

Two new species of the genus *Pogonus* from northern and western Australia (Coleoptera: Carabidae)

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Abstract - Two new species of the genus *Pogonus* Dejean are described: *Pogonus dostali* from north-western Western Australia north of Great Sandy Desert, and *Pogonus dichrous* from a salt lake in central Western Australia. The first species is closely related to *P. nigrescens* Baehr of northern Queensland, the second species probably is next related to *P. hypharpagoides* Sloane of South Australia and Victoria. Both species are inserted in the most recent key to the Australian species of the genus *Pogonus*. Additional records of *Pogonus nigrescens* Baehr from islands off the north coast of Queensland are enumerated. This species was so far known only from two localities in north-eastern Queensland.

Keywords: taxonomy, morphology, new records, *Pogonus*

INTRODUCTION

Recent collecting throughout Western Australia and visits to certain Australian collections revealed a new species and new records of another rarely collected species of the carabid genus *Pogonus* Dejean, 1821. A single specimen, collected by A. Dostal (Vienna) in north-western Australia and sent for identification, turned out to represent another new species of that genus. Both new species are described herein and inserted in the most recent key to the genus (Baehr and Hudson 2001).

The tribe (or subfamily) Pogonini (-inae) in Australia presently includes 16 species of which 15 belong to the genus *Pogonus* (Baehr and Hudson 2001). The species occur along the sea shore as well as in inland saline habitats, but most species were described and recorded from salt lakes in South Australia and inland Victoria, whereas vast areas of Western Australia so far are devoid of any records of pogonine beetles, in spite of the multitude of habitats favourable for these halobiontic beetles.

The scope of the present paper therefore is not only the description of additional new species, but likewise to draw the attention of collectors to these very characteristic group of beetles which in certain areas of South Australia turned out to possess quite restricted ranges at a single salt lake or a system of neighbouring lakes only (Baehr and Hudson 2001). It is to be expected that endemic pogonine species with similarly restricted ranges could exist in Western Australia. To confirm this supposition, however, systematic sampling efforts with ample light collecting, exposition of pitfall traps, but also

careful digging out specimens from the surfaces of salt pans would be needed in the vast salt lake regions in southern and central Western Australia.

METHODS

For the descriptions standard methods are used. The male and female genitalia were removed from specimens soaked overnight in a jar under wet atmosphere, then cleaned for a short while in hot potassium hydroxide (KOH). The habitus photographs were obtained by a digital camera using ProgRes CapturePro 2.6 and AutoMontage and subsequently were worked with Corel Photo Paint 11.

Measurements were taken using a stereo microscope with an ocular micrometer. Length has been measured from apex of labrum to apex of elytra. Lengths, therefore, may slightly differ from those recorded by other authors. Length of pronotum was measured along midline, width of apex between the most advanced parts of the apical angles, width of base at the position of the posterior lateral setae.

The specimens are lodged in the following institutions: Australian Museum, Sydney (AMS); Australian National Insect Collection, Canberra (ANIC); working collection M. Baehr in Zoologische Staatssammlung, München (CBM); Museum Victoria, Melbourne (NMV); Queensland Department of Primary Industries, Brisbane (QDPIB); Queensland Museum, Brisbane (QM); South Australian Museum, Adelaide (SAMA); and Western Australian Museum, Perth (WAM).

SYTEMATICS

Family Carabidae Latreille, 1802

Tribe Pogonini Castelnau, 1834

Genus *Pogonus* Dejean, 1821

Pogonus Dejean, 1821: 9; Csiki 1928: 213; Moore *et al.* 1987: 146; Lorenz 1998: 220; Baehr and Hudson 2001: 3.

Type species

Carabus chalcone Marsham, 1802, by original designation.

Remarks

In Australia the genus *Pogonus* presently includes 15 species (Baehr and Hudson 2001), the majority of which occur in inland saline habitats in South Australia and northern and western Victoria. From Western Australia seven species were recorded so far, but three of these only from coastal habitats (*P. australis* Chaudoir, 1878, *P. sumlini* Baehr, 1999 and *P. variabilis* Moore, 1991), one, *P. cardiotrachelus* Chaudoir, 1871, from coastal as well as inland habitats, and three exclusively from inland salt lakes (*P. diplochaetoides* Baehr, 1997, *P. fenelli* Hudson, 2000 and *P. zietzi* Sloane, 1895).

