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## ***Gasteruption youngi* sp. nov. (Hymenoptera: Evanioidea: Gasteruptionidae) from South Australia; an unusual species with trichoid sensilla on the ovipositor sheaths**

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### **Abstract**

*Gasteruption youngi*, sp. nov. (Evanioidea: Gasteruptionidae) is described based on several female specimens from South Australia. The new species is unusual in that it has stout trichoid sensilla on the ovipositor sheaths and long, thin trichoid sensilla on metasomal tergites T3–T8. The likely host is the colletid bee *Euryglossula microdonta* (Rayment, 1934).

**Key words:** Gasteruptioninae, new species, host record

Gasteruptionidae (Evanioidea) is divided into two subfamilies, Gasteruptioninae and Hyptiogastrinae (Jennings & Austin 2002). They can be separated most readily by the first discal cell in the vast majority of Gasteruptioninae being formed by fore wing vein 1-Rs+M forming a node at 1-Rs, M+Cu and 1-Cu (Fig. 5). A small number of *Gasteruption* L. species, however, show various degrees of occlusion of the discal cell (see Crosskey 1962; Jennings & Austin 1994; Macedo 2011). In Hyptiogastrinae, 1-Rs+M intersects the basal cell about one-quarter to one-third of the distance from M+Cu (Jennings & Austin, 2002), although the discal cell is completely missing in *Pseudofoenus* Kieffer species from New Zealand, 1-Rs+M and 1-Cu(b) being fused to form Rs+M+Cu(b), and veins 1-M and m-cu being absent (Jennings & Austin 1994). Jennings & Austin (2002) provide a more detailed comparison of the two subfamilies.

Most Gasteruptioninae (Gasteruptionidae) belong to the diverse and cosmopolitan genus *Gasteruption*, although several Neotropical species have been assigned recently to three small genera; *Plutofoenus* Kieffer (3 spp.—southern South America), *Spinolafoenus* Macedo (1 sp.—Chile) and *Trilobitofoenus* Macedo (3 spp.—Central and South America) (Macedo 2009). In total, more than 400 *Gasteruption* species have been described worldwide, with more than a quarter (113 valid species but also 14 *incertae sedis*) endemic to Australia (Jennings 2010). Many of these Australian species were described more than a century ago, although Pasteel's revision (Pasteel 1957) provided additional species.

Hyptiogastrinae, which comprises *Hyptiogaster* Kieffer (10 spp.—mainland Australia), and *Pseudofoenus* (79 spp.—largely Australasian in distribution, except for two South American species), has been revised recently (Jennings & Austin 1997, 2002, 2005). As with *Gasteruption*, *Hyptiogaster* have long ovipositors, but in the sister genus *Pseudofoenus*, the ovipositor is very short and hidden by the ovipositor sheaths.

All available host records indicate that Gasteruptionidae are predator-inquilines in the nests of solitary bees and possibly solitary wasps, where they eat the host egg or developing larvae and then consume the pollen store which the host has provided for its developing young (see Jennings & Austin 2004 for a summary).

As part of an on-going examination of Australian Evanioidea, several specimens of a *Gasteruption* with unusual setose ovipositor sheaths were collected in South Australia. We describe this new species herein.

## Materials and methods

Images were taken using a Visionary Digital BK+ imaging system with a Canon EOS 7D 18 megapixel camera. Images were produced using Zerene Stacker, Zerene Systems LLC, PMax software and cropped and resized in Adobe Photoshop CS6 (Adobe Systems Inc., San Jose, CA, USA).

Anatomical and wing venation terminology follows Jennings & Austin (2002), and terms for surface sculpturing follow Harris (1979).

Abbreviations for institutions which are repositories of the specimens referred to in this paper are: South Australian Museum, Adelaide (SAM), and Waite Insect and Nematode Collection, The University of Adelaide (WINC).

