular sclerites. ♂ macropterous, ♀ macropterous or brachypterous ..... **Nothopsocus** Badonnel

Eolachesilla chilensis Badonnel

FIG. 29–34

Eolachesilla chilensis Badonnel, 1967: 583 (♀, Chile: Quinteros).

Augmented description

♂♀. *Coloration.* Buff. Eyes black. Ocelli with small black crescents on inner borders. Labrum and anteclypeus pale. Postclypeus with faint traces of 5–7 very pale gray striae each side of midline. Gena pale. Frons with dark brown streak in front of each lateral ocellus; dorsal rim of antennal socket dark brown, this mark continued to eye and behind eye as trace of pleural stripe. Vertex with transverse crescentic dark brown mark external to each lateral ocellus; posterior and mid region with small grayish brown patches, similar faint patches dorsal to each eye; setae pale. Palpi pale. Antennae grayish brown. Thoracic nota pale, except for slight browning of metanota; upper regions of pleura irregularly darkened.

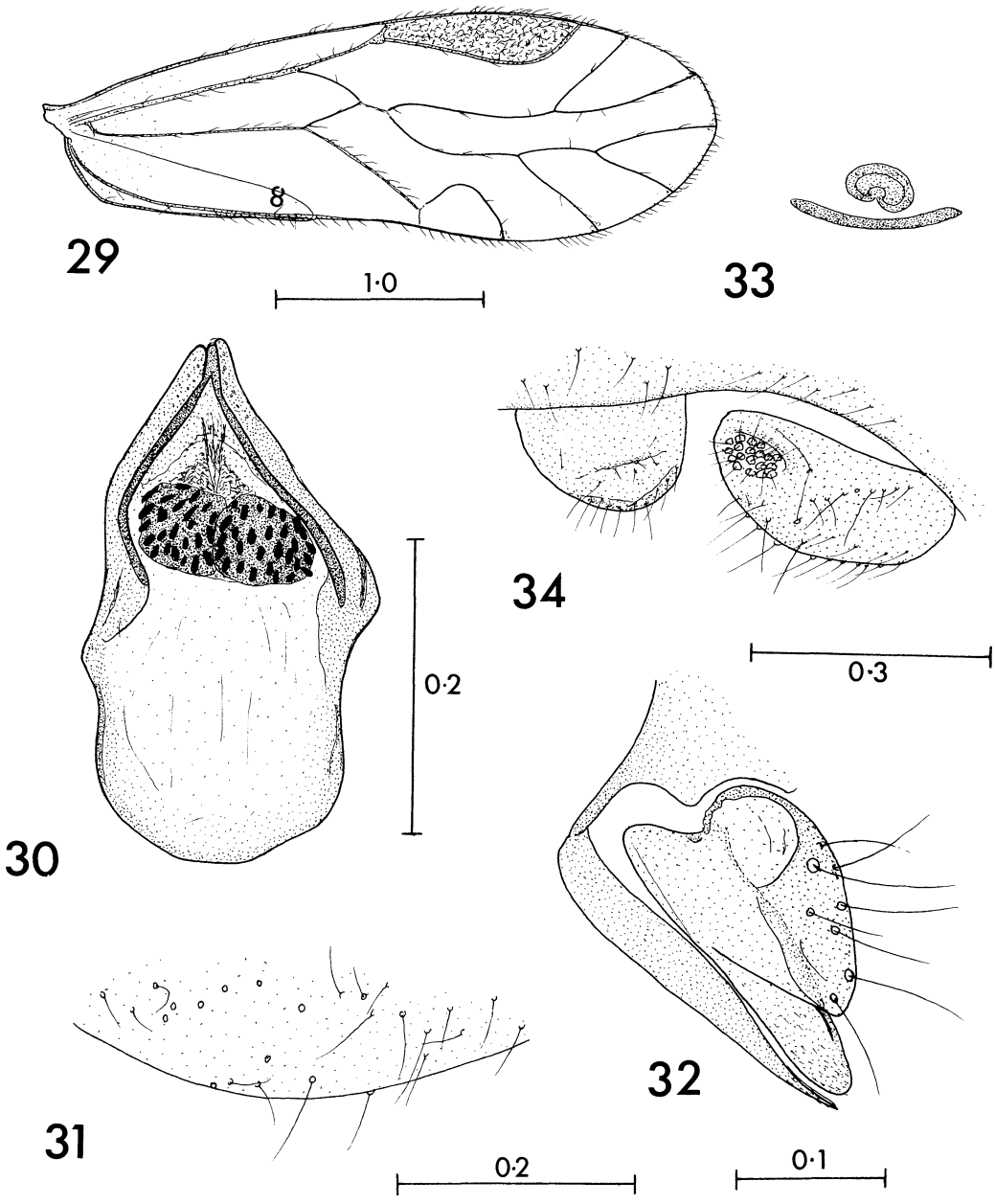

FIG. 29–34. *Eolachesilla chilensis:* **29,** ♂ forewing; **30,** phallosome; **31,** subgenital plate; **32,** gonapophyses; **33,** gonopore; **34,** ♀ epiproct and paraproct. (Scales in mm.)

Legs pale, except tarsi slightly grayed. Forewing unmarked, veins very dark brown. Hindwing pale. Abdomen with strong dark brown bands across each tergite, these usually more pronounced laterally. Genital region scarcely darkened.

Morphology. Forewing as in FIG. 29. Lacinia with two tines.

♂. Hypandrium bluntly rounded. Phallosome (FIG. 30) with outer parameres tapered; slender elongate apex; radular sclerites each with numerous small elongate dense patches. Epiproct shallow, rounded. Paraproct with field of about 23 trichobothria.

♀. Subgenital plate (FIG. 31) simple, rounded. Gonapophyses (FIG. 32): ventral valve tapered to narrow apex; dorsal valve rounded, not lobed; external valve elongate. Gonopore (FIG. 33) heavily sclerotized, with posterior sclerotized bar. Epiproct rounded. Paraproct (FIG. 34) very broad, with field of about 23 trichobothria.

Dimensions. ♀: B 2.55, FW 3.16, HW 2.30, f_1 0.525, f_2 0.435, f_1/f_2 1.207, F 0.660, T 1.170, t_1 0.360, t_2 0.060, t_3 0.075, t_1/t_2 6.000, t_2/t_3 0.800, ct 16.0.0. ♂: B 2.60, FW 3.02, HW 2.30, f_1 0.570, f_2 0.435, f_1/f_2 1.310, F 0.630, T 1.170, t_1 0.375, t_2 0.060, t_3 0.075, t_1/t_2 6.250, t_2/t_3 0.800, ct 19.0.0.

Specimens examined. CHILE: ca 12 ex, Concepcion, Cerro Carocol, 24.X.1976, New & New; 2 ♀, San Pedro, 27.X.1976, New & New; 12 ex, Temuco, Cerro Nielol, *Nothofagus dombeyi,* 31.X.1976, New & New; several ex, same locality, 1.XI.1976; 2♀, same locality, 5.XI.1976; several ex, same locality, 6.XI.1976; 10♀, same locality, 8.XI.1976; ca 20 ex, ca 15 km N of Valdivia, secondary forest, 11.XI.1976, New & New; many ex, same locality, 17.XI.1976; 1♂, Niebla, coastal scrub, 18.XI.1976, New & New; 1♀, Lago Todos los Santos, Isla Margarita, 27.XI.1976, T. R. New; several ex, Chosuenco, native vegetation, 7.XII.1976, New & New.

This species was described from a single female, which Badonnel (1967) believed to represent an archaic form of Lachesillidae. The female and male colorations correspond closely, both with each other and with Badonnel's description, and discovery of the male suggests that the correct placement of the genus is in the Elipsocidae rather than being closely allied to *Lachesilla.* Within the Elipsocidae the genus is discrete in the following combination of characters: macropterous females with forewing Cu_2 bare, pulvillus broad, and (♀) simple rounded subgenital plate and unlobed dorsal gonapophysis valve; (♂) phallosome with peculiar radular sclerotizations. In Chile, it appears to be related to the species here included in *Drymopsocus* but differs from them by the above genitalic features of both sexes. Genitalic features of the ♀ are figured here for comparison.

Roesleria chilensis Badonnel FIG. 35–37

Roesleria chilensis Badonnel, 1963: 331 (♀); 1971: 32 (♂).

Specimens examined. CHILE: 9♂,6♀, Santiago, Cerro San Cristobal, *Acacia melanoxylon,* 9.X.1976, New & New; ca 12 ex, same locality, 10.X.1976; ca 30 ex, same locality, 22.X.1976, ca 20 ex, same locality, 28.XII.1976; ca 10 ex, Fray Jorge National Park, valley floor, 12.X.1976, New & New; 3♂,3♀, La Campana National Park, to 600 m, 19.X.1976, New & New; 1♀, Cajon Grande, nr Granizo, 20.X.1976. ARGENTINA: many ex, San Martin de los Andes, Parque Nacional Lanin, mainly *Colletia spinosissima,* 9.XII.1976, New & New.

This species now appears to be widely distributed in central Chile and is here

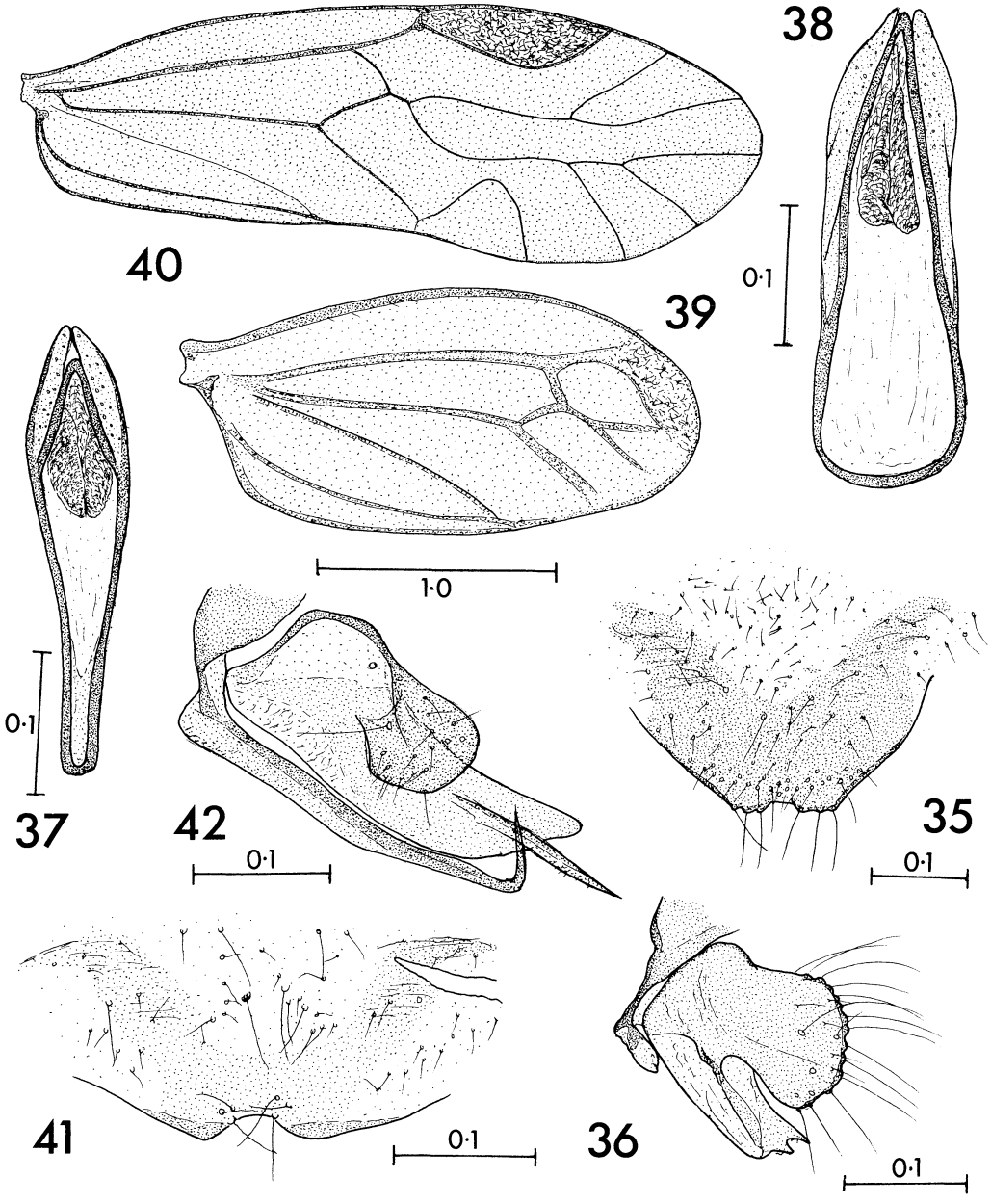

FIG. 35–42. **35–37.** *Roesleria chilensis:* **35,** subgenital plate; **36,** gonapophyses; **37,** phallosome. **38–42.** *Drymopsocus valdiviensis:* **38,** phallosome; **39,** ♀ forewing, brachypterous; **40,** ♀ forewing, macropterous; **41,** subgenital plate; **42,** gonapophyses. (Scales in mm.)