The Australian pogonine fauna is peculiar because it includes several species with reduced flying wings, which is a very rare condition within this group outside of Australia. These flightless species are depigmented and usually possess a rather oval-shaped habitus which also is very rare in pogonines, and they live in deep holes right on the surface of dry or but slightly wet salt lakes. As they do not come to the light at night, they must be searched for on the surface of dry lakes and are best collected by digging them out of their holes. Inadequate collecting efforts but also the difficulties

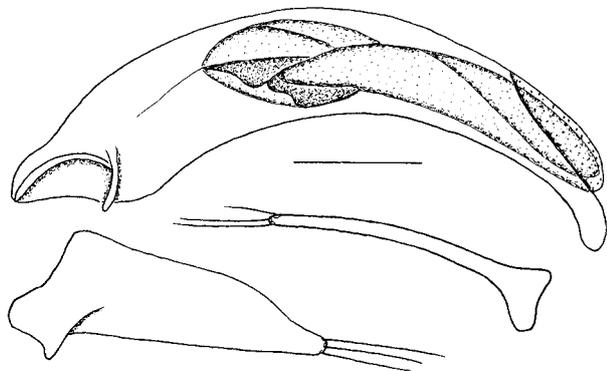


Figure 1 *Pogonus nigrescens* Baehr, male genitalia: aedeagus, parameres, genital ring. Scale bar = 0.25 mm.

in sampling of halobiontic *Pogonus* species may have been responsible for the low number of species so far recorded in Western Australia.

Pogonus nigrescens Baehr, 1984

Figure 1

Pogonus nigrescens Baehr, 1984: 169; Moore 1991: 32; Lorenz 1998: 221.

New material examined:

Australia: Queensland: 7 ♂, 5 ♀, Horn Island, 10°37'S, 142°17'E, 2–5 December 1986, at light, K. Houston and K. Sadler (CBM, QDPIB); 1 ♀, Mornington Island Mission, 3 April 1960. P. Aitken and N.B. Tindale (SAMA); 1 ♀, Bentinck Island, Rokoti. 16 June 1963. P. Aitken, N.B. Tindale. (SAMA); 1 ♀, (unreadable) Termite, I.1714 (SAMA).

Partial redescription

Measurements: length: 6.9–7.3 mm; width: 2.55–2.65 mm. Ratios: Width/length of pronotum: 1.33–1.35; width base/apex of pronotum: 0.91–0.95; width of pronotum/width of head: 1.32–1.35; length/width of elytra: 1.66–1.71; width elytra/pronotum: 1.19–1.23.

Male genitalia (Figure 1): genital ring rather regularly triangular as in *P. dostali* sp. nov. (see Figure 2). Aedeagus small, moderately compact, laterally depressed, slightly asymmetric, lower surface evenly curved, only at the very apex slightly more suddenly curved down. Apex fairly elongate, pointed down, very obtuse at tip, slightly turned to the right side. Internal sac with a small, coiled, circular, sclerotized plate near base. Both parameres elongate, right paramere narrow, barely shorter than left, with three elongate apical setae of which the upper one is decidedly shorter than both lower ones. Left paramere large, tapering to the short apex, with three elongate apical setae.

Note

In the description of this species length of the holotype was noted as 8.1 mm, but this measurement includes the mandibles. When measured in a manner comparable to that used in present paper, the measured body length would be reduced to about 7.3–7.5 mm.

Distribution

Coastal northern Queensland from about Townsville in the east to Wellesley Islands in the west.

Remarks

Most of the newly collected specimens were sampled at MV light as was the holotype.

This species was described from a straggler

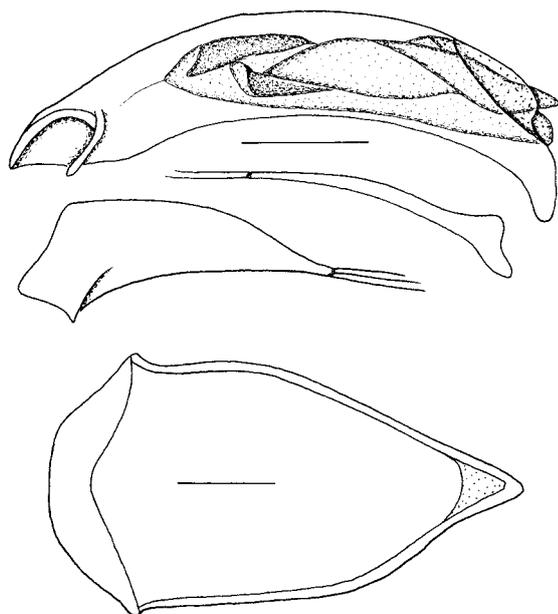


Figure 2 *Pogonus dostali* sp. nov., male genitalia: aedeagus, parameres, genital ring. Scale bars = 0.25 mm.