### *Gasteruption youngi* sp. nov.

(Figs 1–7, 10)

**Material examined.** *Holotype*: ♀, “S. AUST. Wirrabara Forest, Sweeping, 7.iv.2007 J.T. Jennings.” SAM.

*Paratypes*: South Australia: 3♀♀ Melaleuca Cottage, Vivonne Bay, Kangaroo Island. 35°58.690S 137°10.870E, hovering above open ground, 15Feb2010, D.A. Young. Associated with bee. (WINC). [♀ bee with same locality data separately pin mounted]

**Female.** *Length*. 5.71 mm (4.75–6.20 mm), excluding ovipositor.

*Colour*. Head and mesosoma black, antennae and metasoma dark brown-black (Figs 1–2); mandibles and genae largely orange-brown; labio-maxillary complex mostly white (Fig. 4); legs dark brown, except cream band at apex of trochanters, base and apices of femurs, fore and mid tibiae cream, tarsi paler brown (Fig. 1); apical third of ovipositor white, tip brown; apical third of ovipositor sheaths white (Fig. 7); wing veins and pterostigma brown (Fig. 5).

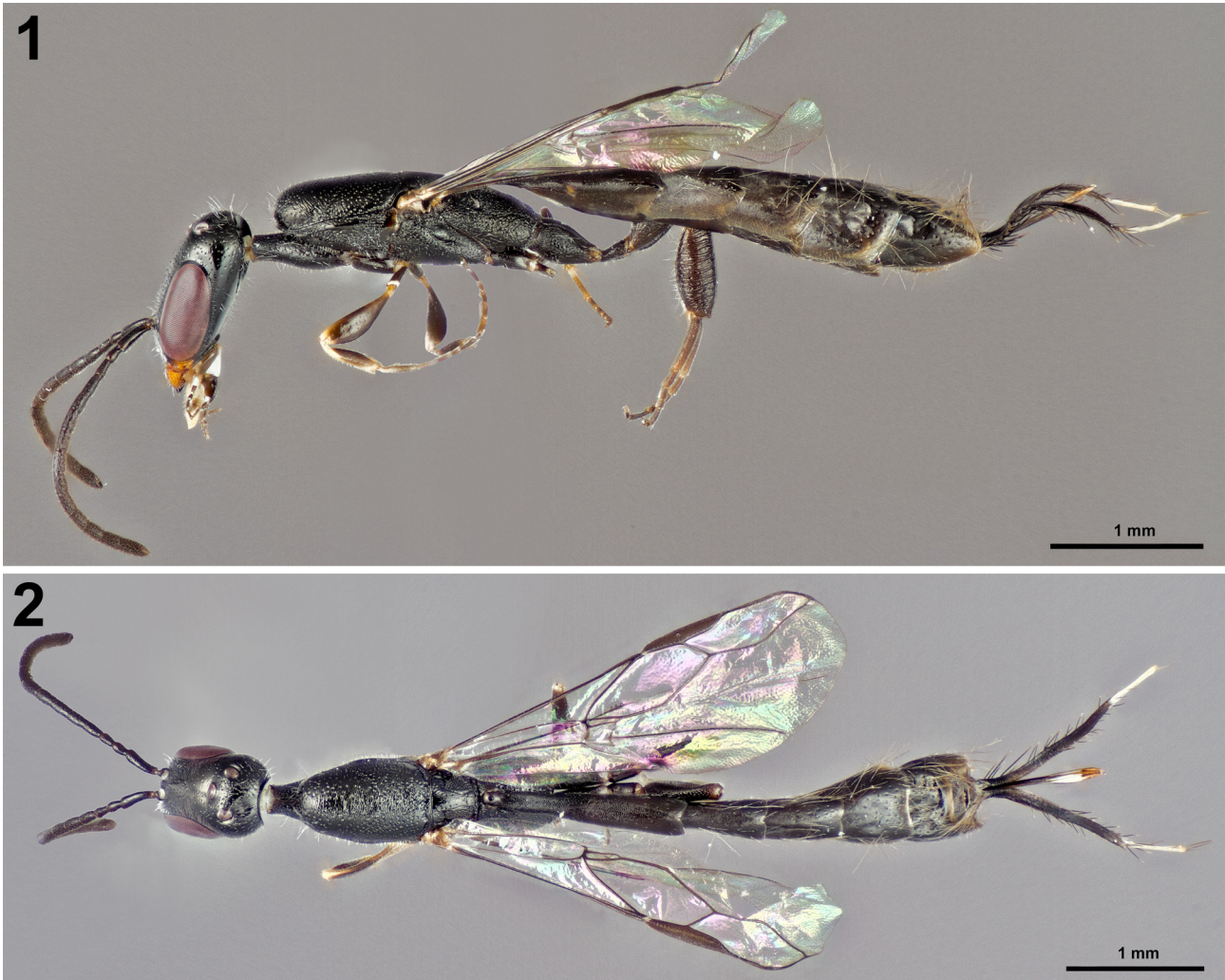
*Head*. 1.98 (1.8–2.1) × as long as wide in dorsal view (Fig. 3); face punctate, rugulose, pubescence long, denser near clypeus (Fig. 3); frons with indistinct medial carina, punctate-rugulose, long setae near antennal scrobes; vertex punctate-rugulose, scattered long setae, denser medially; occipital carina narrow; genae punctate-rugulose, scattered setae (Fig. 5); malar space 0.1 × height eye (Fig. 4); clypeus 0.37 × as wide as high, margin sinuate, with long setae; mandibles broad, with 1 large median tooth; distance between lateral ocellus and inner eye margin 0.76 (0.67–0.83) × distance between lateral ocelli (Fig. 3); scape 2.64 (2.35–2.84) × length pedicel; first flagellomere 0.42 (0.37–0.53) × as long as scape, 0.77 (0.72–0.83) × length second flagellomere.