recorded from Argentina for the first time. The genus contains only a single species, which is separable from all other South American Elipsocidae on genitalic features of both sexes. The females appear to be always apterous, and the males macropterous. Phallosome, gonapophyses and subgenital plate are figured here for comparison with other Chilean Elipsocidae (FIG. 35–37).

Drymopsocus valdiviensis (Blanchard), **new combination** FIG. 38–42

Psocus valdiviensis Blanchard, 1851: 95.
Elipsocus valdiviensis: Enderlein, 1922: 248.
Drymopsocus nigrens Thornton & Lyall, 1978: 8. **New synonymy.**

Specimens examined. CHILE: 1♀, ca 6 km N of Valdivia, 1.VI.1976, New & New; 1♀, Fray Jorge National Park, valley floor, 16.X.1976, N. L. New; 3♂,4 ex, Concepcion, Parque Equador, 25.X.1976, New & New; 10 ex, Concepcion, Cerro de la Virgen, *Eucalyptus,* 26.X.1976, New & New; 23 ex, same locality, 29.X.1976; 1♂,4♀, Temuco, Cerro Nielol, 31.X.1976, New & New; 25 ex, same locality, 1.XI.1976; 6 ex, same locality, 4.XI.1976; many ex, same locality, 6.XI.1976; 6 ex, same locality, 8.XI.1976; many ex, Valdivia, ca 15 km NE, secondary forest, 11.XI.1976, New & New; many ex, same locality, 17.XI.1976; 2♀, Niebla, coastal secondary forest, 12.XI.1976, New & New; 10 ex, same locality, 18.XI.1976; 3♀ Valdivia, Parque Saval, 10.XI.1976, New & New; ca 20 ex, same locality, 16.XI.1976; many ex, same locality, 21.XII.1976; 1♀, Piedra Blanca, 20.XI.1976, New & New; ca 20 ex, Lago Todos los Santos, Isla Margarita, 27.XI.1976, New & Thornton; ca 25 ex, Chiloe I, Gamboa, 1.XII.1976, New, New & Thornton; 1♀, Lower Gamboa, 1.XII.1976, New & New; 2♂,1♀, Puerto Varas, Parque Phillippi, 24.XI.1976, New & New; 1♂, Peulla, ca 5 km E, 28.XI.1976, New & New; many ex, Pucon, 10.XII.1976, New, New & Thornton; many ex, Cordillera Pelada, Cerro Mirador, *Fitzroya, N. dombeyi,* 15.XII.1976, New & New; 19 ex (brachypterous), Magallanes, Monte Alto, 30.X–18.XII.1976, pitfall traps, D. Lanfranco & J. Petersen.

Dr Badonnel has kindly sent sketches of Blanchard's type female of this species. The pulvillus is broad, the wing uniformly darkened, and genitalic features correspond closely to the female illustrated here in FIG. 40–42: subgenital plate incipiently bilobed, each lobe with 2 or 3 preapical setae; gonapophyses with ventral valve long and slender; dorsal valve elongate with slender process and external valve rounded. Many such females were taken in association with males similar to that described as *nigrens* (Thornton & Lyall 1978), which is separable from other Chilean *Drymopsocus* on phallosome form (FIG. 38), and the frequency of this association together with absence of other species in many of the samples renders the above synonymy necessary. *D. valdiviensis* is considerably darker than other Chilean *Drymopsocus*; the head and thorax are almost black in many specimens. Brachypterous females are frequent, the forewings ranging from small flaps extending scarcely beyond the thorax to larger wings projecting to, or beyond, the abdominal apex.

This is one of the few species extending into Magallanes, from where only brachypterous individuals are known.

Drymopsocus griseus New & Thornton, **new species** FIG. 43–47

♂♀. *Coloration.* Yellowish brown. Eyes gray. Ocelli pale, surround scarcely darkened. Labrum and anteclypeus unmarked. Postclypeus with 5–7 faint striae each side of midline. Genae pale. Frons pale, except for slight darkening of central region. Vertex slightly darkened in midline, across posterior border and in small patches dorsal to each eye; scattered dark setae. Palpi pale. Antennae with scape and pedicel pale; flagellum slightly darkened. Thorax pale, unmarked. Legs grayish brown, tarsi slightly darkened. Forewing unmarked, very pale tawny. Hindwing pale. Abdomen pale, unmarked; genital region undarkened.

Morphology. Forewing as FIG. 43. Tarsal claw with broad pulvillus.

♂. Hypandrium transverse. Phallosome as in FIG. 47. Epiproct triangular. Paraproct with field of about 23 trichobothria.

♀. Subgenital plate (FIG. 44) incipiently bilobed, but lobing obscured by small membraneous central process; 2–3 setae each side of midline. Gonapophyses (FIG. 45) with ventral valve slender; dorsal valve bluntly rounded, with slender ventral process, external valve small and rounded. Epiproct deep, rounded. Paraproct with group of spines on ventral border (FIG. 46); a field of 18–22 trichobothria.

Dimensions. ♂: B 2.25, FW 2.30, HW 1.77, f_1 0.555, f_2 0.405, f_1/f_2 1.370, F 0.495, T 0.945, t_1 0.300, t_2 0.060, t_3 0.075, t_1/t_2 5.000, t_2/t_3 0.800, ct 18.0.0. ♀: B 2.30, FW 2.63, HW 2.01, f_1 0.525, f_2 0.360, f_1/f_2 1.458, F 0.540, T 0.990, t_1 0.285, t_2 0.060, t_3 0.080, t_1/t_2 4.750, t_2/t_3 0.750, ct 17.0.0.

Holotype ♀, CHILE: Piedra Blanca, ca 15 km SE of Valdivia, native forest, 20.XI.1976, New & New (BISHOP 11,553). Paratypes: ca 20♂♀, same data as holotype (BISHOP); others from following localities: CHILE: Valdivia, Parque Saval, *Nothofagus,* 10.XI.1976, New & New (AMS); same locality, 16.XI.1976 (AMS); same locality, 21.XII.1976 (AMS); Puerto Varas, Parque Phillippi, 24.XI.1976, New & New (BMNH); Pirihueico, mainly *Nothofagus pumulio,* 8.XII.1976, New & New; ca 10 km E of La Union, towards Cordillera Pelada, 14.XII.1976, New & New (BMNH).

This species is closely related to both *D. carrilloi* Thornton & Lyall and *D. flavus* Thornton & Lyall. It differs from both mainly by having paler eyes and by the lack of a distinct spinous lobe on the ventral edge of the female paraproct. Male genitalia and other female genitalic features of the 3 species are extremely similar, and they may prove to be little more than variants of the same taxon. However, the pigmentation differences are consistent, and the few lightly marked specimens of *D. flavus* encountered at Valdivia have dark eyes. These 3 species can be separated as follows.

1. Forewing with shading along many of the veins, sometimes pronounced in basal ½ of wing **flavus**
   Forewing with veins unshaded except, rarely, for slight shading along branches of R_s and M .. 2
2. Eyes dark; body coloration basically buff ..... **carrilloi**
   Eyes paler (gray); body coloration yellow or brownish yellow ..... **griseus, n. sp.**

Drymopsocus carrilloi Thornton & Lyall

Drymopsocus carrilloi Thornton & Lyall, 1978: 7.

Specimens examined. CHILE: 3♀, Concepcion, Parque Equador, 5.VI.1976, New & New; 1♀, Fray Jorge National Park, 500 m, 14.X.1976, New & New; 1♂, same locality, 16.X.1976; 1♂,5♀, Concepcion, Cerro Carocol, 24.X.1976, New & New; many ex,

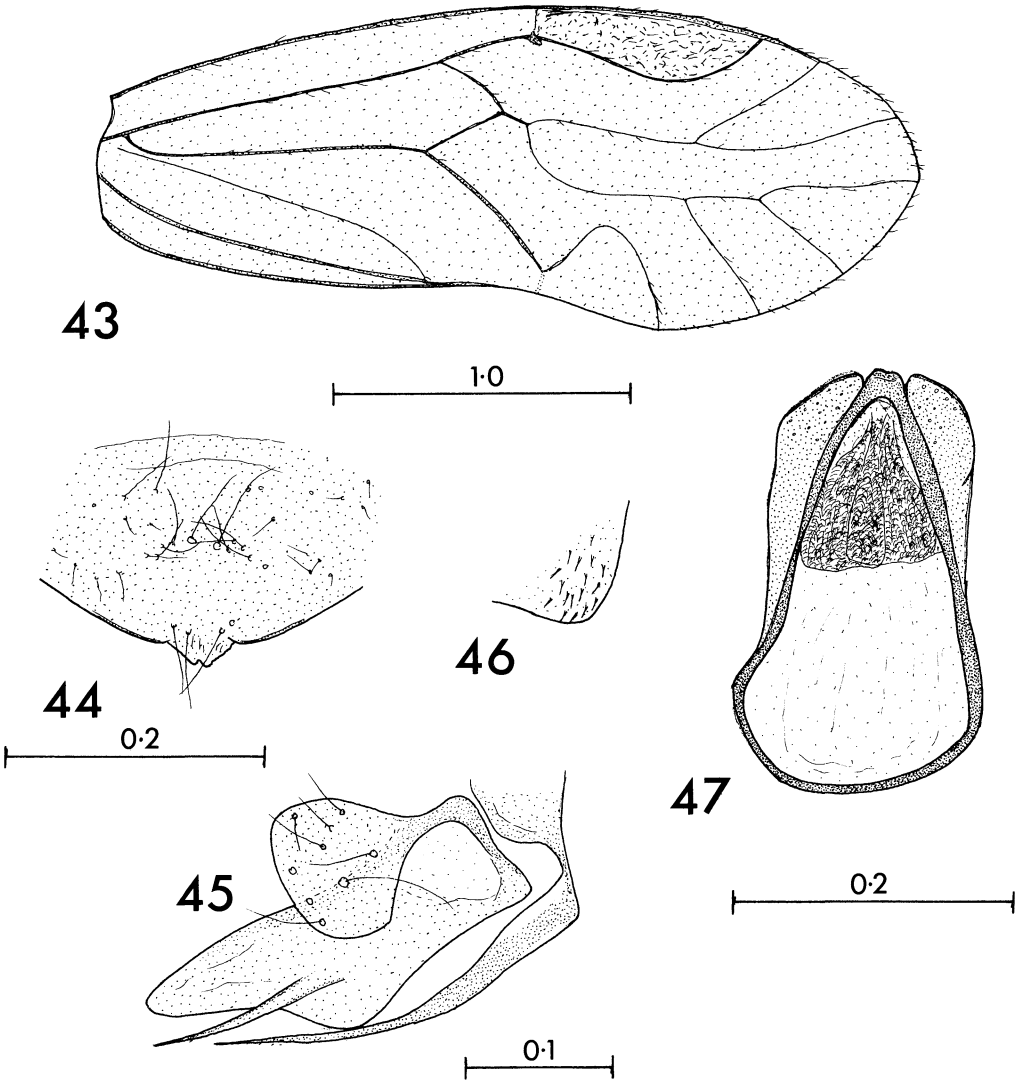

FIG. 43–47. *Drymopsocus griseus:* **43,** ♀ forewing; **44,** subgenital plate; **45,** gonapophyses; **46,** ventral border of ♀ paraproct; **47,** phallosome. (Scales in mm.)