rather inland (Baehr 1984), but later was recorded from saline flats at the East coast near Townsville (Moore 1991). All new records are from islands off the north coast of Queensland and they enlarge the range of this apparently coastal species almost around the whole north-eastern and northern coasts of Queensland. Additional collecting efforts may reveal the occurrence of this species even more westerly in north-eastern Northern Territory.

***Pogonus dostali* sp. nov.**

Figures 2, 5

Material examined

Holotype

Australia: Western Australia: ♂, AU/15^A, Broome, Roebuck Bay, Crab Creek Road. 17°59'07.5"S, 122°21'54.1"E, 20 m, 25 November 2002, at light, A. Dostal (WAM).

Diagnosis

Elongate, glossy black species; distinguished from the most similar *P. nigrescens* by longer and narrower, more depressed elytra, narrower base of the pronotum which is narrower in comparison to head and elytra, absence of any traces of microreticulation on the dorsal surface, and the less curved lower surface of the aedeagus.

Description

Measurements: length: 6.45 mm; width: 2.2 mm. Ratios: width/length of pronotum: 1.32; width base/

apex of pronotum: 0.87; width of pronotum/width of head: 1.26; length/width of elytra: 1.77; width elytra/pronotum: 1.13.

Colour (Figure 5): very dark piceous (specimen probably rather freshly hatched). Mandibles, palpi and antenna dark reddish, except two basal antennomeres slightly paler. Legs reddish-piceous, knees reddish. Lower surface dark piceous, lateral parts of abdomen reddish.

Head: large and wide, rather depressed, narrower than pronotum. Eyes of moderate size, convex, laterally well projected, orbits very short, oblique. Labrum short and wide, apex very slightly emarginate. Mandibles elongate and straight, just at apex incurved. Palpi slender, penultimate palpomere of labial palpus slightly bowed. Submentum quadrisetose, tooth of mentum wide, obtusely triangular, mentum bisetose. Lacinia with elongate spines. Clypeus and frons rather depressed, frontal furrows fairly short, sinuate, shallow, attaining about middle of eye. Posterior supraorbital seta located well in front of posterior margin of eye. Antenna fairly elongate, surpassing base of pronotum by about two antennomeres, 6th and 7th antennomeres ca. 2.2 x as long as wide, antenna densely pilose from middle of 3rd antennomere; 1st antennomere with a single additional seta near apex at lower surface. Surface without any microreticulation, with sparse, extremely fine punctures which are visible only under very high magnification, very glossy.

Pronotum: wide and markedly cordiform, much wider than long, widest at anterior third, dorsal surface rather depressed. Base considerably narrower than apex. Apex straight, but anterior angles slightly produced though obtuse. Lateral border markedly convex, with a very short emargination just in front of basal angles. Marginal channel very narrow throughout, border very slightly raised. Base in middle straight, laterally slightly oblique. Basal angles rectangular, but distinctly projected laterad. Apex not margined except for the extreme lateral parts, base margined except in middle. Median line almost complete, fairly deep, anterior transverse sulcus absent, posterior transverse sulcus very shallow and indistinct. Base laterally with a short, straight basal ridge laterally of the rather shallow, longitudinal basal groove. Anterior lateral seta situated at anterior third at the widest diameter, posterior marginal seta arising from basal angle. Base coarsely and fairly densely punctate. Disk without any microreticulation, with scattered, extremely fine punctures which are visible only under very high magnification, in middle with a few shallow, irregularly transverse striae, very glossy.

