

The Psocoptera (Insecta) of Tasmania, Australia

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Abstract

Schmidt, E.R. and New, T.R. 2008. The Psocoptera (Insecta) of Tasmania, Australia. *Memoirs of Museum Victoria* 65: 71–152.

A systematic synopsis of the Psocoptera of Tasmania, Australia, based on extensive specialist collecting and review of all available material totalling 109 species, including representatives of 15 families. A checklist of species and keys to all taxa are provided. Six new genera (*Bassocaecilius* gen. nov., *Clinocaecilius* gen. nov., *Graminacaecilius* gen. nov., *Nothocaecilius* gen. nov., *Tasmanocaecilius* gen. nov. – all Caeciliusidae; *Abelopsocus* gen. nov. – Philotarsidae) and 30 new species from nine families are described and illustrated, and their affinities discussed. They are: *Lepinotus huoni* sp. nov. (Trogidae), *Embidopsocus lenah* sp. nov. (Liposcelididae), *Bassocaecilius rawlinsoni* sp. nov., *Clinopsocus edwardsi* sp. nov., *Maoripsocus hobartensis* sp. nov., *M. pedderi* sp. nov., *M. spiralosus* sp. nov., *M. tahunensis* sp. nov., *M. wedgei* sp. nov., *M. weindorferi* sp. nov., *Graminacaecilius frontalis* sp. nov., *G. micropterus* sp. nov., *Nothocaecilius thomasi* sp. nov., *Tasmanocaecilius truchanasi* sp. nov. (Caeciliusidae), *Ectopsocus coyae* sp. nov., *E. graminus* sp. nov., *E. hickmani* sp. nov., *E. risdonensis* sp. nov., *E. sprengi* sp. nov. (Ectopsocidae), *Peripsocus cochleus* sp. nov., *P. pamae* sp. nov. (Peripsocidae), *Howeanum tasmaniensis* sp. nov. (Pseudocaeciliidae), *Abelopsocus truganinae* sp. nov., *Philotarsopsis hellyeri* sp. nov. (Philotarsidae), *Propsoocus frodshami* sp. nov. (Elipsocidae), *Ptyctia colei* sp. nov., *P. freycineti* sp. nov., *P. pallawahensis* sp. nov., *Tanystigma maddenii* sp. nov., *T. westae* sp. nov. (Psocidae).

Keywords

Australia, new taxa, Caeciliusidae, Philotarsidae

Introduction

The insect order Psocoptera occurs commonly in all zoogeographic regions (Lienhard and Smithers, 2002). Several species are cosmopolitan and others have wide tropical ranges. Many species, however, have limited distributions, giving rise to characteristic regional faunas. Approximately 300 species are known from Australia (Smithers, 1996a). This number is likely to be a considerable underestimate of the total fauna because large areas, particularly in northern and Western Australia, have not been surveyed by specialists and Psocoptera are not collected routinely by most other entomologists.

Southeastern Australia has been explored more effectively. Surveys of Muogamarra Nature Reserve, near Sydney (Smithers, 1977) and Tuglo Wildlife Refuge, Hunter Valley, New South Wales (Smithers, 1993, 1994b, 1996b, 1996d, 1997), South Australia (Smithers, 1984, 1998), The Grampians and Mt Arapiles, Victoria (Endersby et al., 1990), and Wilsons Promontory, Victoria (Schmidt and Thornton, 1993) indicate that the temperate Australian psocopteran fauna is reasonably diverse. The Wilsons Promontory survey and those of the Otway Ranges (Thomas, 1986) and some Bass Strait islands (Cole et al., 1989) have considerably augmented our knowledge of the psocopteran fauna of the Bass Strait region. Though

limited in scope, most of these surveys have provided some information on vegetation preferences and phenological traits of particular species. Until now 96 species have been recorded from Victoria but other, undescribed species are known.

Tasmania and the Bass Strait region are well suited for the investigation of patterns of distribution and evolution of Psocoptera and the plants with which they are associated. Global changes in climate have exposed land bridges between mainland Australia and Tasmania on numerous occasions since the Miocene, and have considerably altered the range and dominance of particular vegetation communities. The emergence of fire-prone sclerophyllous plant communities and the intermittent land connections and associated vegetation shifts have repeatedly isolated and fused habitats in processes conducive to speciation.

This paper is a systematic account of the Psocoptera of Tasmania. It provides, for the first time, a reasonably complete synopsis of the taxa present and their distributions based on substantial specialist collecting. One hundred and nine species, representing 15 families, are included. Only 31 species of Psocoptera (excluding the name *Liposcelis divinatorius* Müller) have been recorded previously from Tasmania, mainly by Hickman (1934), Edwards (1950) and Smithers (1979), and the

occasional records of Smithers (1963), New (1973a), Thornton and New (1977) and Schmidt and Thornton (1993). Most of these species were recorded from the east and north coasts, and the records from the southwest were limited to the Lower Gordon River area (Smithers, 1979). Coy et al. (1993) listed the Tasmanian Psocoptera identified by ERS that were collected as part of the National Rainforest Conservation Project. Smithers (1996a) listed 49 species for Tasmania, but this figure includes the Bass Strait island fauna. The islands are politically under the control of Tasmania but biogeographically can be treated separately. Schmidt and New (2004b) gave a preliminary outline of the biogeography of the Tasmanian Psocoptera.

Site Area

Tasmania lies south of the southeastern corner of the Australian mainland (fig. 1), separated from it by Bass Strait, which is approximately 240 km wide. It extends from 40°38' to 43°39' south latitude and from 144°36' to 148°23' east longitude (296 km from north to south, 315 km east to west). On the south and west the coastline is bounded by the Southern Ocean and on the east by the Tasman Sea. With an area of 64,409 square kilometres, Tasmania represents about 0.9% of the total area of Australia.

While mainland Australia is basically a warm, dry continent, Tasmania is classified as temperate maritime. Being south of 40° latitude it is on the edge of the wind belts of prevailing westerlies (commonly known as the Roaring Forties). This is the dominant factor producing the climate on the island (Langford, 1965). The insular position of Tasmania and the stabilising effect of the surrounding oceans provide protection against temperature extremes, so that variation between summer and winter mean temperatures in coastal towns rarely exceeds 8°C, rising to about 12°C further inland, indicating a slight continental effect.

Compared with other states, Tasmania has the largest proportion of high country. The mountains are not very high – few exceed 1500 metres – but are very numerous, particularly in the western half of the state. The combination of mountainous terrain in western Tasmania and prevailing westerly winds produces a marked west–east gradient in rainfall. Westerly winds are strongest and most persistent in winter, causing greatest rainfall distribution in the west and northwest. In the west the average annual rainfall ranges from about 1500 mm on the coast to 3500 mm at Lake Margaret (ten km north of Queenstown); and in the northwest from 1000 mm near the coast to 1600 mm in the higher inland areas. Rainfall in the

east and southeast is more evenly distributed throughout the year. In the northeast, rainfall ranges from 500 mm on the coast to 1300 mm on the highlands. A distinct rain shadow occurs east of the Central Plateau (Great Lake region), so that parts of the Midlands (plain south of Launceston) average less than 500 mm per year. Totals in the east and southeast are higher, averaging over 800 mm on some exposed slopes.

Snow and hail can fall on the highlands at any time of the year, but generally the heaviest snowfalls occur in late winter and spring. There is no permanent snowline, but patches of snow often remain on the highest peaks until December.

Very little of the Tasmanian surface lies close to sea level. The most extensive coastal plains consist of a narrow uplifted peneplain along the west coast, and an undulating lowland in the northeast. The only extensive inland plain is in the northern Midlands (south of Launceston), and has developed on soft Tertiary sediments. Davies (1965) broadly divided the mountains into fold and fault provinces. In the west of the island, mountains tend to be ridge-like and run parallel to the west coast. The basement of folded pre-Carboniferous rocks is exposed, and river systems have excavated valleys leaving ridges of hard quartz metamorphics and conglomerates. In the northeast, granite has produced some highland areas, and in other parts erosion has only just exposed the folded basement. In the centre, east and southeast the mountains tend to be plateau-like. The older rocks are covered by horizontal Permian and Triassic sediments, into which dolerite has intruded to form horizontal sheets. The resistant dolerite dominates the landscape, capping plateau-like residuals and commonly forming scarps, often with free faces (Davies, 1965). The Central Plateau is dolerite-capped, relatively undissected and bounded on the north and east by the Great Western Tiers. In the northeast of Tasmania the dolerite-capped mountain Ben Lomond is an outlier of this plateau.

The environments of Tasmania provide a wide diversity of habitats in which a mixture of Australian and Southern Oceanic floral components are found. The composition of the presently known vascular flora is shown in Table 1: some of the totals have changed a little since Brown's (1981) account, but have not been listed together since then. Thus, chapters in Reid et al. (1999) note pteridophyte species number as 102, gymnosperms as ten, and noted total native angiosperms as 1530, all these complemented by an introduced flora of around 700 species. Listing of the flora of Tasmania is updated periodically on-line, as an up-to-date summary of new discoveries and taxonomic revisions (see Buchanan, 2007).

Table 1. The native vascular plant groups of Tasmania (after Brown, 1981).

Number	Pteridophytes	Gymnosperms	Angiosperms	Total	
				Dicots	Monocots
Families	26	3	79	21	129
Genera	42	9	305	134	490
Species	95	11	891	546	1543

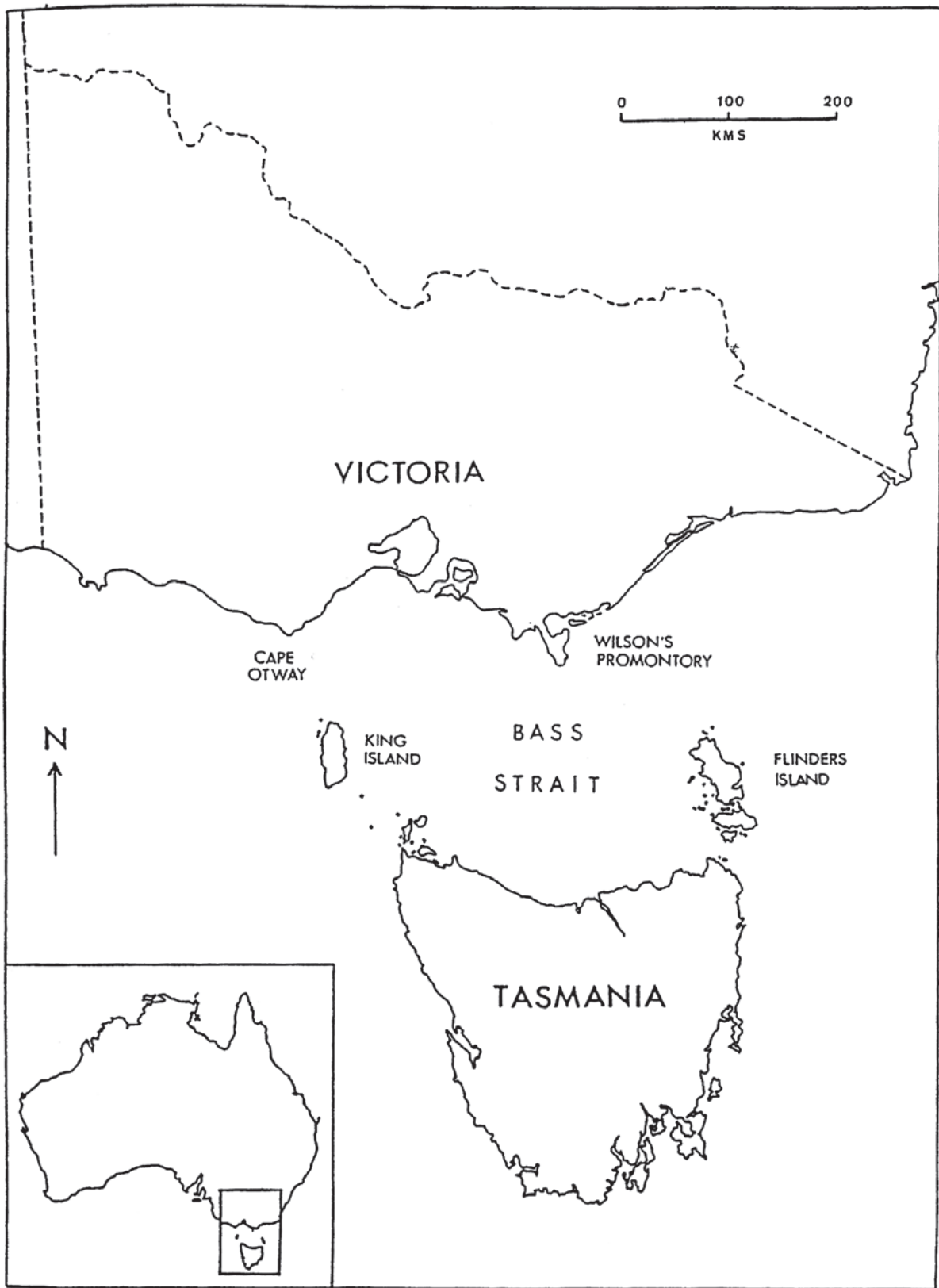


Figure 1. The Bass Strait region, showing major islands and some non-Tasmanian localities mentioned in the text.

The western region, with its high annual rainfall, has close floristic affinities with New Zealand and South America, while the drier eastern region is predominantly Australian in character. The mountainous topography, coupled with rapid changes in soil type, provides a wide range of local environments within these regions, and the vegetation varies floristically and structurally with local changes in altitude, aspect and soil type (Jackson, 1981a). Kirkpatrick and Dickinson (1984) delineated the distribution of 49 vegetation groups, which Duncan (1985) broadly divided into ten major types (five forest, five non-forest), as follows:

1. *Rainforest*. Cool temperate rainforest is defined (Jarman and Brown, 1983) as vegetation with trees greater than eight metres tall, dominated by one or more of the following genera: *Nothofagus*, *Atherosperma*, *Eucryphia*, *Phyllocladus*, *Athrotaxis*, *Lagarostrobos*, and *Anodopetalum* becoming increasingly important on poor soils. On the basis of community structure and floristics, four broad rainforest groups have been identified (Jarman et al., 1984): a) callidendrous – characterised by park-like communities with open, shady understoreys; b) thamnic – with a well developed shrub layer; c) implicate – with a dense understorey network of stems that makes upright movement through these forests difficult, and d) open montane – confined to high altitude boulder fields or rocky outcrops.

On highly fertile soils the forest is simple structurally and floristically (callidendrous), but becomes more complex on soils of low fertility (implicate). The most important climatic determinant limiting the distribution of rainforest is rainfall. Rainforest is the climax in any area with a minimum annual rainfall of 1000 mm and minimum summer monthly rainfall of 25 mm. All rainforest dominants are fire-sensitive. Jackson (1981b) considered that rainforest occupies only about a quarter of its potential habitat, with fire maintaining the presence of disclimax sclerophyll forest, scrub and moorland communities in the remaining area. Rainforest extends from sea level to about 1200 m.

2. *Mixed Forest*. Mixed forest comprises vegetation with an understorey of rainforest species and an overstorey of eucalypts, which become sparse as the forest approaches maturity. The dominance of rainforest or wet sclerophyll shrubs in the understorey depends on the frequency of fires. Lowland mixed forest is maintained by infrequent fires with an interval of 100 to 350 years, which allows the re-establishment of shade-intolerant eucalypts. If fires are too infrequent, pure rainforest develops as the over-mature eucalypts are eliminated. Eucalypts can be maintained in the absence of fire in open montane mixed forests.

3. *Blackwood Swamp Forest*. These forests occur mainly in the far northwestern part of the state, where they occupy slowly draining lowland flats. Closed, almost monospecific forests of *Acacia melanoxylon*, such as those now surviving in Dismal Swamp, were once widespread in the northwest but about two-thirds have been converted to pasture. Isolated blackwood swamp forests are also located in the northeast part of the state.

Scrub dominated by *Leptospermum lanigerum* and *Melaleuca ericifolia* is found in the northern part of the state on small fertile wetland areas where drainage is impeded. On

infertile siliceous sites with high water tables, scrub dominated by *Leptospermum scoparium* and *Melaleuca squarrosa* is found. These species, for the most part, form the understorey of the blackwood swamp forests.

Sclerophyll forest could be termed eucalypt forest, since eucalypts are the dominant trees. The distinction between wet and dry sclerophyll forest is structural as well as floristic (Jackson, 1981c). Wet forests are essentially two-layered, whereas dry forests tend to be multi-layered. The two are not clearly demarcated, however, and intergrade through a mosaic of different communities.

4. *Wet Sclerophyll Forest*. These forests typically have a tall dominant stratum of eucalypts, exceeding 60 m in height at maturity, and an understorey consisting of a layer of dense broad-leaved (mesophytic) shrubs, such as *Pomaderris*, *Bedfordia* and *Phebalium* (at about the 900–1000 mm isohyet). Decreasing fire frequency and increased rainfall brings conditions suitable for species such as *Olearia*, *Pittosporum*, *Atherosperma*, *Anopterus* and tree ferns, until conditions for mixed forest are reached. Kirkpatrick et al. (1988) defined 14 wet forest types from Tasmania, which included those of mixed forests (category 2 above).

5. *Dry Sclerophyll Forest and Woodland*. Dry sclerophyll communities are typified by the presence of a predominantly hard-leaved (xeric) shrub stratum, growing under a eucalypt canopy of varying density (open forest to open woodland) and a mixed (uneven) age structure. Tree ages generally correspond to past fire years. The ground layer is variable, but heaths, bracken, grass or sclerophyllous monocotyledons are the most common components (Duncan, 1981). The shrub layers are low and often sparse with a scattering of lesser trees such as *Banksia*, *Exocarpus*, *Bursaria* and *Casuarina*. In regions such as the Midlands with annual rainfalls of 500 mm and a high frequency of fires, the tree density falls almost to savanna levels with a ground cover of medium to low shrubs or *Poa* grassland. As the rainfall increases and the frequency of fires decreases, the tall shrub layer composed largely of *Acacia* and tall composites increases in density until at the 900 mm isohyet there is a transition to wet sclerophyll forest (Jackson, 1981a). Much of the land now cleared previously supported dry sclerophyll forests and woodland.

The dry sclerophyll communities of the east coast are characterised by a high degree of floral and faunal diversity (Duncan and Brown, 1985; Guiler, 1965). Duncan and Brown (1985) identified 33 communities from six main groups of dry sclerophyll forest.

6. *Dry Coastal Vegetation*. This category combines several lowland vegetation groups delineated by Kirkpatrick and Dickinson (1984), comprising *Casuarina* forest, scrub, heath and coastal grassland. Dry coastal vegetation occurs extensively on the Bass Strait islands and formerly covered much of the far northeast and northwest of Tasmania. Elsewhere its distribution is localised. Most communities have strong affinities with those occupying similar sites on the southeastern mainland, and endemism is low.

Scrub and heath are the most extensive of the dry coastal vegetation types. Heaths are concentrated on deep, leached, acid sands and skeletal siliceous soils. Infertility, drought and

waterlogging interact with high fire frequencies and the effects of salt spray in preventing much of the heath developing into scrub or woodland (Kirkpatrick, 1981). Thirty-seven communities of coastal heath have been classified based on the similarity of floristic composition (Kirkpatrick, 1977). Communities with common boundaries with heath include grassland, *Leptospermum* and *Melaleuca* scrubs, forests and woodlands of *Casuarina stricta* and mallee-form eucalypts and *Banksia serrata* (Sisters Beach only).

7. *Western Moorland and Scrub*. Button grass (*Gymnoschoenus*) moorland and wet scrub occurs throughout Tasmania on acid peats from sea level to over 1000 m, but is isolated in the north, east and southeast. Its greatest complexity and diversity is reached in the west and southwest, where it predominantly exists as fire-deflected disclimaxes of rainforest. In the absence of fire most moorland communities may be capable of progressing through wet scrub and sclerophyll forest to rainforest. Sclerophyllous shrubs (heaths and tea-trees of *Leptospermum*, *Melaleuca*, *Banksia marginata*, *Bauera*, *Agastachys* and *Cenarrhenes*) are widespread, but in its simplest form button grass dominates relatively homogenous sedgeland communities.

8. *Alpine Vegetation*. This comprises treeless high altitude vegetation, generally occurring above 1000 m, dominated by herbfield, grassland and heath communities, with emergent sclerophyllous shrubs and conifers. Most of the alpine vegetation consists of heaths of various types. In the absence of fire the climax community would be a closed heath with the conifers *Microstrobos* and *Diselma* on well drained soils, and *Podocarpus* on boulder fields. Fires have restricted these to protected localities and promoted the expansion of sclerophyllous shrubs. Bolster (cushion plants) communities are often found in a complex mosaic with bogs, dominated by sphagnum moss, and heath vegetation. Occurrences of herbfield are restricted to sites subjected to long periods of snow cover, and grasslands are generally produced by the burning of coniferous heath and bolster communities. Several alpine complexes have been delineated by Kirkpatrick and Dickinson (1984).

9. *Native Grassland*. Lowland grasslands were extensive in the Midlands but have been eliminated from most of their range by cultivation. Remnant grasslands are dominated by *Poa*, *Danthonia*, *Stipa* and *Themeda*. Montane grasslands are generally found on deep and fertile soils subject to severe frosts and/or cold air drainage. *Poa* dominates on well drained sites; on poorly drained sites *Danthonia* and *Microlaena* dominate.

10. *Wetland and Aquatic Vegetation*. This category includes communities of macrophytic vegetation dominated by aquatic or emergent species other than tall woody shrubs. Their distribution is local and dispersed. Duncan (1985) briefly summarised the composition, distribution and conservation status of this vegetation type, which includes salt marshes, saline wetlands and freshwater wetlands.

In recent years there has been a major improvement in the understanding of environments of the Tertiary epoch in Australia. From palaeontological information, Truswell (1993) described the vegetation changes in the Australian Tertiary, incorporating recent advances in the knowledge of

palaeoclimates, the Tertiary timeframe, sedimentary environments and the tectonic setting of Australia within the region. The record now available suggests a transition from widespread, very diverse rainforests in the early Tertiary to predominantly open vegetation, with rainforest restricted to wetter regions. Eocene records of *Banksia* and *Acacia* suggest that sclerophylly may have developed at this time. By the mid Miocene heath-like vegetation had become established locally in coal swamps, growing under particular fire regimes. Drier rainforests, with abundant *Araucaria*, had established first at inland localities, possibly because *Nothofagus* could not compete under more seasonal rainfall. Fire may also have led to the development of wet sclerophyll forests in the late Miocene. Grassland and savanna had become established in the Pliocene, and the expansion of eucalypts (probably at the expense of drier rainforests and Casuarinaceae woodlands) is more recent and possibly linked with human land-management practices.

Bass Strait has existed since the late Cretaceous, and from this time to the early Miocene the Bassian Rise was exposed, linking Tasmania with the mainland (at Wilsons Promontory) through the Hogan, Curtis and Kent groups of islands to Flinders and Cape Barren islands (Schmidt and Thornton, 1993: 140, Map A). King Island was linked to Tasmania in western Bass Strait, and from the early Tertiary to the early Miocene the region between King Island and the mainland (at Mornington Peninsula) was predominantly a shallow opening to a lacustrine environment (BMR Palaeogeographic Group 1990), a precursor to Lake Bass of the Pleistocene (Blom, 1988). After a major fall in sea level in the mid Oligocene, associated with the build-up of Antarctic ice, there were extensive incursions of shallow seas which isolated the Bass Strait islands from both Tasmania and the mainland in the early Miocene. Dramatic lowering of sea level in the late Miocene again exposed the Bassian Rise (except for the region adjacent to Wilsons Promontory?), which in the Pliocene was reduced to linking Flinders Island and Tasmania with the slight incursion of shallow seas. The land bridges were completely exposed again during the Pleistocene glaciations (Blom, 1988), the last peaking between 18,000 and 20,000 years ago (at which time the sea level was 132–150 m lower than today). Since then sea level has risen and the present coastline was attained about 5000 years ago.

Changes in the Australian vegetation during the Tertiary are related to the rapid northward movement of the Australian plate from Antarctica (Veevers et al., 1991) and global changes in temperature (Feary et al., 1991; Truswell, 1993). The vegetation became more open in the later part of the Tertiary in response to aridity and cooling global temperatures, coinciding with periods of incursions of shallow seas isolating Tasmania (and to some extent the Bass Strait islands). These changes undoubtedly involved the extinction of many taxa, particularly those associated with rainforests, as indicated by the fossil record, and speciation of possible endemic biotas within Tasmania. During the Pleistocene glaciations the exposure of the land bridges covered predominantly by grasses and woodlands (Hope, 1978), probably facilitated interchange of some of the biota associated with drier, open vegetation.

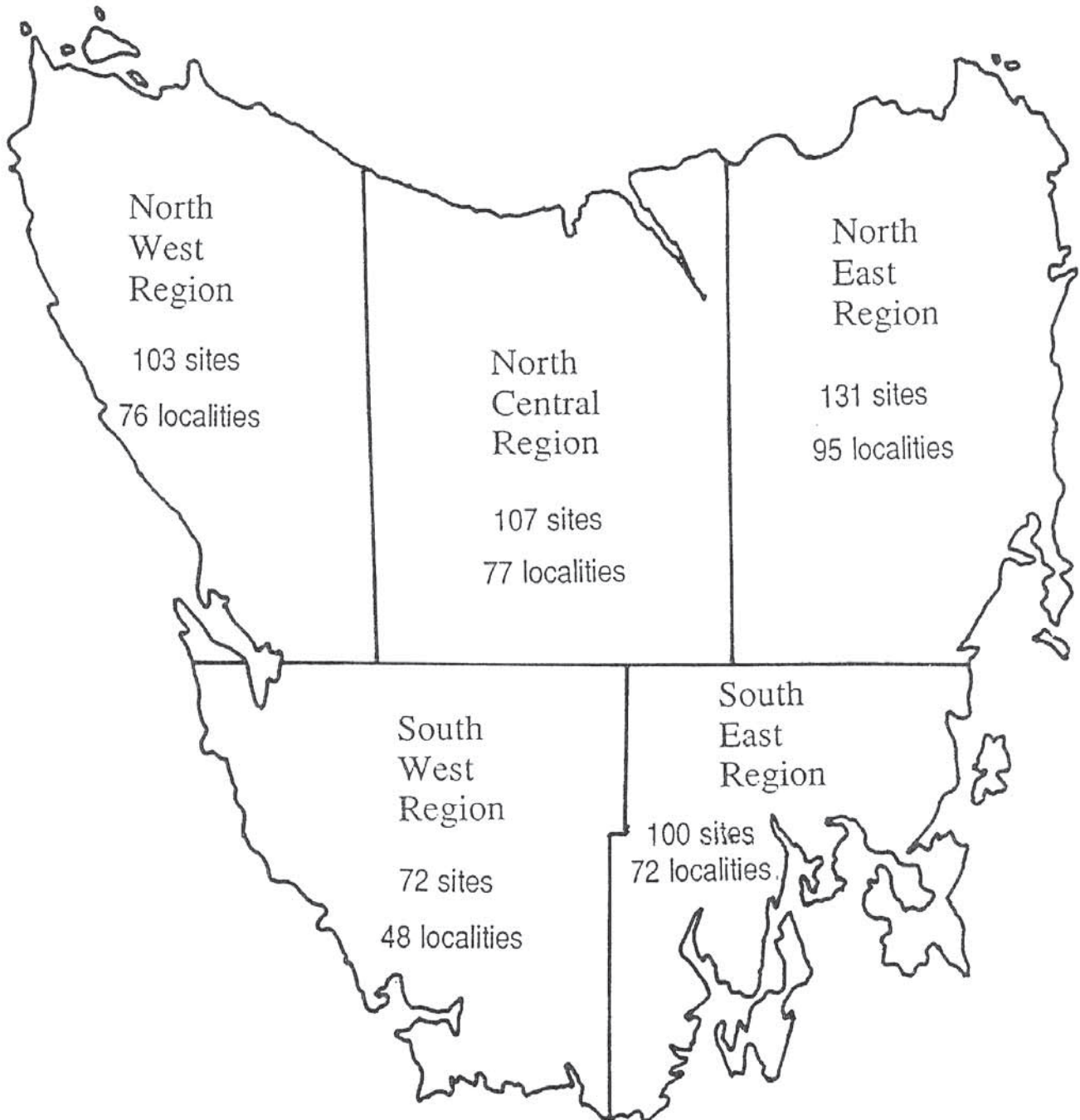


Figure 2. Summary of collecting effort for Psocoptera in Tasmania: for each of the five main regions, numbers of sites and localities are shown: full listing of sites and accompanying maps are given in Appendix 1. Localities are distributed as follows: southeast, localities 1-72; northeast, localities 73-167; north central, localities 168-244; northwest, localities 245-320; southwest, localities 321-368.

Field Methods

Intensive and extensive sampling for Psocoptera from the widest possible range of vegetation types was carried out across Tasmania. Localities of sites sampled from the five Tasmanian regions (fig. 2) are shown in detail in Appendix 1 (figs 254–58, tables 3–7). Several sites were sampled at particular localities (for example, sites 5A, 5B, 5C, 5D and 5E at locality 5, Appendix 1). In total, 513 sites were sampled at 368 localities. Sites tend to be clumped, being restricted to those localities that were accessible. Some other localities were accessible but conditions for parts of the year precluded the collection of Psocoptera. Sites sampled intensively were primarily common vegetation types, selected for their accessibility and for comparison with vegetation types of a similar survey carried out at Wilsons Promontory, Victoria (Schmidt and Thornton, 1993).

On each occasion, at each site, ten samples were taken. Each sample was obtained by beating a branch of a tree or shrub twelve times. Where a number of plant species were present at a site, an attempt was made to sample from the most frequently occurring one. Dislodged insects were aspirated from the beating tray (0.7 m²) and preserved in 75% alcohol. This sampling regime was performed at all sites sampled, except for those where grasses and sedges were sampled, and those sampled only once from isolated areas. Twenty samples were taken on each occasion from grasses and sedges, due to the smaller area of vegetation sampled. Vegetation from isolated (inaccessible) areas (such as Frenchmans Cap Walking Track, Overland Walking Track, Southwest Cape and South Coast Walking Tracks) was sampled for as long as time and weather conditions permitted.

Systematics of the Tasmanian Psocoptera

Checklist of Psocoptera from Tasmania

(With distributional notes included as follows: COS, cosmopolitan; END, implied Tasmanian endemic (not known elsewhere); SEA, known from other parts of southeastern Australia, including some or all of Bass Strait, Victoria, South Australia, New South Wales, southern Queensland; REG, regional, with wider distribution in Australia and/or nearby countries; also indicated are predominant vegetation categories in which the more abundant species were captured (singletons and some others omitted when information insufficient), as an indication of possible habitat ‘preferences’, with numbers 1–10 corresponding broadly to categories discussed in text as: 1, Rainforest; 2, Mixed Forest; 3, Blackwood Swamp Forest; 4, Wet Sclerophyll Forest; 5, Dry Sclerophyll Forest and Woodland; 6, Dry Coastal Vegetation; 7, Western Moorland and Scrub; 8, Alpine Vegetation; 9, Native Grassland; 10, Wetland and Aquatic Vegetation.

Lepidopsocidae

Pteroxanium kelloggi (Ribaga, 1905) COS 1

Tasmanian Trogiidae

Cerobasis guestfalica (Kolbe, 1880) COS 5, 6
Lepinotus huoni sp. nov. END
Lepinotus inquilinus Heyden, 1850 COS
Lepinotus patruelis Pearman, 1931 COS
Lepinotus reticulatus Enderlein, 1905 COS
Lepinotus tasmaniensis Hickman, 1934 SEA
Trogium pulsatorium (Linnaeus, 1758) COS

Psyllipsocidae

Psyllipsocus ramburii Selys-Longchamps, 1872 COS

Liposcelididae

Embidopsocus lenah sp. nov. END
Liposcelis sp. A
Liposcelis sp. B

Sphaeropsocidae

Sphaeropsocopsis recens (Hickman, 1934) SEA

Caeciliusidae

Aphyopsocus prolixus Smithers, 1982 SEA 4, 5, 6
Paracaecilius hilli (Smithers, 1979) SEA wide variety
Paracaecilius seltus (Schmidt and Thornton, 1993) SEA wide variety
Bassocaecilius rawlinsoni gen. nov. sp. nov. SEA 6
Clinocaecilius edwardsi gen. nov. sp. nov. END
Maoripsocus concavistigma (Schmidt and Thornton, 1993) SEA 1, 3, 4, 5, 6
Maoripsocus hobartensis sp. nov. END
Maoripsocus juneae (Schmidt and Thornton, 1993) SEA 1, 2, 4, 5
Maoripsocus pedderi sp. nov. END
Maoripsocus semifuscatus Tillyard, 1923 REG 6, 7
Maoripsocus spiralosus sp. nov. END
Maoripsocus tahunensis sp. nov. END
Maoripsocus wedgei sp. nov. END 1
Maoripsocus weindorferi sp. nov. END
Graminacaecilius frontalis gen. nov. sp. nov. SEA 9
Graminacaecilius micropterus gen. nov. sp. nov. END 9

<i>Stenocaecilius lineatus</i> (Smithers, 1977)	SEA	5
<i>Stenocaecilius quercus</i> (Edwards, 1950)	REG	3, 4, 5, 6
<i>Valenzuela pteridii</i> (Smithers, 1977)	REG	bracken
<i>Nothocaecilius thomasi</i> gen. nov. sp. nov.	SEA	?1
<i>Tasmanocaecilius truchanasi</i> gen. nov. sp. nov.	END	

Lachesillidae

<i>Lachesilla pedicularia</i> (Linnaeus, 1758)	COS	
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Ectopsocidae

<i>Ectopsocus axillaris</i> (Smithers, 1969)	COS	1, 2, 4, 5
<i>Ectopsocus briggsi</i> McLachlan, 1899	COS	wide variety
<i>Ectopsocus brunneus</i> (Edwards, 1950)	SEA	
<i>Ectopsocus californicus</i> (Banks, 1903)	COS	wide variety
<i>Ectopsocus coyae</i> sp. nov.	END	
<i>Ectopsocus edwardsi</i> New, 1973	SEA	?5
<i>Ectopsocus graminus</i> sp. nov.	END	9
<i>Ectopsocus hickmani</i> sp. nov.	END	5
<i>Ectopsocus nerens</i> (Hickman, 1934)	?END	
<i>Ectopsocus petersi</i> Smithers, 1978	COS	1, 2, 4
<i>Ectopsocus rileyae</i> Schmidt and Thornton, 1993	SEA	1, 2, 4
<i>Ectopsocus risdonensis</i> sp. nov.	END	
<i>Ectopsocus sprengi</i> sp. nov.	END	
<i>Ectopsocus vachoni</i> Badonnel, 1945	COS	
<i>Ectopsocus</i> sp.		

Peripsocidae

<i>Cycloperipsocus edwardsi</i> (New, 1973a)	SEA	
<i>Peripsocus cochleus</i> sp. nov.	SEA	1, 2
<i>Peripsocus maoricus</i> (Tillyard, 1923)	REG	wide variety
<i>Peripsocus melaleucaae</i> New, 1971	SEA	1, 5, 6, 7
<i>Peripsocus milleri</i> (Tillyard, 1923)	COS	4, 5, 6
<i>Peripsocus morulops</i> (Tillyard, 1923)	REG	6,7
<i>Peripsocus pamae</i> sp. nov.	END	wide variety
<i>Peripsocus tillyardi</i> New, 1973a	SEA	5, 6

Trichopsocidae

<i>Trichopsocus clarus</i> (Banks, 1908)	COS	
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Pseudocaeciliidae

<i>Austropsocus antennalis</i> Thornton and New, 1977	REG	4
<i>Austropsocus sinuosus</i> (Banks, 1939)	REG	1, 2, 4, 5
<i>Austropsocus tibialis</i> Thornton and New, 1977	REG	1, 2, 4
<i>Austropsocus viridis</i> (Enderlein, 1903)	REG	
<i>Choroecaecilius brunellus</i> (Tillyard, 1923)	REG	1, 2, 5, 6, 7
<i>Cladioneura pulchripennis</i> Enderlein, 1906	SEA	1, 5, 6
<i>Heterocaecilius lachlani</i> (Enderlein, 1903)	SEA	6
<i>Howeanum costale</i> (Thornton and New, 1977)	SEA	5, 6, 7
<i>Howeanum tasmaniensis</i> sp. nov.	END	
<i>Mepleres rotundatus</i> (New, 1974a)	SEA	5, 6
<i>Mepleres tanei</i> (Smithers, 1977)	SEA	

Philotarsidae

<i>Aaroniella rawlingsi</i> Smithers, 1969	REG	1, 5, 6
<i>Abelopsocus fenestratus</i> (Schmidt and Thornton, 1993)	SEA	1, 6
<i>Abelopsocus truganiniaae</i> gen. nov. sp. nov.	END	1
<i>Haplophallus sinus</i> Thornton and New, 1977	SEA	5, 6
<i>Philotarsopsis guttata</i> (Tillyard, 1923)	REG	4, 5
<i>Philotarsopsis hellyeri</i> sp. nov.	END	
<i>Philotarsopsis paraguttata</i> (Thornton and New, 1977)	SEA	4, 5

Elipsocidae

<i>Diademadrilus masseyi</i> (New, 1971)	SEA	6, 7
<i>Gondwanapsocus australis</i> Schmidt and New, 2004a	END	7
<i>Onychophallus diemenensis</i> Schmidt and New, 2004a	END	1
<i>Paedomorpha gayi</i> Smithers, 1963	REG	
<i>Pentacladus eucalypti</i> Enderlein, 1906	REG	4, 5
<i>Propocus frodshami</i> sp. nov.	END	
<i>Propocus pallipes</i> (McLachlan, 1866)	REG	5
<i>Propocus pulchripennis</i> (Perkins, 1899)	COS	

<i>Telmopsocus waldheimensis</i> Schmidt and New, 2004a	END	1
<i>Villopsocus tasmaniensis</i> Schmidt and New, 2004a	END	

Psocidae

<i>Blaste bistrata</i> Schmidt and Thornton, 1993	SEA	
<i>Blaste falcifer</i> Smithers, 1979	END	1, 7
<i>Blaste lignicola</i> (Enderlein, 1906)	REG	5, 6
<i>Blaste panops</i> Smithers, 1979	END	
<i>Blaste taylora</i> New, 1974b	REG	1, 2, 6, 7
<i>Blaste tillyardi</i> Smithers, 1969	REG	
<i>Clematostigma maculiceps</i> (Enderlein, 1903)	SEA	4
<i>Ptycta australis</i> Schmidt and Thornton, 1993	SEA	6, 7
<i>Ptycta campbelli</i> Schmidt and Thornton, 1993	SEA	wide variety
<i>Ptycta colei</i> sp. nov.	SEA	
<i>Ptycta emarginata</i> New, 1974b	REG	6
<i>Ptycta freycineti</i> sp. nov.	END	6
<i>Ptycta glossoptera</i> New, 1974b	SEA	6
<i>Ptycta pallawahensis</i> sp. nov.	END	1, 7
<i>Ptycta umbrata</i> New, 1974b	SEA	6
<i>Tanystigma edwardsi</i> (New, 1974b)	SEA	5, 6
<i>Tanystigma inglewoodense</i> (New, 1974b)	SEA	4, 5, 6, 7
<i>Tanystigma maddeni</i> sp. nov.	END	6
<i>Tanystigma tardipes</i> (Edwards, 1950)	SEA	6
<i>Tanystigma westae</i> sp. nov.	END	

Myopsocidae

<i>Nimbopsocus australis</i> (Brauer, 1865)	REG	
<i>Nimbopsocus hickmani</i> (Smithers, 1964)	SEA	

Systematics

In the following systematic treatment, drawings from permanent preparations were made with the aid of a camera lucida. Measurements of body parts are given in mm, and the method used for determining the ratio of interocular distance to diameter of eye (IO:D in systematic treatment below) was that of Pearman, as described by Ball (1943). The following abbreviations are used: B, body length; FW, length of fore wing; HW, length of hind wing; F, length of hind femur; T, length of hind tibia; t1, t2, t3, length of basal, second and apical tarsal segments respectively; rt, ratio of t1 and t3 to t2; ct, number of ctenidia on hind tarsal segments; f1, length of basal flagellar segment; f2, length of second flagellar segment.

Additional measurements for *Embidopsocus*: SI, longest seta on the lateral margin of the pronotum; Sa, length of a specific long seta; Se, length of the longest seta on the epiproct (Badonnel, 1955, cf longest seta on the paraproct, Mockford, 1963). Scale lines on figures equal 0.1 mm unless otherwise indicated. Holotypes and paratypes are deposited in the Australian Museum, Sydney, unless otherwise indicated.

Key to Tasmanian families of Psocoptera

1. Labial palpi with two segments 2
 - Labial palpi with one segment Psocomorpha 6
2. Paraproct with large anal spine; flagellum beyond segments 4 or 5 without secondary annulations Trogiomorpha 3
 - Paraproct without large anal spine; flagellum beyond segments 4 or 5 with secondary annulations Troctomorpha 5
3. Body and wings with flattened scales Lepidopsocidae
 - Body and wings without flattened scales 4
4. Tarsal claws without subapical tooth Trogiidae
 - Tarsal claws with subapical tooth Psyllipsocidae
5. Body dorsoventrally flattened, hind femora enlarged Liposcelididae
 - Body not dorsoventrally flattened, hind femora not enlarged Sphaeropsocidae
6. Frons absent Peripsocidae
 - Frons present 7
7. Tarsi 2-segmented 8
 - Tarsi 3-segmented 14
8. Setae on hind wing margin at most between radial fork 9
 - Setae around margin of hind wing 12
9. Pulvillus broad Ectopsocidae
 - Pulvillus narrow 10
10. Apterous, or fore wing strongly setose Elipsocidae
 - Fore wing glabrous 11
11. Areola postica joined to *m* Psocidae
 - Areola postica free Lachesillidae
12. Marginal setae crossing each other at fore wing apex Pseudocaeciliidae
 - Marginal setae not crossing each other at fore wing apex 13
13. Setae around margin of hind wing of uniform length Caeciliusidae

- Setae around hind wing margin alternately longer and shorter Trichopsocidae
- 14. Setae on hind wing margin at most between radial fork 15
- Setae around margin of hind wing 16
- 15. Fore wing strongly mottled Myopsocidae
- Fore wing without mottled pattern Elipsocidae
- 16. Marginal setae crossing each other at hind wing apex Philotarsidae
- Marginal setae not crossing each other at hind wing apex Pseudocaciliidae

Lepidopsocidae

Pteroxanium Enderlein

Pteroxanium Enderlein, 1922: 102. Type species: *Pteroxanium squamosum* Enderlein.

Pteroxanium kelloggi (Ribaga)

Lepidilla kelloggi Ribaga, 1905: 100.

Tasmanopsocus litoralis Hickman, 1934: 78.

Pteroxanium kelloggi. --- Roesler, 1943: 13.

For complete synonymy see Lienhard and Smithers (2002).

Material examined. **Site** 21, 6♀, 17 Feb 88; **site** 40, 1♀, 23 Apr 87; **site** 42A, 1 ♀, 12 June 86; **site** 77, 1♀, 29 June 86; **site** 94, 1♀, 27 June 86; **site** 185, 2♀, 1 nymph, 15 June 86; 1♀, 17 June 87; **site** 248A, 1♀, 25 Oct 86; 1♀, 1 Mar 87; 2 nymphs, 28 June 87; 1 nymph, 30 July 87; **site** 264B, 1♀, 22 Sep 86; **site** 294B, 8♀, 4 Mar 88.

Distribution. Cosmopolitan.

Remarks. This species, which appears to have been transported by human agency (Smithers, 1972), is known in Australia only from Tasmania. Interestingly, the majority of specimens collected in this study were taken from two sites of huon pine (*Lagarostrobos franklanii*), which is usually found along riverbanks and is endemic to southwestern Tasmania.

Trogiidae

Key to Tasmanian genera of Trogiidae

1. Head and abdomen without pattern, distal segment of maxillary palp elongate *Lepinotus* Heyden
- Head and abdomen with obvious pattern, distal segment of maxillary palp broad 2
2. In addition to apical spines, one or two subapical spines on hind tibia *Cerobasis* Kolbe
- Only apical spines on hind tibia *Trogium* Illiger

Cerobasis Kolbe

Cerobasis Kolbe, 1882b: 212. Type species: *Cerobasis muraria* Kolbe.

Cerobasis guestfalica (Kolbe)

Hyperetes guestfalicus Kolbe, 1880: 132.

Cerobasis guestfalica Roesler, 1943: 13.

Material examined. Many females and nymphs collected throughout the year.

Distribution. Cosmopolitan.

Remarks. This species was collected from many sites of dry coastal vegetation from eastern, northern and northwestern Tasmania. *C. guestfalica* was particularly abundant throughout the year on *Banksia serrata*.

Lepinotus Heyden

Lepinotus Heyden, 1850: 84. Type species: *Lepinotus inquilinus* Heyden.

Key to Tasmanian species of Lepinotus

1. Postclypeus with obvious reticulated pattern *inquilinus* Heyden
- Postclypeus without reticulated pattern 2
2. Brown stripe between eye and antenna base *patruelis* Pearman
- Brown stripe absent between eye and antenna base 3
3. Parietal glands present, paraproct without ventral sclerotised bar *tasmaniensis* Hickman
- Parietal glands absent, paraproct with ventral sclerotised bar 4
4. Body uniformly dark brown (iridescent pink dorsally on fresh specimens), wings absent *huoni* sp. nov.
- Abdomen clearly paler than rest of body, wings reticulate *reticulatus* Enderlein

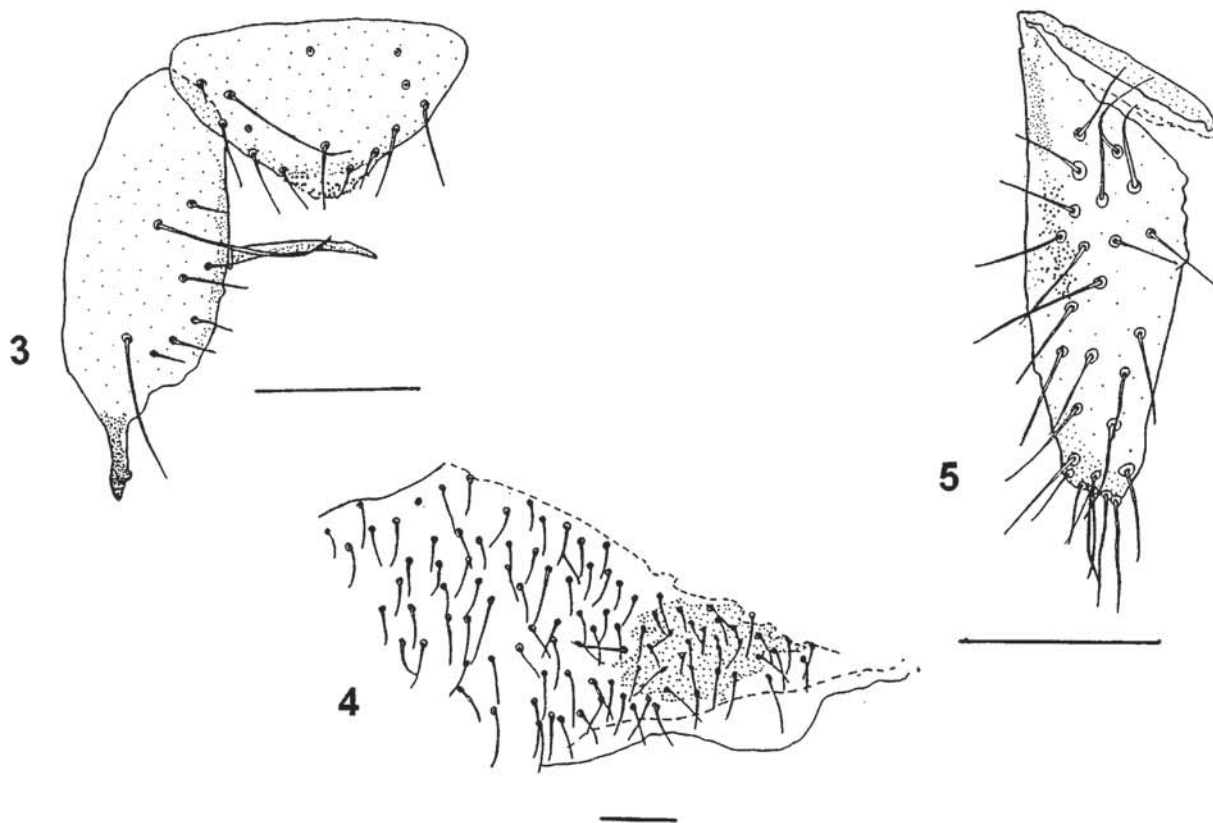
Lepinotus huoni sp. nov.

Figures 3–5

Material examined. Holotype ♀: Tasmania, Tahune Forest Reserve, Pine Tk, *Lagarostrobos franklanii*, 17 Feb 1988. Five ♀ paratypes: same data as holotype.

Description of female. *Coloration* (after ca 5 years in alcohol). Head dark brown. Median epicranial suture black. Antenna brown, maxillary palp brown, apical segment dark brown. Eyes black. Thorax and legs dark brown, tarsi brown. Abdomen dorsally dark brown, cream ventrally, terminal segments dark brown. Freshly killed specimens bright iridescent pink on vertex, dorsal surfaces of thorax and abdomen, and femora. This coloration fades in alcohol.

Morphology. IO:D = 2.3. Eyes ovoid, dorsal margin in line with top of vertex. Antenna complete with 26 flagellar segments (paratype). Distal margin of labrum with anterior row of 5 trichoid sensilla and posterior row of 4 trichoid sensilla. Vertex fairly sharp, postclypeus flattened. Clypeal shelf broad. Lacinia bifid, lateral projection larger than median. Ocelli absent. Apical



Figures 3-5. *Lepinotus huoni*. Female: 3, epiproct and paraproct; 4, subgenital plate; 5, gonapophyses.

segment of maxillary palp broad, second segment with large sensillum. Reticulate pattern on vertex and postclypeus barely visible. Head, including eyes, and thorax bearing scattered setae of differing lengths. Tibiae with 2 apical spurs. Hind tibia with 4 (paratype) long fine setae on outer margin, length about 3 to 4 times width of tibia. A single long, fine seta of similar length on middle of mid tibia. Ctenidiobothria absent. Tarsi 3-segmented, claw lacking subapical denticle. Pulvillus fine, apically broadened. Abdomen with tergites well sclerotised, each bearing two incipient rows of long setae. Sternites not sclerotised, bearing dense shorter setae. Epiproct (fig. 3) simple, setose. Paraproct (fig. 3) lacking trichobothria, with strong posterior spine and ventral sclerotised bar. Subgenital plate (fig. 4) simple, setose, with broad triangular pigmented area. Gonapophyses (fig. 5) with large setose external valve, and sclerotised dorsal valve remnant. Spermathecal duct present, parietal glands apparently absent.

Dimensions. B 2.0, F 0.411, T 0.553, t_1 0.174, t_2 0.047, t_3 0.047, rt 3.7:1:1, f_1 0.087, f_2 0.067.

Male. Unknown.

Remarks. This rare species, collected only from huon pine in southern Tasmania, differs from all other known species in the

genus by the coloration (fresh material). *Lepinotus huoni* also differs from *Lepinotus tasmaniensis* and *Lepinotus stoneae* Smithers (NSW) by the absence of reticulated wings and parietal glands.

Etymology. Named for the French explorer, Jean-Michel Huon de Kermadec.

***Lepinotus inquilinus* Heyden**

Lepinotus inquilinus Heyden, 1850: 84.

Distribution. Cosmopolitan.

Remarks. This species has been recorded from Tasmania previously (Hickman, 1934; Smithers, 1979). No additional material was collected in this study.

***Lepinotus patruelis* Pearman**

Lepinotus patruelis Pearman, 1931: 47.

Material examined. Old Farm Rd, leaf litter, Eucalypt forest, 1♀, 20 Jun 89 (P. Greenslade); Big Sassy Ck, Site 1, PKD Sassafras, 2♂, 17 May 89 (J. Diggle); Big Sassy Ck, Site 1, Soil Cores, 1♂, 12 May 89

(H. Mitchell, J. Diggle); Mt Mangana, Bruny I, Site 2, leaf litter, 1♂, 9 Apr 89 (P. Greenslade); Mt Mangana, Bruny I, Site 2, moss on dead log 2A+B, 1♀, 4–9 Apr 89 (P. Greenslade, J. Diggle) (MV).

Distribution. Cosmopolitan.

Remarks. This species has been recorded previously from litter in southwestern Tasmania (Smithers, 1979). It was not collected during the present study.

Lepinotus reticulatus Enderlein

Lepinotus reticulatus Enderlein, 1905: 31.

! *Lepinotus reticulatus*. --- Schmidt and Thornton, 1993: 148.

Material examined. Site 79, 1♀, 3 Feb 87; site 159A, 1♀, 9 Aug 86.

Distribution. Cosmopolitan.

Remarks. In Australia this species has been recorded from South Australia, Curtis I (Bass Strait) and recently from Wilsons Promontory, Victoria. Closer examination of the Wilsons Promontory material has revealed an error in identification; they are clearly conspecific with Tasmanian material of *Lepinotus tasmaniensis*.

Reticulate wings are not present on the material examined. The reticulate pattern on the vertex and postclypeus is absent and no parietal glands are evident. The sensillum on the second segment of the maxillary palp (Enderlein, 1905, plate 2, fig. 19) appears similar in size to that of *Lepinotus tasmaniensis*, which is smaller than that of *Lepinotus huoni*. The paraprocts possess a ventral sclerotised bar as found in *Lepinotus huoni*, but this is absent in *Lepinotus tasmaniensis* and *Lepinotus stoneae*. The referral of this material to *L. reticulatus* is provisional.

Lepinotus tasmaniensis Hickman

Lepinotus tasmaniensis Hickman, 1934: 81.

Lepinotus reticulatus Enderlein. Schmidt and Thornton, 1993: 148.

Material examined. Site 248A, 1♀, 28 June 87; 2♀, 29 Feb 88; site 294B, 1♀, 4 Mar 88.

Distribution. Tasmania and Victoria.

Remarks. Hitherto known only from Tasmania, *Lepinotus tasmaniensis* is now known from both sides of Bass Strait (see remarks under previous species). Closer examination of material from Curtis I, Bass Strait, referred to *L. reticulatus* by New (1971) may therefore be warranted.

Trogium Illiger

Trogium Illiger, 1798: 500. Type species: *Termes pulsatorium* Linnaeus.

Trogium pulsatorium (Linnaeus)

Termes pulsatorium Linnaeus, 1758: 610.

Trogium pulsatorium. --- Illiger, 1798: 500.

Material examined. Old Farm Rd, leaf litter, Eucalypt forest, 1♀, 20 Jun 89 (P. Greenslade); Savage River Pipeline Rd, Site 2, litter, 1♂, 21 Apr 89 (P. Greenslade) (MV).

Distribution. Cosmopolitan.

Remarks. Previously recorded in Tasmania by Hickman (1934), this species was not found in the present study.

Psyllipsocidae

Psyllipsocus Selys-Longchamps

Psyllipsocus Selys-Longchamps, 1872: 145. Type species: *Psyllipsocus ramburii* Selys-Longchamps.

Psyllipsocus ramburii Selys-Longchamps

Psyllipsocus ramburii Selys-Longchamps, 1872: 145.

Distribution. Cosmopolitan.

Remarks. This species has been recorded previously from southwestern Tasmania (Smithers, 1979) from litter. No additional material was collected in this study.

Liposcelididae

Key to Tasmanian genera of Liposcelididae

1. Macropterous and apterous, eyes of apterous forms with at most two ommatidia *Embidopsocus* Hagen
- Apterous, eyes with 6-8 ommatidia *Liposcelis* Motschulsky

Embidopsocus Hagen

Embidopsocus Hagen, 1866a: 170. Type species: *Embidopsocus luteus* Hagen.

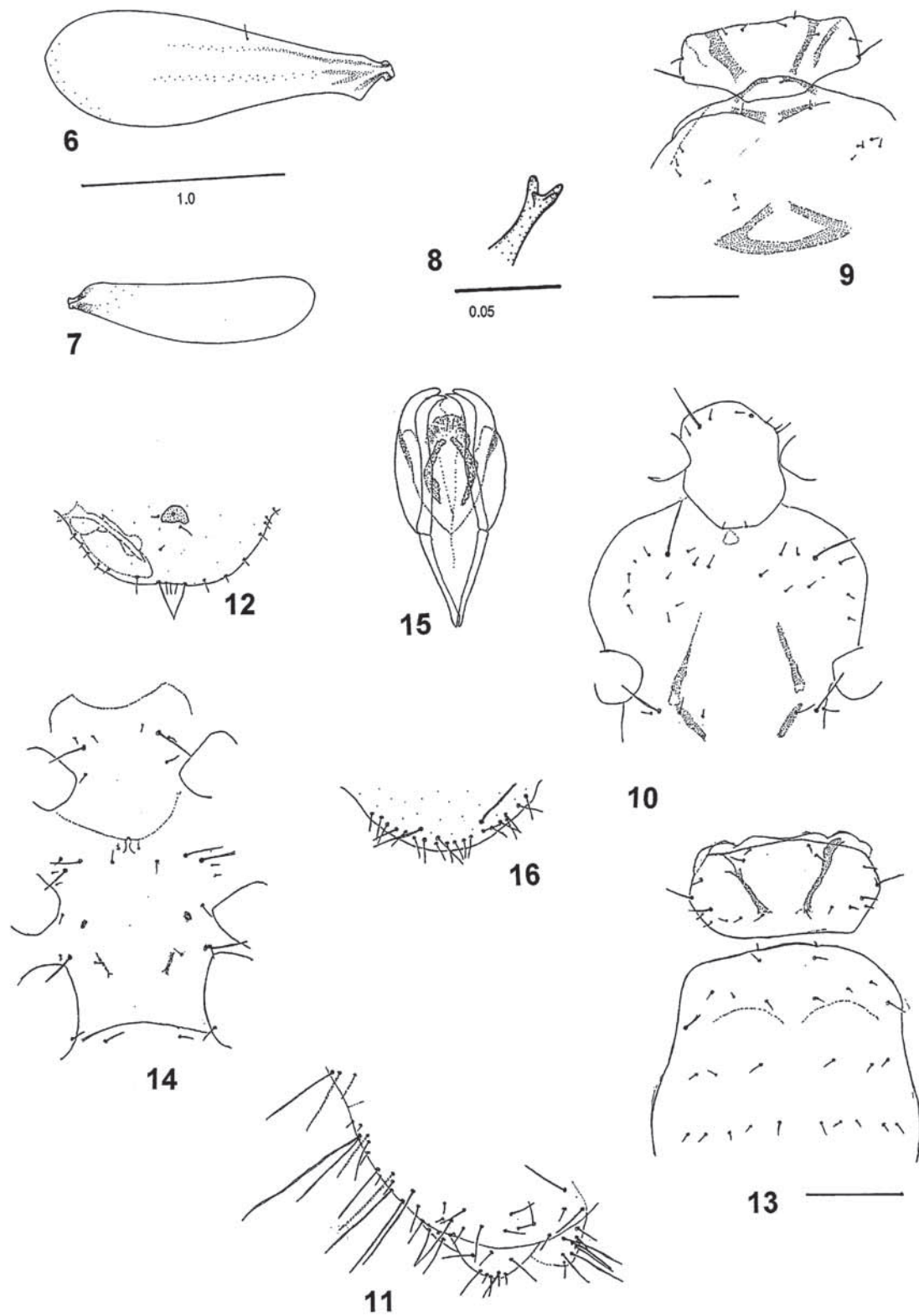
Embidopsocus lenah sp. nov.

Figures 6–16

Material examined. Holotype ♀: Tasmania, Lenah Valley, under bark, 26 May 1937. Two ♂ paratypes: same data as holotype. Additional record (1♀): Lenah Valley, under bark of dead tree, 21 Feb 1934 (V. V. Hickman).

Description of macropterous female. Coloration (after ca 56 years on permanent slide). Light (straw) brown. Eyes black. Ocelli pale, centripetal margins black (from other specimen). Fore wing (fig. 6) very pale brown, veins brown. Hind wing (fig. 7) pale.

