



RESEARCH ARTICLE

A new species of *Amycterus* Schoenherr from the Pilbara region of Western Australia (Coleoptera: Curculionidae: Cyclominae)

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Abstract: *Amycterus pilbara* **sp. nov.** is described and diagnosed. Its distribution appears to be restricted to the vicinity of the Fortescue River in the Pilbara region of Western Australia, based on available specimens. It is most closely allied to *A. caudatus* (W. J. Macleay) and *A. flavosetosus* (Ferguson), based on external structure. Four species of *Amycterus* Schoenherr are now known to occur in Western Australia.

Key words: *Amycterus*, Curculionidae, new species, endemic, Pilbara, Western Australia, ventral structure, relationships, distributions, habitat.

Introduction

The genus *Amycterus* Schoenherr, 1823 (type-species: *Amycterus talpa* Schoenherr, 1823) is mostly referred to in the previously published literature by its junior synonym *Phalidura* Fischer von Waldheim, 1823 (type-species: *Phalidura mirabilis* Fischer von Waldheim, 1823, a junior synonym of *Amycterus talpa* [see Oberprieler (2010: 9) for details of dates]), and is currently considered to contain 52 valid species (Zimmerman 1993). This genus is confined to Australia (including Tasmania) and the species diversity of *Amycterus* is greatest along the Great Dividing Range on the eastern side of continental Australia. New South Wales has the highest number of species occurring within its geopolitical boundaries and also the highest level of endemism (24 species with 58% endemic), followed by Queensland to the north (18 species with 50% endemic) and Victoria to the south (15 species with 40% endemic). *Amycterus* species,

though not all obviously so, are characterized by the males possessing an unusual caudal forceps-like structure that protrudes externally and posteriorly from the caudalmost of the visible sternites, and frequently beyond the elytral apex (to various degrees depending on the species) from its internal origin at abdominal sternite 8.

Amycterus is the type-genus of the terrestrial flightless tribe Amycterini, which is currently placed in the subfamily Cyclominae (Oberprieler 2010: 6, 8–10), and its relatively recent revalidation by Alonso-Zarazaga & Lyal (1999: 139) requires that all specific adjectival epithets previously listed under *Phalidura* (or *Psalidura*) be emended to a masculine form. The specific epithet of the type-species, originally listed and capitalised as “*Talpa*”, is a noun in apposition (*talpa* being the Latin name for a mole) and its ending therefore is not emended. *Amycterus talpa* has mostly been referred to in the published literature as its junior synonym *Phalidura reticulata* (Boisduval, 1835), and this highly distinctive taxon is the only *Amycterus* species possessing a postmental horn in the male.

Amycterus is poorly represented in Western Australia, with Ferguson (1909; 1914) recording only one species, *A. perlatus* (Ferguson, 1909), and Zimmerman (1993) only recording two species, *A. perlatus* and *A. tessellatus* (Pascoe, 1874) from this state. Males of these two species have poorly developed caudal forceps, barely protruding from (visible at) the caudal corners of ventrite 5, and a relatively simple ventrite 5, lacking a great concavity. Additionally I have seen a single female of *Amycterus flavosetosus* (Ferguson, 1909) from Eucla, Western Australia. The male of this species has well developed caudal forceps and a complex ventrite 5.

During fieldwork in the remote large rock-desert area of the Pilbara region of Western Australia, I collected four specimens of a further *Amycterus* species, one pair in 1985 and another in 2012. Two additional females of this species were collected by the Western Australian Department of Environment and Conservation as part of the Pilbara Biological Survey in 2004. The male found in 1985 unfortunately is an incomplete remain, and only the male obtained in April 2012, representing the first complete male specimen collected to date, enabled positive identification of the species. At first I thought that these specimens represented an isolated population of *Amycterus caudatus* (W. J. Macleay, 1865) because the incomplete male keyed out to this species in Zimmerman’s (1993) key to the species of *Amycterus* (as *Phalidura*). However, detailed examination of the complete male and the other specimens, and comparison with all described *Amycterus* species, confirmed that they represent an undescribed species, the fourth species of *Amycterus* known from Western Australia. The discovery of a new species of *Amycterus* is significant both in view of the fairly complete taxonomic knowledge of the genus and of the apparent endemism of the new species in the Pilbara region, the biodiversity of which was surveyed extensively a few years ago. The new species is therefore described below.