Elytra (Figure 5): narrow and elongate, almost parallel, widest at basal fourth, disk rather

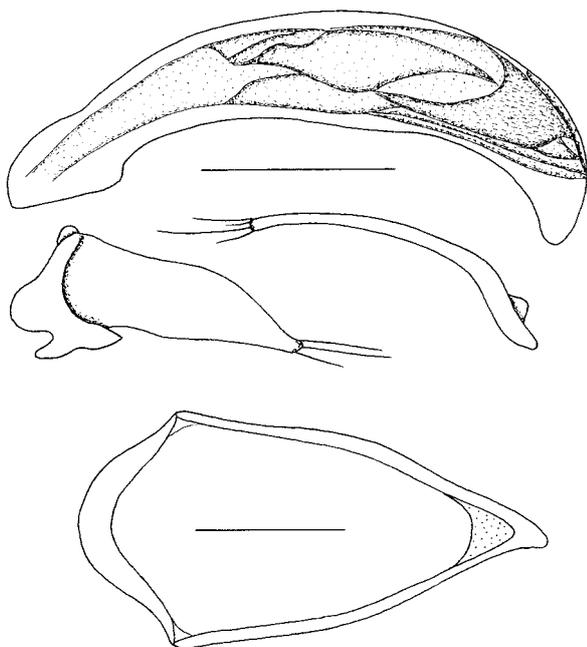


Figure 3 *Pogonus dichrous* sp. nov., male genitalia: aedeagus, parameres, genital ring. Scale bars = 0.5 mm.

depressed. Humerus very obtusely angulate. Lateral margin straight over most of its distance, little narrowed towards humerus, contiguous at sutural angle. Marginal channel extremely narrow, margin not explanate. All striae complete, well impressed, coarsely punctate, only in apical fourth impunctate. 8th stria not bowed away from margin. Basal margin angulately curved into the elongate scutellary stria mediad of 1st stria. Intervals depressed. 3rd interval with four setiferous punctures, of which the three anterior ones are adjacent to the 3rd stria, the apical one attached to the 2nd stria. Left elytron with an additional setiferous puncture close to the 3rd puncture, but attached to the 2nd stria. 11–12 marginal punctures present which are widely spaced in middle. Also with 2 setiferous punctures at the end of 7th stria. Scutellary puncture and seta present, at base of 1st stria. Intervals impunctate, in basal 4/5 without microreticulation, very glossy, only in apical fifth with very superficial, isodiametric microreticulation. Metathoracic wings fully developed.

Lower surface: prosternum asetose and whole lower surface impilose. Metepisternum rather elongate, ca. 1.5 x as long as wide at apex. Whole lower surface with fairly distinct, isodiametric microreticulation. Terminal sternum in male bisetose.

Legs: moderately elongate, metafemur comparatively stout, tibiae well depressed, with sparse and weak spines. Tibial spurs moderately elongate. Tarsi rather elongate, 1st tarsomere

of metatarsus almost as long as both following tarsomeres. Metatrochanter large, wide, two fifth of length of metafemur, apex obtusely rounded. Tarsomeres 1–3 of male protarsus slightly asymmetrically widened on median side, 1st tarsomere biserially squamose, 2nd tarsomere with few squamae on median border only.

Male genitalia (Figure 2): genital ring rather regularly triangular, little sclerotized, because the holotype apparently was rather freshly hatched. Aedeagus small, rather short and compact, laterally depressed, slightly asymmetric, lower surface in basal 4/5 but gently curved, near apex more suddenly curved down. Apex rather short, pointed down, very obtuse at tip, slightly turned to the right side. Internal sac with a small, coiled, circular, sclerotized plate near base. Both parameres elongate, right paramere narrow, barely shorter than left, with two elongate apical setae. Left paramere large, tapering to the short apex, with three elongate apical setae.

Female genitalia: unknown.

Variation: unknown.

Distribution

This species occurs in north-western Western Australia, north of Great Sandy Desert, coastal, and is known only from Broome, the type locality.

Remarks

The holotype was collected at MV light near the coast. Nothing else is recorded about collecting circumstances or habits.

The species certainly is most similar to *P. nigrescens* from eastern and northern Queensland and may constitute its western counterpart.

Etymology

The name is a patronym in honour of the collector of this species, my friend Alexander Dostal, Vienna.

Pogonus dichrous sp. nov.

Figures 3, 4, 6

Material examined

Holotype

Australia: Western Australia: ♂, Australia, WA06/100, Lake Annean, 40 km S of Meekatharra 26.89383°S, 118.27881°E, 425 m, 24 February 2006, M. Baehr (WAM).

