



Australotarsius—a new genus of the rove beetle tribe Staphylinini from Australia (Coleoptera: Staphylinidae: Staphylininae)

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Abstract

Australotarsius Solodovnikov & Newton, **gen. nov.**, a new genus of rove beetles of the tribe Staphylinini, endemic to Australia, is described and compared to other Staphylinini. It includes two new species, *A. grandis* Solodovnikov & Newton, **sp. n.** from Queensland and New South Wales, and *A. tasmanicus* Solodovnikov & Newton, **sp. n.** from Tasmania. The systematic position of *Australotarsius* within Staphylinini needs further investigation in the context of a broad-scale phylogenetic study of this large tribe. Preliminarily this new genus is thought to be a member of the lineage of Staphylinini which includes genera *Anchocerus* Fauvel, 1905, *Acylophorus* Nordmann, 1837, *Anaquedius* Casey, 1915, *Hemiquedius* Casey, 1915 and possibly *Euryporus* Erichson, 1839, all of which are current members of the subtribe Quediina.

Key words: Quediina, systematics, new species, eastern Australia, Tasmania

Introduction

The new rove beetle genus of the tribe Staphylinini described here was discovered by the second author decades ago among the material collected by Philip J. Darlington, Jr., in Australia. However, its description had to be postponed due to fundamental difficulties associated with the study of the Australian fauna of Staphylinini. Only a small fraction of the local diversity of Staphylinini has been hitherto described for Australia, most of these descriptions dating back to the initial period of exploration of the Australian beetle fauna in the 19th and early 20th centuries (for a catalogue of described species see Newton & Thayer 2005). The overall taxonomic standard characteristic for this period is so outdated that the existing taxonomic literature on Australian Staphylinini is now useful primarily as a reference tool for locating types and other material for revisions. Knowledge of Staphylinini of the neighboring fauna of Papua New Guinea, and of the more remote but biogeographically relevant faunas of New Zealand, New Caledonia and southern South America, is more or less in the same condition. Additionally, in recent decades, there has been significant collecting activity in Australia largely focused on methods (sifting, flight intercept and pitfall traps, low-scale fogging) and habitats (leaf litter and mossy logs in forests) productive for rove beetles, which has yielded tens of thousands of new specimens for study. Therefore, to make sound systematic conclusions about any presumably new taxon of the Australian Staphylinini one must revise a large amount of relevant type and non-type material scattered in the museums of Australia and other countries. By this time, within the framework of a long-term focused inventory of the south temperate fauna of rove beetles (Thayer *et al.* 2003) and a broader phylogenetic study of the world Staphylinini (Chatzimanolis *et al.* 2007), both of us have seen enough material to assure proper identification, description and comparison of *Australotarsius* Solodovnikov & Newton, **gen. nov.** The phylogenetic affiliation of *Australotarsius* is also here hypothesized but it will be

further addressed in the course of the much larger study now in progress by us and our collaborators. Interestingly, despite the above-mentioned intense collecting across Australia, including our own repeated collecting trips in this continent, all hitherto available material of *Australotarsius* is still limited to several specimens. The exact habitat preference and biology of both species of this new genus are unknown. New findings of *Australotarsius* in nature will be very important for its further study.

Material and methods

Material on which this paper is based is deposited in the following institutions:

- ANIC Australian National Insect Collection, Canberra, Australia (A. Ślipinski, T. Weir)
BMNH The Natural History Museum, London, UK (R. Booth, M. Barclay)
FMNH Field Museum of Natural History, Chicago, Illinois, USA (A. Newton, M. Thayer, J. Boone)
MCZ Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA (P. Perkins)
MVMA Museum of Victoria, Abbotsford, Australia (C. McPhee, A. Neboiss)
ZMUC Zoological Museum, University of Copenhagen, Copenhagen, Denmark (A. Solodovnikov, O. Martin)

Labels of the holotypes are cited exactly and given in quotation marks. Each label is separated by a slash (/). Our comments or additional information for these labels or specimens are given in square brackets []. Holotypes recorded at the Field Museum-based specimen database is supplied by the 10-digit unique number, all such numbers starting with the prefix "FMNH-INS".