Morphology. Ocelli well developed, compound eyes consisting of many ommatidia. Apex of lacinia (fig. 8) with long bifid lateral projection, a long median projection and in between a short projection with apex directed medially. Apical segment of maxillary palp with a field of 8 thin-walled setae, the lengths and distribution of which are similar to those described for the *laticeps* complex (Mockford, 1987: 852). Flagellar sensilla as in Table 2, following the categories suggested by Mockford (1987). Anterior margin of postclypeus with 2 long median setae, in addition to several shorter setae laterally. Short setae sparsely scattered on vertex and frons. Fore wing with single row of short sparse setae on radial vein in basal third of wing, setae restricted to base of medial vein,



Figures 6-16. *Embidopsocus lenah*. Female: 6, fore wing; 7, hind wing; 8, lacinia; 9, thoracic terga; 10, thoracic sternum; 11, posterior abdominal terga (setae from sternum dotted); 12, subgenital plate. Figures 6, 7 and 9-12 to common scales. Male: 13, thoracic terga; 14, thoracic sternum; 15, phallosome; 16, hypandrium. Figures 13-16 to common scale.

posterior margin bearing 3 setae at base of wing. Chaetotaxy: thoracic terga (fig. 9) with one (humeral) seta on each side of pronotum; thoracic sterna (fig. 10) with pair of large setae (one missing in preparation) and row of smaller setae on anterior margin of prosternum, meso-metasternum with setae concentrated along its anterior margin and a few scattered along its sides. Hind femur with 2 long setae, hind tibia with 5 long setae of various lengths. Tarsal claw with a series of denticles basal to large subapical tooth. Chaetotaxy of posterior abdominal terga as in fig. 11. Sculpture of integument of head and terga of thorax and abdomen absent. Portion of gonapophyses seen (after clearing) through subgenital plate (dotted in fig. 12). Spermathecal plate (fig. 12) rounded anteriorly. Spermatheca very large, spherical (0.11–0.14 mm diameter, other specimen).

Dimensions. B 1.74, FW 1.54, HW 1.06, $F_{(1)}$ 0.356, $F_{(w)}$ 0.126, T 0.276, t_1 0.063, t_2 0.032, t_3 0.047, rt 2:1:1.5. f_1 0.075, f_2 0.067, S_1 0.036, S_a 0.158, S_c 0.055.

Description of apterous male. *Coloration* (after ca 56 years on permanent slide). As female.

Morphology. Ocelli absent. Eyes reduced to 2 ommatidia on each side of head. Chaetotaxy of thoracic terga as in fig. 13, thoracic sterna (fig. 14) with row of setae along anterior margin of prosternum reduced, a single large seta near each anterolateral margin. Sculpture of integument as female, except for a few vague lines along posterior margin of head. Remaining morphology as that of female. Phallosome (fig. 15) with parameres coming together anteriorly, endophallus finely serrate. Hypandrium (fig. 16) with pair of large preapical setae.

Dimensions. B 1.15, $F_{(1)}$ 0.308, $F_{(w)}$ 0.118, T 0.229, t_1 0.047, t_2 0.032, t_3 0.043, rt 1.5:1:1.37, f_1 0.063, f_2 , 0.063, S_1 0.024, S_a 0.103, S_c 0.063.

Remarks. Badonnel (1955) divided this genus into three species groups, utilising several important characters found in apterous females. Additional species from Argentina (Badonnel, 1962), Brazil (Badonnel, 1972), and Central and North America (Mockford: 1963, 1987) have been placed within these groups. A single damaged apterous female is known from the holotype

locality; the sclerotised bands of the mesosternum are present laterally but they do not fuse to form a closed arc, nor are they joined to the pro-mesothoracic spina. At present *E. lenah* cannot be placed into any of the above groups with certainty.

A single individual of this genus has been collected in Victoria (New, 1975).

Etymology. The species name is an indigenous word for kangaroo.

Liposcelis Motschulsky

Liposcelis Motschulsky, 1852: 19. Type species: *Liposcelis brunnea* Motschulsky.

Liposcelis spp.

Material examined. *Liposcelis* sp. A: Mt Victoria, moss on tree, 1♀, 29 Nov 89 (R. Coy); Bradshaws Rd, Site 1, moss on rocks, 1♀, 21 Apr 89 (P. Greenslade); Mt Mangana, Bruny I, Site 2, moss on log, 1♂, 9 Apr 89 (P. Greenslade); Mt Mangana, Bruny I, Site 2, moss on dead logs 1A, 1♂, 9 Apr 89 (P. Greenslade). *Liposcelis* sp. B: Mt Field, *N. gunnii*, suction no. 2, 1♀, 9 Oct 89 (R. Coy); Mt Field, *N. gunnii*, soil cores, 1♀, 1 nymph, 25 Aug 89 (R. Coy); Projection Bluff, soil cores, 2♀, 3 nymphs, 9 Mar 89 (J. Diggle); Mt Mangana, Bruny I, Site 2, moss on live trees, 1♀, 4 Apr 89 (J. Diggle) (MV).

Remarks. Several specimens of two species of *Liposcelis* were examined. As Smithers (1991) noted, these cannot be identified until further work has been done on Australian members of this genus. One species was determined by ERS, possibly incorrectly, as *Liposcelis decolor* (Pearman) (Coy et al., 1993).

'*Liposcelis divinatorius*' (Müller) was recorded from Tasmania by Hickman (1934). This name is now considered a *nomen dubium* (Lienhard, 1990).

Sphaeropsocidae

Sphaeropsocopsis Badonnel.

Sphaeropsocopsis Badonnel, 1963: 322. Type species: *Sphaeropsocopsis chilensis* Badonnel.

Table 2. Nature and distribution of distal thin-walled setiform sensilla on flagellar segments for n individuals of *E. lenah* (setal terminology after Mockford, 1987).

macropterous	f1	f2	f3	f4	f5	f6
n=1	1(IIa2aa)	1(IIa1bb)	1(IIb2cc)	1(IIb2dd)	1(IIb1dd)	1(IIb1dd)
			1(IIa2aa)	1(IIa2cc)		
	f7	f8	f9	f10	f11	f12
	1(IIIb3ee)	1(IIIb3ee)	1(IIIb3ee)	1(IIIb2ee)	1(IIIb3ee)	1(IIb3dd)
apterous	f1	f2	f3	f4	f5	f6
n=2	1(IIa2aa)	1(IIb1aa)	1(IIb3dd)	1(IIIb3ee)	1(IIb1dd)	1(IIb2dd)
	f7	f8	f9	f10	f11	f12
	1(IIIc3ee)	1(IIIc3ee)	1(IIIc3ee)	1(IIb1dd)	1(IIIc3ee)	1(IIIb3ee)

Sphaeropsocopsis recens (Hickman)

Sphaeropsocus recens Hickman, 1934: 83.

Sphaeropsocopsis recens. --- Badonnel, 1963: 323.

Material examined. The (Queens) Domain (Hobart), from loose bark on eucalypt, 2♀, 13 Apr 1968 (V. V. Hickman).

Distribution. Tasmania and South Australia.

Remarks. Not collected during the present study despite several targeted searches at the holotype locality (Trevallyn Gorge, Launceston) and from the Domain, Hobart. Although not recorded formally from Victoria, TRN has collected this species from grass tussocks near Narbethong.

Caeciliusidae**Key to Tasmanian subfamilies of Caeciliusidae**

1. Basal flagellar segment of antenna enlarged
..... Aphyopsocinae Mockford
- Basal flagellar segment of antenna not enlarged 2
2. Seven sensilla on distal margin of labrum, three ventral abdominal vesicles present
..... Paracaeciliinae Mockford
- Five sensilla on distal margin of labrum, at most two ventral abdominal vesicles present
..... Caeciliusinae Mockford

Aphyopsocinae Mockford**Aphyopsocus** Smithers

Aphyopsocus Smithers, 1982: 13. Type species: *Aphyopsocus prolixus* Smithers.

Aphyopsocus prolixus Smithers

Aphyopsocus prolixus Smithers, 1982: 14.

Material examined. **Site** 35A, 1♀, 20 Feb 87; **site** 103, 1♀, 21 Feb 88; **site** 121A, 1♂, 10 Nov 86; **site** 159B, 1♂, 23 Feb 88; **site** 159C, 9♀, 1♂, 19 Apr 87; 6♀, 5♂, 23 Feb 88; **site** 177, 1 nymph, 9 Feb 87; **site** 180A, 6♀, 1♂, 1 nymph, 13 Nov 86; 4♀, 2♂, 8 Dec 86; 3♀, 20 Jan 87; 1♂, 18 Mar 87; 1 nymph, 31 July 87; 1♀, 26 Feb 88; **site** 248A, 1♂, 24 Aug 86; 4♀, 23 Sep 86; 1♀, 25 Oct 86; 1♂, 24 Jan 87; 2♀, 1♂, 1 Mar 87; 1♀, 1♂, 23 May 87; 1♀, 28 June 87; 3♀, 30 July 87; **site** 248B, 1♀, 14 June 86; **site** 280A, 1♂, 26 Jan 87.

Distribution. Tasmania and New South Wales.

Remarks. This species, collected throughout the year, is most common on broad-leaved vegetation such as *Banksia serrata* and in wet forest *Olearia argophylla*. Interestingly, for a limited time many individuals were found on *Monotocca* sp., a very different plant which at the locality (site 159C) was an understorey species of the salt- and drought-tolerant species *Casuarina stricta*. In addition to the two states listed above ERS has collected this species from eastern Victoria and Queensland.

Paracaeciliinae Mockford**Paracaecilius** Badonnel

Paracaecilius Badonnel, 1931: 235. Type species: *Paracaecilius berlandi* Badonnel.

Key to Tasmanian species of Paracaecilius

1. Fore wing sparsely setose, body creamy-white
..... *hilli* (Smithers)
- Fore wing strongly setose, body buff
..... *seltus* (Schmidt and Thornton)

Paracaecilius hilli (Smithers)

Enderleinella hilli Smithers, 1979: 62.

Paracaecilius hilli. --- Smithers, 1994a: 126.

Material examined. Many individuals collected throughout the year.

Distribution. Tasmania and Victoria.

Remarks. This locally widespread species was found on many, predominantly broad-leaved plant species in wet environments. In dry environments it was also common on broad-leaved trees and shrubs such as *Acacia melanoxylon*, *Banksia serrata* and *Myoporum insulare*. Smithers (1979) indicated that the costal vein in the region of the pterostigma and proximal to it is thickened in *Paracaecilius zelandicus* (Tillyard), but is narrow in *Paracaecilius hilli*. Examination of additional material suggests that this characteristic is somewhat variable in the latter species, most possessing those features noted in *P. zelandicus*.

Paracaecilius seltus (Schmidt and Thornton)

Enderleinella selta Schmidt and Thornton, 1993: 157.

Enderleinella zelandica (Tillyard). Cole et al., 1989: 33.

Enderleinella sp. Z. Coy et al., 1993: 77.

Paracaecilius seltus. --- Mockford, 2000: 364.

Material examined. Many individuals collected throughout the year.

Distribution. Tasmania, Bass Strait Is and Victoria.

Remarks. This species is probably the most widespread member of the family in Tasmania. It was abundant on *Nothofagus*, the rainforest conifers, and on shrubs in mixed forest sites. It was also numerous at several dry coastal scrub and dry forest sites, such as *Callitris rhomboidea*. In the description of this species the figure of the subgenital plate (Schmidt and Thornton, 1993: 158, fig. 56) is incorrect; this has been rectified (erratum: Schmidt and Thornton, 1993). Specimens from the Bass Strait Is (Cole et al., 1989) are of this species.

Caeciliusinae Mockford**Key to Tasmanian tribes of Caeciliusinae**

1. Body pale, lacinial tip slender, bidentate or rounded
..... Coryphacini Mockford

- Body dark, lacinial tip broad, denticulate 2
- 2. Two abdominal vesicles Maoripsocini Mockford
- One or no abdominal vesicles 3
- 3. Clypeal shelf broad Bassocaeciliini new tribe
- Clypeal shelf narrow Epicaeciliini Mockford

Bassocaeciliini new tribe

Diagnosis. With the characters of the subfamily (Mockford, 2000) plus the following: clypeal shelf broad; labral stylets present; lacinial tip broad, denticulate; body dark; lateral apophyses of subgenital plate absent; ventral abdominal vesicles single or absent; wings very elongated, narrow, without pattern; papillae on male epiproct and paraproct absent.

Remarks. In what he described as a progress report, Mockford (2000) outlined a combination of characters associated with the five new tribes of the subfamily Caeciliusinae. The distribution of the distal inner labral sensilla excludes one tribe (Caeciliusini) from the Australian fauna, as only labral sensilla type 2 (Mockford 2000: 393, fig. 4) are found in all Australian genera of this subfamily. The genera represent each of the four remaining tribes. A broad clypeal shelf is found only in Coryphacini, but in genera of that tribe the lacinial tip is slender, its shape bicuspid, bilobed or rounded. An absence of both ventral abdominal vesicles and papillae on the male epiproct are characters of Epicaeciliini. However, genera of this tribe possess a clypeal shelf that is narrow or absent, and a lacinial tip that is very wide. Genera within Kodamaiini (not known from Tasmania) and Maoripsocini lack a broad clypeal shelf, and possess two abdominal vesicles. The lacinial tip in the former tribe is of medium width, with one or two shallow denticles between cusps, while in the latter tribe it is broad and denticulate. The above combination of characters is not found in any tribes within Caeciliusinae, and therefore Bassocaeciliini is established.

Key to Tasmanian genera of Bassocaeciliini

- 1. No abdominal vesicles, vein cu_2 of fore wing setose
..... *Bassocaecilius* gen. nov.
- One abdominal vesicle, vein cu_2 of fore wing glabrous
..... *Clinocaecilius* gen. nov.

Bassocaecilius gen. nov.

Diagnosis. With the characters of the tribe plus the following: ventral abdominal vesicles absent; vein cu_2 of fore wing setose; macropterous or micropterous (ocelli reduced, trichobothria absent) females.

Type species: *Bassocaecilius rawlinsoni* sp. nov.

Remarks. Dense short setae found on the ventral surface of the abdomen (although more profuse on the dorsal surface) may perform a function similar to that of the adhesive vesicles. This genus is also unusual in the Caeciliusidae in that both micropterous (possessing rudimentary fore wings, reduced

ocelli, and lacking developed thoracic lobes and trichobothria) and macropterous female forms have been found.

Etymology. The generic name is a combination of the name Bass, after the British naval surgeon and explorer George Bass, and *Caecilius*, a genus of Caeciliusidae.

Bassocaecilius rawlinsoni sp. nov.

Figures 17–25

Material examined. Holotype micropterous ♀: Tasmania, Mt William National Park, sedge, 8 Nov 1986. One nymph, 11♀ and 6♂ paratypes: same data as holotype. Description of macropterous ♀: Victoria, Cape Otway National Park, sedge, 11 Apr 1991. Additional records: **site** 42B, 3♀, 2 nymphs, 12 June 86; 1♀, 1 nymph, 18 July 86; 1♀, 7 nymphs, 2 Oct 86; 1♂, 1 nymph, 3 Nov 86; 1♂, 8 July 87; **site** 158 (holotype locality), 1♀, 6♂, 2 nymphs, 5 June 86; 3♀, 1♂, 1 nymph, 11 July 86; 5♀, 1♂, 2 nymphs, 9 Aug 86; 4♀, 7♂, 4 nymphs, 12 Sep 86; 2♀, 4♂, 1 nymph, 12 Oct 86; 5♀, 4♂, 1 nymph, 7 Dec 86; 2♂, 18 Jan 87; 2♀, 5 Feb 87; 1♂, 1 nymph, 23 Mar 87; 2♀, 4♂, 14 June 87; 3♀, 1♂, 25 July 87; 1♀, 23 Feb 88.

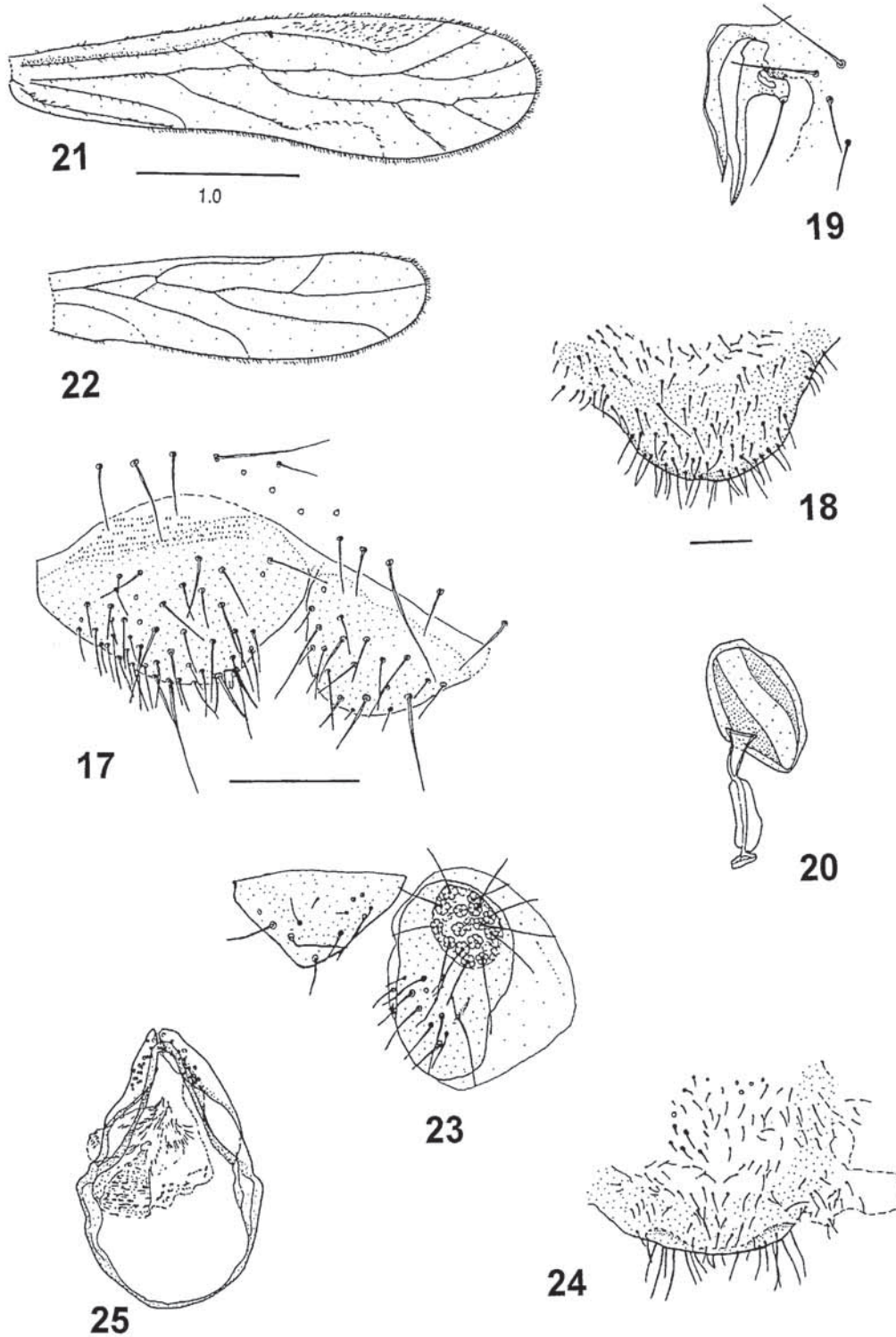
Description of micropterous female. *Coloration* (after ca 6 years in alcohol). Head brown, with darker brown band laterally across vertex half way between ocelli and crest, extending to region between eye and antennal socket. Frons with small dark brown markings. Maxillary palp, antenna and labrum dark brown. Ocelli pale, with small dark centripetal margins. Rudimentary wings brown. Thorax brown. Legs: coxae and tarsi brown, trochanter pale, femora dark brown, tibiae brown merging dark brown apically, claws black. Abdomen pale brown dorsally, cream ventrally. Terminal segments brown.

Morphology. IO:D = 5.0. Eyes and ocelli small. Labrum: stylets large, spiculate; distal anterior margin with 5 sensilla; internal sclerotisation present. Lacinia broad, flat, expanded preapically on one side, with apical denticles. Vertex flattened, elongated. Epicranial suture on posterior half of vertex distinct. Fore wing reduced to a rudimentary flap, setose. Hind wing absent. Thoracic lobes not developed. Abdomen elongate, covered by dense small dark setae which are more profuse dorsally, ventral vesicles lacking. Epiproct and paraproct (fig. 17) setose, latter lacking trichobothrial field and possessing a small apically bifid projection between two macrosetae on posterior margin. Subgenital plate (fig. 18) very setose, margin round, well pigmented with short anteriorly diverging sclerotised areas. Gonapophyses (fig. 19) with external valve sometimes represented by one seta, otherwise absent. Spermatheca (fig. 20) with relatively long glandular area.

Dimensions. B 2.4, F 0.37, T 0.58, t_1 0.134, t_2 0.103, rt 1.3:1, ct 0.0, f_1 0.190, f_2 0.134.

Description of macropterous female. *Coloration* (after ca 1 year in alcohol). As micropterous female. Wings hyaline with brown tinge, veins brown.

Morphology. IO:D = 4.3. Basal flagellar segment not enlarged, bent. Vertex flattened, elongated. Ocelli more prominent than in micropterous female. Wings elongate, narrow. One specimen with fore wing venation asymmetrical – one fore wing with veins *rs* and *m* fused for a short length – on the other these veins are separate with no cross vein joining them.



Figures 17-25. *Bassocaecilius rawlinsoni*. Female: 17, epiproct and paraproct; 18, subgenital plate; 19, gonapophyses; 20, spermathecal sac. Male: 21, fore wing; 22, hind wing; 23, epiproct and paraproct; 24, hypandrium; 25, phallosome. Figures 17, 19, 20, 23, 25; 18, 24 and 21 and 22 to common scales.

Pterostigma and areola postica low, elongate. Vein cu_1 only partially developed and the radial vein not forked in both wings examined. Vein cu_2 setose. Legs and antenna longer than in micropterous female. Mesothoracic precoxal suture absent. Abdomen as in micropterous female. Genitalia as in micropterous female except paraproct with small field of 13 trichobothria, the apically bifid projection on the posterior margin larger than in micropterous female, adjacent to a single large macroseta.

Dimensions. B 2.5, FW 2.27, HW 1.90, F 0.41, T 0.63, t_1 0.158, t_2 0.111, rt 1.4:1, ct 0.0, f_1 0.229, f_2 0.158.

Description of male. Coloration (after ca 6 years in alcohol). As micropterous female. Fore wing (fig. 21) and hind wing (fig. 22) hyaline, veins brown.

Morphology. IO:D = 3.5. Head rounded. Clypeus and labrum as in female. Ocelli on raised tubercle. Epicranial suture distinct. Wings elongate, narrow. In fore wing (fig. 21) veins rs and m fused for short length, venation as in *Caecilius*, vein cu_2 setose; pterostigma and areola postica long, narrow; radial fork approximately same length as stem. Hind wing (fig. 22) with vein cu_1 curved toward wing margin. Tibiae of uniform width, swellings absent. Mesothoracic precoxal suture absent. Epiproct (fig. 23) trianguloid. Paraproct (fig. 23) with round field 19 trichobothria, bifid projection on posterior margin small, lying between 2 large setae. Small fields of papillae on epiproct and paraproct absent. Hypandrium (fig. 24) a simple shallow lobe, well sclerotised, posterolateral margins with field of large setae. Phallosome (fig. 25) with feebly developed endophallus.

Dimensions. B 1.8, FW 3.01, HW 2.36, F 0.47, T 0.79, t_1 0.190, t_2 0.126, rt 1.5:1, ct 10.0, f_1 0.395, f_2 0.284.

Etymology. Named for our friend and colleague, the late Peter Rawlinson, a specialist on the ecology and biogeography of reptiles of the Bass Strait region.

Clinocaecilius gen. nov.

Diagnosis. With the characters of the tribe plus the following: vein cu_2 of fore wing glabrous; single abdominal vesicle present.

Etymology. The generic name is a combination of the Latin *clino*, to bend, recline, or lean over, and *Caecilius*, a genus of Caeciliusidae.

Clinocaecilius edwardsi sp. nov.

Figures 26–29

Material examined. Holotype ♂: Tasmania, Ferntree, in rolled bark, 19 Oct 1962. 5♂ paratypes: same data as holotype (V. V. Hickman). Additional material (1♂): Tunbridge, Steppes Rd, *Bedfordia salicina*, 13 Nov 1986.

Description of male. Coloration (after ca 30 years in alcohol). Head pale brown with suggestion of darker markings as follows: dorsal to eyes, across back of vertex and each side of median epicranial suture; central patch on frons; postclypeal striae. Ocelli pale, tubercle dark brown. Eyes greyish-black. Fore wing (fig. 26) and hind wing (fig. 27) with faint brown tinge,

veins brown. Thorax brown, legs and abdomen pale brown.

Morphology. IO:D = 2.7. Ocelli large, on prominent tubercle. Median epicranial suture distinct. Clypeal shelf broad. Labrum: stylets small, spiculate; internal sclerotisation not distinct; sensilla 5 in total. Lacinia apically broad, preapically expanded on one side, apical margin with denticles. Setae on fore wing (fig. 26) veins in single rank, short, slanting distally; vein cu_2 glabrous; pterostigma elongate; areola postica elongated, narrow; junction of veins rs and m variable from fusion for a short length, meeting at a point or joined by short cross-vein. Mesothoracic precoxal suture absent, sterna very broad. One ventral abdominal adhesive vesicle present. Epiproct triangular, with short setae in apical half. Paraproct with oval field of about 22 trichobothria. Hypandrium (fig. 28, paratype) setose, with 2 large median preapical setae. Phallosome (fig. 29) rounded anteriorly, aedeagus bluntly pointed, endophallic lobe spiculate.

Dimensions. B 2.3, FW 3.25, HW 2.51, F 0.61, T 0.98, t_1 0.253, t_2 0.095, rt 2.7:1, ct 17.0, f_1 0.474, f_2 0.355.

Female. Unknown.

Remarks. The genitalia of this species grossly resemble those of *Bassocaecilius rawlinsoni* in the shape of the phallosome and by the absence of papillae on the epiproct and paraproct. *Clinocaecilius edwardsi* differs, however, by the hypandrium possessing a pair of large median preapical setae.

Etymology. Named for Barry A. B. Edwards, in recognition of his pioneering synopsis of the Tasmanian Psocoptera.

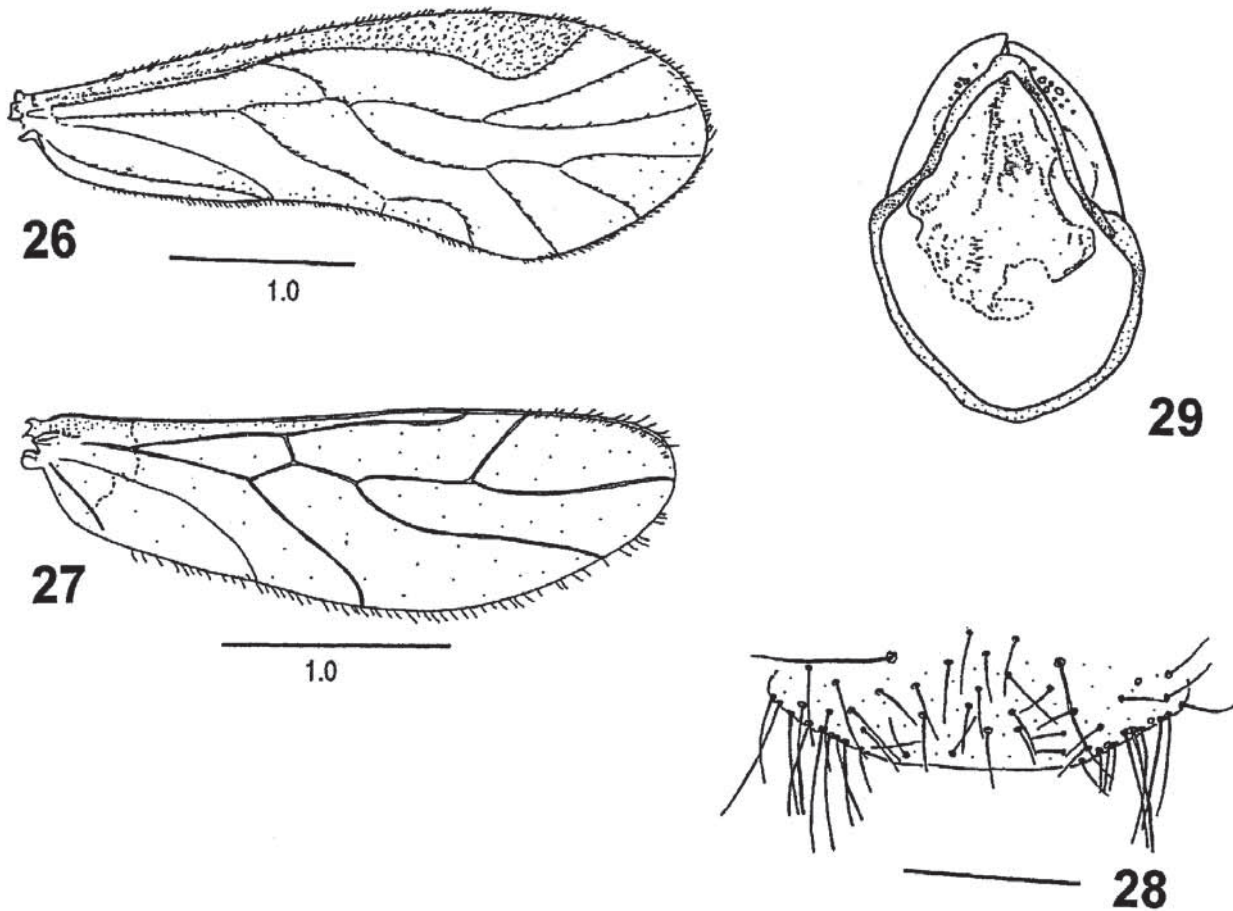
Maoripsocini Mockford

Maoripsocus Tillyard

Maoripsocus Tillyard, 1923: 191. Type species: *Maoripsocus semifuscatus* Tillyard.

Key to Tasmanian species of *Maoripsocus*

1. Micropterous *pedderi* sp. nov.
– Macropterous 2
2. Fore wing membrane with setae *tahunensis* sp. nov.
– Fore wing membrane without setae 3
3. Fore wing basal veins with two ranks of setae 4
– Fore wing basal veins with single rank of setae 6
4. Postclypeus with distinct striae *semifuscatus* Tillyard
– Postclypeus uniformly brown 5
5. Head pattern with dark X-mark centred on ocellar protuberance, fore wing with pterostigmal spur-vein
..... *juneae* (Schmidt and Thornton)
– Head pattern lacking dark X-mark centred on ocellar protuberance, fore wing lacking pterostigmal spur-vein
..... *concavistigma* (Schmidt and Thornton)
6. Lacinia basally spiraloid *spiralosus* sp. nov.



Figures 26-29. *Clinocaecilius edwardsi*. Male: 26, fore wing; 27, hind wing; 28, hypandrium; 29, phallosome. Figures 28 and 29 to common scale.

- Lacinia not basally spiraloid 7
- 7. Fore wing with apices of cells R_1 , R_3 and R_5 pigmented
..... *hobartensis* sp. nov.
- Fore wing with apices of cells R_1 , R_3 and R_5 hyaline 8
- 8. ♀ IO:D = 3.8, ♂ IO:D = 2.5 *wedgei* sp. nov.
- ♀ IO:D = 2.7, ♂ IO:D = 0.8 *weindorferi* sp. nov.

Remarks. Mockford (2000) considered this genus to possess a clypeal shelf that is narrow in development. We consider that it is somewhat intermediate in development as it is broader than the narrow clypeal shelf found in genera placed in the Epicaeciliini below.

Maoripsocus concavistigma (Schmidt and Thornton)

Caecilius concavistigma Schmidt and Thornton, 1993: 149.
Maoripsocus concavistigma. --- Mockford, 2000: 345.

Material examined. Many individuals collected throughout the year.

Distribution. Tasmania, Victoria and New South Wales.

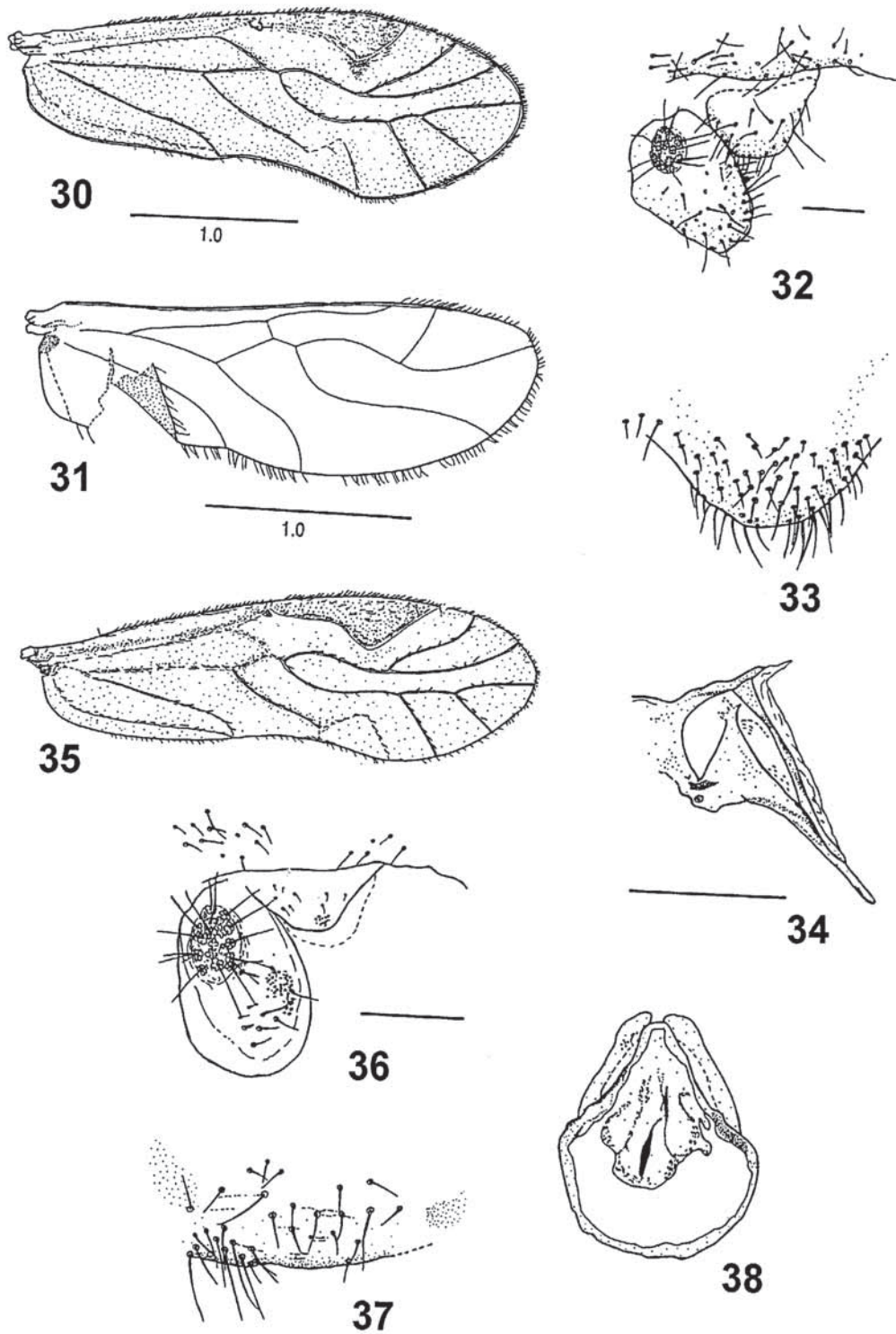
Remarks. This species is widespread in Tasmania. Except for a few individuals found on *Banksia serrata*, *M. concavistigma* was taken only on *Acacia melanoxylon* and *Myoporum insulare*.

Maoripsocus hobartensis sp. nov.

Figures 30-38

Material examined. Holotype ♀: Tasmania, Queens Domain, Hobart, *Bursaria* sp., 23 Mar 1961. One ♂ and 4♀ paratypes: same data as holotype (V. V. Hickman).

Description of female. Coloration (after ca 32 years in alcohol). Head buff with the following dark brown: markings dorsal to eyes, across back of vertex and each side of median epicranial suture, central region of frons, close-set postclypeal striae,



Figures 30-38. *Maoripsocus hobartensis*. Female: 30, fore wing; 31, hind wing; 32, epiproct and paraproct; 33, subgenital plate; 34, gonapophyses. Male: 35, fore wing; 36, epiproct and paraproct; 37, hypandrium; 38, phallosome. Figures 31, 35; 32, 33 and 36-38 to common scales.

labrum, antenna and two apical segments of maxillary palp. Centripetal margins of ocelli and eyes black. Fore wing (fig. 30) suffused with shades of brown. Hind wing (fig. 31) with slight brown tinge. Thoracic dorsum dark brown, remainder of thorax brown, sutural areas paler. Legs brown except pale brown femora. Abdomen pale mauve dorsally, cream ventrally, terminal segments brown.

Morphology. IO:D = 2.8. Median epicranial suture distinct. Basal flagellar segment slightly bent. Labrum: stylets small, spiculate; sensilla 5 in all; internal sclerotisation present. Lacinia apically broad, preapically expanded on one side, apical margin with denticles. Mesothoracic precoxal suture absent. Fore wing (fig. 30) strongly setose, setae short, slanting distally in a single rank; vein cu_2 setose; short spur-vein from pterostigma present. Epiproct (fig. 32). Paraproct (fig. 32) with round field of 14 trichobothria, posterior margin with small bifid projection and associated seta lying between a short and long seta. Subgenital plate (fig. 33) with transverse margin, two pigmented arms diverging anteriorly from apical margin. Gonapophyses (fig. 34).

Dimensions. B 2.85, FW 2.89, HW 2.27, F 0.56, T 1.0, t_1 0.308, t_2 0.134, rt 2.3:1, ct 17.0, f_1 0.458, f_2 0.316.

Description of male. *Coloration* (after ca 32 years in alcohol). Head, thorax and legs dark brown. Fore wing as in fig. 35, hind wing as female. Abdomen cream, terminal segments dark brown.

Morphology. IO:D = 2.3. Eyes small, not reaching top of vertex in lateral aspect. Median epicranial suture distinct. Labrum and lacinia as female. Fore wing (fig. 35) as female, except spur-vein from pterostigma absent. Epiproct and paraproct (fig. 36) with small field of papillae, latter with round field of about 22 trichobothria. Hypandrium (fig. 37, torn) with posterolateral group of large setae each side of median area. Phallosome (fig. 38) with blunt-tipped aedeagus, endophallus with 3 membranous lobes.

Dimensions. B 1.7, FW 2.24, HW 1.77, F 0.48, T 0.77, t_1 0.237, t_2 0.103, rt 2.3:1, ct 14.0, f_1 0.355, f_2 0.205.

Remarks. This species is similar to *M. spiralosus* (below) and *M. weindorferi* (below) in features of coloration, genitalia and in the distribution of setae on the fore wing. It differs from *M. spiralosus* (males unknown) in the shape of the basal half of the lacinia. The absence of dark brown pigment in the apical part of the pterostigma of *M. hobartensis* differentiates it from *M. spiralosus* and *M. weindorferi*, but this character is known to vary in other species (e.g. *M. semifuscatus* and *M. wedgei* below). *M. hobartensis* lacks the small distinct hyaline areas in cells *An* and *Cu* found in the other two species.

Etymology. Referring to the type locality, Hobart.

Maoripsocus juneae (Schmidt and Thornton)

Caecilius juneae Schmidt and Thornton, 1993: 152.

Caecilius sp. RF. Coy et al., 1993: 77.

Maoripsocus juneae. --- Mockford, 2000: 346.

Material examined. Many individuals collected throughout the year.

Distribution. Tasmania and Victoria.

Remarks. *M. juneae* is locally widespread and was most common in rainforest habitats of *Nothofagus* and the conifers, those of mixed forest and in some cases in wet forest. Within dry forest it was found mainly on *Banksia serrata*.

Maoripsocus pedderi sp. nov.

Figures 39–44

Material examined. Holotype ♀: Tasmania, South Cape Rivulet, coastal scrub, 29 Mar 1988.

Description of female. *Coloration* (after ca 4.5 years in alcohol). Head dark brown, with the following brown: large patch on crest of vertex each side of median epicranial suture, broad band on vertex adjacent to epistomal suture extending across front of head to antennal socket, gena and antenna. Maxillary palps brown, terminal segment dark brown. Ocelli pale, centripetal margins black. Eyes black. Fore wing (fig. 39) brown, apex pale. Meso- and meta-thoracic terga with small dorsal median cream patch, remainder of thorax and legs brown. Abdomen cream, terminal segments brown.

Morphology. IO:D = 4.0. Head glossy. Postclypeal striae not obvious. Labrum: stylets small, spiculate; sensilla 5 in total; internal sclerotisation present. Lacinia (fig. 40) broad, preapically strongly expanded on one side, apical margin denticulate, strongly bent mid way. Antennal flagellar segments extremely short. Micropterous. Fore wing (fig. 39): vein cu_2 glabrous; apex narrowing; microtrichia on wing margin obvious, reduced at apical region of wing; anterior wing margin lacking setae. Hind wing a small rudiment. Presence of abdominal adhesive vesicles not known. Epiproct (fig. 41) setose. Paraproct (fig. 41) with small sclerotised cone and adjacent macroseta on posterior margin, a round field of 14 trichobothria. Subgenital plate (fig. 42) apically emarginate with lateral apophyses; posterior region bearing larger setae than remainder of plate; sclerotised pigment band with pair of anteriorly diverging arms. Gonapophyses (fig. 43) with external valve remnant represented by one seta. Spermatheca (fig. 44) with long glandular area, sac large and well sclerotised.

Dimensions. B 2.4, FW 0.50, F 0.58, T 0.90, t_1 0.284, t_2 0.118, rt 2.4:1, ct 0.0, f_1 0.300, f_2 0.197.

Male. Unknown.

Remarks. Known only from a single specimen, this species is distinctive in that vein cu_2 of the forewing is glabrous. In all other characters it agrees with *Maoripsocus*, and thus is tentatively placed here.

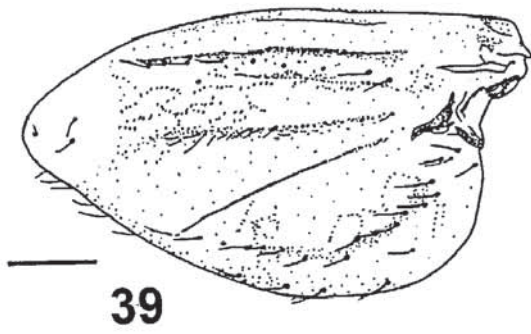
Etymology. Named for Sir John L. Pedder, the first Chief Justice of Tasmania.

Maoripsocus semifuscatus Tillyard

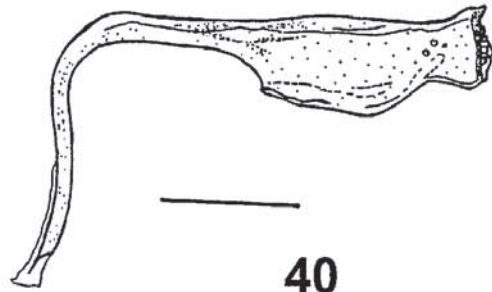
Maoripsocus semifuscatus Tillyard, 1923: 191.

Material examined. Many individuals collected throughout the year.

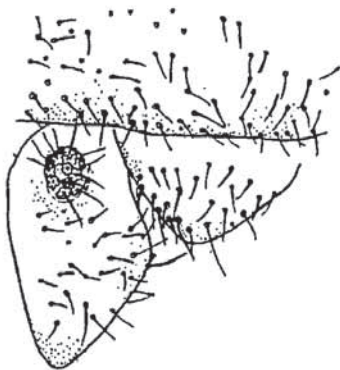
Distribution. Tasmania, Bass Strait Is, Victoria, New South Wales, South Australia and New Zealand.



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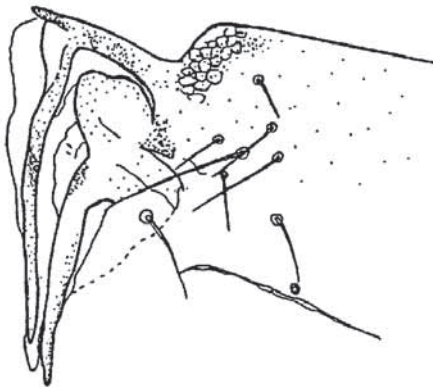
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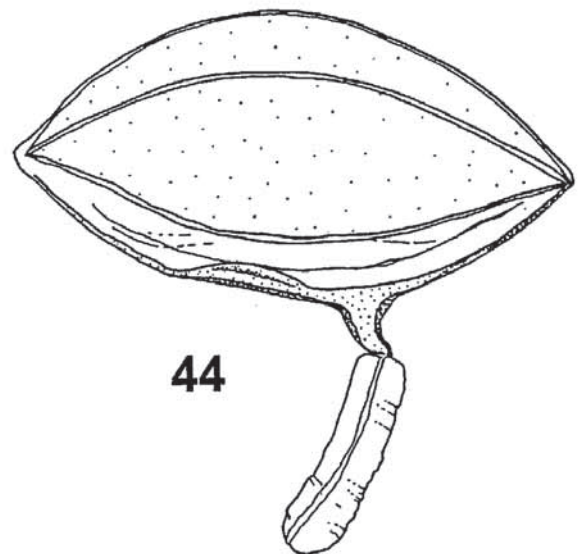
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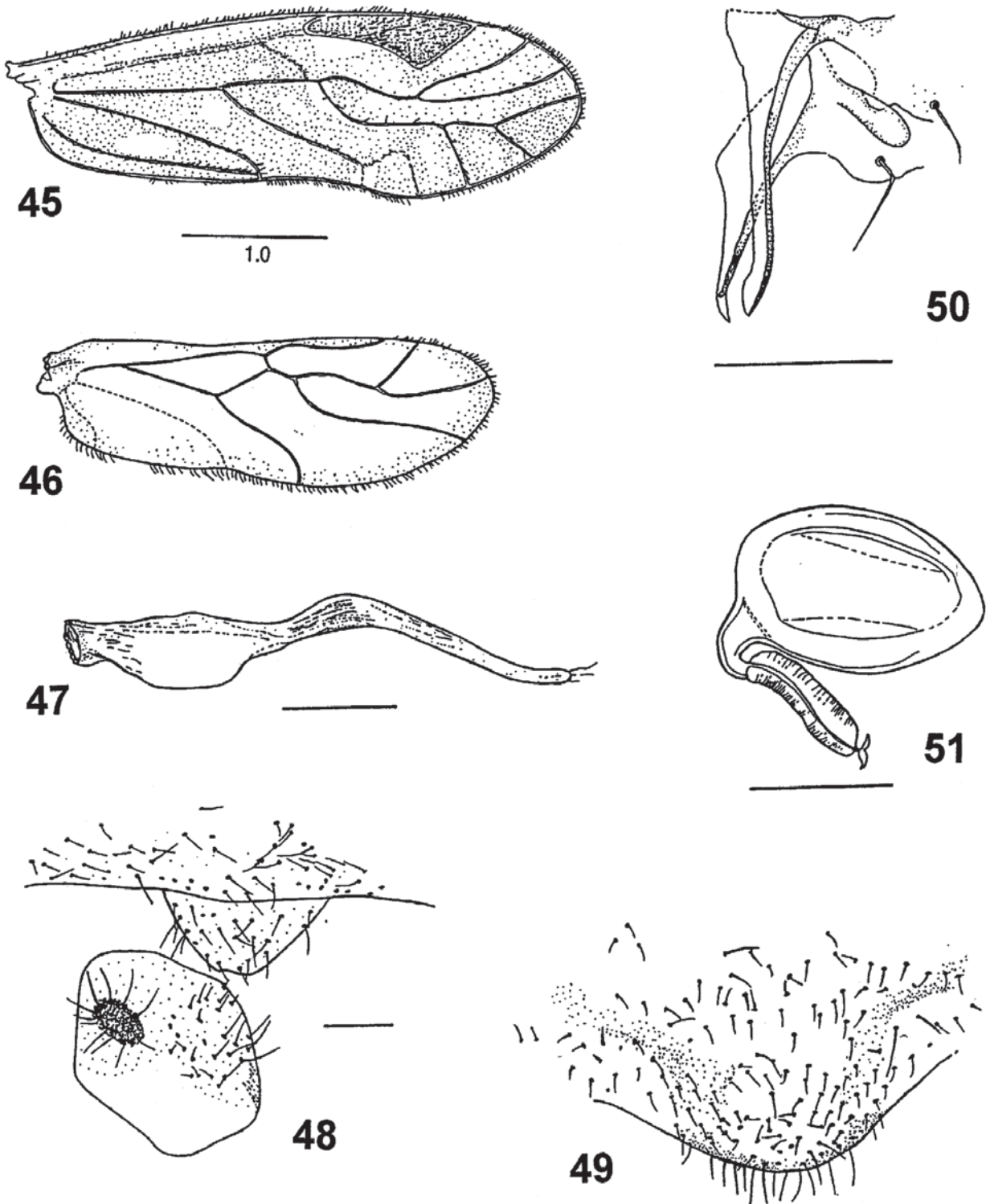


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44

Figures 39-44. *Maoripsocus pedderi*. Female: 39, fore wing; 40, lacinia; 41, epiproct and paraproct; 42, subgenital plate; 43, gonapophyses; 44, spermathecal sac. Figures 39, 41, 42 and 43 and 44 to common scales.



Figures 45-51. *Maoripsocus spiralousus*. Female: 45, fore wing; 46, hind wing; 47, lacinia; 48, epiproct and paraproct; 49, subgenital plate; 50, gonapophyses; 51, spermathecal sac. Figures 45, 46 and 48 and 49 to common scales.

Remarks. This widespread species was found at many sites (some with dead foliage), but predominated in those of dry coastal scrub in the northern part of the state, and wet coastal scrub in the south. In dry forest the species was numerous on *Banksia serrata*.

Maoripsocus spiralosus sp. nov.

Figures 45–51

Material examined. Holotype ♀: Tasmania, Lyell Hwy, *Hakea epiglottis*, 16 Nov 1986.

Description of female. Coloration (after ca 6 years in alcohol). Head brown, with the following dark brown: markings dorsal to eyes, across back of vertex and each side of median epicranial suture, median area of frons, postclypeal striae, two apical segments of maxillary palp, centripetal margins of ocelli, antenna. Eyes black. Fore wing (fig. 45) with brown markings and small hyaline areas. Hind wing (fig. 46) with slight brown tinge. Thoracic dorsa dark brown, remainder of thorax and legs brown. Abdomen cream, terminal segments brown.

Morphology. IO:D = 3.3. Basal flagellar segment slightly bent. Labrum: stylets small, spiculate; internal sclerotisation present; 5 distal sensilla. Lacinia (fig. 47) apically broad, preapically expanded on one side, apical margin with denticles, basally spiral-shaped. Mesothoracic precoxal suture absent. Setae on fore wing (fig. 45) veins short in single rank, slanting distally; vein cu_2 strongly setose. Epiproct and paraproct (fig. 48). Subgenital plate (fig. 49) rounded posteriorly, pigment area broad medially, with two slender arms diverging anteriorly. Gonapophyses (fig. 50) with external valve remnant bearing a single seta. Spermatheca (fig. 51) with long glandular area, sac large and well sclerotised.

Dimensions. B 2.9, FW 3.30, HW 2.60, F 0.71, T 1.21, t_1 0.324, t_2 0.134, rt 2.4:1, ct 19.0, f_1 0.577, f_2 0.348.

Male. Unknown.

Remarks. In details of the distribution of setae on the fore wing and genitalia this species closely resembles *M. weindorferi* (below). It differs in the shape of the basal half of the lacinia, and in the more extensive pigmentation of the fore wing. The dark brown pigment in the pterostigma is almost entire in *M. spiralosus*, and brown pigment is present basally in cell R_1 and apically in cell R_5 . In *M. weindorferi* the dark brown pigment is limited to the apical half of the pterostigma; cell R_1 and the apical part of cell R_5 are hyaline.

Etymology. The specific name refers to the unusual form of the lacinia.

Maoripsocus tahunensis sp. nov.

Figures 52–56

Material examined. Holotype ♀: Tasmania, Franklin – Gordon Wild Rivers National Park, Tahune Lake, 7 Mar 1988.

Description of female. Coloration (after ca 4 years in alcohol). Head brown with the following dark brown: broad band dorsal to eyes extending across centre of vertex, centripetal margins

of ocelli, central region of frons, postclypeal striae, antenna and narrow band from antennal socket half way around ventral margin of eye. Eyes black. Fore wing (fig. 52) brown with hyaline patches. Hind wing (fig. 53) with brown tinge. Thorax dark brown, sutural lines nearly black. Legs brown except pale trochanters and dark brown claws. Abdomen dorsally pale mauve, cream ventrally. Terminal segments brown.

Morphology. IO:D = 4.2. Clypeal shelf intermediate in development. Basal flagellar segment bent. Labrum: stylets small, spiculate; distal sensilla 5 in all, internal sclerotisation present. Lacinia broad, flat, expanded preapically on one side with apical denticles. Postclypeal striae not quite reaching anterior margin. In basal half of fore wing, setae on veins in 2 ranks: cu_2 setose; setae on membrane basally in cell M_3 , in cell cu_2 and at apex of cell cu_1 (the latter in one wing only). On one fore wing vein M_3 absent and areola postica joined to media by cross-vein. Spur-vein from pterostigma present. Mesothoracic precoxal suture absent. Presence of abdominal adhesive vesicles not known. Epiproct setose, apical fifth not sclerotised and bearing 3 small setae on posterior margin. Paraproct setose with oval field of 17 trichobothria. Subgenital plate (fig. 54) with transverse posterior margin, pigmented band with pair of anteriorly diverging arms. Gonapophyses (fig. 55) with external valve remnant as one or two setae. Spermatheca (fig. 56) with long glandular area, sac large and sclerotised.

Dimensions. B 2.2, FW 2.68, HW 2.2, F 0.63, T 1.04, t_1 0.292, t_2 0.126, rt 2.3:1, ct 0.0, f_1 0.474, f_2 0.308.

Male. Unknown.

Remarks. This species is similar to species of *Kodamaius* Okamoto in possessing setae on the fore wing membrane, a pterostigmal spur-vein, long setae on the basal veins in 2 ranks and vein cu_2 strongly setose. In *M. tahunensis* veins rs and m of the fore wing are fused for a short distance, in *Kodamaius* they are joined by a cross-vein.

Only a single specimen of this species is known, and until further material can be studied it is presently retained in *Maoripsocus*.

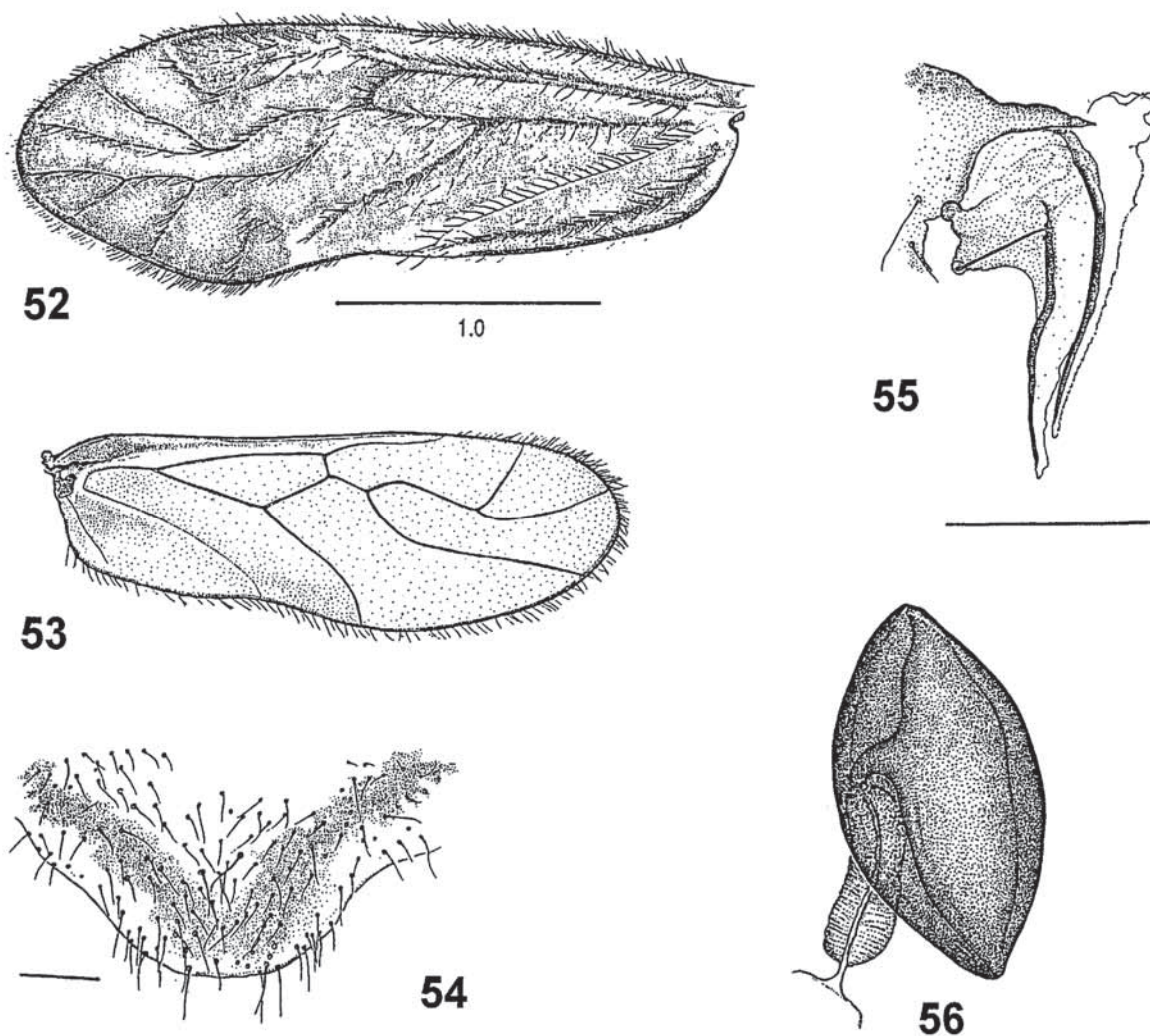
Etymology. Referring to the type locality, Tahune Lake.

Maoripsocus wedgei sp. nov.

Figures 57–65

Material examined. Holotype ♀: Tasmania, Cradle Mtn - Lake St Clair National Park, Weindorfers Forest, *Athrotaxis selaginoides*, 26 Nov 1986. Four ♀ and 5 ♂ paratypes: same data as holotype. Additional records: **site** 179B, 2♀, 26 Feb 88; **site** 219A, 1♂, 1 nymph, 26 Nov 86; 1♂, 7 Feb 87; **site** 219C (holotype locality), 5♀, 5♂, 26 Nov 86; **site** 219D, 12♀, 24♂, 2 nymphs, 27 Nov 86; 1♀, 7 Feb 87; **site** 219E, 1♂, 26 Nov 86; **site** 219F, 10♀, 3♂, 27 Nov 86; 4♀, 23 Jan 87; 3♀, 7 Feb 87; 1♀, 2 Mar 87; **site** 219G, 1♀, 1 nymph, 23 Jan 87; **site** 221, 6♀, 9♂, 4 nymphs, 27 Nov 86.