Paratypes

Australia: Western Australia: 33 ♂, 16 ♀, same data (1 ♂, 1 ♀, AMS; 1 ♂, 1 ♀, ANIC; 27 ♂, 10 ♀ (partly damaged) CBM; 1 ♂, 1 ♀, NMV; 1 ♂, 1 ♀, QM; 1 ♂, 1 ♀, SAMA; 1 ♂, 1 ♀, WAM).

Diagnosis

Medium sized, compact, bicoloured species, distinguished from the most similar *P. hypharpagoides* Sloane by dark fore body, bicoloured elytra, shorter, wider, and dorsally more convex elytra, and more distinct apical angles of the pronotum.

Description

Measurements: length: 6.7–8.9 mm; width: 2.6–3.55 mm. Ratios: width/length of pronotum: 1.09–1.17; width base/apex of pronotum: 1.11–1.16; width of pronotum/width of head: 1.32–1.37; length/width of elytra: 1.55–1.63; width elytra/pronotum: 1.36–1.44.

Colour (Figure 6): head, pronotum and medio-basal part of the elytra metallic dark brownish to black, in some specimens with faint greenish lustre; rest of elytra reddish, towards apex paler; palpi, antenna, and legs dirty yellow to pale reddish. Lower surface of head and thorax brown to blackish, abdomen posteriad changing to pale reddish.

Head: large and wide, fairly convex, markedly narrower than pronotum. Eyes rather small, moderately convex, laterally not much projected, posteriorly slightly enclosed by the orbits. Labrum short and wide, apex gently emarginate. Mandibles rather elongate, apex fairly incurved. Palpi of moderate size, penultimate palpomere of labial palpus fairly slender, slightly bowed. Submentum quadrisetose, tooth of mentum wide, distinctly cleft, bidentate. Lacinia with elongate spines. Clypeus and frons in middle convex, frontal furrows irregular, sinuate, shallow, posteriorly ending in an irregularly shaped impression. Impressions at bottom with fine, irregular wrinkles. Antenna short, just reaching the base of the pronotum, median antennomeres ca. 1.5 × as long as wide, rather sparsely pilose from middle of 3rd antennomere, more densely pilose from middle of 4th antennomere; 1st antennomere with 2–3 additional setae near apex at lower surface. Surface with moderately distinct, in middle more superficial, approximately isodiametric microreticulation, with some wrinkles and transverse lines, moderately glossy.

Pronotum: slightly wider than long, dorsally convex, not cordiform, but laterally convex, widest about at middle. Base slightly wider than apex. Apex almost straight, apical angles very slightly produced. Lateral border evenly convex throughout, with a very short concavity just in front of basal angles. Marginal channel very narrow, border barely upturned. Basal angles obtuse but laterally very slightly produced, base convex, laterally rather oblique. Apex not margined, base coarsely margined. Both transverse sulci shallow,

median line very shallow, attaining base though not apex. Basal grooves shallow, longitudinal but short. Anterior lateral seta situated slightly behind anterior third, in front of widest diameter, posterior marginal seta arising from basal angle. Disk impunctate, with very fine, in middle very superficial, about isodiametric microreticulation, with very faint, irregularly transverse striae, glossy.

Elytra (Figure 6): moderately elongate, wide, rather parallel-sided, dorsally remarkably convex, widest at middle. Humeri markedly angulate but not dentate. Lateral margin straight over most of its distance, narrowed towards humeri, contiguous at sutural angle. Marginal channel extremely narrow, margin not explanate. Inner four striae distinct, but apart from inner two striae, beginning at a short distance from base. 5th stria more or less distinct, 6th and 7th striae very weak. All striae ending far from apex of elytra, the outer ones being gradually shorter. Inner four striae well impressed, more or less distinctly punctate. 8th stria not bowed away from margin. Scutellary stria medially of 1st stria elongate. 1st stria curved into 2nd stria which bears at its base the scutellary puncture and seta. Inner four or five intervals in basal half rather convex. 3rd interval with three setiferous punctures, the anterior and median ones adjacent to 3rd stria, situated about at basal third and at or behind middle, the third one in posterior third situated in middle of 3rd interval, setae short. 12–13 widely spaced, inconspicuous submarginal punctures in a more or less uninterrupted row attached to 8th stria. 7th stria with two setiferous punctures at apex. Intervals impunctate, with fine, rather superficial, about isodiametric microreticulation, surface rather glossy. Metathoracic wings fully developed.

