

Three new species of the genus *Acrogenys* Macleay, 1864 from Australia (Insecta, Coleoptera, Carabidae, Zuphiini).

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Abstract

Three new species of the Australian zuphiine genus *Acrogenys* Macleay, 1864 are described: *A. heathlandica* from extreme northern Cape York Peninsula, North Queensland, and *A. arafurae* and *A. curtipennis*, both from the northern part of the Northern Territory. A completely new key to the species of the genus *Acrogenys* is provided.

Zusammenfassung

Drei neue Arten der australischen Zuphiinen-Gattung *Acrogenys* Macleay, 1864 werden beschrieben: *A. heathlandica* aus der nördlichen Cape York Peninsula, Nordqueensland, und *A. arafurae* und *A. curtipennis* aus dem nördlichen Northern Territory. Ein völlig neuer Bestimmungsschlüssel für die Arten der Gattung *Acrogenys* ist beigelegt.

Keywords

Coleoptera, Carabidae, Zuphiini, *Acrogenys*, new species, Australia

Introduction

During a recent visit at the Australian National Insect Collection, Canberra (ANIC) I had the opportunity to sort through the large amount of unidentified material of carabid beetles present in this collection. During this work I found, inter alia, some specimens of the zuphiine genus *Acrogenys* Macleay, 1864 that represent three additional undescribed species. The following descriptions thus are regarded a further supplement to my revisions of the Australian Zuphiini.

Acrogenys is an exclusively Australian genus of very basal, in terms of their pylogenetic status, flightless Zuphiini which is distributed over the whole tropical belt of northern Australia, from central eastern Queensland to north-western Australia. The few records of ecological preferences suggest that most species inhabit rather open, even semiarid areas. Two species even were able to invade the dry interior of Central and central Western Australia.

The genus was revised by Baehr (1984), and Baehr subsequently (1992a, 2001, 2008) described several additional species. Because they are unable to fly and thus do not readily come to light, specimens of *Acrogenys* are very rarely collected, or perhaps they generally are rare insects on whatever reasons. Therefore, of most species only a single or few specimens have been ever sampled. The absence of flying wings also accounts for the apparently very restricted ranges that most species of *Acrogenys* seem to possess. In particular in the far north of Australia several species exist which belong to a common stock and are distinguished only by minor morphological differences.

Material and Methods

In the taxonomic survey standard methods are used. The genitalia were removed from specimens relaxed for a night in a jar under moist atmosphere, then cleaned for a short while in hot 10% 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 X4.

Measurements were taken using a stereo microscope with an ocular micrometer. Length has been measured from the apex of the labrum to the apex of the elytra. Length of pronotum was measured along midline. Length of the elytra was measured from the most advanced part of the humerus to the very apex.

A / with a blank before and after it denotes a new label, two blanks mark a new line on the same label.

The holotypes of the new species are stored in the Australian National Insect Collection, Canberra (ANIC), paratypes of two species are stored in the working collection of the author at Zoologische Staatssammlung, München (CBM).

Genus *Acrogenys* Macleay

Acrogenys Macleay, 1864: 109. – Csiki 1932: 1569; Baehr 1984: 119; 1992a: 75; 2001: 94; 2008: 114. Moore et al. 1987: 313; Lorenz 1998: 479. See Baehr (1984) for additional references.

Type species: *Acrogenys hirsuta* Macleay, 1864, by monotypy.

Diagnosis

Rather large, uniformly black, flightless beetles, immediately recognized by the sharply raised 7th interval (less sharp only in *A. longicollis* Gestro, 1975, the single representative of the subgenus *Paracrogenys* Baehr. 1984) and the very hirsute surface which bears several elongate, erect setae situated on the odd intervals, that are particularly elongate on the 7th interval.

Presently 11 species are recorded from the nominate subgenus and a single species from the subgenus *Paracrogenys* Baehr, 1984. The species are distributed through the tropical belt of Australia, in the east also into the subtropics, with a single species so far recorded from central Australia. One species also was recorded from the semiarid interior of northern Western Australia, another species is known from the Pilbara region in north-west Western Australia.

Acrogenys heathlandica sp. n.

Figs 1, 5

Examined types

Holotype: ♂, “11.45S 142.35E Heathlands QLD Jan.-Feb. 1993 J. Stuart pitfall traps” / “burnt grassland” (ANIC). - **Paratype:** 1 ♂, same data (CBM).