Description of female. Coloration (after ca 6 years in alcohol). Head pale brown with the following brown: markings dorsal to eyes, across back of vertex, along median epicranial suture, ocellar region, frons, striae on postclypeus, antenna and labrum. Maxillary palpi brown, apical segment darker. Centripetal margins of ocelli and eyes black. Thorax dark brown, paler



Figures 52-56. *Maoripsocus tahunensis*. Female: 52, fore wing; 53, hind wing; 54, subgenital plate; 55, gonapophyses; 56, spermathecal sac. Figures 52, 53 and 55 and 56 to common scales.

ventrally, sutural lines dark. Fore wing (fig. 57) light brown with hyaline areas, hind wing (fig. 58) hyaline. Legs: coxae, tibiae and tarsi brown, claws black, femora pale brown merging brown apically. Abdomen pale mauve dorsally, slightly paler ventrally. Terminal segments brown.

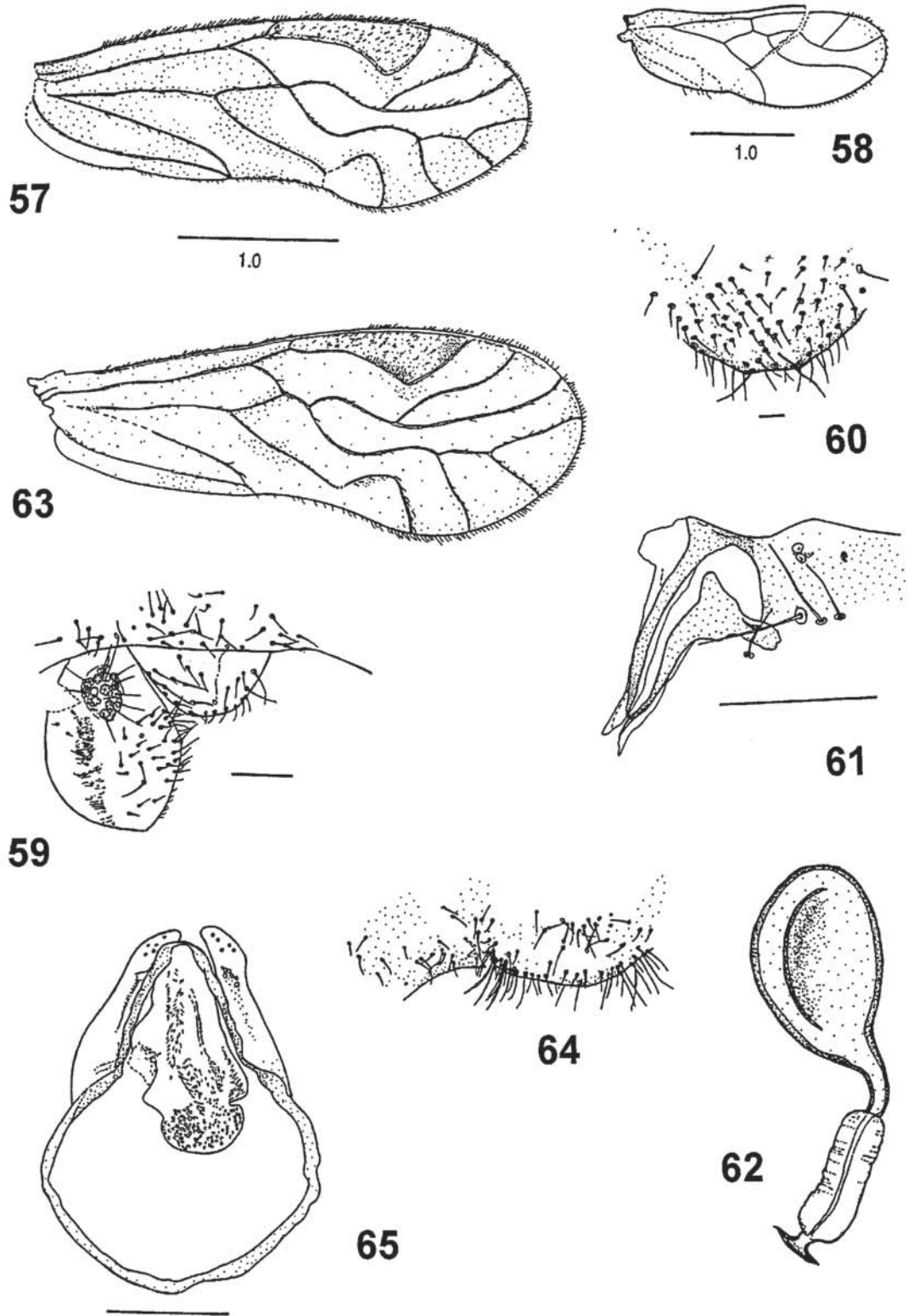
Morphology. IO:D = 3.8. Median epicranial suture distinct. Basal flagellar segment not enlarged, slightly bent. Labrum: stylets small, spiculate; distal anterior margin with 5 sensilla; internal sclerotisation present. Lacinia broad, flat, expanded preapically on one side, with apical denticles. Mesothoracic precoxal suture absent. Setae on fore wing (fig. 57) veins short, in single rank, slanting distally; vein cu_2 of fore wing setose. Abdomen with two eversible vesicles. Epiproct (fig. 59)

semicircular, setose. Paraproct (fig. 59) with rounded field of 16 trichobothria. Subgenital plate (fig. 60): simple, setose, with median transverse margin; single large seta at each posterolateral margin; sclerotised pigment arms diverging anteriorly. Gonapophyses (fig. 61). Spermatheca (fig. 62) with long glandular area, sac moderately large and sclerotised.

Dimensions. B 2.5, FW 2.80, HW 2.24, F 0.61, T 1.06, t_1 0.308, t_2 0.142, rt 2.2:1, ct 21.0, f_1 0.474, f_2 0.269.

Description of male. *Coloration* (after ca 6 years in alcohol). As in female. Fore wing pigmented as in fig. 63, hind wing hyaline.

Morphology. IO:D = 2.5. Eyes small, not reaching top of vertex when looking at side of head. Median epicranial suture distinct. Labrum and lacinia as female. Tibiae of uniform



Figures 57-65. *Maoripsocus wedgei*. Female: 57, fore wing; 58, hind wing; 59, epiproct and paraproct; 60, subgenital plate; 61, gonapophyses; 62, spermathecal sac. Male: 63, fore wing; 64, hypandrium; 65, phallosome. Figures 57, 63; 59, 64 and 61 and 62 to common scales.

width, swellings absent. Mesothoracic precoxal suture absent. Epiproct and paraproct with small fields of papillae, latter with oval field of 26 trichobothria. Hypandrium (fig. 64) simply rounded, posterolateral margins with field of strong setae. Phallosome (fig. 65).

Dimensions. B 2.3, FW 2.98, HW 2.36, F 0.66, T 1.17, t_1 0.355, t_2 0.150, rt 2.4:1, ct 21.0, f_1 0.624, f_2 0.387.

Remarks. *M. wedgei* was found mainly on *Nothofagus* and conifer rainforest habitats at Cradle Mountain. This species is similar to *M. semifuscatus* in details of genitalia and fore wing pigmentation. Considerable variation occurs in the extent of fore wing pigmentation (light brown to prominent dark brown pattern), particularly in the pterostigma. The fore wing of *M. semifuscatus* is densely setose, and veins *r* and *an* have two incipient rows of setae. The fore wing of *M. wedgei* is more sparsely setose, and all veins have a single row of setae. The eyes of males of *M. semifuscatus* (IO:D = 1.1, eyes are level with the top of the vertex when looking at the side of the head) are larger than those of *M. wedgei*.

M. wedgei is a seasonal species, being found only from November to March.

Etymology. Named for John H. Wedge, an early surveyor and explorer in Tasmania.

Maoripsocus weindorferi sp. nov.

Figures 66–74

Material examined. Holotype ♀: Tasmania, Wilmot, Cradle Mtn Road, dead rainforest material (row from clearing), 17 Mar 1987. One ♂ and 2 ♀ paratypes: same data as holotype. Additional records: **site** 179A, 1 ♀, 2 nymphs, 18 Mar 1987; **site** 304A, 1 ♀, 1 ♂, 29 Nov 1986.

Description of female. Coloration (after ca 5 years in alcohol). Ground colour of head pale brown, with brown markings as follows: dorsal to eyes, across back of vertex and each side of median epicranial suture; broad patch centrally on frons; postclypeal striae converging towards midline. Antenna, labrum and two apical segments of maxillary palp dark brown. Ocelli pale, with black centripetal margins. Eyes black. Fore wing (fig. 66) with pattern of hyaline and brown areas. Hind wing (fig. 67) with brown tinge. Thorax and legs dark brown. Abdomen cream with terminal segments brown.

Morphology. IO:D = 2.7. Median epistomal suture distinct. Labrum: stylets spiculate; distal margin with 5 sensilla; internal sclerotisation present. Lacinia broad, flat, expanded preapically on one side, with apical denticles. Setae on flagellar segments short, uniform. Distribution of placoid sensilla: 2 small at base of f_1 , 1 at apices f_4 , f_6 and f_{10} , short filament on latter two placoids. Apex of distal segment narrowing, bluntly rounded. Head and thorax glossy. Mesothoracic precoxal suture absent. Setae on fore wing (fig. 66) in single rank, short and slanting distally; vein cu_2 setose. Abdomen with two ventral eversible vesicles. Epiproct (fig. 68) semicircular, setose. Paraproct (fig. 68) with round field of 16 trichobothria. Subgenital plate (fig. 69) uniformly setose, with pair of anteriorly diverging pigmented arms. Gonapophyses (fig. 70). Glandular area of spermathecal duct long (fig. 71), sac moderately large and sclerotised.

Dimensions. B 2.7, FW 3.01, HW 2.27, F 0.576, T 1.018, t_1 0.308, t_2 0.118, rt 2.6:1, ct 21.0, f_1 0.442, f_2 0.269.

Description of male. Coloration (after ca 5 years in alcohol). As female. Fore wing pattern (fig. 72) less intense than that of female.

Morphology. IO:D = 0.8. Eyes large, reaching above top of vertex when looking at side of head. General morphology as in female. Epiproct triangular, setose, with median small field of papillae. Paraproct with ovoid field of 29 trichobothria, and dorsal field of papillae. Hypandrium (fig. 73) sclerotised, posterolateral margins with strong setae. Phallosome (fig. 74).

Dimensions. B 2.2, FW 3.30, HW 2.51, F 0.614, T 1.114, t_1 0.355, t_2 0.126, rt 2.8:1, ct 21, 0, f_1 0.553, f_2 0.332.

Remarks. See those under the descriptions of *M. hobartensis* and *M. spiralosus* (above).

Etymology. Named for Gustav Weindorfer, a conservationist and pioneer of the Cradle Mountain region.

Coryphacini Mockford

Key to Tasmanian genera of Coryphacini

1. Eyes horizontally ovoid, vertex flattened and elongated
..... *Graminacaecilius* gen. nov.
- Eyes and vertex round 2
2. Lacinial tip rounded *Valenzuela* Navas
- Lacinial tip bidentate *Stenocaecilius* Mockford

Graminacaecilius gen. nov.

Diagnosis. With the characters of the tribe Coryphacini (Mockford, 2000) plus the following: anterior labral sensilla distinct; clypeal shelf intermediate in development; eyes horizontally ovoid; labral stylets rudimentary; lacinia narrow, apex rounded; vertex flattened, elongated; subgenital plate with two large preapical setae; hypandrium with two large preapical setae.

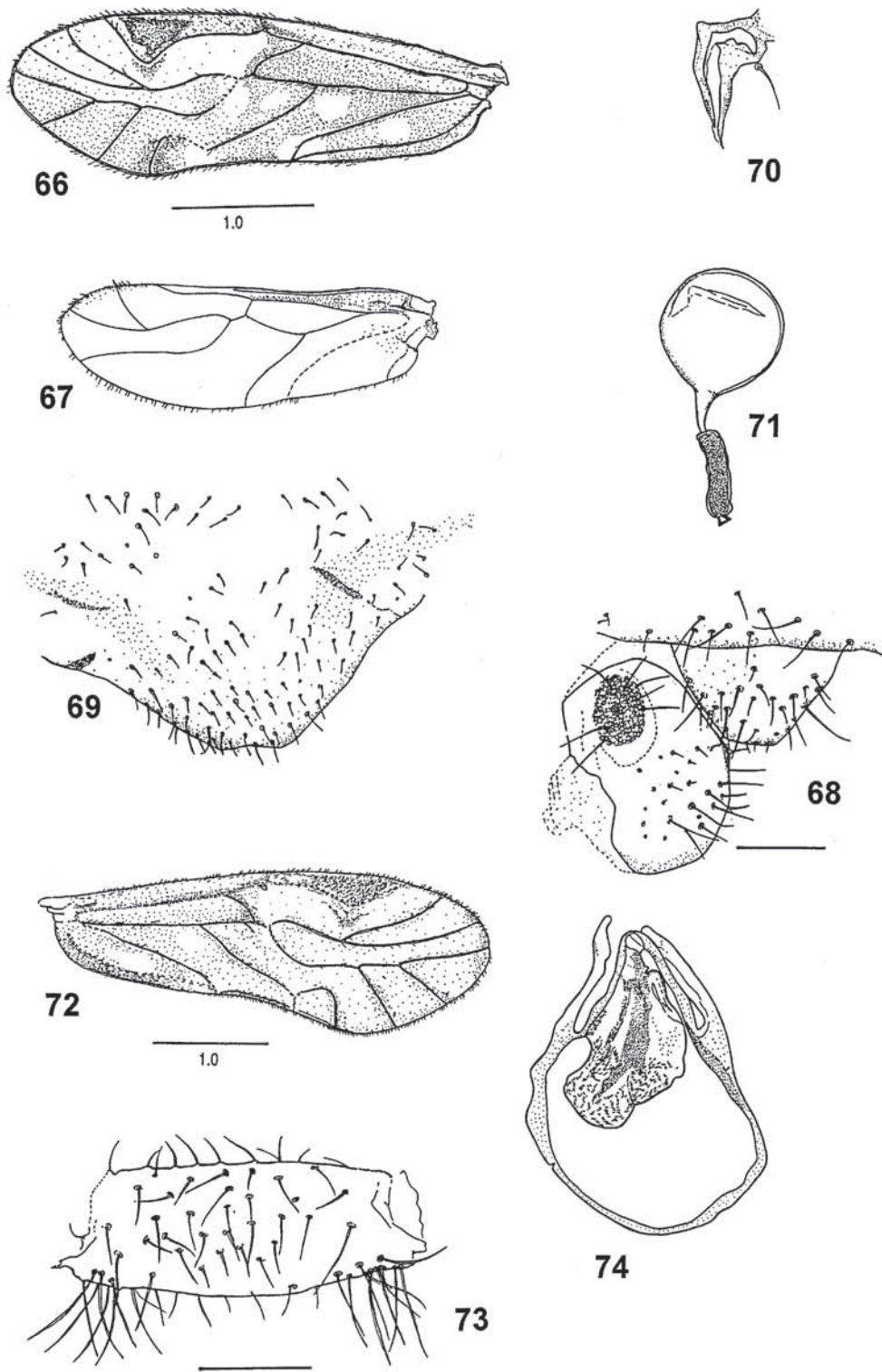
Type species: *Graminacaecilius micropterus* sp. nov.

Remarks. This genus is unusual in the family Caeciliusidae by possessing a distinct row of four large sensilla on the anterior margin of the outer surface of the labrum. This and the combination of other characters listed above are not found in other genera of the subfamily Caeciliusinae. This genus has been included in the Coryphacini even though it possesses an intermediate clypeal shelf.

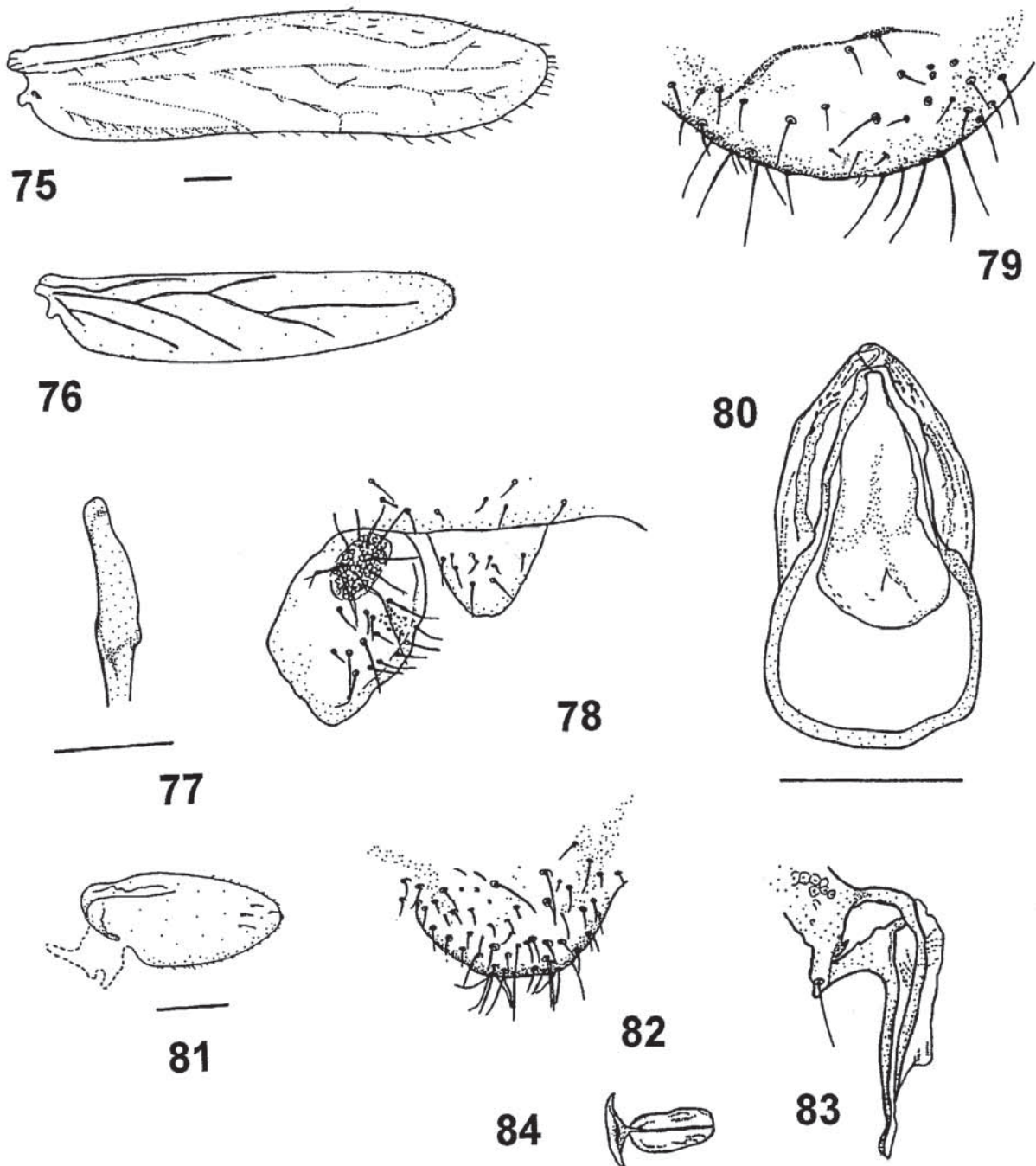
Etymology. The generic name is a combination of the Latin *gramineus*, grass-like, and *Caecilius*, a genus of Caeciliusidae. It refers to the low vegetation habitat of members of this genus.

Key to Tasmanian species of Graminacaecilius

1. Frons without broad brown band *micropterus* sp. nov.
- Frons with broad brown band *frontalis* sp. nov.



Figures 66-74. *Maoripsocus weindorferi*. Female: 66, fore wing; 67, hind wing; 68, epiproct and paraproct; 69, subgenital plate; 70, gonapophyses; 71, spermathecal sac. Figures 66, 67 and 68-71 to common scales. Male: 72, fore wing; 73, hypandrium; 74, phallosome. Figures 73 and 74 to common scale.



Figures 75-84. *Graminacaecilius micropterus*. Male: 75, fore wing; 76, hind wing; 77, lacinia; 78, epiproct and paraproct; 79, hypandrium; 80, phallosome. Female: 81, fore wing; 82, subgenital plate; 83, gonapophyses; 84, spermathecal duct. Figures 75, 76; 77-79; 80, 83, 84 and 81 and 82 to common scales.

Graminacaecilius micropterus sp. nov.

Figures 75–84

Material examined. Holotype ♂: Tasmania, Jackeys Marsh (east), *Carex appressa*, 12 Nov 1986. Eleven nymphs, 20♀ and 22♂ paratypes: same data as holotype.

Description of male. Coloration (after ca six years in alcohol). Head testaceous except the following: brown ocellar tubercle; f_1 testaceous basally merging light brown apically, f_2 light brown basally merging dark brown apically, remaining segments dark brown; eyes black. Fore wing (fig. 75) and hind wing (fig. 76) hyaline. Thorax and legs testaceous. Abdomen creamy white.

Morphology. IO:D = 1.8. Eyes ovoid. Ocelli on raised tubercle. Antenna very long, basal segment slightly bent. Head and thorax glossy. Vertex flattened, elongate. Epicranial suture not distinct. Labrum: stylets as rudimentary spiculate bumps; internal sclerotisation present; distal sensilla 5 in total, row of 4 distinct sensilla on anterior margin of outer surface. Lacinia (fig. 77) apically narrow, rounded, preapically broader. Wings brachypterous. Fore wing (fig. 75): venation as in macropterous *Caecilius*, except apices of radial, medial and cubital veins not distinct; setae short, slanting distally, on veins and margin in a single rank; vein cu_2 glabrous. Hind wing (fig. 76) venation as in macropterous wing, except apices of radial veins not distinct; anal vein absent. Microtrichia obvious on the membranes of wings, particularly at apices. Meso- and meta-thorax not strongly developed. Epiproct (fig. 78). Paraproct (fig. 78) with ovoid field of about 11 trichobothria and small field of papillae. Hypandrium (fig. 79): simply rounded, each posterolateral margin with few strong setae; pair of large median preapical setae. Phallosome (fig. 80) relatively elongated and narrow.

Dimensions. B 1.9, FW 1.10, HW 0.85, F 0.59, T 0.86, t_1 0.245, t_2 0.118, rt 2.1:1, ct 0,0, f_1 0.608, f_2 0.458.

Description of female. Coloration (after ca 6 years in alcohol). As male, except brown ocellar tubercle absent, antenna slightly paler than male.

Morphology. IO:D = 2.0. Median epicranial suture distinct. Ocelli present. Labrum and lacinia as male. Abdomen elongated and slender. Fore wing (fig. 81) reduced to small rudiment, with few setae and covered by microtrichia. Hind wing reduced to small bud. Epiproct semicircular, setose. Paraproct with round field of 8 trichobothria. Subgenital plate (fig. 82): apical median area covered by long setae; anteriorly diverging pigment bands faint and short; body of plate with two large preapical setae. Gonapophyses (fig. 83) with external valve remnant bearing a single seta. Spermatheca (fig. 84) with short glandular area (sac not present).

Dimensions. B 2.3, FW 0.25, F 0.50, T 0.77, t_1 0.182, t_2 0.118, rt 1.5:1, ct 0,0, f_1 0.434, f_2 0.332.

Etymology. Refers to the micropterous nature of known specimens.

Graminacaecilius frontalis sp. nov.

Figures 85–90

Material examined. Holotype ♂: Tasmania, Queens Domain, Hobart, tussock grasses, 8 July 1986. One nymph and 2♀ paratypes: same data

as holotype. Additional records: site 42A, 1♀, 12 June 86; 1♀, 18 July 86; 3♀, 1♂, 4 nymphs, 2 Oct 86; site 42B, 1♀, 1♂, 18 July 86; site 73, 2 ♀, 1♂, 25 Apr 87; site 158, 1♂, 12 Oct 86; 1♀, 25 July 87.

Description of male. Coloration (after ca 6 years in alcohol). Body creamy white, with the following exceptions: anterior margin of frons with broad brown band; centripetal margins of ocelli dark brown; f_1 light brown, f_2 light brown basally merging to dark brown apically, remaining segments dark brown; eyes black; prothorax with brown pleural stripe.

Morphology. IO:D = 2.2. Eyes ovoid. Median epicranial suture distinct. Ocelli present. Fore wing reduced to a small rudiment, hind wing a small bud. Basal flagellar segment bent. Vertex flattened, elongated. Labrum and lacinia as *G. micropterus*. Epiproct (fig. 85). Paraproct (fig. 85) with small field of papillae and ovoid dome of 10 trichobothria, one seta not in rosette. Hypandrium (fig. 86) median region lacking setae, membranous; posterolateral margins with few strong setae; pair of strong median preapical setae. Phallosome (fig. 87) relatively narrow.

Dimensions. B 2.0, F 0.434, T 0.679, t_1 0.174, t_2 0.111, rt 1.6:1, ct 0,0, f_1 0.395, f_2 0.316.

Description of female. Coloration (after ca 6 years in alcohol). As male.

Morphology. IO:D = 3.0. Median epicranial suture distinct. Apterous. Epiproct strongly setose. Paraproct with large macroseta on posterior margin and small round field of 4 trichobothria. Subgenital plate (fig. 88): apical median area membranous, setae absent; pigmentation barely visible; body of plate setose, pair of preapical setae not as distinct as in *G. micropterus*. Gonapophyses (fig. 89) with external valve remnant bearing a single seta. Spermatheca (fig. 90) with short glandular area.

Dimensions. B 2.5, F 0.427, T 0.671, t_1 0.158, t_2 0.111, rt 1.4:1, ct 0,0, f_1 0.328, f_2 0.217.

Remarks. This species has been found by ERS on the Mornington Peninsula, Victoria.

Etymology. Referring to the strongly marked frons of this species.

Stenocaecilius Mockford

Stenocaecilius Mockford, 2000: 356. Type species: *Stenocaecilius casarum* Badonnel.

Key to Tasmanian species of *Stenocaecilius*

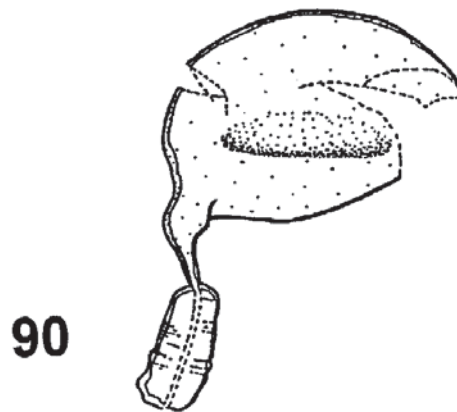
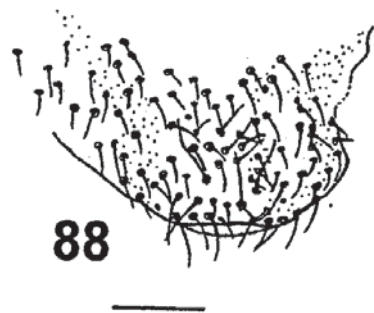
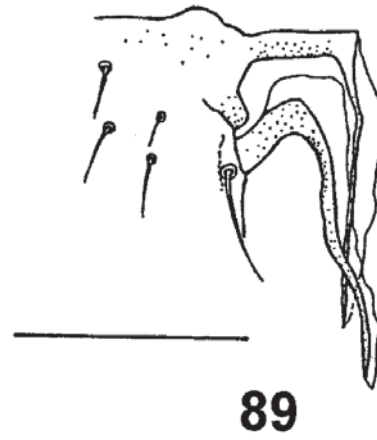
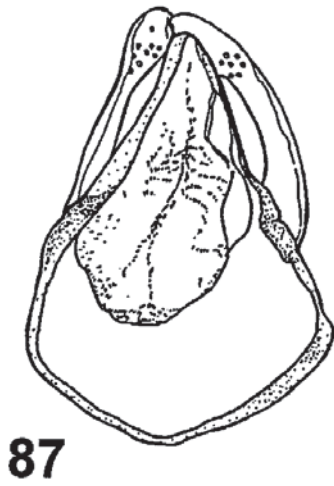
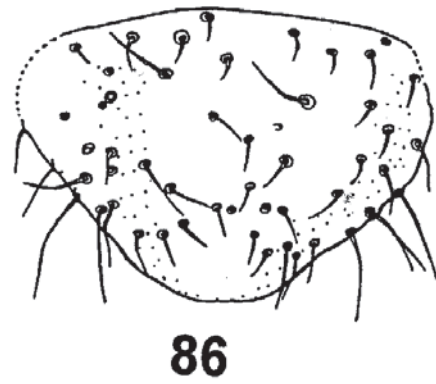
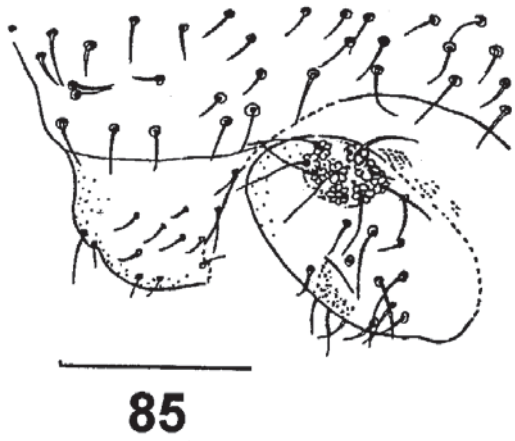
1. Brown mark behind antenna base *quercus* (Edwards)
- No brown mark behind antenna base *lineatus* (Smithers)

Stenocaecilius lineatus (Smithers)

Caecilius lineatus Smithers, 1977: 256.

Stenocaecilius lineatus. --- Mockford, 2000: 357.

Material examined. Site 131E, 3♀, 2 nymphs, 24 Feb 88; site 137A, 2 ♀, 3♂, 11 July 86; 1♂, 9 Aug 86; 2 nymphs, 8 Nov 86; 1♀, 23 Mar 87; 3 ♂, 14 June 87; 1♀, 1♂, 25 July 87; 1♀, 5♂, 3 nymphs, 24 Feb 88.



Figures 85-90. *Graminacaecilius frontalis*. Male: 85, epiproct and paraproct; 86, hypandrium; 87, phallosome. Female: 88, subgenital plate; 89, gonapophyses; 90, spermathecal sac. Figures 85-87 and 89 and 90 to common scales.

Distribution. Tasmania and New South Wales.

Remarks. This species was taken only from *Casuarina littoralis* at two localities.

Stenocaecilius quercus (Edwards)

Caecilius quercus Edwards, 1950: 131.

Stenocaecilius quercus. --- Mockford, 2000: 357.

Material examined. Many individuals collected throughout the year.

Distribution. Tasmania, Bass Strait Is, Victoria, New South Wales and Lord Howe I.

Remarks. *S. quercus* was found on a limited number of occasions at many sites. The great majority of individuals were taken from *Myoporum insulare* and *Acacia melanoxylon*. The latter plant species is found in climatic zones ranging from dry forest to rainforest, and on this species *S. quercus* was abundant in dry, swamp and some limited wet forest sites, but was usually absent in wetter mixed forest and rainforest sites.

Valenzuela Navas

Valenzuela Navas, 1924: 20. Type species: *Valenzuela marianus* Navas.

Valenzuela pteridii (Smithers)

Caecilius pteridii Smithers, 1977: 257.

Valenzuela pteridii. --- Mockford, 2000: 353.

Material examined. Many individuals collected throughout the year.

Distribution. Tasmania, Bass Strait Is, Victoria, New South Wales and Lord Howe I.

Remarks. This locally widespread species was found on a limited number of occasions on many plant species, particularly those of dry coastal scrub and dry forest, and wet scrub. It was most numerous and taken throughout the year on bracken.

Epicaeciliini Mockford

Key to Tasmanian genera of Epicaeciliini

1. Brachypterous, fore wing basal veins with two ranks of setae, vein cu_2 strongly setose *Nothocaecilius* gen. nov.
- Macropterous, fore wing basal veins with one rank of setae, vein cu_2 glabrous *Tasmanocaecilius* gen. nov.

Nothocaecilius gen. nov.

Diagnosis. With the characters of the tribe Epicaeciliini (Mockford, 2000) plus the following: clypeal shelf narrow; labral stylets present; abdominal adhesive vesicles absent; brachypterous; setae of fore wing long, standing relatively upright, in at least two ranks on veins in basal half of wing; external valve represented by two or three setae; anterior margin of phallosome transverse; male epiproct with a small papillar field.

Type species: *Nothocaecilius thomasi* sp. nov.

Remarks. The combination of the above characters, particularly those associated with the brachypterous wings, are unique.

Etymology. The generic name is a combination of the Greek *nothos*, spurious, and *Caecilius*, a genus of Caeciliusidae. It alludes to the *Nothofagus* rainforest habitat of the type species.

Nothocaecilius thomasi sp. nov.

Figures 91–101

Caecilius sp. C. Coy et al., 1993: 77.

Material examined. Holotype ♀: Mt Michael, 740 m, 41°10.9'S 148°00.4'E, PKD, tree #2, 26 Nov 1989 (H. Mitchell). Paratype ♂: Frodshams Pass, Scotts Peak Road, 1.5 km west Gordon River Road, 42°49'S 146°23'E, fogging *Nothofagus cunninghamii* Sample B, 15 Feb 1990 (R. Coy, P. Lillywhite, A. Yen) (MV). Additional records: 3 ♀, 1 ♂, under stones, Ferntree, 28 May 1957 (V. V. Hickman).

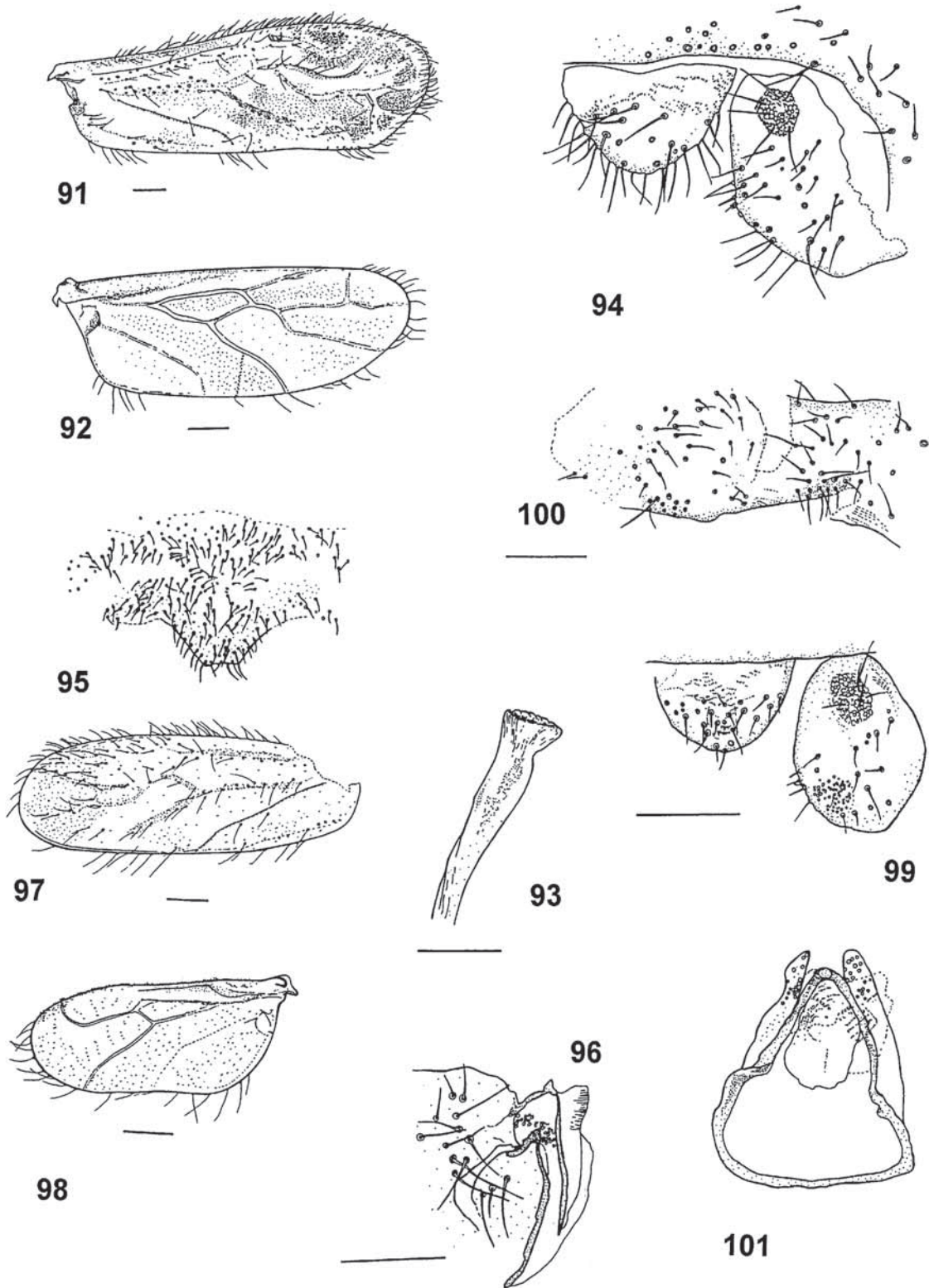
Description of female. Coloration (after ca 2 years in alcohol). Head very dark brown except for buff vertex. Scape, pedicel, f_1 and f_2 dark brown, f_3 - f_{11} slightly paler (from Hickman specimen). Maxillary palps brown, apical segment dark brown. Eyes black. Fore wing (fig. 91) and hind wing (fig. 92) with shades of brown. Thorax and legs dark brown, trochanter pale brown, tibiae merging brown apically. Abdomen pale mauve with darker annulations, terminal segments dark brown.

Morphology. IO:D = 3.4. Head and thorax glossy. Median epicranial suture distinct. Vertex rounded. Labrum: stylets large, spiculate; internal sclerotisation present; sensilla 5 in total. Lacinia (fig. 93, Hickman specimen) apically very broad, preapically expanded on one side, apical margin with broad denticles. Flagellar segments bearing long thick setae, f_1 slightly bent. Brachypterous. Fore wing (fig. 91) apical venation variable; setae on basal veins in at least 2 ranks; vein cu_2 strongly setose; setae long and standing relatively upright; veins rs and m fused for a short length. In hind wing (fig. 92) vein r sometimes simple. Microtrichia obvious in both wings. Mesothoracic precoxal suture absent. Abdominal adhesive vesicles absent. Epiproct (fig. 94). Paraproct (fig. 94) with round field of 10 trichobothria; small bifid projection and associated seta between one short and one long macroseta on posterior margin. Subgenital plate (fig. 95) with transverse apical margin, pigment band extending into two broad arms diverging anteriorly. Ventral valve of gonapophyses (fig. 96, Hickman specimen) considerably shorter than broad dorsal valve, external valve remnant bearing 2-3 setae. Spermatheca with long glandular area (sac not present).

Dimensions. B 2.3, FW 1.07, HW 0.81, F 0.66, T 0.98, t_1 0.355, t_2 0.126, rt 2.8:1, ct 0.0, f_1 0.419, f_2 0.284.

Description of male. Coloration (after ca 2 years in alcohol). As female, except vertex with dark brown pigment each side of median epicranial suture separating both pale regions laterally on vertex. Fore wing (fig. 97) and hind wing (fig. 98) generally as female.

Morphology. IO:D = 3.2. Head glossy, vertex rounded. Labrum and lacinia as female. Brachypterous. Venation of fore wing (fig. 97) reduced. Epiproct (fig. 99) with longitudinal raised area bearing a few papillae. Paraproct (fig. 99) with



Figures 91-101. *Nothocaecilius thomasi*. Female: 91, fore wing; 92, hind wing; 93, lacinia; 94, epiproct and paraproct; 95, subgenital plate; 96, gonapophyses. Figures 91, 95 and 93 and 94 to common scales. Male: 97, fore wing; 98, hind wing; 99, epiproct and paraproct; 100, hypandrium; 101, phallosome. Figures 99 and 101 to common scale.

round field of about 10 trichobothria; posterior margin with small bifid projection (side on for paraproct shown, appearing as a single cone) and associated seta between 2 small setae, an adjacent region of papillae. Hypandrium (fig. 100) with field of posterolateral setae on each side, median margin lacking setae. Phallosome (fig. 101) with transverse anterior margin.

Dimensions. B 2.0, FW 0.81, HW 0.46, F 0.56, T 0.84, t_1 0.308, t_2 0.111, rt 2.8:1, ct 0.0, f_1 0.466, f_2 0.308.

Remarks. This rare species, restricted to cool-temperate closed forest, was not collected during this study. It has also been found on *Nothofagus* by S. Thomas in Cape Otway National Park, Victoria. Males with micropterous wings have been collected.

Etymology. Named for Simon R. Thomas, in recognition of his contribution to the knowledge of Bass Strait Psocoptera.

Tasmanocaecilius gen. nov.

Diagnosis. With the characters of the tribe Epicaeciliini (Mockford, 2000) plus the following: clypeal shelf narrow; labral stylets present; abdominal adhesive vesicles absent; radial and medial veins in fore wing simple; radial vein in hind wing simple; stigmasac in fore wing absent; anterior margin of phallosome straight, transverse.

Type species: *Tasmanocaecilius truchanasi* sp. nov.

Remarks. This genus differs from other genera within the tribe by the venation and ciliation of the wings. The fore wing venation is only approached by *Ypsiloneura* Pearman, but differs from that genus in possessing a simple medial vein, and lacking both a stigmasac and a spur-vein from the pterostigma.

Etymology. The generic name is a combination of the name Tasmania, the state, and *Caecilius*, a genus of Caeciliusidae.

Tasmanocaecilius truchanasi sp. nov.

Figures 102–07

Material examined. Holotype ♂: Tasmania, Cradle Mtn, Cradle Valley above Weindorfers grave, 41°38'S 145°57'E, fogging *Nothofagus cunninghamii*, 25 Feb 1990 (R. Coy, P. Lillywhite, A. Yen). Additional record (1♂, badly damaged): same data as holotype (MV).

Description of male. *Coloration* (after ca 2.5 years in alcohol). Body very dark brown. Eyes and median epistomal suture black. Fore wing (fig. 102) hyaline with brown markings. Hind wing (fig. 103) brown. Abdomen greyish-brown, terminal segments brown. Legs: coxae, femora and claws dark brown, trochanter pale, tibiae and tarsi brown.

Morphology. IO:D = 3.0. Head and thorax very glossy. Vertex rounded. Basal flagellar segment not enlarged, bent. Labrum: stylets small, spiculate; sensilla 5 in total; internal sclerotisation present. Lacinia (fig. 104) broad, expanded preapically on one side, apical margin denticulate; projection on median apical margin; bent midway. Maxillary palps and antennal flagellar segments beyond f_1 missing. Mesothoracic precoxal suture absent. Fore wing (fig. 102); radial and medial

veins simple; setae in a single rank; vein cu_2 glabrous; stigmasac absent. Hind wing (fig. 103) with radial vein simple. Microtrichia obvious on the membrane of both wings. Abdominal adhesive vesicles apparently absent. Epiproct (fig. 105). Paraproct (fig. 105) with small field of papillae and oval field of 15 trichobothria. Hypandrium (fig. 106) well sclerotised, posterolateral margins setose. Phallosome (fig. 107) aedeagus blunt tipped, anterior margin transverse and endophallus basally spiculate.

Dimensions. B 1.9, FW 2.30, HW 1.77, F 0.62, T 0.94, t_1 0.316, t_2 0.126, rt 2.5:1, ct 0.0, f_1 0.553.

Female. Unknown.

Remarks. The general area where this unusual species was found was well sampled. However, it was not collected in this study.

Etymology. Named for the late Olegas Truchanas, conservationist and nature photographer.

Lachesillidae

Lachesilla Westwood

Lachesilla Westwood, 1840: 47. Type species: *Hemerobius pedicularius* Linnaeus.

Lachesilla pedicularia (Linnaeus)

Hemerobius pedicularius Linnaeus, 1758: 551.

Lachesilla pedicularia. --- Enderlein, 1919: 16.

For complete synonymy see Lienhard and Smithers (2002).

Material examined. Risdon, 2♀, 1♂, 27 Apr 1938 (V. V. Hickman).

Distribution. Cosmopolitan.

Remarks. Previously recorded in Australia from Victoria and South Australia, this species was not collected during this survey.

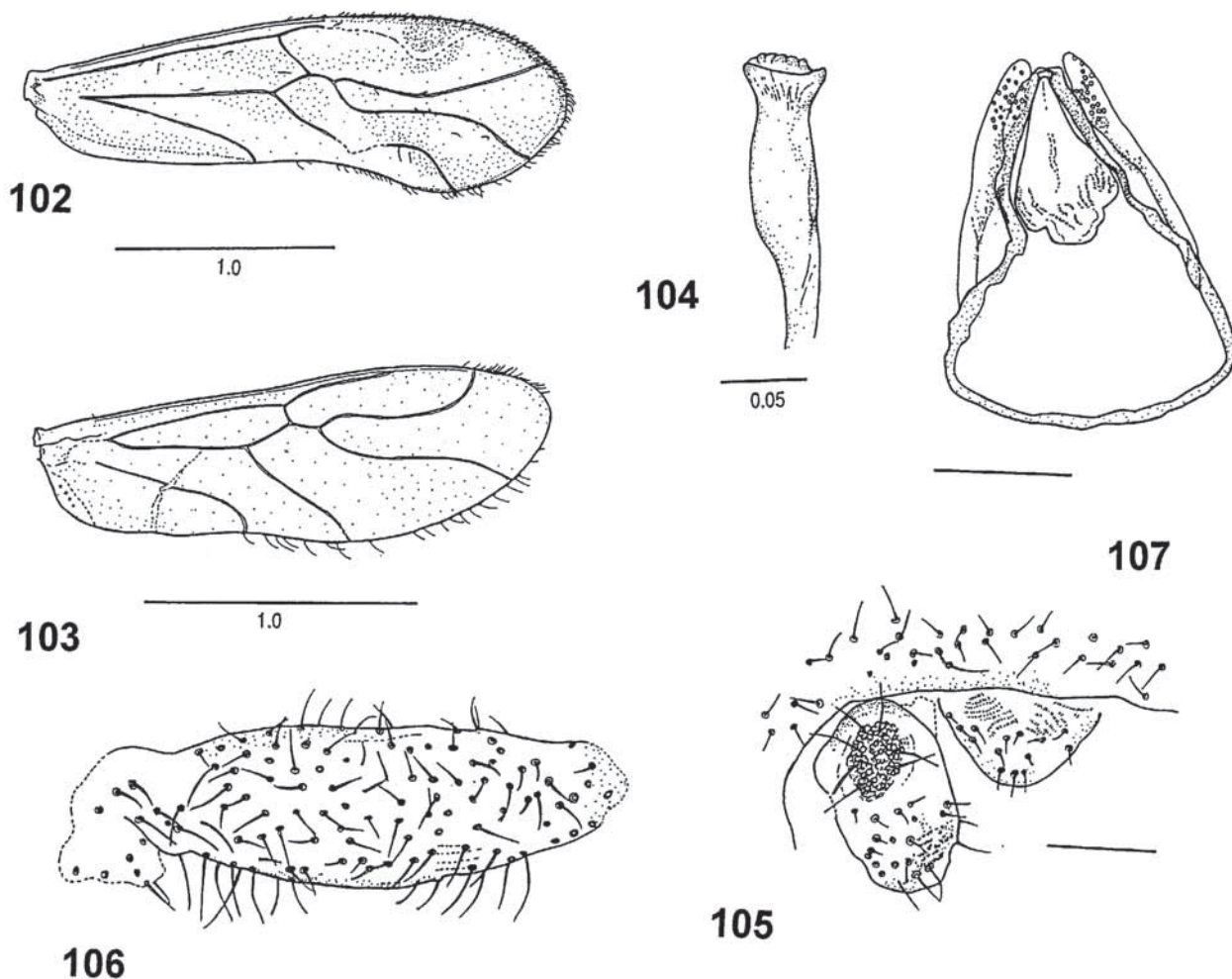
Ectopsocidae

Ectopsocus McLachlan

Ectopsocus McLachlan, 1899: 277. Type species: *Ectopsocus briggsi* McLachlan.

Key to Tasmanian species of *Ectopsocus**

1. Ground colour of head pale with obvious brown markings, fore wing with spots at end of veins 2
 - Colour of head brown, fore wing lacking spots at end of veins 7
2. Posterior margin of paraproct with single spine
 - *californicus* (Banks)
 - Posterior margin of paraproct with pair of spines 3
3. Paraproct spines equal in size 4
 - Paraproct spines not equal in size 5



Figures 102-107. *Tasmanocaecilius truchanasi*. Male: 102, fore wing; 103, hind wing; 104, lacinia; 105, epiproct and paraproct; 106, hypandrium; 107, phallosome. Figures 105 and 106 to common scale.

- | | |
|--|---|
| <p>4. Single comb on ninth tergite of male, lobes of female subgenital plate long and slender <i>briggsi</i> McLachlan</p> <p>– Pair of combs on ninth tergite of male, lobes of female subgenital plate short and wide <i>risdonensis</i> sp. nov.</p> <p>5. Ninth sternite of male lacking field of ornamentation, gonapophyses lacking spermathecal sac <i>rileyae</i> Schmidt and Thornton</p> <p>– Ninth sternite of male with field of ornamentation, gonapophyses with spermathecal sac 6</p> <p>6. Endophallus with series of long spines, ventral valve of gonapophyses short and broad <i>hickmani</i> sp. nov.</p> <p>– Endophallus lacking spines, ventral valve of gonapophyses long and slender <i>petersi</i> Smithers</p> <p>7. Rudimentary fore wing with convex dome in apical half ..</p> | <p>..... <i>coyae</i> sp. nov.</p> <p>– Rudimentary fore wing lacking convex dome in apical half 8</p> <p>8. Phallosome with complex of asymmetrical sclerites, gonapophyses lacking ventral valve <i>vachoni</i> Badonnel</p> <p>– Phallosome without complex of asymmetrical sclerites, gonapophyses complete 9</p> <p>9. Male antenna with spines on two basal flagellar segments, endophallus with long sinuous sclerite, subgenital plate strongly spiculate between apical lobes <i>graminus</i> sp. nov.</p> <p>– Male antenna lacking spines on basal flagellar segments, endophallus lacking long sinuous sclerite, subgenital plate not spiculate between apical lobes 10</p> |
|--|---|

10. Posterior margin of paraproct with single spine, macropterous forms with hind wing veins *r* and *m* joined by cross-vein *edwardsi* New
- Posterior margin of paraproct with pair of spines, macropterous forms with hind wing veins *r* and *m* fused ..
..... 11
11. Paraproct spines equal in size, tubercles present on male eighth tergite, inner parameres of phallosome fused apically, external valve of gonapophyses strongly spiculate, posterior margin of median area between apical lobes of subgenital plate adjacent to row of preapical setae
..... *axillaris* (Smithers)
- Paraproct spines unequal in size, tubercles absent on male eighth tergite, inner parameres of phallosome not fused apically, external valve of gonapophyses not spiculate, posterior margin of median area between apical lobes of subgenital plate and row of preapical setae separate 12
12. Endophallus lacking median sclerite, subgenital plate lobes angular with seven apical setae, lateral margins strongly sclerotised *brunneus* (Edwards)
- Endophallus with median sclerite, subgenital plate lobes rounded and shallow with four apical setae, lateral margins not sclerotised *sprenti* sp. nov.

* *Ectopsocus nerens* (Hickman) is not included in this key as genitalic information is not available.

***Ectopsocus axillaris* (Smithers)**

Interpsocus axillaris Smithers, 1969: 293.

Ectopsocus axillaris. --- Thornton and Wong, 1968: 3.

Ectopsocus brunneus (Edwards). Cole et al., 1989: 33 (in part).

Material examined. **Site** 66, 6♀, 3♂, 4 Sep 86; 38♀, 4♂, 2 nymphs, 30 Oct 86; **site** 67B, 1♀, 19 Feb 88; **site** 85, 4♀, 11 Sep 86; 1♀, 10 Oct 86; **site** 92, 2♀, 11 Sep 86; **site** 94, 1♀, 6 Nov 86; **site** 142C, 12♀, 2♂, 24 Feb 88; **site** 181, 1, 13 Nov 86; **site** 269, 6♀, 3♂, 1 Mar 88; **site** 278A, 7♀, 25 Mar 87; **site** 352, 3♀, 21 Mar 88; **site** 357, 1♀, 7♂, 18 Mar 88; **site** 361, 5♀, 3♂, 25 Mar 88; **site** 363, 1♀, 27 Mar 88; **site** 366E, 4♀, 2♂, 16 Feb 88; **site** 366F, 3♀, 4♂, 16 Feb 88.

Distribution. Tasmania, King I (Bass Strait), Victoria, New Zealand, Ireland and Britain.

Remarks. *E. axillaris* appears to have little habitat specificity, being found on dead foliage from rainforest, mixed forest, dry and wet forests. Smithers and O'Connor (1991) have noted the unusual distribution of this species with its discovery in Ireland. The records of Cole et al. (1989) of *Ectopsocus brunneus* (Edwards) from King I are incorrect. Subsequent examination of these specimens indicates that they are conspecific with Victorian and Tasmanian material of this species.

The incidence of *E. axillaris* (and the closely related *E. brunneus*) suggests that they are spring and autumn species with summer and winter breaks. Few individuals were found, and the suggested phenology would need to be substantiated with additional sampling.

***Ectopsocus briggsi* McLachlan**

Ectopsocus briggsi McLachlan, 1899: 277

Material examined. Many individuals collected throughout the year.

Distribution. Cosmopolitan.

Remarks. *E. briggsi* and *E. californicus* were taken at many sites. In dry vegetation they were common on broad-leaved foliage (e.g. *Acacia melanoxylon* and *Myoporum insulare*), and were numerous on dead *Eucalyptus* foliage from both dry and wet forests.

***Ectopsocus brunneus* (Edwards)**

Interpsocus brunneus Edwards, 1950: 126

Ectopsocus brunneus. --- Thornton and Wong, 1968: 3.

Ectopsocus brunneus. --- Cole et al., 1989: 33 (in part).

Material examined. **Site** 2, 1♀, 29 Mar 88; **site** 168, 1♀, 25 Apr 87; **site** 181, 1♂, 14 Oct 86; 1♀, 26 Apr 87; **site** 200C, 1♂, 18 Apr 87; **site** 231, 1♀, 16 Nov 86.

Distribution. Tasmania, Flinders I (Bass Strait) and New South Wales.

Remarks. See those for *E. axillaris*. Few individuals were found, but the wide range of vegetation from which they were taken indicates little habitat specificity.

***Ectopsocus californicus* (Banks)**

Peripsocus californicus Banks, 1903: 237.

Ectopsocus californicus. --- Peck, 1951: 413.

Ectopsocus froggatti Enderlein, 1906: 407.

Ectopsocus sp. H. Cole et al., 1989: 33.

Ectopsocus sp. M. Cole et al., 1989: 33.

Material examined. Many individuals collected throughout the year.

Distribution. Cosmopolitan.

Remarks. See those for *E. briggsi*.

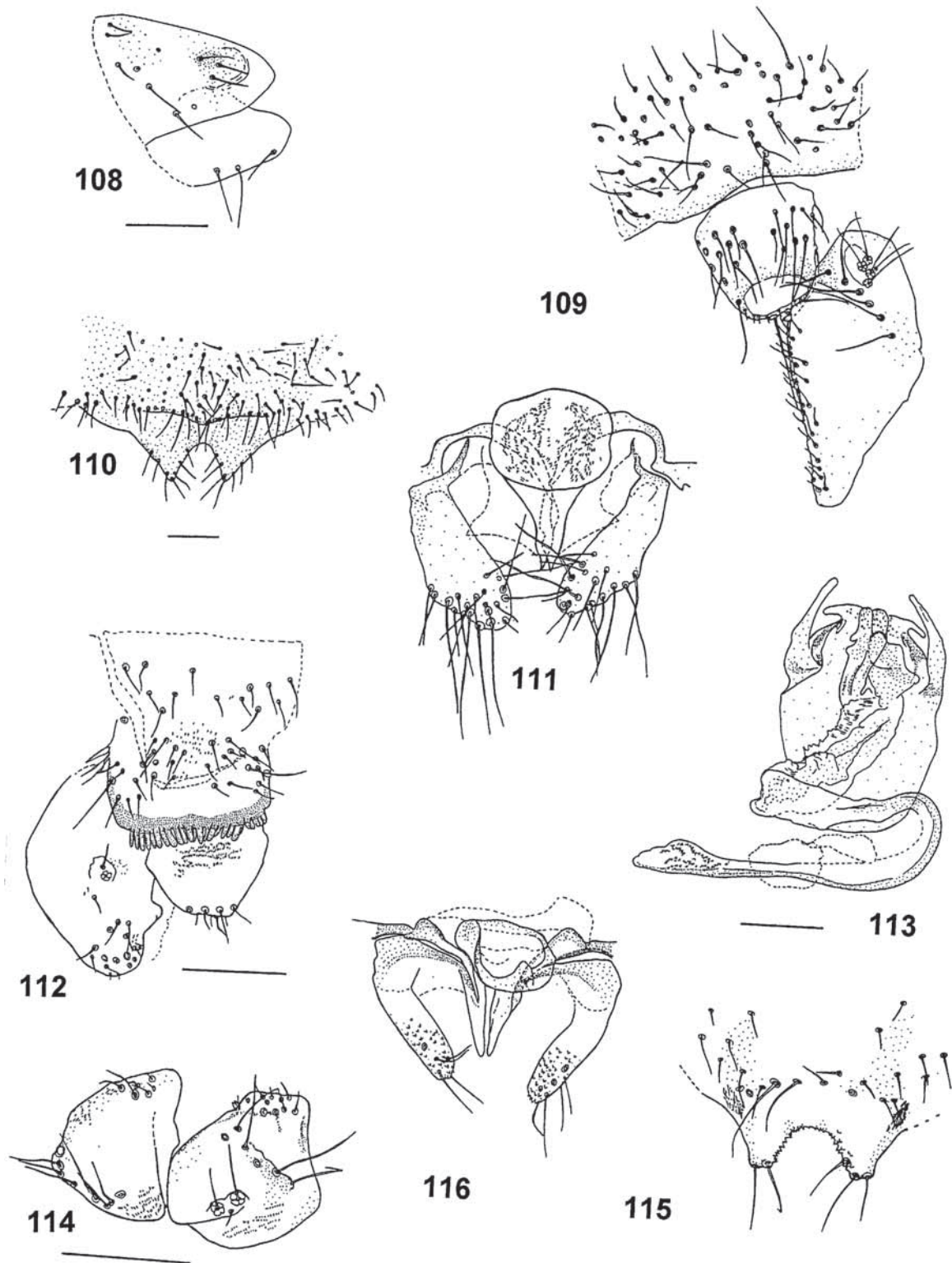
***Ectopsocus coyae* sp. nov.**

Figures 108–11

Material examined. Holotype ♀: Tasmania, Rocky Cape National Park, Sisters Beach Road, wet scrub, 25 Oct 1986.

Description of female. *Coloration* (after ca 7 years in alcohol). Head brown with the following dark brown: markings dorsal to eyes, along back of vertex and on each side of black median epicranial suture; broad patch on frons, between ocelli and dark epistomal suture; postclypeal striae and labrum. Eyes black. Anteclypeus colourless. Fore wing (fig. 108), hind wing (fig. 108), thorax and legs brown, thoracic sutures dark brown. Abdomen buff, terminal segments brown.

Morphology. IO:D = 3.5. Median epicranial suture not distinct on anterior half of vertex. Ocelli absent. Distal margin of labrum with 5 sensilla. Distinct row of 6 trichoid sensilla on anterior margin of outer surface of labrum, each lateral sensillum much smaller than the four median sensilla. Epistomal suture present, clypeal shelf absent. Lacinia apically bifid, apex of outer projection bidentate. Vertex with vague suggestion of being



Figures 108-116. (108-111) *Ectopsocus coyae*. Female: 108, fore wing and hind wing; 109, epiproct and paraproct; 110, subgenital plate; 111, gonapophyses. Figures 108, 109 and 111 to common scale. (112-116) *Ectopsocus graminus*. Male: 112, epiproct, paraproct and ninth tergite; 113, phallosome. Female: 114, epiproct and paraproct; 115, subgenital plate; 116, gonapophyses. Figures 112, 115 and 116 to common scale.

sculptured with large polygonal-shaped cells. Flagellar segments with two placoids near base of f_1 , one at apices of f_4 , f_6 and f_{10} ; placoids of f_6 and f_{10} with a long slender filament. Fore wing and hind wing (fig. 108) as small setose rudimentary flaps, a small spiculate dome located on apical half of fore wing and a few setae on posterior margin of hind wing. Epiproct (fig. 109): basally sclerotised, bearing setae each side of median line; posterior margin bearing 2 large setae (one missing in preparation) and a row of minute setae. Paraproct (fig. 109) with 3–4 trichobothria and 1 seta not in rosette. Posterior margin bearing group of setae and a single spine, median region bearing a row of long setae. Subgenital plate (fig. 110): pair of apical sclerotised lobes, each bearing 7 setae; small median region between lobes not sclerotised; well developed row of preapical setae; pigment band not divided into anteriorly diverging arms. Gonapophyses (fig. 111): external valve well sclerotised, setose over apical third; dorsal valve broad, membranous, with spiculate apex; ventral valve sclerotised, apex spiculate. Spermathecal plate (fig. 111) membranous, rounded, containing numerous granules.