Concepcion, Cerro de la Virgen, 26.X.1976, New & New; 5 ex, San Pedro, 27.X.1976, New & New; many ex, Temuco, Cerro Nielol, 31.X.1976, New & New; same locality, 4.XI.1976; same locality, 17.XI.1976, Thornton; many ex, Valdivia, Parque Saval, 10.XI.1976, New & New; 1♂, same locality, 16.XI.1976; ca 20 ex, same locality, 21.XII.1976; 3♀, ca 15 km N of Valdivia, 17.XI.1976, New & New; many ex, Valdivia, garden trees, 21.XI.1976, T. R. New; 7 ex, Lago Todos los Santos, Isla Margarita,

27.XI.1976, New, New & Thornton; 1♀, Petrohue, 26.XI.1976, New & New; 4♀, Peulla, 27.XI.1976, New & New; 15 ex, same locality, 28.XI.1976, Thornton; 23 ex, Panguipulli, island ca 3 km in lake, 5.XII.1976, New, New & Thornton; 4♀, Puesco, 10.XII.1976, New, New & Thornton; 1♂,3♀, Pucon, 10–11.XII.1976, New, New & Thornton; several ex, Villarrica, 11.XII.1976, New, New & Thornton; many ex, ca. 10 km E of La Union, 14.XII.1976, New & New; 1♀, ca 25 km E of La Union, 14.XII.1976, New & New; 1♂, Cordillera Pelada, Cerro Mirador, ca 600 m, 15.XII.1976, T. R. New; many ex, Chol Chol, ca 30 km W of Temuco, *Araucaria,* 18.XI.1976, Thornton; ca 30 ex, Puerto Varas, Parque Phillippi, 24.XI.1976, Thornton; 1 ex, Casa Pangue, 29.XI.1976, Thornton; ca 20 ex, Chiloe I, Castro, 30.XI.1976, Thornton.

Female genitalia are closely similar to those of both *D. flavus* and *D. griseus,* and the major distinction between the species is in body and wing coloration. Phallosome form and lacinal form are also virtually identical in the 3 species. The wing was figured by Thornton & Lyall (1978).

Drymopsocus flavus Thornton & Lyall FIG. 48–50

Drymopsocus flavus Thornton & Lyall, 1978: 9.

Specimens examined. CHILE: many ex, Temuco, Cerro Nielol, 1.XI.1976, New & New; many ex, Valdivia, Isla Teja, Parque Saval, 14.XI.1976, New & New; many ex, same locality, 16.XI.1976; many ex, same locality, 19.XI.1976; many ex, same locality, 21.XII.1976 and 25.XII.1976, New, New & Thornton; 2♀, Chiloe I, lower Gamboa, New, New & Thornton; several ex, Petrohue, SE slopes of V. Orsono, ca 900 m, mainly *Nothofagus dombeyi,* 26.XI.1976, Thornton.

See comment under *D. carrilloi. D. flavus* appears to be of more limited distribution than *D. carrilloi,* but the 2 species were taken together on some trees near Valdivia. The female forewing, gonapophyses and paraproct border are shown in FIG. 48–50.

Nothopsocus badonneli New & Thornton, **new species** FIG. 51–55

♂♀. *Coloration.* Buff, with extensive dark brown markings. Eyes black. Ocelli pale, each in black annulus. Face mainly dark brown: labrum and anteclypeus uniformly darkened; postclypeus dark, with traces of about 5 striae each side of midline. Frons dark. Vertex dark brown behind ocelli, across posterior border; a group of small brown patches dorsal to each eye. Palpi and antennae dark brown. Thorax dorsally dark brown, glossy, with narrow pale areas between lobes. Pleura dark brown. Legs uniform grayish brown. Forewing marked with dark grayish brown as in FIG. 51, 52: both sexes with pigment on and behind apical ½ of pterostigma, flanking apex of areola postica, around Rs-M junction, behind separation of M and Cu_1 and at nodulus. Male, in addition, with traces of pigmentation in cells Rs and M_1–M_3.

♀ *morphology.* Forewing as in FIG. 51; Cu_2 with few minute setae. Subgenital plate (FIG. 53) with apex transverse, bearing row of 8 setae; sclerotization pattern broad, arms strongly divergent anteriorly. Gonapophyses (FIG. 54): ventral valve slender; dorsal valve slender, with pointed dorsal apex and small, slender curved ventral process; external valve very large, produced to narrowly rounded dorsal point, setae on posterior ½. Epiproct deeply rounded. Paraproct with field of about 24 small trichobothria. Tarsal claw with subapical tooth and pulvillus very slightly expanded at apex.

♂ *morphology.* Forewing as in FIG. 52. Hypandrium transverse, simple. Phallosome frame (FIG. 55) broad;

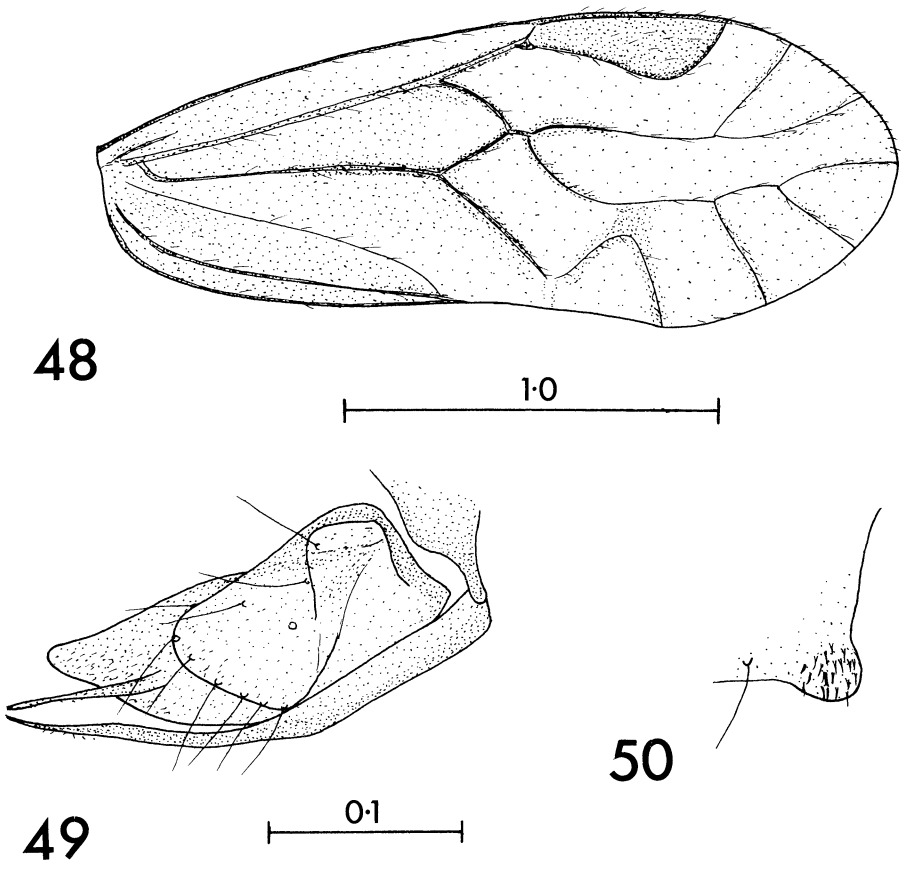

FIG. 48–50. *Drymopsocus flavus*, ♀: **48,** forewing; **49,** gonapophyses; **50,** ventral border of paraproct. (Scales in mm.)

apex transverse, with border rugose laterally; outer parameres rounded; complex radular sclerites. Epiproct rounded. Paraproct with large field of about 35 trichobothria.

Dimensions. ♀: B 2.85, FW 3.21, HW 2.30, f_1 0.450, f_2 0.285, f_1/f_2 1.579, F 0.450, T 0.975, t_1 0.240, t_2 0.060, t_3 0.090, t_1/t_2 4.000, t_2/t_3 0.667, ct 14.0.0. ♂. B 2.78, FW 2.87, HW 2.11, f_1 0.540, f_2 0.330, f_1/f_2 1.636, F 0.420, T 0.780, t_1 0.165, t_2 0.053, t_3 0.083, t_1/t_2 3.113, t_2/t_3 0.639.

Holotype ♀, CHILE: Concepcion, Parque Ecuador, dead foliage, 29.X.1976, New & New (BISHOP 11,554). Paratypes, 1♂: same data as holotype (BISHOP); 1♂, same locality as holotype, 25.X.1976 (AMS).

This species is named for Dr A Badonnel, in appreciation of his pioneering work on Psocoptera of Chile.