Etymology

The name refers to the type locality, “Heathlands” in northern Cape York Peninsula, Australia.

Diagnosis

Species of subgenus *Acrogenys* s. str. In view of the extremely cordiform shape of the pronotum and the regularly shaped lateral margins most closely related to *A. demarzi* BAEHR, 1984 and *A. arafuriae* sp. n. Distinguished from both species by the differently shaped aedeagus; further on from *A. demarzi* by absence of a patch of denser pilosity at the apex of the elytra; and from *A. arafuriae* by shorter antenna, less coriaceous punctures on the head, longer elytra, and more superficial elytral microreticulation.

Description

Measurements. Length: 10.0-10.7 mm; width: 3.0-3.3 mm. Ratio width/length of pronotum: 1.04-1.05; ratio widest diameter/narrowest diameter of pronotum: 1.98-2.0; ratio length/width of elytra: 1.88-1.90; ratio length/width of 7th antennomere in male: 1.5.

Colour. Black. Labrum and mandibles dark piceous, apical antennomeres laterally dark reddish.

Head (Fig. 5). Considerably narrower than the pronotum. Eye large, laterally protruded, orbit about half as long as eye. Base of head wide. Labrum anteriorly almost straight, smooth. Mandibles short, evenly curved. Mentum with triangular, unidentate tooth. Glossa polysetose, paraglossae elongate, membranous, curved inwards. Lacinia strongly setose, with few short hairs at lateral border of apex. Labial palpus narrow, elongate, slightly widened to apex, terminal palpomere slightly shorter than penultimate, very sparsely and shortly pilose. Maxillary palpus large, short and stout, densely setose, terminal palpomere widened at apex. Antenna moderately elongate, surpassing the base of the pronotum by about three antennomeres. Median antennomeres about 1.5 x as long as wide. Whole antenna densely setose. Dorsal surface very coarsely and rather sparsely punctate, middle of clypeus impunctate, middle of frons anteriorly more sparsely punctate, with some glossy areas, punctures anteriorly larger than towards neck. Microreticulation absent. Surface hirsute, hairs elongate, erect, slightly inclined anteriad.

Prothorax (Fig. 5). Large, moderately wide, slightly wider than long, remarkably cordiform. Apex wide, slightly concave, anterior angles rounded off. Sides evenly convex in anterior half, in posterior half very deeply concave. Basal angles acute, far less than rectangular, laterally remarkably projected. Base comparatively narrow, laterally deeply excised. Lateral margin smooth, raised, marginal channel widely explanate. Disk uneven, median sulcus deep and wide, even deepened in middle and near apex, median line not attaining apex. Anterior transverse sulcus barely indicated. Basal grooves rather deep, linear, gently curved outwards, attaining the middle of pronotum. Lateral margin in anterior half with three to four long, erect setae and with an elongate seta at basal angle. Punctures very coarse, dense, at widest diameter of pronotum about 15 punctures between middle and lateral margin. Punctures much wider than the interspaces between them. Microreticulation absent.

Pilosity dense, elongate, hirsute, on disk inclined posteriad, at apical margin erect or slightly inclined anteriad.

Elytra. Very narrow and elongate, laterally slightly though evenly convex, widest about at middle or slightly behind. Humerus well projected, rounded. Lateral margin behind humerus barely concave. Apex slightly sinuate. 7th interval markedly raised, tectiform, complete and even near apex barely intersected. Sutural interval markedly raised along almost the whole of its length, in apical half even higher than 7th interval. Surface between 7th interval and suture depressed but not concave. Striae coarsely punctate, crenulate. Intervals fairly densely, irregularly biseriately punctate. Microreticulation superficial, surface moderately glossy. Odd intervals with a row of elongate, erect setae. Pilosity dense, elongate, hirsute, much inclined posteriad, almost depressed. Marginal setae numerous, very elongate. Apex of elytra without denser pilosity. Elytra fused together, posterior wings absent.

Lower surface. Densely punctate and pilose. Pilosity on thorax erect, on abdomen much inclined posteriad. Metepisternum quadrate. Sternum VII in male with two elongate setae on either side of posterior margin.

Legs. Rather elongate, densely punctate and pilose. 1st - 3rd tarsomeres of male protarsus widened and slightly asymmetrically squamose.