Material and Methods

Codens for collections examined housing specimens are as follows: Australian National Insect Collection, Canberra (ANIC); Museum of Natural History, London (BMNH); author’s personal Coleoptera collection, Perth (MPWA); Western Australian Museum collection, Perth (WAMP).

For morphological description the following abbreviations are used: TL: total length from anterior end of rostrum to elytral apex; TLF: total length from anterior end of rostrum to apex of

forceps; SL: standard length from anterior margin of pronotum to elytral apex; TW: total width at widest part of body.

Measurements were taken using vernier calipers (accuracy $\pm 0.02\text{mm}$).

Results

Amycterus pilbara Peterson **sp. nov.** (Figs. 1-3)

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Diagnosis (male only): Prothorax dorsally with almost obsolete median apical lobe; elytra each with 7 finely granulate (not costate) interstitial ridges; ventrite 5 with two sub-basal fascicles narrowly separated by 2.4 x fascicle width, fascicle width 4.4% of ventrite width; median area on apical margin of ventrite 5 great concavity with erect fascicle of long reddish truncated setae; posterior declivity of median area of great concavity with dense mass of erect black hair-like setae not forming discrete rows or fascicles; forceps large, arcuate with internal laminae small, narrow, linear, basal, widely separated from each other; without erect transverse fascicle on ventral apex of pygidium near great concavity, postmental horn, ventrolateral mandibular tusks or lobes, metaventrite protuberances or large laminae on forceps that contact each other internally.

Description

Measurements: Male holotype (Fig. 1): TL: 20.84 mm, TLF: 23.54 mm, SL: 20.06 mm, TW: 9.12 mm, exposed forceps length 6.64 mm; Females (Fig. 2): TL: 21.98–22.56 mm; SL: 19.74–20.48 mm, TW: 9.22–9.30 mm.

Coloration: appearing red-brown, due to tiny decumbent coppery setae covering head, prothorax, elytra (including punctures), and parts of venter and legs and to a small amount of red-brown soil adhering to cuticle; all granules on body with a single small brown decumbent seta emerging from a single small central fovea, and without tiny coppery setae; somatic and appendage cuticle (including forceps and granules) black.

Head: smooth, without granules; external ridges of rostrum straight and parallel to each other; eyes ovate with narrow (almost pointed) end ventrally, each with ca. 480 facets and with eye surface not protruding from head; mandibles with apex narrow, rounded (unarmed, without a ventrolateral tusk or lobe); underside without postmental horn.

Antennae: scapes long, reaching to anterior pronotal margin at postocular lobe, cylindrical and moderately thick, gradually widening from base to apex; funicle segments and antennal club also cylindrical, the two basal funicle segments twice as long as each of the remaining four.

Prothorax: not dilated or strongly widened; anterior margin dorsally almost forming a straight line, with a very slight (almost obsolete) dorsal median apical lobe projecting over vertex, laterally with a well-developed, anteriorly produced rounded postocular lobe; pronotum granulate, 18 granules along midline, all granules small and well separated, each with a single small brown seta inserted in a small central fovea.



Figure 1. *Amycterus pilbara* Peterson sp. nov., holotype ♂, dorsal habitus. Photo: M. Peterson.

Elytra: each elytron striate with 7 longitudinal low rounded interstitial ridges (including sutural) on dorsum of disc, 5 of them located between elytral suture and humeral tubercle, no such ridges below edge of lateral declivity, interstitial ridges finely granulate (not costate) along entire length, 2-3 separated granules across width of each ridge, area between interstices with small shallow puncta, not foveate; short subtriangular mucro at apex of each elytron next to median suture.