Nothopsocus Badonnel (1967) was erected for a single brachypterous female from Nahuelbuta (south of Concepcion), and no further specimens have been examined. The form of the gonapophyses and of the tarsal claw are closely similar to those of

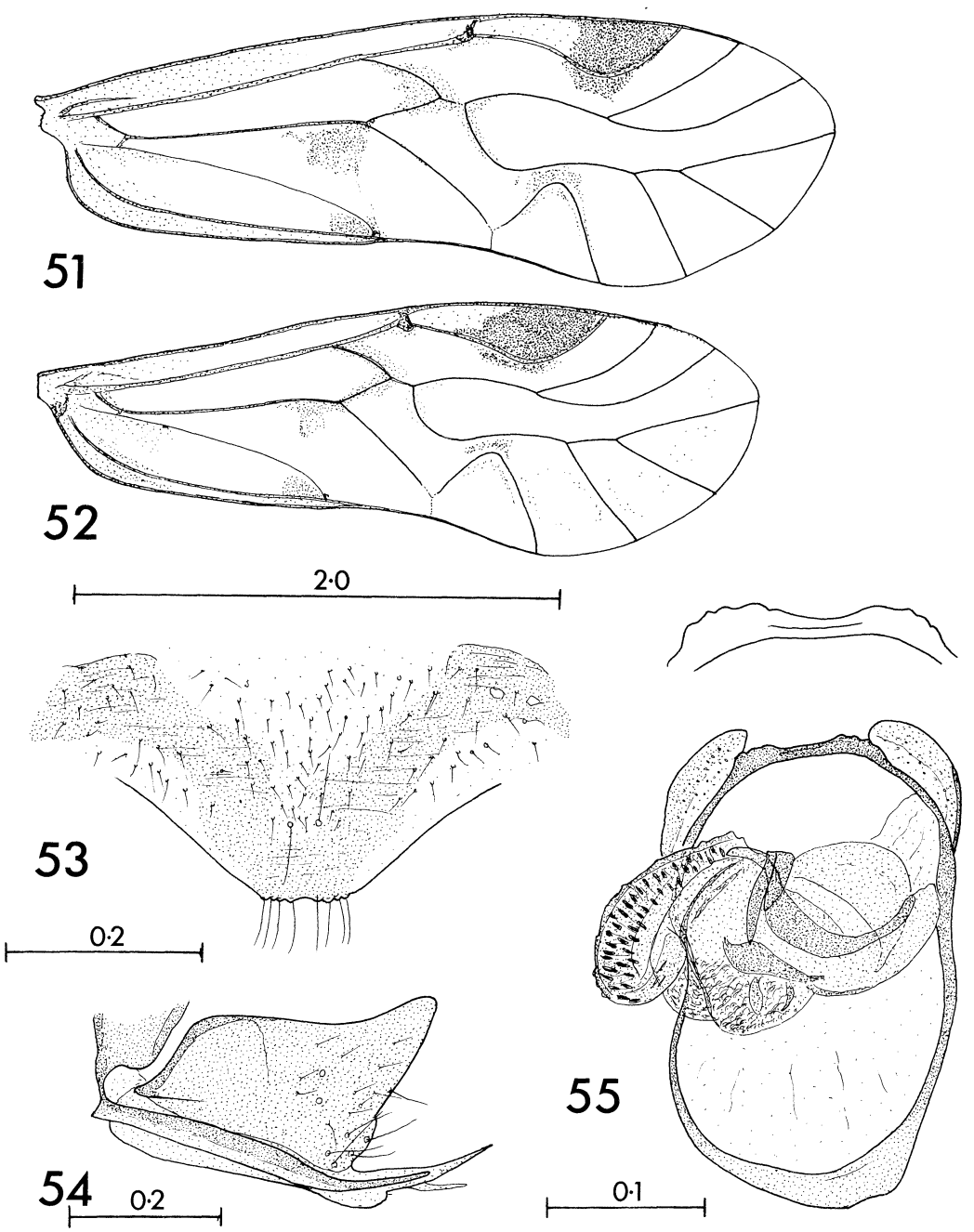

FIG. 51–55. *Nothopsocus badonneli:* **51,** ♀ forewing; **52,** ♂ forewing; **53,** subgenital plate; **54,** gonapophyses; **55,** phallosome, with insert of apical border. (Scales in mm.)

N. oxyurus Badonnel; both have 3-segmented tarsi, and the form of the subgenital plate is grossly similar. Alary dimorphism is known in other elipsocid genera, such as *Paedomorpha* Smithers, and cannot itself be taken as a generic feature in this family. Differences between *N. badonneli* and *N. oxyurus* are largely due to the macroptery of the former, and none could be considered of generic value.

Discovery of this species allows augmentation of Badonnel's generic diagnosis as follows:

Forewing with Cu_2 bearing a few small setae, AP free; hindwing with few marginal setae in radial fork. ♂: hypandrium simple; phallosome frame very broad, apex transverse and with complex radular inclusions.

Propsocus pulchripennis (Perkins)

Stenopsocus pulchripennis Perkins, 1899: 83.
Propsocus pulchripennis (Perkins): Badonnel, 1963: 330.

Specimens examined. CHILE: 1♂, Valdivia, Parque Saval, 21.XII.1976, New & New; 1♂, Piedra Blanca, ca 15 km SE of Valdivia, 20.XI.1976, New & New; 1♀, Temuco, ex *Nothofagus obliqua,* 17.XI.1976, Thornton; 1♂, Chol Chol, 30 km W of Temuco, *Araucaria,* 18.XI.1976, Thornton.

The few specimens of *P. pulchripennis* captured, together with earlier records, suggest that the species is widely distributed in central Chile.

Family PHILOTARSIDAE

Haplophallus chilensis Thornton & Lyall

Haplophallus chilensis Thornton & Lyall, 1978: 12.

Specimens examined. CHILE: 3 ex, Piedra Blanca, *Nothofagus,* 1.VI.1976, New & New; 1♀, 6 km N of Valdivia, 1.VI.1976, New & New; 2♀, Concepcion, Cerro de la Virgen, 5.VI.1976, New & New; 2♂, Fray Jorge National Park, bosque, 500 m, 12.X.1976, New & New; 2♀, same locality, 14.X.1976; 17 ex, same locality, 15–16.X.1976; 2♂,5♀, Concepcion, Parque Equador, 25.X.1976, New & New; 11♀, Concepcion, Cerro de la Virgen, 26.X.1976, New & New; 15 ex, San Pedro, 27.X.1976, New & New; 1♂, Lota, 28.X.1976, New & New; many ex, Temuco, Cerro Nielol, 31.X–8.XI.1976, New & New; 9 ex, same locality, 16.XI.1976, Thornton; 3♀, Valdivia, Parque Saval, 10.XI.1976, New & New; 56 ex, same locality, 18.XI.1976; many ex, ca 15 km N of Valdivia, secondary native forest, 11.XI.1976, New & New; many ex, same locality, 17.XI.1976; 10 ex, Niebla, coastal vegetation, 12.XI.1976, New & New; many ex, Valdivia, Isla Teja, *Quercus,* 14–16.XI.1976, New & New; many ex, Valdivia, various dates from 21.XI–27.XII.1976, New, New & Thornton; 4 ex, Lago Todos los Santos, Isla Margarita, 27.XI.1976, New, New & Thornton; many ex, Petrohue, 25.XI.1976, New, New & Thornton; many ex, Peulla, 28.XI.1976, New, New & Thornton; 3 ex, Casa Pangue, 29.XI.1976, New, New & Thornton; many ex, Chiloe I, Castro & Gamboa, 30.XI–1.XII.1976, New, New & Thornton; many ex,

Puerto Varas, Parque Phillippi, New, New & Thornton; many ex, Panguipulli, shore and island in lake, 5.XII.1976, New, New & Thornton; many ex, Chosuenco and Puerto Fuy, 6–7.XII.1976, New, New & Thornton; 7♀, Pirihueico, *N. pumilio,* 8.XII.1976, New, New & Thornton; 9 ex, Puesco, 10.XII.1976, New, New & Thornton; ca 15 ex, Pucon, 10–11.XII.1976, New, New & Thornton; many ex, Villarrica, 11.XII.1976, New, New & Thornton; 1♀, Futa, 14.XII.1976, New & New; ca 20 ex, Cordillera Pelada, to 500 m, 14–15.XII.1976, New & New; ca 20 ex, Puyehue, 16.XII.1976, New & New; 1♀, Anticura, secondary forest, 16.XII.1976, New & New; 23 ex, Chol Chol, 30 km W of Temuco, 18–19.XI.1976, Thornton; many ex, nr Curico, 20.XI.1976, Thornton; ca 20 ex, Melipeuco, below V. Llaima, 20.XI.1976, Thornton; 8♀, SE slopes of V. Osorno, 900 m (treeline), 26.XI.1976, Thornton; 7 ex, Punta Arenas, 15.XII.1976, Thornton; 14 ex, nr Punta Arenas, 16.XII.1976, Thornton; ca 20 ex, same locality, 22.XII.1976; 6 ex, Puerto Natales, Ultima Esperanza, 17.XII.1976, Thornton; 2♀, Ultima Esperanza, Cuevo Milodon, ex *N. pumilio,* 18.XII.1976, Thornton; 1♀, Torres del Paine National Park, SE shore Lago Pehoe, 19.XII.1976, Thornton; ca 10 ex, Magallanes, Puerto Eslora, 16.II.1977, D. Lanfranco & J. Petersen; ca 20 ex, Punta Arenas, 22.II.1962, T. Cekalovic.

This species now appears to be one of the commonest and most widely distributed arboreal psocids in Chile, occurring in many different forest types. A number of slightly brachypterous females were found.

Haplophallus cruciclypeus New & Thornton, **new species** FIG. 56–66

♂♀. *Coloration.* Buff to white. Eyes black. Ocelli pale, on black tubercle. Labrum darkened, anteclypeus pale. Postclypeus with median transverse narrow dark brown band, and median stripe from this to center of frons (FIG. 56): otherwise unmarked, striae not evident. Genae pale. Dorsal edge of antennal socket dark brown. Frons with dark marking between ocellar tubercle and antennal sockets. Vertex irregularly darkened behind ocelli and dorsal to eyes; a more pronounced dark brown spot anterodorsal to each eye. Antennae pale. Apical segment of maxillary palp slightly darkened. Thorax dark brown dorsally, sutural areas paler; a broad, irregular dark brown pleural stripe. Legs: coxae grayish brown; femora with slight dark brown band near apex, otherwise white; tibiae white; tarsi very slightly darkened. Forewing marked with grayish brown as in FIG. 59, 60: pterostigma ringed with brown; dark shading flanking many veins but most evident in central part of wing; apex of areola postica and posterior margin of wing partially darkened. Hindwing with slight grayish-brown shading around nodulus. Abdomen strongly marked with irregular dark chocolate bands across tergites.

Morphology. Antennal apex with single seta; apex more elongate in ♀ (FIG. 57, 58). Forewing (FIG. 59): Cu_2 glabrous. Hindwing vein setae: R_1 7–10, Rs 0; R_{2+3} 0, R_{4+5} 11–16, M 11–13; Cu_1 1–2.

♀. Subgenital plate (FIG. 61) apically bipartite with rounded, tapered apical lobe lacking setae. Gonapophyses (FIG. 62): ventral valve slender; dorsal valve very broad, apical border not lobed or incised; external valve trianguloid, broad. Epiproct (FIG. 63) broad, with long setae on apical ½. Paraproct (FIG. 63) rounded, with field of 18–23 trichobothria and 2 setae without basal rosettes. Basal hind tarsal segment with 17–19 ctenidia.

♂. Hypandrium with apex (FIG. 64) slightly bilobed and thickened. Phallosome (FIG. 65) broadly rounded at apex; outer parameres truncate. Epiproct (FIG. 66) rounded, with setae near apex. Paraproct (FIG. 66) with field of 22–28 trichobothria and 2 setae without basal rosettes. Basal hind tarsal segment with 16–19 ctenidia.