Specimens were examined dry mounted. Dissected genitalia were macerated in 10% KOH, washed in distilled water and placed in plastic genitalia vials with glycerin and pinned under the respective specimens for permanent storage. All line illustrations were made with the aid of a camera lucida attached to a dissecting microscope. Total length of the body was measured from the apex of the labrum to the tip of the abdomen. All measurements were made with the aid of an eyepiece micrometer, they are given in millimeters and abbreviated as follows:

- HL head length (from apex of clypeus to neck constriction)
HW head width (maximal, including eyes)
PL pronotum length (along mid line)
PW pronotum width (maximal)
EL elytral length (from acute humerus to most distal apical margin; best taken from lateral view of the elytron)
EW combined width of both elytra (maximal, when elytra closed along suture)

Taxonomy

Australotarsius Solodovnikov & Newton, new genus

(Figs. 1–19)

Type species. *Australotarsius grandis* Solodovnikov and Newton, new species.

Diagnosis. From all other genera of Staphylinini, *Australotarsius* can be distinguished by the following combination of characters: entire body evenly setose; apical segment of maxillary palpus setose; neck broad; infraorbital ridges well developed; anterior tarsi in both sexes very broad; male sternite VIII without secondary sexual modifications, of the same shape as in females.

Description. Habitus as in Figs 1, 2. Entire body covered by dense setation. Body length 7.4–14 mm.

Head capsule (Figs 1–2, 8) rounded with well developed, moderately large eyes; nuchal constriction indicated only laterally (in *A. grandis*) or laterally and dorsally (in *A. tasmanicus*), in the former case nuchal ridge developed only laterally, in the latter—laterally and dorsally; epistomal suture absent; infraorbital ridges present, extending to about the middle of the distance from neck to base of mandibles; postgenal and ventral basal ridges well developed; postmandibular ridge and dorsal basal ridge absent. Antennal insertions at anterolateral margins of frons, anterior to eyes, not concealed from above; distance between them slightly longer than distance from either insertion to margin of eye. Antennae moderately long, with distinctly elongate first antennomere (as long as second and third antennomeres together); first three antennomeres setose, but without pubescence, remaining antennomeres setose and pubescent. Mandibles (Fig. 6) moderately long, symmetrical, each with teeth on inner side, without dorso-lateral mandibular groove; prosthema broadly attached near base of mandible, mola not developed. Labrum (Fig. 3) strongly transverse, without transparent apical membrane, only slightly notched medio-apically. Maxilla (Fig. 4) with lacinia and galea densely hairy at apex; stipes with clear sutures; maxillary palpus four-segmented, last segment fusiform, finely setose. Labium (Fig. 5): ligula small, only slightly notched apically, paraglossae long with comb of stout setae internally; last segment of labial palpus fusiform with slightly truncate apex, finely setose.

Pronotum (Fig. 7) with anterior angles projecting anteriorly over apical margin of prosternum; pronotal hypomera slightly inflected inwards, only slightly visible in lateral view; superior marginal line of pronotum well developed throughout its whole length, not deflexed ventrad; inferior marginal line shorter, not meeting with superior marginal line; pronotal hypomeron with weakly sclerotized postcoxal process. Pronotosternal sutures visible but not membranous. Prosternum with midlongitudinal carina, without large conspicuous macrosetae. Mesoventrite without large conspicuous macrosetae, with narrow, acute mesoventral intercoxal process. Meso-metaventral suture well developed, membranous. Mesoscutellum (Fig. 11) with two transverse carinae: one very close to base, another close to middle. Elytra (Fig. 11) relatively long, with sharp humeri and well developed sub-basal ridge immediately adjacent to elytral articulation and extending anteriorly to anterior margin of elytron; epipleural part gradually deflexed, lacking epipleural ridge; sutural angle distinct. Hind wings (Fig. 12) fully developed, with veins CuA and MP4 completely separate. Metaventricle (Fig. 10) well developed, with deep mesocoxal acetabuli delimited by carina. Legs moderately long and slender; anterior and middle (smaller) coxae large, conical, contiguous (Figs. 7, 10). Hind coxae (Fig. 10) as long as wide, almost contiguous at base. Anterior tibia densely setose, without spines externally; middle and posterior tibiae setose, with spines externally. Tarsal formula 5-5-5; claws moderately long, arcuate; pair of empodial setae on each tarsus, shorter on anterior tarsi and very long, longer than claws on middle and posterior tarsi. Anterior tarsi (Fig. 9) in both sexes with tarsomeres I–IV strongly dilated and with dense, long whitish adhesive setae ventrally.