Dimensions. B 1.05, FW 0.20, HW 0.09, F 0.39, T 0.54, t_1 0.134, t_2 0.095, rt 1.4: 1, ct 0.0, f_1 0.150, f_2 0.087.

Male. Unknown.

Remarks. This species is similar to *Ectopsocus edwardsi* (below) in details of coloration and genitalia. The lobes of the subgenital plate are somewhat angular, and the apices bluntly pointed compared to the shallow rounded lobes of *E. edwardsi*. The setae are more numerous on the external valve of the gonapophyses of *E. coyae*. The wings of the two species differ considerably. The small spiculate dome on the fore wing and the setae on the hind wing (fig. 108) are absent in *E. edwardsi*.

Etymology. Named for Dr Robyn Coy, in recognition of her contribution to the knowledge of Tasmanian rainforest invertebrates.

***Ectopsocus edwardsi* New**

Ectopsocus edwardsi New, 1973b: 347.

Material examined. Site 248A, 2♀, 14 June 86; 3♀, 1 nymph, 24 Aug 86; 1♀, 23 Sep 86.

Distribution. Tasmania, Victoria and New South Wales.

Remarks. The few specimens collected during this study were all taken at Sisters Beach from *Banksia serrata*.

***Ectopsocus graminus* sp. nov.**

Figures 112–16

Material examined. Holotype ♂: Tasmania, Jackeys Marsh (east), *Carex appressa*, 12 Nov 1986. Four ♂ and 4♀ paratypes: same data as holotype. Additional record: 1♀, South Arm Recreation Area, tussock grasses, 18 July 1986.

Description of male. *Coloration* (after ca 7 years in alcohol). Buff. Head with vague suggestions of darker markings dorsal to eyes, and on each side of pale median epicranial suture. Eyes black. Thoracic pleura brownish, markings extending from this posteriorly as brown flecks on lateral margins of abdominal terga.

Morphology. IO:D = 4.25. Ocelli absent. Distal margin of labrum with 5 sensilla. Distinct row of 6 trichoid sensilla, 4 median in line and each lateral slightly posteriorly on anterior margin of outer surface of labrum. Epistomal suture present, clypeal shelf absent. Lacinia apically bifid, lateral projection apically bidentate and larger than median projection. Two basal flagellar segments with strong spinous setae on outer margin, 5 on f_1 and 3 on f_2 . Distribution of placoids as follows: 1 third from base on f_1 , 1 at apices of f_1 , f_4 , f_6 and f_{10} ; those on f_6 and f_{10} possessing a long slender hyaline filament. Fore wings as small setose rudimentary flaps. Hind wings absent. Epiproct (fig. 112) bearing 3 small setae and 1 large seta apically, preapically a row of 4 large setae. Paraproct (fig. 112) with 1–2 trichobothria, posterior margin bearing a pair of spines and associated seta. Ninth tergite (fig. 112) with apical comb of long rounded teeth, setose. Apex of eighth tergite and lateral margins of ninth sternite lacking ornamentation. Hypandrium with transverse apical margin, setose. Phallosome (fig. 113) with unusual long sinuous sclerite.

Dimensions. B 1.7, FW 0.16, F 0.403, T 0.521, t_1 0.142, t_2 0.087, rt 1.6:1, ct 0.0, f_1 0.348, f_2 0.190.

Description of female. *Coloration* (after ca 7 years in alcohol). As male.

Morphology. IO:D = 4.0. Two basal flagellar segments with a single long seta at apex. Features of head and wings as male. Epiproct (fig. 114). Paraproct (fig. 114) with 1–2 trichobothria, posterior margin bearing pair of spines and associated seta. Subgenital plate (fig. 115) bearing 2–3 setae on each lobe, apical margin between lobes spiculate, preapical row of setae including a pair of large setae (one absent in preparation). Gonapophyses (fig. 116). Spermathecal plate (fig. 116) with circular sclerotisation.

Dimensions. B 1.8, FW 0.17, F 0.38, T 0.49, t_1 0.118, t_2 0.087, rt 1.4:1, ct 0.0, f_1 0.269, f_2 0.150.

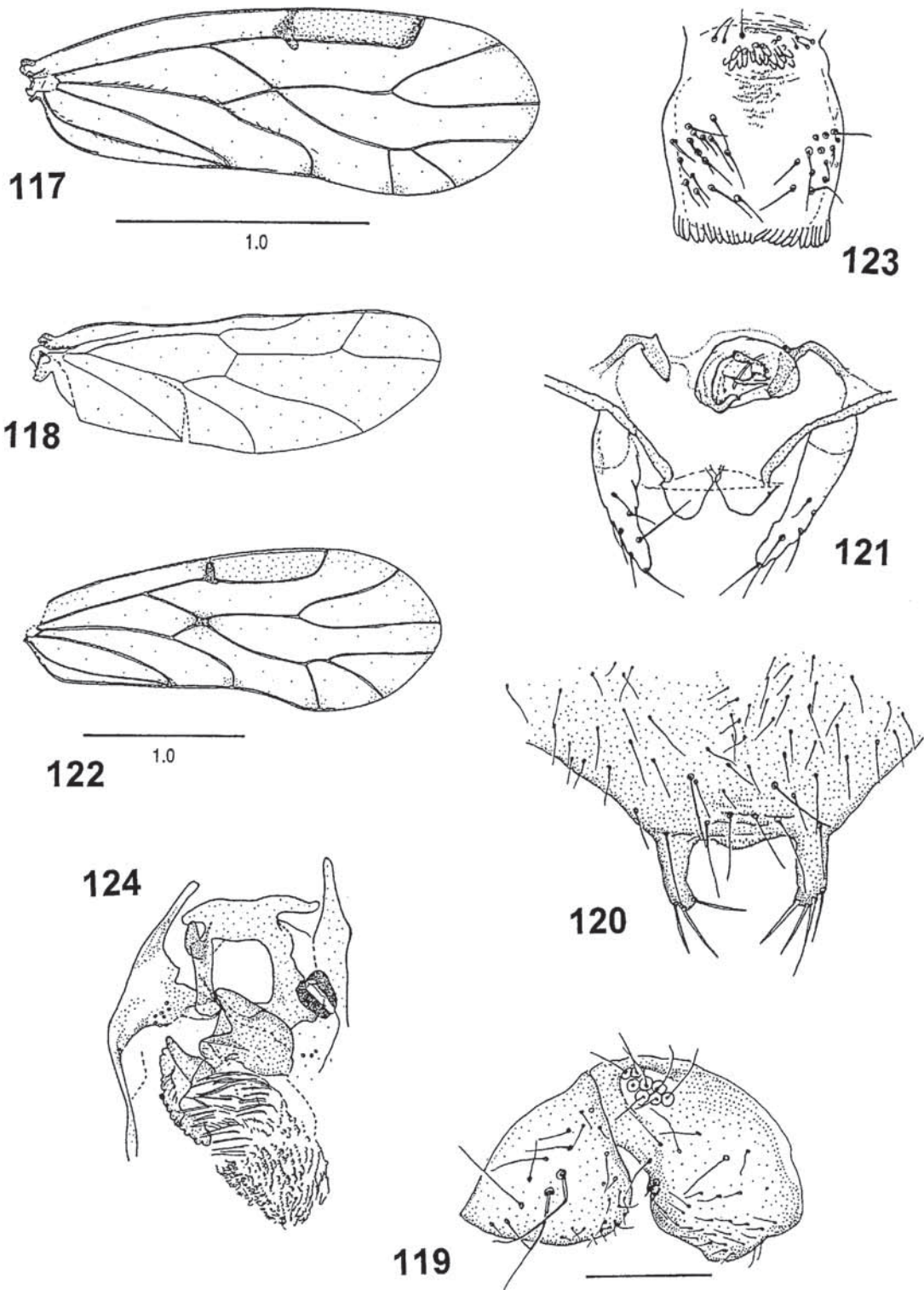
Remarks. By possessing a long sinuous sclerite the phallosome of this species resembles that of *Ectopsocus vilhenai* Badonnel, found in Africa, Madagascar, Central America and Venezuela. *E. vilhenai* differs in the following features from *E. graminus*: an elongated penial frame, the fused inner parameres with two lateral rounded lobes, the eighth tergite with characteristic ornamentation, and macroptery. Females of the two species also differ in details of genitalia, particularly in the shape of the subgenital plate apical lobes and in differences of the valves of the gonapophyses. Males possessing spinous setae on the two basal flagellar segments of the antenna were hitherto only known in *Mascaropsocus spinosus* Badonnel and Pearman (1971: 859, fig. 1), known only from the Mascarene Is.

Etymology. In reference to the low grassy habitat of this species.

***Ectopsocus hickmani* sp. nov.**

Figures 117–24

Material examined. Holotype ♀: Tasmania, the Domain, Hobart, from loose bark on eucalypts, 17–18 Apr 1968. One ♀ and 4♂ paratypes: same data as holotype (V.V. Hickman).



Figures 117-124. *Ectopsocus hickmani*. Female: 117, fore wing; 118, hind wing; 119, epiproct and paraproct; 120, subgenital plate; 121, gonapophyses. Male: 122, fore wing; 123, ninth tergite; 124, phallosome. Figures 117, 118 and 119-121, 123 and 124 to common scales.

Description of female. Coloration (after ca 25 years in alcohol). Head buff with the following brown: confluent markings dorsal to eyes, along back of vertex and each side of median epicranial suture; region between ocelli; broad band on frons adjacent to epistomal suture; postclypeus, except area near each ventrolateral margin; labrum; band between eye and antenna socket; antenna. Eyes black. Fore wing (fig. 117) hyaline, with ten brown clouds: one at apex of each vein at wing margin, one at the apex and base of the pterostigma and one at the *rs* – *m* junction. Hind wing (fig. 118) hyaline. Thorax brown, sutural areas darker. Legs buff. Abdomen buff, lateral margins of terga with incipient annulations, terminal segments pale.

Morphology. IO:D = 4.0. Median epicranial suture not distinct. Distal margin of labrum with 5 sensilla. Distinct row of six trichoid sensilla on anterior margin of outer surface of labrum, four median in a row and each lateral sensillum posteriorly to these. Epistomal suture present, clypeal shelf absent. Lacinia apex not divided, outer margin longer than median. Flagellar segments bearing setae of differing lengths, larger setae on (anterior) outer margin. Placoid sensilla distributed as follows: 2 base f_1 , 1 apices f_4 , f_6 and f_{10} ; sensilla of f_6 and f_{10} possessing a long slender filament. Apex of terminal segment narrowed, bluntly rounded. Fore wing (fig. 117) with veins bearing single row of short, distally slanting setae; vein cu_2 glabrous; stigmasac prominent. Hind wing (fig. 118) with veins *r* and *m+cu* fused for short distance at base of wing; veins *r* and *m* joined by a small cross-vein, about six small setae on margin between radial fork. Epiproct (fig. 119) setose, pair of prominent setae on central unsclerotised region. Paraproct (fig. 119) with round field of 8–9 trichobothria, posterior margin bearing pair of adjacent unequal duplex spines and associated seta. Subgenital plate (fig. 120) prominent apical lobes each bearing 3–4 strong apical setae; preapical row of setae divided into 4 median and 2 lateral, latter setae near the lateral margin of plate; pair of large setae medially on plate; apex of median region between lobes spiculate. Gonapophyses (fig. 121): ventral valve short, sclerotised, with spiculate apex; dorsal valve short, apically broadly rounded, spiculate; apical half of external valve bearing about 6 scattered shorter setae and 1 large seta, apex also spiculate. Spermathecal sac (fig. 121) small, sclerotised.

Dimensions. B 2.0, FW 1.98, HW 1.50, F 0.45, T 0.73, t_1 0.253, t_2 0.095, *rt* 2.7:1, *ct* 14.0, f_1 0.379, f_2 0.213.

Description of male. Coloration (after ca 25 years in alcohol). As female. Fore wing as in fig. 122.

Morphology. IO:D = 3.0. Features of head and wings as female. Epiproct with apical third setose. Paraproct with round field of trichobothria and duplex spines as in female. Ninth tergite (fig. 123, paratype) with apical comb of rounded teeth, shorter over central section. Apex of eighth tergite with semicircular field of blunt spines (fig. 123, paratype). An ill-defined field of short spines on ninth sternite lateral to the field on eighth tergite. Hypandrium apical margin transverse, a pair of long setae on each lateral margin adjacent to a small sclerotised thickening. Phallosome (fig. 124) similar to that of *Ectopsocus petersi*, with a single “thimble” structure near apex of inner fused parameres. Endophallus with well developed spiculate lobe and a series of long spines.

Dimensions. B 2.0, FW 2.45, HW 1.80, F 0.50, T 0.90, t_1 0.276, t_2 0.095, *rt* 2.9:1, *ct* 17.0, f_1 0.498, f_2 0.308.

Remarks. Of the genitalic features listed by Schmidt and Thornton (1993: 165, Table 3) for seven species of *Ectopsocus* this species is most similar to those of *Ectopsocus australis*, now a synonym of *E. petersi* (Smithers, 2003). Both species share the following: straight apical lobes of the subgenital plate, adjacent unequal duplex spines on the posterior margin of the paraproct, the presence of a spermathecal sac, a single “thimble” structure on the phallosome and a field of spines on the apex of the eighth tergite. *Ectopsocus hickmani* differs from *E. petersi* on two features of the subgenital plate: apical lobes are not separated from the disc by a suture, and the projection between the distal setae of the apical lobe is absent. The long spines associated with the endophallus of *E. hickmani* are absent in *E. petersi*.

Etymology. Named for the late Prof. Vernon V. Hickman, who collected the specimens of this species.

Ectopsocus nerens (Hickman)

Microsocus nerens Hickman, 1934: 88.

Ectopsocus nerens. --- Roesler, 1944: 154.

Remarks. No material was collected in this study which could be assigned to this species. Material consists of the holotype (female) only, which has a fore wing 1.16 mm long with incipient spots at the ends of the veins. Unusually, vein cu_2 of the fore wing is setose (Hickman, 1934: fig. 6a). For the duration of this study the type specimen was unavailable.

Ectopsocus petersi Smithers

Ectopsocus petersi Smithers, 1978: 144.

Ectopsocus australis Schmidt and Thornton, 1993: 162.

Ectopsocus sp. E. Cole et al., 1989: 33.

Ectopsocus froggatti Enderlein. Coy et al., 1993: 77.

Material examined. Many individuals collected throughout the year.

Distribution. Cosmopolitan.

Remarks. *E. petersi* was collected from living foliage, predominantly in wet and mixed forests, and rainforest. Considerable colour variation has been found in this species, from that of the original description (and also the description of *E. australis*) to specimens that are extremely pale, lacking any brown body coloration and spots on the wings. ERS has examined material of *Ectopsocus* sp. E of Cole et al. (1989), and they are clearly of this species.

Ectopsocus rileyae Schmidt and Thornton

Ectopsocus rileyae Schmidt and Thornton, 1993: 167.

Material examined. **Site** 19A, 1♀, 31 Mar 87; **site** 53, 1♀, 7 June 87; **site** 74, 1♂, 18 Mar 87; **site** 115B, 2♂, 22 Feb 88; **site** 118, 1♀, 9 Nov 86; **site** 119A, 6♀, 10 Nov 86; **site** 119B, 2♀, 3♂, 22 Feb 88; **site** 119C, 3♀, 2♂, 22 Feb 88; **site** 219D, 5♂, 19 May 87; **site** 220, 2♂, 27 Nov 86; **site** 224B, 1♀, 27 Feb 88; **site** 230B, 1♂ 15 Sep 86; **site** 248A, 1♂, 14 June 86; **site** 280A, 1♂, 14 June 86; **site** 313, 1♀, 30 Nov 86; **site** 361, 1♂, 25 Mar 88.

Distribution. Tasmania and Victoria.

Remarks. This species was mainly found in rainforest, mixed forest and wet forest.

***Ectopsocus risdonensis* sp. nov.**

Figures 125–32

Material examined. Holotype ♀: Tasmania, East Risdon, from shrubs, 27 Apr 1961. Thirteen ♀ and 6♂ paratypes: same data as holotype (V.V. Hickman).

Description of female. Coloration (after ca 32 years in alcohol). Ground colour of head buff, with the following dark brown: patches (some confluent) dorsal to eyes, across back of vertex and on each side of median epicranial suture; round mark on frons between median ocellus and epistomal suture; prominent striae on postclypeus converging towards midline. Apical segment of maxillary palpi brown. Eyes black. Ocelli pale, with brown centripetal margins. Fore wing with strong clouds at the end of veins and at *rs* and *m* junction, brownish tinge on membrane (fig. 125). Hind wing hyaline (fig. 126). Thorax brown, pleural sutures dark brown. Thoracic dorsa dark brown, paler along sutures. Legs pale brown. Abdomen buff.

Morphology. IO:D = 4.5. Epistomal suture with median region convex, clypeal shelf absent. Distal margin of labrum with 5 sensilla. Distinct row of 7 trichoid sensilla on anterior margin of outer surface of labrum. Lacinia apically bifid, outer projection larger than median. Head densely covered by setae of various lengths. Anterior margin of postclypeus bearing a row of 6 strong setae, divided medially into 2 groups of 3 setae. Antenna short, setae on flagellar segments differing in length. Placoid sensilla distributed as follows: 2 at base f_1 , 1 apices f_4 , f_6 and f_{10} ; placoids on f_6 and f_{10} bearing a long slender filament. Apex of terminal segment narrowed, bluntly rounded. Fore wing veins bearing a row of distally slanting setae (fig. 125), vein cu_2 glabrous. Hind wing (fig. 126): veins *r* and *m* joined by a cross-vein; veins *r* and *m+cu* fused for short distance basally; setae on margin absent. Epiproct (fig. 127) bearing 2 prominent apical setae. Paraproct (fig. 127) with 7/8 trichobothria and a median row of strong setae, posterior margin with 2 small cones and associated seta (not apparent on paraproct figured). Subgenital plate as in fig. 128. Gonapophyses and spermathecal plate (fig. 129).

Dimensions. B 1.35, FW 1.27, HW 1.03, F 0.28, T 0.47, t_1 0.166, t_2 0.087, rt 1.9:1, ct 9.0, f_1 0.182, f_2 0.095.

Description of male. Coloration (after ca 32 years in alcohol). As female. Fore wing pigmented as in fig. 130.

Morphology. IO:D = 3.3. General morphology similar to female, except anterior margin of outer surface of labrum bearing distinct row of 6 trichoid sensilla, flagellar segments of antennae much thicker than those of female. Epiproct (fig. 131). Paraproct (fig. 131) with 8 trichobothria, duplex spines and associated seta as on female. Ninth tergite (fig. 131) with two apical combs of long rounded teeth: apical row slightly sinuous, teeth shorter medially than laterally; basal comb straight, teeth shortest laterally; lateral margins bearing prominent rugose areas. Apex of eighth tergite ovoid, bearing scattered tubercles. Ninth sternite lacking ill-defined fields of ornamentation. Hypandrium with lateral apical margins

bearing long setae, median margin lightly sclerotised. Phallosome (fig. 132) with a pair of apical outcurving spines, adjacent to a long sclerotised spine.

Dimensions. B 1.3, FW 1.56, HW 1.24, F 0.28, T 0.50, t_1 0.166, t_2 0.087, rt 1.9:1, ct 8.0, f_1 0.241, f_2 0.134.

Remarks. This species appears most closely related to *Ectopsocus cetratus* Smithers, from Western Australia and South Australia. Males of both species possess a pair of apical combs on the ninth tergite, a characteristic feature of *Ectopsocopsis* Badonnel, and the female subgenital plate is identical in these species. This species differs from *Ectopsocus cetratus* in four ways: a narrow ventral valve of the gonapophyses, the ornamentation of the apex of the eighth tergite, the characteristic sclerites of the endophallus, and fore wing pigmentation. *Ectopsocus cetratus* is also a larger species (body length: ♀ 2.0 mm, ♂ 1.85; wing length: ♀ 2.0 mm, ♂ 1.9 mm) than *Ectopsocus risdonensis*. This species was not collected during the present study.

Etymology. The specific name refers to the type locality, East Risdon.

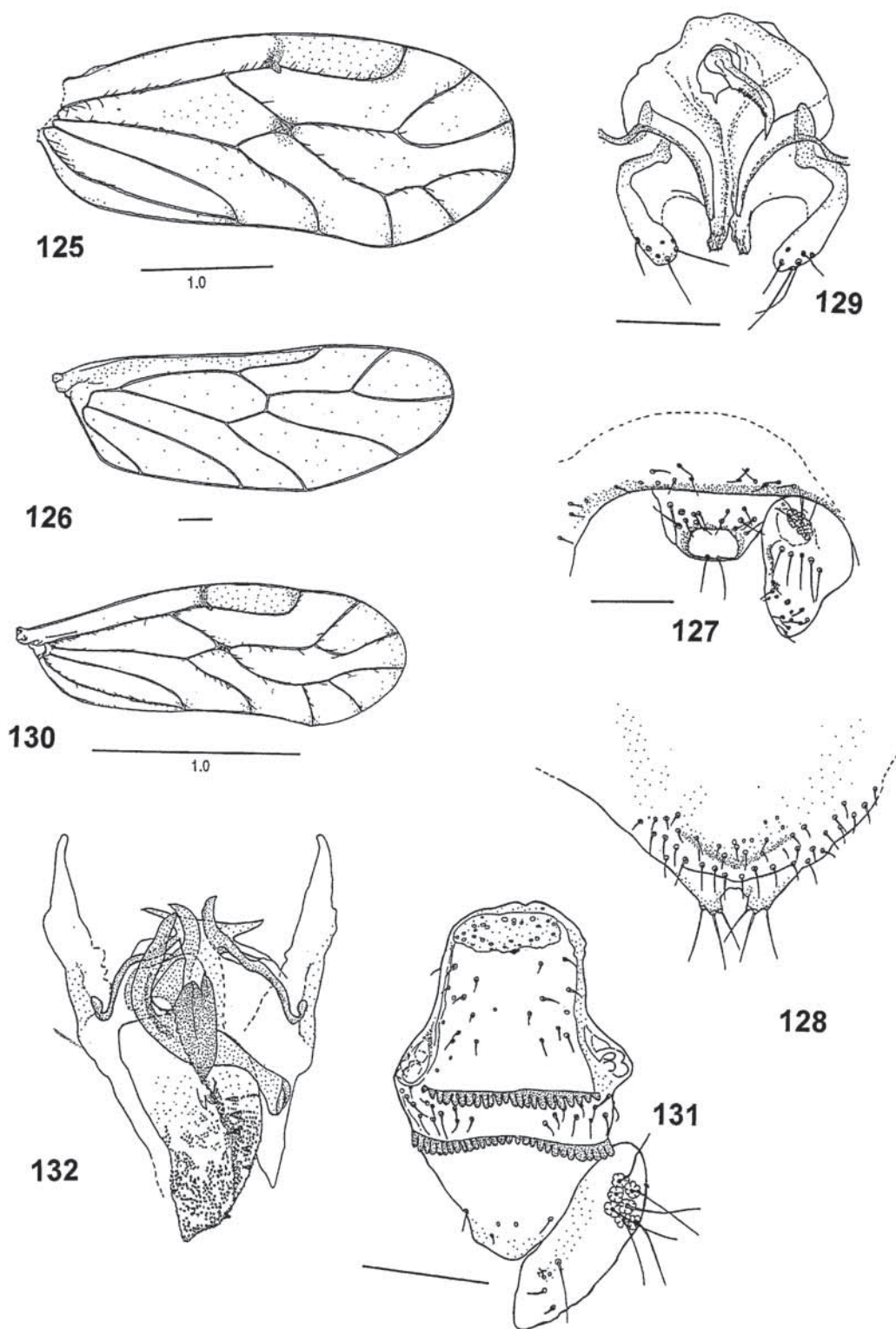
***Ectopsocus sprengi* sp. nov.**

Figures 133–41

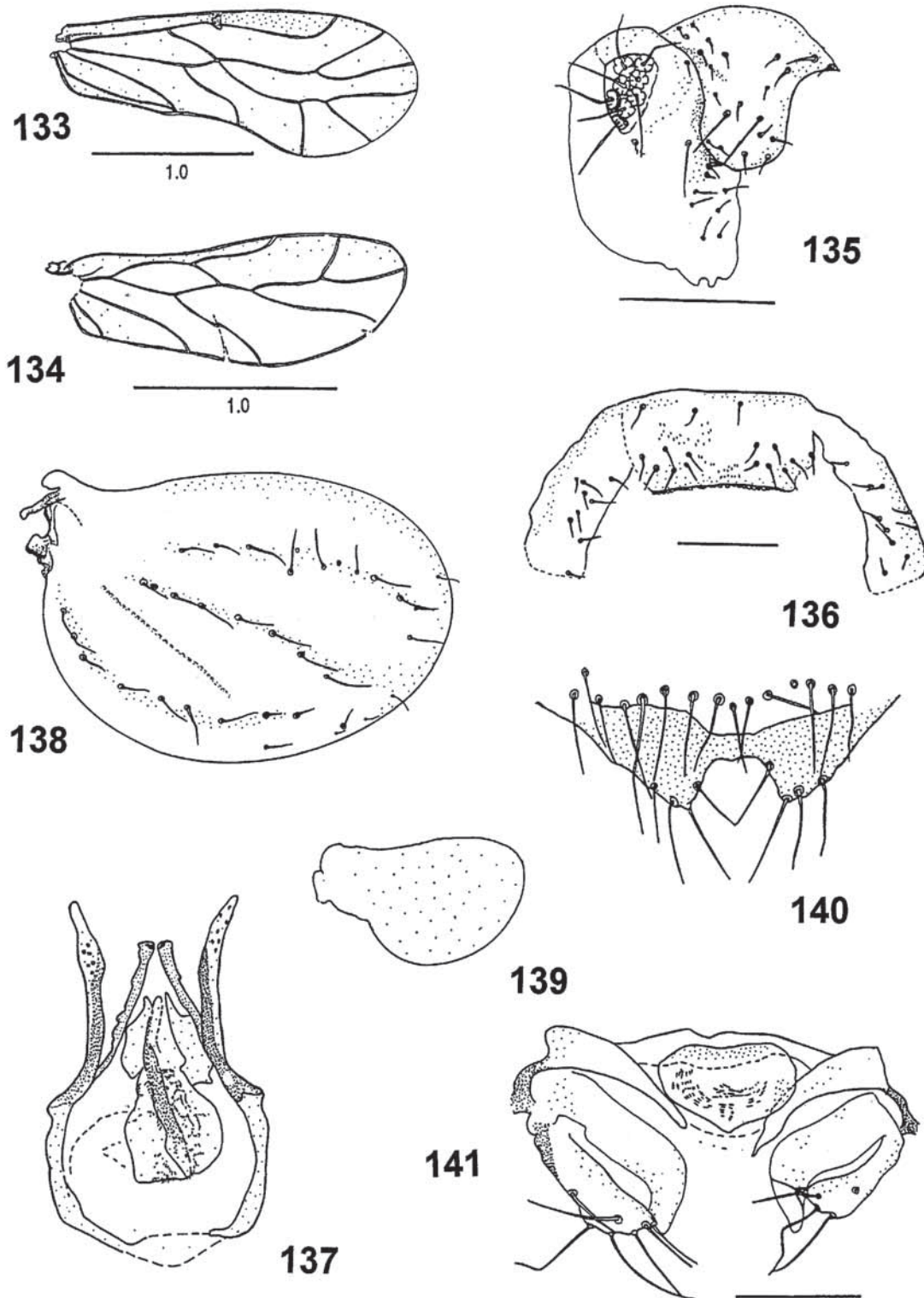
Material examined. Holotype ♂: Tasmania, South Arm Recreation Area, dead *Eucalyptus* foliage, 3 Sep 1986. Paratype ♀ and 1 nymph: same data as holotype.

Description of male. Coloration (after ca 7 years in alcohol). Head brown, with vague darker markings dorsal to eyes, each side of dark median epicranial suture and on postclypeus, striae converging towards midline. Ocelli dark brown, with dark brown centripetal margins. Antenna pale brown. Eyes black. Fore wing hyaline (fig. 133), veins brown. Hind wing hyaline (fig. 134). Thorax and legs brown. Abdomen cream.

Morphology. IO:D = 3.0. Epistomal suture present, clypeal shelf absent. Distal margin of labrum with 5 sensilla. Distinct row of 6 trichoid sensilla on anterior margin of outer surface of labrum, each lateral sensillum slightly apart from the 4 median. Lacinia apically bifid, lateral projection larger than median. Head covered by setae of various lengths. Setae on flagellar segments of uniform length. Distribution of placoids as follows: 2 at base f_1 , 1 at apices f_4 , f_6 and f_{10} ; those on f_6 and f_{10} bearing a long slender filament. Apex of terminal segment bluntly rounded. Fore wing (fig. 133): veins bearing single row of distally slanting setae; vein cu_2 glabrous; pterostigma elongated, posterior apex rounded, shape not rectangular as is usual for the genus. Hind wing (fig. 134) with veins *rs* and *m* fused for a length; veins *r* and *m+cu* fused for a length basally, setae on margin absent. Epiproct (fig. 135). Paraproct (fig. 135) with 8 trichobothria, posterior margin bearing a pair of unequal duplex spines and associated seta. Ninth tergite (fig. 136) bearing apical comb of very short blunt spines. Apex of eighth tergite and lateral margins of ninth sternite lacking fields of ornamentation. Hypandrium apical margin strongly setose. Phallosome (fig. 137) with inner parameres meeting apically, endophallus bearing strong median sclerite.



Figures 125-132. *Ectopsocus risdonensis*. Female: 125, fore wing; 126, hind wing; 127, epiproct and paraproct; 128, subgenital plate; 129, gonapophyses. Figures 127 and 128 to common scale. Male: 130, fore wing; 131, epiproct, paraproct and ninth tergite; 132, phallosome. Figures 131 and 132 to common scale.



Figures 133-141. *Ectopsocus sprengi*. Male: 133, fore wing; 134, hind wing; 135, epiproct and paraproct; 136, ninth tergite; 137, phallosome. Female: 138, fore wing; 139, hind wing; 140, subgenital plate; 141, gonapophyses. Figures 135 and 137-140 to common scale.

Dimensions. B 1.60, FW 2.12, HW 1.62, F 0.37, T 0.59, t_1 0.174, t_2 0.095, rt 1.8:1, ct 11.0, f_1 0.237, f_2 0.142.

Description of female. Coloration (after ca 7 years in alcohol). As male. Fore wing (fig. 138) and hind wing (fig. 139) hyaline.

Morphology. IO:D = 3.0. Ocelli present, very small. Epistomal suture present, clypeal shelf absent. Distal margin of labrum with 5 sensilla. Anterior margin of outer surface of labrum with distinct row of 6 trichoid sensilla. Flagellar segments with setae of differing lengths. Distribution of placoid sensilla as follows: 1 at two-thirds distance from base of f_1 (on other antenna 1 at apex f_1), 1 apices f_4 , f_6 and f_{10} ; those of f_6 and f_{10} with a long slender filament. Micropterous. Fore wing (fig. 138) with venation reduced, setae in a single row on veins, vein cu_2 glabrous. Hind wing (fig. 139) reduced to small veinless flap. Epiproct setose, with 2 prominent apical setae. Paraproct with 2 trichobothria and one seta not in rosette, posterior margin with pair of small unequal duplex spines and associated seta. Subgenital plate (fig. 140) apical lobes with 4 setae. Gonapophyses (fig. 141) with ventral valve broad, dorsal valve with spiculate apex, greater in length than external valve, apically with about 6 setae. Spermathecal plate (fig. 141) rounded.

Dimensions. B 1.35, FW 0.24, HW 0.09, F 0.28, T 0.43, t_1 0.158, t_2 0.079, rt 2:1, ct 0.0, f_1 0.111, f_2 0.079.

Remarks. This species is similar to *E. brunneus* (both sexes macropterous) in general colour, in the fusion of veins *rs* and *m* in the hind wing and in the shape of the inner parameres of the phallosome. *E. sprenti* differs in possessing fewer setae on the male fore wing, the male hind wing lacking marginal setae, the endophallus containing a large median sclerite, and microptery in females. *E. sprenti* is a much smaller species than *E. brunneus*. The female of *E. sprenti* is similar to that of *E. edwardsi* in general morphology and in details of genitalia. The shape of the apical lobes of the subgenital plate, the form of the gonapophyses and shape of the spermathecal plate are similar in both species. *E. sprenti* differs from *E. edwardsi* in details of chaetotaxy on the apical lobes of the subgenital plate and on the external valve of the gonapophyses. The duplex spines of the paraproct also differ between the two species.

Etymology. Named for James Sprent, an early surveyor and explorer in Tasmania.

***Ectopsocus vachoni* Badonnel.**

Ectopsocus vachoni Badonnel, 1945: 44.

Material examined. University of Tasmania, Hobart, litter from wet gully, 6♀, 28 Apr 1984.

Distribution. Cosmopolitan.

Remarks. The present material includes only micropterous individuals with rudimentary wing buds, as figured by Badonnel (1945: 44, fig. 30). In Australia this species could be confused only with *Ectopsocus spiculatus* New, found in Victoria. New (1973b) noted the similarities and differences between the two species. This widespread species has previously been recorded from Western Australia (Smithers, 1996c).

***Ectopsocus* sp.**

Figures 142–46

Material examined. The (Queens) Domain, Hobart, from loose bark on eucalypts, 1♀, 17–18 Apr 1968 (V. V. Hickman).

Remarks. This single individual apparently represents a new species. However, while slide material is available, the rest of the insect, in alcohol, has been misplaced. The fore wing (fig. 142), hind wing (fig. 143), epiproct and paraproct (fig. 144), subgenital plate (fig. 145) and gonapophyses (fig. 146) with spermathecal sac are shown for future reference. Dimensions have also been included. The fore wing (fig. 142) has a brownish tinge on the membrane, and the hind leg is dark brown. The antennae are brown, the flagellar segments bearing setae of differing lengths. Placoid sensilla are distributed as follows: 2 in middle of f_1 , 1 at apices of f_4 , f_6 and f_{10} ; those on f_6 and f_{10} bearing a long slender filament. The apex of the terminal segment is narrowed and bluntly rounded. The posterior margin of the paraproct (fig. 144) bears a single spine, unlike the duplex unequal spines found in *E. hickmani* and *E. petersi*. The subgenital plate (fig. 145) apical lobes also differ from those of *E. hickmani* and *E. petersi*. The gonapophyses (fig. 146) bear a general resemblance to those of *E. petersi*. The spermathecal sac is similar in size to that of *E. hickmani*, which is smaller than that of *E. petersi*.

Dimensions. B 1.9, FW 1.50, HW 1.21, F 0.33, T 0.53, t_1 0.150, t_2 0.079, rt 1.9:1, ct O,O, f_1 0.197, f_2 0.107.

Peripsocidae

Key to Tasmanian genera of Peripsocidae

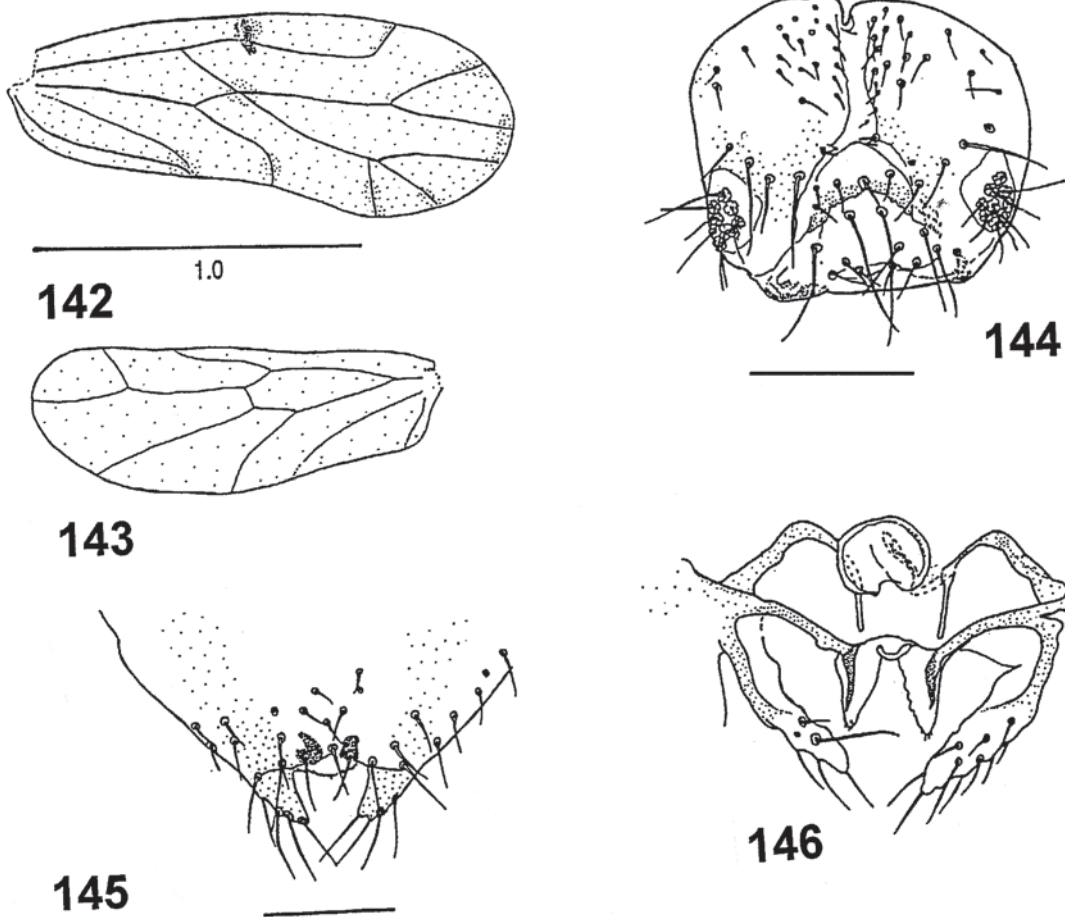
The two genera recorded from Tasmania are very similar, and females cannot be separated on genitalic features.

1. Wings broad, fore wing with distinct dark banding; phallosome basally broad, transverse, apex rounded and lacking acuminate point *Cycloperipsocus* Li Fasheng
- Wings not unduly broad, if marked – this as darker suffusion rather than discrete dark banding; phallosome tapered or rounded at base, apex usually tapered to slender median point *Peripsocus* Hagen

***Cycloperipsocus* Li Fasheng**

Cycloperipsocus Li Fasheng, 1993: 377. Type species: *Cycloperipsocus pangi* Li Fasheng.

Remarks. This genus was raised to contain a new Chinese species. The genus is very similar to more typical *Peripsocus*, and females may be differentiated only on the intensity of wing markings, as genitalia in the two genera are similar. Li Fasheng also included two Australian species in his initial concept of *Cycloperipsocus*. One of these occurs in Tasmania, as below, but its recognition is facilitated by including it in a broader key to *Peripsocus*, which we have opted to do, whilst not formally changing its current placement.



Figures 142-146. *Ectopsocus* sp. Female: 142, fore wing; 143, hind wing; 144, epiproct and paraprocts; 145, subgenital plate; 146, gonapophyses. Figures 142, 143 and 144 and 146 to common scales.

Cycloperipsocus edwardsi (New)

Peripsocus edwardsi New, 1973a: 340.

Cycloperipsocus edwardsi. --- Li Fasheng, 1993: 379.

Material examined. **Site** 27A, 1♀, 13 Feb 88; **site** 186, 1♀, 27 July 87; **site** 194A, 1♀, 27 July 87.

Distribution. Tasmania, Victoria, New South Wales and South Australia.

Peripsocus Hagen

Peripsocus Hagen, 1866b: 203. Type species: *Psocus phaeopterus* Stephens.

Key to Tasmanian species of *Peripsocus*

- 1. Macropterous 4
- Brachypterous or micropterous (♀ only) 2

- 2. Apex of dorsal valve of gonapophyses not spiculate *pamae* sp. nov.
- Apex of dorsal valve of gonapophyses strongly spiculate .. 3
- 3. Subgenital plate apex broad, transverse *maoricus* (Tillyard)
- Subgenital plate apex broad basally, tapered *edwardsi* New (*Cycloperipsocus*)
- 4. Fore wing with stem of *rs* as long as r_{4+5} ; subgenital plate lobe rectangular, longer than wide; small projection on posterior margin of male ninth tergite apically with sharp pointed teeth *milleri* (Tillyard)
- Fore wing with stem of *rs* shorter than r_{4+5} ; subgenital plate lobe squarish or apically tapered; posterior margin of male ninth tergite with large rounded clunium 5

5. Apex of dorsal valve of gonapophyses strongly spiculate; endophallus with large median conical sclerite and each side a large outwardly curving spine; arms of outer parameres sclerotised, projecting posterolaterally 6
- Apex of dorsal valve of gonapophyses not spiculate; endophallus with pair of symmetrical sclerites; arms of outer parameres membranous, projecting posteriorly 7
6. Subgenital plate apex broad, transverse; phallosome: apex of aedeagal arch tapered, with two lateral and one median rounded projections *maoricus* (Tillyard)
- Subgenital plate apex broad basally, tapered; phallosome: apex of aedeagal arch rounded, without projections *edwardsi* New (*Cycloperipocus*)
7. Fore wing of male with thickened costa between wing base and base of pterostigma; endophallus with anterior spinous sclerites and posterior rounded sclerites; femora of legs lacking dark brown band 8
- Fore wing of male lacking thickened costa between wing base and base of pterostigma; endophallus with anterior spinous sclerites but lacking posterior rounded sclerites; femora of legs with dark brown band 10
8. Fore wing hyaline *morulops* (Tillyard)
- Fore wing pigmented 9
9. Anterior sclerites of endophallus with three large spines adjacent to posterior sclerites; dorsolateral margin of external valve of gonapophyses straight *melaleucae* New
- Anterior sclerites of endophallus with three spines of different size some distance from posterior sclerites; dorsolateral margin of external valve of gonapophyses convex, apex of lobe bluntly pointed *cochleus* sp. nov.
10. ♀ IO:D = 4.8, ♂ IO:D = 2.6 *pamae* sp. nov.
- ♀ IO:D = 2.8, ♂ IO:D = 1.0 *tillyardi* New

***Peripsocus cochleus* sp. nov.**

Figures 147–56

Peripsocus morulops (Tillyard). New, 1973a: 345.

Material examined. Holotype ♀: Tasmania, Cockle Creek, *Leptospermum lanigerum*, 21 June 1986. Paratype ♂: same data as holotype. Additional records: many individuals collected throughout the year.

Description of female. *Coloration* (after ca 7 years in alcohol). Ground colour of head buff, with the following brown: markings dorsal to eyes, across back of vertex and along each side of black median epicranial suture; postclypeal striae, converging toward pale midline; pair of thin bands extending from eye to antennal socket; maxillary palp; antenna. Ocelli pale, with blackish centripetal margins; tubercle brown surrounded by black margin. Labrum dark brown. Anteclypeus brown in basal third, remainder colourless. Eyes black. Fore wing with shades

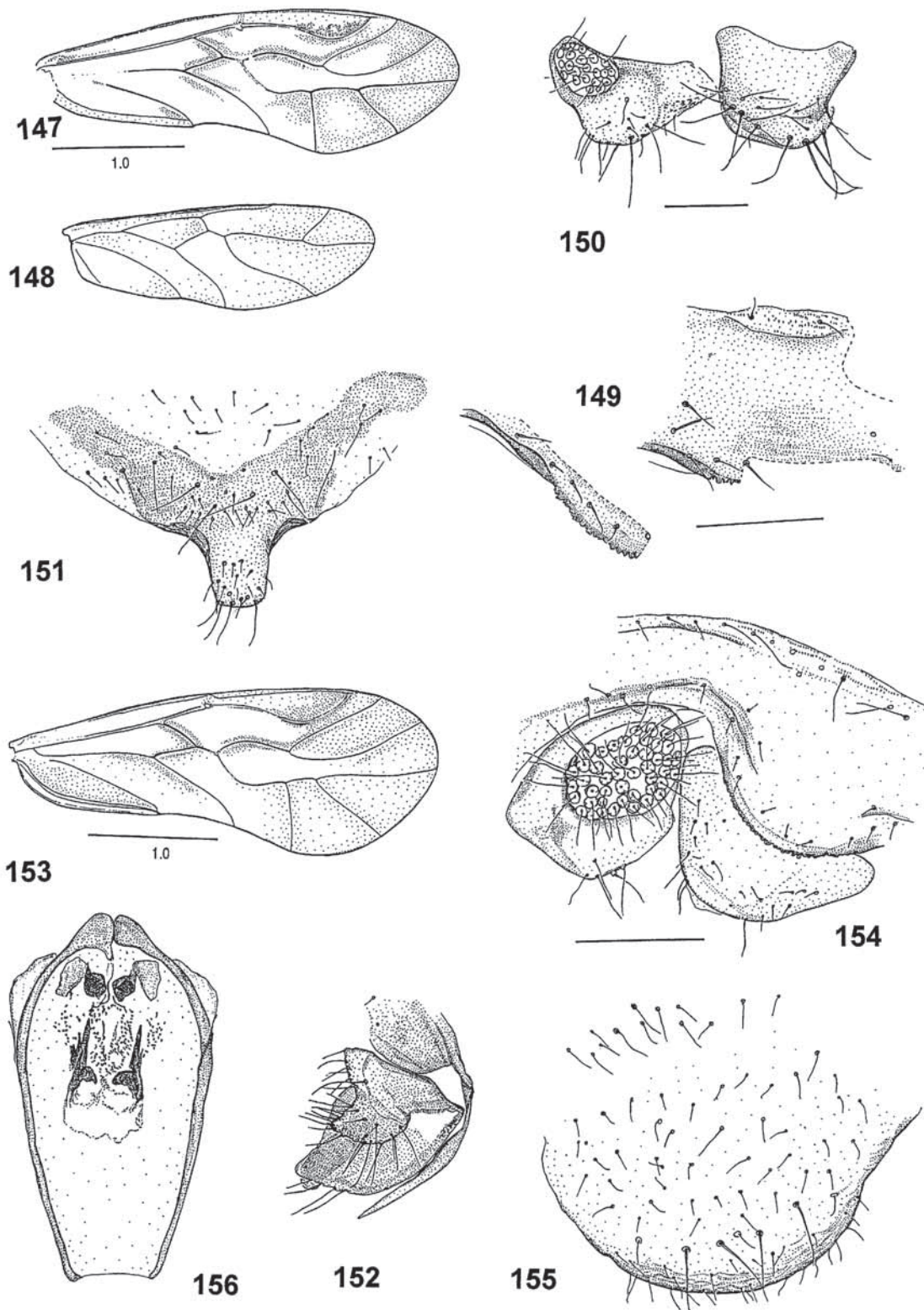
of brown pigment (fig. 147). Veins dark brown, except basally veins *m* and *r*₄₊₅. Hind wing hyaline (fig. 148), with brown tinge in region of radial fork. Thorax dark brown, sutural areas buff dorsally, sutural lines blackish on pleura. Legs: coxae brown, femora pale brown, hind tibia pale brown, tibiae of fore- and mid-legs brown, tarsi brown. Abdomen buff, terga with grey-brown annulations, sterna laterally greyish-brown. Terminal segments brown.

Morphology. IO:D = 3.0. Distal margin of labrum with 5 sensilla, bases very thickened. Distinct row of 4 trichoid sensilla on anterior margin of outer surface of labrum. Suture surrounding ocellar tubercle an extension of median epicranial suture. Vertex-postclypeal suture fusing to anterolateral margins of ocellar tubercle, frons sclerite absent. Clypeal shelf absent. Head with reticulate granular pattern where brown markings occur on vertex and postclypeus. Anterior to median ocellus is an elongated patch filled with reticulate polygonal cells, not granulated. Lacinia apically bifid. Head with small scattered setae. Flagellar segments with fine small setae, placoid sensilla distributed as follows: 3 base *f*₁, 1 apices *f*₄, *f*₆ and *f*₁₀; those of *f*₆ and *f*₁₀ with a filament of medium length. Terminal segment with bluntly pointed apex. Fore wing (fig. 147): veins with sparse short setae; vein *cu*₂ glabrous; veins *rs* and *m* fused for a length. Hind wing (fig. 148) with veins *r* and *m* fused for a length, veins *r* and *m+cu* fused basally. Mesothoracic sterna broad. Claw with subapical tooth, pulvillus fine, flexuous with expanded tip. Rasp and mirror of Pearman's organ well developed. Preapical margin of ninth tergite (fig. 149) bearing a single row of setae, apical margin with small tubercles. Epiproct (fig. 150) strongly setose in apical half. Paraproct (fig. 150) with ovoid field of about 22 trichobothria, posterior margin setose. Subgenital plate (fig. 151): lateral margins of median lobe folded; apex bearing 3–4 long setae, preapically a field of short setae; body of plate bearing 6 long setae in transverse arc; basal pigmented region extending into pair of anteriorly diverging arms; small membranous area medially at apex. Gonapophyses (fig. 152): ventral valve well sclerotised, apex bluntly pointed, spiculate; dorsal valve broad, strongly sclerotised basally next to membranous area, apically bearing 4 setae; external valve with sclerotised inner opening, outer surface of lobe setose in apical half and along dorsolateral margin, apex of lobe appears bluntly pointed due to convex shape of dorsolateral margin.

Dimensions. B 2.3, FW 3.07, HW 2.21, F 0.43, T 0.86, *t*₁ 0.205, *t*₂ 0.111, *rt* 1.9:1, *ct* 17.0, *f*₁ 0.371, *f*₂ 0.284.

Description of male. *Coloration* (after ca 7 years in alcohol). As female, with the following exceptions: eyes purple-black; hind tibia pale brown, merging brown apically; abdomen buff, lacking grey-brown annulations. Fore wing (fig. 153).

Morphology. IO:D = 0.9. Eyes large, reaching beyond level of vertex when looking at side of head. General morphology as in female. Fore wing (fig. 153) as female, costa between base and pterostigma incipiently thickened. Ninth tergite (fig. 154) with well developed curved lobe bearing an apical row of tubercles and a preapical row of setae. Epiproct (fig. 154) basally broad, with basal convex margin. Paraproct (fig. 154) with round field of 45 trichobothria. Hypandrium (fig. 155) with simple rounded apical margin, setose, and possessing a



Figures 147-156. *Peripsocus cochleus* Female: 147, fore wing; 148, hind wing; 149, clunium; 150, epiproct and paraproct ; 151, subgenital plate; 152, gonapophyses. Figures 147, 148 and 149-151 to common scales. Male: 153, fore wing; 154, clunium, epiproct and paraproct; 155 hypandrium; 156, phallosome. Figures 154-156 to common scale

preapical row of 4 long setae. Phallosome (fig. 156) with anterior margin of frame not sclerotised. Endophallus with an anterior and posterior pair of sclerites: anterior sclerites each bearing 3 spines of differing lengths, median spine long, lateral spine small and in between one of medium length; posterior pair of sclerites somewhat rounded, apices pointed.

Dimensions. B 1.9, FW 3.10, HW 2.45, F 0.47, T 0.96, t_1 0.284, t_2 0.118, rt 2.4:1, ct 20.0, f_1 0.498, f_2 0.395.

Distribution. Tasmania and Victoria.

Remarks. This locally widespread species is very similar to *Peripsocus morulops* (below). As noted for that species the thickening on the costa of the male fore wing varies. In this species it is not as distinct as in *P. morulops*. This feature, and the overall similarity of male genitalia led New (1973a) to record the Tasmanian specimen of this species as *P. morulops*, noting, however, the darker markings as emphasised in his figure of the fore wing (New, 1973a: 344, fig. 14) of the Tasmanian specimen. The darker brown markings in the fore wing, the different shape of the external valve lobe of the gonapophyses and the clunium bearing a single preapical row of setae distinguish *P. cochleus* from *P. morulops*. The chaetotaxy of the clunium appears uniform in the material examined of both sexes (better developed in males) in the two species. However the figure by New of the male clunium (New, 1973a: 344, fig 16) shows setae more typically found in the clunium of *P. morulops* (setae in 2 incipient rows). The specimens collected by New (1973a: 345) from Victoria are considerably larger (2.66–2.95 mm, possibly individuals of *P. morulops*?) than those of *P. cochleus* collected from Tasmania. *P. cochleus* was collected largely from *Nothofagus* and mixed forest.

Etymology. An allusion to Cackle Creek, the type locality, through the Latin *cochlea*, a possible origin of “cackle”.

Peripsocus maoricus (Tillyard)

- Peripsocopsis maoricus* Tillyard, 1923: 194.
Peripsocus maoricus. --- Roesler, 1944: 154.
Peripsocus macropterus Edwards, 1950: 124.
Peripsocus maoricus. --- New, 1973a: 345.

Material examined. Many individuals collected throughout the year.

Distribution. Widely distributed in southern Australia and New Zealand.

Remarks. This locally widespread species was found in most vegetation types.

Peripsocus melaleuca New

- Peripsocus melaleuca* New, 1971: 224.
Peripsocus melaleuca. --- Cole et al., 1989: 33.
Peripsocus morulops (Tillyard). Cole et al., 1989: 33.

Material examined. Many individuals collected throughout the year.

Distribution. Tasmania, Bass Strait Is and Victoria.

Remarks. Locally widespread and predominantly found in coastal scrub (dry and wet) and dry forest; *P. melaleuca* was also found in some rainforest. Examination of the Bass Strait

material indicated that the single male specimen recorded as *P. morulops* is actually *P. melaleuca*; the material recorded as *P. melaleuca* consisted of females only.

Peripsocus milleri (Tillyard)

- Peripsocopsis milleri* Tillyard, 1923: 195.
Peripsocus milleri. --- Roesler, 1944: 154.
Peripsocus eucalypti Edwards, 1950: 122.
Peripsocus milleri. --- New, 1973a: 346.
Peripsocus sp. PR. Cole et al., 1989: 33.

Material examined. Many individuals collected from February to July.

Distribution. Tasmania, Flinders I (Bass Strait), Victoria, New South Wales, Western Australia, Norfolk I, Lord Howe I, New Zealand and Britain.

Remarks. This locally widespread species was found in both dry and wet forests, and coastal scrub and heath (particularly with species of *Leptospermum*).

Peripsocus morulops (Tillyard)

Figures 157–63

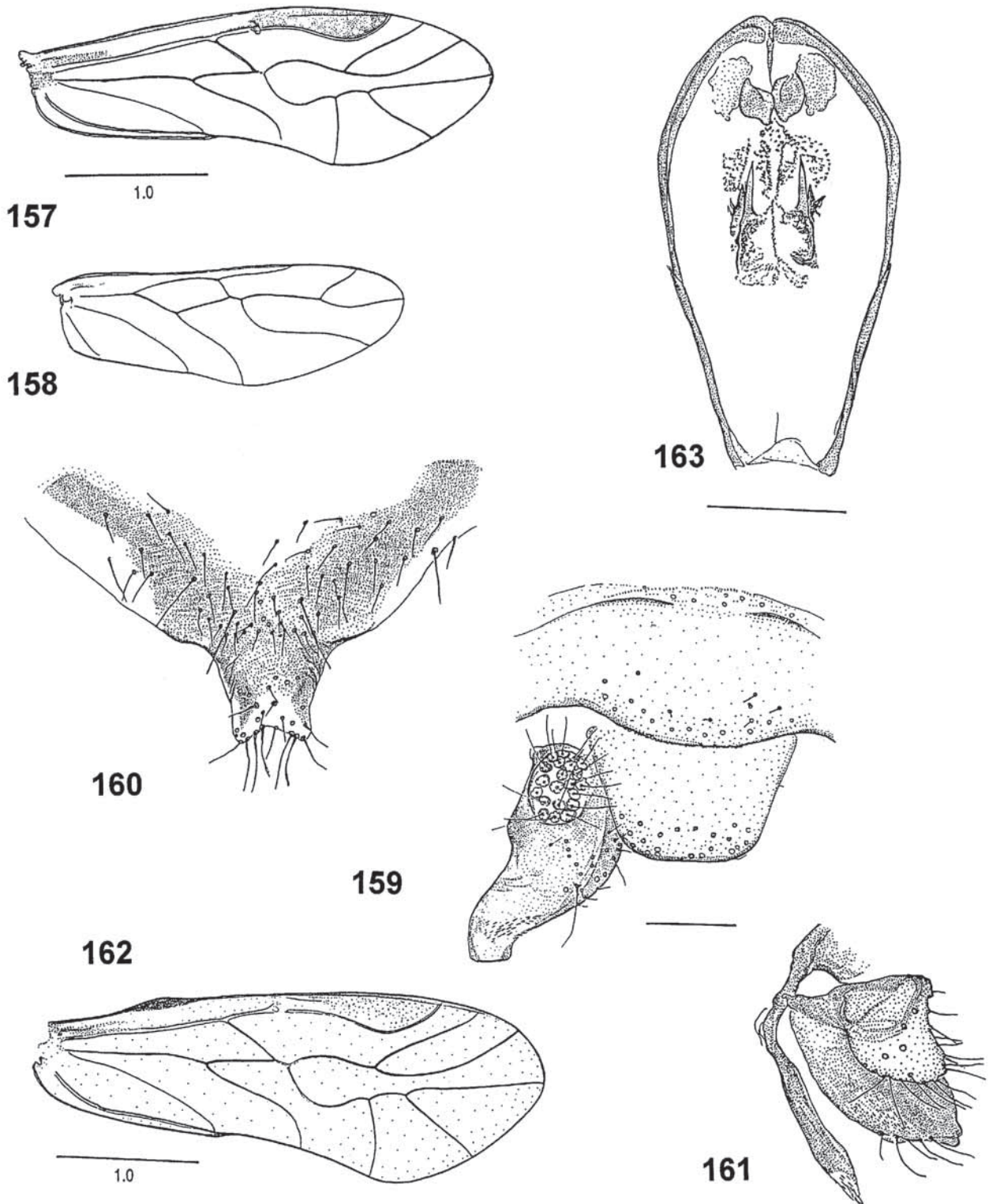
- Peripsocopsis morulops* Tillyard, 1923: 194.
Peripsocus morulops. --- Roesler, 1944: 154.
Peripsocus morulops. --- New, 1973a: 345.
!Peripsocus morulops. --- Cole et al., 1989: 33.
Peripsocus sp. D. Cole et al., 1989: 33.

Smithers (1994b) previously described the female from New South Wales material. The description here of a Tasmanian female, with figures, is provided for comparison with females of *P. cochleus* above.

Material examined. Specimen on which description is based: Tasmania, 1♀, *Dodonaea viscosa*, South Arm Recreation Area, 8 July 1987. Additional records: many individuals collected from January to September.

Description of female. *Coloration* (after ca 6 years in alcohol). Ground colour of head buff, light brown on top of vertex with the following dark brown: confluent markings dorsal to eyes, along back of vertex and each side of blackish median epicranial suture; postclypeal striae, converging towards pale midline; posterior half of anteclypeus; labrum; antenna; maxillary palpi; pair of bands between eye and antennal socket, lower band extending around ventral margin of eye. Gena buff anteriorly, merging light brown posteriorly. Epistomal suture blackish. Ocelli pale with blackish centripetal margins, tubercle brown surrounded by blackish margin. Eyes black. Fore wing (fig. 157): membrane with slight brown tinge; pterostigma with slightly darker cloud in apical half; veins dark brown. Hind wing (fig. 158) hyaline. Thorax dark brown, sutural lines blackish. Legs brown, femur and tarsi slightly darker. Abdomen ventrally buff, dorsal terga with greyish-brown annulations. Terminal segments dark brown.

