



Discovery and description of a new species of the weevil genus *Stenobelus* Zimmerman, 1999 (Belidae: Belinae) from southern Western Australia.



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Abstract

The genus *Stenobelus* Zimmerman, 1999 of the weevil tribe Belini Schoenherr, 1826 currently contains two species, *Stenobelus testaceus* (G. R. Waterhouse, 1839) and *S. tibialis* (Blackburn, 1893). Both species were described from southwest Western Australia (WA), and *S. testaceus* is the first weevil species described from the specimens collected by Charles Darwin in Australia in 1836 (Oberprieler *et al.* 2010). Now, a third species, *Stenobelus minutus* Glatz, **sp. nov.**, is described from a single specimen collected 180 years later, in 2016, at East Mount Barren in the Fitzgerald River National Park at the south coast of WA. This is the first new *Stenobelus* to be described in 131 years. It is compared with the two previously described species, from which it most obviously differs by size, and the form of the elytra and dorsal vitae. A key is provided to distinguish the three known *Stenobelus* species.

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Introduction

The belid genus *Stenobelus*, containing only *S. testaceus* (G. R. Waterhouse) and *S. tibialis* (Blackburn), has an interesting and convoluted taxonomic history. Waterhouse (1839) described the type species as *Belus testaceus* from a specimen collected by Charles Darwin in 1836 at King George Sound (Albany) in Western Australia (WA) (Oberprieler *et al.* 2010; Darwin 1839). The species was also later described by Pascoe (1870) as

Belus linearis. Blackburn (1893) subsequently described a second species, as *Belus tibialis*, which is believed to have been collected in or near Perth (Oberprieler *et al.* 2010).

Two further scientific insights were required to arrive at the contemporary taxonomic concept of *Stenobelus*. The first was the recognition by Zimmerman (1994) that *B. tibialis* and *B. linearis* share morphological traits that warrant their placement in a different genus, which he described as *Leptobelus*. This proposition had already

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been made earlier by Blackburn (1893) when he remarked on some unusual structural features of *B. tibialis* as compared with other belids. Unfortunately, however, *Leptobelus* Zimmerman, 1999 turned out to be a junior homonym of *Leptobelus* Stål, 1866 (Hemiptera), and Zimmerman (in Alonso-Zarazaga & Lyal 1999) therefore proposed *Stenobelus* as replacement name for *Leptobelus*. Legalov (2009) later divided *Stenobelus* into two subgenera, *Stenobelus* and *Germaribelus*, and in both erroneously included some species of *Rhinotia* Kirby, 1819. This expansion and division of *Stenobelus* was, however, refuted by Oberprieler *et al.* (2010), who again restricted *Stenobelus* to include only *S. testaceus* and *S. tibialis*.

The second key piece of science came from Oberprieler *et al.* (2010), when they discovered that the type specimens of *B. testaceus* and *B. linearis* are conspecific and consequently synonymised the name *Belus linearis* Pascoe, 1870 with the older *Belus testaceus* G. R. Waterhouse, 1839. Herein, 131 years after the description of the second species (*S. tibialis*), a new species of *Stenobelus* is described and compared with the other two species included in the genus. The only known specimen of the new species was collected in 2016 at East Mount Barren in the Fitzgerald River National Park, along the southern coast of WA.

Methods

Terminology generally follows Zimmerman 1994, including standard length (SL), which is the length of the pronotum and elytra combined in lateral view.

The specimen was measured using a Zeiss Stemi 508 stereo microscope combined with Zeiss "Axiocam 105 color camera" and Zeiss ZEN 2.3 (blue edition) imaging software. Photographs were taken using a BK Lab Imaging system, and a Leica M205 digital camera attached to a microscope, and edited with Adobe® Photoshop®.

The specimen has been deposited at Western Australian Museum (WAM), Perth, WA.

Discussion

Stenobelus minutus is the first new species of its genus to be described in 131 years. The single specimen was collected in 2016 at East Mount Barren in southern WA, 180 years after Charles Darwin collected the holotype of the type species about 225 km to the southwest, at King George Sound, near Albany (Darwin, 1839). The description of *S. minutus* strengthens the generic concept proposed by Zimmerman (1994) and further elucidated by Oberprieler *et al.* (2010). The most obvious morphological differences between *S. minutus* and the two previously described species are the 3-segmented antennal clubs and the lack of a mucro on the meso- and metatibiae, which only have two apical spurs.