Abdomen more or less parallel-sided along most of its length, narrowed posteriorly, slightly flattened dorsoventrally; abdominal tergite I with protergal glands externally manifested by deep indentation (acetabulum) at each side of tergite and adjacent groups of setae (Fig. 11). Segments III–VI each with two pairs of elongate paratergites, segment VII with two pairs of paratergites, basal short one and apical long one; segment VIII without paratergites; tergites III–VII only with one basal carina; sternite III with basal carina medially strongly angulate (Fig. 13). Sternite VIII without apical emargination in males, with apical margin similarly rounded in both sexes. Abdominal intersegmental membranes attached preapically and having a pattern of small irregular rounded sclerites. Male (Fig. 14) and female (Fig. 15) tergite IX consisting of two elongate, inflated lateral sclerites, apically obtuse, widely separated dorsally by tergite X and ventrally by sternite IX in males or valvifers (first gonocoxites) in females. Male sternite IX (Fig. 14) elongate, more or less symmetrical, with short asymmetrical basal portion.

Aedeagus (Figs. 16–19): median lobe elongate, apically obtuse, symmetrical; paramere with peg setae on the underside, and four pairs of setae apically. Aedeagus rotated by 90° in the abdomen in repose: its dorsal (parameral) side facing left laterally.

Female external genitalia consisting of a pair of large basal valvifers, short coxites (second gonocoxites) and tiny styli; female tergite X symmetrical, large (Fig. 15).

Etymology. The genus name is derived from two words “Australia” and “tarsus”. It refers to the country of origin and spectacular wide anterior tarsi of this new taxon. It is Latinized noun of masculine gender.



FIGURES 1–2. *Australotarsius grandis* (1) and *A. tasmanicus* (2), habitus. Scale bar 5 mm.

Comparison and phylogenetic relationships. Due to somewhat inflexed hypomera of pronotum and well developed infraorbital ridges *Australotarsius* looks like a member of the conventional subtribe Quediina (for its definition and list of included taxa see, for example, Smetana & Davies 2000 and Herman 2001, respectively), which has been shown to be a polyphyletic group (Solodovnikov 2006; Solodovnikov & Schomann 2009). Within the newly emerging phylogenetic framework for Staphylinini, *Australotarsius* can be placed in the clade “Quediina propria”, which, according to Solodovnikov and Schomann (2009, Fig. 1), includes two subclades: one with the north temperate members of the genus *Quedius* Stephens, 1829 and the genus *Indoquedius* Blackwelder, 1952 and another with the genera *Anchocerus* Fauvel, 1905, *Acylophorus* Nordmann, 1837, *Euryporus* Erichson, 1839 and *Hemiquedius* Casey, 1915. Presumably *Australotarsius* belongs to that latter subclade of “Quediina propria”. The exact limits of this lineage within Staphylinini are not finally clear yet: apparently it also includes the genus *Anaquedius* Casey, 1915, but may not include *Euryporus*. All these genera here affiliated with *Australotarsius* share numerous character states (e.g., datamatrix in Solodovnikov & Schomann 2009; and work in progress) but only some of them are preliminarily thought to be synapomorphies: setose apical segments of the maxillary and labial palps; more or less distinctly elongate first antennomere; lack of conspicuous large macrosetae on mesoventrite; abdominal tergites III–VII with only one basal carina; and male sternite VIII without secondary sexual modifications, medially straight to very slightly concave. Within this tentative group, strongly dilated anterior tarsi and evenly setose head and pronotum are autapomorphies of *Australotarsius*.

Of the listed genera, only one species of *Anchocerus* (Solodovnikov 2008) and five species of *Acylophorus* (Newton & Thayer 2005) occur in Australia. But both species of *Australotarsius* can be easily distinguished from the Australian *Anchocerus tenuipes* (Lea, 1929) externally by very broad anterior tarsi and setose head and pronotum. The same characters also easily separate *Australotarsius* from *Acylophorus*, and

the latter genus, in addition, has a conspicuously narrow neck and a much more strongly elongate first antennomere.

