

SPIXIANA	15	1	75–80	München, 1. März 1992	ISSN 0341–8391
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A new *Acrogenys* Macleay from Central Australia Supplement to the Revision of the Australian Zuphiinae

(Insecta, Coleoptera, Carabidae)

By Martin Baehr

Baehr, M. (1992): A new *Acrogenys* Macleay from Central Australia. Supplement to the Revision of the Australian Zuphiinae (Insecta, Coleoptera, Carabidae). – Spixiana 15/1: 75–80

Acrogenys centralis, spec. nov. from the Musgrave Ranges, South Australia, is described. It is closest related to *A. demarzi* Baehr from northernmost Northern Territory, and is the most apomorphic species of the whole genus. Because all known *Acrogenys* live in leaf litter of forests, it is suggested that the ancestor of *A. centralis* invaded its present range in the arid interior from the north during a wet pluvial of the Glacial period, when woodlands spread over considerable parts of interior Australia. Later this population was isolated and it now survives in an environment very different from that of all other species of the genus.

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When sorting unidentified Carabidae in the Australian National Insect Collection, Canberra (ANIC), Ross Bell (Burlington) found a small series of unidentified *Acrogenys* he took for a new species. He kindly informed me of his finding, and Tom Weir (Canberra) sent me the specimens for identification. They indeed proved to belong to a further new species and are being described herein as a supplement to my revision of the Australian Zuphiinae (Baehr 1984, 1985 a, 1985 b, 1986 a, 1986 b, 1987).

Measurements

Measurements have been made by a stereo microscope using an ocular micrometer. Length has been measured from apex of labrum to apex of elytra.

Acknowledgements

I am very grateful to Dr. R. T. Bell (Burlington) for kind information on the new species, and to Mr. T. Weir (Canberra) for the loan of the specimens.

Genus *Acrogenys* Macleay

Acrogenys Macleay, 1864, p. 109; Castelnau 1867, p. 19; 1868, p. 105 (*Acrogonys* by error); Gestro 1875, p. 858; Blackburn 1890, p. 132; Csiki 1932, p. 1569; Baehr 1984, p. 119; Moore et al. 1987, p. 313.

Type species: *Acrogenys hirsuta* Macleay, 1864.

Acrogenys centralis, spec. nov.

Figs 1–3

Types. Holotype: ♂, 26.09 S, 130.35 E, 56 km W. of Amata, Musgrave Ranges, S.A., 20–21 Jan. 1982, D. C. F. & B. G. F. Rentz & R. Honeycutt. Stop 14 (ANIC). – Paratypes: 4 ♀♀, same data (ANIC, Coll. M. Baehr, München).



Fig. 1. *Acrogenys centralis*, spec. nov. ♀ paratype. Length: 12.7 mm.

Diagnosis

Species of subgenus *Acrogenys* s. str. Recognized by comparatively small eyes, wide, cordiform pronotum having conspicuously crenulate borders, and extremely raised and tectiform 7th intervals and suture of elytra, giving the space between them a markedly concave appearance.

Description

Measurements. Length: 12.5–13.8 mm; width of elytra: 4.15–4.6 mm; ratio width/length of pronotum: 1.06–1.10; ratio widest/narrowest part of pronotum: 1.90–1.95; ratio length/width of elytra: 1.85–1.90.

Colour. Very dark piceous to blackish. Antennae, palpi, tibiae, and tarsi reddish-piceous. Lower surface piceous. Pilosity yellow.

Head. Distinctly narrower than pronotum. Eyes rather large, though smaller and laterally less projecting than in all other species, orbits c. $3/5 \times$ as longer as eyes. Base of head rather wide. Labrum anteriorly straight, smooth. Mandibles rather short. Mentum with convex, unidentate tooth. Glossa polysetose, paraglossae elongate, membranous, curved inwards. Lacinia strongly setose, apically on outer border with few hairs. Labial palpus narrow, elongate, terminal segment slightly shorter than penultimate segment, almost impilose. Maxillary palpus densely setose, terminal segment widened. Antenna elongate, longer than in all other species, surpassing base of pronotum by almost 4 segments, median segments more than twice as long as wide, all segments densely setose. Dorsal surface coarsely, though somewhat diffusely punctate and densely hirsute. Hairs elongate, inclined anteriorly. Fixed setae more or less easily visible.

