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A new genus of millipedes (Diplopoda: Polydesmida: Dalodesmidae) from wet forests in southern Victoria, with brief remarks on the Victorian Polydesmida

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Victoriombrus gen. nov. is erected for *Victoriombrus acanthus* sp. nov. from the Otway Ranges and *V. seminudus* sp. nov. from the Mt Donna Buang area. Four species of Dalodesmidae and 15 species of Paradoxosomatidae have now been described from Victoria. A diverse fauna of non-paradoxosomatid Polydesmida remains to be described from Victorian wet forests.

Keywords Diplopoda, Polydesmida, Dalodesmidae, millipede, Australia, Victoria

Introduction

At the time of writing, there are 18 valid names for native polydesmidan millipedes known or believed to occur in Victoria (Table 1). Sixteen of these taxa are in Paradoxosomatidae, a family with numerous representatives in the dry forests and woodlands of eastern and western Australia. Paradoxosomatids also occur in Victoria's wetter forests, where they share moist microhabitats with Polydesmida most closely related to forms found in the wet forests of Tasmania and New Zealand. This non-paradoxosomatid, wet-forest polydesmidan fauna is very poorly known, yet collections by the author and others have shown it to be diverse and to include undescribed species in the genera *Asphalidesmus* Silvestri, 1910, *Lissodesmus* Chamberlin, 1920 and *Paredrodesmus* Mesibov, 2003.

In this paper I describe two wet-forest species in a genus with a novel gonopod structure. Victorian species of *Lissodesmus* will be reviewed in a forthcoming paper.

All material examined has been preserved in 75–80% ethanol. Preliminary drawings on graph paper were made using an eyepiece graticule. Gonopods were cleared and temporarily mounted in 60% lactic acid; other body parts were temporarily mounted in glycerine jelly. A Philips Electroscan ESEM 2020 operated in high-vacuum mode was used to examine material which had been air-dried before sputter-coating with gold. SEM images were acquired digitally. Abbreviations are as follows: NMV, Museum Victoria, Melbourne, Vic.; QVM, Queen Victoria Museum and Art Gallery, Launceston, Tas.

Order **Polydesmida** Leach, 1815

Suborder **Dalodesmidea** Hoffman, 1980

Dalodesmidae Cook, 1896

Victoriombrus gen. nov.

Type species. Victoriombrus acanthus sp. nov., by present designation.

Diagnosis. Dalodesmids c. 15 mm long with head + 20 segments, rounded and somewhat swollen paranota and pore formula 5, 7, 9–19. Telopodite of gonopod short, wide, divided by a transverse constriction into a setose, posteromesally excavated basal portion and a bare distal portion bearing a small mesal branch comprising a long, tapering solenomere accompanied by a distally flattened and roughened process, a much larger lateral branch, and between the two a narrow, more or less rod-like process arising posteromesally.

Description. Head with moderately deep impression lateral to antennal base; bases separated by about twice a socket diameter; vertigial sulcus faintly indicated; head moderately setose with moderately long setae on clypeus and frons, a few long setae on the vertex. Antenna (Fig. 1) short, slender; antennomere 2 the longest, 6 the widest. Collum about as wide as head and second somite; sparsely setose with moderately long setae; posterior margin straight, anterior margin gently convex, corners rounded. Somite 2 with lateral margin of paranotum well below collum corner, somite 3 margin at about the level of the collum corner. Somites with well-defined waist (Fig. 1); a

Table 1. Native Polydesmida from Victoria.