According to the preliminary phylogeny of Staphylinini (Solodovnikov & Schomann 2009), a quediine-like *Australotarsius* does not belong to “Tanygnathinina sensu novo”, the lineage whose members superficially resemble “Quediina propria” and which is a predominant and the most abundant faunal element among Australian Staphylinini. Current Australian species of “*Quedius*”, and “*Heterothops*”, all members of “Tanygnathinina sensu novo”, are not congeneric with the north temperate representatives of these genera; but some other, less species-rich Australian genera now formally in Quediina also belong to this group. From any species of “Tanygnathinina sensu novo” *Australotarsius* differs in the structure of the mesoscutellum which has two (not one) transverse carinae, and in the shape of the paramere which is closely attached to the median lobe only at its base, and has distinct, strongly sclerotized and obtuse sensory peg setae (in “Tanygnathinina sensu novo” the paramere is closely attached to the median lobe along the entire length of the latter, and lacks sensory peg setae, or, if those present, they are inconspicuous and sharp). By such combination of characters as very broad anterior tarsi, somewhat deflexed hypomera of the pronotum, evenly setose head and pronotum, strongly cuspidate teeth at the base of the mandibles, and well developed infraorbital ridges, *Australotarsius* can be easily distinguished from any other genus of Staphylinini recorded in Australia including the very poorly known and phylogenetically puzzling genera *Lonia* Strand, 1943 and *Antimerus* Fauvel, 1878.

Description of new species

Here we provide short descriptions of the new species currently included in the new genus. They do not duplicate characters used above in the generic description.

Australotarsius grandis Solodovnikov & Newton, new species

(Figs. 1, 3–17)

Type material. Holotype: AUSTRALIA: Queensland: ♂, “Boar Pocket, 13-dec-1969, J.G. Brooks, at light” [17°12’S, 145°37’E] [FMNH-INS 0000036 001](MVMA). **Paratypes:** AUSTRALIA: Queensland: 2♀♀, same data as in holotype (MVMA, FMNH); ♂, 2♀♀, “Boar Pocket, N.Q. 13.12.69. J.G. Brooks, at light, 649 / Brit. Mus. 1970-641 / Quediina new genus sp. 1 det. A.F. Newton 1989” (BMNH); ♂, same data (ZMUC); 2♂♂, ♀, “Boar Pkt. Rd. sm. N. Gillies h’way. N.Q. 13.12.69, J.G. Brooks, at light / Boar pkt. N.Q. 12/69 G.B. / Q. 694 / J.G. Brooks Bequest, 1976” (BMNH); ♀, same data (ZMUC); ♂, ♀, “Boar Pocket Rd. 20. 5 m. N. Gillies Highway N.Q. 13.12.69, at light, Q. 694” (ANIC); ♂, same data (ZMUC); 2♂♂, “W. of Ravenshoe, Atherton Tab., Q. [Queensland] c. 3000’, Feb. 58 Darlingtons [P.J. Darlington Jr., wife & son] / Quediini Gen. A sp. 1” [17°36’S, 145°29’E] (MCZ, FMNH); ♀, “Byfield, N. of Yeppoon, Darlingtons [P.J. Darlington Jr., wife & son], Nov. 57 [XI.1957] [22°53’S, 150°38E]” (MCZ); **New South Wales:** ♀, “New South Wales, Crowdy Bay Nat. Pk., Kylie Beach camp area, ca. 35 km NE Taree, 26-dec-1990, D.A. Pollock & L.A. Reichert, coastal scrub, u-v [31°49’S, 152° 40’E]” (FMNH).

Description. Measurements (n=5): HL: 1.25–1.35; HW: 1.85–2.05; PL: 2.10–2.30; PW: 2.45–2.60; EL: 2.90–2.95; EW: 2.80–2.95.

Habitus as in Fig. 1. Size of the body 13–14 mm. Brown, glossy, with entire body covered by moderately dense setae-bearing punctation; elytra more densely setose than head and pronotum; setae on the abdomen longer and stouter than those on head, pronotum and elytra; all body parts, in addition to even general setation, also with a few large conspicuous macrosetae in regular arrangement.

Head transverse; eyes distinctly longer than tempora; neck constriction distinct at sides only, dorsally indistinct; no nuchal ridge. Antennae: antennomere IV about as long as antennomere II; antennomere V slightly shorter than antennomere IV; antennomeres V–IX gradually becoming shorter towards apex of

antenna, each longer than wide; antennomere X distinctly short, wider than long, about 2 times as short as antennomere IX.

Pronotum slightly wider than long, widest at about its middle, with broadly rounded anterior and posterior angles, the former somewhat protruding anteriorly. Pronotal disk without any dorsal or sublateral conspicuous macrosetae, only with large lateral seta latero-anteriorly, close to pronotal lateral margin.

Scutellum as setose as elytra. Elytra distinctly longer and wider than pronotum.