Venter: metaventrite laterally without erect subrectangular cuticular protuberance between middle and hind coxae and medially without protuberance behind inside of middle coxae; ventrite 5 (Fig. 3) strongly modified and structurally complex, caudal margin forming a strongly developed arcuately emarginate great concavity with a very slightly caudally projecting almost truncate median area between the anal forceps; a transverse dense fascicle or line of long reddish peg-like truncated erect setae (similar to those of the subbasal fascicles but larger) present along median area of great concavity margin, restricted to this central section of ventrite 5 between forceps (fascicle width 30% of ventrite 5 width), and not extending beyond opposite inner margins of forceps to caudal corners of ventrite 5; a large single mass (without discrete rows) of moderately long black hair-like erect setae located on and covering posterior declivity of the median great concavity caudal margin between base of forceps immediately caudally of peg-like setae and obscuring gap between ventrite caudal margin and pygidial apical margin where anal orifice occurs; a deep small circular medial preanal fossa present immediately cephally of median area of great concavity caudal margin and peg-like setae; a pair of reddish subbasal fascicles (fascicle width 4.4% of ventrite 5 width) near base of ventrite 5 just below rim of a large shallow semicircular excavation, fascicles separated by 2.4 x their width; ventral apex of pygidium (between forceps) wide, shallowly emarginate, without wide transverse fascicle or line of dense long erect hair-like setae adjacent to great concavity but with scattered short single brown decumbent setae covering pygidial surface the latter forming a gradual low mound over its entire length; forceps very large, well developed, arcuate, exposed forcep length 6.64 mm projecting well beyond elytral apex; each arm tapering to roundly pointed apex, nearly contacting the other, inner margin of apex without setal pad, each inner margin of base with dense brown setal fringe adjacent to small, short, narrow, basal, linear lamina (lamina length 23% of forceps length) projecting mesad, laminae widely separated from each other, not contacting or overlapping; surface smooth, covered in scattered short brown decumbent setae.

Legs: simple, tibiae straight, without structural modifications (i.e. subapical notches) though with small rounded mucro at inner apex; hind tibiae 1.3 x longer than fore and middle ones; underside of all tarsites on all legs with dark-brown setal pads but without specialized spongiöse pulvilli (of paler setae) set in pit.

Aedeagus: not studied (holotype is the only complete male).

Females (Fig. 2): similar to males but differ by possessing a broader (though still rounded) mandibular apex, and without structural modifications to ventrite 5, which is simple in structure (flattened with a rounded apex), and lacking great concavity, fascicles, forceps and inturned ventral expression of pygidium.

Material Examined: Western Australia: Holotype ♂: 109.75 km WNW of Newman at 22°52'.235"S 118°48'.322"E (22°52'14.10"S 118°48'19.32"E) (Map Datum: WGS 84) at 739 m elevation, 6 April 2012, coll. M. Peterson (WAMP); paratype ♀: same data except 7 April 2012 (WAMP). Paratype ♀: 6 km SW Millstream, 21°38'32.70"S 117°02'12.60"E, 24 November

2003-7 May 2004, Pilbara Biological Survey (ANIC); paratype ♀: 6 km N Cowra Line Camp, 22°18'06.40"S 119°00'48.20"E, 23 May-18 October 2004, Pilbara Biological Survey (ANIC); paratype ♂ (damaged partial remains): 7 km E Mt Bruce, 22°36'S 118°12'E, 21 June 1985, M. Peterson (MPWA); paratype ♀: Marandoo, 22°38'S 118°07'E, 21 June 1985, M. Peterson (MPWA).



Figure 2. *Amycterus pilbara* Peterson sp. nov., paratype ♀ (7 April 2012), dorsal habitus. Photo: M. Peterson.

Distribution: This species is only known from a very limited area of the northern Pilbara region of Western Australia, between latitudes 21°38'S in the north and 22°53'S in the south, and longitudes 117°02'E in the west and 119°01'E in the east, based on the six type-specimens. It appears to be restricted to the northern and southern sides of the Fortescue River drainage system having been found within 65 km of this major river.

Habitat: The holotype male was collected at 08:50 hrs in a funnel-trap in a creekline/moist zone in a valley between two low rocky ironstone hills. The area was vegetated with a low species of *Corymbia* (ca. 5 m tall) forming the over-storey, several species of *Acacia* and a species of *Dodonaea* (up to 2 m tall) the mid-storey, and *Triodia pungens* R. Br. and other diverse grass genera and species (up to 1 m tall) the under-storey. The soil type was a red-brown clay with many small stones and ironstone pisoliths scattered through the soil profile. The paratype female was collected in a pitfall-trap within three metres of the holotype male in the same habitat.

Etymology: The specific epithet refers to the region of occurrence of this species and is to be treated as a noun in apposition.

Comments: This species constitutes yet another Pilbara endemic, knowledge of which is a consequence of the more intensive recent survey work undertaken in this region, and it appears to be a relictual taxon confined to the more mesic parts of this rock desert.