Taxon	Published localities
Dalodesmidae	
Gephyrodesmus cineraceus Jeekel, 1983	Drummer State Forest, 15 km E of Cann River (Jeekel, 1983)
Lissodesmus martini (Carl, 1902)	Melbourne (Carl, 1902); Ferntree Gully National Park, 18 km NNE of Dandenong (Jeekel,1983); Cockatoo Creek (Johns, 1964).
Paradoxosomatidae	
Archicladosoma magnum Jeekel, 1984	Australia (Jeekel, 1984;[1]); Ferntree Gully National Park, 18 km NNE of Dandenong (Jeekel, 1984; tentative identification)
Australiosoma laminatum Jeekel, 1984	Australia (Jeekel, 1984)[1]
Cladethosoma forceps (Verhoeff, 1941)	Gippsland (Verhoeff, 1941)
Dicranogonus pix Jeekel, 1982	13 km SE of Buchan; 4 km ESE of Bruthen; Mt Taylor, 11 km NNW of Bairnsdale (Jeekel, 1982)
Hoplatessara nigrocingulata Jeekel, 1984	Australia (Jeekel, 1984)[1]
H. pugiona Verhoeff, 1941	Whittlesea (Verhoeff, 1941)[2]; Belgrave (Jeekel, 1984)
Hoplatria clavigera Verhoeff, 1941	Australia (Jeekel, 1984)[1]; Gippsland (Verhoeff, 1941)
Isocladosoma guttatum Jeekel, 1984	Glenaladale National Park, 28 km WNW of Bairnsdale (Jeekel, 1984)
I. maculatum Jeekel, 1984	Australia (Jeekel, 1984)[1]
I. pallidulum Jeekel, 1984	Gunyah Gunyah, 32 km SSW of Morwell (Jeekel, 1984)
Pogonosternum adrianae Jeekel, 1982	Toongabbie, 18 km NNE of Traralgon (Jeekel, 1982)
P. coniferum Jeekel, 1965	Australia (Jeekel, 1965, 1982)[1]
P. laetificum Jeekel, 1982	Ferntree Gully National Park, 18 km NNE of Dandenong (Jeekel, 1982)
P. nigrovirgatum infuscum Jeekel, 1982	Mt Taylor, 11 km NNW of Bairnsdale (Jeekel, 1982)
P. nigrovirgatum nigrovirgatum (Carl, 1902)	Melbourne (Carl, 1902)
Somethus biramus Jeekel, 1984	Drummer State Forest, 15 km E of Cann River; 13 km SE of Buchan; also NSW and SA (Jeekel, 1984)

[1] Jeekel (1982, 1984) believed that the type specimens of these species are from Victoria because they were collected by Victorian naturalist Charles Barrett and, in the case of *Isocladosoma* and *Pogonosternum* spp., because congeners are known from Victoria.
[2] Verhoeff (1941: 14) gives "Whettlerea bei Melbourne", probably an error for 'Whittlesea', c. 40 km north of Melbourne.

few setae on somite 2, remaining somites bare and apparently smooth (very small seta-like processes scattered over dorsal surface of metazonite, only visible under high magnification); paranota on most somites just above midlateral (Fig. 1), somewhat swollen, laterally with a very narrow, upwardly concave groove bordered by a slightly thickened margin; from above, anterior margin of paranotum gently curved, lateral margin very slightly convex, posterior margin slightly concave on anterior somites, more so on posterior somites, where the posterior corner projects slightly and bluntly; limbus a comb of fine, straight teeth. Ozopores small, opening dorsolaterally just above and near the posterior end of the paranotal groove on somites 5, 7 and 9–19. Sternites slightly longer than wide, cross impressions well-defined. Anterior legs (Fig. 1) with swollen podomeres, prefemur strongly arched dorsally; posterior legs less swollen; tarsus about as long as next longest podomere, the femur. Sphaerotrichomes on tibia and tarsus only, from leg 3 rearwards, diminishing in number on the more posterior legs and absent from the last leg. Dense 'brushes' of setae ventrally on prefemur, femur and postfemur of most legs from 3 rearwards. Leg 2 coxa somewhat extended mesally, the genital opening a simple pit on this extension. Legpairs 4 and 5 not separated at bases, legpairs 6 and 7 well-separated; flexed gonopod telopodites reaching to legpair 6. Spiracles simple in structure with slightly raised rims; on diplosegments the anterior spiracle just above and anterior to the anterior leg, the posterior spiracle just anterior to the midway point between the leg bases. Preanal ring moderately setose; epiproct tapering to blunt, rounded and depressed tip extending well past anal valves; hypoproct paraboloid in outline.

Gonopod aperture ovoid (Figs 2, 4), wider than long, about one-half width of somite 7 prozonite, with posterior margin in the form of a flattened 'V'and posterolateral portions of rim projecting ventrally. Gonocoxa in overall form a truncated cone, tapering distally, with moderately long setae on posteromesal surface; gonocoxae fairly firmly joined along midline but not quite fused into a syncoxite. Cannula prominent. Gonopod telopodites (Figs 2, 4), short, wide, closely appressed but not joined; partly fused with gonocoxa on anterior side of base; basal portion clearly separated from branched distal portion by a transverse constriction; basal portion excavated posteromesally, sparsely setose, mainly posterolaterally; distal portion bare, divided into a small mesal branch with a long, tapering solenomere joined basally to a distally flattened and roughened process, a much larger lateral branch, and a narrow, more or less rod-like posterior process arising posteromesally.