Abdomen: tergites with metallic iridescence; tergite VII with whitish apical seam.

Aedeagus (Figs. 16, 17): median lobe apically rounded; paramere slightly asymmetrical, entire, apically obtusely pointed, with four pairs of apical setae and two fields of numerous sensory peg setae on its underside near apex.

Comparison. *Australotarsius grandis* strongly differs from *A. tasmanicus*, the second known species of this genus, by the following complex of character states: neck constriction developed only laterally, dorsally obliterated; last segment of the maxillary palps relatively longer and with narrowly truncated apex; antennomere X at most half as long as antennomere IX and slightly shorter than antennomere XI; prosternum glabrous with only a row of short setae along its anterior margin; and aedeagus with an entire and slightly asymmetrical paramere. Finally, *A. grandis* is much larger than *A. tasmanicus*.

Distribution and bionomics. The species is known only from three localities in northern Queensland and one locality in New South Wales (for details see Type material). Nothing is known about its bionomics. The largest sample (15 specimens) was collected at Boar Pocket in Queensland at light. The single specimen from New South Wales was also attracted to ultra-violet light, in coastal scrub. It is noteworthy that despite the fact that the rainforest rove beetle fauna in Queensland and New South Wales has been relatively well sampled during recent decades, no specimens of *Australotarsius* have turned up among samples from sifted leaf litter, in flight intercept traps or in samples obtained by low-scale pyrethrum fogging of dead mossy logs. Probably *Australotarsius* is confined to some other special habitat, like for example stream edges. It may occur in drier scrubby bush or other non-forest landscapes, which were sampled less frequently by collectors looking for mesophilous beetles.

Etymology. The species name “*grandis*” is the Latin adjective for “large”, of masculine gender. It refers to the relatively large size of the species.

***Australotarsius tasmanicus* Solodovnikov & Newton, new species**

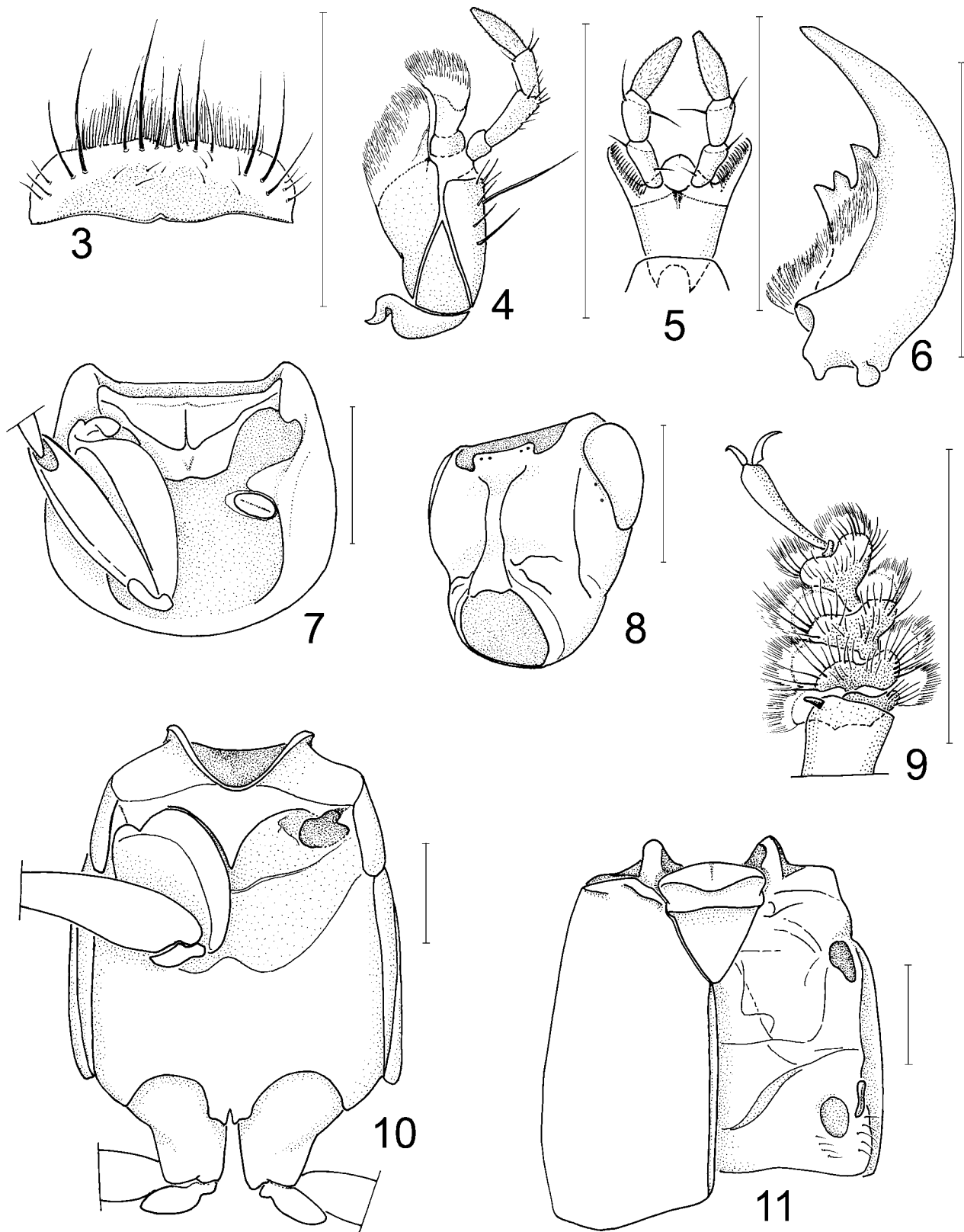
(Figs. 2, 18, 19)