Male genitalia (Fig. 1). Genital ring narrow and elongate, convexly triangular, slightly asymmetric, with elongate base and narrow, elongate apex. Aedeagus comparatively small, but stout and in basal half wide. Lower surface very gently concave throughout. Apex short, with stout but narrow apical knob which is only angulate at the upper side. Internal sac with several coiled, but not sclerotized folds, and with a slightly more sclerotized, narrow, transverse bar in middle at bottom. Both parameres short with convex apex, apical part of right paramere rather wide.

Female gonocoxites. Unknown.

Variation. Very little variation noted.

Distribution

Northern Cape York Peninsula, North Queensland, Australia. Known only from the type locality.

Collecting circumstances

Both specimens were sampled in pitfall traps in burnt grassland, probably in open Tropical Savannah.

Relationships

In view of the very cordiform shape of the pronotum, the acute basal angles, and the elongate elytra the species most probably is closely related to *A. demarzi* Baehr and *A. arafuriae* sp. n. from northernmost Northern Territory. In the shape of the aedeagus it differs from both mentioned species, but in the narrower prothorax and longer elytra it is more similar to *A. demarzi*.

Acrogenys arafuriae sp. n.

Figs 2, 3, 6

Examined types

Holotype: ♂, "NT. Kym Brennan PWCNT 2001 Arafura Swamp Site Gul 08" (ANIC). - **Paratypes:** 1 ♀, same data (ANIC); 1 ♂, same data, but "Site Gul 05" (CBM).

Etymology

The name refers to the type locality, "Arafura Swamp" in Arnhem Land, far Northern Territory, Australia.

Diagnosis

Species of subgenus *Acrogenys* s. str. In view of the extremely cordiform shape of the pronotum and the regular lateral margins most closely related to *A. demarzi* Baehr and *A. heathlandica* sp. n. Distinguished from both species by longer antenna, more coriaceous punctures on the head, and shorter elytra; further distinguished from *A. demarzi* by the far larger aedeagus and the absence of a patch of denser pilosity at the apex of the elytra; and from *A. heathlandica* by different shape of the aedeagus and more distinct elytral microreticulation.

Description

Measurements. Length: 10.4-10.5 mm; width: 3.3-3.35 mm. Ratio width/length of pronotum: 1.07-1.09; ratio widest diameter/narrowest diameter of pronotum: 1.79-1.83; ratio length/width of elytra: 1.82-1.84; ratio length/width of 7th antennomere in male: 1.85-1.9, in female: 1.7.

Colour. Black. Labrum and mandibles dark piceous, outer antennomeres laterally dark reddish.

Head (Fig. 6). Considerably narrower than the pronotum. Eye large, laterally protruded, orbit about half

as long as eye. Base of head wide. Labrum anteriorly almost straight, smooth. Mandibles short, evenly curved. Mentum with triangular, unidentate tooth. Glossa polystose, paraglossae elongate, membranous, curved inwards. Lacinia strongly setose, with few short hairs at lateral border of apex. Labial palpus narrow, elongate, slightly widened to apex, terminal palpomere slightly shorter than penultimate, very sparsely and shortly pilose. Maxillary palpus large, short and stout, densely setose, terminal palpomere widened at apex. Antenna moderately elongate, surpassing the base of the pronotum by about three antennomeres. Median antennomeres more than 1.5 x as long as wide. Whole antenna densely setose. Dorsal surface very coarsely and rather densely punctate, punctuation rather coriaceous, middle of clypeus impunctate, middle of frons anteriorly more sparsely punctate, frons without glossy areas, punctures anteriorly larger than towards neck. Microreticulation absent. Surface hirsute, hairs elongate, erect, slightly inclined anteriad.

Prothorax (Fig. 6). Large, wide, much wider than long, remarkably cordiform. Apex wide, slightly concave, anterior angles rounded off. Sides evenly convex in anterior two thirds, in posterior half deeply concave. Basal angles acute, far less than rectangular, laterally remarkably projected. Base comparatively narrow, laterally deeply excised. Lateral margin smooth, considerably raised, marginal channel wide and rather deep, explanate. Disk very uneven, median sulcus very deep and wide, even deepened in middle and near apex, median line not attaining apex. Anterior transverse sulcus barely indicated. Basal grooves deep, linear, sulcate, almost straight, attaining or slightly surpassing the middle of pronotum. Lateral margin in anterior half with three to four long, erect setae and with an elongate seta at basal angle. Punctures very coarse, dense, at widest diameter of pronotum about 15 punctures between middle and lateral margin. Punctures much wider than the interspaces between them. Microreticulation absent. Pilosity dense, elongate, hirsute, on disk inclined posteriad, at apical margin erect or slightly inclined anteriad.