Dimensions. ♀: B 3.65, FW 3.88, HW 2.87, f_1 0.705, f_2 0.510, f_1/f_2 1.382, F 0.690, T 1.470, t_1 0.480, t_2 0.075, t_3 0.135, t_1/t_2 6.400, t_2/t_3 0.556. ♂: B 3.40–3.85, FW 3.83–4.07, HW 2.87–3.07, f_1 0.750–0.855, f_2

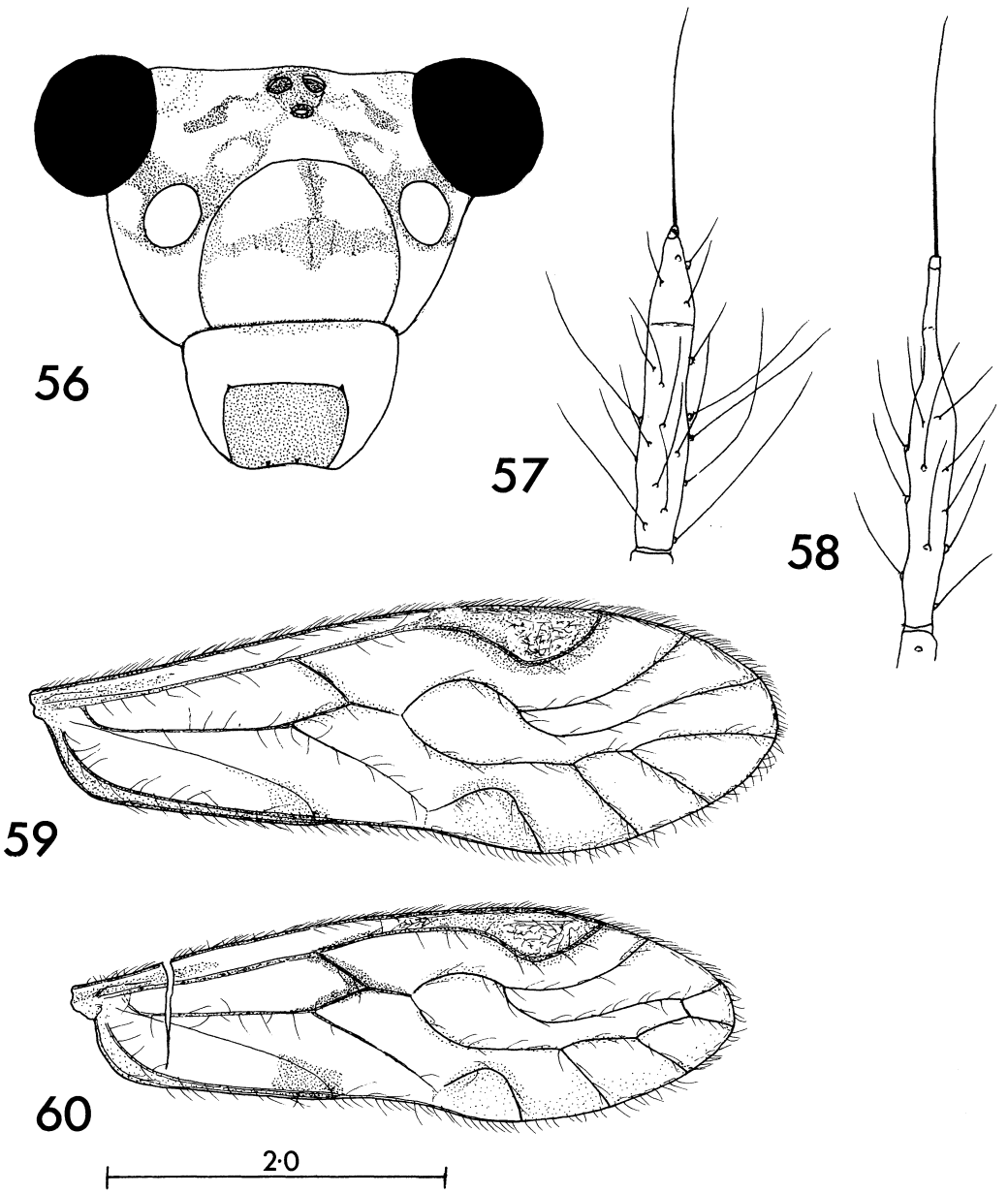

FIG. 56–60. *Haplophallus cruciclypeus:* **56,** ♀ facial pattern; **57,** apical segment of ♀ antenna; **58,** apical segment of ♂ antenna; **59,** ♀ forewing; **60,** ♂ forewing. (Scales in mm.)

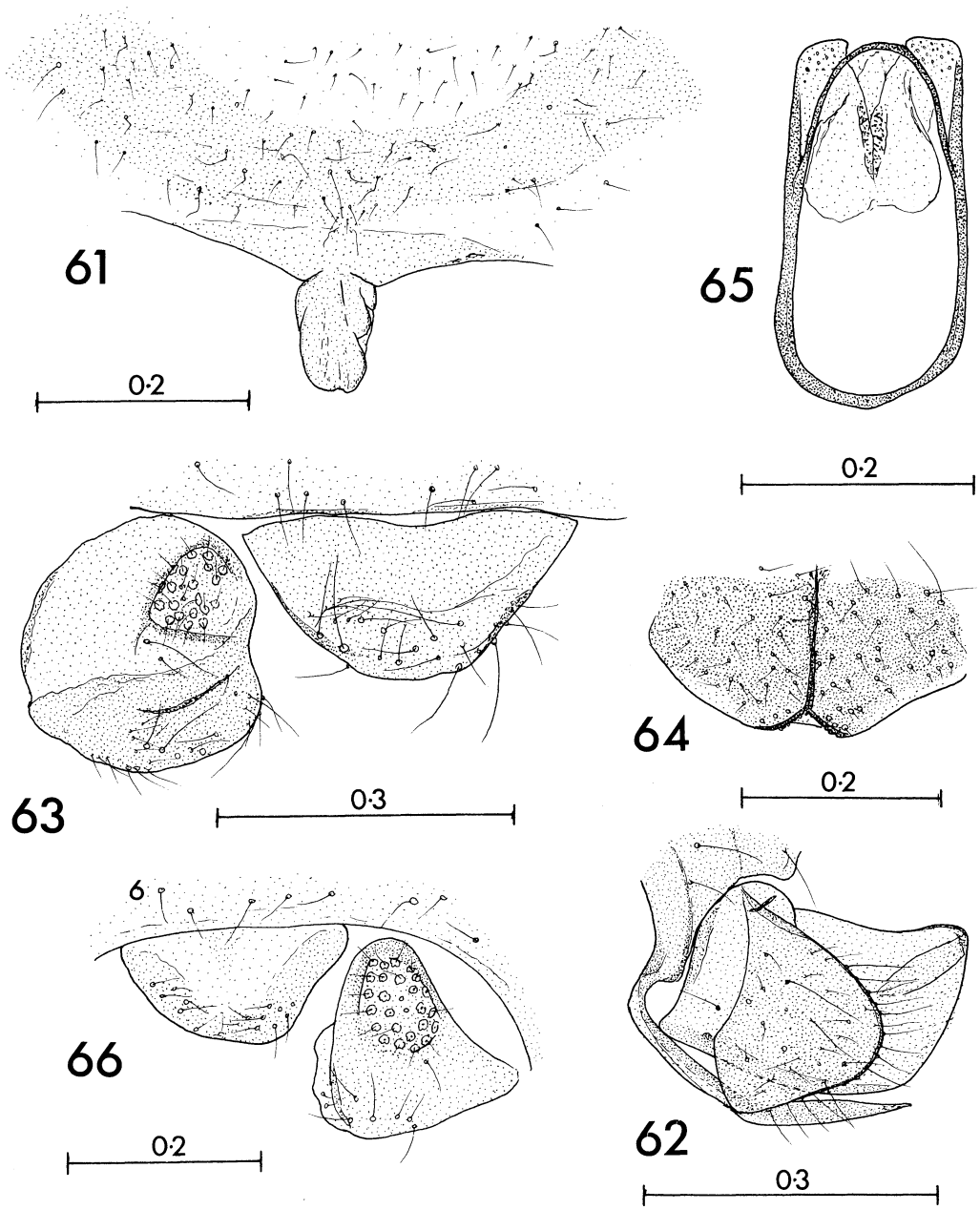

FIG. 61–66. *Haplophallus cruciclypeus:* **61,** subgenital plate; **62,** gonapophyses; **63,** ♀ epiproct and paraproct; **64,** hypandrium; **65,** phallosome; **66,** ♂ epiproct and paraproct. (Scales in mm.)

0.540–0.570, f_1/f_2 1.389–1.500, F 0.675–0.720, T 1.410–1.500, t_1 0.450–0.480, t_2 0.060–0.075, t_3 0.090–0.105, t_1/t_2 6.400–7.500, t_2/t_3 0.667–0.714.

Holotype ♀, CHILE: Fray Jorge National Park, bosque, 500 m, 15.X.1976, New & New (BISHOP 11,555). Paratypes: CHILE: 2♂,3♀, same data as holotype (BISHOP); 3 ex, Concepcion, Cerro de la Virgen, introduced trees, 26.X.1976, New & New (AMS); 2♀, Valdivia, Parque Saval, 10.XI.1976, New & New (AMS); 1♂,2♀, same locality, 19.XI.1976 (AMS); ca 45 ex, Pucon, 10.XII.1976, New, New & Thornton (AMS); 2♂,4♀, Villarrica, 11.XII.1976, New, New & Thornton (BMNH); 1♀, Valdivia, garden trees, 19.XII.1976, New & New (BMNH); 6 ex, Chol Chol, 30 km W of Temuco, 18.XI.1976, Thornton.

This is the 3rd philotarsid to be described from Chile. Dr Badonnel has kindly dissected and set us details of the male type of *Philotarsus triangulum* (Blanchard), which has not been found in our collections. *P. triangulum* is distinct from both *H. chilensis* Thornton & Lyall and *H. cruciclypeus* by having vein cu_2 in the fore wing setose.

H. cruciclypeus is separable from *H. chilensis* by the very different facial pattern, the nature of the antennal apex, and by the forms of the subgenital plate, gonapophyses and hypandrium. It appears to be much more limited in its distribution than *H. chilensis,* but the 2 species were taken together in several localities. *H. cruciclypeus* has many of the characteristics of the *bundoorensis* group of species (Thornton & New 1977), which is distributed over the Australian and Melanesian regions. It differs from species in this group most notably in that vein cu_2 of the fore wing is bare.

Family MESOPSOCIDAE

Mesopsocus termitiformis New & Thornton, **new species** FIG. 67–68

♀. *Coloration.* Buff. Eyes gray. Anteclypeus and labrum pale. Postclypeus with about 6 broad brown striae each side of midline, striae narrowing anteriorly. Central region of frons with broad U-shaped brown mark. Vertex posteriorly, around midline and dorsal to each eye with small patches of dark brown; a similar patch between eye and antennal socket. Ventral region of head unmarked. Palpi pale. Antennae dark grayish brown. Thoracic nota slightly darkened. Legs pale. Abdomen pale, slightly darkened apically.

Morphology. Apterous. Eyes minute. Ocelli absent. Antennae very short, with flagellar segments almost moniliform. Legs very short. Abdomen long, cylindrical. Subgenital plate (FIG. 67) with short rounded median lobe bearing row of posterior setae. Gonapophyses (FIG. 68): ventral valve narrowed apically; dorsal valve very broad, with small projection on apical margin, spiculate apically; external valve small, with spicules and few long setae. Epiproct broad, shallow, with 3 long marginal setae. Paraproct broad; no trichobothrial field: inner border with divided hyaline cone. Hind tarsus without ctenidia.

Dimensions. B 2.85, f_1 0.045, f_2 0.038, f_1/f_2 1.184, F 0.240, T 0.360, t_1 0.060, t_2 0.045, t_3 0.052, t_1/t_2 1.333, t_2/t_3 0.865.

♂. Unknown.

Holotype ♀, CHILE: Fray Jorge National Park, valley floor, on dead vegetation, 13.X.1976, New & New (BISHOP 11,556).