Type material. Holotype: AUSTRALIA: Tasmania: ♂, “Corinna W Tas. [Tasmania], Mar.’57 Darlington [P.J. Darlington Jr., wife & son] / MCZ / Quediini Gen. A. sp. 2 det. A.F. Newton 1987” [FMNH-INS 000036 008] (MCZ).

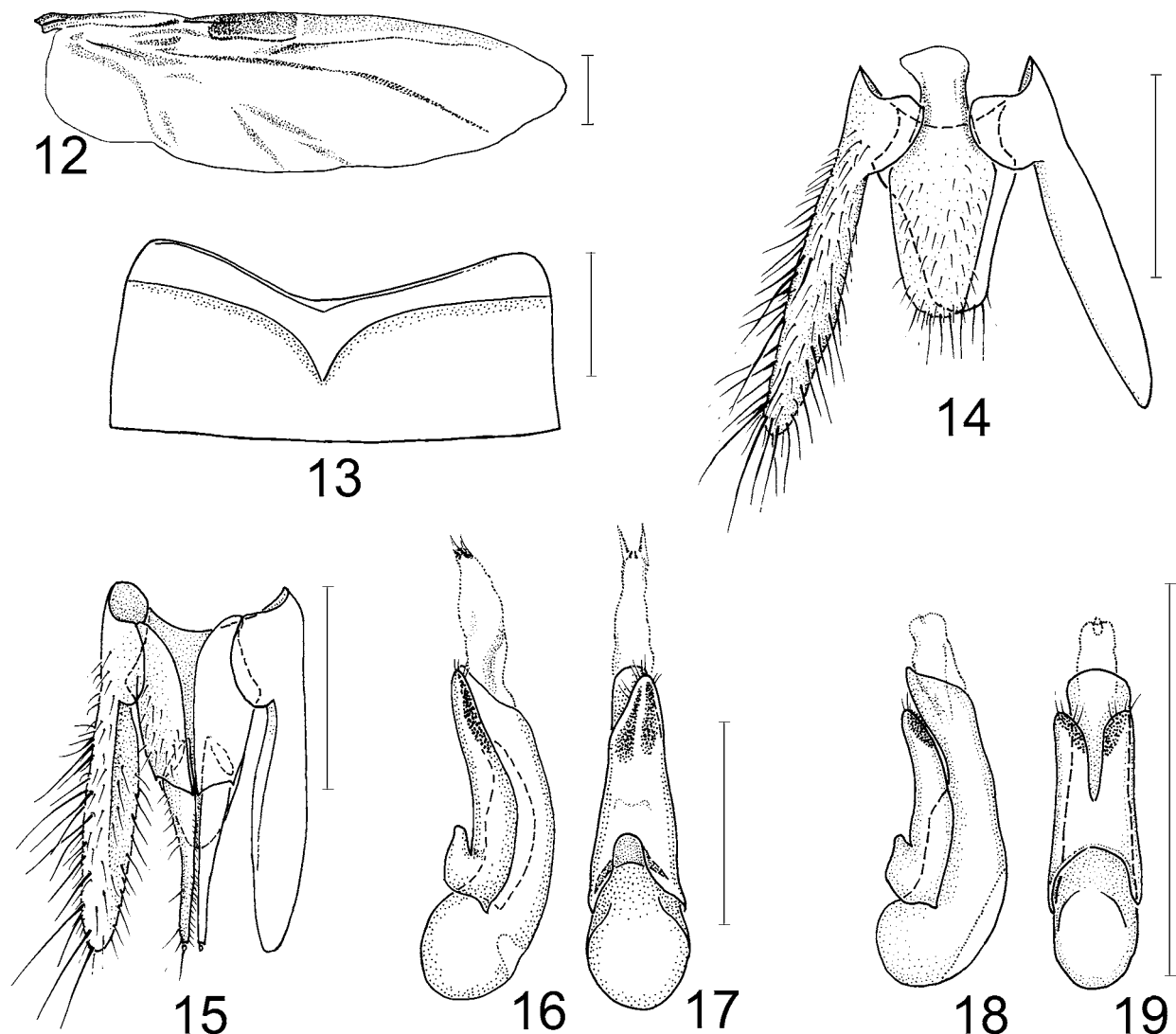
Description. Measurements: HL: 0.92; HW: 1.00; PL: 1.20; PW: 1.24; EL: 1.68; EW: 1.56.