*Mesosoma*. Propleura punctate-rugulose, pubescence long; pronotum punctate-rugulose; mesoscutum in lateral view rounded antero-dorsally, median and lateral lobes punctate-rugulose, tending to reticulate anterolaterally, with long setae anteriorly; notauli U-shaped, marked by punctures; mesoscutellum and axillae with a few scattered punctures; mesopleura and metapleura punctate-rugulose, with scattered long setae; propodeum punctate-rugulose; hind coxae punctate-rugulose; hind trochanters and femora punctate-rugulose, pubescence short; prefemora small, about one-third length of trochanters; hind tibiae strigate-rugulose on outer surface, with scattered punctures, pubescence generally short, with scattered long setae, inner surface punctate-rugulose, with dense short setae; hind femora 0.67 (0.60–0.71) × length hind tibiae; hind tibiae with ventro-apical pecten of short robust spines; hind tarsomeres 1–5 with ventro-apical pecten of short robust spines, tarsomere 1, 2.78 (2.65–2.85) × length tarsomere 2; tarsomere 2, 1.26 (1.05–1.46) × length tarsomere 3; tarsomere 3, 1.46 (1.36–1.6) × length tarsomere 4; tarsomere 4, 0.53 (0.5–0.61) × length tarsomere 5; hind tarsal claw 0.49 (0.38–0.61) × length tarsomere 5; wings hyaline, fore wing vein 1-Rs+M forming a node at 1-Rs, M+Cu and 1-Cu (Fig. 5); fore wing vein 2-M spectral, except apical third nebulous (Fig. 5); hind wing with 3 hamuli (Fig. 5).