Morphology. IO:D = 3.4. Distal margin of labrum with 5 sensilla, bases very thickened. Distinct row of 4 trichoid sensilla on anterior margin of outer surface of labrum. Suture surrounding ocellar tubercle an extension of median epicranial suture.



Figures 157-163. *Peripsocus morulops* Female: 157 fore wing; 158, hind wing; 159, clunium, epiproct and paraproct; 160, subgenital plate; 161, gonapophyses. Figures 154, 155 and 157-159 to common scales. Male: 162, fore wing; 163, phallosome.

Vertex-postclypeal suture fusing to anterolateral margins of ocellar tubercle, frons sclerite absent. Clypeal shelf absent. Head with reticulate granular pattern where dark brown markings occur on vertex and postclypeus. Anterior to median ocellus is an elongated patch, filled with reticulate polygonal cells, not granulated. Head bearing small scattered setae. Lacinia apically narrow, incipiently bifid. Flagellar segments bearing fine small setae, placoid sensilla distributed as follows: 3 base f_1 , 1 apices f_4 , f_6 and f_{10} , those on f_6 and f_{10} with a short setiform filament. Terminal segment with bluntly pointed apex. Fore wing (fig. 157): veins with sparse short setae; vein cu_2 glabrous; veins rs and m fused for a short length. Hind wing (fig. 158) with veins r and $m+cu$ fused basally. Mesothoracic sterna broad. Claw with subapical tooth. Pulvillus fine, flexuous, with expanded tip. Rasp and mirror of Pearman's organ well developed. Clunium of ninth tergite (fig. 159) bearing small tubercles, margin bearing 2 incipient rows of preapical setae. Epiproct (fig. 159) with straight transverse apical margin, strongly setose in apical half. Paraproct (fig. 159) with ovoid field of about 22 trichobothria, posterior margin setose. Subgenital plate (fig. 160): median lobe with strongly sclerotised lateral margins; apex bearing 5-6 long setae, preapically a field of short setae; body of plate bearing 4 long setae, 2 medially and 2 anterolaterally; pigmented region surrounding apical membranous area extending into pair of anteriorly diverging arms. Gonapophyses (fig. 161): ventral valve well sclerotised, apex bluntly pointed, spiculate; dorsal valve broad, strongly sclerotised basally next to membranous area, apically bearing 4/5 setae; external valve with sclerotised inner opening, outer surface of lobe setose in apical half and along dorsolateral margin.

Dimensions. B 2.5, FW 3.07, HW 2.33, F 0.54, T 1.00, t_1 0.245, t_2 0.166, rt 1.5:1, ct 14.0, f_1 0.387, f_2 0.237.

Distribution. Tasmania, Deal I (Bass Strait), New South Wales and New Zealand.

Remarks. Smithers (1994b) described the overall coloration of the female as being similar to that of the male (cf. Smithers, 1969), and noted that postclypeal striae were present. The antennae, legs and maxillary palpi were pale brown. There appears to be considerable variation in the extent of coloration, as the Tasmanian females are much darker than those from New South Wales. In comparing the original description of the male by Tillyard (1923) with that of Smithers' (1969) redescription, Tillyard noted that the postclypeus lacked striae whereas Smithers indicated they were faint. Tillyard also noted that the antennae were dark brown, and both the thorax and abdomen blackish. Smithers, however, indicated that both the antennae and thorax were pale brown, and the colour of the abdomen was not mentioned. Postclypeal striae are very obvious on the Tasmanian material and, apart from this and the blackish abdomen, the coloration is most similar to the original description of Tillyard. Tillyard did not mention a costal thickening on the male fore wing between the base and pterostigma and, interestingly, the hind wing (Tillyard, 1923: 195, fig. 19) shows vein $m+cu$ originating separately from vein r at the wing base. The degree of thickening of the costa on the male fore wing appears to vary: in some the length is quite short, but the costa very thick; in others the length is a little longer but the costa not

quite as thick and the posterior margin bears small ripples or undulations. We have shown a male fore wing (fig. 162) for comparison with those of Tillyard (1923), and Smithers (1969). Such thickenings are present, but not as obvious, on the fore wings of males of *P. melaleuca*, *P. bifasciatus* Schmidt and Thornton and *P. cochleus* (see above). The four species appear to be closely related in details of the phallosome, which is nearly identical in all. Differences however can be noted. In *P. melaleuca* the anterior pair of endophallic sclerites each bear 3 large spines [not obvious in the phallosome figured by New (1971: 225, fig. 5)] and are adjacent to the pair of posterior sclerites. The anterior pair of endophallic sclerites of *P. bifasciatus* each bear 3 short spines, and lie a considerable distance from the posterior pair of sclerites. In both *P. morulops* and *P. cochleus* the anterior pair of sclerites each bear 3 spines of differing lengths: a long median spine, a rudimentary lateral spine and, in between, a spine of medium length. A phallosome is shown (fig. 163) of *P. morulops* from a Tasmanian specimen for comparison with those of Smithers (1969) and New (1973a). *P. morulops* differs from *P. cochleus* in details of both fore wing pigmentation and female genitalia (see remarks under *P. cochleus*). *P. morulops* is locally widespread and was found mainly in heath, and in dry coastal scrub and wet scrub.

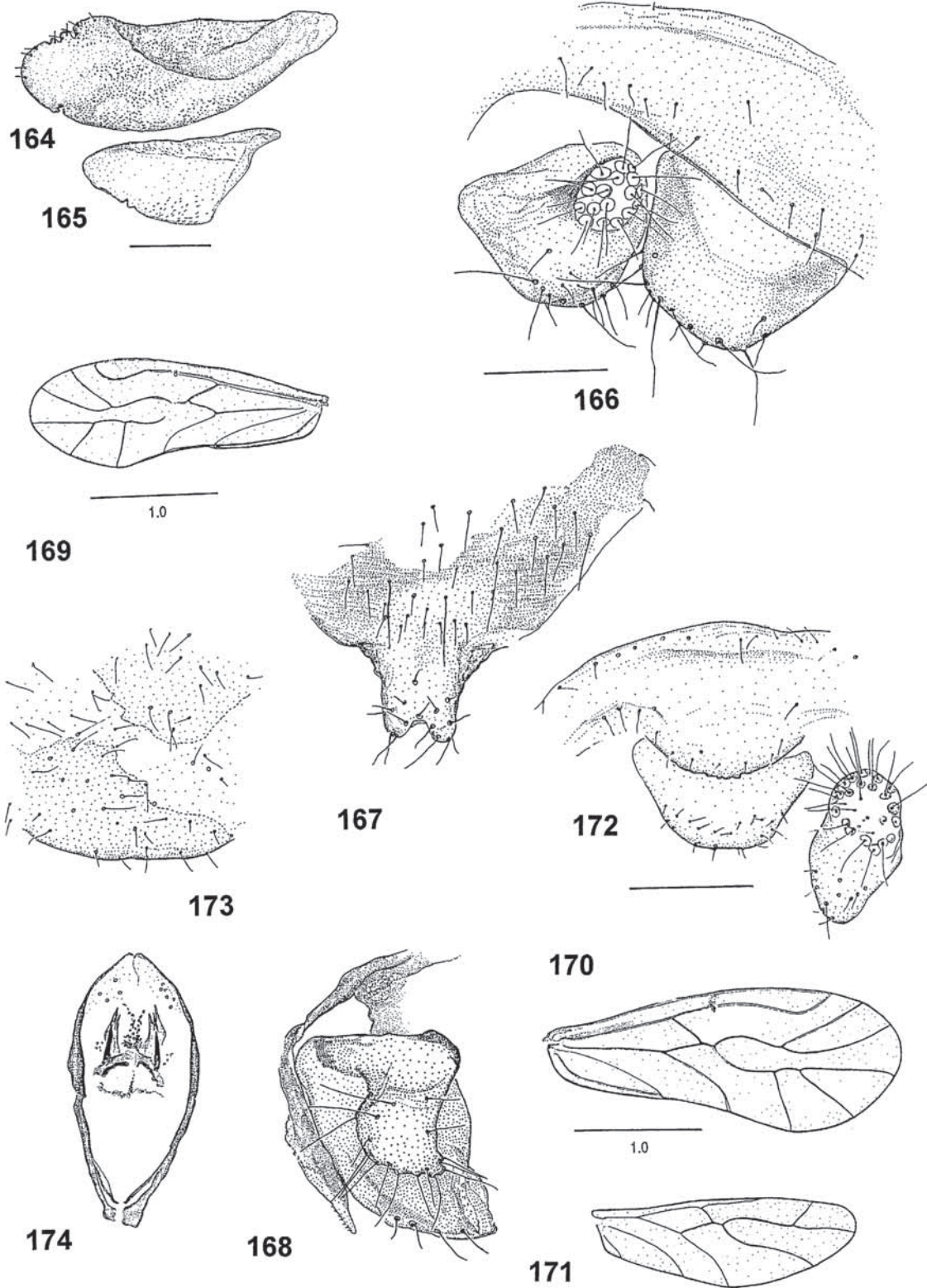
Peripsocus pamae sp. nov.

Figures 164–74

Material examined. Holotype micropterous ♀: Tasmania, *Banksia* scrub, Southwest National Park, Port Davey Tk at Crossing River, 10 Feb 1988. Four nymphs, 4♀ and 4♂ paratypes: same data as holotype. Additional records: many individuals collected throughout the year.

Description of micropterous female. *Coloration* (after ca 5 years in alcohol). Ground colour of head buff, with the following dark brown: confluent markings across back of vertex, dorsal to eyes and on each side of median epicranial suture; postclypeal striae converging towards pale midline; 2 bands between eye and antennal socket, lower band extending below eye towards back of head; basal third of anteclypeus; labrum; 2 apical segments of maxillary palp; ocellar tubercle, anteriorly a squarish patch flanked by postclypeal striae. A light brown patch extending to markings dorsal to eyes lateral to each lateral ocellus. Ocelli pale. Antenna light brown. Eyes black. Fore wing (fig. 164) with slight brown markings. Hind wing (fig. 165) hyaline. Thoracic pleura dark brown, dorsum pale brown. Legs: coxae dark brown; trochanters pale, femora dark brown in basal two-thirds, apical third pale; tibiae pale; tarsi dark brown. Abdomen cream, with grey-brown annulations. Terminal segments dark brown.

Morphology. IO:D = 4.8. Distal margin of labrum with 5 sensilla, bases very thickened. Distinct row of 4 trichoid sensilla on anterior margin of outer surface of labrum. Suture surrounding ocellar tubercle an extension of median epicranial suture. Vertex-postclypeal suture fusing to anterolateral margins of ocellar tubercle, frons sclerite absent. Clypeal shelf absent. Lacinia apically very narrow, apex bifid. Head with very obvious reticulate granular pattern where dark brown markings occur on vertex and postclypeus. Squarish patch anterior to median ocellus filled with reticulate polygonal cells, not granulated. Head bearing small scattered setae. Antenna very short (length



Figures 164-174. *Peripsocus pamae*. Female: 164, fore wing; 165, hind wing; 166, epiproct and paraproct; 167, subgenital plate; 168, gonapophyses; 169, macropterous fore wing. Figures 164, 165 and 166-168 to common scales. Male: 170, fore wing; 171, hind wing; 172, epiproct, paraproct and clunium; 173, hypandrium; 174, phallosome. Figures 170, 171 and 172-174 to common scales.

0.86 mm), flagellar segments bearing setae of differing lengths. Placoid sensilla distributed as follows: 2 base f_1 , 1 apices f_4 , f_6 and f_{10} , those of f_6 and f_{10} bearing a long slender filament. Terminal segment with bluntly pointed apex. Venation of fore wing (fig. 164) and hind wing (fig. 165) absent. Setae small and sparse along apical margin of fore wing. Membranes of both wings densely covered by small apically pointed scales, these being less prominent apical to invaginations on the posterior and anterior margins. Surface of thoracic pleura with reticulate granular pattern, shape of cells varying from polygonal to an elongated spindle. Surface of dorsum lacking pattern, though still very granular. Dorsal lobes not well developed. Claw with subapical tooth, pulvillus fine, flexuous with expanded tip. Rasp and mirror of Pearman's organ well developed. Epiproct (fig. 166) trapezoidal, apical half setose. Paraproct (fig. 166) with round field of 15 trichobothria. Subgenital plate (fig. 167) apically bilobed; few small setae towards apex, and longer setae on body of plate. Gonapophyses (fig. 168).

Dimensions. B 1.7, FW 0.32, HW 0.22, F 0.30, T 0.58, t_1 0.150, t_2 0.111, rt 1.4:1, ct 0.0, f_1 0.150, f_2 0.103.

Description of macropterous female. Coloration (after ca 7 years in alcohol). As micropterous female except pigmentation of head less intense, and thorax overall dark brown, sutural areas buff. Fore wing (fig. 169) and hind wing hyaline, veins dark brown. Annulations on abdomen also less intense than those of micropterous females.

Morphology. IO:D = 4.7. General morphology as in micropterous female, except head with less obvious reticulate pattern on brown markings. Antennae slightly longer (length 1.06 mm). Dorsal lobes of thorax well developed, apices of lobes of metathoracic dorsa bearing anastomosing network of small tubercles. Mesothoracic sterna broad. Fore wing (fig. 169): veins with sparse short setae; vein cu_2 glabrous; veins rs and m fused for a length. Hind wing with veins r and m fused for a length, veins r and $m+cu$ fused basally. Genitalia as in micropterous female.

Dimensions. B 1.8, FW 2.15, HW 1.62, F 0.32, T 0.68, t_1 0.166, t_2 0.111, rt 1.5:1, ct 8.0, f_1 0.182, f_2 0.134.

Description of male. Coloration (after ca 5 years in alcohol). Head as in micropterous female. Thorax, fore wing (fig. 170) and hind wing (fig. 171) as in macropterous female. Abdomen buff, terminal segments dark brown.

Morphology. IO:D = 2.6. Eyes small, not reaching level of vertex when looking at side of head. General morphology as in macropterous female. Head with obvious reticulate pattern as in micropterous female. Antenna longer than female (length 1.82 mm), dense setae of flagellar segments uniform in length. Lobe of ninth tergite basal to epiproct well developed (fig. 172), apically bearing small broad tubercles, preapically bearing a single row of setae. Epiproct (fig. 172) setose in apical half. Paraproct (fig. 172) with round field of 28 trichobothria. Hypandrium (fig. 173, torn): margin rounded apically, setose; band of pigment broad around apical margin; median indentation absent. Phallosome (fig. 174) frame anteriorly with median unsclerotised region. Endophallic pair of sclerites symmetrical, each consisting of: an anterior transverse sclerite; a longitudinally broad median sclerite

bearing 2-5 apical finger-like projections, the lateral projection being longest and the median projection shortest; a longitudinally narrow lateral sclerite, heavily sclerotised, shorter in length than projections of preceding sclerite. Endophallic pair of lobes membranous, strongly spiculate.

Dimensions. B 1.7, FW 2.65, HW 1.92, F 0.34, T 0.73, t_1 0.190, t_2 0.095, rt 2.0:1, ct 15.0, f_1 0.316, f_2 0.237.

Remarks. In features of the phallosome this species is closely related to *P. tillyardi* and *P. hickmani* New. Micropterous, brachypterous and macropterous females of *P. pamae* have been collected: the brachypterous females possessing the dark brown patches on the head found in micropterous females, and the dark brown well developed thorax of macropterous females. Some brachypterous females possess the dark shading concentrated at the apex of the pterostigma of the fore wing as noted in the description of the holotype of *P. tillyardi* (New, 1973a: 343). *P. hickmani* clearly differs from *P. pamae* in coloration, the shape of the apical median lobe of the subgenital plate and in features of the phallosome, notably in the absence of particular endophallic sclerites and in the shape of the external parameres.

New (1973a: 344) noted that the endophallic sclerites of *P. tillyardi* are asymmetrical. Subsequent examination of the phallosome of the holotype and those of additional material from Victoria and Tasmania indicate that the sclerites are symmetrical, and similar in form to those described above for *P. pamae*. The finger-like projections of the longitudinal median sclerite also vary in number (from 2-5); the longitudinally narrow lateral sclerite, however, is longer, and the apex is in line with the apex of the longest projection of the median sclerite.

Some features of female genitalia have been found to vary. The setae along the dorsolateral margin of the external valve of the gonapophyses in most of the specimens examined are similar to those figured for the holotype. In some individuals, however, the setae extend further along the margin towards the base of the gonapophyses. The number of setae on the apical margin of the dorsal valve varies between 4 and 7, most specimens having only 4. The extent of the bilobed apex of the subgenital plate also varies (depending on the nature of the preparation) to the extent that, in some cases, the apical margin is transverse.

P. pamae differs from *P. tillyardi* in possessing the short lateral longitudinal endophallic sclerite within the phallosome, in coloration, particularly noticeable in the legs, and in possessing small eyes (*P. tillyardi* IO:D - ♀ 2.8, ♂ 1.0). Micropterous and brachypterous females of *P. tillyardi* are thus far unknown. This locally widespread species was found in most vegetation types.

Etymology. Named for Pamela Gaulke, for her friendship and generous hospitality while ERS was in Tasmania.

Peripsocus tillyardi New

Peripsocus tillyardi New, 1973a: 343.

Material examined. Many individuals collected throughout the year.

Distribution. Tasmania, Bass Strait Is, Victoria and New South Wales.

Remarks. This locally widespread species was commonly found in dry coastal scrub and dry forest.

Trichopsocidae

Trichopsocus Kolbe

Trichopsocus Kolbe, 1882a: 25. Type species: *Caecilius hirtellus* McLachlan.

Trichopsocus clarus (Banks)

Caecilius clarus Banks, 1908: 258.

Trichopsocus clarus (Banks). --- Lienhard, 1998: 276.

Trichopsocus australis Edwards, 1950: 119. --- Smithers, 2002: 155.

Material examined. Cataract Gorge, Launceston, *Acacia melanoxylon*, 1♀, 22 July 1986.

Distribution. Cosmopolitan.

Remarks. This species has been collected in Victoria by ERS.

Pseudocaeciliidae

Key to Tasmanian genera of Pseudocaeciliidae

1. Tarsi three-segmented 2
- Tarsi two-segmented 3
2. Fore wing with setae on basal veins in single rank
..... *Howeanum* Smithers
- Fore wing with setae on basal veins in two ranks
..... *Austropsocus* Smithers
3. Fore wing vein *m* two-branched, hind wing veins lacking setae
..... *Mepleres* Enderlein
- Fore wing vein *m* three-branched, setae on apical veins of hind wing 4
4. Fore wing veins with setae sited on dark spots
..... *Cladioneura* Enderlein
- Fore wing veins with setae not sited on dark spots 5
5. Body pale, fore wing hyaline
..... *Choroecaecilius* Li Fasheng
- Body dark, fore wing with strong pattern
..... *Heteroecaecilius* Lee and Thornton

Austropsocus Smithers

Austropsocus Smithers, 1962: 930. Type species: *Austropsocus insularis* Smithers.

Key to Tasmanian species of Austropsocus

1. Fore wing with setae on apical veins in single rank
..... *viridis* (Enderlein)

- Fore wing with setae on apical veins in two or more ranks 2
- 2. Fore wing vein *rs* strongly arched, bearing setae in more than two ranks *sinuosus* (Banks)
- Fore wing vein *rs* only slightly curved, bearing setae in two ranks 3
- 3. Maxillary palp buff, apical segment dark brown; male hind tibiae swollen; antennae normal
..... *tibialis* Thornton and New
- Apical segment of maxillary palp no darker than other segments; hind tibiae of male normal; antennae of male with basal flagellar segment much thicker and darker than other segments *antennalis* Thornton and New

Austropsocus antennalis Thornton and New

Austropsocus antennalis Thornton and New, 1977: 24.

Material examined. **Site** 35A, 1♂, 20 Feb 87; 1♀, 6 June 87; **site** 36, 1♂, 21 Feb 87; **site** 119B, 5♀, 22 Feb 88; **site** 139, 1♂, 24 Feb 88; **site** 177, 1♀, 18 June 87; **site** 366E, 2♀, 1 nymph, 16 Feb 88.

Distribution. Tasmania, Bass Strait Is, Victoria, New South Wales and Queensland.

Remarks. *A. antennalis* was taken from dead *Eucalyptus* foliage in wet forest.

Austropsocus sinuosus (Banks)

Zelandopsocus sinuosus Banks, 1939: 441.

Austropsocus sinuosus. --- Thornton and New, 1977: 28.

Material examined. Many individuals collected from March to September.

Distribution. Tasmania, Flinders I (Bass Strait), Victoria, New South Wales, Queensland and South Australia.

Remarks. This autumn–winter locally widespread species was taken from dead *Eucalyptus* foliage of dry and wet forests, dead foliage of mixed forest and some *Nothofagus*.

Austropsocus tibialis Thornton and New

Austropsocus tibialis Thornton and New, 1977: 30.

Austropsocus tibialis. --- Cole et al., 1989: 33.

Austropsocus hyalinus Thornton and New. Cole et al., 1989: 33.

Material examined. **Site** 20, 2♀, 22 May 86; **site** 138, 1♀, 12 June 87; **site** 183, 1♀, 11 Nov 86; 1♀, 17 June 87; **site** 186, 1♂, 27 July 87; **site** 193C, 1♀, 17 June 87; **site** 258, 2♀, 26 Mar 87; 1♀, 27 Apr 87; **site** 269, 16♀, 6♂, 2 nymphs, 1 Mar 88; **site** 272, 1♀, 3 nymphs, 2 Mar 88; **site** 277, 11♀, 5♂, 2 Mar 88; **site** 280A, 1♂, 25 Mar 87; 1♀, 27 Apr 87; 1♀, 22 May 87; 1♀, 29 July 87; **site** 291, 1♂, 4 Mar 88; **site** 294B, 1♀, 2♂, 4 Mar 88.

Distribution. Tasmania, Flinders I (Bass Strait), Victoria, New South Wales and Queensland.

Remarks. Examination of material recorded as *Austropsocus hyalinus* from Flinders I, Bass Strait (Cole et al., 1989) has shown an error in identification. The specimens are conspecific

with Victorian and Tasmanian material of *A. tibialis*. Apart from an isolated southeastern site this essentially autumn species (March to July) was found in northern Tasmania, predominantly in the northwestern Tarkine region, where it was taken from dead foliage of wet and mixed forests, and rainforest (*Nothofagus*).

Austropsocus viridis (Enderlein)

Philotarsus viridis Enderlein, 1903: 309.

Austropsocus viridis. --- Thornton and New, 1977: 32.

Material examined. **Site** 38A, 5♀, 2♂, 2 nymphs, 1 Oct 86; **site** 40, 12♀, 5♂, 10 nymphs, 30 Sep 86; 1♀, 23 Apr 87; **site** 184, 1♂, 27 Aug 86; 3♀, 7♂, 1 nymph, 15 June 87.

Distribution. Tasmania, Victoria, New South Wales and Queensland.

Remarks. Apart from some exotic vegetation at Launceston this species was collected only at Hobart.

Chorocaecilius Li Fasheng

Chorocaecilius Li Fasheng, 2000: 20. Type species: *Heterocaecilius diogenes* Lee and Thornton.

Chorocaecilius brunellus (Tillyard)

Caecilius brunellus Tillyard, 1923: 188.

Pseudocaecilius brunellus. --- Lee and Thornton, 1967: 111.

Heterocaecilius diogenes Lee and Thornton, 1967: 109.

Heterocaecilius brunellus. --- New, 1974a: 69.

Chorocaecilius diogenes. --- Li Fasheng, 2000: 20.

Chorocaecilius brunellus. --- Lienhard and Smithers, 2002: 301.

Material examined. Many individuals collected throughout the year.

Distribution. Tasmania, Bass Strait Is, Victoria, New South Wales and New Zealand.

Remarks. *C. brunellus* was most common on *Nothofagus*, but was numerous and taken on many occasions from mixed forest, wet scrub, dry forest and dry coastal scrub (particularly *Melaleuca ericifolia*) habitats. The species is locally widespread.

Cladioneura Enderlein

Cladioneura Enderlein, 1906: 404. Type species: *Cladioneura pulchripennis* Enderlein.

Cladioneura pulchripennis Enderlein

Cladioneura pulchripennis Enderlein, 1906: 405.

Material examined. Many individuals collected throughout the year.

Distribution. Tasmania, Bass Strait Is, Victoria and New South Wales.

Remarks. This species was found in several types of vegetation, particularly from low vegetation sites of heath and scrub (dry and wet) and also from rainforest (*Nothofagus*). *C. pulchripennis* is locally widespread.

Heterocaecilius Lee and Thornton

Heterocaecilius Lee and Thornton, 1967: 13. Type species: *Heterocaecilius minotus* Lee and Thornton.

Heterocaecilius lachlani (Enderlein)

Pseudocaecilius lachlani Enderlein, 1903: 263.

Heterocaecilius lachlani. --- Schmidt and Thornton, 1993: 179.

Material examined. Many individuals collected from January to September.

Distribution. Tasmania, Flinders I (Bass Strait), Victoria and New South Wales.

Remarks. With the exception of exotic vegetation at Mt Field NP (site 321A) all individuals of this species were collected from northeastern Tasmania. Essentially restricted to the coast *H. lachlani* was found from Friendly Beaches to Asbestos Range NP, predominantly at sites at Eddystone Point and in Mt William NP. *H. lachlani* was taken from heath and coastal scrub, and *Casuarina stricta*.

Howeanum Smithers

Howeanum Smithers, 1995: 4. Type species: *Howeanum huberi* Smithers.

Key to Tasmanian species of *Howeanum*

1. Endophallic sclerites of phallosome basally narrow
..... *costale* (Thornton and New)
- Endophallic sclerites of phallosome basally broad (female unknown) *tasmaniensis* sp. nov.

Howeanum costale (Thornton and New)

Austropsocus costalis Thornton and New, 1977: 36.

Howeanum costale. --- Schmidt and Smithers, 2004: 14.

Material examined. **Site** 57, 1♀, 18 Feb 88; **site** 60, 1♀, 18 Feb 88; **site** 164B, 1♀, 19 Apr 87; **site** 207, 1♀, 20 May 87; **site** 246, 1♀, 1♂, 2 nymphs, 24 Aug 86; 15♀, 2♂, 25 Oct 86; 5♀, 2♂, 4 nymphs, 24 Jan 87; 16♀, 3♂, 1 Mar 87; 1♀, 30 July 87; 3♀, 2♂, 3 Mar 88; **site** 251, 1♀, 24 Jan 87; **site** 252B, 8♀, 1♂, 1 nymph, 24 Jan 87; 1♀, 1 Mar 87; 1♂, 4 nymphs, 30 July 87; **site** 253, 1♀, 23 Oct 86; **site** 255, 1♂, 1 nymph, 27 June 87; **site** 353, 2♀, 1♂, 21 Mar 88.

Distribution. Tasmania, Bass Strait Is, Victoria, New South Wales and Queensland.

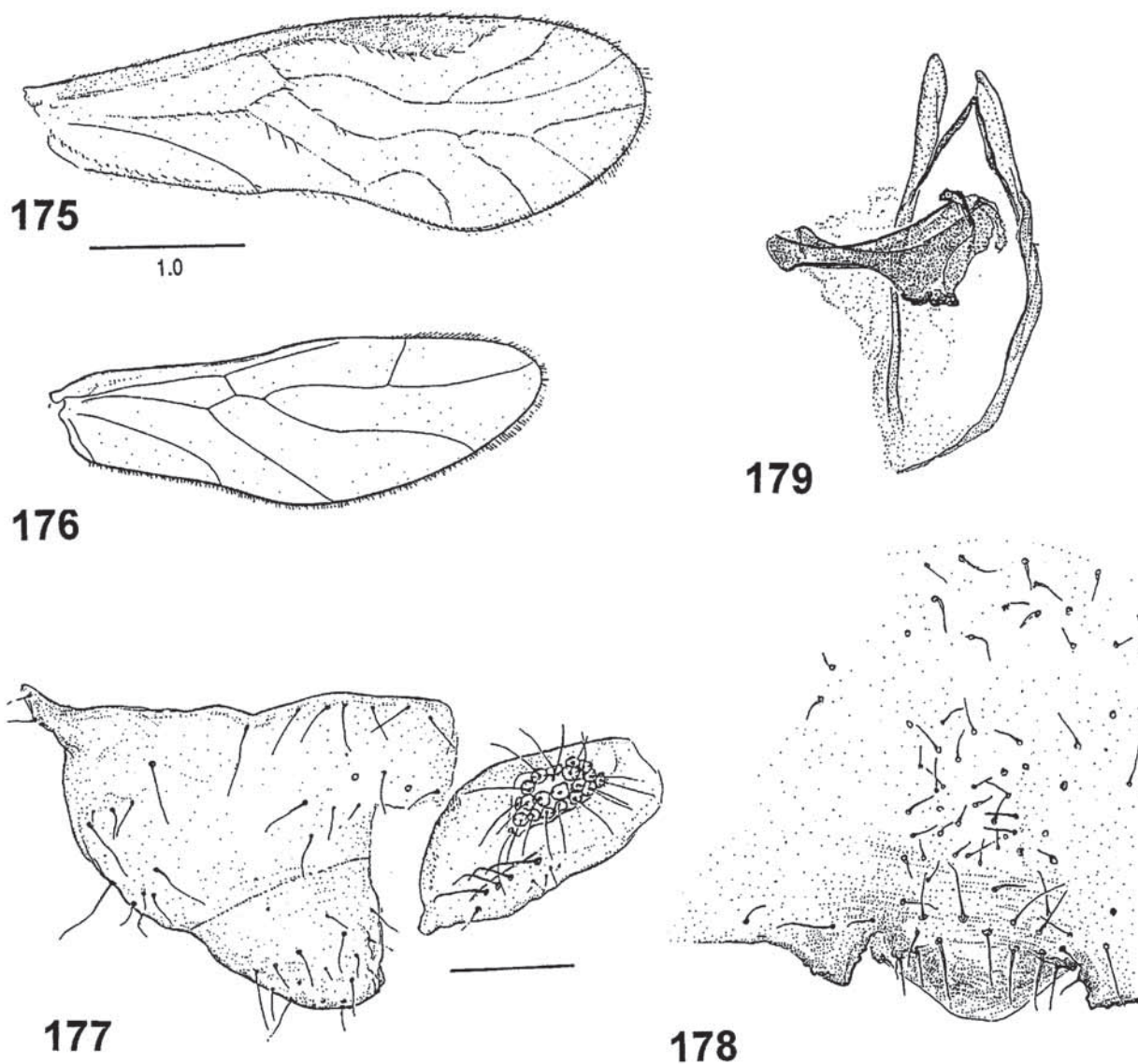
Remarks. This species was mainly found in coastal scrub (dry and wet) and in the heath understorey of *Eucalyptus* and *Banksia serrata*.

Howeanum tasmaniensis sp. nov.

Figures 175–79

Material examined. Holotype ♂: Tasmania, Mt Maurice walking track, *Eucalyptus* foliage, 10 Nov 1986.

Description of male. *Coloration* (after ca 7 years in alcohol, slightly teneral). Creamy-buff, with barely discernible darker



Figures 175-179. *Howeanum tasmaniensis*. Male: 175, fore wing; 176, hind wing; 177, epiproct and paraproct; 178, hypandrium; 179, phallosome. Figures 175, 176 and 177-179 to common scales.

markings dorsal to eyes, along each side of median epicranial suture and on postclypeus, striae converging towards pale midline. Ocelli with dark brown centripetal margins. Eyes black. Fore wing (fig. 175) and hind wing (fig. 176) hyaline.

Morphology. IO:D = 3.0. Eyes small, below level of vertex when looking at side of head. Head and thorax glossy. Median epicranial suture not distinct. Postclypeus not bulbous. Flagellar segments bearing dense long thin setae, sensory placoids distributed as follows: 2 small, somewhat apart near base of f_1 , 1 at apex of f_4 , 1 near apices f_6 and f_{10} ; those of f_6 and f_{10} bearing a long slender filament. Surface of flagellar segments very

undulating, more prominent on apical segments. Terminal segment with elongated narrow apex. Fore wing (fig. 175): setae in single rank on veins; posterior margin of pterostigma bearing 2 ranks; vein cu_2 glabrous; veins rs and m joined by a short cross-vein. Hind wing (fig. 176) margin bearing long setae around apex to vein m , remainder of posterior margin bearing alternating setae of short and intermediate length. Claw lacking subapical tooth, pulvillus broad. Rasp and mirror of Pearman's organ well developed. Epiproct and paraproct (fig. 177), latter with round field of 18 trichobothria. Hypandrium (fig. 178) with a large median and on each side smaller apical lateral lobes.

Phallosome (fig. 179) with pair of endophallic sclerites basally broad.

Dimensions. B 2.2, FW 3.66, HW 2.95, F 0.54, T 1.11, t_1 0.379, t_2 0.071, t_3 0.079, rt 5.3:1:1.1, ct 16.0:0, f_1 0.632, f_2 0.355.

Female. Unknown.

Remarks. *Howeanum tasmaniensis* is similar to *H. costale* in the fore wing veins bearing a single rank of setae. It differs from *H. costale* in the shape of the endophallic sclerites – being basally narrow in *H. costale* and basally broad in *H. tasmaniensis*.

Etymology. From Tasmania.

Mepleres Enderlein

Mepleres Enderlein, 1926: 61. Type species: *Mepleres maeandricus* Enderlein.

Key to Tasmanian species of *Mepleres*

1. Body pale, fore wing hyaline *rotundatus* (New)
- Body dark, fore wing with strong pattern
..... *tanei* (Smithers)

Mepleres rotundatus (New)

Pseudoscottiella rotundata New, 1974a: 67.

Meniscopsocus rotundatus. --- Li Fasheng, 1993: 382

Mepleres rotundatus. --- Yoshizawa, 2000: 674.

Material examined. Many individuals collected occasionally throughout the year.

Distribution. Tasmania, Victoria and New South Wales.

Remarks. This species was found only on *M. insulare* and *A. melanoxyton* at some sites in eastern, northern and northwestern Tasmania.

Mepleres tanei (Smithers)

Pseudoscottiella tanei Smithers, 1977: 279.

Meniscopsocus tanei. --- Li Fasheng, 1993: 382

Mepleres tanei. --- Yoshizawa, 2000: 674.

Material examined. **Site** 35A, 3♀, 20 Feb 87; **site** 46, 1♀, 3 Nov 86; **site** 159B, 1♀, 23 Mar 87.

Distribution. Tasmania, Victoria and New South Wales.

Philotarsidae

Key to Tasmanian genera of Philotarsidae

1. Antenna flagellar segments uniformly pigmented 2
- Antenna flagellar segments with white apices
..... *Aaroniella* Mockford
2. Fore wing vein cu_2 bare 3
- Fore wing vein cu_2 setose *Philotarsopsis* Tillyard
3. Fore wing with strong pattern *Abelopsocus* gen. nov.
- Fore wing hyaline *Haplophallus* Thornton

Aaroniella Mockford

Aaroniella Mockford, 1951: 102. Type species: *Elipsocus maculosus* Aaron.

Aaroniella rawlingsi Smithers

Aaroniella rawlingsi Smithers, 1969: 324.

Material examined. Many individuals collected from January to August.

Distribution. Southern Australia and New Zealand.

Remarks. This locally widespread species was taken from a range of habitats including dry forest, dry coastal scrub, heath and some rainforest. It was absent in spring and early summer.

Abelopsocus gen. nov.

Diagnosis. Belonging to the Philotarsidae Pearman (1936) as defined by Thornton (1981). Fore wing: slipper-shaped, strongly pigmented, vein cu_2 glabrous. Hind wing: with slight pigmented regions, particularly around posterior margin; vein cu_1 glabrous; veins r_{4+5} and m setose. Female antennae: flagellar segments long, slender; setae on segments short, sparse and uniform in length; terminal segment with long apical seta. Male antennae: flagellar segments long, slender; setae on segments very long; terminal segment lacks both the attenuated apex and the long apical seta. Subgenital plate lobe bearing small apical setae. Dorsal valve of gonapophyses sub-rectangular, external valve trianguloid. Hypandrium incipiently bilobed posteriorly. Phallosome simple, frame ovoid without sclerites.

Type species: *Latrobiella fenestrata* Schmidt and Thornton.

Remarks. Thornton (1981) applied principal co-ordinates analysis on selected characters to identify groups of philotarsid species, which subsequently formed the basis for establishing *Latrobiella*. The two New Zealand species, *Aaroniella parda* Thornton, Wong and Smithers and *Aaroniella basipunctata* Thornton, Wong and Smithers, did not associate consistently with any group. Thornton placed both species in *Latrobiella*, regarding them as aberrant members of the genus. Along with the recently described *Latrobiella fenestrata* and a new species here described below they now appear to form a close-knit species group within *Philotarsopsis* (of which *Latrobiella* is a synonym). The four species possess features in common contrasting them from other species within the genus. The fore wings are strongly pigmented, and vein cu_2 glabrous. The flagellar segments of the antennae are long and slender. In contrast, other species of *Philotarsopsis* possess nearly hyaline fore and hind wings, and vein cu_2 of the fore wing is setose. The antennae are shorter and segments thicker. The setae on the female flagellar segments vary in length and thickness, those of the male are short, dense and uniform. On the terminal segment both sexes possess an attenuated apex with a long apical seta.

Of the four species, *parda* is the most distinctive as it possesses antennal segments with white apices and the female has an attenuated apex (as does *basipunctata*) on the terminal segment. The subgenital plate lobe has two long apical setae, and the external valve of the gonapophyses is oval. The

hypandrium apex is smoothly rounded. Both *fenestrata* and *basipunctata* have fore wing setae sited on dark spots, but in the latter species the spots are only in the basal half of the wing. The Chilean species *P. cruciclypeus* (New and Thornton) has features which place it between the two groups of species. The female antennal apex is attenuated, bearing a long seta (New and Thornton 1981: 165, fig. 58 – noted incorrectly as the apical segment of male antenna) and the flagellar setae appear uniform and short. The flagellar setae of the male (New and Thornton 1981: 165, fig 57 – noted incorrectly as the apical segment of the female antenna) are long, the apex not attenuated but bearing a long seta. The lengths of the 2 basal flagellar segments suggest the antenna is long and slender. Vein cu_2 is glabrous, but the fore wing is not pigmented. On the balance of diagnostic features however, *cruciclypeus*, along with *parda*, *basipunctata*, and *fenestrata*, are here formally transferred to *Abelopsocus*.

Etymology. The generic name is a combination of the name Abel, after the Dutch seafarer, explorer, and merchant Abel Tasman, and *Psocus*, a genus of Psocidae.

Abelopsocus basipunctatus (Thornton, Wong and Smithers) comb. nov.

Aaroniella basipunctata Thornton, Wong and Smithers, 1977: 204.

Latrobiella basipunctata. --- Thornton, 1981: 433.

Philotarsopsis basipunctata. --- Lienhard and Smithers, 2002: 334.

Distribution. New Zealand.

Abelopsocus cruciclypeus (New and Thornton) comb. nov.

Haplophallus cruciclypeus New and Thornton, 1981: 164.

Latrobiella cruciclypeus. --- Thornton, 1981: 433.

Philotarsopsis cruciclypeus. --- Lienhard and Smithers, 2002: 334.

Distribution. Chile.

Abelopsocus pardus (Thornton, Wong and Smithers) comb. nov.

Aaroniella parda Thornton, Wong and Smithers, 1977: 201.

Latrobiella parda. --- Thornton, 1981: 434.

Philotarsopsis parda. --- Lienhard and Smithers, 2002: 336.

Distribution. New Zealand.

Key to Tasmanian species of *Abelopsocus*

1. Fore wing setae sited on dark spots
..... *fenestratus* (Schmidt and Thornton)
- Fore wing setae not sited on dark spots
..... *truganinia* sp. nov.

Abelopsocus fenestratus (Schmidt and Thornton) comb. nov.

Latrobiella fenestrata Schmidt and Thornton, 1993: 188.

Philotarsopsis fenestrata. --- Lienhard and Smithers, 2002: 335.

Material examined. **Site** 130, 1♀, 20 Apr 87; **site** 159A, 1♂, 5 June 86; 1♀, 2♂, 11 July 86; 1♂, 9 Aug 86; 1♀, 1♂, 12 Sep 86; 1♀, 1 nymph, 8 Nov 86; 1♀, 6 nymphs, 7 Dec 86; 1♂, 4 nymphs, 18 Jan 87; 1♀, 2 nymphs, 5 Feb 87; 1♂, 1 nymph, 23 Mar 87; 1♂, 19 Apr 87; 1♂, 25 July 87; 1♀, 1 nymph, 23 Feb 88; **site** 159C, 1♀, 12 May 87; **site** 194B, 1♀, 1 nymph, 17 June 87; **site** 246, 1♂, 26 Mar 87; **site** 258, 1♀, 27 Apr 87; **site** 268, 2♂, 1 nymph, 1 Mar 88; **site** 281, 1♂, 1 nymph, 24 Oct 86; 2♀, 26 Jan 87; 2♂, 25 Mar 87; 2♀, 1♂, 27 Apr 87; 1♀, 1♂, 22 May 87.

Distribution. Tasmania and Victoria.

Remarks. This species, which was found throughout the year, was taken mainly from two very different habitats: *Casuarina stricta* (site 159A) and a rainforest consisting predominantly of *Phyllocladus asplenifolius* and *Anodopetalum biglandulosum* (site 281).

Abelopsocus truganinia sp. nov.

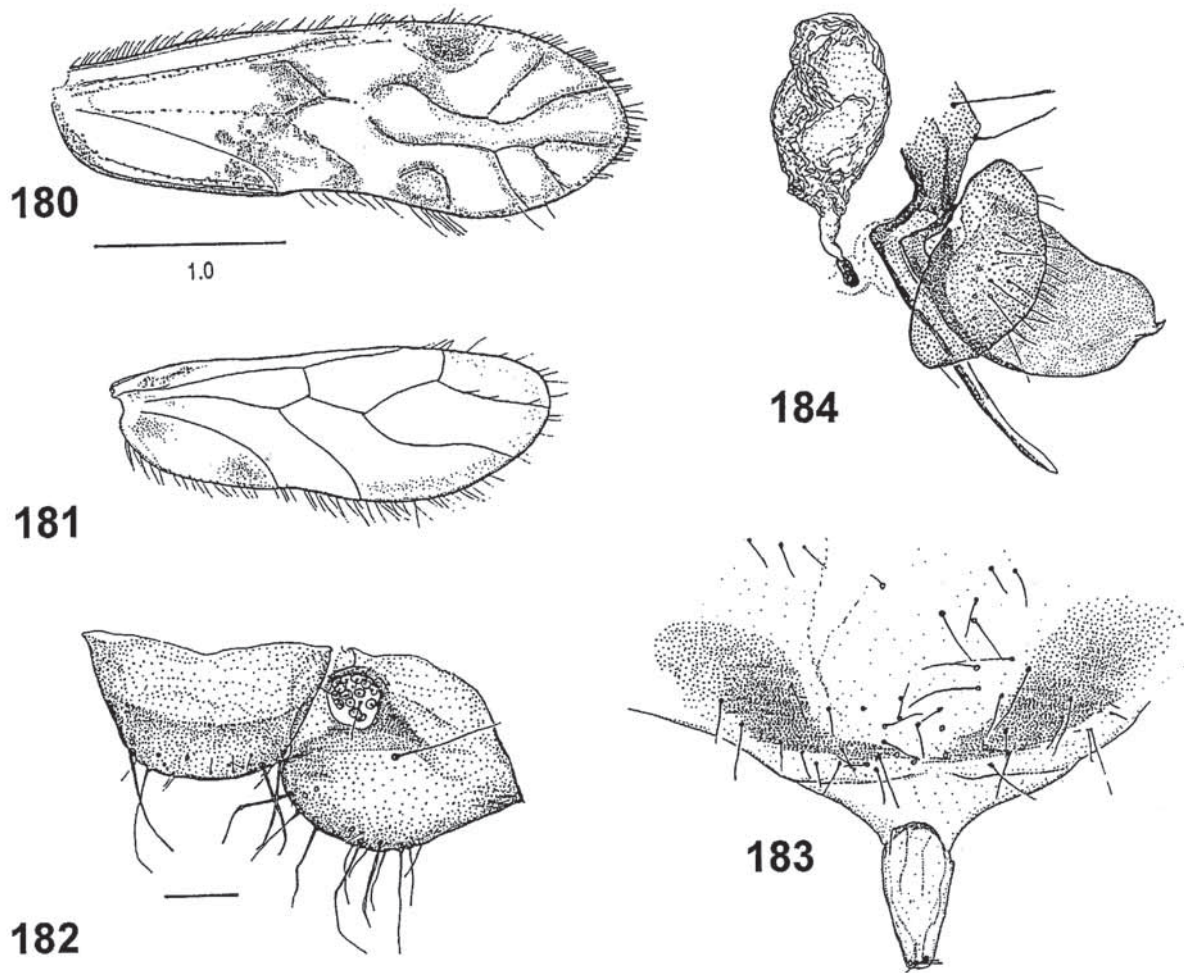
Figures 185–94

Latrobiella sp. B. Coy et al., 1993: 77.

Material examined. Holotype ♀: Tasmania, Mt Field National Park, dead rainforest foliage, 3 Apr 1987. Paratype ♂: dead rainforest foliage, 3 Mar 1988. Additional records: **Site** 10, 2♀, 21 Nov 86; **site** 18, 1♀, 18 Nov 86; **site** 175, 1♀, 26 Apr 87; **site** 209, 1♀, 17 Apr 87; 1♀, 20 May 87; **site** 281, 1♀, 25 Nov 86; 1♀, 22 May 87; **site** 360, 2♀, 4 nymphs, 24 Mar 88; Big Sassy Ck, Site 1, PKD Sassafras, 2♀, 9 nymphs, 12 May 89 (J. Diggle); Big Sassy Ck, Site 2, PKD Sassafras, 2♀, 12 nymphs, 12 May 89 (P. Greenslade).

Description of female. *Coloration* (after ca 6 years in alcohol). Ground colour buff, with the following dark brown: round patch on each side of vertex, surrounded by markings (some confluent) dorsal to eyes, across back of vertex and along each side of median epicranial suture; squarish patch centrally on frons extending from median ocellus to epistomal suture; postclypeal striae converging towards midline; markings adjacent to posterior margin of gena; basal half of anteclypeus; labrum; apical segment of maxillary palp; antenna. Greyish-brown markings as follows: short band extending from eye to anterior margin of antennal socket; band extending from lateral ocellus along lateral epicranial arm, not reaching preceding band; patch on each side of frons between mid-line and antennal socket. Ocelli pale, with blackish centripetal margins. Eyes black. Fore wing with brown pigmented areas (fig. 185). Hind wing (fig. 186) hyaline, with pale brown band around posterior margin, cell cu_2 brown. Thorax dark brown, sutural areas buff. Legs with coxae dark brown, femora and tibia buff, tarsi brown. Abdomen buff, with extensive greyish-brown annulations. Terminal segments dark brown.

Morphology. IO:D = 3.0. Distal margin of labrum bearing 11 sensilla, each lateral sensillum posterior to remaining sensilla, anterior margin of outer surface with distinct row of 4 sensilla. Epistomal suture present; clypeal shelf absent, however narrow remnant appears present on lateral margins of epistomal suture. Lacinia with large apical lateral projection. Head with reticulate pattern, surface slightly granulated. Patch centrally on frons anterior to median ocellus with large polygonal-shaped cells, not granulated, and in cross-section the apically round margins protrude beyond the surface. Vertex and frons bearing scattered



Figures 180-184. *Philotarsopsis hellyeri*. Female: 180, fore wing; 181, hind wing; 182, epiproct and paraproct; 183, subgenital plate; 184, gonapophyses and spermathecal sac. Figures 180, 181 and 182-184 to common scales.

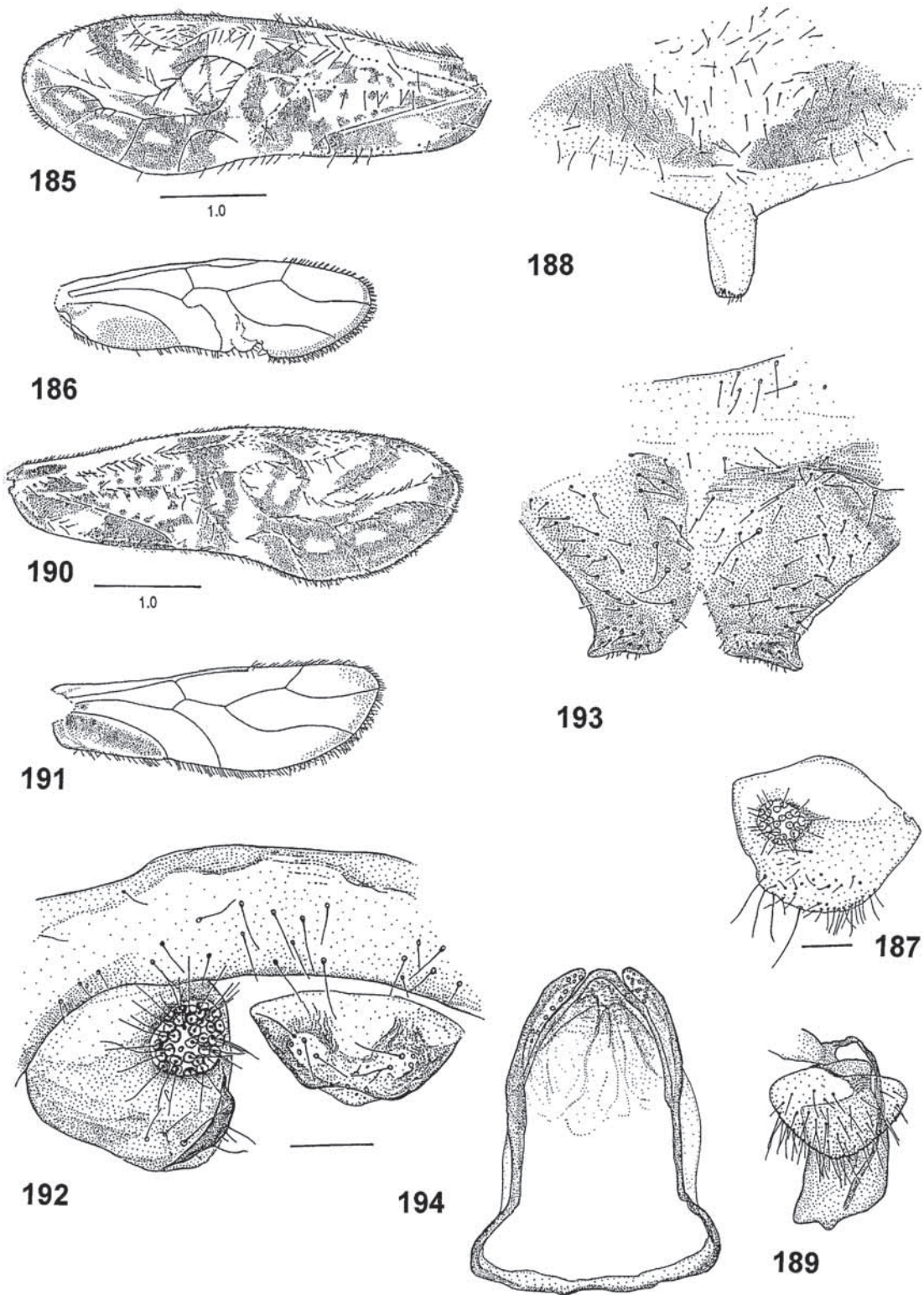
thick large setae, these associated with smaller fine setae on postclypeus. Gena with small region of small fine setae. Antennae with very slender flagellar segments bearing small sparse setae, these becoming longer in apical segments. Ten flagellar segments present, f_{10} and f_{11} fused. Placoid sensilla distributed as follows: 2 base f_1 , 1 apex f_4 . Trichoid sensillum near apex of f_6 and near centre of f_{10} , each bearing a long slender filament. Terminal segment narrowing apically, not attenuated, bearing long apical seta. Fore wing (fig. 185): basal veins bearing 2 ranks of long thick setae, staggered in arrangement; vein cu_2 glabrous; medial and radial veins, and vein cu_{1b} bearing a single rank of long thick setae, and a second rank of short fine setae. Two setae on membrane basally in cell R_5 , 3 setae basally in cell M_3 . Pterostigma granular, strongly setose. Setae on hind wing (fig. 186) veins: r_1 2 (small), rs 0, r_{2+3} 0, r_{4+5} 16, m 11, cu_1 0; those on r_{4+5} and m in 2 ranks. Both wings densely covered by microtrichia. Claw with subapical tooth, pulvillus fine with expanded tip. Rasp

and mirror of Pearman's organ well developed. Epiproct setose in apical half. Paraproct (fig. 187) with round field of 24 trichobothria. Subgenital plate (fig. 188) apical sclerite bearing 11 small setae on distal margin, anteriorly diverging pigmented arms well developed. Gonapophyses (fig. 189): ventral valve long, slender, apically with recurrent spinelets; dorsal valve with sclerotised basal bar, rudimentary spine on distal margin apically rounded, bearing recurrent spinelets; external valve subtriangular, rounded posteriorly, setose.

Dimensions. B 2.8, FW 4.19, HW 2.95, F 0.65, T 1.27, t_1 0.395, t_2 0.079, t_3 0.103, rt 5:1:1.3, ct 17.0, f_1 0.466, f_2 0.419.

Description of male. Coloration. (after ca five years in alcohol). As female. Fore wing (fig. 190), hind wing (fig. 191) hyaline except for slight apical shading and darkened anal field.

Morphology. IO: D = 2.5. Eyes below level of vertex when looking at side of head. Antenna flagellar segments thicker,



Figures 185-194. *Abelopsocus truganinae*. Female: 185, fore wing; 186, hind wing; 187, paraproct; 188, subgenital plate; 189, gonapophyses. Figures 185, 186 and 187-189 to common scales. Male: 190, fore wing; 191, hind wing; 192, epiproct and paraproct; 193, hypandrium; 194, phallosome. Figures 190, 191 and 192-194 to common scales.

and flagellar setae much longer than those in female. Segments f_{10} and f_{11} fused as in female. Distribution of sensilla as in female except base of f_1 bearing 1 placoid. Terminal segment not attenuated, apex lacking large seta. Fore wing (fig. 190) as in female, except setae on membrane basally in cell M_3 absent. Setae on hind wing (fig. 191) veins: r_1 3, rs 0, r_{2+3} 0, r_{4+5} 21, m 16, cu_1 0; those on r_{4+5} and m in 2 ranks. Epiproct (fig. 192) with pair of lobes, each bearing 4/5 long setae and 1 small seta. Paraproct (fig. 192) with round field of 33 trichobothria and 2 setae not in rosettes. Hypandrium (fig. 193) basally incised, apically emarginate with a pair of bluntly pointed curved hooks. Phallosome (fig. 194): frame anteriorly transverse; endophallus consisting of median and lateral pairs of membranous lobes.

Dimensions. B 2.7, FW 2.98, HW 2.98, F 0.63, T 1.32, t_1 0.442, t_2 0.087, t_3 0.103, rt 5.1:1:1.2, ct 18.0:0, f_1 0.750, f_2 0.608.

Remarks. *A. truganinia* can be distinguished from *A. fenestratus* by the fore wing setae not being sited on dark spots, and in the form of the male epiproct; from *A. pardus* in the form of the subgenital plate, male epiproct and hypandrium; from *A. basipunctatus* in the fore wing pigmentation, and in the form of the male epiproct and hypandrium. *A. truganinia* is essentially a rainforest species that was taken in November and in the autumn months.

Etymology. Named for Truganini, considered to be the last surviving full-blood indigenous person from Tasmania.

Haplophallus Thornton

Haplophallus Thornton, 1959: 336. Type species: *Haplophallus orientalis* Thornton.

Haplophallus sinus Thornton and New

Haplophallus sinus Thornton and New, 1977: 20.

Material examined. Many individuals collected throughout the year.

Distribution. Tasmania, Bass Strait Is, Victoria, New South Wales and Queensland.

Remarks. Essentially confined to the coastal rim of Tasmania. *H. sinus* was very common in dry forest, dry coastal scrub and heath.

Philotarsopsis Tillyard

Philotarsopsis Tillyard, 1923: 182. Type species: *Philotarsopsis delicata* Tillyard.

Latrobiella Thornton, 1981: 433. --- Lienhard and Smithers, 2002: 334.

Key to Tasmanian species of *Philotarsopsis*

1. Rudimentary spine of dorsal valve of gonapophyses with sharply pointed apex, basal portion of spermathecal duct sclerotised (males unknown) *hellyeri* sp. nov.
- Rudimentary spine of dorsal valve of gonapophyses with rounded apex, basal portion spermathecal duct membranous 2

2. Line of dark pigment from ocellar protuberance to antennal socket; pigment on prothorax distinctly darker than that on mesothorax; areola postica less than one third covered with brown cloud, fore wing fascia distinct *paraguttata* (Thornton and New)
- No dark line from antennal socket to ocellar protuberance; prothorax no darker than mesothorax; areola postica at least two-thirds covered with brown cloud, fore wing fascia broken or indistinct *guttata* (Tillyard)

Philotarsopsis guttata (Tillyard)

Philotarsis guttatus Tillyard, 1923: 181.

Philotarsopsis delicatus Tillyard, 1923: 182.

Philotarsis greyi Edwards, 1950: 116.

Haplophallus guttatus. --- Smithers, 1969: 322.

Latrobiella guttata. --- Thornton, 1981: 433.

Philotarsopsis guttata. --- Lienhard and Smithers, 2002: 335.

Latrobiella lemsidia Thornton and New. Cole et al., 1989: 34.

Material examined. Many individuals collected from January to July.

Distribution. Tasmania, Bass Strait Is, all mainland states (except Northern Territory) and New Zealand.

Remarks. This species was collected mainly in dry and wet forests with an understorey of sclerophyllous shrubs. Examination of the material recorded as *Latrobiella lemsidia* from the Bass Strait Is (Cole et al., 1989) shows this material to be conspecific with Victorian and Tasmanian specimens of *Philotarsopsis guttata*.

Philotarsopsis hellyeri sp. nov.

Figures 180–84

Material examined. Holotype ♀: Tasmania, Cradle Mtn, Cradle Valley above Weindorfers grave, 41°38'S 145°57'E, fogging *Nothofagus cunninghamii*, 25 Feb 1990 (R. Coy, P. Lillywhite, A. Yen). Twenty-five ♀ paratypes: same data as holotype (MV).

Description of female. *Coloration* (after ca 3 years in alcohol). Head ground colour buff, with the following dark brown: confluent markings dorsal to eyes, along back of vertex and along each side of blackish median epicranial suture; large patch centrally on frons, extending to include background of ocelli; ring surrounding antennae base; lateral margins of postclypeus; basal half of anteclypeus; labrum; apical segment of maxillary palp. Gena buff ventrally, merging brown dorsally. Scape and pedicel dark brown, basal flagellar segment light brown, apically merging dark brown, remainder of flagellar segments dark brown. Ocelli pale, centripetal margins blackish. Eyes black. Fore wing (fig. 180) with brown markings, veins dark brown, membrane with pale brown tinge. Hind wing (fig. 181) membrane with pale brown tinge. Thorax dark brown, sutural areas pale on dorsa. Legs with coxa dark brown, femur and tibia pale brown, tibia merging brown apically, tarsi dark brown. Abdomen buff, terga with lateral grey-brown annulations, terminal segments dark brown.