Elytra. Rather narrow and elongate, laterally slightly though evenly convex, slightly widened towards apical third. Humerus well projected, rounded. Lateral margin behind humerus barely concave. Apex slightly sinuate. 7th interval markedly raised, tectiform, complete and even near apex barely intersected. Sutural interval barely raised in basal half, well raised in apical half and here even higher than 7th interval. Surface between 7th interval and suture depressed but not concave. Striae coarsely punctate, crenulate. Intervals fairly densely, irregularly biserrately punctate, punctures combined to irregularly transverse sulci. Microreticulation distinct, surface rather dull. Odd intervals with a row of elongate, erect setae. Pilosity dense, elongate, hirsute, much inclined posteriad, almost depressed. Marginal setae numerous, very elongate. Apex of elytra without denser pilosity. Elytra fused together, posterior wings absent.

Lower surface. Densely punctate and pilose. Pilosity on thorax erect, on abdomen much inclined posteriad. Metepisternum quadrate. Sternum VII in male with two, in female with three elongate setae on either side of posterior margin.

Legs. Rather elongate, densely punctate and pilose. 1st - 3rd tarsomeres of male protarsus widened and slightly asymmetrically squamose.

Male genitalia (Fig. 2). Genital ring very narrow and elongate, convexly triangular, almost symmetric, with elongate base and narrow, elongate apex. Aedeagus large, narrow and depressed. Lower surface gently concave in basal four fifth, then convex. Apex moderately elongate, with depressed, but very wide apical knob which is barely angulate at the upper side, but slightly angulate at the lower side. Internal sac with several coiled, but not sclerotized folds. Both parameres rather short with convex apex, apical part of right paramere narrow.

Female gonocoxites (Fig. 3). Gonocoxite 1 elongate, with a single short seta at the upper rim. Gonocoxite 2 comparatively narrow and elongate, regularly curved, with acute apex; with three setae at the lateral margin close to the base, of which the upper two are much more elongate than the lower one; without nematiform setae at the apex. Lateral plate with one very elongate seta at the upper rim, and with about 10 shorter setae.

Variation. Rather little variation noted. In the single female the prothorax is slightly narrower, the marginal sulcus is deeper, and the basal sulci are longer and bear an additional impression at their anterior end.

Distribution

Arnhem Land, northern part of Northern Territory, Australia. Known only from the type locality.

Collecting circumstances

Not recorded, but perhaps collected in pitfall traps.

Relationships

In view of the very cordiform shape of the pronotum and the acute basal angles the species most probably is closely related to *A. demarzi* Baehr from northernmost Northern Territory and *A. heathlandica* sp. n. from northern Cape York Peninsula. In the shape of the aedeagus it is more similar to *A. demarzi*, but has a wider prothorax and considerably shorter elytra than both mentioned species.

Acrogenys curtipennis sp. n.
Figs 4, 7

Examined types

Holotype: ♀, "N.T. O. Price Douglas Daly N.T. PWCNT study Jun 1999" (ANIC).

Etymology

The name refers to the comparatively short elytra.

Diagnosis

Species of subgenus *Acrogenys* s. str. In view of the shape of pronotum and rather short elytra probably most closely related to *A. jabiruensis* Baehr, 2001, *A. kimberleyanus* Baehr, 2008, and *A. sumlini* Baehr, 2001. Distinguished from the three mentioned species by the low 7th interval which ends well in front of the apex and by shorter elytra. Further distinguished from *A. kimberleyanus* and *A. sumlini* by the distinct elytral microreticulation, and from *A. jabiruensis* by lesser body size and even shorter antenna.

Description

Measurements. Length: 10.0 mm; width: 3.3 mm. Ratio width/length of pronotum: 1.11; ratio widest diameter/narrowest diameter of pronotum: 1.77; ratio length/width of elytra: 1.73; ratio length/width of 7th antennomere in female: 1.4.

Colour. Black. Mouth parts, tibiae and tarsi dark piceous, outer antennomeres laterally dark reddish.