*Metasoma*. 2.0 (1.95–2.06) × length of mesosoma; metasomal tergites reticulate medially, smoother laterally, with scattered punctures on T3–T8, most punctures with a long, thin trichoid sensillum (mean length ~0.27 mm), sensilla denser laterally, with density increasing gradually towards end of metasoma (Fig. 7); terebra 1.26 (1.20–1.30) mm; ovipositor sheath dorsally coarsely strigate near base progressing to smooth apically, with stout trichoid sensilla (mean length ~0.27 mm) on the dorsal (outer) surface (Fig. 7).

**Male.** Unknown.

**Variation.** One specimen from Kangaroo Island has an extra cross-vein in the discal cell of the left fore wing (Fig. 6).



FIGURES 1–2. *Gasteruption youngi* sp. nov., paratype ♀. 1. Dorsal habitus; 2. Lateral habitus.

**Host/associations.** On Kangaroo Island, this species has been collected with *Euryglossula microdonta* (Rayment, 1934) (Apoidea: Colletidae: Euryglossinae) (Figs 8–9).

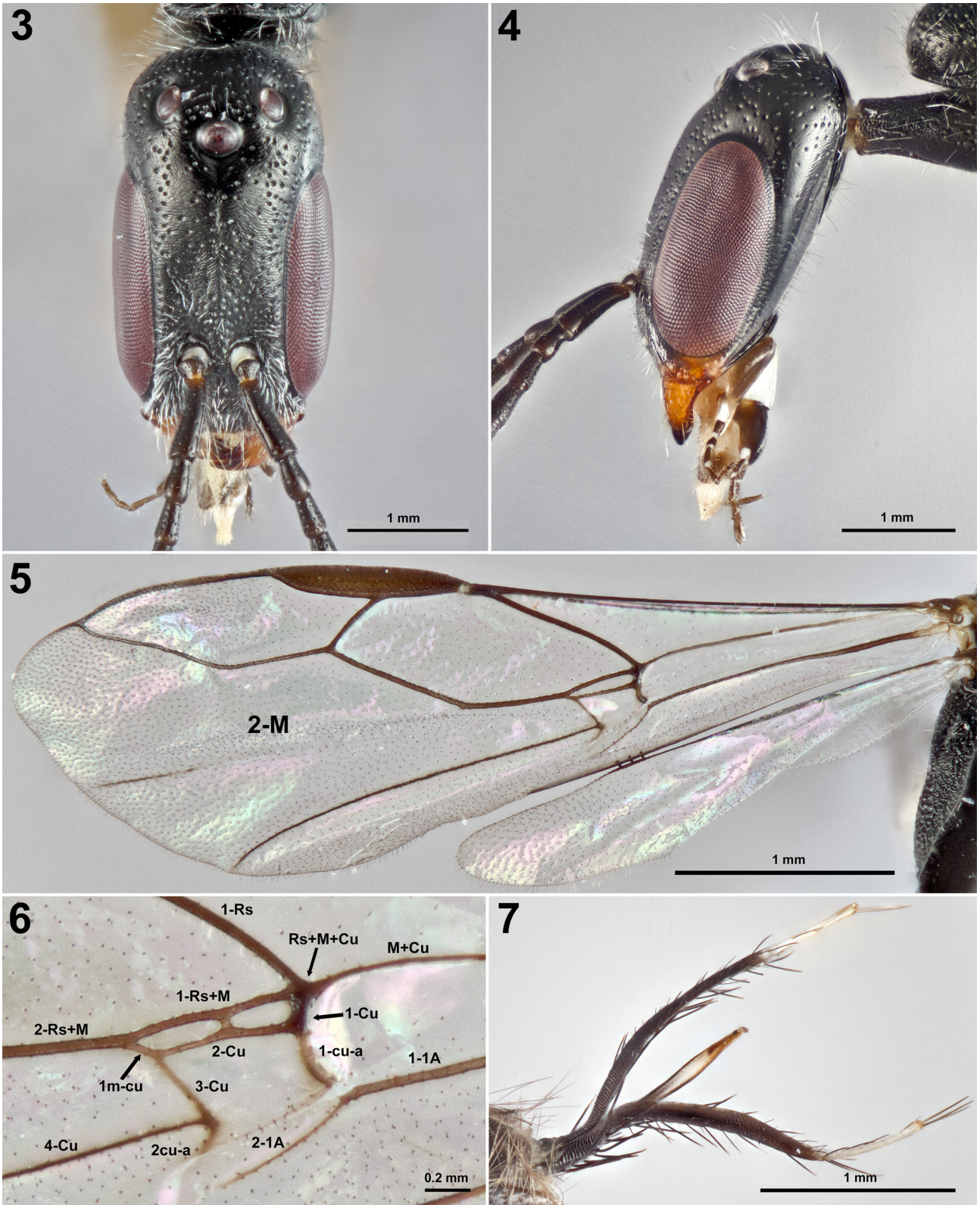
**Etymology.** This species is named in honour of D. A. (Andy) Young, Kangaroo Island, South Australia.