Females somewhat larger than males, with the same colouring; legs smaller than corresponding male legs and not swollen; posterior rim of epigynum projecting slightly, more so in centre; cyphopods not examined.

Distribution. Southern Victoria.

Etymology. Victoria + Greek *ombros* ("rainshower"), masculine.

Remarks. It is not clear how *Victoriombrus* is related to other Australian dalodesmid genera. The new genus shares with Tasmanian *Bromodesmus* (Mesibov, 2004) a long, tapering, acutely pointed solenomere and telopodite elements fringed with teeth, but the gonocoxae in *Victoriombrus* are more nearly fused into a syncoxite than in the Tasmanian genus, the telopodites are much shorter and wider, and the pore formula is 5, 7, 9–19 instead of 5, 7, 9, 10, 12, 13, 15–19.

Victoriombrus acanthus sp. nov.

Figures 1, 2, 3, 6 (map)

Material examined. Holotype. Male, Australia, Victoria. Young Creek Road, 0.2 km NE of Ciancio Creek crossing, 38°40'S, 143°29'E, pitfall 15.xi.1994–31.i.1995, G. Milledge, *Nothofagus* forest, sample NOH-1079, NMV K-8842.

Paratypes. 1 stadium 7 juvenile male, same details as holotype, NMV K-8843; 2 females, Aire Crossing Track, 0.5 km N of Aire River crossing, 38°40'S, 143°29'E, pitfall 15.xi.1994–31.i.1995, G. Milledge, *Nothofagus* forest, sample NOH-1084, NMV K-8844, K-8857; 1 male, same details but pitfall 31.i.–11.iv.1995, NMV K-8845; 2 males, 1 female, Maits Rest, 10 km W of Apollo Bay, 22.x.1991, K. Walker, *Nothofagus* litter and moss, NMV K-8846, K-8874, K-8875; 1 male, Beauchamp Falls, 38°39'S, 143°36'E, pitfall 6.ix.–15.xi.1994, G. Milledge, *Nothofagus* forest, sample NOH-1089, NMV K-8847; 2 females, same details but pitfall 15.xi.1994–31.i.1995, sample NOH-1090, NMV K-8848, K-8858; 5 males, Turtons Pass, 38°38'39"S, 143°41'20"E, 12.xii.2003, R. Mesibov and T. Moule, wet eucalypt forest litter, NMV K-8849, K-8859–K8862; 2 females, 9 stadium 7 juvenile males, 1 stadium 7 juvenile female, same details, NMV K-8851, K-8863–K8873; 1 stadium 7 juvenile male, same details but 38°38'43"S, 143°40'36"E, NMV K-8850.

Diagnosis. Differs from *V. seminudus* sp. nov. in the form of the gonopod, notably the posterior curvature of the solenomere and the presence of small, branched, spiny processes on the lateral division of the telopodite.

Description. Males c. 15 mm long, c. 1.2 mm in maximum vertical diameter. In alcohol, freshly collected specimens with pale yellow head and antennae; ground colour of body pale yellow, patterned with brown patches: prozonite with a patch laterally and a pair of paramedian patches dorsally, metazonite with a triangular mid-dorsal patch anteriorly, a quadrangular mid-dorsal patch posteriorly, a small patch anteroventrally on paranotum; posterior margin of metazonite and distal podomeres brown.

Gonopod telopodites (Figs 2, 3) short, wide, closely appressed basally but not joined. Basal portion of telopodite excavated posteromesally, with variably long setae on postero-lateral surface and surrounding the excavate area. Telopodite with a transverse constriction at between one-third to one-half its length, separating setose basal portion from bare distal portion, the latter divided basally into mesal, posteromesal and lateral branches. Mesal branch divides basally into a long, tapering, acutely pointed solenomere and a long, flattened process arising posterior to solenomere. Solenomere curves first anteriorly and basally, then turns sharply distally, curving slightly posteriorly but remaining parallel to long axis of telopodite, terminating at about two-thirds telopodite length. Prostatic groove running along mesal surface of telopodite, following curvature of the solenomere and terminating at its tip. Laterally flattened process accompanying the solenomere curves first mesally, then anteriorly, terminating just distal to solenomere; tip of process and a somewhat expanded portion at about mid-length with numerous marginal teeth and a roughened surface. Just distal and posterior to solenomere origin, posteromesal process arising as a narrow, rod-like, tapering process, laterally flattened from about half its length, curving slightly mesally, then laterally. Lateral branch of telopodite by far the largest, complicated in structure (Figs 2, 4), basically a laterally flattened process, curving slightly laterally and somewhat concave mesally, with marginal teeth of varying sizes; posterior edge giving rise to a mesally curving process ending in a rounded, somewhat expanded tip resembling a spanner or wrench midway between solenomere origin and tip; lateral and anterior surfaces of main process armed at about one-third the process length with small, short, branched, spiny structures resembling the tips of a thorny shrub.