Morphology. IO:D = 2.9. Distal margin of labrum bearing 11 sensilla, each lateral sensillum posterior to remaining sensilla, anterior margin of outer surface with distinct row of

four sensilla. Epistomal suture present, clypeal shelf absent, but narrow remnant appears present on lateral margins of epistomal suture. Lacinia with apical lateral projection larger than median. Postclypeal striae not distinct. Vertex of head with obvious reticulate pattern, surface of head strongly granulated except patch of polygonal cells centrally on frons anterior to median ocellus. Vertex, frons and gena bearing setae of two lengths, one short and narrow, the other thick and very long. Postclypeus bearing short narrow setae. Antennae flagellar segments bearing setae of differing lengths, placoid sensilla distributed as follows: 1 base f_1 , 1 apex f_4 . Trichoid sensillum near apices of f_6 and f_{10} , each bearing a long slender filament. Terminal segment apically attenuated, bearing large apical seta. Fore wing (fig. 180) veins, including cu_2 , bearing single rank of large setae. Medial and radial veins, and vein cu_{1b} bearing a second rank of shorter fine setae. Costa adjacent to pterostigma strongly thickened. Setae on hind wing (fig. 181) veins: r_1 1, rs 0, r_{2+3} 0, r_{4+5} 10 (2 ranks), m 12 (2 ranks), cu_1 1. Both wings with microtrichia on margins and membranes. Ninth tergite with central reticulate field of polygonal cells. Epiproct (fig. 182) with 2 large setae at each posterolateral margin. Paraproct (fig. 182) with round field of 13–17 trichobothria. Subgenital plate (fig. 183): lobe elongated, narrowing posteriorly, apex with 4–5 small setae; pigment band extending into pair of anteriorly diverging arms. Gonapophyses (fig. 184): ventral valve long, slender; dorsal valve broad with sclerotised basal bar, rudimentary spine apically pointed; external valve transverse, posterior margin shallowly rounded, setose. Spermathecal sac (fig. 184) membranous, basal portion of duct sclerotised.

Dimensions. B 3.0, FW 2.83, HW 2.18, F 0.63, T 1.17, t_1 0.427, t_2 0.071, t_3 0.111, rt 6:1:1.5, ct 12.0/0, f_1 0.411, f_2 0.253.

Male. Unknown.

Remarks. This species, found only on *Nothofagus* from Cradle Valley, is similar to *P. guttata* and *P. paraguttata* in the pigmentation of the fore wing. *P. hellyeri* differs from these two species in lacking distinct postclypeal striae converging towards a pale midline, in the shape of both the apical spine on the dorsal valve and the external valve of the gonapophyses, and in possessing a sclerotised basal portion on the spermathecal duct.

Etymology. Named for Henry Hellyer, an early surveyor and explorer in Tasmania.

Philotarsopsis paraguttata (Thornton and New)

Haplophallus paraguttata Thornton and New, 1977: 8.

Latrobiella paraguttata. --- Thornton, 1981: 433.

Philotarsopsis paraguttata. --- Lienhard and Smithers, 2002: 336.

Material examined. Many individuals collected from February to June.

Distribution. Tasmania, Victoria, New South Wales and Queensland.

Remarks. This locally widespread species was collected in similar habitats to *P. guttata*.

Elipsocidae

Key to Tasmanian genera of Elipsocidae

1. Tarsi two-segmented 2
 - Tarsi three-segmented 3
2. Macropterous or micropterous
 - *Villopsocus* Schmidt and New
 - Apterous *Paedomorpha* Smithers
3. Ventral valve of gonapophyses very short (males unknown)
 - *Paedomorpha* Smithers
 - Ventral valve of gonapophyses long and slender (males known) 4
4. Small pores in female fore wings; dorsal valve spine longer than apex of lobe; hypandrium margin round
 - *Gondwanapsocus* Schmidt and New
 - Female fore wings without pores; apex of dorsal valve lobe and spine about equal in length; hypandrium margin transverse or laterally lobed 5
5. Fore wing with single rank of setae on basal veins, pulvillus broad 6
 - Fore wing with two ranks of setae on basal veins, pulvillus narrow 7
6. Macropterous, fore wing vein *m* five-branched
 - *Pentacladus* Enderlein
 - Macropterous, brachypterous or micropterous, fore wing vein *m* three-branched *Propsocus* McLachlan
7. Antenna segments with white apices; clypeal shelf narrow; eyes small and round
 - *Diademadrilus* Schmidt and New
 - Antenna segments uniformly pigmented; clypeal shelf broad; eyes large and ovoid 8
8. Subgenital plate lacking apical setae; aedeagal arch of phallosome with apical “clawed” projections
 - *Onychophallus* Schmidt and New
 - Subgenital plate with pair of apical setae; apex of aedeagal arch of phallosome lacking “clawed” projections
 - *Telmopsocus* Schmidt and New

Diademadrilus Schmidt and New

Diademadrilus Schmidt and New, 2004a: 164. Type species: *Spilopsocus annulatus* Smithers.

Diademadrilus masseyi (New)

Spilopsocus masseyi New, 1971: 226.

Diademadrilus masseyi. --- Schmidt and New, 2004a: 164.

Material examined. Many individuals collected throughout the year.

Distribution. Tasmania, Bass Strait Is, Victoria, New South Wales and South Australia.

Remarks. This species is restricted to coastal sites in northern, northwestern and northeastern Tasmania. On the east coast it is found as far south as Freycinet National Park. It was taken only in dry coastal scrub and heath.

Gondwanapsocus Schmidt and New

Gondwanapsocus Schmidt and New: 2004a: 166. Type species: *Gondwanapsocus australis* Schmidt and New.

Gondwanapsocus australis Schmidt and New

Gondwanapsocus australis Schmidt and New, 2004a: 167.

Material examined. **Site** 353, 1♂, 21 Mar 88; **site** 356, 2♂, 18 Mar 88; **site** 364A, 1♂, 15 Feb 88; **site** 364B, 1♂, 15 Feb 88; **site** 364C, 1♂, 15 Feb 88; **site** 365B, 1♂, 15 Feb 88; **site** 366B, 2♂, 16 Feb 88.

Distribution. Tasmania.

Remarks. Confined to coastal vegetation on the southern coast of Tasmania.

Onychophallus Schmidt and New

Onychophallus Schmidt and New, 2004a: 167. Type species: *Onychophallus diemenensis*.

Onychophallus diemenensis Schmidt and New

Onychophallus diemenensis Schmidt and New, 2004a: 169.

Material examined. Many individuals collected from October to February.

Distribution. Tasmania.

Remarks. Most common on *Nothofagus* and rainforest conifers this early summer species was taken in October as nymphs only. At the type locality (site 75A) adults were taken only in November (site not sampled in December) but nymphs, presumed to be of this species, were collected from July to October. By January at this site adults were not found but again nymphs, this time presumably of *Telmopsocus*, were taken.

Paedomorpha Smithers

Paedomorpha Smithers, 1963: 32. Type species: *Paedomorpha gayi* Smithers.

Paedomorpha gayi Smithers

Paedomorpha gayi Smithers, 1963: 32.

Material examined. Queens Domain, Hobart, loose bark on eucalypt, 11♀, 17 April 1968 (V. V. Hickman).

Distribution. Tasmania, Victoria, New South Wales, Western Australia and New Zealand.

Remarks. This species has been recorded previously from this locality in Tasmania. Although Queens Domain was sampled on several occasions no additional material was collected during this study.

Pentacladus Enderlein

Pentacladus Enderlein, 1906: 408. Type species: *Pentacladus eucalypti* Enderlein.

Pentacladus eucalypti Enderlein

Pentacladus eucalypti Enderlein, 1906: 408.
! *Pentacladus eucalypti*. --- Cole et al., 1989: 34.

Material examined. Many individuals collected throughout the year.

Distribution. Tasmania, Victoria, New South Wales, Queensland, South Australia and New Zealand.

Remarks. *P. eucalypti* was found from September to May, but dead *Eucalyptus* foliage was not sampled from June to August. The species has been collected previously in May, June, August and September (Edwards, 1950) in Tasmania, and therefore appears to be present all year. It is locally widespread and known from both dry and wet forests. Closer examination of the Flinders I (Bass Strait) material of this species reveals marked differences in the shape of the apex of the aedeagal arch of the phallosome. The size, coloration and details of female genitalia are similar to those of *P. eucalypti*. The material represents a new undescribed species of *Pentacladus*.

Propsocus McLachlan

Propsocus McLachlan, 1866: 352. Type species: *Psocus pallipes* McLachlan.

Key to Tasmanian species of *Propsocus*

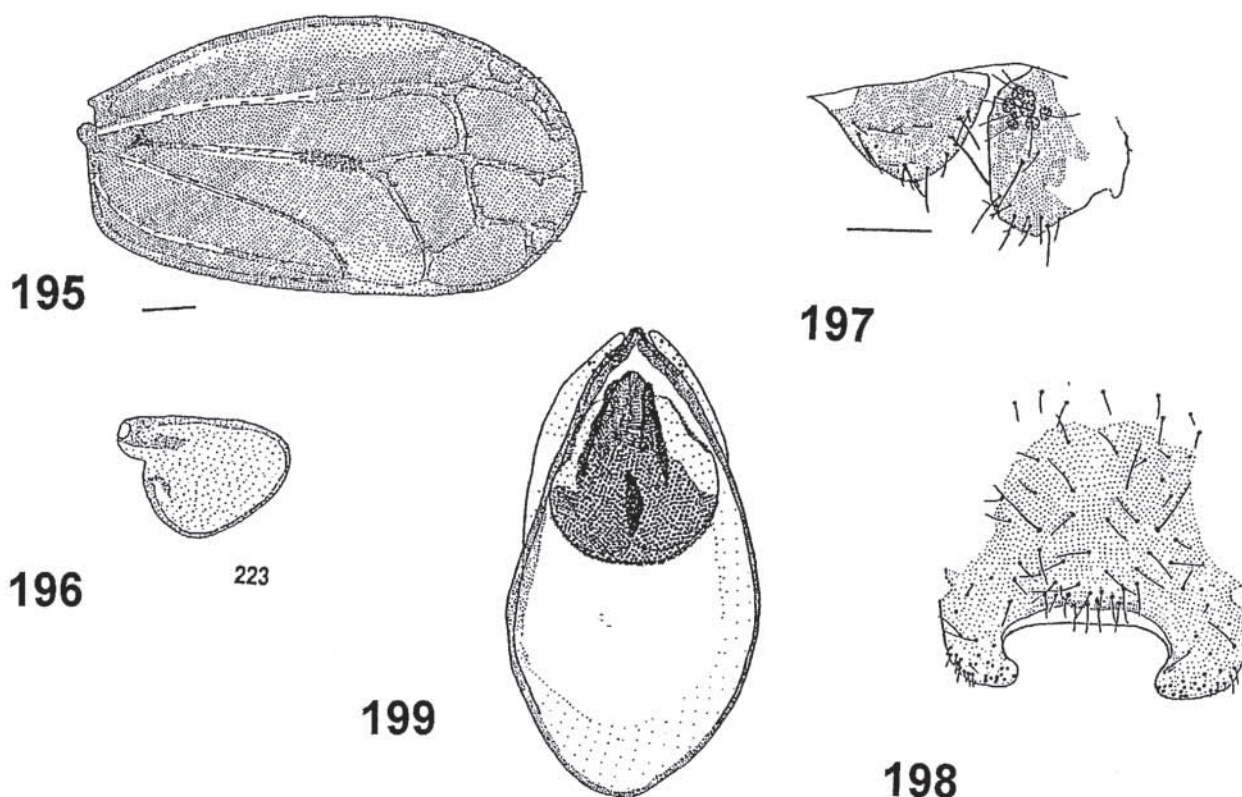
1. Hyandrium with transverse margin (gonapophyses with broad, well developed membranous break between inner sclerotised margin of dorsal valve and external valve)
..... *pallipes* McLachlan
- Hyandrium with lateral lobes 2
2. Aedeagus of phallosome with mucronate apex (gonapophyses with narrow, somewhat incipient membranous break between inner sclerotised margin of dorsal valve and external valve) *pulchripennis* (Perkins)
- Aedeagus of phallosome lacking mucronate apex (females unknown) *frodshami* sp. nov.

***Propsocus frodshami* sp. nov.**

Figures 195–99

Material examined. Holotype ♂: Tasmania, Central Plateau, near Projection Bluff, 1200 m, 41°44'S 146°42'E, Suction, 27 April 1988 (L. Hill). Additional record: 1♂, Mt William National Park, sedge, 11 July 1986.

Description of male. *Coloration* (after ca 5 years in alcohol). Vertex brown, with dark brown elongated spots on each side of median epicranial suture, along back of vertex and dorsal to eyes, these fusing into band extending anteriorly around eye and merging with dark brown gena. Ocelli pale, brown ocellar region with narrow dark brown surround. Narrow band along lateral epicranial suture dark brown. Frons brown, with dark brown median stirrup mark. Epistomal suture dark brown.



Figures 195-199. *Propsocus frodshami*. Male: 195, fore wing; 196, hind wing; 197, epiproct and paraproct; 198, hypandrium; 199, phallosome. Figures 195, 196 and 197-199 to common scales.

Postclypeal striae dark brown, merging at midline, striae originating short distance anteriorly of epistomal suture, leaving narrow brown posterior postclypeal margin. Anteclypeus pale. Labrum dark brown. Maxillary palpi brown. Scape, pedicel and basal flagellar segment of antenna pale brown, remaining segments brown. Eyes black. Fore wing (fig. 195) brown, basal veins hyaline over most of their length. Hind wing (fig. 196) with brown tinge. Prothorax pale, meso- and meta-thorax dark brown. Legs: procoxa pale, meso- and metacoxa dark brown; femora, tibiae and basal tarsus pale, mid and apical tarsal segments brown. Abdomen pale brown, terminal segments brown.

Morphology. IO:D = 3.0. Distal margin of labrum bearing 11 sensilla, anterior margin of outer surface with distinct row of 4 sensilla. Lacinia usual for genus, outer tine larger than median. Epistomal suture present, clypeal shelf broad. Head and thorax glossy. Frons tall. Majority of setae clothing head lost in preparation. Sockets on vertex and frons fairly sparse, those of postclypeus smaller and slightly denser. Setae on gena short and fine. Surface of head finely granular. Stirrup-mark on frons consisting of large polygonal cells, not granulated. Apex of terminal segment incipiently mucronate. Distribution of placoid sensilla: 2 base f_1 , 1 apices f_4 , f_6 and f_{10} ; those of f_6 and f_{10} each

bearing a short slender filament. Brachypterous. Fore wing (fig. 195): veins bearing single rank of setae; vein cu_2 setose; setae of single rank on inner margin of costa around apical margin. Hind wing (fig. 196) rudimentary, lacking setae. Marginal scales of wings of low relief, bluntly pointed at distal ends. Tarsi 3-segmented, claw with incipient subapical tooth, pulvillus broad. Rasp and mirror of Pearman's organ well developed. Epiproct (fig. 197) semicircular, setose. Paraproct (fig. 197) with field of 8/9 trichobothria. Hypandrium (fig. 198) lateral lobes apically medially directed, apices bearing very short setae. Phallosome (fig. 199): frame broad; sclerotised arms of aedeagal arch short, bearing small tubercles; endophallus similar to that of *Pentacladus eucalypti* Enderlein.

Dimensions. B 2.2, FW 0.96, HW 0.24, F 0.66, T 1.09, t_1 0.332, t_2 0.079, t_3 0.095, rt 4.2:1:1.2, ct 7.0,0, f_1 0.569, f_2 0.521.

Female. Unknown.

Remarks. In possessing a bilobed hypandrium and a phallosome apex bearing small tubercles this species resembles *P. pulchripennis*. The apex of the aedeagal arch of *P. pulchripennis* is mucronate with small tubercles, differing from that of *P. frodshami*, which has a small transverse apex with small tubercles extending anteriorly along the arms of the inner

parameres. The form of the endophallus also differs between the two species. *P. frodshami* is larger than *P. pulchripennis*.

Etymology. Named for Thomas Frodsham, an early surveyor and explorer in Tasmania.

Propsoocus pallipes (McLachlan)

Psocus pallipes McLachlan, 1866: 349.

Propsoocus pallipes. --- McLachlan, 1866: 352.

Material examined. **Site** 66, 1♀, 2♂, 4 Sep 86; 3♀, 30 Oct 86; **site** 74, 1♂, 18 Mar 87; **site** 98, 2♀, 1♂, 1 nymph, 11 Sep 86; **site** 99, 9♀, 19♂, 2 nymphs, 10 Oct 86.

Distribution. All Australian states including Victoria (unpublished) except Northern Territory.

Remarks. This species was found mainly on dead *Eucalyptus* foliage only in dry forests. Additional collecting is required to determine the phenology of this species.

Propsoocus pulchripennis (Perkins)

Stenopsocus pulchripennis Perkins, 1899: 83.

Propsoocus pulchripennis. --- Zimmerman, 1957: 179.

Material examined. **Site** 16A, 2♀, 1♂, 26 Feb 87; **site** 87, 1♂, 16 Jan 87; **site** 104, 1♀, 22 Mar 87; 1♂, 21 Apr 87; **site** 107, 1♀, 1♂, 4 Feb 87; 7♀, 5♂, 22 Mar 87; **site** 139, 1♂, 18 Jan 87; **site** 185, 1♀, 22 July 86; **site** 200A, 1♀, 18 Apr 87; **site** 200B, 1♂, 18 Apr 87; **site** 268, 1♀, 1 nymph, 28 Feb 88.

Distribution. Cosmopolitan.

Remarks. This species was taken from several sites but not from dead *Eucalyptus* foliage. Apart from a single individual in July this species was found only from January to April.

Telmopsocus Schmidt and New

Telmopsocus Schmidt and New, 2004a: 174. Type species: *Telmopsocus waldheimensis* Schmidt and New.

Telmopsocus waldheimensis Schmidt and New

Telmopsocus waldheimensis Schmidt and New, 2004a: 174.

Material examined. Many individuals collected from February to July.

Distribution. Tasmania.

Remarks. As noted above under *Onychophallus*, nymphs of this species may have been taken in January at one site. It is more common than *Onychophallus* and occurs in many of the same sites, but is found in late summer and autumn.

Villopsocus Schmidt and New

Villopsocus Schmidt and Thornton, 2004a: 176. Type species: *Villopsocus tasmaniensis* Schmidt and New.

Villopsocus tasmaniensis Schmidt and New

Villopsocus tasmaniensis Schmidt and New, 2004a: 177.

Distribution. Tasmania.

Remarks. Previously recorded from Tasmania (Schmidt and New, 2004a), this species was not found during this study.

Psocidae

Key to Tasmanian genera of Psocidae

1. Pterostigma of fore wing elongate, narrow *Tanystigma* Smithers
- Pterostigma of fore wing normal 2
2. Phallosome frame posteriorly open, dorsal valve of gonapophyses with rudimentary apical spine* *Blaste* Kolbe
- Phallosome frame closed, dorsal valve of gonapophyses with apical spine well developed 3
3. Phallosome with apical pair of double spines, subgenital plate lobe with lateral pair of pigmented bands *Clematostigma* Enderlein
- Phallosome lacking apical pair of double spines, subgenital plate lobe medially uniformly pigmented *Ptycta* Enderlein

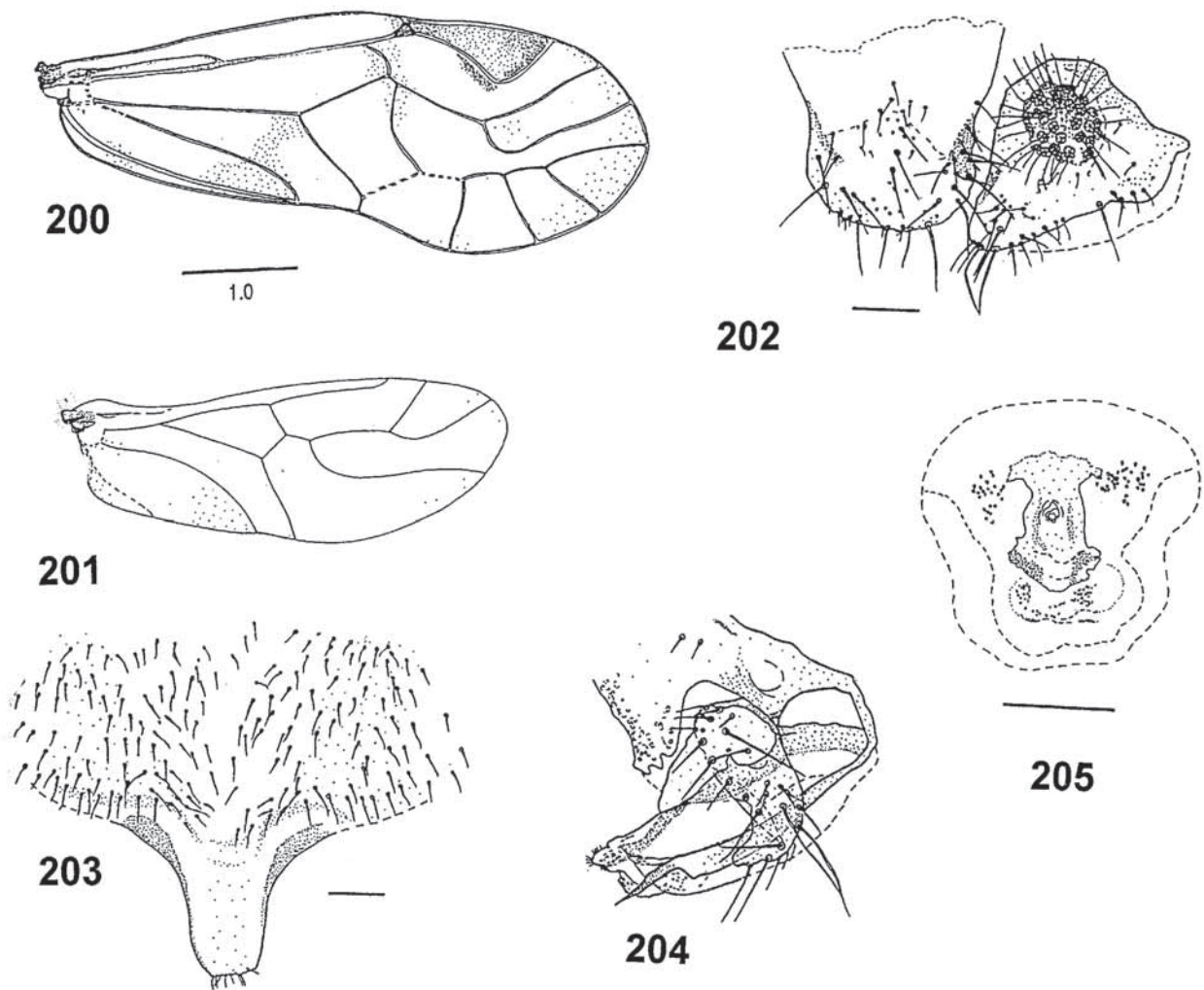
* The apical spine on the dorsal valve of the gonapophyses of *Blaste lignicola* (Enderlein) is well developed.

Blaste Kolbe

Blaste Kolbe, 1883b: 79. Type species: *Blaste juvenilis* Kolbe.

Key to Tasmanian species of Blaste

1. Male epiproct with lateral anteriorly directed lobes, dorsal flap absent; subgenital plate with sinuous row of preapical setae *lignicola* (Enderlein)
- Male epiproct lacking anteriorly directed lobes, dorsal flap present; subgenital plate lacking row of preapical setae 2
2. Hypandrium lacking lateral “horns”; subgenital plate lobe short, apical margin emarginate *panops* Smithers
- Hypandrium with conspicuous lateral “horns”; subgenital plate lobe well developed, apical margin rounded or transverse 3
3. Hypandrium with median tongue and longitudinal ridges with apical group of spines; anterior pigmented arms of subgenital plate not divergent *taylori* New
- Hypandrium with rounded median apex; anterior pigmented arms of subgenital plate divergent 4
4. Fore wing with apical brown bands *bistriata* Schmidt and Thornton
- Fore wing lacking strong apical pattern 5



Figures 200-205. *Blaste falcifer*. Female: 200, fore wing; 201, hind wing; 202, epiproct and paraproct; 203, subgenital plate; 204, gonapophyses; 205, spermathecal plate. Figures 200, 201 and 202 and 204 to common scales.

Clematostigma maculiceps (Enderlein)

Copostigma maculiceps Enderlein, 1903: 231.

Clematostigma maculiceps. --- Enderlein, 1906: 403.

Material examined. **Site** 115B, 1♀, 1♂, 22 Feb 88; **site** 152A, 1♀, 4♂, 10 nymphs, 23 Feb 88; **site** 175, 1♀, 26 Apr 87; **site** 177, 2♀, 3♂, 10 nymphs, 18 Mar 87; 1♀, 26 Apr 87; **site** 179A, 2♀, 10♂, 18 Mar 87; **site** 180A, 1♂, 18 Mar 87; **site** 200A, 1♀, 2♂, 8 nymphs, 18 Apr 87; **site** 200C, 8 nymphs, 18 Apr 87; **site** 207, 1♀, 17 Apr 87; **site** 248A, 11♀, 8♂, 24 Jan 87.

Distribution. Tasmania, Flinders I (Bass Strait), Victoria and New South Wales.

Remarks. This species was collected from January to April on the northern plains and slopes predominantly from wet forest. It was also taken at two coastal localities (Eddystone Point and Sisters Beach) from *Casuarina stricta* and *Banksia serrata*.

Ptycta Enderlein

Ptycta Enderlein, 1925: 102. Type species: *Psocus haleakalae* Perkins.

1. Hypandrium with asymmetrical tongue, ventral valve of gonapophyses long and slender 2
- Hypandrium lobes symmetrical, ventral valve of gonapophyses short 6
2. Antedorsum and dorsa of mesothorax dark brown
..... *colei* sp. nov.
- Antedorsum and dorsa of mesothorax pale 3
3. ♀ IO:D = 3.0, ♂ IO:D = 2.2
..... *australis* Schmidt and Thornton

- ♀ IO:D = 2.0-2.4, ♂ IO:D = 1.3-1.5 4
- 4. Head with brown and mauve markings
..... *freycineti* sp. nov.
- Head with brown markings 5
- 5. Pterostigma of fore wing pigmented in apical third, not extending basally past apex where spur-vein originates
..... *glossoptera* New
- Pterostigma of fore wing pigmented in apical half, extending basally past apex where spur-vein originates
..... *pallawahensis* sp. nov.
- 6. Fore wing hyaline (except pterostigma), male paraproct with rugose basal region *emarginata* New
- Fore wing with brown patches (except pterostigma), male paraproct lacking rugose basal region 7
- 7. Phallosome incompletely closed; epiproct with narrow elongated anterior projection; female fore wing with brown band medially in cell Cu_2 *umbrata* New
- Phallosome completely closed; epiproct with broad semi-circular anterior projection; female fore wing lacking brown band medially in cell Cu_2
..... *campbelli* Schmidt and Thornton

Ptycta australis* Schmidt and ThorntonPtycta australis* Schmidt and Thornton, 1993: 201.*Ptycta glossoptera* New. Cole et al., 1989: 34.*Ptycta* sp. A. Cole et al., 1989: 34.

Material examined. Many individuals collected from November to August.

Distribution. Tasmania, Bass Strait Is and Victoria.

Remarks. Examination of the Bass Strait material (Cole et al., 1989) shows that records of *Ptycta glossoptera* New (males only) and *Ptycta* sp. A (females only) are of this species. The IO:D measured for males of this species by Schmidt and Thornton (1993) is incorrect; the correct value appears in the above key.

This species was found in wet scrub and heath in western, northwestern and northern regions, but on the northern coast it was taken on drier coastal scrub and heath. It was not found on the east coast south of Eddystone Point.

Ptycta campbelli* Schmidt and ThorntonPtycta campbelli* Schmidt and Thornton, 1993: 205.*Ptycta* sp. C. Cole et al., 1989: 34.*Ptycta* sp. C. G. Endersby et al., 1990: 219.

Material examined. Many individuals collected throughout the year.

Distribution. Tasmania, Bass Strait Is, Victoria and New South Wales.

Remarks. This species is the most locally widespread and common of the Psocidae in Tasmania. It appears to have little habitat specificity.

***Ptycta colei* sp. nov.**

Figures 206–13

Ptycta hollowayae Smithers. Cole et al., 1989: 34.

Material examined. Holotype ♂: Tasmania, UV light trap, open forest remnant, University of Tasmania, Hobart, 13 May 1986. Paratype ♂: same data as holotype; paratype ♀: *Bedfordia salicina*, montane grassy forest, Tunbridge-Steppes Road, 29 May 1986. Additional records: **site** 45, 1♂, 1 nymph, 5 June 87; **site** 127A, 1♀, 24 Mar 87; 1♂, 22 Feb 88; **site** 131E, 1♀, 2 nymphs, 24 Feb 88; **site** 159B, 1♂, 18 Jan 87; **site** 214A, 1♀, 2 Mar 87; 1♀, 17 Mar 87.

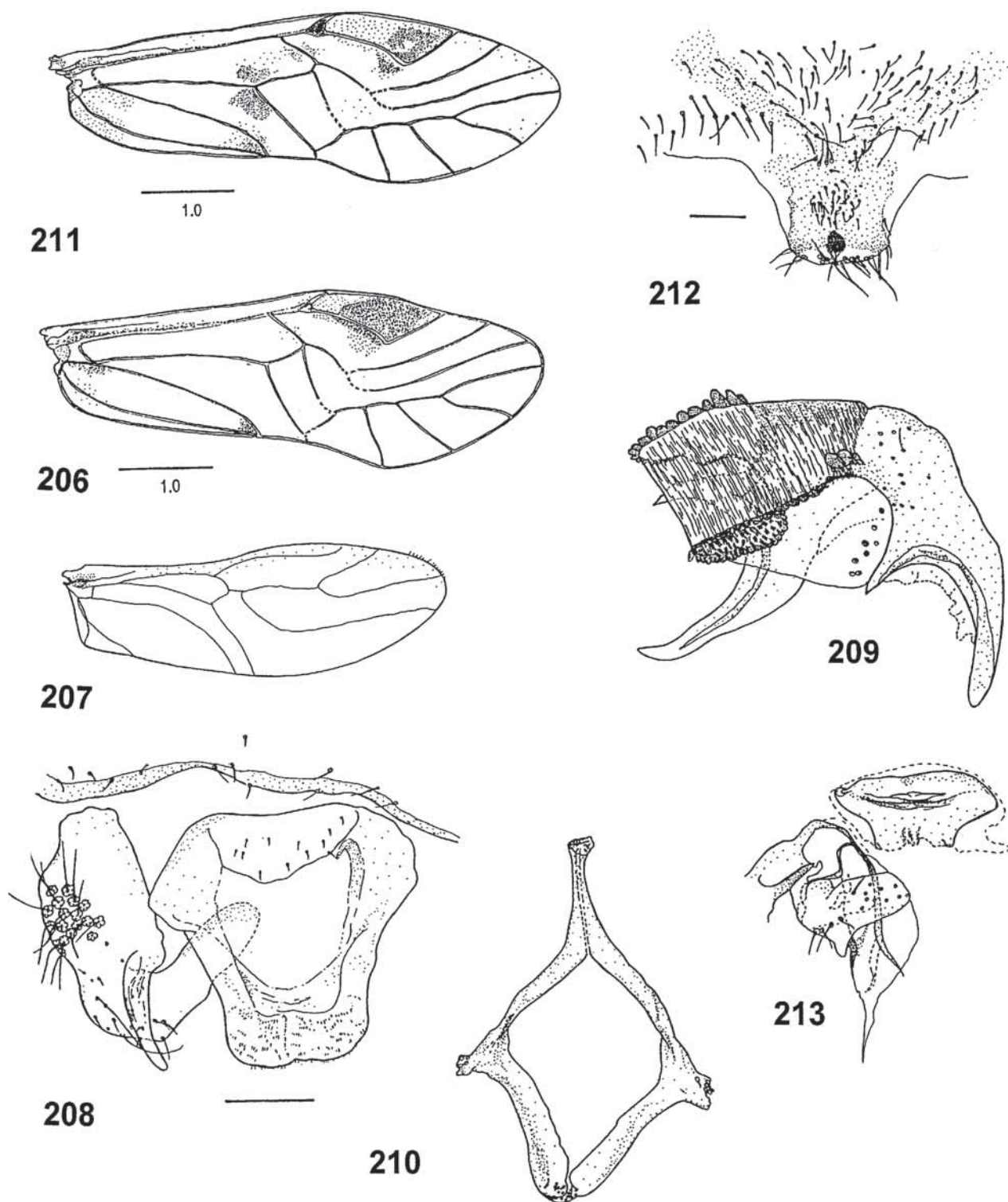
Description of male. Coloration (after ca 4.5 years in alcohol). Ground colour of head buff, with the following dark brown: markings along back of vertex, dorsal to eyes and along median epicranial suture; band along epicranial arm from ring surrounding antenna base to narrow band adjacent to lateral ocelli; stirrup mark centrally on frons; parallel striae on postclypeus; antenna; two apical segments of maxillary palp. Posterior third of anteclypeus and labrum brown. Eyes black. Ocelli pale, with black internal borders. Thorax dark brown, with paler sutural areas. Legs buff except coxa, apices of femur and tibia, tarsal segments dark brown. Fore wing (fig. 206). Hind wing (fig. 207) hyaline. Abdomen grey-brown dorsally, pale ventrally, terminal segments dark brown.

Morphology. IO:D = 1.2. Eyes large, offstanding, reaching well beyond vertex when viewed from side of head. Median epicranial suture distinct, ocelli on raised tubercle. Antennae long, finely setose, sensory placoids: 2 at base f_1 , 1 apices f_2 , f_4 and f_{10} . Apex of terminal segment bluntly pointed. Fore wing (fig. 206): few fine setae on costa in region of pterostigma; veins sparsely setose, except cu_2 ; short fine setae on basal veins as follows: posterior margin of r , scattered on vein and margin of $m+cu$, on both posterior and anterior margins of an . Both sections of vein cu_{1a} at slight angle, approximately equal in length. Pterostigma lacking spur-vein, veins rs and m joined by a short cross-vein. Hind wing (fig. 207) glabrous, except for few short fine setae on margin between veins r_{2+3} and r_{4+5} . Epiproct (fig. 208, anterior margin facing posterior direction) margin well sclerotised, anterior margin bilobed, spiculate. Paraproct (fig. 208) with large terminal spine, round field of 38 trichobothria. Hypandrium (fig. 209) with strap-like tongue, bearing row of bluntly pointed teeth along margin, these becoming smaller, with more rounded apex towards distal end of tongue; apex of tongue asymmetrically curled. Phallosome (fig. 210) frame closed, with short central lateral projections and slender elongate apex.

Dimensions. B 3.8, FW 5.10, HW 3.86, F 0.99, T 2.15, t_1 0.576, t_2 0.197, rt 2.9:1, ct 27.4, f_1 1.181, f_2 0.941.

Description of female. Coloration (after ca 4.5 years in alcohol). As male, except dark brown band along epicranial arm and ring surrounding base of antenna not as distinct. Fore wing (fig. 211).

Morphology. IO:D = 1.8. Eyes offstanding. Antennae finely pubescent, sensory placoids: 4 at base f_1 , 1 at apices f_4 , f_6 and f_{10} . Fore (fig. 211) and hind wings as male. Epiproct setose in apical half, lateral margins sclerotised. Paraproct with round field of 38 trichobothria. Subgenital plate (fig. 212) with



Figures 206-213. *Ptycta colei*. Male: 206, fore wing; 207, hind wing; 208, epiproct and paraproct; 209, hypandrium; 210, phallosome. Figures 206, 207 and 208-210 to common scales. Female: 211, fore wing; 212, subgenital plate; 213, gonapophyses and spermathecal plate. Figures 212 and 213 to common scale.

small field of preapical setae on lobe, and longer setae on body of plate. Gonapophyses and spermathecal plate (fig. 213).

Dimensions. B 4.0, FW 5.16, HW 3.98, F 1.03, T 2.33, t_1 0.624, t_2 0.229, rt 2.7:1, ct 28.4, f_1 1.286, f_2 0.941.

Distribution. Tasmania and Bass Strait Is.

Remarks. This species is most similar to *P. hollowayae* Smithers. Females differ in details of fore wing pigmentation: a triangular pigmented area bound by veins *r* and *rs* of *P. hollowayae* is absent in *P. colei*; the basal third of cell *An* is lightly pigmented in *P. colei* which appears absent in *P. hollowayae*. The pterostigma of the fore wing of males of *P. hollowayae* is uniformly pigmented. In contrast only about the apical half is pigmented in *P. colei*. *Ptycta colei* also lacks the darker clouds in the basal half of cell R_1 and apices of cells R_1 and R_3 which are present in the males of *P. hollowayae* (Smithers, 1984; fig. 70). The sclerotised process basad of the trichobothrial field of the male paraproct (Smithers, 1984; fig. 72) of *P. hollowayae* is not distinct in *P. colei*, and the basal margin of the anterior lobe of the epiproct is much more bilobed in *P. colei* than that shown for *P. hollowayae* (Smithers, 1984; fig. 71). *Ptycta colei* is a larger species, fore wing lengths vary from 4.6–5.1 mm (♀), 5.1–5.4 mm (♂). In both sexes the junction of veins *rs* and *m* in the fore wing varies from a short cross-vein to a short fusion.

Etymology. Named for Peter Cole, whose studies of the Bass Strait Psocoptera form a foundation for knowledge of this genus in the region.

***Ptycta emarginata* New**

Ptycta emarginata New, 1974b: 299.

Ptycta cornigera New, 1974b: 301. --- Smithers, 1997: 119.

Ptycta sp. M. Cole et al., 1989: 34.

Material examined. **Site** 90A, 1♂, 1♀, 20 Feb 88; **site** 90B, 5♀, 20 Feb 88; **site** 159A, 2♀, 2♂, 7 Dec 86; 1♂, 23 Mar 87; 1♀, 23 Feb 88; **site** 160, 2♀, 3♂, 23 Feb 88; **site** 252B, 1♀, 1 nymph, 29 Feb 88.

Distribution. Tasmania, Bass Strait Is, Victoria (unpublished), New South Wales and Western Australia.

Remarks. New (1974b) described both *P. emarginata* (single female) and *P. cornigera* (males only) from Western Australian material. Female specimens from Tasmania are considerably darker than the described specimen. Both sexes have a central stirrup mark on the frons, and the epicranial arm bears a broad brown band (less distinct in the female) which is not mentioned in either of the original descriptions. This species was taken only in dry coastal scrub and the heath understorey of *Banksia serrata*.

***Ptycta freycineti* sp. nov.**

Figures 214–21

Material examined. Holotype ♂: Tasmania, Cape Tourville, *Leptospermum grandiflorum*, 11 June 1987. One nymph, 2♀ and 1♂ paratypes: same data as holotype. Additional records: many individuals collected throughout the year.

Description of male. Coloration (after ca 4.5 years in alcohol). Ground colour of head buff. The following are dark brown: markings on back of vertex, dorsal to eyes and along median epicranial suture; ring surrounding antennae base; central stirrup mark on frons; parallel striae on postclypeus, these becoming obsolete anteriorly except in midline; two apical segments of maxillary palp; antennae. The following are mauve: patch each side of median epicranial suture on top of vertex; band along epicranial arm from lateral ocelli to base of antenna; small patch adjacent to epistomal suture each side of stirrup mark on frons. Labrum and anteclypeus colourless. Eyes purple-black. Ocelli pale purple, internally bordered black. Antedorsum and dorsa of mesothorax with mauve tinge, except anterior margin of antedorsum, both posterior mesad patches and margin of mesothorax dorsa, which are dark brown. Dorsa of metathorax dark brown, pleura dark brown with pale sutural areas. Legs buff except: coxa of meso- and meta-thoracic legs dark brown, femur with basally narrow and apically broader brown bands, tibia merging brown basally and apically, tarsal segments brown. Fore wing with brown pigment (fig. 214). Hind wing (fig. 215) hyaline. Abdomen brown with mauve annulations, terminal segments dark brown.

Morphology. IO:D = 1.5. Eyes large, offstanding, reaching beyond level of vertex when looking from side of head. Median epicranial suture distinct. Ocelli on raised tubercle. Antenna (type incomplete) long, slender, pubescent; sensory placoids: 3 at base f_1 , 1 at apices f_4 , f_6 and f_{10} , terminal segment bluntly rounded (from another preparation). Fore wing (fig. 214) and hind wing (fig. 215) with fine setae, veins *rs* and *m* fused for a short length. Epiproct (fig. 216) margin well sclerotised, anterior lobe transverse, spiculate. Paraproct (fig. 216) with large terminal spine and round field of 28 trichobothria, small rounded sclerotised area basad of trichobothrial field. Hypandrium (fig. 217). Phallosome (fig. 218) frame closed, with long lateral anteriorly directed projections.

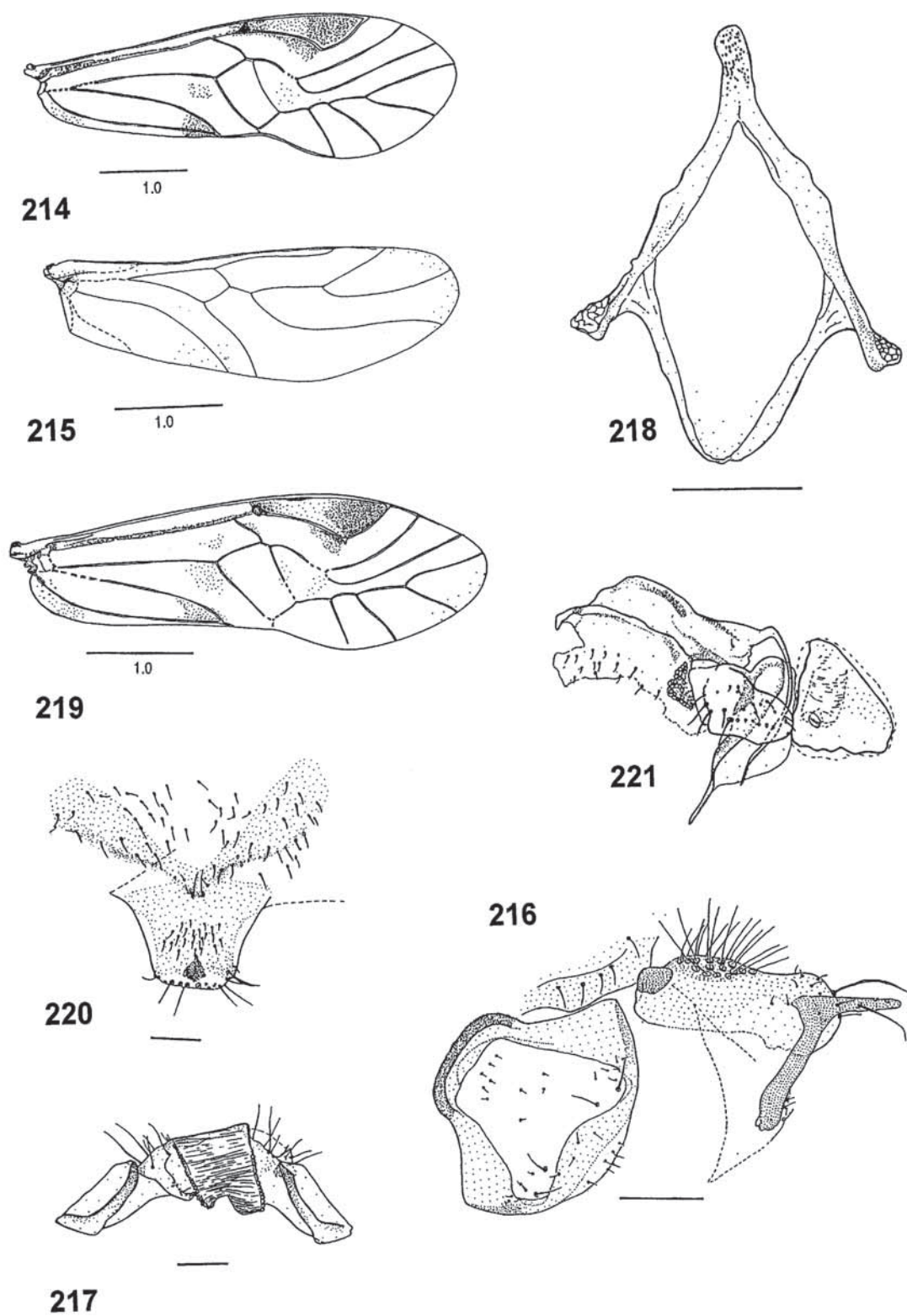
Dimensions. B 2.8, FW 4.45, HW, 3.36, F 0.83, T 1.71, t_1 0.474, t_2 0.197, rt 2.5:1, ct 23.4, f_1 1.008, f_2 0.787.

Description of female. Coloration (after ca 4.5 years in alcohol). As male, with following exceptions: apical segment of maxillary palp brown, apex darker; basal flagellar segment of antennae brown, merging to dark brown apically, remaining segments dark brown. Fore wing (fig. 219).

Morphology. IO:D = 2.2. Eyes slightly offstanding. Median epicranial suture distinct. Antennal segments (incomplete) not as thick and less setose than male, sensory placoids: 3 at base f_1 , 1 at apices f_2 , f_4 , f_6 and f_{10} . Fore wing (fig. 219) as male except incipient spur-vein present from pterostigma. Epiproct setose in apical half, lateral margins sclerotised. Paraproct with round field of 26 trichobothria. Subgenital plate (fig. 220) median lobe apically setose, with small subapical triangular sclerotisation. Gonapophyses and spermathecal plate (fig. 221).

Dimensions. B 3.2, FW 3.92, HW 3.01, F 0.77, T 1.63, t_1 0.434, t_2 0.205, rt 2.2:1, ct 20.3, f_1 0.814, f_2 0.711.

Remarks. This species is closely related to *P. glossoptera*, *P. australis* and *P. pallawahensis* (below). It can be distinguished from the former two species in details of head pattern, as both



Figures 214-221. *Ptycta freycineti*. Male: 214, fore wing; 215, hind wing; 216, epiproct and paraproct; 217, hypandrium; 218, phallosome. Female: 219, fore wing; 220, subgenital plate; 221, gonapophyses and spermathecal plate. Figures 220 and 221 to common scale.

lack the mauve pigmentation found on *P. freycineti*. Differences from *P. pallawahensis* are noted in the comments following that species description (below). The development of the spur-vein from the pterostigma on the fore wing varies from small to absent (see comments on this character under the description of *P. glossoptera*, New 1974b). Wing length varies from 3.8–4.5 mm (♂), 4.2–4.5 mm (♀). Restricted to the peninsula in which Freycinet National Park forms a large part, this species was taken from only three dry coastal scrub habitats: *Hakea epiglottis*, *Kunzea ambigua* and *Leptospermum grandiflorum*.

Etymology. Named for Louis de Freycinet, a French navigator.

***Ptycta glossoptera* New**

Ptycta glossoptera New, 1974b: 302.

!*Ptycta glossoptera*. --- Cole et al., 1989: 34.

Material examined. **Site** 194B, 4♀, 17 June 87; 1♀, 27 July 87; **site** 261B, 1♂, 26 Mar 87; 1♀, 27 Apr 87; **site** 262A, 1♀, 1 nymph, 1 Mar 87; 1♀, 21 May 87; 1♀, 1 Mar 88; **site** 263, 6♀, 2♂, 25 Jan 87; 2♀, 2♂, 2 nymphs, 1 Mar 87; 1♀, 26 June 87; 5♀, 3 nymphs, 1 Mar 88.

Distribution. Tasmania, Victoria and South Australia.

Remarks. This species was taken in dry coastal scrub (particularly *Melaleuca ericifolia*) and heath. See comments below *P. australis* (above).

***Ptycta pallawahensis* sp. nov.**

Figures 222–30

Ptycta sp. H. Coy et al., 1993: 77.

Material examined. Holotype ♂: Tasmania, Daisy Dell, *Nothofagus cunninghamii*, 2 Mar 1987. Two nymphs, 1♂ and 3♀ paratypes: same data as holotype. Additional records: many individuals collected from January to May.

Description of male. Coloration (after ca 4.5 years in alcohol). Ground colour of head buff, with the following exceptions: patches on back of vertex, dorsal to eyes and along median epicranial suture; ring surrounding antennae base; central stirrup mark on frons; parallel striae on postclypeus, becoming obsolete anteriorly except at midline; two basal segments of maxillary palp; antenna. Eyes black. Ocelli pale, internally bordered black. Labrum and anteclypeus colourless. Antedorsum and anterior half of mesothoracic dorsa buff, remainder of thorax dark brown with pale sutural areas. Legs buff except coxa of meso- and meta-thoracic legs dark brown, femora with broad brown apical band, tibiae merging brown apically, tarsal segments dark brown. Fore wing pigmented (fig. 222). Hind wing hyaline (fig. 223). Abdomen grey-brown, terminal segments dark brown.

Morphology. IO:D = 1.3. General morphology similar to *Ptycta freycineti* (above) with following exceptions: antenna sensory placoids: 2 at base f_1 , 1 at apices f_2 , f_4 , f_6 and f_{10} ; small spur-vein from pterostigma. Epiproct (fig. 224). Paraproct (fig. 224) with sclerotised region basal to round field of 42 trichobothria. Hyandrium (fig. 225) with asymmetrical tongue, bearing row of bluntly pointed teeth along margin.

Phallosome (fig. 226).

Dimensions. B 3.3, FW 4.87, HW 3.75, F 0.92, T 1.96, t_1 0.569, t_2 0.221, rt 2.6:1, ct 25.5, f_1 0.979, f_2 0.826.

Description of female. Coloration (after ca 4.5 years in alcohol). As male, with the following exceptions: apical segment of maxillary palp brown, apex darker; scape, pedicel and three quarters of basal flagellar segment of antenna buff, apical quarter merging brown, remaining segments dark brown; tibia wholly buff. Fore wing (fig. 227).

Morphology. IO:D = 2.4. Postclypeal striae less distinct than in male. General morphology similar to *Ptycta freycineti* (above). Epiproct and paraproct (fig. 228), latter with round field of 29 trichobothria. Subgenital plate (fig. 229, torn at apex) lobe bearing row of long marginal setae, thickening of the internal membrane near posterior margin elongate. Gonapophyses (fig. 230): ventral valve slender; dorsal valve broad with long narrow process; external valve transverse, setose. Spermathecal plate (fig. 230).

Dimensions. B 3.9, FW 4.28, HW 3.36, F 0.86, T 1.75, t_1 0.474, t_2 0.205, rt 2.3:1, ct 23.3, f_1 0.798, f_2 0.648.

Remarks. This species is closely related to *P. australis*, *P. glossoptera* and *P. freycineti* (all above). The pterostigma of the fore wing of *P. glossoptera* is pigmented in the apical third, and basally does not extend beyond the apex where the spur-vein originates. *P. australis* is smaller than the other species, the males having very small eyes. Some specimens of *P. pallawahensis* have traces of the mauve pigmentation mentioned in the description of *P. freycineti*, however this is slight and lacking in the majority of specimens collected. The fascia of the fore wing is broader and more extensively pigmented in females of *P. pallawahensis*. The scape, pedicel and basal flagella segment of the antennae are buff in females of this species, compared to brown in *P. freycineti*. Males of *P. pallawahensis* are larger than those of *P. freycineti*. The extent of the spur-vein from the pterostigma on the fore wing varies in males, from small to absent; in females it appears always to be present. Wing length varies marginally, 4.3–4.5 mm (♀), 4.7–5.0 mm (♂). This widespread species was taken from *Nothofagus* and in wet scrub.

Etymology. In reference to *pallawah*, an indigenous term of self reference, and the former name of the type locality prior to it being named Daisy Dell.

***Ptycta umbrata* New**

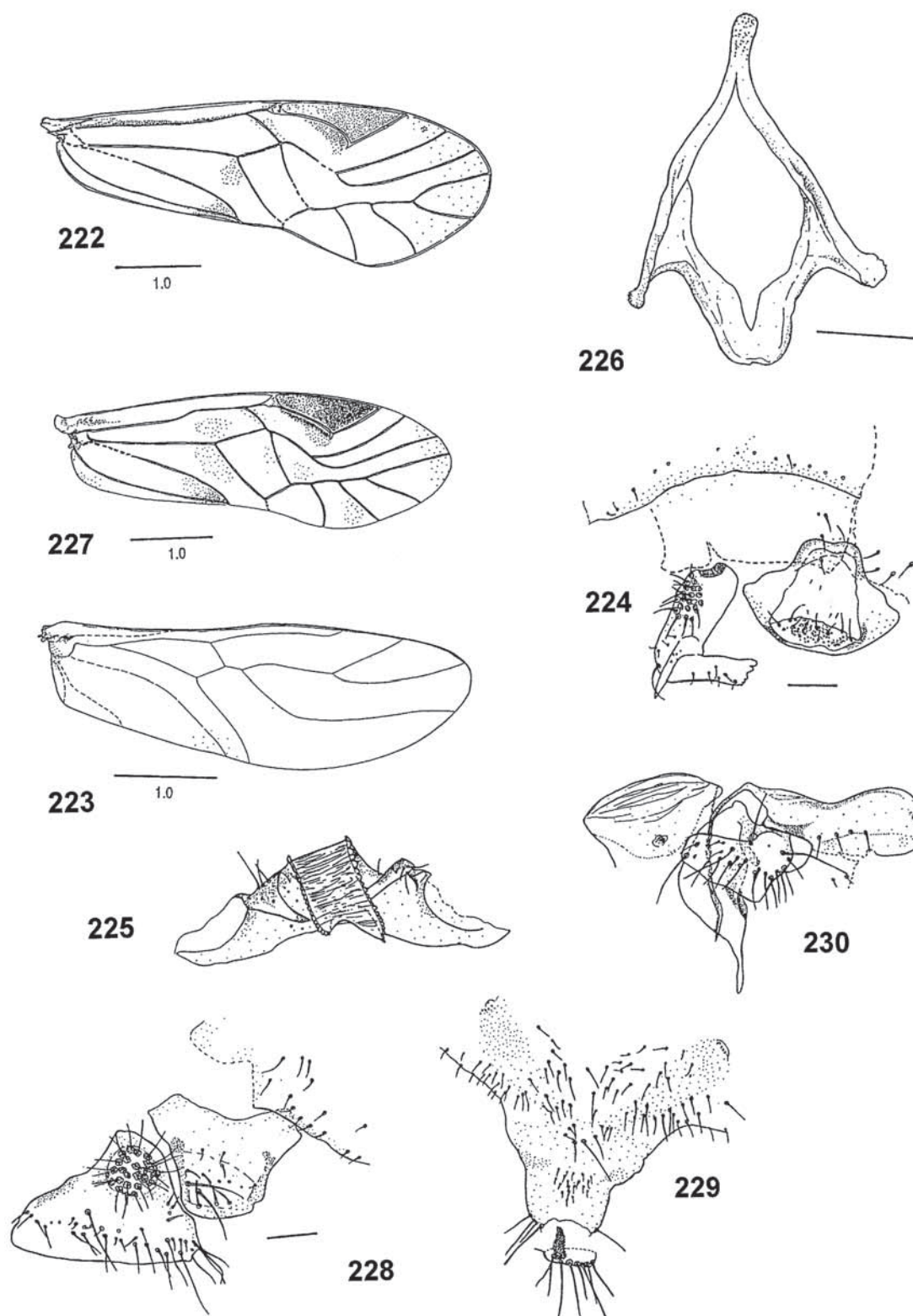
Ptycta umbrata New, 1974b: 297.

Material examined. St Helens Point, St Helens, *Casuarina littoralis*, 1♂, 24 Feb 1988.

Distribution. Tasmania, Victoria, New South Wales and South Australia.

***Tanystigma* Smithers**

Tanystigma Smithers, 1983: 77. Type species: *Copostigma (Clematostigma) paulum* Smithers.



Figures 222-230. *Ptycta pallawahensis*. Male: 222, fore wing; 223, hind wing; 224, epiproct and paraproct; 225, hypandrium; 226, phallosome. Figures 224 and 225 to common scale. Female: 227, fore wing; 228, epiproct and paraproct; 229, subgenital plate; 230, gonapophyses and spermathecal plate. Figures 228-230 to common scale.

Key to Tasmanian species of *Tanystigma*

1. Fore wing with both sections of vein cu_{1a} in straight line, phallosome with posterior pair of double spines **notiale group 2**
- Fore wing with both sections of vein cu_{1a} at distinct angle, phallosome with posterior pair of single spines **paulum group 3**
2. Hypandrium with apical pair of bulbous lobes; female epiproct apically emarginate; subgenital plate pigmented arms anteriorly divided *westae* sp. nov.
- Hypandrium apically with two short blunt spines; female epiproct apically transverse; subgenital plate pigmented arms anteriorly fused *maddeni* sp. nov.
3. Hypandrium apically bilobed, spermathecal plate triangular with pair of lateral sclerotised bars *edwardsi* New
- Hypandrium apically trilobed, spermathecal plate rounded 4
4. Distal segment of female maxillary palp distinctly darker at apex; two basal flagellar segments of female antenna pale brown; ♂ IO:D = 2.6 *inglewoodense* New
- Distal segment of female maxillary palp uniform dark brown; basal flagellar segment of female antenna pale brown; ♂ IO:D = 1.6 *tardipes* Edwards

Notiale Group

Diagnosis. Apical segment of antenna short, length about twice width. Fore wing with both sections of vein cu_{1a} in a straight line, and somewhat sinuous. Phallosome posteriorly with pair of double spines. A small apophysis extending posteriorly from ninth tergite adjacent to paraproct (not mentioned in the description of *notiale*). Lightly sclerotised setose dome between trichobothrial field and apical spur of paraproct of males absent.

Remarks. As noted by Schmidt and Thornton (1993) *Tanystigma* can be divided into two species groups based on the form of cu_{1a} in the fore wing and by the number of apical spines on the phallosome. Species of the *notiale* group include *T. notiale* (Smithers), *T. bifurcatum* Smithers, *T. dubium* (New) (males unknown), *T. valvula* Schmidt and Thornton, *T. maddeni* (below) and *T. westae* (below). No distinct genitalic characters appear to separate females into the two species groups.

***Tanystigma maddeni* sp. nov.**

Figures 231–39

Material examined. Holotype ♂: Tasmania, Freycinet National Park, *Casuarina stricta*, 17 Jan 1987. Eight nymphs and 6♀ paratypes: same data as holotype. Additional records: **site** 45, 2♀, 1♂, 5 June 87; **site** 52A, 1♀, 1 nymph, 7 June 87; **site** 88A, 1♀, 26 June 86; 1♀, 7 Aug 86; 6♀, 5♂, 8 nymphs, 21 Mar 87; 7♀, 3♂, 22 Apr 87; 3♀, 2♂, 11 May 87; 6♀, 2♂, 1 nymph, 20 Feb 88; **site** 95A, 1♀, 22 Apr 87.