Lower surface: prosternal process on ventral and posterior surfaces with several elongate setae, mesosternum and metasternum laterally, and meso- and metacoxae, with a few elongate setae. Metepisternum short, slightly longer than wide at apex. Lower surface with very fine, about isodiametric microreticulation. Terminal sternum in male bisetose, in female quadrisetose.

Legs: rather short and stout, metafemur comparatively stout, tibiae well depressed, with dense spines. Tibial spurs moderately elongate. Tarsi rather short, 1st tarsomere of metatarsus slightly shorter than both following tarsomeres. Metatrochanter in both sexes large, wide, about two fifth of length of metafemur, apex obtusely rounded. Tarsomeres 1–3 of male protarsus slightly asymmetrically widened on median side, 1st and 2nd tarsomeres uniseriately squamose on median side.

Male genitalia (Figure 3): genital ring almost regularly triangular with very convex base.

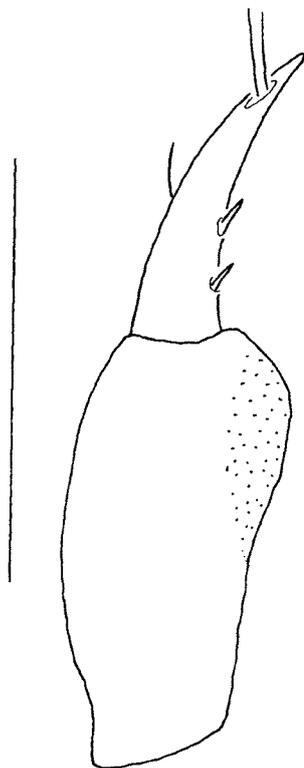


Figure 4 *Pogonus dichrous* sp. nov., female gonocoxites. Scale bar = 0.2 mm.

Aedeagus rather large, moderately compact, laterally depressed, slightly asymmetric, lower surface in middle slightly convex, towards apex suddenly curved down. Apex large, pointed down, very obtuse at tip, slightly turned to the right side. Internal sac without any sclerotized parts, but in apical part with a large, triangular, very finely denticulate plate. Both parameres elongate, right paramere very narrow, barely shorter than left, with two elongate and two shorter and thinner apical setae. Left paramere large, tapering to the short apex, with three elongate apical setae.

Female genitalia (Figure 4): gonocoxite 1 without setae at apex. gonocoxite 2 narrow and elongate, slightly curved, with 0–2 small ventro-lateral ensiform seta near base, one almost nematiform dorso-median seta in middle, and 2 rather elongate nematiform setae originating from a groove near apex.

Variation: some variation noted in body size, relative length of pronotum and elytra, and depth of elytral striae.

Distribution

This species is known only from the type locality, Lake Annean, south of Meekatharra, in central Western Australia.

Remarks

All specimens were sampled in pitfall traps at the shore of Lake Annean, a salt lake which at the time of sampling was largely filled up with water. The traps were exposed for about three weeks in moist, clayish ground near the water front, in an area with rather sparse, low salt vegetation.

With respect to body shape and surface structure, this species is most similar to *P. hypharpagoides* Sloane, recorded from salt lakes in South Australia and north-western Victoria.