In many locations in eastern Australia a number of *Amycterus* species occur in syntopy, but the great similarity between females of many of the species (particularly within species-groups) makes it difficult to identify species based on females only, and thus description of a new *Amycterus* species requires emphasis on male structure.

I consider *Amycterus pilbara* to be most closely related to the structurally similar *A. caudatus* (W. J. Macleay, 1865) and *A. flavosetosus* (Ferguson, 1909), of the described species included in this genus by Zimmerman (1993).

Amycterus caudatus is the most widely distributed species in the genus, occurring in all mainland Australian states except for Western Australia, and reaching as far west as Roma Gorge (23°25'S, 132°01'E) as part of an apparently isolated population in the McDonnell Ranges of the central southern Northern Territory. Males of *A. caudatus* (Fig. 4) are distinguishable from those of *A. pilbara* (Fig. 3) by possessing the following characters: mandible apex with small short rounded ventrolateral lobe (not a tusk); anterior margin of prothorax with well-developed dorsal median rounded apical lobe projecting over vertex; ventrite 5 with extensive fringe of short orange setae lining entire great concavity margin to its caudal corners, becoming a longer transverse erect fascicle of orange setae along margin of great concavity median area (no short fringe lining entire great concavity margin but with transverse erect fascicle of long reddish robust truncated setae limited to median 30% of ventrite 5 width, along the margin of the great concavity in *A. pilbara*); two discrete transverse fascicles of long erect orange setae on posterior declivity of great concavity median area (one upper on margin/lip, one lower on slope) between forceps (reddish truncated setal fascicle on margin/lip and single mass of black setae covering posterior declivity of great concavity median area in *A. pilbara*) and one discrete dense transverse fascicle of long erect setae (with slight triangular emargination at apex of fascicle) on the apex of pygidium between forceps (no fascicle on apex of pygidium in *A. pilbara*); inner margin of forceps with fringe of short orange setae along its length (fringe of brown setae in *A.*

pilbara) and a rounded short lamina (longer linear lamina in *A. pilbara*); ventral apex of pygidium with abrupt pre-apical mound sprouts the tall, wide, erect apical fascicle (gradual mound of entire ventral pygidium does not sprout an apical fascicle in *A. pilbara*); subbasal fascicles broad (7.3% of ventrite 5 width) separated by 0.9–1.2 x fascicle width (4.4% of ventrite 5 width and separated by 2.4 x their width in *A. pilbara*). This comment is based on comparison with the syntype of *A. caudatus* in the ANIC and fresh males of *A. caudatus* in MPWA from New South Wales (55.1 km NW of Collarenebri; 1 km west of Yetman; 4 km south of Quambone) and Queensland (Longreach).



Figure 3. Abdominal apex (ventrite 5, pygidium and forceps) of *Amycterus pilbara* Peterson **sp. nov.**, holotype ♂, ventral view. Photo: M. Peterson.

Amycterus flavosetosus is distributed from far south-eastern Western Australia at Eucla, eastwards through the southern Great Victoria Desert, Nullarbor Plain, Eyre Peninsula and the Renmark district of southern South Australia to north-western Victoria. Males of *A. flavosetosus* are distinguishable from *A. pilbara* males by the following characters: mandible apex with small short rounded ventrolateral lobe (not a tusk); anterior margin of prothorax with well-developed dorsal median rounded apical lobe projecting over the vertex; ventrite 5 with extensive fringe of short orange setae lining entire great concavity margin to its caudal corners, becoming a longer transverse erect fascicle of orange setae along the central margin of the great concavity (no short fringe lining the entire great concavity margin but with transverse erect fascicle of long reddish robust truncated setae limited to median 30% of ventrite 5 width, at middle of great concavity

margin in *A. pilbara*); posterior declivity of great concavity median area with fascicle on lip and mass of shorter orange setae, without discrete fascicle, on slope; flat ventral pygidium without pre-apical mound; one discrete dense transverse fascicle of long erect orange setae (with slight triangular emargination at apex of fascicle) on apex of pygidium between forceps (no fascicle on apex of pygidium in *A. pilbara*); reddish subbasal fascicles broad (9.3–11.3% of ventrite 5 width) separated by 2.5–3.0 x fascicle width (4.4% of ventrite 5 width and separated by 2.4 x their width in *A. pilbara*); more strongly projecting triangular median area of great concavity margin. This comparison is based on the holotype and paratypes of *A. flavosetosus* in ANIC and fresh males of this species in ANIC and MPWA from South Australia (32 km north of Renmark; 100 km east of Border Village) and Victoria (Sea Lake). It is evident that *A. flavosetosus* is even more closely allied to *A. caudatus* than is *A. pilbara*, based on fine structure of males.