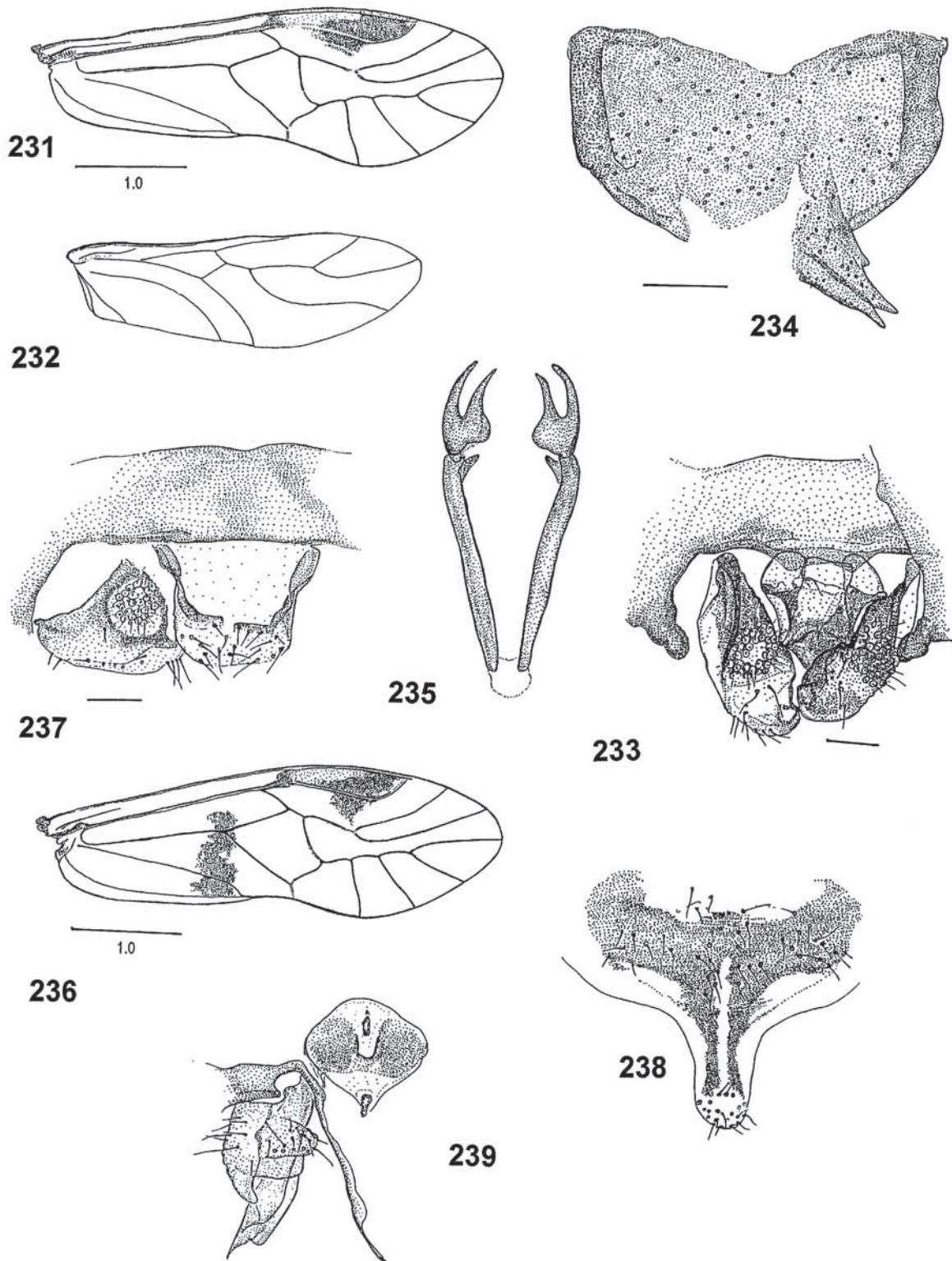
Description of male. Coloration (after ca 4 years in alcohol). Head buff with the following dark brown: patches dorsal to eyes, across back of vertex and along median epicranial suture, which is nearly black; band between eye and antennal socket; semicircular patch on frons ventral to anterior ocellus; epistomal suture and longitudinal parallel postclypeal striae; labrum and anteclypeus. Ocelli pale purple, interior borders black. Eyes purple-black. Antenna dark brown. Maxillary palps dark brown, apices of three basal segments buff. Fore wing (fig. 231) hyaline, veins dark brown. Hind wing (fig. 232) hyaline. Dorsa dark brown, scutella pale brown. Postnotum pale brown dorsally, dark brown ventrally. Pleura dark brown, sutural areas buff. Coxae and legs dark brown, trochanter buff. Abdomen with grey-brown longitudinal stripes, terminal segments dark brown.

Morphology. IO:D = 1.4. Eyes large, just below apex of vertex when viewed from side of head. Ocelli on raised tubercle. Antennae short (length 3.48mm), setose, f_{10} and f_{11} fused in terminal segment which narrows apically. Sensory placoids: 2 at base f_1 , 1 at apices f_4 , f_6 and f_{10} . Fore wing (fig. 231): very small scattered setae present on costa and vein of pterostigma, otherwise glabrous; first and second segments of cu_{1a} almost in straight line, and approximately equal in length; spur-vein not present. Hind wing (fig. 232) with few setae on margin between r_{2+3} and r_{4+5} . Epiproct (fig. 233) with small rectangular flap at base, each side of this a lightly sclerotised projection. Paraproct (fig. 233) with round field of 36 trichobothria, distinct curved sclerotised bar and an apical sclerotised spur. Posterior margin of ninth tergite with two rounded lobes where the epiproct articulates, larger lateral projections adjacent to paraprocts (fig. 234). Hypandrium (fig. 234) apically bifid, terminating in two short blunt spines. Phallosome (fig. 235) closed anteriorly, junction not sclerotised, posteriorly open with pair of double, sharp sclerotised spines.

Dimensions. B 2.8, FW 3.89, HW 2.95, F 0.69, T 1.54, t_1 0.411, t_2 0.190, rt 2.2:1, ct 22.0, f_1 0.798, f_2 0.656.

Description of female. Coloration (after ca 4 years in alcohol). As male, with following exceptions: stirrup mark on frons ventral to anterior ocellus; brown band extending from back of eye around ventral margin of eye; basal three segments of maxillary palp buff; ocelli buff. Fore wing (fig. 236) with complete transverse fascia.

Morphology. IO:D = 2.6. Antenna less setose than male, shorter (length 2.78mm). Terminal segment very small, apex rounded, sensory placoids: 2 at base f_1 , 1 at apices f_2 , f_4 , f_6 and f_{10} . Setae on fore wing (fig. 236) margin more extensive than male, basal section of cu_{1a} longer than apical section. Epiproct (fig. 237): sclerotised arms directed anteriorly; apical third with scattered setae. Paraproct (fig. 237) with round field of 27 trichobothria, apical margin setose. Subgenital plate (fig. 238) median lobe apically setose, few scattered setae near apical margin on lobe; pigment band fused anteriorly, laterally broad; two narrow arms extending posteriorly not reaching apical margin; scattered setae on plate. Gonapophyses (fig. 239): ventral and dorsal valves with narrow spiculate apices, external valve with large apical posterior lobe and a dorsal lobe. Spermathecal plate (fig. 239).



Figures 231-239. *Tanystigma maddeni*. Male: 231, fore wing; 232, hind wing; 233, ninth tergite, epiproct and paraproct; 234, hypandrium; 235, phallosome. Figures 231, 232 and 234 and 235 to common scales. Female: 236, fore wing; 237, epiproct and paraproct; 238, subgenital plate; 239, gonapophyses and spermathecal plate. Figures 237-239 to common scale.

Dimensions. B 3.2, FW 3.83, HW 2.83, F 0.67, T 1.44, t_1 0.363, t_2 0.197, rt 1.8:1, ct 14.0, f_1 0.711, f_2 0.498.

Remarks. This species is most similar to *T. valvula* found at Wilsons Promontory, Victoria, and *T. bifurcatum*, found in South Australia. All three species are similar in fore wing pigmentation, shape of the posterior apical lobe and smaller dorsal lobe of the external valve of the female gonapophyses, and the males possessing double-spined phallosomes. In female fore wing pigmentation *T. maddeni*, like *T. bifurcatum*, has a complete fascia, differing from the broken fascia of *T. valvula*. The anteriorly diverging pigmented arms of the subgenital plate are not fused medially in *T. bifurcatum* and *T. valvula* as they are in *T. maddeni*, and the small dorsal lobe of the external valve of the female gonapophyses is longer and more distinct in *T. maddeni* than in the other two species. The apically bifid hypandrium of *T. maddeni* is very similar to that of *T. valvula*, unlike the rounded median lobe of *T. bifurcatum*. The inner pair of spines on the phallosome is larger than the outer pair in *T. bifurcatum*, unlike *T. valvula*, in which the outer spines are larger, and *T. maddeni*, in which the spines are approximately equal in length. This species was collected from January to August mainly in dry coastal scrub from a few sites on the east coast.

Etymology. Named for Dr John Madden, in acknowledgement of his friendship, and his help to ERS during exploration in Tasmania.

Tanystigma westae sp. nov.

Figures 240–48

Material examined. Holotype ♂: Tasmania, Lyell Hwy, 20 kms east Derwent Bridge, *Hakea epiglottis*, 27 Aug 1991. Two ♀ and 2♂ paratypes: same data as holotype. Additional records: site 242 (holotype locality), 17 nymphs, 3 July 86; 14 nymphs, 12 Aug 86; 1 nymph 15 Sep 86; 1 nymph, 16 Oct 86.

Description of male. *Coloration* (after ca 3 months in alcohol). Ground colour of head light brown, with darker brown patches dorsal to eyes, across back of vertex and each side of median epicranial suture; broad brown band along arms of epicranial suture, merging with brown band between eye and dark brown ring of antennal socket; epistomal suture and longitudinal postclypeal stripes brown; ocellar protuberance dark brown, ocelli pale with black centripetal borders; large brown patch on frons below anterior ocellus; labrum and anteclypeus dark brown. Maxillary palp dark brown, apices of basal three segments pale. Antennae dark brown. Eyes black. Fore wing (fig. 240): hyaline, pigmentation of pterostigma dark brown; veins dark brown except: base of r_{2+3} and r_{4+5} ; cu_{1b} ; distal half of section of m between its leaving rs and joining cu_{1a} . Hind wing hyaline. Thorax: dorsa dark brown; postnotum light brown dorsally, dark brown ventrally; pleura dark brown, sutural areas pale. Coxae and legs dark brown. Abdomen pale brown with longitudinal brown stripes, one dorsally and two on each side. Terminal segments dark brown.

Morphology. IO:D = 2.5. Eyes small. Ocelli on slightly raised tubercle. Antenna: short (length 2.95mm), strongly setose; terminal segment small with narrow rounded apex; sensory placoids: 2 at base f_1 , 1 at apices f_4 and f_{10} . Fore wing

(fig. 240) glabrous, hind wing with few setae at margin between veins r_{2+3} and r_{4+5} . First and second sections of cu_{1a} almost in straight line, both sections approximately equal in length. Distal half of section of vein between its leaving rs and joining cu_{1a} strongly curved. Spur-vein present on pterostigma. Mesothoracic and metathoracic scutella well developed. Epiproct (fig. 241) sclerotised, fused to ninth tergite; a rounded basal median projection, each side of this a rounded setose lobe; posteriorly arrow shaped, a small central area containing three large setae and numerous smaller setae. Paraproct (fig. 241) with rounded field of 52 trichobothria, distinct curved sclerotised bar and an apical sclerotised spur. Ninth tergite with large lateral anvil-shaped projection adjacent to paraproct (fig. 241). Hypandrium (fig. 242): well sclerotised, symmetrical with apical pair of rounded bulbous lobes; at posterior lateral angle plate broadly folded anteriorly, adjacent to a longitudinal sclerotised bar at edge of plate; densely setose. Phallosome (fig. 243) posteriorly open with pair of double, sharp sclerotised spines.

Dimensions. B 3.9, FW 4.5, HW 3.4, F 0.79, T 1.75, t_1 0.474, t_2 0.205, rt 2.3:1, ct 18.3, f_1 0.830, f_2 0.600.

Description of female. *Coloration* (after ca 3 months in alcohol). As male with the following exceptions: brown band along ventral margin of eye; epicranial suture brown, arms lacking brown band; fore wing (fig. 244) with complete transverse fascia; hind wing (fig. 245) with areas of slight brown tinge; metathoracic scutellum dark brown.

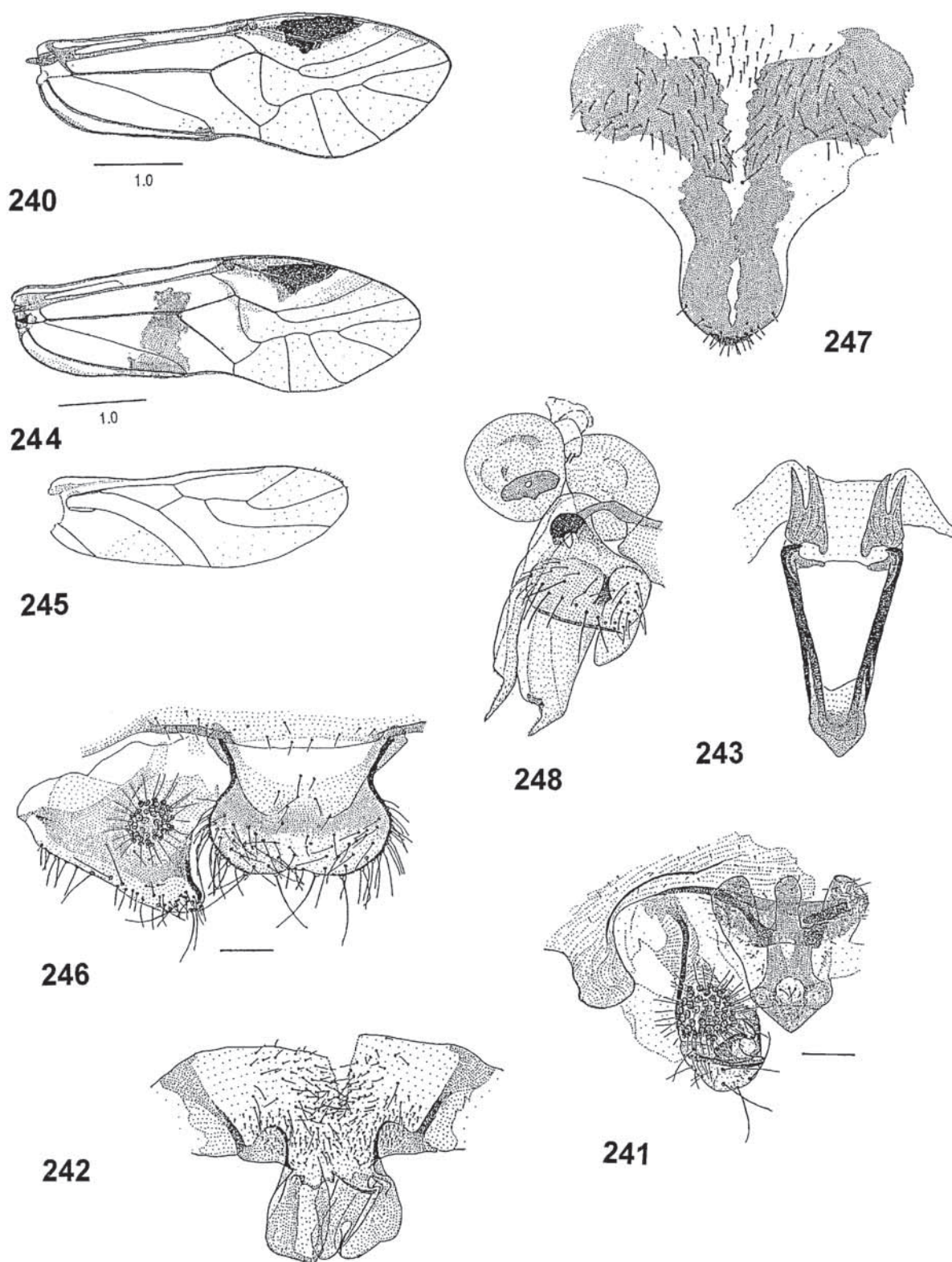
Morphology. IO:D = 3.6. Antenna: less setose than male, shorter (length 2.65mm); terminal segment very small, sensory placoids: 1 at base f_1 , 1 at apices f_2 , f_4 , f_6 and f_{10} . Epiproct (fig. 246): sclerotised arms directed anteriorly, incipiently bilobed posteriorly with two strong setae apically on each lobe; margin and body heavily setose. Paraproct (fig. 246): round field of 43 trichobothria; ventral surface rugose; apical margin setose. Subgenital plate (fig. 247): median lobe with small apical transverse sclerotised band, surrounding this numerous small setae; pigment band fusing apically, generally divided medially; scattered setae on plate with two larger setae posteriorly. Gonapophyses (fig. 248): ventral valve long, slender, apex narrow, spiculate; dorsal valve broad with narrow spiculate apex; external valve with small dorsal lobe, posterior edge of transverse lobe sclerotised, setose. Spermathecal plate (fig. 248) represented by two large round sclerotised areas.

Dimensions. B 4.2, FW 4.4, HW 3.3, F 0.75, T 1.61, t_1 0.363, t_2 0.198, rt 1.8:1, ct 15.0, f_1 0.670, f_2 0.510.

Remarks. Only nymphs of this species have been collected in the field. The holotype and paratypes were reared in the laboratory and were subsequently killed on 8 Sep 1991.

Males of *T. westae* differ from other species of this genus by the exaggerated size of the apophyses extending posteriorly from the ninth tergite adjacent to the paraprocts, the peculiar epiproct and shape of the hypandrium. Females differ markedly in the pigmentation of the subgenital plate, the bilobed epiproct and the sclerotisation of the spermathecal plate.

Etymology. Named for Dr Jan West, a friend and former fellow postgraduate student with ERS, who once attempted to collect this species while on a visit to Tasmania.



Figures 240-248. *Tanystigma westae*. Male: 240, fore wing; 241, ninth tergite, epiproct and paraproct; 242, hypandrium; 243, phallosome. Figures 241-243 to common scale. Female: 244, fore wing; 245, hind wing; 246, epiproct and paraproct; 247, subgenital plate; 248, gonapophyses and spermathecal plate. Figures 244, 245 and 246-248 to common scales.

Paulum Group

Diagnosis. Apical segment of antennae elongated, length about four times width. Fore wing with both sections of vein cu_{1a} at a distinct angle. Phallosome posteriorly with pair of single spines. The small apophysis extending posteriorly from ninth tergite adjacent to paraproct of males absent. Males with a lightly sclerotised setose dome between trichobothrial field and apical spur of paraproct.

Remarks. Species of the *paulum* group include *T. paulum* (Smithers), *T. latimentulum* (Smithers) (females unknown), *T. elongatum* Smithers, *T. longitibia* Smithers, *T. tardipes* (Edwards), *T. inglewoodense* (New), *T. edwardsi* (New) and *T. striatifrons* (McLachlan) (males unknown).

Tanystigma edwardsi (New)

Figures 249–53

Clematostigma edwardsi New, 1974b: 292.
Tanystigma edwardsi. --- Smithers, 1983: 77.

New (1974b) described this species from material consisting of males only. Both sexes were collected from Tasmania, and a description of the female is provided.

Material examined. Specimen on which description based: Tasmania, 1♀, Cape Tourville, *Leptospermum grandiflorum*, 5 Dec 1986. Additional records: **site** 77, 1♂, 2 nymphs 4 Feb 87; 6♀, 22 Mar 87; 1♂, 21 Feb 88; **site** 86, 1♀, 21 Mar 87; 2♀, 1♂, 22 Apr 87; 1♂, 20 Feb 88; **site** 88B, 1♂, 11 May 87; **site** 95A, 1♀, 20 Feb 88.

Distribution. Tasmania and Victoria.

Description of female. **Coloration** (after ca 5 years in alcohol). Head paler than that of male. Usual markings on back of vertex, dorsal to eyes and along epicranial suture dark brown. Ocelli internally bordered black. Black lines extending from lateral ocelli to antennal bases not present. Brown mark extending from back of eye along its ventral margin to brown ring of antenna base. Brown stirrup mark on frons. Striae on postclypeus very pale. Labrum and anteclypeus colorless. Eyes black. Maxillary palp pale except dark brown apical segment. Fore wing (fig. 249) with complete brown fascia. Hind wing (fig. 250) hyaline. Thorax, legs and abdomen as male.

Morphology. IO:D = 3.7. Fore wing (fig. 249): fine sparse setae on margin and veins; both sections of vein cu_{1a} at a distinct angle, basal section longer than apical section; spur-vein from pterostigma present. Hind wing (fig. 250) with few fine setae on margin between r_{2+3} and r_{4+5} . Epiproct (fig. 251) with pair of lateral longitudinal sclerotised bars. Paraproct (fig. 251) with round field of 27 trichobothria, apical margin setose. Subgenital plate (fig. 252) with setose median lobe, pigmentation arms converging posteriorly fusing at basal section of lobe. Gonapophyses (fig. 253): ventral and dorsal valves with narrow spiculate apical spine; external valve with large posterior lobe and small apical dorsal lobe. Spermathecal plate (fig. 253).

Dimensions. B 3.0, FW 2.74, HW 2.06, F 0.58, T 1.08, t_1 0.284, t_2 0.178, rt 1.6:1, ct 16.0, f_1 0.600, f_2 0.506.

Remarks. In fore wing pigmentation the females of *T. edwardsi*

most resemble the larger *T. inglewoodense*. The pigmentation of the pterostigma is more extensive in the latter species, however the pigmentation surrounding the $rs + m$ vein junction is more extensive in *T. edwardsi*. The two species differ markedly in the shape and extent of the lateral sclerotised bars of the female epiproct (not figured for *T. inglewoodense* by New, 1974b), in the pattern of pigmentation of the subgenital plate and in the structure of the spermathecal plate (not figured or mentioned for *T. inglewoodense* by New, 1974b). The males from Tasmania are smaller (fore wing length about 4.0 mm) than those described from Victoria (fore wing length about 4.5 mm), and have a stirrup mark on the frons, a feature not mentioned in the original description by New (1974b). However, on the balance of other characters, specimens of this species are provisionally referred to *edwardsi*. This species has a limited distribution and a dry coastal scrub habitat preference similar to *P. freycineti*, but is also found in dry forest. It was taken from December to May.

Tanystigma inglewoodense (New)

Clematostigma inglewoodense New, 1974b: 296.
Tanystigma inglewoodense. --- Smithers, 1983: 77.

Material examined. Many individuals collected from February to July.

Distribution. Tasmania and Victoria.

Remarks. The IO:D measured for males of this species by Schmidt and Thornton (1993) is incorrect; the correct value is indicated in the above key. This species is predominantly coastal and limited to the northern half of the state where it was found in dry coastal scrub, wet scrub, and in the heath understorey of dry and wet forests.

Tanystigma tardipes (Edwards)

Clematostigma tardipes Edwards, 1950: 95.
Tanystigma tardipes. --- Smithers, 1983: 77.

Material examined. Many individuals collected from January to July.

Distribution. Tasmania, Bass Strait Is, Victoria and South Australia.

Remarks. This species is restricted to dry coastal scrub and dry forest sites along the east coast from South Arm Recreation Area to Eddystone Point.

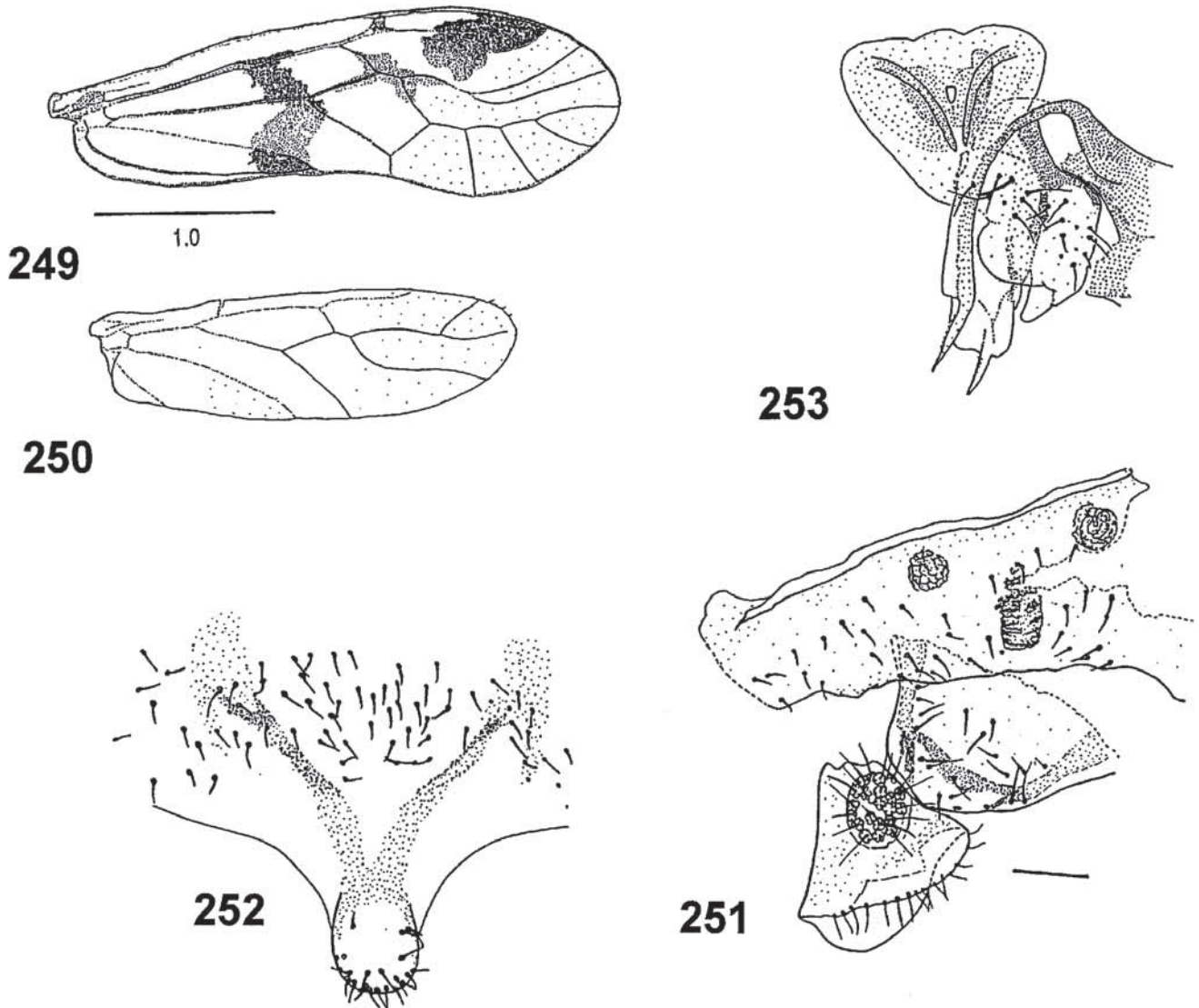
Myopsocidae

Nimbopsocus Smithers

Nimbopsocus Smithers, 2004: 160. Type species: *Nimbopsocus thorntoni* Smithers.

Key to Tasmanian species of *Nimbopsocus*

1. Female body length 4.4–4.8 mm, male body length 2.9–3.1 mm *australis* (Brauer)
- Female body length 3.6–3.8 mm, male body length 2.0–2.1 mm *hickmani* (Smithers)



Figures 249-253. *Tanystigma edwardsi*. Female: 249, fore wing; 250, hind wing; 251, epiproct and paraproct; 252, subgenital plate; 253, gonapophyses and spermathecal plate. Figures 249, 250 and 251-253 to common scales.

***Nimbopsocus australis* (Brauer)**

Psocus australis Brauer, 1865: 908.

Myopsocus australis. --- Kolbe, 1883a: 145.

Nimbopsocus australis. --- Smithers, 2004: 162.

Material examined. **Site 77**, 1♂, 22 Mar 87; **site 104**, 1♀, 4 Feb 87.

Distribution. Tasmania, Flinders I (Bass Strait), all mainland states (except Northern Territory), Norfolk I, Lord Howe I, Solomon Is, Kermadecs and New Zealand.

***Nimbopsocus hickmani* (Smithers)**

Myopsocus australis (Brauer). Hickman, 1934: 85.

Myopsocus griseipennis (McLachlan). Edwards, 1950: 104.

Myopsocus hickmani Smithers, 1964: 135.

Nimbopsocus hickmani. --- Smithers, 2004: 162.

Distribution. Tasmania and Victoria.

Remarks. This species was not collected during the present study.

Discussion

The Psocoptera of Tasmania is far richer than supposed previously, and this work has also demonstrated the considerable wider biogeographical and evolutionary interest of this fauna. Interpretation can still only be rather tentative. Some parts of the state, particularly in the remote southwest, remain undercollected and some specialised habitats – such as karst caves – likely to support species of Psocoptera have not been surveyed for these insects.

Nevertheless, as noted by Schmidt and New (2004b), some distributional interpretation is possible. Several faunal elements are evident, and reflected in richness of particular families. About 15 species are cosmopolitan, 32 species appear to be endemic to Tasmania, almost the same number are known only from southeastern Australia, and others are more widespread in Australia or shared with New Zealand or other nearby countries. This survey has not led to augmentation of some families (such as Lepidopsocidae and Trichopsocidae), but has indicated the presence of Tasmanian diversification in other families such as Caeciliusidae (with five new genera, two of them in a new tribe), Elipsocidae (with four endemic genera: Schmidt and New, 2004a), both of which merit further study to clarify evolutionary relationships, and additional species in Ectopsocidae and Psocidae (5 each) and other families. Many of the newly described taxa, despite the extensive field work on which this study is founded, were captured in only small numbers, and from single or few sites. Some, indeed, may prove to be narrow-range endemics within Tasmania, and to have specialised habitat associations as “genuinely rare species” that could be or become vulnerable as their environments change.

The topographic and vegetational diversity of Tasmania supports one of the richest global southern arrays of Psocoptera, many associated with particular vegetation systems. As Schmidt and New (2004b) noted, it is still premature to define the biogeography of psocids in southeastern Australia. However, information available to date supports the expected considerable affinity with more natural parts of Victoria (such as Wilsons Promontory: Schmidt and Thornton, 1993), with a strong complement of taxa constituting a southeastern Australian regional fauna transcending Bass Strait and extending northward along the east coast, some of which are likely Gondwanan elements.

Acknowledgements

This study, as part of a survey of the Psocoptera of Bass Strait, was initiated by the late Professor Ian Thornton, former Head of the Department of Zoology at La Trobe University, and was undertaken by ERS as a doctoral study. During the candidature, Doctors J. West, B. Van Praagh, Endang Sri Kentjonowati, Ms J. Cheah, Ms C. Crawford, the late Ms J. Browning and Mrs T. Carpenter provided valuable assistance and encouragement. For advice and assistance during field work in Tasmania, ERS is grateful to Professors J. Lovett, J. Kirkpatrick and Dr J. Madden (University of Tasmania), Dr H. Elliot, Mr R. Bashford and Mr C. Turnball (Forestry Commission), Dr S. Smith (Department of Parks, Wildlife and Heritage), and Ms P. Gaulke, Wilmot. Additional study material was provided by

Dr J. Hickman (University of Tasmania) and Doctors R. Coy, A. Yen and Mr P. Lillywhite (Museum Victoria).

We are grateful to the Department of Parks, Wildlife and Heritage, Tasmania, and the then Department of Conservation and Natural Resources, Victoria, for permission to work in areas under their control. The study was supported by a Commonwealth Postgraduate Award and a grant from the Royal Society of Victoria to ERS.

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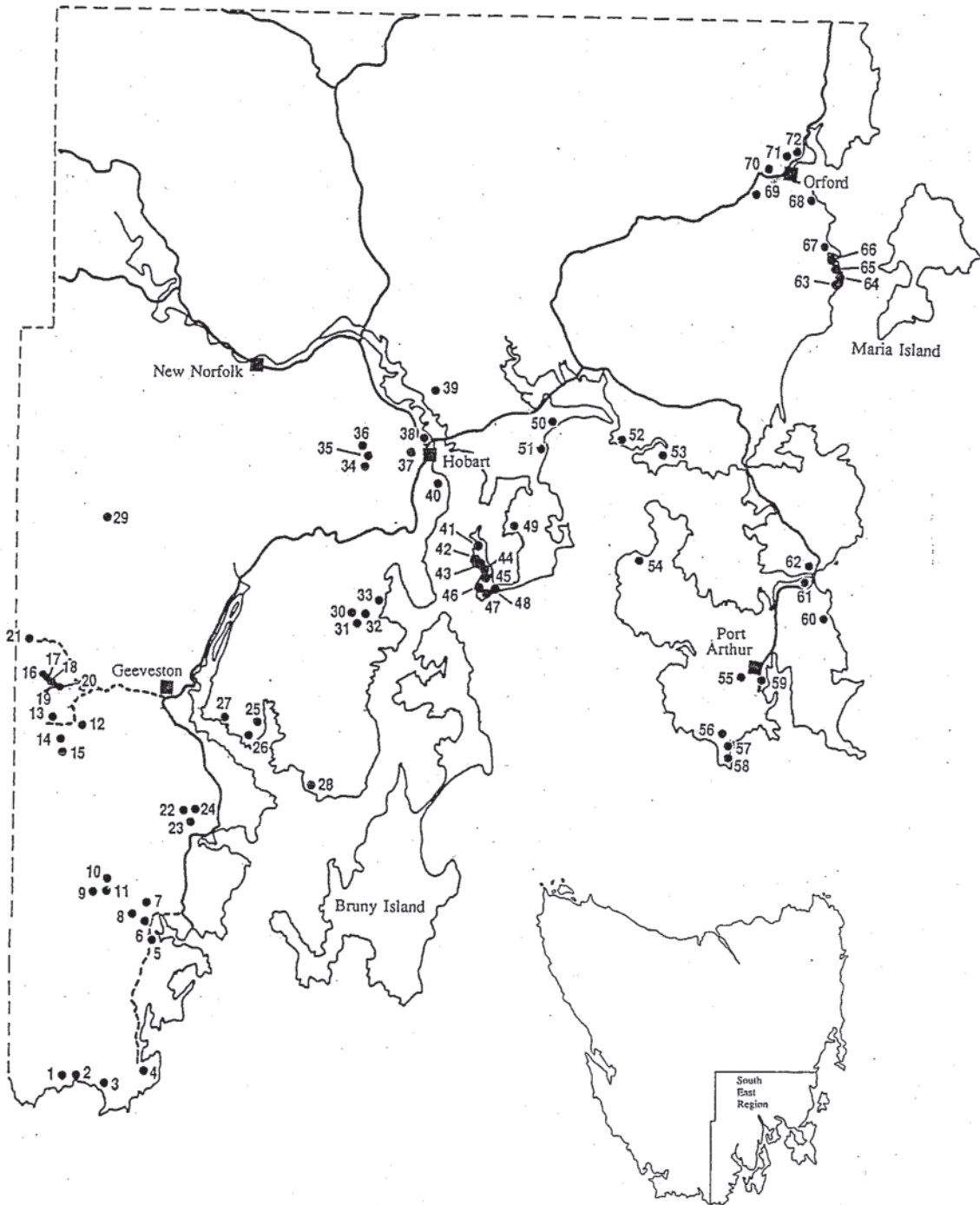
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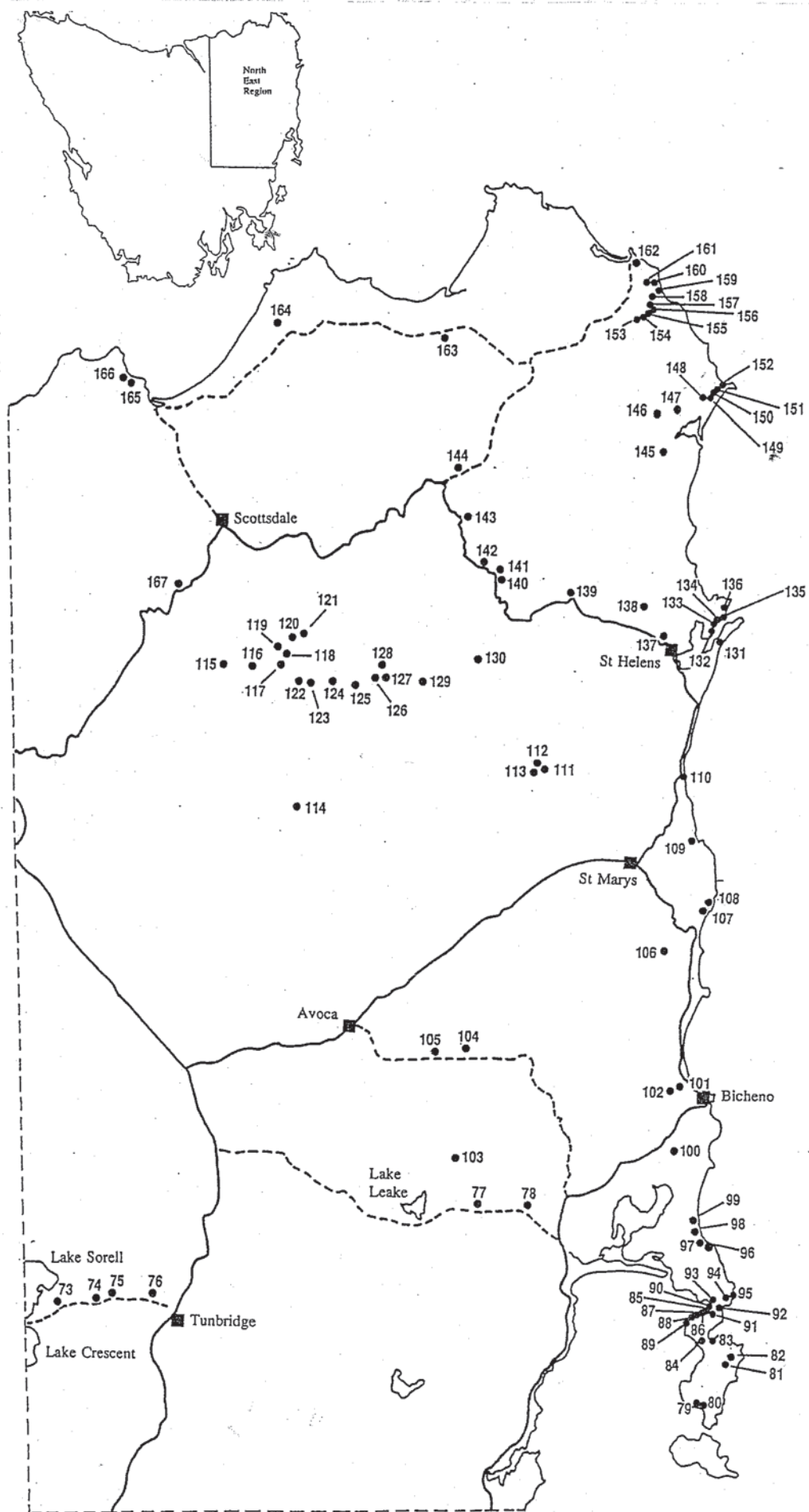
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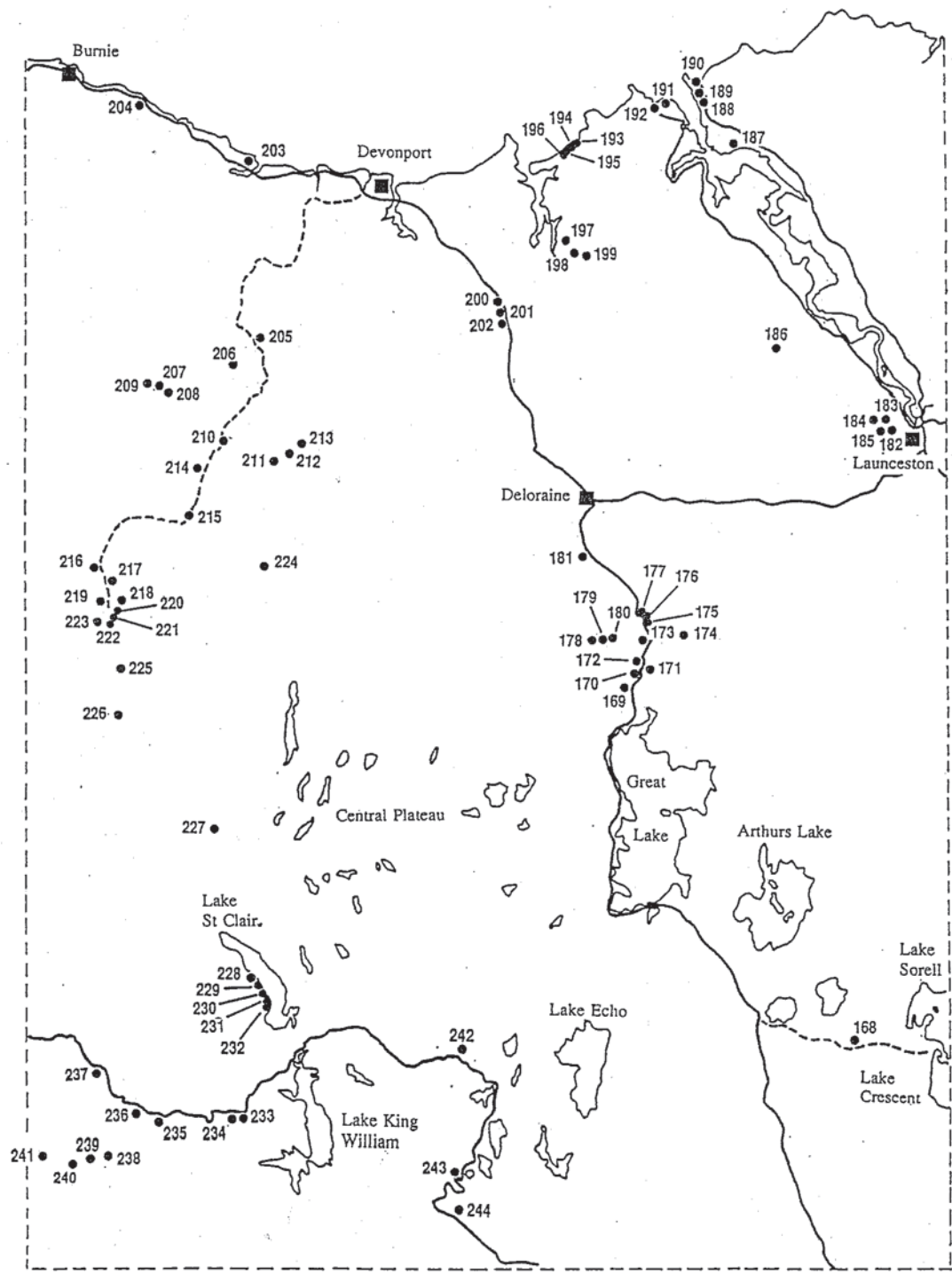
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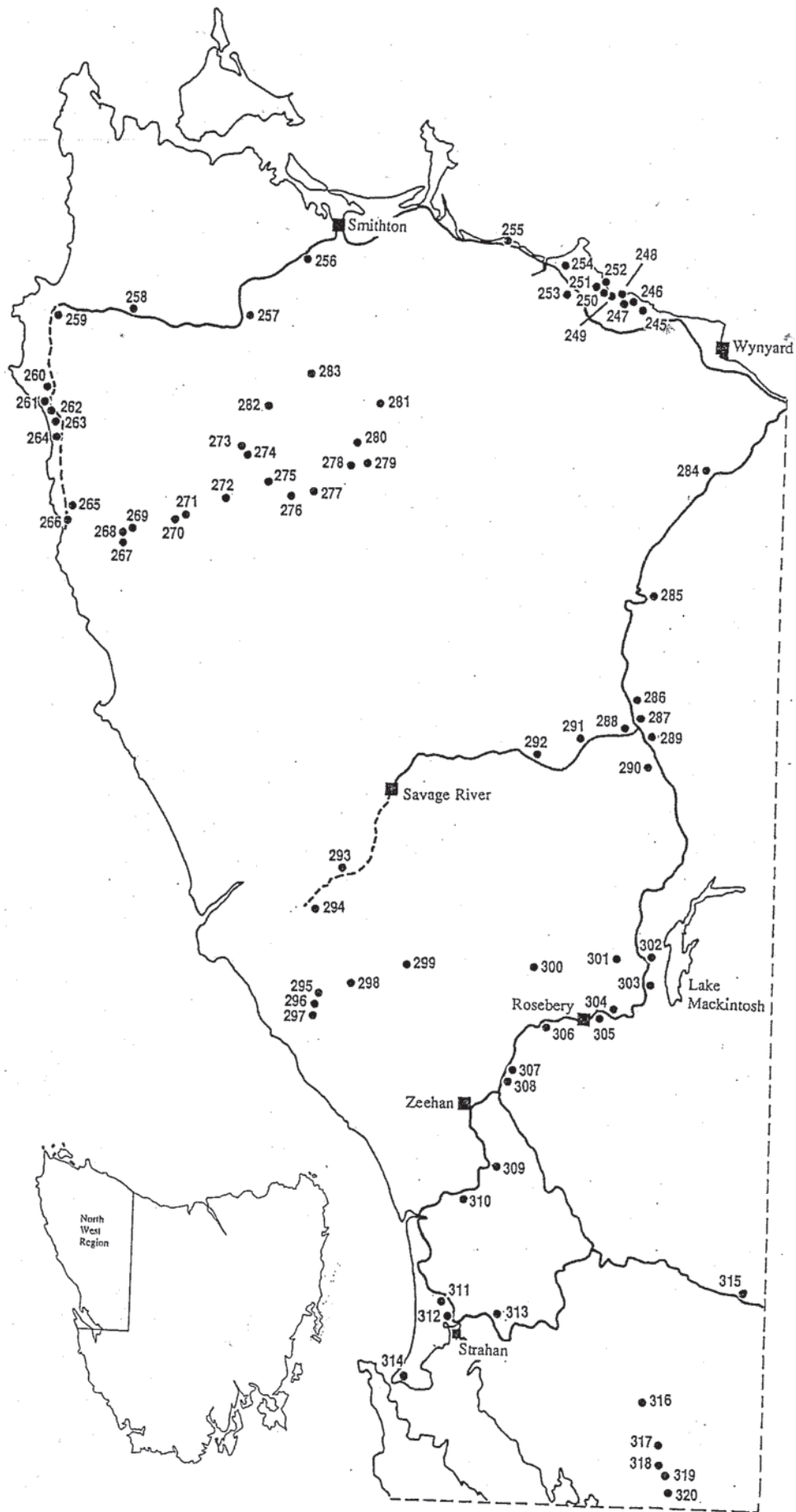
Appendices 1 and 2

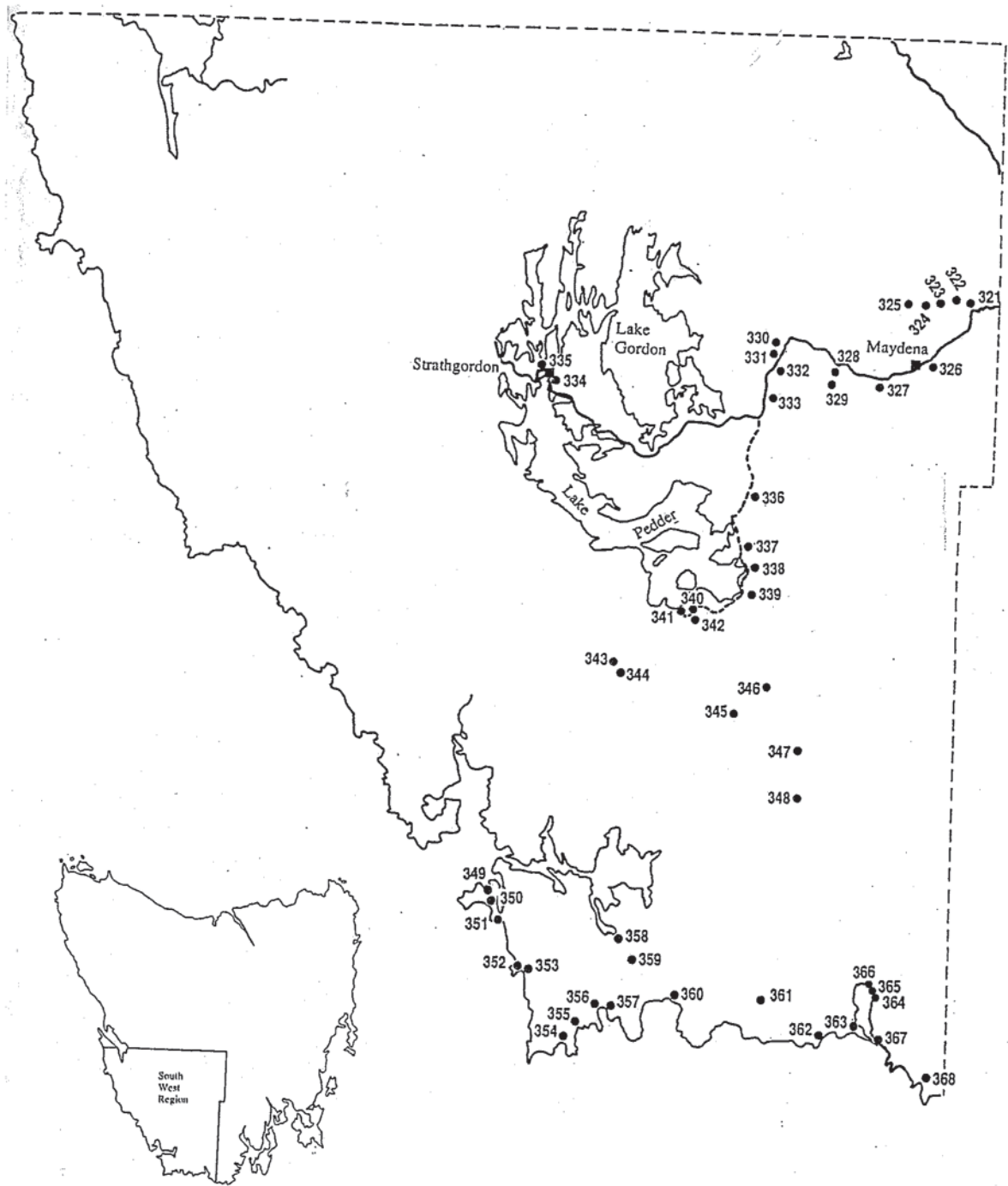
Maps and Tables of all collecting localities for Psocoptera in Tasmania visited during this survey on <http://www.museumvictoria.com.au/About/Books-and-Journals/Journals/Memoirs-of-Museum-Victoria>











The Psocoptera (Insecta) of Tasmania, Australia

E.R. Schmidt & T.R. New

APPENDIX

Site numbers, localities, vegetation types and dates (1986-1988) of sampling for Psocoptera from Tasmania. Sites are shown on accompanying maps. Psocoptera were not collected from sites sampled and indicated by (x).

SOUTHEAST TASMANIA

Site	Locality	Vegetation	Date
1	South Cape Rivulet, South Coast Tk	Rainforest	28 Mar 88 (x)
2	South Cape Rivulet	Coastal scrub	29 Mar 88
3	Cockle Ck, South Coast Tk	Coastal scrub	21 June 86, 19 Nov 86
4	Cockle Ck	<i>Leptospermum lanigerum</i>	21 June 86
5A	Ida Bay State Reserve	<i>Acacia melanoxylon</i> (wet forest)	14 Feb 88
5B	Ida Bay State Reserve	<i>Pinus radiata</i>	14 Feb 88
5C	Ida Bay State Reserve	<i>Leptospermum scoparium</i>	14 Feb 88
5D	Ida Bay State Reserve	Bracken	14 Feb 88 (x)
5E	Ida Bay State Reserve	Wet scrub (mainly <i>Melaleuca</i>)	14 Feb 88
6	Lune River, Duck Hole Lake	Rainforest	11 Feb 87
7	Lune River, Coal Hill Road	<i>Acacia melanoxylon</i> (wet forest)	11 Feb 87 (x)
8A	Lune River, Thermal Springs Tk	Swamp forest	14 Feb 88
8B	Lune River, Thermal Springs Tk	Wet forest	14 Feb 88 (x)
9	Hastings Cave	Mixed forest	14 Feb 88
10	Adamsons Falls Tk	Rainforest	21 Nov 86
11	Adamsons Falls Tk	Wet forest	21 Nov 86
12	Hartz Mtns NP	dead <i>Eucalyptus</i> foliage	7 May 87
13	Hartz Mtns NP, Waratah Lkt Tk	dead <i>Leptospermum</i> foliage	7 May 87, 17 Feb 88
14	Hartz Mtns NP, Hartz Peak Tk	Mixed forest	7 May 87
15	Hartz Mtns NP, Hartz Peak Tk	Heath (mainly <i>Leptospermum</i>)	7 May 87 (x)
16A	Arve Loop	<i>Leptospermum nitidum</i>	22 May 86, 15 July 86, 26 Aug 86, 20 Sep 86, 21 Oct 86, 18 Nov 86, 28 Jan

Site	Locality	Vegetation	Date
			87, 26 Feb 87, 31 Mar 87, 24 Apr 87 (x), 28 May 87 (x), 21 June 87, 21 July 87
16B	Arve Loop	<i>Phebalium squameum</i>	15 July 86, 26 Aug 86, 20 Sep 86, 21 Oct 86, 18 Nov 86, 28 Jan 87 (x), 26 Feb 87 (x), 31 Mar 87 (x), 24 Apr 87, 28 May 87 (x), 21 June 87 (x), 21 July 87
16C	Arve Loop	<i>Melaleuca squarrosa</i>	18 Nov 86
16D	Arve Loop	Bracken	28 Jan 87
17	Arve Loop	Mixed forest	22 May 86, 15 July 86, 26 Aug 86, 21 Oct 86, 18 Nov 86, 28 Jan 87 (x), 26 Feb 87, 31 Mar 87, 24 Apr 87, 21 June 87, 21 July 87
18	Arve Loop	Mixed forest	22 May 86, 15 July 86, 26 Aug 86, 20 Sep 86, 21 Oct 86, 18 Nov 86, 28 Jan 87 (x), 26 Feb 87, 31 Mar 87, 24 Apr 87, 29 May 87, 21 June 87, 21 July 87
19A	Arve Loop	Mixed forest	22 May 86, 15 July 86 (x), 26 Aug 86, 20 Sep 86 (x), 21 Oct 86, 18 Nov 86, 28 Jan 87, 26 Feb 87, 31 Mar 87, 24 Apr 87, 29 May 87, 21 June 87 (x), 21 July 87
19B	Arve Loop	Wet forest	21 Oct 86, 18 Nov 86, 31 Mar 87
20	Arve Loop, Spur Rd I.	Mixed forest	22 May 86, 15 July 86, 26 Aug 86, 20 Sep 86, 21 Oct 86, 18 Nov 86, 28 Jan 87, 26 Feb 87, 31 Mar 87, 24 Apr 87, 29 May 87, 21 June 87, 21 July 87
21	Tahune Forest Reserve, Pine Tk	Rainforest	20 Sep 86, 17 Feb 88
22	Dover, Bates Loop	dead <i>Eucalyptus</i> foliage	15 July 86
23	Dover, cnr Hopetoun + Storm Hill Rds	dead foliage (wet/dry forest mosaic)	15 July 86
24	Dover, Hopetoun Rd	dead <i>Eucalyptus</i> foliage	15 July 86
25	Lymington	Wet scrub (mainly <i>Leptospermum scoparium</i> and <i>Melaleuca squarrosa</i>)	13 Feb 88
26A	Drip Beach	<i>Leptospermum scoparium</i>	13 Feb 88
26B	Drip Beach	Bracken	13 Feb 88 (x)
27A	Petchey Bay	Dry forest	13 Feb 88
27B	Petchey Bay	Dry forest	13 Feb 88
28	Verona Sands	<i>Acacia melanoxylon</i> (dry forest)	2 Apr 87
29	Lonna Vale	Wet scrub (mainly <i>Leptospermum scoparium</i>)	14 Feb 88
30	Snug Tiers	Sub-alpine vegetation	9 May 86

Site	Locality	Vegetation	Date
31	Snug Tiers	Sub-alpine vegetation	9 May 86
32	Snug Falls	Wet/dry forest mosaic	1 Aug 86
33	Electrona	Dry forest	8 May 87
34	Mt Wellington, Radfords Tk	<i>Leptospermum lanigerum</i>	19 Feb 87, 6 June 87
35A	Mt Wellington, Finger Post Tk	Wet forest (dead foliage)	20 Feb 87, 6 June 87, 12 Feb 88
35B	Mt Wellington, Finger Post Tk	Wet forest (dead foliage)	20 Feb 87
36	Mt Wellington, Woods Tk	Wet forest (dead <i>Eucalyptus</i> foliage)	21 Feb 87
37	Hobart, Pottery Rd	Dry forest	30 Jan 87 (sweep)
38A	Hobart, Queens Domain	Dry woodland	8 July 86, 1 Oct 86, 29 Jan 87 (sweep)
38B	Hobart, Queens Domain	<i>Acacia melanoxylon</i> (dry woodland)	8 July 86, 8 May 87
38C	Hobart, Queens Domain	Tussock grasses (<i>Poa</i> sp)	8 July 86
39	Risdon Vale	Dry forest	6 June 87 (x)
40	Hobart, University	Wet forest (gully)	30 Sep 86, 23 Apr 87
41	South Arm Recreation Area	<i>Casuarina stricta</i>	12 June 86 (x), 18 July 86, 3 Sep 86
42A	South Arm Recreation Area	Tussocks grasses (<i>Poa</i> sp)	12 June 86, 18 July 86, 2 Oct 86, 5 June 87 (x)
42B	South Arm Recreation Area	Sedge	12 June 86, 18 July 86, 2 Oct 86, 3 Nov 86, 8 July 87
43A	South Arm Recreation Area	Bracken	12 June 86, 18 July 86, 3 Sep 86, 2 Oct 86, 3 Nov 86, 5 June 87, 8 July 87 (x)
43B	South Arm Recreation Area	<i>Exocarpus cupressiformis</i>	5 June 87
44	South Arm Recreation Area	Heath (mainly <i>Leptospermum</i>)	5 June 87
45	South Arm Recreation Area	<i>Dodonaea viscosa</i>	5 June 87, 8 July 87
46	South Arm Recreation Area	dead <i>Eucalyptus</i> foliage (dry forest)	3 Sep 86, 2 Oct 86, 3 Nov 86
47	South Arm Recreation Area	<i>Myoporum insulare</i>	3 Nov 86, 5 June 87
48	South Arm Recreation Area	<i>Acacia melanoxylon</i> (dry forest)	3 Nov 86
49	South Arm, Gellibrand Dve	dead <i>Melaleuca squarrosa</i>	18 July 86
50	Seven Mile Beach	<i>Pinus radiata</i>	8 June 87
51A	Seven Mile Beach	<i>Banksia marginata</i>	8 June 87
51B	Seven Mile Beach	<i>Casuarina stricta</i>	8 June 87 (x)
51C	Seven Mile Beach	<i>Dodonaea viscosa</i>	8 June 87
52A	Dodges Ferry	<i>Banksia marginata</i>	7 June 87
52B	Dodges Ferry	Tussock grasses (<i>Poa</i> sp)	7 June 87
52C	Dodges Ferry	Coastal scrub	7 June 87

Site	Locality	Vegetation	Date
53	Dodges Ferry	<i>Casuarina stricta</i>	7 June 87
54A	Tasman Peninsula, Gwondalon	Heath (mainly <i>Leptospermum</i>)	13 July 87 (x)
54B	Tasman Peninsula, Gwondalon	Tussock grasses (<i>Poa</i> sp)	13 July 87 (x)
55	Tasman Peninsula, Nubeena Rd	Heath (mainly <i>Leptospermum</i>)	18 Feb 88
56	Tasman Peninsula, Sth Nubeena	Heath (mainly <i>Leptospermum</i>)	13 July 87
57	Tasman Peninsula, Cape Raoul Tk	<i>Melaleuca squarrosa</i>	18 Feb 88
58	Tasman Peninsula, Cape Raoul	Heath (mainly <i>Leptospermum</i> and <i>Melaleuca</i>)	20 July 86
59A	Tasman Peninsula, Stewarts Bay Tk	<i>Acacia melanoxylon</i> (dry forest)	18 Feb 88
59B	Tasman Peninsula, Stewarts Bay Tk	Dry forest	18 Feb 88
59C	Tasman Peninsula, Stewarts Bay Tk	Dry forest	18 Feb 88
59D	Tasman Peninsula, Stewarts Bay	<i>Melaleuca squarrosa</i>	18 Feb 88
59E	Tasman Peninsula, Stewarts Bay	<i>Callitris rhomboidea</i>	18 Feb 88
60	Tasman Peninsula, Waterloo Bay	Wet/dry forest mosaic	18 Feb 88
61	Tasman Peninsula, West Eaglehawk Neck	<i>Acacia melanoxylon</i> (dry forest)	13 July 87
62	Tasman Peninsula, Eaglehawk Neck	<i>Melaleuca squarrosa</i>	13 July 87
63	Rheban	<i>Myoporum insulare</i>	30 Oct 86
64	Rheban	<i>Exocarpus cupressiformis</i>	30 Oct 86
65A	Rheban	Dry forest	19 Feb 88
65B	Rheban	Dry forest (dead foliage)	4 Sep 86, 19 Feb 88
66	Rheban	Dry forest (dead <i>Eucalyptus</i> foliage)	4 Sep 86, 30 Oct 86
67A	Sandspit Walking Tk	Wet forest	19 Feb 88
67B	Sandspit Walking Tk	Wet forest (dead foliage)	19 Feb 88
68A	Spring Beach	Coastal vegetation	19 Feb 88
68B	Spring Beach	<i>Callitris rhomboidea</i>	19 Feb 88
69	Tasman Hwy, Sth Orford	Dry forest	25 June 86
70	Tasman Hwy, Sth Orford	<i>Casuarina stricta</i>	3 June 86 (x), 25 June 86 (x)
71	Tasman Hwy, Nth Orford	Exotic Poplars	3 June 86 (x)
72	Tasman Hwy, Nth Orford	Exotic Hedge	3 June 86