This species is highly unusual in having the abdomen cylindrical (rather than globular, as in many apterous *Mesopsocus* females) and the legs and antennae very short. These features, together with the very small eyes, give the insect the superficial ap-

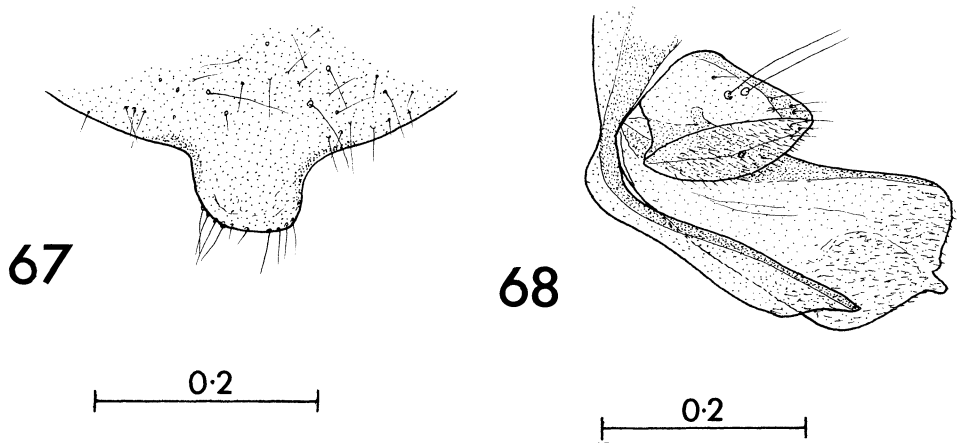

FIG. 67–68. *Mesopsocus termitiformis*, ♀: **67,** subgenital plate; **68,** gonapophyses. (Scales in mm.)

pearance of a worker termite; it was collected as such, and thus other individuals may have been overlooked.

Mesopsocus has not been recorded from Chile and only 1 species (*M. achocallae* Williner, 1949) has been recorded from South America (Bolivia). Details of genitalia of *M. achocallae* are not known but *M. termitiformis* appears to be considerably smaller.

Family PSOCIDAE

Blaste castala Thornton & Lyall FIG. 69–74

Blaste castala Thornton & Lyall, 1978: 14 (♂).

This species was described from a single male, which was somewhat damaged. Series of both sexes are now available. The female is described below and the male genitalia refigured in FIG. 69–71.

♀. *Coloration.* Pale brown. Eyes black. Ocelli on large black tubercle. Labrum and anteclypeus dark brown. Postclypeus with 6–8 narrow striae each side of midline. Frons darkened centrally. Vertex with groups of small dark brown spots behind ocelli and dorsal to eyes; posterior border dark brown. Antennae dark brown. Apical segment of maxillary palpi dark brown. Thorax dorsally glossy, dark brown, sutural areas pale; pleura dark brown. Legs with coxae dark, femora pale, tibiae and tarsi dark brown. Forewing (FIG. 72) with grayish-brown shading, intense in pterostigma, and forming a partial broad band from base of pterostigma to nodulus and basal to this. Hindwing with slight grayish shading near nodulus. Abdomen with irregular dark brown dorsal marking, somewhat concentrated into 4 longitudinal bands; genital region dark brown or black.

Morphology. Forewing as in FIG. 72. Subgenital plate (FIG. 73) with short transverse apical lobe. Gonapophyses (FIG. 74): ventral valve slender; dorsal valve bluntly rounded, with narrow ventral process; external valve small. Epiproct rounded. Paraproct large, with field of about 40 small trichobothria. Hind tarsal segments with 16:0 ctenidia.

Dimensions. B 3.25, FW 3.45, HW 2.68, f_1 0.525, f_2 0.390, f_1/f_2 1.346, F 0.750, T 1.380, t_1 0.360, t_2 0.180, t_1/t_2 2.000.

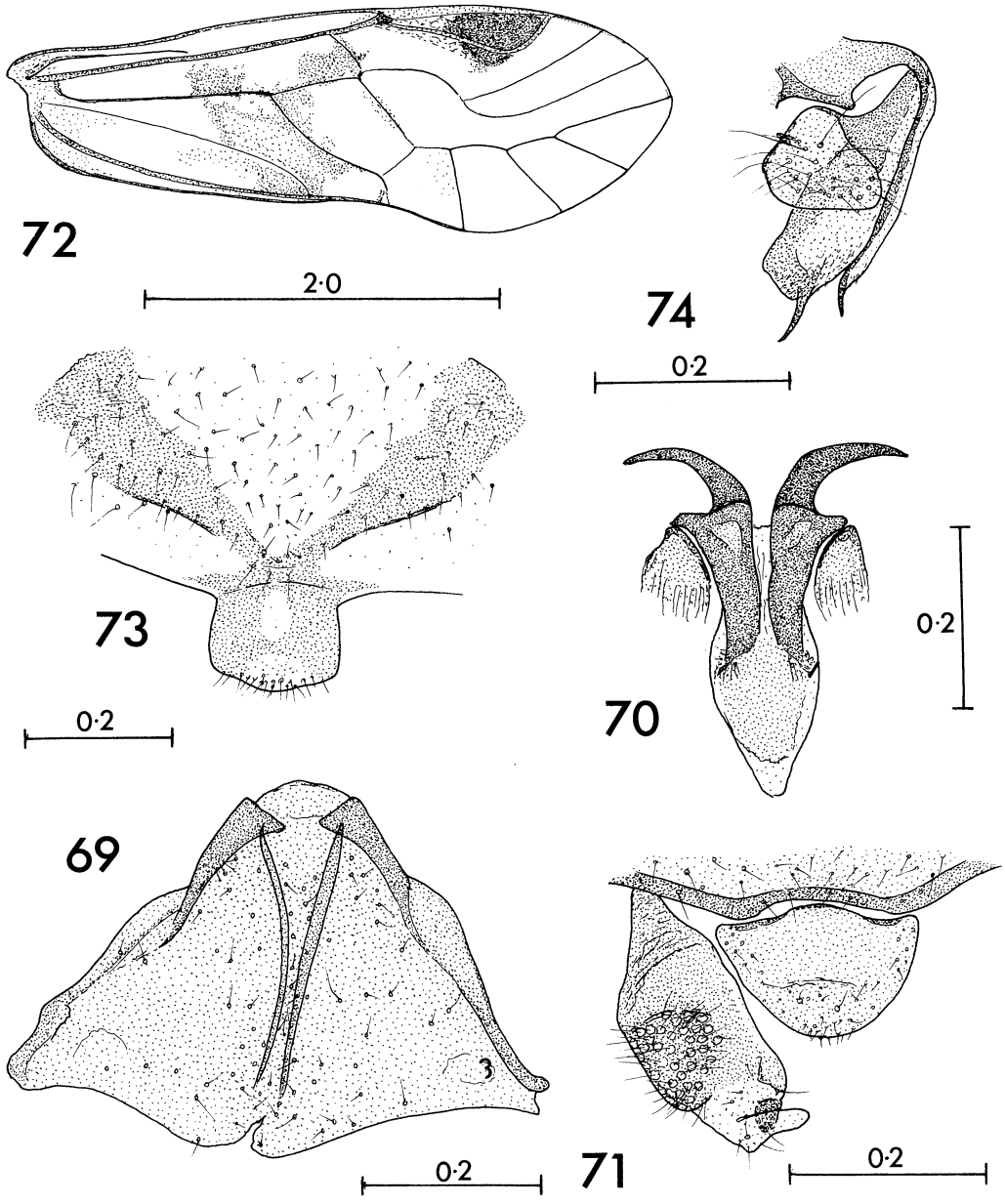

FIG. 69–74. *Blaste castala:* **69,** hypandrium; **70,** parameres; **71,** ♂ epiproct and paraproct; **72,** ♀ forewing; **73,** subgenital plate; **74,** gonapophyses. (Scales in mm.)

Specimens examined. CHILE: 1♂,5♀, Fray Jorge National Park, valley floor, 13.X.1976, New & New; 1♂, same locality, 16.X.1976; 5♂,8♀, Valdivia, garden trees, 12.XII.1976, New & New; 9♂,9♀, same locality, 13.XII.1976; 15♂,28♀, same locality, 20–25.XII.1976, New, New & Thornton, 3♂,4♀, Valdivia, Sta. Rosa, apple, 10.XII.1976, R. Carrillo.

Affinities of this species were outlined by Thornton & Lyall (1978). *Amphigerontia martini* Navás (1922), from Villa Alemana near Valparaiso, may be the nearest Chilean relative of *B. castala.* Navás' figure, presumably of a female, shows cell R_3 wholly dark, a feature not found in any specimen of *B. castala* seen. *A. hyalina* Enderlein (1925) may also be similar to this species, but appears to be considerably larger: forewing length was given by Enderlein as 5½ mm.

Ptycta cristata New & Thornton, **new species** FIG. 75–81

♂♀. *Coloration.* Pale brown, with strongly contrasted dark brown markings. Eyes dark gray. Labrum and anteclypeus dark brown. Postclypeus with 6–8 narrow dark brown striae each side of midline. Ocelli on dark brown or black tubercle. Antennae dark brown; flagellum black beyond f_1. Central region of frons with dark annulus; posterior border of frons dark brown. Vertex with dark brown patches behind ocelli, across posterior border and dorsal to each eye: in some specimens the latter a series of discrete small patches, more usually confluent. Thorax dark brown, sutural areas pale. Legs with coxae dark brown, apices of femora and whole of tarsi dark brown. Forewing (♂): pterostigma and apex of cell Cu_2 dark brown; sometimes a small dark area at fork of M and Cu_1; (♀) markings more extensive: a partial dark brown band across basal ½ of wing; (♂♀) base of forewing pale grayish brown. Hindwing with slight shading at apex of Cu_2. Abdomen with genital segments very dark brown; (♂) otherwise mainly pale, with traces of darker dorsal markings; (♀) more extensively marked with dark grayish brown, posterior of each tergite pale ivory.

♀ *morphology.* Forewing as in FIG. 75. Subgenital plate (FIG. 77) with short blunt median lobe. Gonapophyses (FIG. 78): ventral valve slender; dorsal valve with slender apical process; external valve transverse, with small rounded dorsal lobe. Epiproct rounded. Paraproct with field of about 28 trichobothria. Hind tarsal segments with 23:1 ctenidia.

♂ *morphology.* Forewing as in FIG. 76. Hypandrium (FIG. 79) broadly rounded, with strong median posterior crest. Phallosome frame (FIG. 80) closed; broad anteriorly; a short posterior spike and rugose rounded posterolateral lobes. Clunium (FIG. 81) strongly produced, rounded. Epiproct (FIG. 81) shallow, membranous, with short setae. Paraproct (FIG. 81) without basal process, with a slender apical spine and a field of about 30 trichobothria. Hind tarsal segments with 25:3 ctenidia.

Dimensions. ♀: B 3.20, FW 3.78, HW 2.78, f_2 0.435, F 0.690, T 1.395, t_1 0.405, t_2 0.180, t_1/t_2 2.250. ♂: B 3.35, FW 4.65, HW 3.50, f_1 0.795, f_2 0.675, f_1/f_2 1.178, F 0.810, T 1.740, t_1 0.510, t_2 0.180, t_1/t_2 2.833.

Holotype ♂, CHILE: Santiago, Cerro San Cristobal, *Acacia melanoxylon,* 22.X.1976, New & New (BISHOP 11,557). Paratypes: CHILE: 4♂,7♀, same data as holotype (BISHOP); 23♂,25♀, same locality, 9–10.X.1976 (AMS); 2♂,2♀, Fray Jorge National Park, bosque, 16.X.1976, New & New (BMNH).