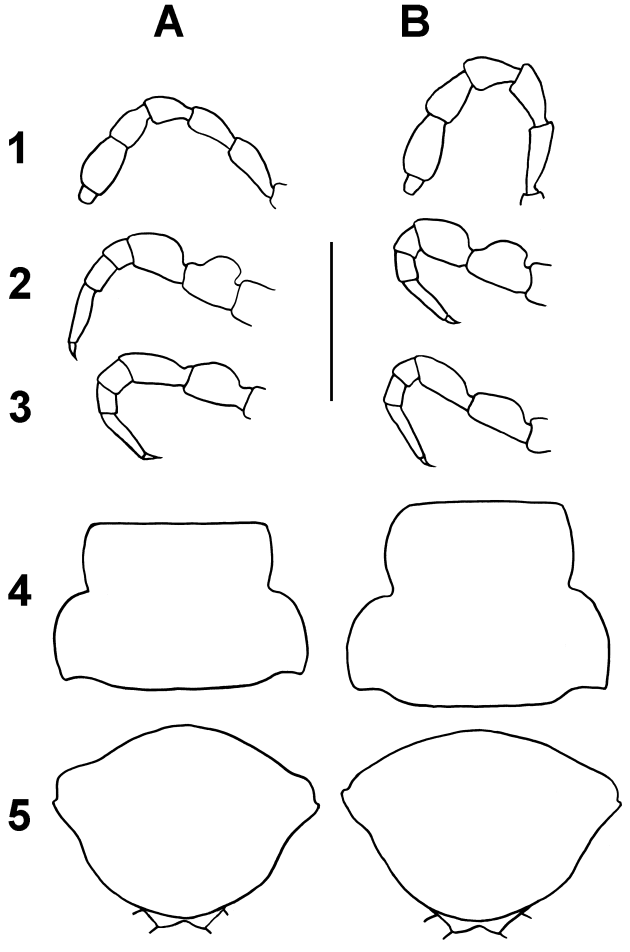

Figure 1. *Victoriombrus* spp. details. A, *V. acanthus* sp. nov., male paratype from NMV K-8849; B, *V. seminudus* sp. nov., male paratype from NMV K-8856. 1, Antenna; 2, posterior leg on somite 6; 3, posterior leg on somite 12; 4, dorsal outline view of somite 12; 5, posterior outline view of somite 12. Scale bar = 1.0 mm; setation and antennal cones not shown.