**Diagnosis.** This species can be readily separated from all other Australian *Gasteruption* species by the abundant stout trichoid sensilla on the ovipositor sheaths (Fig. 7).

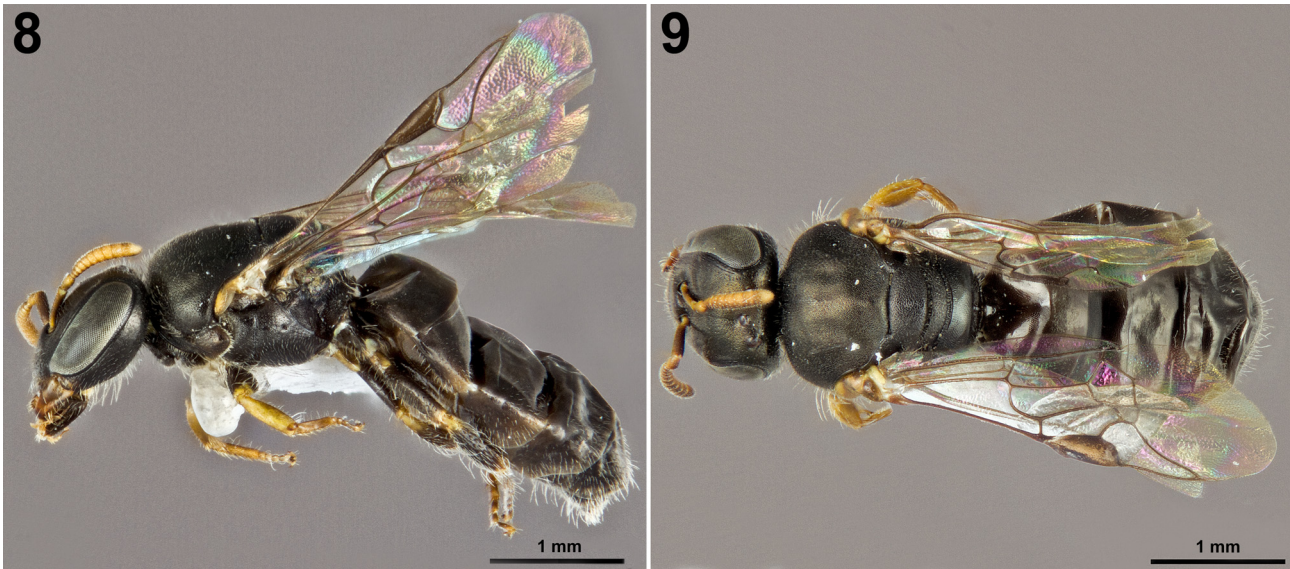
**Remarks.** The authors have examined several thousand *Gasteruption* specimens from Australasia and other biogeographical regions, and as far as is known, the presence of stout trichoid sensilla on the ovipositor sheaths is unique to this species. It should also be noted that *Hyptiogaster* (Hyptiogastrinae) have exerted ovipositors, but none have setose ovipositor sheaths (Jennings & Austin 1997, 2002). The exact function of the stout trichoid sensilla on the ovipositor sheaths has not been determined.