Etymology

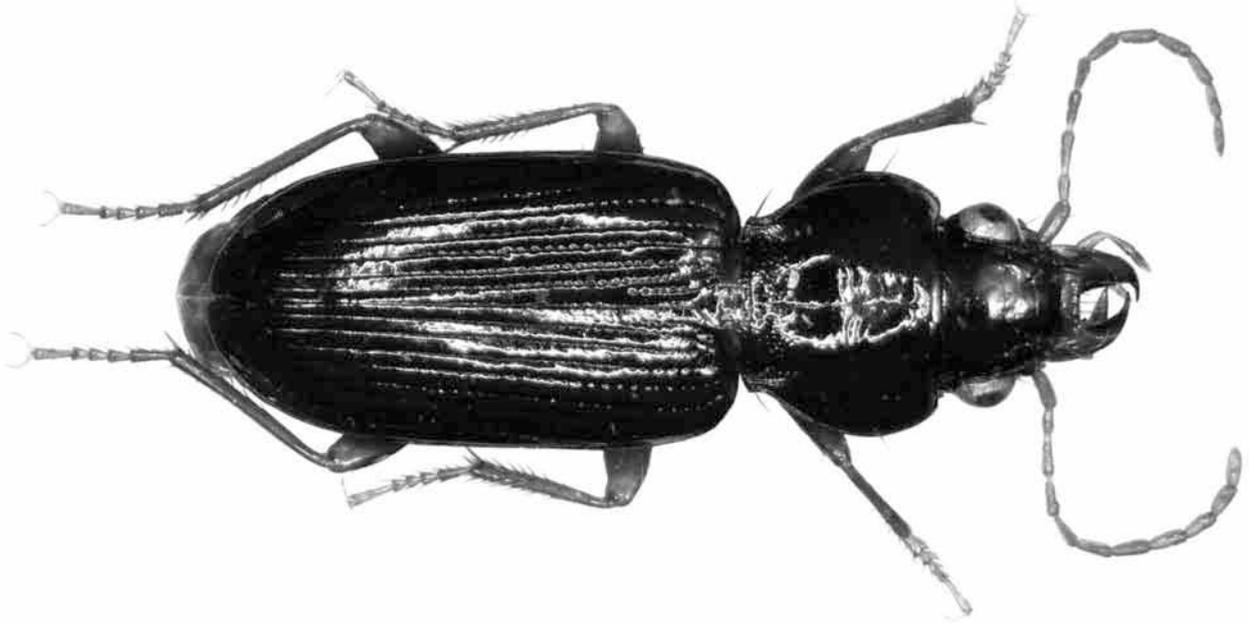
The name refers to the bicolourous dorsal surface of this species which has black, rarely slightly greenish, head, pronotum and medio-basal part of the elytra, whereas the rest of the elytra is pale reddish.

Recognition

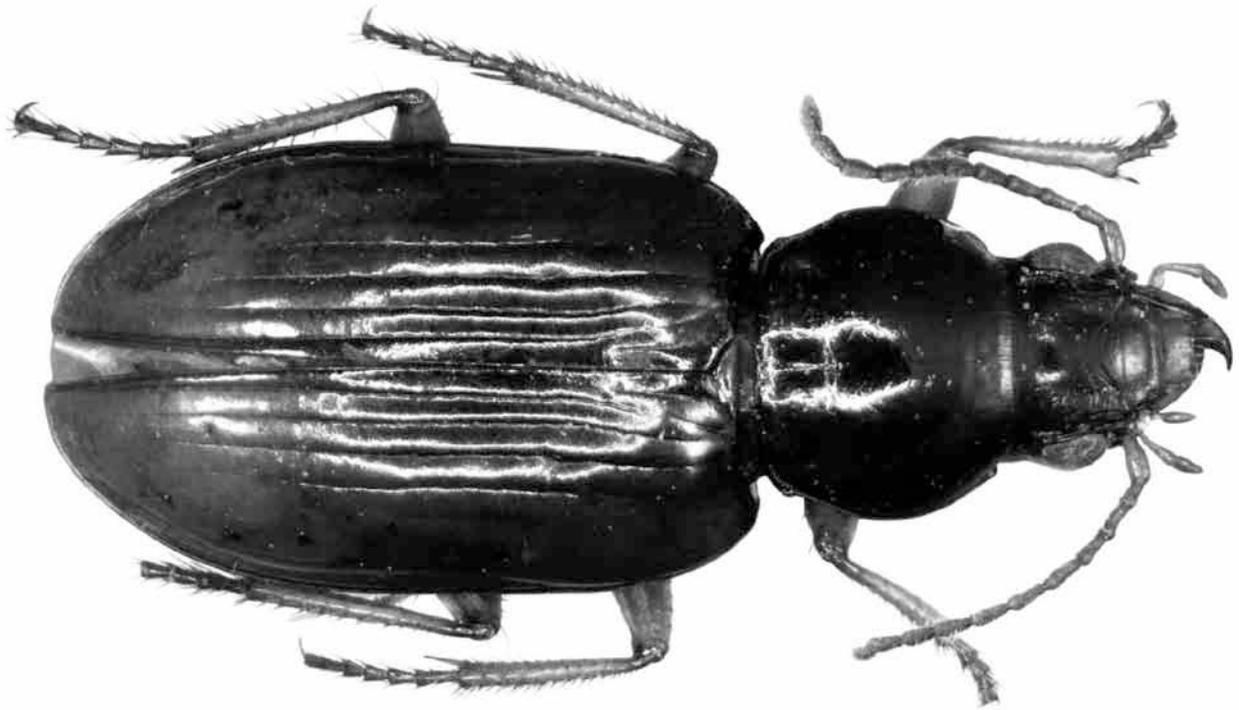
For recognition of the two newly described species the most recent key to the Australian species of the genus *Pogonus* in Baehr and Hudson (2001: 14) is partly revised.