Figure 4. Abdominal apex (ventrite 5, pygidium and forceps) of *Amycterus caudatus* (W. J. Macleay, 1865), ♂ (55.1 km NW of Collarenebri, NSW), ventral view. Photo: M. Peterson.

The close similarity of *A. pilbara* males to those of *A. caudatus* and *A. flavosetosus* indicates that detailed descriptions of the fine structure of ventrite 5 and its great concavity, the forceps and associated caudal areas of the abdomen are essential to reliably differentiate *Amycterus* species. The previously published descriptions of these features are inadequate, and in

some cases it requires examination of large series from single localities and across the broader distribution, as well as confirmed associated sexes, to be certain of identification, because the setal arrangements of ventrite 5 and adjacent pygidium in males can be easily abraded.

Discussion

Amycterus, as currently construed, is a morphologically diverse genus containing a number of distinct species-groups. A complete analysis of the relationships of all species included in this genus is beyond the scope of this paper. However, based on Ferguson (1909: 530–533; 1914: 12), Zimmerman (1991: 264–285, 304–305, 360–361; 1992: 66–81; 1993: 343–351, 358–359, 362–364, 372–373) and my previous comments on *Amycterus pilbara*, I consider that there are five species of *Amycterus* that have a similar general appearance and structure to that of *A. pilbara*: *A. caudatus*, *A. flavosetosus*, *A. frenchi* (Ferguson, 1909), *A. forficulatus* (W. J. Macleay, 1865) and *A. cuneicaudatus* (Ferguson, 1909). The distributions of the latter three species are restricted to far north-east and eastern Queensland, and they are structurally divergent from the remainder by possessing lamelliform processes (formed by fusion of fascicle-like setae) on the caudal margin of ventrite 5 caudal margin between the forceps instead of setal fascicles or fringes. Males of these five species share the following combination of characters: relatively simple mandibles without large ventrolateral tusks or large lobes; elytra striate with 7 finely granulate (not costate) interstitial ridges each, not deeply foveate; ventrite 5 complex with a well-developed “great concavity” margin, and with two well-developed subbasal fascicles; a large to very large forceps, each arm possessing a small inner to ventral lamina at or near base (that does not contact the other); pygidium curved ventrad so that its apex terminates between forceps adjacent to great concavity of ventrite 5. These five species are likely to form a natural complex, which possesses the largest forceps in the genus and appears to be highly derived, but further morphological study and analysis, as well as support from genetics data is required to substantiate it because of the likelihood of many in-group evolutionary parallelisms within the genus.

The Pilbara region of north-west Western Australia, and in particular the iron-dominated Hamersley Range that comprises the vast majority of this region, is a rock desert with a tropical climate and an average rainfall of 300–350mm per annum. It has zoogeographical connections with the rock ranges of both the Kimberley region of northern Western Australia and the Centralian region of the southern Northern Territory/northern South Australia/far eastern Western Australia. In the insect order Odonata, the Pilbara region shares the low-vagility zygopteran species *Austroagrion pindrina* Watson, 1969 and *Nososticta liveringa* Watson & Theischinger, 1984 with the Kimberley region only, whereas the anisopteran species *Austroepigomphus gordonii* (Watson, 1962) occurs in the Pilbara and Centralian regions only. However, many of the invertebrate and vertebrate taxa found in the Pilbara are endemic to this region and form species-pairs with those of the Kimberleys, central or eastern Australia. For example, the terrestrial/fossorial elapid snake *Vermicella snelli* Storr, 1968 from the Pilbara is most closely related to *Vermicella vermiformis* Keogh & Smith, 1996 from central Australia (Keogh & Smith 1996), while the Pilbara endemic zygopteran *Nososticta pilbara* Watson, 1969 is most closely allied to *Nososticta solida* (Hagen, 1860) from the eastern states (Watson & Theischinger 1984). The close relationship of *Amycterus pilbara* to *A. caudata* represents a similar phylogeographical pattern to that of the latter two examples combined.

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