There are relatively few *Stenobelus* specimens known; the larvae and their host plants remain unknown. Oberprieler *et al.* (2010) examined 10 specimens of *S. testaceus* and 30 of *S. tibialis* from various collections. All the *S. testaceus* specimens were collected more than a century ago, with King George Sound (Albany) as the only specific locality recorded, and no host plant data have been published. *Stenobelus tibialis* has been collected intermittently and patchily across a wide distribution, Oberprieler *et al.* (2010) citing localities in southwestern WA, Victoria (Kiata), South Australia (Lucindale) and several in southeastern Queensland. More recently, photographic records of a few further specimens and localities have been posted in the Atlas of Living Australia, from Lake Hiawatha (northeastern New South Wales), Yallakar State Forest (eastern Victoria) and Cape Portland (northeastern Tasmania) (Atlas of Living Australia (ALA) 2024). The habitat of *Stenobelus tibialis* has been linked to swamps, and the only plant species associated with significant numbers of adult weevils is a rush (Restionaceae). Photographic evidence (ALA data) also supports the association of adults with rushes or sedges (Cyperaceae).

The collecting of *S. minutus* on an endemic southern WA species of *Boronia* is intriguing, given the potentially limited distribution of the species suggested by the lack of previous collections. If this *Boronia* species is a specific larval foodplant of *S. minutus*, it would restrict the weevil species to a small area along the southern coast of WA. However, the single collecting event of the holotype on a *Boronia* bush probably merely reflects a random perching or perhaps a feeding event of an adult weevil.

The collection date of 14 August for *S. minutus* is the only winter record for any specimen of *Stenobelus*. Across all cited sources, *S. tibialis* has been collected between October and January, and for *S. testaceus* the only recorded seasonal occurrence is in March. Many questions remain about the life history of *Stenobelus*, including the function of the opposing spines on the front legs, the larval host plants, seasonal occurrence and natural enemies.

Taxonomy

Key to species of *Stenobelus*

SL = standard length (see methods).

- 1 Elytra markedly extended caudad in form of narrow extensions with concave outer margins and acuminate apices, extending beyond ventrite 5 by more than its length
***S. testaceus* (G. R. Waterhouse)**
- 1a Elytra extending caudad of ventrite 5 by less than its length, apex tapering somewhat but with outer margins straight or slightly convex **2**

- 2** Median line of pronotum with narrow vitta of dense white setae, continuing along elytral suture; ventrites clothed in dense, white setae largely obscuring cuticle; SL > 6 mm

***S. tibialis* (Blackburn)**

- 2a** Median line of pronotum with a weak, medially interrupted vitta of white setae, not continuing along elytral suture; ventrites clothed in white setae longer than on dorsum but not obscuring cuticle; SL < 6 mm ***S. minutus* Glatz, sp. nov.**

Belidae Schoenherr, 1826

Belinae Schoenherr, 1826

Belini Schoenherr, 1826

Stenobelus Zimmerman, 1999

Stenobelus minutus has the key traits that distinguish *Stenobelus* from other genera of Belinae (see Oberprieler *et al.* (2010) for a complete diagnosis of *Stenobelus*). These traits include: sparse dorsal vestiture of single white setae, each arising from a pit (Fig. 1); antennae inserted into rostrum subbasally (about an eye length from base) and with basal segment subequal in length to segments 2 and 3 combined; rostrum as long as head and pronotum combined, downcurved (Fig. 2); front legs (Fig. 3) with a large pre-apical femoral spine shearing against largest and most basal of four tibial spines when leg closed (protibiae excised basally of these spines), basal tarsites strongly expanded most markedly on front legs.

***Stenobelus minutus* Glatz, sp. nov.**

Figures 1-3.