PARTLY REVISED KEY TO THE AUSTRALIAN SPECIES OF THE GENUS *POGONUS*

1. Body completely metallic green or black..... 2
 - Body entirely or in parts testaceous 6
2. Colour shining black; punctures of elytra very coarse, microreticulation fine or absent. Northern half of Australia..... 3
 - Colour greenish metallic; punctures of elytra finer, microreticulation conspicuous. Southern half of Australia 4
3. Larger species, body length > 6.9 mm; base of pronotum wider, ratio width of base/apex > 0.91, pronotum wider in comparison to head, ratio width of pronotum/head > 1.32; elytra shorter, wider, and less depressed, ratio length/width < 1.71; aedeagus more evenly curved on lower surface (Figure 1). North-eastern and northern Queensland, coastal (described from a straggler at some distance inland) *P. nigrescens* Baehr
 - Smaller species, body length 6.45 mm; base of pronotum narrower, ratio width of base/apex 0.87, pronotum narrower in comparison to head, ratio width of pronotum/head 1.26; elytra longer, narrower, and more depressed, ratio length/width 1.77; aedeagus less curved on lower surface (Figure 2). Northwestern Western Australia, coastal..... *P. dostali* sp. nov.



5



6

Figures 5, 6 Habitus. 5, *Pogonus dostali* sp. nov. (length: 6.45 mm); 6, *Pogonus dichrous* sp. nov. (length: 8.2 mm).

4. 6th and 7th striae almost as distinct as median striae; metathoracic wings reduced; elytral margins ovate. Lake Yindarlgooda, Western Australia..... *P. fennelli* Hudson

6th and 7th striae less marked than median striae; metathoracic wings fully developed; elytral margins more parallel sided 5

5. Smaller (body length 6.3–6.8 mm), body narrower, more convex; pronotum markedly sinuate in front of the acute basal angles, these being 90° or less; submarginal basal ridge of pronotum scarcely indicated. Southern Australia from Western Australia to Victoria, coastal *P. australis* Chaudoir

Larger (body length 7.5–8.5 mm), body wider, less convex; pronotum less sinuate, basal angles more obtuse, these being c. 100°; submarginal basal ridge of pronotum conspicuous. Coastal and inland from southern half of Western Australia to southeastern Queensland *P. cardiotrachelus* Chaudoir

6. Bicoloured, head and pronotum distinctly darker than the elytra..... 7

Completely testaceous or light reddish, head and pronotum not perceptibly darker than elytra (variable species under both couplets)..... 9

7. Elytra distinctly bicoloured: base in middle dark, rest pale reddish (Figure 6); body convex; pronotum barely sinuate at basal angles; lateral striae weak **and** median striae in basal half deep **and** striae not or little punctate; aedeagus rather large, with blade-like, markedly curved down apex (Figure 3). Saline Lake Annean, central Western Australia.. *P. dichrous* sp. nov.

Elytra not or but faintly bicoloured; **either** body convex **and** pronotum distinctly sinuate at basal angles **and** all striae deep **and** coarsely punctate; **or** body markedly depressed **and** pronotum not sinuate at basal angles **and** all striae shallow and impunctate..... 8

8. Large, convex species (body length 9–11 mm); pronotum at base not lobate, lateral margins distinctly sinuate in front of basal angles. Northern Australia from north-western

Queensland to the Kimberleys, coastal and along tidal rivers *P. variabilis* Moore

Small, depressed species (body length c. 6.5 mm); pronotum at base lobate, lateral margins barely sinuate in front of basal angles. Inland saline habitats in Western Australia and South Australia *P. zietzi* Sloane

9. = 7 of key in Baehr and Hudson (2001: 14).

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