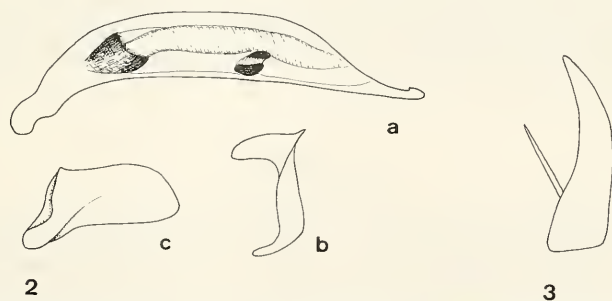
Pronotum. Large and wide, slightly wider than long, markedly cordiform. Apex slightly concave, anterior angles rounded off. Sides markedly convex in anterior half, posteriorly strongly sinuate to the remarkably projecting, very acute posterior angles. Transition from anterior convex part to posterior sinuosity somewhat angular. Lateral margin anteriorly conspicuously crenulate, raised throughout, hence middle of surface at same level with margin. Base laterally excised. Marginal channel very wide. Surface uneven, median sulcus conspicuous, deep, median line not attaining apex. Basal grooves deep, straight, very elongate, reaching to anterior $2/5$ of pronotum. Behind apex with rather deep, slightly v-shaped transversal sulcus. Margin in anterior half with 3–5, at posterior angles with 1 elongate setae, these not always easily visible. Puncturation dense, rather coarse, somewhat coriaceous. Pilosity dense, elongate, hirsute, inclined posteriorly, but intermixed with erect hairs.

Elytra. Narrow and elongate, almost twice as long as wide. Sides rather feebly convex. Shoulders rounded off. Margin behind shoulders barely concave. Apex feebly sinuate. Suture and 7th interval extremely raised, tectiform, hence surface between them distinctly concave. Striae coarsely punctate, crenulate, intervals slightly raised, punctate in c. 3 rows. Pilosity dense, elongate, inclined posteriorly, though intermixed with rows of erect hairs, the latter situated especially on odd intervals. Marginal pores numerous, setae elongate. Apex of elytra without densely pilose yellow spot. Elytra fused together. Hind wings absent.

Lower surface. Densely punctate and pilose. Sometimes in middle of first visible abdominal sternite with an impilose spot. Metepisternum c. quadrate. Sternum VII in ♂ with 2, in ♀ with 3 elongate setae on either side at posterior border, additionally with 1 seta on either side in middle.

Legs. Rather elongate, densely punctate and pilose. 1st–3rd segments of ♂ anterior tarsus enlarged and with dense tuft of hairs on external surface.

♂ genitalia. Aedeagus elongate, narrow, lower surface almost straight, apex with feeble, slightly hooked terminal knob. Parameres as in figs 2 b, c.



Figs. 2. and 3. *Acrogenys centralis*, spec. nov. ♂ and ♀ genitalia. 2 a. Aedeagus, lateral view. 2 b. Right paramere. 2 c. Left paramere. 3. ♀ stylomere 2.

♀ genitalia. Stylomere 2 very elongate, narrow, basally barely widened, with 2 nematiform setae not rising from a groove, at the place of the usually tooth-like ventral ensiform setae.

Variation. Apart from some differences in size and relative width of pronotum and elytra little variation recognized.

Distribution. Northernmost South Australia. Known only from type locality.

Habits. Unknown. Type series collected in January which is the hottest period of the year in this semidesert area.

Etymology. Named from the unusual range in Central Australia.

Identification. For identification of this species, the key in my revision (Baehr 1984) has to be changed as following.

Renewed key to genus *Acrogenys* Macleay

1. 7th interval of elytra distinctly tectiform, sutural interval raised. Pronotum as long as wide or even wider. Terminal segment of labial palpus very sparsely pilose. ♂ aedeagus with distinct, hooked terminal knob . 2.
 - 7th interval of elytra not tectiform, sutural interval not raised. Pronotum distinctly longer than wide. Terminal segment of labial densely pilose. ♂ aedeagus with upturned hooked apex only, without distinct knob. Eastern Queensland *longicollis* Gestro
2. Pronotum with very acute, projecting posterior angles, prebasal sinuosity very deep. 7th interval markedly tectiform, surface of elytra between sutural and 7th interval distinctly concave 3.
 - Pronotum with less acute, less projecting posterior angles, prebasal sinuosity rather shallow. 7th interval less tectiform, surface of elytra between sutural and 7th interval not concave, usually slightly convex . 4.
3. Larger species, over 12.5 mm long. Eyes rather small, laterally little projecting. Antennae elongate, median segments more than 2 × as long as wide. Margin of pronotum anteriorly distinctly crenulate, passing somewhat angularly into prebasal sinuosity. Sutural interval of elytra distinctly tectiform. No yellow tufted spot at apex of elytra visible. Northernmost South Australia *centralis*, spec. nov.
 - Smaller species, less than 12 mm long. Eyes large, laterally markedly projecting. Antennae shorter, median segments c. 1.5 × as long as wide. Margin of pronotum anteriorly not crenulate, evenly passing into prebasal sinuosity. Sutural interval of elytra raised, but not tectiform. Apex of elytra with distinct yellow tufted spot. Northernmost Northern Territory *demarzi* Baehr
4. Wider species. Pronotum considerably wider than long, lateral margin anteriorly more convex, ratio widest/narrowest diameter 1.73–1.80. Elytra wider, ratio length/width 1.72–1.76. ♂ aedeagus big, terminal knob long and stout, with strong lateral teeth. Northwestern Australia and northernmost Northern Territory *laticollis* Baehr
 - Narrower species. Pronotum barely wider than long, lateral margin anteriorly less convex, ratio widest/narrowest diameter 1.60–1.67. Elytra narrower, ratio length/width 1.80–1.84. ♂ aedeagus more delicate, terminal knob stout, but short, lateral teeth less distinct. Eastern Queensland, northernmost Northern Territory, ? central western Western Australia *hirsuta* Macleay