Habitus as in Fig. 2. Body length 7.4 mm. Pale brown (the single available specimen may be teneral, without additional material the real coloration of the species is not clear), glossy, with entire body covered by moderately dense setae-bearing punctation; elytra more densely setose than head and pronotum; setae on abdomen slightly longer and stouter than those on head, pronotum and elytra; all body parts, in addition to even general setation, also with a few large conspicuous macrosetae in regular arrangement.

Head only slightly wider than long; eyes about as long as temporae; neck distinct laterally and dorsally; nuchal ridge present. Antennae: antennomere IV shorter than antennomere II; antennomeres V and VI, each, only slightly shorter than antennomere IV; antennomeres VII–XI gradually becoming shorter and wider towards apex of antenna, each no longer than wide; antennomere X wider than long, shorter than antennomere IX and about the same length as antennomere XI.



FIGURES 3–11. *Australotarsius grandis*, details of structure. 3, labrum, dorsally; 4, maxilla, left, ventrally; 5, labium, ventrally; 6, mandible, right, dorsally; 7, prothorax, ventrally, left leg removed; 8, head capsule, latero-ventrally; 9, anterior tarsus, left, dorsally; 10, meso- and metathorax, ventrally, left middle leg removed; 11, meso- and metathorax dorsally, right elytron removed. Scale bars 1 mm.



FIGURES 12–19. *Australotarsius grandis* (12–17) and *A. tasmanicus* (18–19), details of structure. 12, hind wing, right; 13, abdominal sternites II+III, ventrally; 14, male terminalia (abdominal segments IX, X), ventrally; 15, female terminalia (abdominal segments IX, X), ventrally; 16, 18, aedeagus, laterally; 17, 19, aedeagus, dorsally (parameral side). Scale bars 1 mm.

Pronotum as long as wide, parallel-sided behind anterior third of its length, with broadly rounded anterior and posterior angles, the former not so distinctly protruding anteriorly. Pronotal disk without any dorsal or sublateral conspicuous macrosetae, only with large lateral seta latero-anteriorly, close to pronotal lateral margin.

Scutellum as setose as elytra. Elytra distinctly longer and wider than pronotum.

Abdominal tergite VII with whitish apical seam.

Aedeagus (Figs. 18, 19): median lobe apically broadly rounded; paramere broad, symmetrical, deeply bilobed, each lobe with two pairs of apical setae and field of numerous sensory peg setae on the underside.

Comparison. *Australotarsius tasmanicus* strongly differs from *A. grandis* in the following complex of character states: neck constriction fully developed dorsally and laterally; last segment of maxillary palps relatively shorter and with widely truncated apex; antennomere X but slightly shorter than antennomeres IX and XI; setose prosternum with numerous irregularly arranged setae; aedeagus with deeply bifurcate symmetrical paramere. *Australotarsius tasmanicus* is also much smaller than *A. grandis*.

Distribution and bionomics. The species is known only from the type locality in western Tasmania. Nothing is known about its habitat requirements.

Etymology. The name refers to the species distribution confined to Tasmania. It is a Latin adjective of masculine gender.

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