This species most closely resembles *P. expansa* New & Thornton, 1975 (♂, Colombia) in both wing pattern and form of the phallosome. It differs clearly from *P. expansa* on the details of phallosome structure, and on other genitalic features. Details of the Chilean *Copostigma* (*Mecampsis*) *cinctifemur* Enderlein (1925) are not available, but it appears to differ in coloration from the present species.

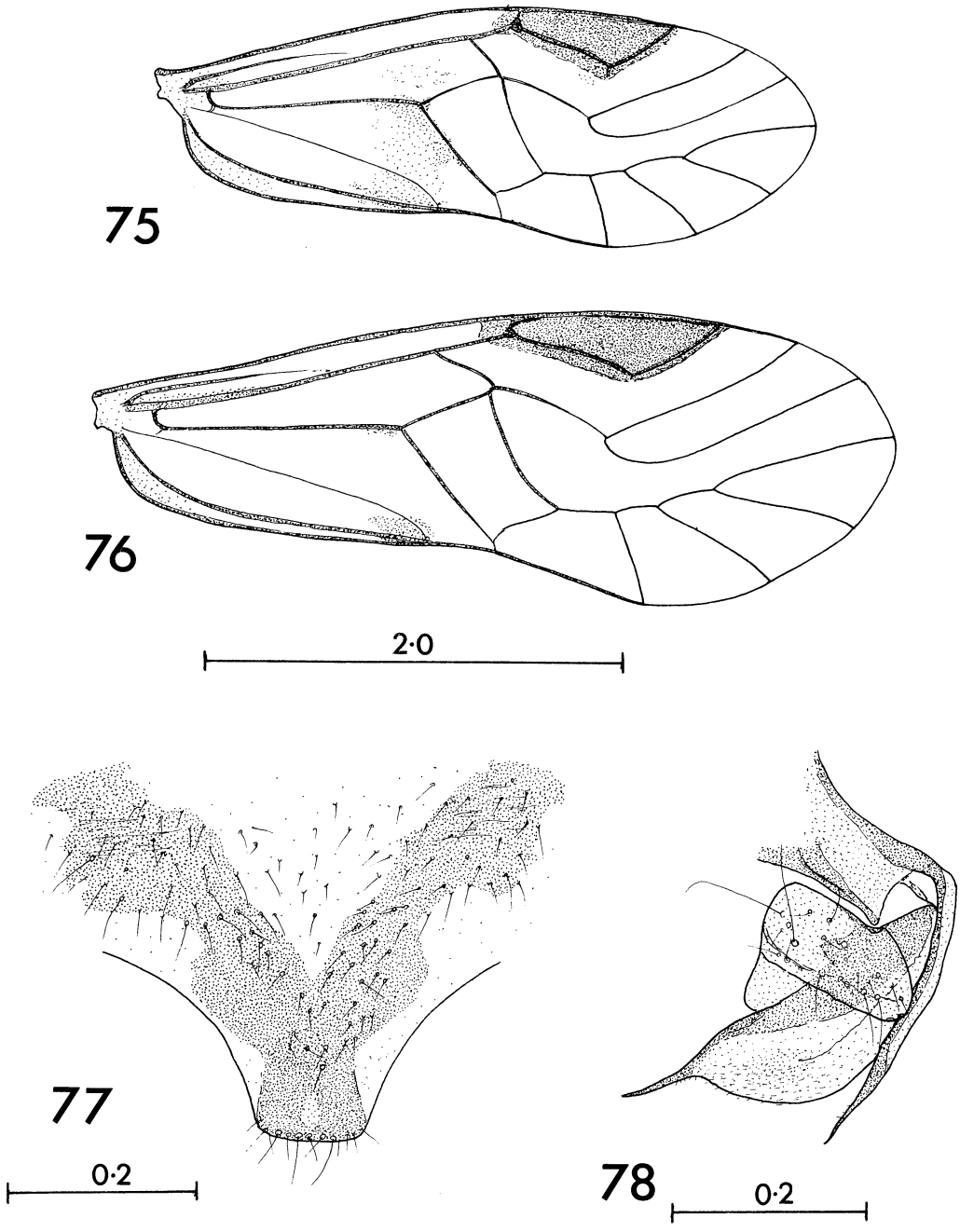

FIG. 75–78. *Ptycta cristata:* **75,** ♀ forewing; **76,** ♂ forewing; **77,** subgenital plate; **78,** gonapophyses. (Scales in mm.)

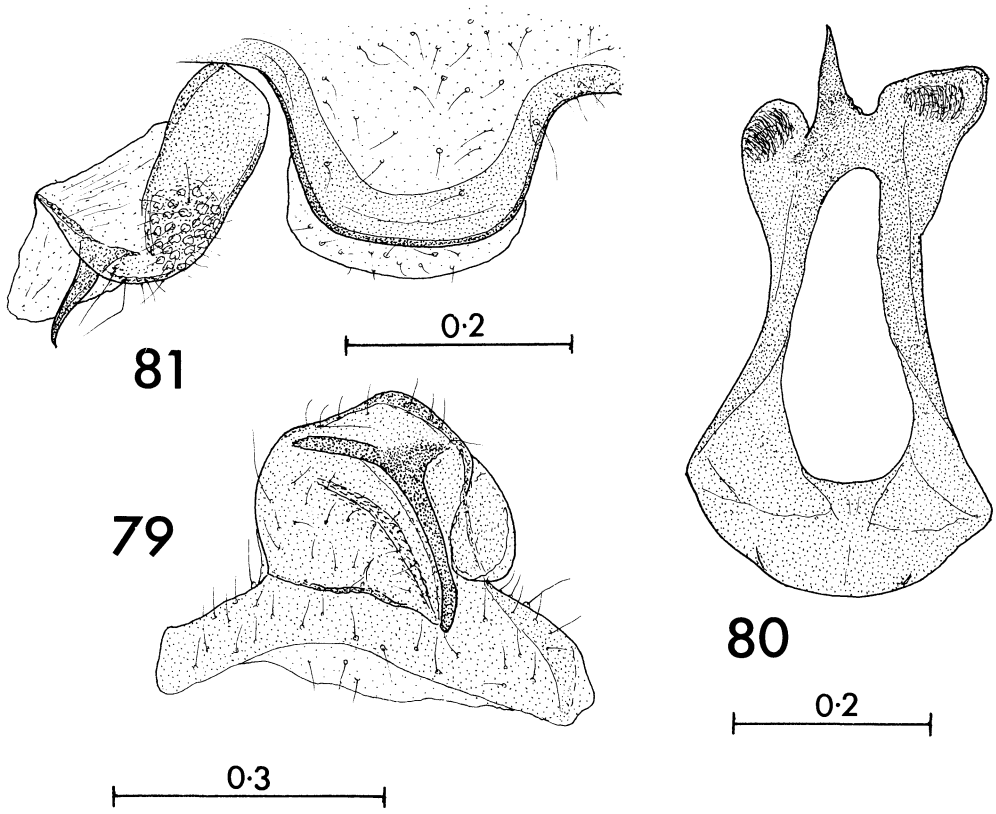

FIG. 79–81. *Ptycta cristata*, ♂: **79,** hypandrium; **80,** phallosome; **81,** clunium, epiproct and paraproct. (Scales in mm.)

Ptycta frayorgensis New & Thornton, **new species** FIG. 82–89

♂ ♀. *Coloration.* Pale brown. Eyes very dark gray. Ocelli pale, on small black tubercle. Labrum dark brown, anteclypeus paler, postclypeus with about 6 striae each side of midline: these more pronounced anteriorly, sometimes confluent in midline, central striae partially broken to series of dots. Frons with 2 dark brown spots near midline; antennal socket ringed with dark brown, genae dorsally dark brown. Vertex with central posterior block of 3 rows of dark brown patches, these sometimes partially confluent; posterior border dark; a group of 6–8 similar patches dorsal to each eye. Antenna: scape and pedicel brown, base of flagellar segment 1 pale, remainder of flagellum very dark brown. Maxillary palpi dark brown. Thorax dorsally dark brown, sutural areas pale. Pleura dark brown. Legs with coxae, apex of femora, whole of tarsi dark brown, otherwise pale buff or white. Forewing marked with grayish brown as in FIG. 82, 83. Hindwing with slight grayish-brown shading behind M and in marginal area behind Cu_2; slight marginal shading at apices of Rs branches. Abdomen pale, with traces of darker bands across all tergites; genital segments darkened.

♀ *morphology.* Forewing as in FIG. 82, venation as ♂. Subgenital plate (FIG. 84) with elongate rounded median posterior lobe. Gonapophyses (FIG. 85): ventral valve slender, elongate; dorsal valve broad, with slender dorsal apical process; external valve large, transverse, with small triangular dorsal lobe. Epiproct (FIG. 86). Paraproct (FIG. 86) broad, with field of about 25 trichobothria and 2 or 3 central setae without basal rosettes. Hind tarsal segments with 18:3 ctenidia.

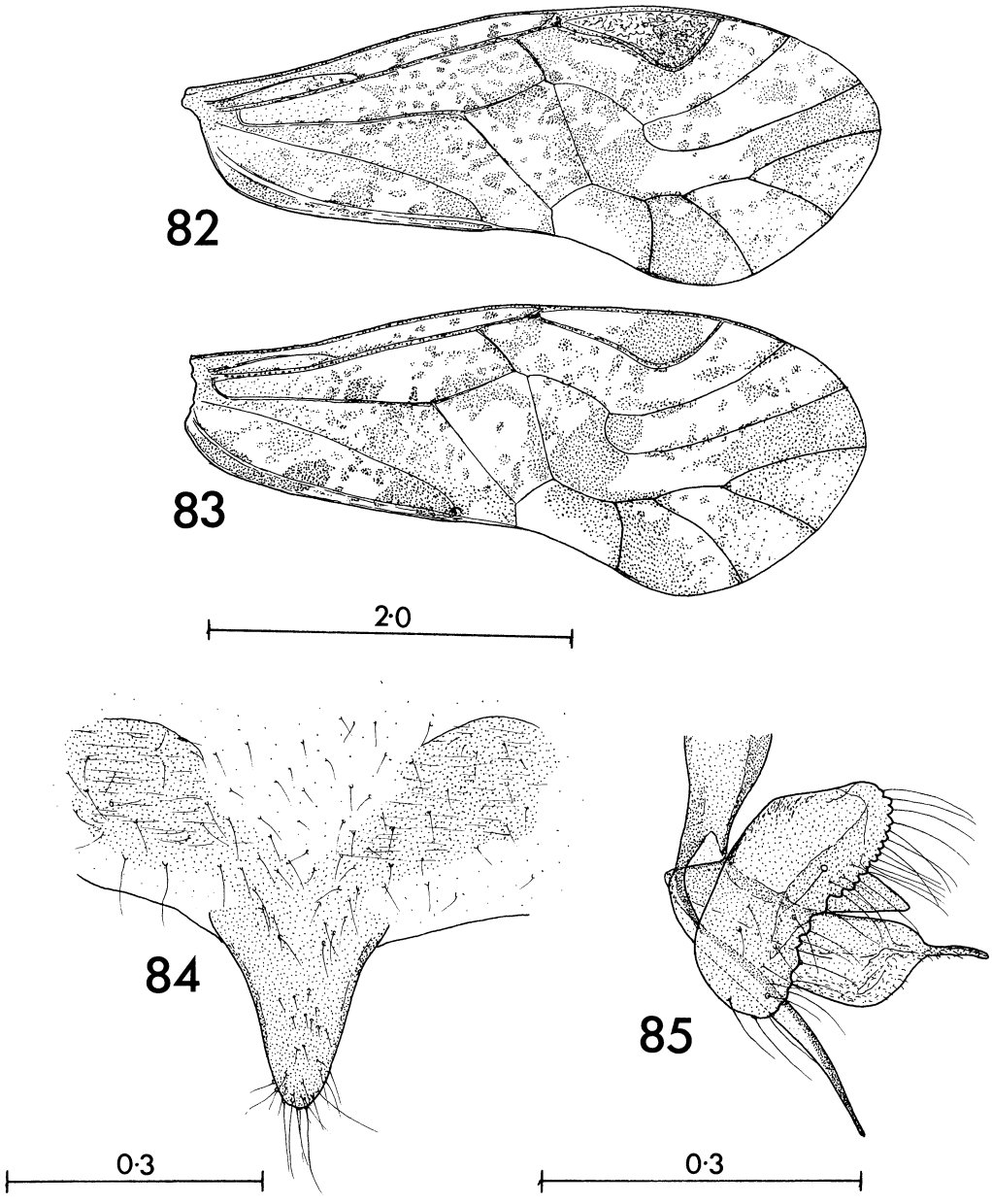

FIG. 82–85. *Ptycta frayorgensis:* **82,** ♀ forewing; **83,** ♂ forewing; **84,** subgenital plate; **85,** gonapophyses. (Scales in mm.)