Relationships

Several apomorphic characters (wide, heart-shaped pronotum with very acute posterior angles, raised margins of pronotum with enlarged marginal channel, deep, elongate basal grooves of pronotum, extremely tectiform 7th intervals of elytra), as well as the rather similar shape of ♂ aedeagus, suggest that the new species has its closest relative in *A. demarzi* Baehr from far Northern Territory.

A. centralis is in some respects even more apomorphic than *A. demarzi*, e. g. in extremely tectiform 7th interval, tectiform sutural interval, crenulate margin of pronotum, comparatively small eyes. Therefore it is without doubt the most apomorphic species in the whole genus.

Zoogeographical conclusions

The genus *Acrogenys* was so far known only from eastern Queensland, far Northern Territory, and far northwestern Australia (one record from Carnarvon in central coastal Western Australia is highly doubtful). Because the most plesiomorphic species of the whole genus, *A. (Paracrogenys) longicollis* Gestro, as well as the presumably most primitive species of the advanced subgenus *Acrogenys* s. str., *A. hirsuta* Macleay both live in eastern Australia and are mainly found in leaf litter and under logs on the ground, *A. longicollis* even in rain forest (there commonly collected in pit fall traps by Geoff Monteith), humid eastern Queensland is perhaps the original range, and the mentioned habits is presumably the original way of life within the genus. The northern Australian species *A. laticollis* Baehr and *A. demarzi* Baehr presumably live in more open forests, though all known species are believed to be forest dwellers.

The new species enlarges the range of the genus to a considerable extent. It was collected in an arid region in far northwestern South Australia, where certainly no forest or even woodland of any sort exist, although this is a montane area (Musgrave Ranges). Hence this species must have rather aberrant habits to be able to live in such arid environments.

The presumed relationship with *A. demarzi*, as well as the occurrence of its nearest relative in less humid and less densely forested areas than the other species, strongly suggests that *A. centralis* is an offshoot of a form much alike *A. demarzi* and that it invaded Central Australia from the north during a period when the climate was more humid in interior Australia than it is today. As both species, *A. demarzi* and *A. centralis* are still rather closely related, the period of this range extension into the area where *A. centralis* lives today was most probably one of the pluvials of the Glacial period, when large areas of interior Australia were much more humid than today and were to a considerable extent grown with more or less open woodlands. During the warm and dry interglacials the population of *A. centralis* then became apparently isolated in its present montane range and was able to survive there, although we have no idea about its actual distribution. Although we do not know, when *A. centralis* originated, in view of its rather close relationships with *A. demarzi* we can assume that it evolved not before the forelast pluvial. In view of the possession of several peculiar characters, on the other hand, it is fairly unlikely that *A. centralis* evolved much later, e. g. within the last pluvial.

We actually do not know how this species manages to survive in such an inhospitable environment, especially because it was originally derived from an forest dwelling ancestor. So, this remarkable discovery gives a fine example of a rather fundamental ecological shift in a primitive genus which was not believed to be able to do that, and this discovery actually raises more questions than it solves.

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Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Spixiana, Zeitschrift für Zoologie](#)

Jahr/Year: 1992

Band/Volume: [015](#)

Autor(en)/Author(s): Baehr Martin

Artikel/Article: [A new Acrogenys Macleay from Central Australia Supplement to the Revision of the Australian Zuphiinae \(Insecta, Coleoptera, Carabidae\) 75-80](#)