The long, thin trichoid sensilla on metasomal tergites T3–T8, which are denser laterally and towards the apex of the metasoma (Fig. 7), are apparently also distinctive for this species. Their function is also unknown.

The specimens from Kangaroo Island were collected along with the bee *Euryglossula microdonta*, and it is highly likely that this is the host of *Gasteruption youngi* sp. nov. These small bees that are ~3.5 mm in length (Figs 8–9) have a disjunct distribution, being known from various localities in South Australia (Kangaroo Island, Keith, Tintinara and Wallaroo—Fig. 10) and the type locality, Rottneest Island, Western Australia (Rayment 1934).



**FIGURES 3–7.** *Gasteruption youngi* sp. nov., paratype ♀. 3. Frontal head; 4. Lateral head; 5. Left fore and hind wings; 6. Left fore wing showing discal cell variation; 7. Lateral ovipositor and ovipositor sheaths.



FIGURES 8–9. *Euryglossula microdonta* ♀. 8. Lateral habitus; 9. Dorsal habitus.

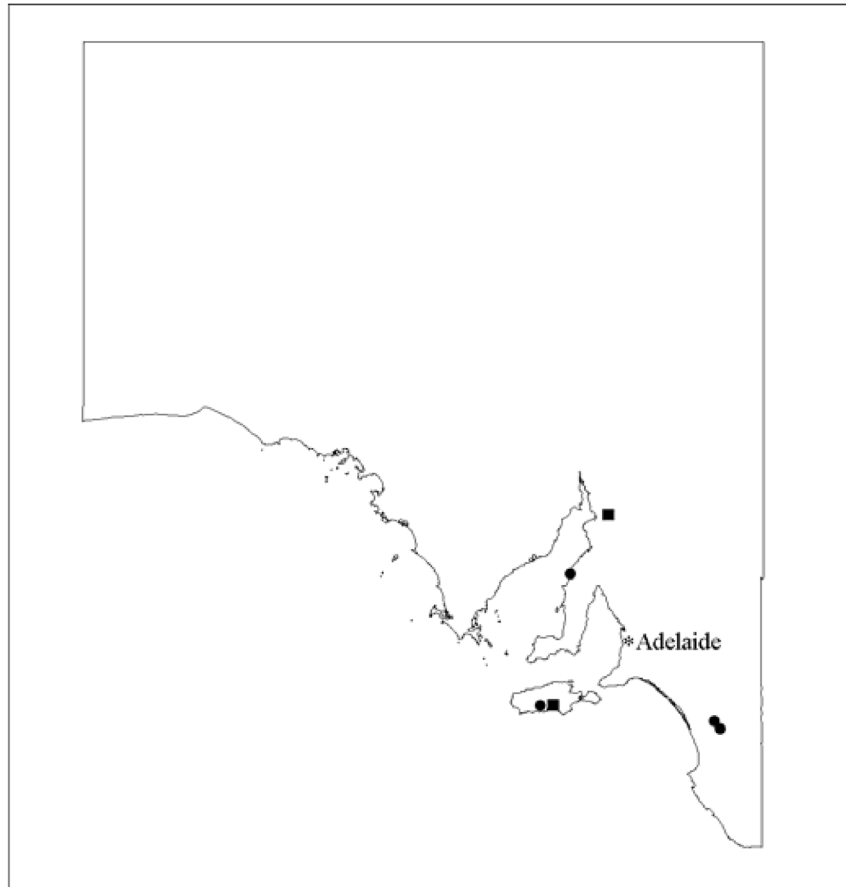


FIGURE 10. Distribution of *Gasteruption youngi* sp. nov. (■) and *Euryglossula microdonta* (●) in South Australia.

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