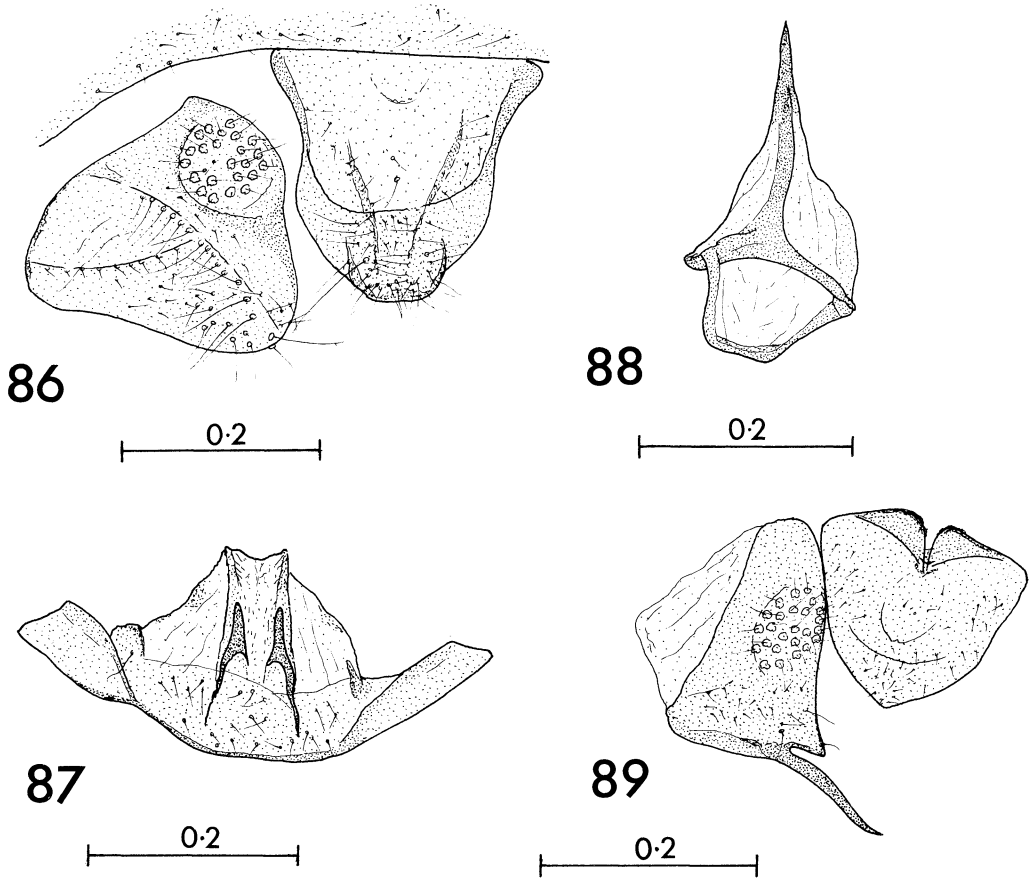

FIG. 86–89. *Ptycta frayorgensis:* **86,** ♀ epiproct and paraproct; **87,** hypandrium; **88,** phallosome; **89,** ♂ epiproct and paraproct. (Scales in mm.)

♂ *morphology.* Forewing as in FIG. 83: Sc joining R_1; areola postica long; veins glabrous. Hypandrium (FIG. 87) symmetrical, with double central crest and 2 elongate dorsally-directed spines on central posterior region. Phallosome frame (FIG. 88) closed, with very long posterior process. Epiproct (FIG. 89) with small bifurcated dorsal process, membranous, with short setae. Paraproct (FIG. 89) with elongate tapered spine, and a field of about 25 small trichobothria. Hind tarsal segments with 17:3 ctenidia.

Dimensions. ♂: B 2.85, FW 3.64, HW 2.83, f_1 0.795, f_2 0.525, f_1/f_2 1.514, F 0.585, T 1.335, t_1 0.420, t_2 0.150, t_1/t_2 2.800. ♀: B 2.95, FW 3.54, HW 2.78, f_1 0.720, f_2 0.465, f_1/f_2 1.548, F 0.570, T 1.290, t_1 0.405, t_2 0.150, t_1/t_2 2.700.

Holotype ♂, CHILE: Coquimbo, Fray Jorge National Park, bosque, 16.X.1976, T. R. New (BISHOP 11,558). Paratypes: 10♂,15♀, all same locality as holotype, 12–16.X.1976, New & New (BISHOP).

Wing markings of this species readily separate it from other South American species. The pattern is reminiscent of species of *Trichadenotecnum* Enderlein s.l., and it is possible that this is the species described by Enderlein (1926) as *T.* (*Loensia*)

schonemanni; this species has not been examined since its original description. It appears to be extremely local and was found only in the "relict" Valdivian forest area of the Fray Jorge Park. It was taken only in small numbers on each day, but was the most common species of Psocidae present in the area. Nearly all specimens were found on *Aextoxicum.*

DISCUSSION

The collections enumerated here are believed to be sufficiently comprehensive to enable some comments about relative abundance and distribution to be made. However, several species described by earlier authors have not been re-collected, and these include several zoogeographically intriguing forms, such as *Polypsocus bimaculatus* Enderlein (1925). *Polypsocus* species are known from Peru and are one of the most characteristic psocid groups of tropical South America. *Amphigerontia martini* Navás is mentioned in the comment on *Blaste castala*; the type-locality for this species, Villa Alemana, was visited by T.R.N. in both May and October. Little native vegetation now occurs in the district, and no Psocidae were found on either occasion. There are, thus, still anomalous species which merit further investigation. Likewise, several important areas have not been examined. In particular, the relict *Araucaria* forest of the Nahuelbuta National Park, south of Concepcion, was not visited and should be a priority for future fieldwork on Chilean Psocoptera in conjunction with more detailed investigation of the Andean *Araucaria* forests.

The total of 30 vegetation-frequenting species found during this work is less than the number of "edaphic" species (49) treated by Badonnel (1963, 1967, 1971). The latter include 29 species of Liposcelidae and Sphaeropsocidae, groups only rarely beaten from trees. Badonnel's collections did not include any Caeciliidae, Psocidae or Philotarsidae, nor any *Drymopsocus* spp.—groups which together make up a very large proportion of our Chile collections, but all of which are apparently absent from Robinson Crusoe I (Thornton & New 1981). The overlap between the collections is largely due to species which are associated with dead foliage and litter (*Ectopsocus briggsi, Eolachesilla chilensis, Roesleria chilensis*) or cortical/subcortical forms (*Cerobasis*).

The arboreal psocid fauna may be regarded as typically temperate, in that it contains relatively few species which are both abundant and widely distributed. The most abundant species are *Ptenopsila delicatella, Haplophallus chilensis, Caecilius ornatipennis* and *Drymopsocus valdiviensis,* all of which were found in many samples. *Ptenopsila delicatella* is the most characteristic psocid of southern South America and is confined to that region. *H. chilensis* and *D. valdiviensis* also occur in Magallanes, but *C. ornatipennis* appears to be more characteristic of Valdivian forest types, and it was not found in the Magellanic sites sampled. There is some tentative evidence that *H. chilensis* and *D. valdiviensis* may not extend across the Andes into Argentina: they were not found in our few Argentinian samples. More extensive work is needed before suggesting that the southern Andes constitute a barrier to these species. In contrast, the other 2 taxa were abundant in Argentinian samples. Neither have pre-

viously been recorded from the Argentinian mainland, although New (1973) recorded *Ptenopsila* from Argentinian Tierra del Fuego. Many Argentinian arboreal psocids are not known from Chile and appear to include some southward incursives with Brazilian affinities.

The Fray Jorge Park, considered as the northern limit of many Valdivian insects, supported an unusual *Ptycta* not found elsewhere. *Ptenopsila* was not found in the Park, but most other widespread psocids occurred in the unique forest of this area: *Ptenopsila* appears to be more closely associated with wetter forest regions. Virtually all the more common species of psocids were found in both native and exotic vegetation, and there is little evidence of specific association with, for example, *Nothofagus* spp.

The Chilean psocid fauna is not closely related to that of tropical South America, and many groups of psocids widespread in the tropics appear to be absent. However, Elipsocidae (in particular) appear to have radiated in Chile to a far greater extent than in other parts of South America, and the genera *Nothopsocus* (most diverse on Robinson Crusoe I), *Eolachesilla* and *Roesleria* may be regarded as Chilean endemics. *Drymopsocus* appears more diverse on the Chilean mainland than elsewhere, but it was erected for an Australian species, and *Propsocus pulchripennis* is widespread in Australia and elsewhere. The 2 *Haplophallus* species are related to different philotarsid groups, both of which are well represented in the Australian region and western Pacific (Thornton & New 1977), with *H. chilensis* being a more typical member of its group than is *H. cruciclypeus*. The family is rare in tropical South America. No analogue of *Ptenopsila* is known from southern Australia, and no caeciliid is as abundant as either *Ptenopsila delicatella* or *C. ornatipennis*.

The *Drymopsocus* and *Haplophallus* species represent the only strong affinity between the Chilean psocopteran fauna and that of the Australian region.

Acknowledgments. Many people helped to make our time in Chile both happy and useful. In particular we wish to thank Sr Roberto Carrillo L, Director of the Instituto de Defensa de las Plantas, Universidad Austral de Chile, Valdivia, for his kindness and hospitality; he, his family, and his staff gave much help in many ways. Luiz and Harriet Espinoza and Iris Wilson (Temuco), Edouardo and Audrey Rivas Plat (Chol Chol), Prof. Dolly Lanfranco L (Instituto de la Patagonia, Punta Arenas), Dr Tomas Cekalovic (Universidad de Concepcion), Sr Ariel Camousseight (Museo Nacional de Santiago), are thanked for hospitality, for advice and, with Dr Maria Etcheverry (Universidad de Santiago) and Dr Luciano Campos (Universidad de Santiago, Sede Sur), for allowing examination of collections in their care. We are also very grateful to Sr Ronald Wilkins and to other officers of the Corporacion Nacional Forestal (CONAF) for allowing us to collect in the National Parks of Chile. We thank Mrs Nesta New for her companionship and enthusiastic help during the work in South America.

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