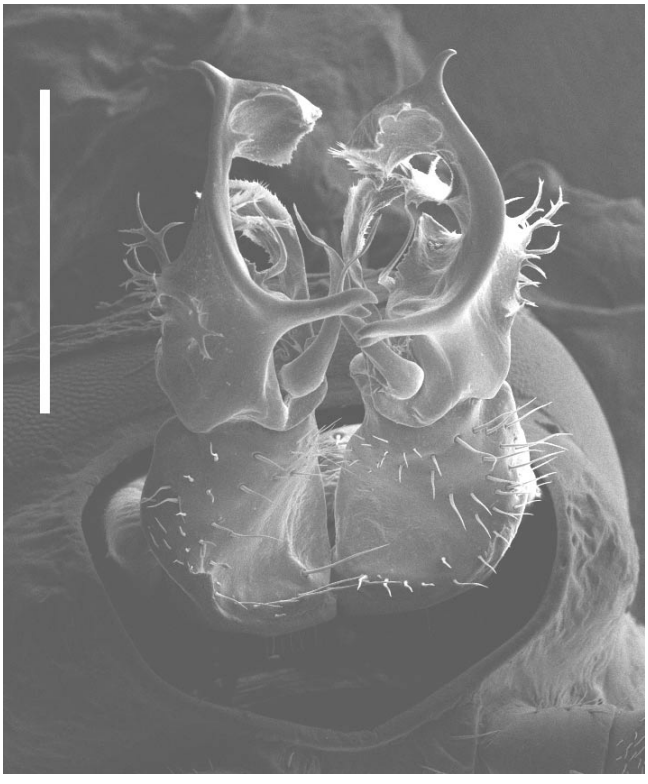

Figure 2. *Victoriombrus acanthus* sp. nov., male, paratype. Posterior view of gonopods in situ (specimen from NMV K-8849). Scale bar = 0.5 mm.

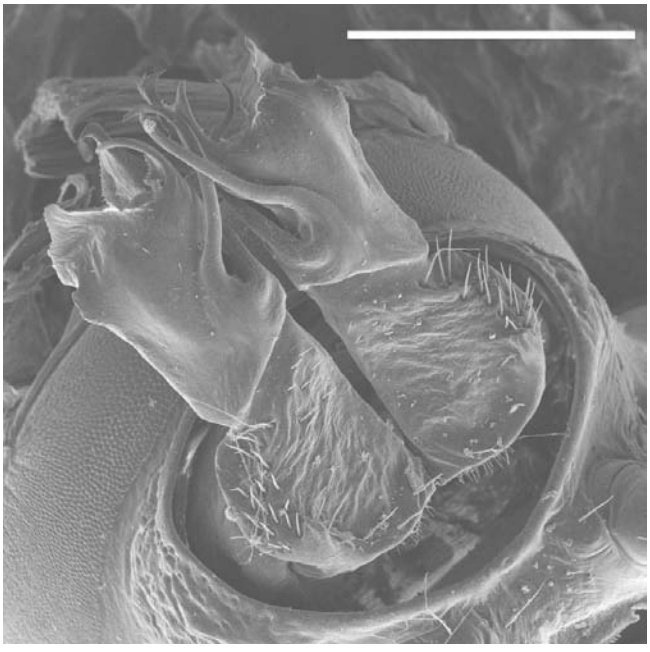

Figure 4. *Victoriombrus seminudus* sp. nov., male, paratype. Posterior view of gonopods in situ (specimen from NMV K-8853). Scale bar = 0.5 mm.

Figure 3. *Victoriombrus acanthus* sp. nov., male, paratype. Anterior (left) and mesal (right) views of right gonopod (specimen from NMV K-8849). Dashed line indicates course of prostatic groove; for clarity, the continuation of the groove to the solenomere tip is not indicated.

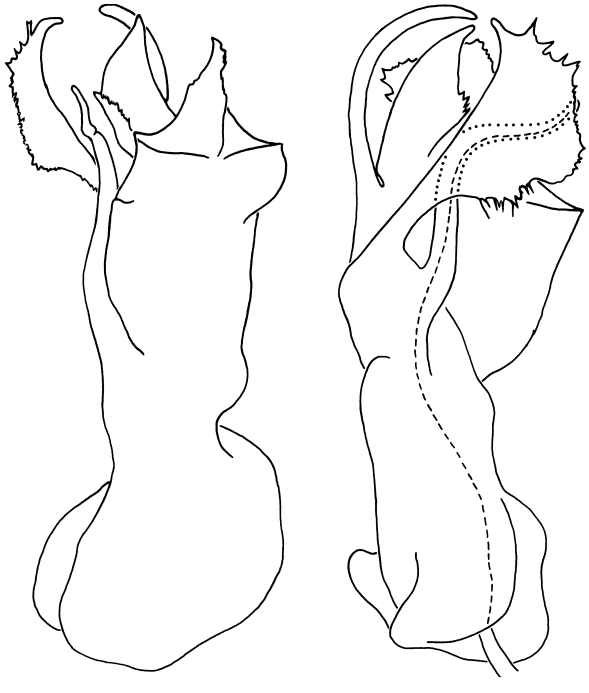

Figure 5. *Victoriombrus seminudus* sp. nov., male, paratype. Anterior (left) and mesal (right) views of right gonopod (specimen from NMV K-8856). Dashed line indicates course of prostatic groove.

