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Aulacocyclus yorkensis a new species of Passalidae (Coleoptera: Scarabaeoidea) from Australia, with a key to the identification of Australian species of the genus

Pedro Reyes-Castillo[a], Larry Jiménez-Ferbans[b,*]

[a] *Biodiversity and Systematic Network, Instituto de Ecología, Xalapa, Mexico*
[b] *Universidad del Magdalena, Facultad de Ciencias Básicas, Grupo de Investigacion en Evolución, Sistemática y Ecología Molecular, Santa Marta, Colombia*

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ABSTRACT

A new species, *Aulacocyclus yorkensis* **sp. nov.**, is described from Cape York Peninsula, Australia. This species is similar to *A. teres* Percheron, these two being the largest *Aulacocyclus* in Australia, but they can be distinguished by the shape of the central tubercle and the pattern of pubescence on the mentum and metasternum. Additionally, illustrations of the new species and a key to the identification of the species of *Aulacocyclus* of Australia are provided.

Introduction

Passalidae is a pantropical family composed of 640 described species (Reyes-Castillo et al., 2005), occurring mostly in humid forest. The genus *Aulacocyclus* was proposed by Kaup (1868) and then redefined by Gravely (1918). Nowadays, the genus is composed of 32 species and presents a discontinuous geographical distribution from India to Australia (Dibb, 1933). Mjöberg (1917) described *A. tambourinensis* and cited 12 species of this genus from Australia, four of which synonymized later (Table 1). The most comprehensive work about *Aulacocyclus* of Australia is that of Dibb (1938), who proposed a key to identify 11 species, not including *A. tambourinensis*. More recently Cassis and Weir (1992) cited 12 species from Australia, including *A. deyrollei* Kaup, a species transferred earlier to *Taeniocerus* Kaup (Kaup, 1871). Finally, Doesburg (1992) described additional species from Queensland. Thus, prior to this study, 12 species of *Aulacocyclus* were recognized from Australia, most of them found in Queensland. Here we describe a new species and provide a new key to the genus for Australia.

Material and methods

We reviewed material deposited in the South Australian Museum, Adelaide, Australia (SAM). The terminology used in the description of the head characters corresponds to Boucher (2005) and Reyes-Castillo (1970) for the rest of the body. The drawings were made using a camera lucida coupled to a stereomicroscope.

Taxonomy

Aulacocyclus yorkensis **sp. nov.** (Fig. 1).

Description

Habitus: Cylindrical, parallel sides, shiny black. Total length (tip of mandibles to tip of elytra): 35.4–39.6 mm.

Head: Labrum asymmetric, anterior margin concave with angles rounded, evenly covered by long setae. Clypeus transverse, straight and narrow, with small punctures. Frontal and occipital areas smooth. Frontal ridges, internal tubercles and cephalic mamelon absent. Central tubercle short, apex truncate (lateral view), projecting anteriorly at 45° and divided lengthwise with punctures on groove. Posterolateral tubercles absent. Supra-orbital ridges straight and thick. Ocular canthus glabrous,

* Corresponding author.
E-mail: larryjimenezferbans@gmail.com (L. Jiménez-Ferbans).

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Table 1
Species of Australian *Aulacocyclus* cited by different authors.

Mjöberg (1917)	Dibb (1938)	Cassis and Weir (1992)	This work
A. aliicornis	*A. aliicornis*	*A. aliicornis*	*A. aliicornis*
A. collaris	*A. collaris*	*A. collaris*	*A. collaris*
A. edentulus	*A. deyrollei* (transferred to *Taeniocerus* by Kaup, 1871)	*A. deyrollei* (as *A. deyrolli*)	*A. edentulus*
A. errans	*A. edentulus*	*A. edentulus*	*A. fracticornis*
A. fracticornis (synonym of *A. errans*)	*A. fracticornis* (as *A. errans*)	*A. fracticornis*	*A. gravelyi*
A. foveipunctatus (synonym of *A. mastersi*)	*A. gravelyi*	*A. gravelyi*	*A. hangayi*
A. kaupi	*A. kaupi*	*A. kaupi*	*A. kaupi*
A. tambourinensis	*A. macleayi*	*A. macleayi*	*A. macleayi*
A. teres	*A. mastersi*	*A. mastersi*	*A. mastersi*
A. teroides (synonym of *A. edentulus*)	*A. rosenbergi*	*A. rosenbergi* (as *A. rosenbergii*)	*A. rosenbergi*
A. rosenbergi	*A. teres*	*A. tambourinensis*	*A. tambourinensis*
A. rotundoclypeatus (synonym of *A. errans*)		*A. teres*	*A. teres*
			A. yorkensis