Site	Locality	Vegetation	Date
73	Tunbridge - Steppes Rd	Tussock grasses (<i>Poa</i> sp)	25 Apr 87
74	Tunbridge - Steppes Rd	<i>Acacia melanoxylon</i> (wet forest)	29 May 86, 14 Aug 86, 13 Sep 86, 16 Oct 86, 13 Nov 86, 20 Jan 87, 9 Feb 87 (x), 18 Mar 87, 25 Apr 87, 31 May 87, 18 June 87, 31 July 87
75A	Tunbridge - Steppes Rd	<i>Bedfordia salicina</i>	29 May 86, 22 July 86, 14 Aug 86, 13 Sep 86, 16 Oct 86, 13 Nov 86, 20 Jan 87, 9 Feb 87, 18 Mar 87, 25 Apr 87, 31 May 87 (x), 18 June 87 (x), 31 July 87 (x)
75B	Tunbridge - Steppes Rd	<i>Bedfordia salicina</i>	29 May 86
76A	Tunbridge - Steppes Rd	<i>Acacia melanoxylon</i> (gully, dry forest)	29 May 86, 29 June 86, 22 July 86, 14 Aug 86, 13 Sep 86, 16 Oct 86, 13 Nov 86, 20 Jan 87, 9 Feb 87, 18 Mar 87, 25 Apr 87, 31 May 87, 18 June 87, 31 July 87 (x)
76B	Tunbridge - Steppes Rd	<i>Leptospermum lanigerum</i>	29 May 86 (x), 29 June 86 (x), 22 July 86 (x), 14 Aug 86 (x), 13 Sep 86 (x), 13 Nov 86 (x)
77	Lake Leake Rd	Dry forest	29 May 86, 29 June 86, 6 Aug 86 (x), 10 Sep 86 (x), 11 Oct 86, 5 Nov 86, 6 Dec 86, 17 Jan 87 (x), 4 Feb 87, 22 Mar 87, 22 Apr 87, 11 May 87, 12 June 87 (x), 24 July 87 (x), 21 Feb 88
78	Lake Leake Rd	dead <i>Eucalyptus</i> foliage (dry forest)	29 May 86
79	Freycinet NP, Brians Beach	dead <i>Myoporum insulare</i> foliage	3 Feb 87
80	Freycinet NP, Brians Beach	<i>Monotoca</i> sp	3 Feb 87
81	Freycinet NP, Mt Graham	dead dry forest vegetation	2 Feb 87
82	Freycinet NP, Mt Graham	<i>Leptospermum grandiflorum</i>	2 Feb 87
83A	Freycinet NP, Wineglass Bay	<i>Myoporum insulare</i>	2 Feb 87
83B	Freycinet NP, Wineglass Bay	<i>Monotoca</i> sp	11 June 87
83C	Freycinet NP, Wineglass Bay	<i>Casuarina stricta</i>	11 June 87 (x)
84	Freycinet NP, Hazards Beach - Wineglass Bay Tk	dead foliage (dry forest)	11 June 87
85	Freycinet NP, Hazards Beach Tk	dead <i>Casuarina</i> (dry forest)	16 May 86, 11 Sep 86, 10 Oct 86
86	Freycinet NP, Hazards Beach Tk	dead <i>Leptospermum</i> (dry forest)	16 May 86, 26 June 86, 10 Oct 86, 6 Nov 86, 21 Mar 87, 22 Apr 87, 10 June 87, 20 Feb 88
87	Freycinet NP, Hazards Beach Tk	<i>Letrosperrum glaucescens</i>	16 May 86, 26 June 86, 7 Aug 86, 11 Sep 86 (x), 10 Oct 86 (x), 6 Nov 86 (x), 5 Dec 86, 16 Jan 87, 3 Feb 87, 21 Mar 87, 22 Apr 87, 11 May 87, 10 June 87, 23 July 87, 20 Feb 88
88A	Freycinet NP, Hazards Beach Tk	<i>Hakea epiglottis</i>	26 June 86, 7 Aug 86, 11 Sep 86, 10 Oct 86, 6 Nov 86, 5 Dec 86, 16 Jan 87, 3 Feb 87, 21 Mar 87, 22 Apr 87, 11 May 87, 10 June 87, 23 July 87, 20 Feb 88
88B	Freycinet NP, Hazards Beach Tk	<i>Kunzea ambigua</i>	16 May 86, 26 June 86, 7 Aug 86, 11 Sep 86 (x), 10 Oct 86, 6 Nov 86, 5 Dec 86, 16 Jan 87, 3 Feb 87, 21 Mar 87, 22 Apr 87, 11 May 87, 10

Site	Locality	Vegetation	Date
			June 87, 23 July 87, 20 Feb 88
88C	Freycinet NP, Hazards Beach Tk	dead <i>Kunzea ambigua</i>	10 Oct 86, 6 Nov 86
89	Freycinet NP, Hazards Beach Tk	<i>Acacia terminalis</i>	26 June 86, 21 Mar 87
90A	Freycinet NP, Honeymoon Bay	<i>Casuarina stricta</i>	16 May 86, 26 June 86, 7 Aug 86, 11 Sep 86, 10 Oct 86, 6 Nov 86 (x), 5 Dec 86, 17 Jan 87, 4 Feb 87, 21 Mar 87, 22 Apr 87, 11 May 87, 10 June 87, 23 July 87, 20 Feb 88
90B	Freycinet NP, Honeymoon Bay	<i>Monotoxa</i> sp	22 Apr 87, 10 June 87, 23 July 87, 20 Feb 88
91	Freycinet NP, Mt Amos Tk	dead <i>Leptospermum</i> (dry forest)	26 May 86
92	Freycinet NP, Cape Tourville Rd	dead <i>Casuarina</i> (dry forest)	11 Sep 86, 23 July 87 (x)
93A	Freycinet NP, Rangers Creek	<i>Melaleuca squarrosa</i>	25 June 86 (x), 22 Apr 87, 11 May 87, 10 June 87, 23 July 87, 20 Feb 88
93B	Freycinet NP, nr Rangers Creek	dead <i>Eucalyptus</i> foliage (dry forest)	11 May 87
94	Cape Tourville Rd	<i>Callitris rhomboidea</i>	27 June 86, 7 Aug 86, 11 Sep 86 (x), 10 Oct 86, 6 Nov 86, 5 Dec 86, 16 Jan 87, 4 Feb 87, 21 Mar 87, 22 Apr 87, 11 May 87, 11 June 87, 23 July 87, 20 Feb 88
95A	Cape Tourville	<i>Leptospermum grandiflorum</i>	25 May 86 (x), 26 June 86, 7 Aug 86, 11 Sep 86, 10 Oct 86, 6 Nov 86 (x), 5 Dec 86, 16 Jan 87, 4 Feb 87, 21 Mar 87, 22 Apr 87, 11 May 87, 11 June 87, 23 July 87, 20 Feb 88
95B	Cape Tourville	dead <i>Leptospermum grandiflorum</i> foliage	26 June 86
96	Friendly Beaches	<i>Myoporum insulare</i>	6 Nov 86
97	Friendly Beaches	Heath (mainly <i>Leptospermum</i> and <i>Banksia</i>)	27 June 86, 8 Aug 86, 11 Sep 86 (x), 10 Oct 86 (x), 6 Nov 86, 21 Mar 87 (x), 22 Apr 87 (x), 11 May 87 (x), 11 June 87, 23 July 87 (x), 20 Feb 88
98	Friendly Beaches	dead foliage (mainly <i>Casuarina</i> , dry forest)	11 Sep 86, 10 Oct 86
99	Friendly Beaches	dead <i>Eucalyptus</i> foliage (dry forest)	10 Oct 86
100	Coles Bay Rd	Heath (mainly <i>Leptospermum</i>)	10 June 87
101	Apsley Gorge	dead material (dry forest)	21 Apr 87
102	Apsley Gorge	Wet/dry forest mosaic	29 June 86
103	Meetus Falls	Wet forest	21 Feb 88
104	Royal George, St Pauls River	<i>Callitris oblonga</i>	28 June 86, 8 Aug 86, 11 Sep 86 (x), 11 Oct 86, 7 Nov 86, 6 Dec 86, 17 Jan 87, 4 Feb 87, 22 Mar 87, 21 Apr 87, 11 May 87, 12 June 87, 24 July 87, 21 Feb 88
105	Avoca - Royal George Rd, St Pauls River	<i>Callitris oblonga</i>	3 June 86 (x)
106	Inland from Chain of Lagoons	Dry forest (mainly <i>Leptospermum</i>)	21 Apr 87
107	Chain of Lagoons	<i>Melaleuca ericifolia</i>	25 May 86, 27 June 86, 8 Aug 86, 12 Sep 86, 11 Oct 86, 7 Nov 86, 6 Dec 86, 17 Jan 87, 4 Feb

Site	Locality	Vegetation	Date
			87, 22 Mar 87, 21 Apr 87, 12 May 87, 12 June 87, 24 July 87, 22 Feb 88
108	Chain of Lagoons	<i>Myoporum insulare</i>	7 Nov 86
109A	Four Mile Creek	Tussock grasses (<i>Poa</i> sp)	12 June 87 (x)
109B	Four Mile Creek	Sedge	12 June 87 (x)
110	Falmouth	Heath (mainly <i>Leptospermum</i> and <i>Melaleuca</i>)	12 June 87 (x)
111A	Evercreech Forest Reserve	Wet forest	28 June 86, 13 Oct 86, 19 Jan 87 (x), 24 Mar 87, 20 Apr 87, 13 May 87 (x), 16 June 87
111B	Evercreech Forest Reserve	Mixed forest	28 June 86, 13 Oct 86, 11 Nov 86, 19 Jan 87, 24 Mar 87, 20 Apr 87, 13 May 87, 16 June 87 (x)
112	Evercreech Forest Reserve	Bracken	28 June 86 (x)
113	Evercreech Forest Reserve	<i>Exocarpus cupressiformis</i> (dry/wet forest mosaic)	28 June 86
114	Ben Lomond NP	<i>Acacia melanoxylon</i> (wet forest)	13 Oct 86
115A	Diddleum Plains	<i>Nothofagus cunninghamii</i>	9 Nov 86, 19 Jan 87, 6 Feb 87, 22 Feb 88
115B	Diddleum Plains	dead <i>Acacia dealbata</i> foliage	22 Feb 88
116	Cnr Mt Maurice and Ben Ridge Rds	<i>Leptospermum lanigerum</i>	22 Feb 88
117	Mt Maurice Rd	<i>Nothofagus cunninghamii</i>	10 Nov 86, 19 Jan 87
118	Mt Maurice Tk	<i>Nothofagus cunninghamii</i>	9 Nov 86, 6 Feb 87, 24 Mar 87, 13 May 87, 22 Feb 88
119A	Mt Maurice Tk	<i>Nothofagus cunninghamii</i> (mixed forest)	10 Nov 86, 19 Jan 87
119B	Mt Maurice Tk	dead <i>Eucalyptus</i> foliage (mixed forest)	24 Mar 87, 13 May 87 (x), 22 Feb 88
119C	Mt Maurice Tk	dead <i>Eucalyptus</i> foliage (mixed forest)	22 Feb 88
120	Mt Maurice Rd	<i>Nothofagus cunninghamii</i>	9 Nov 86
121A	Mt Maurice Rd	Wet forest	9 Nov 86, 19 Jan 87
121B	Mt Maurice Rd	Wet forest	19 Jan 87
122	Ben Ridge Rd	<i>Drimys lanceolata</i>	16 June 87 (x)
123	Cnr Ben Ridge and Telopea Rds	Rainforest	9 Nov 86, 24 Mar 87, 15 May 87
124A	Ben Ridge Rd	Tussock grasses (<i>Poa</i> sp)	16 June 87 (x)
124B	Ben Ridge Rd	Sedge	16 June 87 (x)
125	Ben Ridge Rd	<i>Nothofagus cunninghamii</i>	11 Nov 86, 6 Feb 87, 24 Mar 87, 20 Apr 87, 13 May 87, 16 June 87, 22 Feb 88
126	Ben Ridge Rd	<i>Melaleuca squarrosa</i>	6 Feb 87
127A	Ben Ridge Rd	dead scrub (mainly <i>Melaleuca</i> and <i>Leptospermum</i>)	6 Feb 87, 24 Mar 87, 20 Apr 87, 13 May 87, 16 June 87, 22 Feb 88
127B	Ben Ridge Rd	dead scrub (mainly <i>Melaleuca</i>)	6 Feb 87

Site	Locality	Vegetation	Date
128A	Ringarooma - Mathinna Rd	<i>Nothofagus cunninghamii</i>	13 Oct 86, 9 Nov 86, 19 Jan 87
128B	Ringarooma - Mathinna Rd	<i>Leptospermum lanigerum</i> (scrub)	9 Nov 86, 20 Apr 87
129	Mt Victoria Tk	Heath (mainly <i>Melaleuca</i>)	11 Nov 86, 6 Feb 87, 24 Mar 87, 20 Apr 87, 13 May 87, 16 June 87 (x)
130	St Columba Falls	Wet forest	11 July 86, 20 Apr 87
131A	St Helens Point	<i>Myoporum insulare</i>	24 Feb 88
131B	St Helens Point	<i>Casuarina stricta</i>	24 Feb 88 (x)
131C	St Helens Point	<i>Monotoca</i> sp	24 Feb 88
131D	St Helens Point	Tussock grasses (<i>Poa</i> sp)	24 Feb 88 (x)
131E	St Helens Point	<i>Casuarina littoralis</i>	24 Feb 88
131F	St Helens Point	<i>Melaleuca ericifolia</i>	24 Feb 88
132	Humbug Point	dead coastal vegetation	7 Nov 86
133	Humbug Point	<i>Melaleuca ericifolia</i>	11 Oct 86, 6 Dec 86, 22 Mar 87, 24 July 87
134	Humbug Point	<i>Acacia melanoxylon</i> (dry forest)	11 Oct 86
135	Humbug Point	Bracken	11 Oct 86
136	Humbug Point	Coastal vegetation	10 July 86
137A	Tasman Hwy	<i>Casuarina littoralis</i>	4 June 86, 11 July 86, 9 Aug 86, 12 Sep 86 (x), 12 Oct 86 (x), 8 Nov 86, 7 Dec 86 (x), 18 Jan 87 (x), 23 Mar 87, 20 Apr 87 (x), 12 May 87 (x), 14 June 87, 25 July 87, 24 Feb 88
137B	Tasman Hwy	dead foliage (<i>Leptospermum lanigerum</i>)	12 May 87
138	Ansons Bay Rd	Dry forest	12 June 87
139	Tasman Hwy	<i>Acacia melanoxylon</i> (swamp)	4 June 86, 11 July 86, 9 Aug 86, 12 Sep 86, 12 Oct 86, 8 Nov 86, 7 Dec 86, 18 Jan 87, 5 Feb 87, 20 Apr 87, 23 Mar 87, 20 Apr 87, 12 May 87, 14 June 87, 25 July 87, 24 Feb 88
140	Tasman Hwy, near Myrtle Forest	<i>Acacia melanoxylon</i> (rainforest)	11 July 86, 9 Aug 86, 12 Sep 86, 12 Oct 86, 8 Nov 86, 7 Dec 86, 18 Jan 87 (x), 5 Feb 87, 20 Apr 87 (x), 12 May 87, 14 June 87 (x), 25 July 87 (x), 24 Feb 88
141	Tasman Hwy, near Myrtle Forest	<i>Nothofagus cunninghamii</i>	11 July 86 (x), 9 Aug 86, 12 Sep 86 (x), 12 Oct 86, 8 Nov 86, 7 Dec 86, 18 Jan 87, 5 Feb 87, 20 Apr 87, 12 May 87, 14 June 87, 25 July 87 (x), 24 Feb 88
142A	Myrtle Forest	<i>Nothofagus cunninghamii</i>	4 June 86, 12 May 87, 24 Feb 88
142B	Myrtle Forest	<i>Acacia melanoxylon</i> (rainforest)	4 June 86, 14 June 87,
142C	Myrtle Forest	dead treefern foliage	24 Feb 88
143	Tasman Hwy	Wet forest	4 June 86, 5 Feb 87 (x)
144	Herrick	Heath (mainly <i>Leptospermum</i>)	12 May 87, 24 Feb 88
145	Ansons Bay Rd	Dry forest	13 June 87 (x)

Site	Locality	Vegetation	Date
146	Eddystone Point Rd	Dry forest	23 Feb 88
147	Eddystone Point Rd	Dry forest	23 Feb 88
148	Eddystone Point Rd	Dry forest	13 June 87, 23 Feb 88
149A	Eddystone Point Rd	<i>Melaleuca squarrosa</i>	13 June 87
149B	Eddystone Point Rd	<i>Melaleuca ericifolia</i>	13 June 87
150	Eddystone Point Rd	<i>Leptospermum lanigerum</i>	13 June 87, 26 July 87, 23 Feb 88
151	Eddystone Point Rd	dead heath (mainly <i>Melaleuca</i>)	13 June 87, 26 July 87
152A	Eddystone Point	<i>Casuarina stricta</i>	13 June 87, 26 July 87, 23 Feb 88
152B	Eddystone Point	<i>Monotoca</i> sp	13 June 87, 26 July 87, 23 Feb 88
152C	Eddystone Point	<i>Myoporum insulare</i>	13 June 87, 26 July 87, 23 Feb 88
152D	Eddystone Point	<i>Acacia</i> sp (?)	13 June 87
152E	Eddystone Point	Heath (mainly <i>Casuarina</i>)	13 June 87, 26 July 87
152F	Eddystone Point	Tussock grasses (<i>Poa</i> sp)	26 July 87 (x)
153	Mt William NP, Mt William Summit	Heath/scrub mosaic (mainly <i>Kunzea</i>)	23 Feb 88
154	Mt William NP, Mt William Walking Tk	Dry forest	23 Feb 88
155	Mt William NP, Mt William Car Park	Heath (mainly <i>Kunzea</i>)	23 Feb 88
156	Mt William NP, Loop	dead Heath (<i>Leptospermum</i>)	5 Feb 87, 23 Mar 87, 19 Apr 87, 14 June 87, 23 Feb 88
157	Mt William NP, Loop	Dry woodland (mainly <i>Kunzea</i>)	5 June 86 (x), 11 July 86, 9 Aug 86, 12 Sep 86, 12 Oct 86 (x), 8 Nov 86 (x), 7 Dec 86, 18 Jan 87, 5 Feb 87 (x), 23 Mar 87, 19 Apr 87, 12 May 87, 14 June 87, 25 July 87, 23 Feb 88
158	Mt William NP, Loop	Sedge	5 June 86, 11 July 86, 9 Aug 86, 12 Sep 86, 12 Oct 86, 8 Nov 86, 7 Dec 86, 18 Jan 87, 5 Feb 87, 23 Mar 87, 19 Apr 87, 12 May 87 (x), 14 June 87, 25 July 87, 23 Feb 88
159A	Mt William NP, Stumpys Bay	<i>Casuarina stricta</i>	5 June 86, 11 July 86, 9 Aug 86, 12 Sep 86, 12 Oct 86, 8 Nov 86, 7 Dec 86, 18 Jan 87, 5 Feb 87, 23 Mar 87, 19 Apr 87, 12 May 87, 14 June 87, 25 July 87, 23 Feb 88
159B	Mt William NP, Stumpys Bay	<i>Myoporum insulare</i>	12 Oct 86, 8 Nov 86, 7 Dec 86, 18 Jan 87, 5 Feb 87, 23 Mar 87, 19 Apr 87, 25 July 87, 23 Feb 88
159C	Mt William NP, Stumpys Bay	<i>Monotoca</i> sp	12 Oct 86, 7 Dec 86, 19 Apr 87, 12 May 87, 23 Feb 88
159D	Mt William NP, Stumpys Bay	dead foliage (<i>Casuarina</i> and <i>Myoporum</i>)	8 Nov 86, 5 Feb 87
160	Mt William NP, Loop	Heath (mainly <i>Casuarina</i>)	5 June 86, 11 July 86, 9 Aug 86 (x), 12 Sep 86, 12 Oct 86, 8 Nov 86 (x), 7 Dec 86 (x), 18 Jan 87 (x), 5 Feb 87, 23 Mar 87, 19 Apr 87, 12 May 87, 14 June 87, 25 July 87 (x), 23 Feb 88
161	Mt William NP, Loop	Heath (mainly <i>Leptospermum</i>)	19 Apr 87

Site	Locality	Vegetation	Date
162	Poole	<i>Leptospermum laevigatum</i>	5 June 86 (x), 11 July 86 (x), 9 Aug 86, 12 Sep 86, 12 Oct 86 (x), 8 Nov 86 (x), 7 Dec 86, 18 Jan 87, 23 Mar 87, 19 Apr 87, 12 May 87, 14 June 87, 25 July 87, 23 Feb 88
163	Gladstone - Bridport Rd	Heath (mainly <i>Leptospermum</i> and <i>Casuarina</i>)	19 Apr 87, 12 May 87, 14 June 87, 26 July 87, 24 Feb 88
164A	Blackmans Lagoon	exotic Cypress trees	5 June 86
164B	Blackmans Lagoon	<i>Myoporum insulare</i>	5 June 86, 9 Aug 86, 12 Sep 86, 12 Oct 86, 8 Nov 86, 7 Dec 86, 18 Jan 87, 5 Feb 87, 23 Mar 87, 19 Apr 87, 12 May 87, 14 June 87, 26 July 87, 24 Feb 88
165	Bridport	Coastal vegetation	26 July 87
166	Bridport	<i>Casuarina stricta</i>	26 July 87
167	Tasman Hwy	Wet forest	5 June 86, 10 Aug 86, 12 Sep 86, 12 Oct 86 (x), 7 Dec 86 (x)

Site	Locality	Vegetation	Date
168	Tunbridge - Steppes Rd	<i>Leptospermum lanigerum</i>	29 May 86, 13 Sep 86, 16 Oct 86, 20 Jan 87 (x), 9 Feb 87 (x), 18 Mar 87 (x), 25 Apr 87, 31 May 87, 18 June 87 (x), 31 July 87 (x)
169	Lake Hwy	<i>Arthrotaxis cupressoides</i>	30 May 86 (x), 13 Sep 86 (x), 13 Nov 86, 20 Jan 87 (x), 9 Feb 87 (x), 18 Mar 87, 25 Apr 87, 31 May 87 (x), 18 June 87 (x), 31 July 87 (x)
170	Lake Hwy	<i>Nothofagus cunninghamii</i>	13 Nov 86
171	Lake Hwy, Lkt near Projection Bluff	Wet woodland	25 Apr 87
172	Lake Hwy	<i>Nothofagus cunninghamii</i>	30 May 86, 10 Aug 86 (x), 13 Sep 86 (x), 13 Nov 86, 20 Jan 87, 9 Feb 87, 18 Mar 87, 25 Apr 87, 31 May 87 (x), 18 June 87 (x), 31 July 87 (x), 26 Feb 88
173	Lake Hwy	<i>Pinus radiata</i>	30 May 86
174	Liffey Falls	<i>Nothofagus cunninghamii</i>	26 Feb 88
175	Lake Hwy	<i>Nothofagus cunninghamii</i>	30 May 86, 12 July 86, 10 Aug 86, 13 Sep 86 (x), 14 Oct 86 (x), 13 Nov 86, 20 Jan 87, 9 Feb 87, 18 Mar 87, 26 Apr 87, 31 May 87, 18 June 87 (x), 31 July 87 (x), 26 Feb 88
176	Lake Hwy	Wet forest	13 Nov 86
177	Lake Hwy	Wet forest	30 May 86, 12 July 86, 10 Aug 86, 13 Sep 86, 14 Oct 86, 13 Nov 86, 20 Jan 87, 9 Feb 87, 18 Mar 87, 26 Apr 87, 31 May 87, 18 June 87, 31 July 87, 26 Feb 88
178A	Jackeys Marsh (east)	Bracken	12 Nov 86
178B	Jackeys Marsh (east)	<i>Carex appressa</i>	12 Nov 86
179A	Jackeys Marsh (east)	Wet forest (dead foliage)	18 Mar 87, 26 Feb 88
179B	Jackeys Marsh (east)	Wet forest (dead foliage)	26 Feb 88
180A	Jackeys Marsh (east)	Wet forest	13 Nov 86, 8 Dec 86, 20 Jan 87, 18 Mar 87, 1 June 87, 31 July 87, 26 Feb 88
180B	Jackeys Marsh (east)	<i>Nothofagus cunninghamii</i> (mixed forest)	13 Nov 86, 8 Dec 86, 20 Jan 87, 18 Mar 87, 1 June 87, 31 July 87, 26 Feb 88
181	Lake Hwy	<i>Exocarpus cupressiformis</i> (wet/dry forest mosaic)	30 May 86, 12 July 86 (x), 10 Aug 86 (x), 13 Sep 86, 14 Oct 86, 13 Nov 86, 20 Jan 87, 9 Feb 87, 18 Mar 87, 26 Apr 87, 31 May 87, 18 June 87, 31 July 87, 26 Feb 88
182	Launceston, Cataract Gorge	<i>Acacia melanoxylon</i> (dry forest)	22 July 86, 11 Nov 86, 15 June 87

Site	Locality	Vegetation	Date
183	Launceston, Cataract Gorge	<i>Casuarina stricta</i> (dead foliage)	22 July 86, 11 Nov 86, 17 June 87
184	Launceston, Cataract Gorge	Exotic vegetation	27 Aug 86, 11 Nov 86, 15 June 87
185	Launceston, Cataract Gorge	Tussock grasses (<i>Poa</i> sp)	22 July 86, 15 June 87, 17 June 87
186	Notley Gorge	Wet forest	27 July 87
187	Bell Bay	Dry forest	15 June 87 (x)
188	Low Head, Eastern Beach	<i>Acacia melanoxylon</i> (planted alongside of road)	15 June 87
189	Low Head, Eastern Beach	<i>Melaleuca ericifolia</i>	15 June 87
190	Low Head, Eastern Beach	<i>Acacia</i> sp (?)	15 June 87
191	Greens Beach	<i>Melaleuca ericifolia</i>	15 June 87
192	Greens Beach	<i>Myoporum insulare</i>	15 June 87
193A	Asbestos Range NP	<i>Banksia marginata</i>	17 June 87, 27 July 87, 25 Feb 88
193B	Asbestos Range NP	<i>Casuarina stricta</i>	17 June 87, 27 July 87, 25 Feb 88
193C	Asbestos Range NP	Bracken	17 June 87, 27 July 87, 25 Feb 88 (x)
194A	Asbestos Range NP	Heath (mainly <i>Leptospermum scoparium</i>)	17 June 87, 27 July 87, 25 Feb 88
194B	Asbestos Range NP	<i>Melaleuca ericifolia</i>	17 June 87, 27 July 87, 25 Feb 88
195	Asbestos Range NP	<i>Acacia melanoxylon</i> (dry forest)	17 June 87, 25 Feb 88 (x)
196	Asbestos Range NP	<i>Myoporum insulare</i>	6 June 86, 17 June 87, 25 Feb 88 (x)
197	Asbestos Range NP Rd	<i>Leptospermum</i> scrub	25 Feb 88
198	Frankford Main Rd	<i>Casuarina littoralis</i>	25 Feb 88
199	Frankford Main Rd	Wet/dry forest mosaic	25 Feb 88
200A	Bass Hwy	<i>Melaleuca ericifolia</i> (understorey in wet/dry forest mosaic)	18 Apr 87
200B	Bass Hwy	<i>Exocarpus cupressiformis</i>	18 Apr 87
200C	Bass Hwy	<i>Melaleuca ericifolia</i> (understorey in dry/west forest mosaic)	18 Apr 87
201	Bass Hwy	dead <i>Eucalyptus</i> foliage (wet/dry forest mosaic)	18 Apr 87
202	Bass Hwy	Wet/dry forest mosaic (mainly <i>Leptospermum</i> heath understorey)	18 Apr 87
203A	Bass Hwy	<i>Myoporum insulare</i>	24 Jan 87
203B	Bass Hwy	dead <i>Myoporum</i> foliage	24 Jan 87
204	Bass Hwy	<i>Melaleuca ericifolia</i>	25 June 87 (x)
205	Forth - Wilmot Rd	Wet/dry forest mosaic	8 June 86, 12 July 86 (x), 25 Mar 87

Site	Locality	Vegetation	Date
206	Spellmens Gorge	Wet forest	26 July 86
207	Leven Canyon Lkt	<i>Leptospermum scoparium</i> (low wet/dry mosaic)	17 Apr 87, 20 May 87, 29 June 87, 28 Feb 88
208	Leven Canyon Tk	Tall scrub	17 Apr 87
209	Leven Canyon	<i>Callistemon</i> sp.	17 Apr 87, 20 May 87, 29 June 87 (x), 28 Feb 88
210	Bell Mtn	Wet forest (heath understorey)	1 June 87
211	Cnr Mole Creek and Wilmot - Sheffield Rds	Wet forest (heath understorey)	27 Jan 87
212	Garrie Park	Wet forest (heath understorey)	27 Feb 88
213	Garrie Park	Wet forest (heath understorey)	1 June 87 (x), 27 Feb 88
214A	Wilmot - Cradle Mtn Rd	dead rainforest foliage	2 Mar 87, 17 Mar 87, 16 Apr 87, 19 May 87, 29 June 87, 28 Feb 88
214B	Wilmot - Cradle Mtn Rd	Tussock grasses (<i>Poa</i> sp)	19 May 87 (x)
215	Daisy Dell	<i>Nothofagus cunninghamii</i>	6 June 86, 12 July 86, 30 Aug 86 (x), 29 Sep 86, 26 Oct 86, 26 Nov 86, 23 Jan 87, 7 Feb 87, 2 Mar 87, 17 Mar 87, 16 Apr 87, 19 May 87, 29 June 87, 28 Feb 88
216A	Pencil Pine Inn	<i>Nothofagus cunninghamii</i>	26 Nov 86, 2 Mar 87
216B	Pencil Pine Inn	<i>Athrotaxis cupressoides</i>	26 Nov 86, 2 Mar 87
216C	Pencil Pine Inn	<i>Richea pandanifolia</i>	26 Nov 86
216D	Pencil Pine Inn	dead <i>Eucalyptus</i> foliage (wet forest)	16 Apr 87
217	Cradle Mtn Rd	<i>Nothofagus cunninghamii</i>	26 Nov 86, 19 May 87
218	Cradle Mtn - Lake St Clair NP, Camping Area	<i>Athrotaxis cupressoides</i>	27 Nov 86, 23 Jan 87, 17 Mar 87, 16 Apr 87, 19 May 87, 28 Feb 88
219A	Cradle Mtn - Lake St Clair NP, Weindorfers Forest	<i>Nothofagus cunninghamii</i>	26 Oct 86, 26 Nov 86, 7 Feb 87, 2 Mar 87, 17 Mar 87, 28 Feb 88
219B	Cradle Mtn - Lake St Clair NP, Weindorfers Forest	<i>Richea scoparia</i>	26 Oct 86, 26 Nov 86, 23 Jan 87 (x)
219C	Cradle Mtn - Lake St Clair NP, Weindorfers Forest	<i>Athrotaxis selaginoides</i>	26 Oct 86, 26 Nov 86, 7 Feb 87, 28 Feb 88
219D	Cradle Mtn - Lake St Clair NP, Weindorfers Forest	<i>Phyllocladus aspleniifolius</i>	26 Oct 86, 27 Nov 86, 23 Jan 87, 7 Feb 87, 2 Mar 87, 17 Mar 87, 16 Apr 87, 19 May 87, 30 July 87 (x), 28 Feb 88
219E	Cradle Mtn - Lake St Clair NP, Weindorfers Forest	<i>Nothofagus cunninghamii</i>	26 Nov 86, 23 Jan 87, 2 Mar 87, 16 Apr 87, 19 May 87, 30 July 87 (x), 28 Feb 88
219F	Cradle Mtn - Lake St Clair NP, Weindorfers Forest	<i>Athrotaxis selaginoides</i>	27 Nov 86, 23 Jan 87, 7 Feb 87, 2 Mar 87, 17 Mar 87, 16 Apr 87, 19 May 87

Site	Locality	Vegetation	Date
219G	Cradle Mtn - Lake St Clair NP, Weindorfers Forest	<i>Nothofagus gunnii</i>	27 Nov 86, 23 Jan 87, 2 Mar 87
219H	Cradle Mtn - Lake St Clair NP, Weindorfers Forest	<i>Leptospermum lanigerum</i>	23 Jan 87, 2 Mar 87, 17 Mar 87, 16 Apr 87, 19 May 87 (x), 28 Feb 88
220	Cradle Mtn - Lake St Clair NP, Dove Lake	Heath	27 Nov 86, 17 Mar 87 (x), 16 Apr 87 (x)
221	Cradle Mtn - Lake St Clair NP, Dove Lake	<i>Diselma archeri</i>	27 Nov 86, 23 Jan 87, 16 Apr 87, 19 May 87
222	Cradle Mtn - Lake St Clair NP, Ballroom Forest	Rainforest	7 June 86, 26 Oct 86, 27 Nov 86, 23 Jan 87
223	Cradle Mtn - Lake St Clair NP, Marions Lkt	<i>Diselma archeri</i>	23 Jan 87 (x)
224A	Emu Plains	<i>Leptospermum lanigerum</i>	27 Feb 88
224B	Emu Plains	<i>Drimys lanceolata</i>	27 Feb 88
225A	Cradle Mtn - Lake St Clair NP, Overland Tk, Cirque Hut	<i>Athrotaxis cupressoides</i>	4 Mar 87
225B	Cradle Mtn - Lake St Clair NP, Overland Tk, Cirque Hut	<i>Leptospermum lanigerum</i>	4 Mar 87
225C	Cradle Mtn - Lake St Clair NP, Overland Tk, Cirque Hut	<i>Nothofagus cunninghamii</i>	4 Mar 87
225D	Cradle Mtn - Lake St Clair NP, Overland Tk, Cirque Hut	dead heath (mainly <i>Leptospermum</i>)	4 Mar 87
226A	Cradle Mtn - Lake St Clair NP, Overland Tk, Windermere Hut	<i>Nothofagus cunninghamii</i>	5 Mar 88
226B	Cradle Mtn - Lake St Clair NP, Overland Tk, Windermere Hut	dead rainforest foliage	5 Mar 88
226C	Cradle Mtn - Lake St Clair NP, Overland Tk, Windermere Hut	dead rainforest foliage	5 Mar 88
227A	Cradle Mtn - Lake St Clair NP, Overland Tk, Du Cane Hut	<i>Leptospermum lanigerum</i>	10 Mar 87
227B	Cradle Mtn - Lake St Clair NP, Overland Tk, Du Cane Hut	<i>Nothofagus cunninghamii</i>	10 Mar 87
228	Cradle Mtn - Lake St Clair NP, Overland Tk	Rainforest	15 Sep 86
229	Cradle Mtn - Lake St Clair NP, Lake St Clair	<i>Nothofagus cunninghamii</i>	1 Dec 86, 27 Jan 87 (x), 27 Feb 87, 29 Apr 87, 1 July 87, 10 Mar 88
230A	Cradle Mtn - Lake St Clair NP, Lake St Clair	<i>Nothofagus cunninghamii</i>	31 May 86 (x), 1 July 86 (x), 12 Aug 86 (x), 15 Sep 86 (x), 16 Oct 86 (x), 16 Nov 86 (x), 1 Dec 86, 1 July 87 (x)
230B	Cradle Mtn - Lake St Clair NP, Lake St Clair	<i>Phyllocladus aspleniifolius</i>	31 May 86, 1 July 86 (x), 12 Aug 86 (x), 15 Sep 86, 16 Oct 86 (x), 16 Nov 86, 1 Dec 86, 27 Jan 87 (x), 27 Feb 87 (x), 29 Apr 87 (x), 1 July 87 (x), 10 Mar 88
231	Cradle Mtn - Lake St Clair NP, end of Watersmeet Tk	dead <i>Leptospermum</i> foliage (rainforest)	31 May 86, 16 Nov 86, 29 Apr 87, 10 Mar 88

Site	Locality	Vegetation	Date
232	Cradle Mtn - Lake St Clair NP, Watersmeet Tk	dead <i>Leptospermum</i> foliage (wet forest)	31 May 86
233	Lyell Hwy	<i>Nothofagus cunninghamii</i> (mixed forest)	31 May 86, 13 June 86, 1 July 86 (x), 30 Nov 86 (x)
234	Lyell Hwy	<i>Nothofagus cunninghamii</i>	30 Nov 86, 29 Apr 87, 9 Mar 88
235	Lyell Hwy	<i>Nothofagus cunninghamii</i>	30 Nov 86
236	Lyell Hwy, Frenchmans Cap NP, Start of Walking Tk	Heath	29 Apr 87
237	Lyell Hwy, Wild Rivers NP	Heath	29 Apr 87
238	Frenchmans Cap NP, Philips Creek	Wet Scrub	9 Mar 88
239	Frenchmans Cap NP, Lake Vera	Wet Scrub	8 Mar 88
240	Frenchmans Cap NP Walking Tk	Rainforest	9 Mar 88 (x)
241	Frenchmans Cap NP, Tahune Lake	Rainforest	7 Mar 88
242	Lyell Hwy	<i>Hakea epiglottis</i>	3 July 86, 12 Aug 86, 15 Sep 86 (x), 16 Oct 86, 16 Nov 86, 27 Jan 87, 27 Feb 87, 29 Apr 87, 1 July 87 (x), 10 Mar 88
243	Tarraleah	Bracken	31 May 86, 1 July 86, 12 Aug 86, 15 Sep 86, 16 Oct 86, 16 Nov 86, 1 Dec 86, 27 Jan 87 (x), 27 Feb 87, 29 Apr 87, 1 July 87 (x), 10 Mar 88 (x)
244A	Lyell Hwy	<i>Atherosperma moschatum</i>	16 Nov 86
244B	Lyell Hwy	Wet forest	16 Nov 86 (x)
244C	Lyell Hwy	<i>Nothofagus cunninghamii</i>	16 Nov 86, 1 Dec 86

Site	Locality	Vegetation	Date
245	Rocky Cape NP, Postmans Tk Car Park	Wet scrub (mainly <i>Leptospermum scoparium</i> and <i>Melaleuca squarrosa</i>)	26 Apr 87, 3 Mar 88
246	Rocky Cape NP, Sisters Beach Rd	Heath/wet scrub (mainly <i>Leptospermum scoparium</i> and <i>Melaleuca squarrosa</i>)	14 June 86, 25 July 86, 23 Sep 86, 25 Oct 86, 24 Nov 86, 24 Jan 87, 1 Mar 87, 26 Mar 87, 26 Apr 87, 23 May 87, 28 June 87, 30 July 87, 3 Mar 88
247A	Sisters Beach	dead <i>Banksia serrata</i> foliage	26 Apr 87, 29 Feb 88
247B	Sisters Beach	dead <i>Eucalyptus</i> foliage (dry forest)	26 Apr 87
248A	Sisters Beach	<i>Banksia serrata</i>	14 June 86, 25 July 86, 24 Aug 86, 23 Sep 86, 25 Oct 86, 24 Nov 86, 9 Dec 86 (x), 24 Jan 87, 1 Mar 87, 26 Mar 87, 26 Apr 87, 23 May 87, 28 June 87, 30 July 87, 29 Feb 88
248B	Sisters Beach	Bracken	14 June 86, 25 July 86, 24 Aug 86, 23 Sep 86, 25 Oct 86, 24 Nov 86, 9 Dec 86, 24 Jan 87 (x), 1 Mar 87, 26 Mar 87, 26 Apr 87, 23 May 87, 28 June 87, 30 July 87, 29 Feb 88
249	Sisters Beach	<i>Myoporum insulare</i>	23 Oct 86
250	Rocky Cape NP, Banksia Grove Tk	Heath (mainly <i>Leptospermum</i> and <i>Casuarina</i>)	24 Aug 86
251	Rocky Cape NP, Banksia Grove Tk	Low <i>Eucalyptus</i> woodland (heath understorey)	24 Jan 87
252A	Rocky Cape NP, Banksia Grove	<i>Banksia serrata</i>	24 Jan 87, 1 Mar 87, 26 Mar 87, 26 Apr 87, 23 May 87, 28 June 87, 30 July 87, 29 Feb 88
252B	Rocky Cape NP, Banksia Grove	<i>Banksia</i> woodland (heath understorey)	24 Jan 87, 1 Mar 87, 26 Mar 87, 26 Apr 87, 23 May 87, 28 June 87 (x), 30 July 87, 29 Feb 88
253	Detention Falls	Wet/dry forest mosaic	23 Oct 86
254	Rocky Cape NP, Rocky Cape Rd	Heath (mainly <i>Leptospermum</i>)	23 Oct 86, 26 Jan 87 (sweep), 29 July 87
255	Port Latta	Dry forest (heath/scrub understorey)	27 June 87
256	Smithton	Heath (mainly <i>Leptospermum</i>)	27 Apr 87, 21 May 87, 26 June 87, 28 July 87 (x)
257	Brittons Swamp	<i>Acacia melanoxylon</i>	15 June 86, 25 July 86, 28 Aug 86, 22 Sep 86, 25 Oct 86, 24 Nov 86
258	Bass Hwy	Wet forest	15 June 86, 25 July 86, 28 Aug 86 (x), 22 Sep 86, 25 Oct 86, 24 Nov 86, 25 Jan 87, 26 Mar 87, 27 Apr 87, 21 May 87, 26 June 87, 28 July 87, 1 Mar 88
259	Marawah - Arthur River Rd	<i>Acacia melanoxylon</i> (swamp)	22 Sep 86, 25 Oct 86, 24 Nov 86, 25

Site	Locality	Vegetation	Date
		forest)	Jan 87, 1 Mar 87, 26 Mar 87, 27 Apr 87, 25 May 87, 26 June 87, 28 July 87, 1 Mar 88
260	Marrawah - Arthur River Rd	Dry woodland	24 Nov 86
261A	Arthur River	<i>Myoporum insulare</i>	15 June 86, 24 July 86, 28 Aug 86, 22 Sep 86, 25 Oct 86, 24 Nov 86, 25 Jan 87, 1 Mar 87, 26 Mar 87, 27 Apr 87, 21 May 87, 26 June 87, 28 July 87, 1 Mar 88
261B	Arthur River	<i>Leptospermum laevigatum</i>	15 June 86, 24 July 86 (x), 28 Aug 86 (x), 22 Sep 86 (x), 25 Oct 86, 24 Nov 86, 25 Jan 87, 1 Mar 87, 26 Mar 87, 27 Apr 87, 21 May 87, 26 June 87 (x), 28 July 87 (x), 1 Mar 88
261C	Arthur River	<i>Leptospermum lanigerum</i>	15 June 86, 24 July 87, 28 Aug 86 (x), 22 Sep 86, 25 Oct 86, 24 Nov 86, 25 Jan 87, 1 Mar 87, 26 Mar 87, 27 Apr 87, 21 May 87, 26 June 87, 28 July 87, 1 Mar 88
262A	Temma - Arthur River Rd	<i>Melaleuca ericifolia</i>	15 June 86, 24 July 86 (x), 28 Aug 86, 22 Sep 86, 25 Oct 86, 24 Nov 86, 25 Jan 87, 1 Mar 87, 26 Mar 87, 27 Apr 87, 21 May 87, 26 June 87, 28 July 87, 1 Mar 88
262B	Temma - Arthur River Rd	<i>Leptospermum laevigatum</i>	26 June 87
263	Temma - Arthur River Rd	<i>Melaleuca ericifolia</i>	28 Aug 86 (x), 25 Jan 87, 1 Mar 87, 26 Mar 87, 21 May 87, 26 June 87, 28 July 87, 1 Mar 88
264A	Temma - Arthur River Rd	dead <i>Eucalyptus</i> foliage (dry woodland)	28 Aug 86, 22 Sep 86
264B	Temma - Arthur River Rd	Heath (mainly <i>Leptospermum</i>)	22 Sep 86, 25 Jan 87 (sweeping), 21 May 87
265A	Temma - Arthur River Rd	Heath (mainly <i>Leptospermum</i> and <i>Casuarina</i>)	15 June 86, 24 July 86, 28 Aug 86, 22 Sep 86, 25 Oct 86, 24 Nov 86, 25 Jan 87, 1 Mar 87, 26 Mar 87, 27 Apr 87, 21 May 87, 26 June 87, 28 July 87, 1 Mar 88
265B	Temma - Arthur River Rd	Heath	25 Jan 87 (sweeping)
266	Temma - Arthur River Rd	<i>Melaleuca squarrosa</i>	28 Aug 86
267	Rebecca Rd	Mixed forest (mainly dead rainforest foliage)	1 Mar 88
268	Rebecca Rd	Mixed forest (mainly dead rainforest foliage)	1 Mar 88
269	Sumac Rd	Mixed forest (mainly dead rainforest foliage)	1 Mar 88
270	Sumac Rd, Frankland River	Rainforest shrubs	2 Mar 88
271	Sumac Rd	dead Heath (<i>Leptospermum</i>)	2 Mar 88

Site	Locality	Vegetation	Date
272	Balfour Tk	Rainforest	2 Mar 88
273	Roger River West Rd	Heath (mainly <i>Melaleuca</i>)	22 May 87
274	Kanunah Bridge	<i>Acacia melanoxylon</i> (rainforest)	29 Aug 86, 23 Sep 86, 24 Oct 86 (x), 25 Nov 86, 9 Dec 86, 26 Jan 87, 28 Feb 87, 25 Mar 87, 22 May 87, 29 July 87, 2 Mar 88
275	Sumac Rd	<i>Nothofagus cunninghamii</i>	29 Aug 86, 23 Sep 86, 24 Oct 86, 25 Nov 86, 9 Dec 86 (x), 26 Jan 87, 28 Feb 87, 25 Mar 87, 27 Apr 87 (x), 22 May 87, 29 July 87, 2 Mar 88
276	Julius River Forest Reserve	<i>Nothofagus cunninghamii</i>	29 Aug 86, 23 Sep 86, 24 Oct 86, 25 Nov 86 (x), 9 Dec 86, 26 Jan 87, 28 Feb 87, 25 Mar 87, 27 Apr 87 (x), 22 May 87, 29 July 87, 2 Mar 88
277	Lake Chisolm	Rainforest	29 Aug 86, 2 Mar 88
278A	Rapid River Rd	dead <i>Eucalyptus</i> foliage (mixed forest)	25 Mar 87, 22 May 87
278B	Rapid River Rd	dead <i>Nothofagus</i> foliage (mixed forest)	25 Mar 87
279	Rapid River Rd	Heath (mainly <i>Leptospermum</i> and <i>Melaleuca</i>)	26 Jan 87 (sweep), 28 Feb 87, 25 Mar 87, 22 May 87, 2 Mar 88
280A	Milkshakes Forest Reserve	<i>Nothofagus cunninghamii</i> (mixed forest)	14 June 86, 25 July 86 (x), 29 Aug 86, 23 Sep 86, 24 Oct 86, 25 Nov 86, 9 Dec 86, 26 Jan 87, 28 Feb 87, 25 Mar 87, 24 Apr 87, 22 May 87, 29 July 87, 2 Mar 88 (x)
280B	Milkshakes Forest Reserve Rd	Heath	22 May 87
281	Trowutta Rd, Pine Tk	Rainforest	14 June 86, 25 July 86 (x), 23 Sep 86, 24 Oct 86, 25 Nov 86, 9 Dec 86, 26 Jan 87, 28 Feb 87, 25 Mar 87, 27 Apr 87, 22 May 87, 29 July 87 (x), 2 Mar 88
282A	Roger River West	<i>Nothofagus cunninghamii</i>	29 Aug 86 (x)
282B	Roger River West	<i>Acacia melanoxylon</i> (rainforest)	29 Aug 86 (x)
282C	Roger River West	Wet forest	29 Aug 86 (x)
283	Roger River	Wet forest	14 June 86
284	Murchison Hwy	dead foliage (wet scrub)	27 Mar 87
285A	Hellyer Gorge	Wet forest	28 Nov 86
285B	Hellyer Gorge	<i>Nothofagus cunninghamii</i>	27 Mar 87, 2 June 87, 3 Mar 88
285C	Hellyer Gorge	dead rainforest foliage	27 Mar 87, 3 Mar 88
285D	Hellyer Gorge	Rainforest (mainly <i>Eucryphia</i>)	27 Mar 87
285E	Hellyer Gorge	Rainforest (mainly <i>Nothofagus</i>)	28 Nov 86, 27 Mar 87, 3 Mar 88

Site	Locality	Vegetation	Date
286	Murchison Hwy	Tussock grasses (<i>Poa</i> sp)	27 Mar 87
287	Murchison Hwy	<i>Acacia melanoxylon</i> (tall woodland)	28 Nov 86
288	Savage River Rd	dead rainforest foliage	27 Mar 87
289	Murchison Hwy, Rest Stop	Rainforest	28 Apr 87, 4 Mar 88
290A	Staffords Rd	Mixed forest	28 Apr 87
290B	Staffords Rd	Rainforest	2 June 87
291	Savage River Rd	<i>Nothofagus cunninghamii</i>	4 Mar 88
292	Savage River Rd	<i>Nothofagus cunninghamii</i>	28 Nov 86
293	Corinna Rd	dead <i>Leptospermum</i> foliage	27 Mar 87
294A	Corinna, Pieman River	<i>Nothofagus cunninghamii</i>	28 Nov 86, 27 Mar 87
294B	Corinna, Whyte River Tk	Rainforest	28 Nov 86, 27 Mar 87, 4 Mar 88
294C	Corinna, Whyte River Tk	<i>Acacia melanoxylon</i>	28 Nov 86, 27 Mar 87
295	Pieman Dam Rd	Heath	28 Apr 87
296	Pieman Dam Rd	dead foliage (heath)	28 Apr 87
297	Pieman Dam Rd	Heath	28 Apr 87 (x)
298	Pieman Dam Rd	Wet forest	28 Mar 87
299	Pieman Dam Rd	<i>Nothofagus cunninghamii</i>	29 Nov 86, 28 Mar 87
300	Pieman Dam Rd	<i>Eucalyptus</i> woodland	29 Nov 86 (x), 28 Mar 87
301	Pieman Dam Rd	Heath	28 Apr 87 (x)
302	Murchison Hwy, N Tullah	Wet forest (<i>Leptospermum</i> heath understorey)	28 Mar 87, 28 Apr 87, 2 June 87 (x), 4 Mar 88
303	Murchison Hwy, S Tullah	Wet scrub (<i>Leptospermum</i> and <i>Melaleuca</i>)	28 Mar 87, 28 Apr 87, 2 June 87, 4 Mar 88
304A	Murchison Hwy, nr Rosebery	<i>Acacia melanoxylon</i>	29 Nov 86
304B	Murchison Hwy, nr Rosebery	<i>Nothofagus cunninghamii</i>	29 Nov 86
305	Rosebery	Exotic pine trees	29 Nov 86
306	Murchison Hwy	<i>Nothofagus cunninghamii</i>	29 Nov 86
307	Murchison Hwy, Scenic Drive	<i>Nothofagus cunninghamii</i>	29 Nov 86
308	Murchison Hwy	Wet scrub	28 Mar 87 (x)
309	Zeehan - Strahan Rd	Wet scrub	28 Mar 87 (x)
310	Zeehan - Strahan Rd	Heath	28 Apr 87
311	Zeehan - Strahan Rd	Heath	29 Nov 86 (x)
312	Strahan	<i>Melaleuca ericifolia</i>	5 Mar 88
313	Strahan, Hogarth Falls	Rainforest	30 Nov 86
314A	Wellington Head	<i>Acacia melanoxylon</i> (wet/dry forest mosaic)	5 Mar 88
314B	Wellington Head	<i>Monotoca glauca</i>	5 Mar 88

Site	Locality	Vegetation	Date
314C	Wellington Head	<i>Banksia marginata</i>	5 Mar 88
314D	Wellington Head	<i>Monotoca elliptica</i>	5 Mar 88
314E	Wellington Head	Heath (mainly <i>Leptospermum</i> and <i>Melaleuca</i>)	5 Mar 88
315	Lyell Hwy	Wet scrub (mainly <i>Phebalium</i>)	1 July 86
316	Crotty Rd	<i>Nothofagus cunninghamii</i>	30 Nov 86
317	Crotty Rd	<i>Acacia melanoxylon</i>	2 July 87, 30 Nov 86
318	Crotty Rd	Wet scrub (<i>Acacia mucronata</i> and <i>Leptospermum</i>)	2 July 87 (x)
319	Crotty Rd	<i>Acacia melanoxylon</i>	2 July 87
320A	Crotty Rd	<i>Acacia mucronata</i>	2 July 87
320B	Crotty Rd	Wet scrub (<i>Acacia</i> and <i>Leptospermum</i>)	2 July 87
320C	Crotty Rd	<i>Acacia melanoxylon</i>	2 July 87
320D	Crotty Rd	<i>Nothofagus cunninghamii</i>	30 Nov 86

Site	Locality	Vegetation	Date
321A	Mt Field NP, Entrance	Exotic deciduous trees	14 July 87
321B	Mt Field NP, Entrance	<i>Acacia melanoxylon</i> (planted)	14 July 87
322A	Mt Field NP, Russell Falls Tk	dead foliage (wet forest)	3 Apr 87, 14 July 87
322B	Mt Field NP, Russell Falls Tk	dead rainforest foliage	3 Apr 87
323A	Mt Field NP, Lyrebird Nature Tk	<i>Nothofagus cunninghamii</i>	3 Apr 87, 14 July 87 (x)
323B	Mt Field NP, Lyrebird Nature Tk	<i>Acacia melanoxylon</i>	3 Apr 87
323C	Mt Field NP, Lyrebird Nature Tk	<i>Phyllocladus aspleniifolius</i>	14 July 87
324	Mt Field NP, Lake Dobson Rd	Rainforest	4 Nov 86
325A	Mt Field NP, Lake Dobson	<i>Leptospermum lanigerum</i>	14 July 87
325B	Mt Field NP, Lake Dobson	<i>Athrotaxis cupressoides</i>	14 July 87 (x)
326	Fitzgerald	Heath (mainly <i>Leptospermum</i>)	6 Apr 87, 14 July 87
327	Gordon River Road	<i>Acacia melanoxylon</i> (wet forest)	11 Apr 87
328	Maynes Rd	dead foliage (mixed forest)	12 Apr 87
329	Meullers Rd	dead foliage (mixed forest)	12 Apr 87
330	Timms Tk	Heath (<i>Leptospermum</i> and <i>Melaleuca</i>)	11 Apr 87
331A	Timms Tk	Mixed forest	11 Apr 87
331B	Timms Tk	Mixed forest	11 Apr 87
332	Needles Picnic Area	Wet forest (mainly <i>Acacia mucronata</i>)	11 Apr 87
333	Gordon River Rd	Heath (<i>Leptospermum</i> and <i>Melaleuca</i>)	11 Apr 87
334	Strathgordon, Jacks Tk	dead foliage (mixed forest)	10 Apr 87
335	Strathgordon	Wet forest (heath understorey)	10 Apr 87 (x)
336A	Scotts Peak Rd, Sandfly Creek	Heath (mainly <i>Leptospermum</i>)	11 Feb 88
336B	Scotts Peak Rd, Sandfly Creek	Wet scrub (<i>Melaleuca</i>)	11 Feb 88
337A	Scotts Peak Rd, Condominium Creek	Heath (mainly <i>Leptospermum</i>)	10 Apr 87
337B	Scotts Peak Rd, Condominium Creek	<i>Nothofagus cunninghamii</i> (dead foliage)	10 Apr 87
338	Scotts Peak Rd	<i>Acacia melanoxylon</i>	10 Apr 87 (x)
339A	Scotts Peak Rd, Lake Judd Tk Camp	<i>Acacia verticillata</i>	10 Apr 87
339B	Scotts Peak Rd, Lake Judd Tk Camp	Rainforest	10 Apr 87
340	Scotts Peak Camping Area	Heath (mainly	10 Apr 87

Site	Locality	Vegetation	Date
		<i>Leptospermum</i>)	
341	Scotts Peak Rd	Heath (mainly <i>Leptospermum</i>)	10 Apr 87
342	South West NP, Huon River Campground	<i>Nothofagus cunninghamii</i> (mixed forest)	9 Apr 87
343A	South West NP, Port Davey Tk, Crossing River	<i>Banksia</i> scrub	10 Feb 88
343B	South West NP, Port Davey Tk, Crossing River	Heath/wet scrub mosaic (<i>Leptospermum</i> and <i>Melaleuca</i>)	10 Feb 88
344	South West NP, Crossing River	Heath/wet scrub mosaic	10 Feb 88 (x)
345	South West NP, Arthur Range, Promontory Lake	Alpine vegetation	10 Feb 88 (x)
346A	South West NP, McKays Tk, Wullyacca Creek	Wet scrub	10 Feb 88
346B	South West NP, McKays Tk, Wullyacca Creek	Wet scrub	10 Feb 88
347	South West NP, Luckmans Lead, Luckmans Creek	Wet scrub/heath mosaic	11 Feb 88
348	South West NP, Thwaites Plateau	Alpine vegetation	11 Feb 88 (x)
349	South West NP, Spain Bay	Coastal vegetation	22 Mar 88
350	South West NP, Stephens Bay	Coastal vegetation	22 Mar 88
351A	South West NP, Loyhener Beach	Coastal vegetation	22 Mar 88
351B	South West NP, Loyhener Beach	<i>Myoporum insulare</i>	22 Mar 88
352	South West NP, Window Pane Bay	Tall <i>Leptospermum</i> scrub	21 Mar 88
353	South West NP, Window Pane Bay	Coastal vegetation	21 Mar 88
354	South West NP, Wilson Bight	Coastal vegetation	19 Mar 88
355	South West NP, Ketchem Bay	Coastal vegetation	19 Mar 88
356	South West NP, New Harbour Beach	Wet forest	18 Mar 88
357	South West NP, New Harbour Beach	Wet forest	18 Mar 88
358	South West NP, Melaleuca Lagoon	<i>Leptospermum</i> scrub	16 Mar 88
359A	South West NP, Half Woody Hill	dead foliage (wet forest)	16 Mar 88
359B	South West NP, Half Woody Hill	Rainforest	16 Mar 88
360	South West NP, Cox Bight	Coastal vegetation	24 Mar 88
361	South West NP, South Coast Tk, Louisa River	Mixed forest	25 Mar 88
362	South West NP, Little Deadmans Bay	Wet forest (mainly <i>Acacia melanoxylon</i>)	27 Mar 88
363	South West NP, Prion Beach	dead <i>Eucalyptus</i> foliage (wet forest)	27 Mar 88
364A	South West NP, New River Lagoon	Coastal scrub	15 Feb 88

Site	Locality	Vegetation	Date
364B	South West NP, New River Lagoon	Coastal scrub	15 Feb 88
364C	South West NP, New River Lagoon	Coastal scrub	15 Feb 88
365A	South West NP, New River Lagoon	Coastal scrub	15 Feb 88
365B	South West NP, New River Lagoon	Coastal scrub	15 Feb 88
365C	South West NP, New River Lagoon	Coastal scrub	16 Feb 88
366A	South West NP, New River Lagoon	Wet forest	16 Feb 88
366B	South West NP, New River Lagoon	Wet forest	16 Feb 88
366C	South West NP, New River Lagoon	<i>Acacia melanoxylon</i>	16 Feb 88
366D	South West NP, New River Lagoon	<i>Nothofagus cunninghamii</i>	16 Feb 88
366E	South West NP, New River Lagoon	dead <i>Eucalyptus</i> foliage (wet forest)	16 Feb 88
366F	South West NP, New River Lagoon	dead <i>Eucalyptus</i> foliage (wet forest)	16 Feb 88
366G	South West NP, New River Lagoon	dead rainforest foliage	16 Feb 88
366H	South West NP, New River Lagoon	dead rainforest foliage	16 Feb 88
367	South West NP, Prion Beach	<i>Myoporum insulare</i>	27 Mar 88 (x)
368	South West NP, Surprise Bay	Coastal vegetation	28 Mar 88