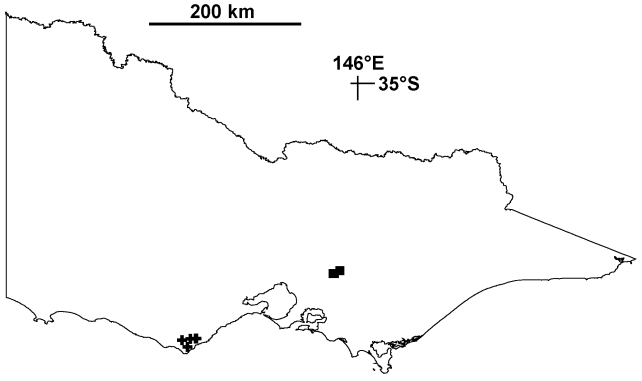

Figure 6. Localities in Victoria of *Victoriombrus acanthus* sp. nov. (crosses) and *V. seminudus* sp. nov. (squares).

Distribution and microhabitat. In wet eucalypt and *Nothofagus* forest litter in the Otway Ranges (Fig. 6).

Etymology. Latin *acanthus* ("prickly shrub"), noun in apposition, from the appearance of the gonopod telopodite.

Victoriombrus seminudus sp. nov.

Figures 1, 4, 5, 6 (map)

Material examined. Holotype. Male, Australia, Victoria. Myrtle Gully Reserve, 3.4 km WSW of Mt Donna Buang, 37°43'S, 145°38'30"E, pitfall 29.xi.1994–20.i.1995, G. Milledge, *Nothofagus* forest, sample NOH-1840, NMV K-8852.

Paratypes. 1 male, 7 females, 1 stadium 7 juvenile female, same details as holotype, K-8853, K-8876– K-8883; 1 male, same details but pitfall 21.i.–7.iv.1995, sample NOH-1841, NMV K-8854; 2 males, 2 females, Road 26, 0.2 km WNW of Donna Buang Road junction, 37°43'S, 145°39'30"E, pitfall 29.xi.1994 to 20.i.1995, G. Milledge, *Eucalyptus* forest, sample NOH-1846, NMV K-8855, K-8884–K-8886; 1 male, Acheron Gap, 6 km NE of Mt Donna Buang, 37°40'43"S, 145°44'20"E, pitfall 28.xii.1995–21.ii.1996, G. Milledge, *Nothofagus* forest, sample NOH-1853, NMV K-8856.

Diagnosis. Differs from *V. acanthus* sp. nov. in the form of the gonopod, notably the anterior curvature of the solenomere and the absence of small, branched, spiny processes on the lateral division of the telopodite.

Description. Males c. 15 mm long, 1.2 mm in maximum vertical diameter. In alcohol, well-coloured specimens with pale yellow antennae and yellow-orange head, legs and paranota; prozonite and metazonite ground colour pinkish-brown; metazonite reddish-brown below paranota and with mid-dorsal, triangular reddish-brown patch; posterior margin of metazonite and distal podomeres reddish-brown.

Gonopod telopodites (Figs 4, 5) short, wide, closely appressed basally but not joined. Basal portion of telopodite excavated posteromesally, with variably long setae on posterolateral surface. Telopodite with a transverse constriction at between one-third to one-half its length, angled distad from lateral to mesal, separating setose basal portion from bare distal portion, latter divided basally into mesal, posteromesal and lateral branches. Mesal branch divides basally into a long, tapering, acutely pointed solenomere and a long, flattened process arising posterior to solenomere. Solenomere extends distally, then turns abruptly anteriorly at about three-quarters the length of the telopodite before terminating in a short, distally directed tip. Prostatic groove running along mesal surface of telopodite, following curvature of the solenomere and terminating at its tip. Laterally flattened process accompanying the solenomere directed anterodistally and slightly mesally, expanding in its distal half into a large flattened, fan-like structure with numerous marginal teeth and a roughened surface. Just distal and posterior to solenomere origin, posteromesal process arising as a narrow, rod-like, tapering process, curving mesally and anteriorly and terminating just distal to the most distal teeth of the process accompanying the solenomere. Lateral branch of telopodite by far the largest, greatly inflated basally, terminating in toothed crests anteriorly and posteriorly.

Distribution and microhabitat. In wet eucalypt and *Nothofagus* forest litter in the Mt Donna Buang area (Fig. 6).

Etymology. Latin *semi-* (half) + *nudus* (naked), adjective, because the setose basal portion of the gonopod telopodite is so clearly separated by a transverse constriction from the bare distal portion.

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