anterior margin concave and acutely angled. Postocular margin and lateral–occipital area punctate and setose. Anterior border of ligula tridentate, central tooth longer than lateral teeth; ligula concave. Maxilla with lacinia bidentate, superior tooth divided in two small teeth. Hypostomal process widely separated from mentum, small, not reaching anterior border of median basal region of mentum. Median basal region of mentum glabrous, with a longitudinal groove. Lateral fossae of mentum pubescent. Anterior line of the gula arched. Antennal club with three short and thick lamellae. Mandibles tridentate, supraterminal tooth small, barely insinuated and infra-apical tooth bigger than median-apical tooth; mandibular pubescence dorsally covering internal-superior teeth base.

Thorax: Pronotum quadrangular, only lateral fossae and marginal groove with small punctures; anterior angles smoothly right-angled; marginal groove wide on anterior margin, occupying 4/5 of pronotal anterior border; median groove well defined and complete; lateral fossae glabrous and well defined. Prosternellum rhomboidal acute and shagreened. Pronotal arms shiny and pubescent on posterior border. Mesosternum shiny, with small group of setae on anterior edge; scar absent. Posterior angle of mesepisternum with short setae; mesepimeron pubescent. Metasternal disk not bounded by punctate area; anteriolaterally and laterally completely pubescent. Metasternal groove pubescent.

Elytra: Dorsal surface shiny, anterior border rectangular and pubescent; humeri and epipleurae glabrous; lateral and dorsal striae with weak, rounded punctures.

Wings: Fully developed.

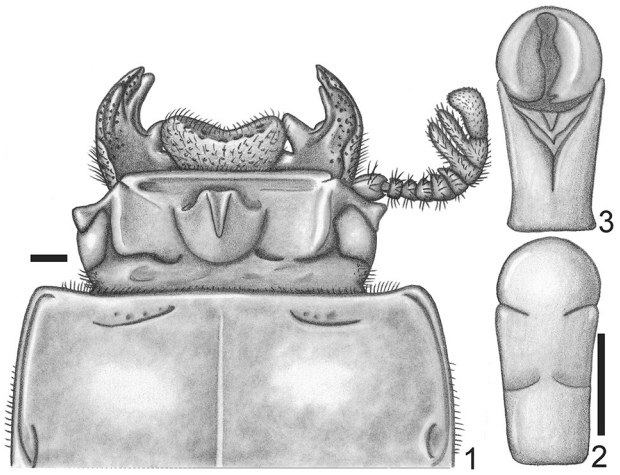

Fig. 1. *Aulacocyclus yorkensis* **sp. nov.** (1) Head and anterior part of pronotum. (2) Aedeagus ventral view. (3) Aedeagus dorsal view. Scale bars: 1 mm.

Legs: Groove over anterior ventral border of profemur complete; protibia widened toward the apex, with dorsal groove complete; meso and metatibiae without lateral spines.

Abdomen: Last sternite glabrous, all other sternites setose. Marginal groove of last sternite incomplete laterally.

Aedeagus: elongate; in ventral view (Fig. 1), basal piece fused to parameres; median lobe strongly sclerotized, spherical, being 1/3 of total length of aedeagus. In dorsal view (Fig. 1), ventrodorsal basal sclerotizations of the phallus present.

Variation: The lengths of the sides of labrum are variable, in the holotype the right side of labrum is longer than left side; however, in one of paratypes the lengths are reversed and in the other paratypes both sides are of equal length.

Type material

HOLOTYPE male labeled: Australia: Queensland, Cape York Peninsula, 8-XI-1992, C. Funch/*Aulacocyclus* Queensland/S.A. Museum specimen (SAM). PARATYPES: 1 male and 1 female, same data as Holotype (SAM).