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Diagnosis

Stenobelus minutus can be differentiated from *S. testaceus* due to the latter having a long, acuminate, apical projection of each elytron, which extends beyond ventrite 5 by more than the length of the latter. Additionally, these projections have slight but obvious concave outer margins. By contrast, *S. minutus* (and *S. tibialis*) have elytra that lack apical projections and extend beyond ventrite 5 by less than its length, and the outer margin of the projections is straight to slightly convex (Fig. 1).

Stenobelus tibialis has an obvious unbroken vitta of white setae along the elytral suture and continuing on the pronotal midline (where it is unbroken), and its underside is clothed in dense white setae that often obscure the underlying cuticle. By contrast, the elytra of *S. minutus* lack a conspicuous white median vitta, being clothed only in sparse, almost evenly spread setae, the white median vitta on the pronotum is weak and medially interrupted, and the underside is only clothed in sparse setae that are rarely dense enough to obscure

the cuticle. Care should be used when considering the pronotal vitta as this character may show intraspecific variation.

As its name suggests, *S. minutus* is much smaller than the other *Stenobelus* species, the holotype having a SL of only 4.1 mm, compared to the smallest of the *Stenobelus* specimens reported by Oberprieler *et al.* (2010) having a SL of > 7mm.

Description

Holotype (Figs. 1-3). SL 4.1 mm. Body generally dark brown with pronotum and head (but not antennae) darker. Antennae 11-segmented, filiform, with 3-segmented club, the last segment divided into two areas by a weak suture with distal area conical and distinguished by shorter, denser setae; basal segment wider than all subsequent ones except those of club; all segments with small number of white setae mainly in apical half and directed apicad; club segments also with smaller, recumbent, closely opposed setae primarily laterally & apically. Rostrum downcurved (Fig. 2), weakly rugose in basal half, glabrous distally of antennal insertions.

Elytral setae almost evenly spaced, contained in pits but not forming vittae; setae denser on scutellum, effectively forming basal extension of pronotal vitta. Pronotal midline with weak vitta of white setae interrupted in middle. Setae protruding somewhat from elytral edges in dorsal view, giving a weak fringe but denser near apex. Recumbent setae on pronotum, occipital region and base of rostrum, shorter than elsewhere, largely contained in pits. Setae denser on venter (particularly in lateral region of pronotum) but never completely obscuring cuticle beneath. Apical tergite and ventrite each with a fringe of gold-brown setae apically.

Profemora enlarged, with single large subapical tooth with weakly incurved tip on inner side (Fig. 3); other femora without subapical spines. Protibiae on inner side basally excavated into a single spine (as in *S. testaceus*), with a series of weaker spines along apical half; also with two apical spurs and preapical mucro; meso- and metatibiae with two apical spurs but lacking an obvious mucro. Basal tarsites expanded, most markedly on forelegs, there almost circular (Fig. 3). All tarsites with white setae dorsally (very sparse on tarsite 5), all except 5 covered with fine setae beneath; tarsite 3 strongly lobed; claws weakly divaricate and with a minute tooth about half way along the claw (Fig. 3, left panel).

Material examined

Holotype

Male (WAM-E122969), Western Australia, East Mount Barren, Fitzgerald River National Park, 33.927899°S 120.014831°E, 14 August 2016, D.A.Young. On *Boronia albiflora*.



Figure 1. *Stenobelus minutus* sp. nov., holotype, dorsal image. Scale bar 1 mm.



Figure 2. *Stenobelus minutus*, sp.nov. holotype, lateral image. Scale bar 1 mm.



Figure 3. *Stenobelus minutus*, sp.nov. holotype. Dorsal images of the foretarsus (left panel), mesotarsus (centre panel), and spination of the foreleg (right panel). Scale bars 0.25 mm.

Distribution & Habitat

The only known location is that of the holotype from the lower slopes of East Mount Barren in Fitzgerald River National Park, southern WA. The habitat consists of rocky areas with pockets of white, unconsolidated sand. The plant species on which the specimen was caught is a southern WA endemic, *Boronia albiflora* R.Br. ex Benth.,

which was growing amongst low herbaceous flora with shrubby patches.

Etymology

The specific epithet *minutus* refers to the small size of this species relative to the other members of the genus, which are almost double the size of *S. minutus*.

Disclosures

There are no conflicts of interest.

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