Remarks

Affinities: The length and habitus of *A. yorkensis* sp. nov. resemble *A. teres* Percheron. However, *A. teres* has the central tubercle longer and very free, mesosternum pubescent laterally, ligula not concave and metasternal pubescence reduced to mesocoxal cavity and anterior part of lateral groove.

Etymology

The species is named after Cape York Peninsula, the type locality.

Key to species of *Aulacocyclus* from Australia (modified from Dibb, 1938)

We have not been able to find differences between a specimen of the type series of *A. collaris* Blackburn, 1896 and the description made by Doesburg (1992) of *A. hangayi*. The latter is very probably a synonym, and for this reason, we do not include *A. hangayi* in this key.

1. Postfrontal groove complete joining supra-orbital ridges behind central tubercle; pronotal scars narrow and irregular. Lateral striae of elytra distinctly punctate. Anterior tibiae broad (body length 27 mm) ..... *A. macleayi* Kaup.
- Postfrontal groove incomplete, not joining supra-orbital ridges behind central tubercle. pronotal scars variable. Lateral striae of elytra distinctly punctate or not ..... 2.
2. Elytra completely shiny ..... 3.
- Elytra broadly shagreened on tips of elytra ..... *A. tambourinensis* Mjöberg
3. Lateral areas of metasternum very broad, wider than mesotibia. Species 35 mm or more in length ..... 4.
- Lateral areas of metasternum not very broad, compared with mesotibia; species less than 35 mm in length ..... 5.
4. Central tubercle oh head very free. Mesosternum pubescent laterally. Ligula protruding. Metasternal pubescence reduced to mesocoxal cavity and anterior part of lateral groove (body length 35–40 mm) ..... *A. teres* Percheron.
- Central tubercle of the head not very free. Mesosternum glabrous laterally. Ligula concave. Metasternal pubescence extends beyond mesocoxal cavity and lateral groove (body length 35–40 mm) ..... *A. yorkensis* **sp. nov.**
5. Central tubercle small, viewed from above with a narrow U-shaped carina (body length 20 mm) ..... *A. gravelyi* Dibb.
- Central tubercle large or small, viewed from above without U-shaped carina ..... 6.
6. Central tubercle of the head with dorsal groove from cleft apex ..... 7.
- Central tubercle with dorsal groove obsolete, central tubercle tall, steeply inclined and gradually curved forward, anterior face almost vertical; antennal lamellae long and slender; primary pronotal scars small, narrow and punctate, small secondary scars present; lateral areas of metasternum almost smooth; elytra rather short, dorsal striae deep, lateral striae shallower, all striae regularly punctate (body length 25 mm) ..... *A. rosenbergi* Kaup.
7. Central tubercle pedunculate, not depressed ..... 8.
- Central tubercle somewhat depressed, not pedunculate, short and stout, apex blunt; antennal lamellae of average length; pronotal scars deep, angular; lateral areas of metasternum finely rugose; dorsal elytral striae impunctate, lateral striae distinctly punctate (body length 23–28 mm) ..... *A. mastersi* (MacLeay).
8. Central tubercle, viewed laterally, bent at right angle with apical portion approximately horizontal ..... 9.
-. Central tubercle, viewed laterally, not bent at right angle, apical portion not horizontal ..... 10.
9. Apical portion of central tubercle long, considerably longer than upright basal portion (body length 27–29 mm) ..... *A. kaupi* MacLeay.
-. Apical portion of central tubercle short, not longer than upright basal portion (body length 22–28 mm) ..... *A. fracticornis* Kuwert.
10. Central tubercle angular or almost vertical, never reaching anterior margin of head. Antenna lamellae at least five times as long as broad. Median basal region of mentum glabrous ..... 11.
-. Central tubercle strongly elevated and arcuate, reaching anterior margin of head. Antennal lamellae less than five times as long as broad. Median basal region of mentum pubescent (body length 23–30 mm) ..... *A. edentulus* MacLeay.
11. Punctures in elytral striae coarse and large; lateral areas of metasternum rugose (body length 20–22 mm) ..... *A. collaris* Blackburn.
-. Punctures in elytral striae minute but distinct; lateral areas of metasternum almost smooth (body length 20–26 mm) ..... *A. aliicornis* Kuwert.

Conflicts of interest

The authors declare no conflicts of interest.

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