Head (Fig. 7). Considerably narrower than the pronotum. Eye large, laterally protruded, orbit more than half as long as eye. Base of head wide. Labrum anteriorly almost straight, smooth. Mandibles short, evenly curved. Mentum with triangular, unidentate tooth. Glossa polysetose, paraglossae elongate, membranous, curved inwards. Lacinia strongly setose, with few short hairs at lateral border of apex. Labial palpus narrow, elongate, slightly widened to apex, terminal palpomere slightly shorter than penultimate, very sparsely and shortly pilose. Maxillary palpus large, short and stout, densely setose, terminal palpomere widened at apex. Antenna moderately elongate, surpassing the base of the pronotum by less than three antennomeres. Median antennomeres slightly < 1.5 x as long as wide. Whole antenna densely setose. Dorsal surface very coarsely but only moderately densely punctate, middle of clypeus impunctate, middle of frons more sparsely punctate, with some small, glossy areas, punctures anteriorly larger than towards neck. Microreticulation absent. Surface hirsute, hairs elongate, erect, slightly inclined anteriad.

Prothorax (Fig. 7). Large, wide, much wider than long, cordiform. Apex wide, slightly concave, anterior angles rounded off. Sides evenly convex in anterior two thirds, in posterior half moderately (in genus) concave. Basal angles acute, slightly less than rectangular, laterally well projected. Base comparatively wide, laterally deeply excised. Lateral margin smooth, slightly raised, marginal channel wide, explanate. Disk very uneven, median sulcus deep and wide, even deepened in middle and near apex, median line not attaining apex. Anterior transverse sulcus distinct though shallow. Basal grooves comparatively shallow, linear, gently sulcate, straight, attaining the middle of pronotum. Lateral margin in anterior half with three to four long, erect setae and with an elongate seta at basal angle. Punctures coarse, very dense, at widest diameter of pronotum more than 15 punctures between middle and lateral margin. Punctures much wider than the interspaces between them. Microreticulation absent. Pilosity dense, elongate, hirsute, on disk inclined posteriad, at apical margin erect or slightly inclined anteriad.

Elytra. Comparatively short and wide (in genus), laterally slightly though evenly convex, very slightly widened towards apical third. Humerus well projected, rounded. Lateral margin behind humerus barely concave. Apex slightly sinuate. 7th interval moderately raised, tectiform, reduced well in front of apex, in apical third rather intersected. Sutural interval barely raised in basal half, well raised in apical half and here even higher than 7th interval. Surface between 7th interval and suture only slightly depressed but not concave. Striae coarsely punctate, crenulate. Intervals fairly densely, irregularly biserrately punctate, punctures here and there combined to irregularly transverse sulci. Microreticulation distinct, surface rather dull. Odd intervals with a row of elongate, erect setae. Pilosity dense, elongate, hirsute, much inclined posteriad, almost depressed. Marginal setae numerous, very elongate. Apex of elytra without denser pilosity. Elytra fused together, posterior wings absent.

Lower surface. Densely punctate and pilose. Pilosity on thorax erect, on abdomen much inclined posteriad. Metepisternum quadrate. Sternum VII in female with 3-4 elongate setae on either side of posterior margin.

Legs. Rather elongate, densely punctate and pilose. Squamosity of male protarsus unknown.

Male genitalia. Unknown.

Female gonocoxites (Fig. 4). Gonocoxite 1 elongate, with a single short seta at the upper rim. Gonocoxite 2 comparatively short and wide, little curved except near apex, with moderately acute apex; with four setae at the lateral margin close to the base of which the upper two are much more elongate than the lower two; with two short nematiform setae near apex. Lateral plate with one very elongate seta at the upper rim, and with about 10 shorter setae.

Variation. Unknown

Distribution

Northern part of Northern Territory, Australia. Known only from the type locality.

Collecting circumstances

Not recorded, but probably collected in pitfall traps.

Relationships

In view of body shape and surface structure of the elytra this species is most similar to *A. jabiruensis* Baehr from far Northern Territory and *A. kimberleyensis* Baehr and *A. sumlini* Baehr from northern parts of Western Australia. However, it differs from the mentioned species by the shorter elytra and the less raised 7th interval. Future knowledge of the male genitalia might further elucidate the relationships.

Recognition

For recognition of the new species comparison of measurements and ratios is recommended, therefore ratios for all species of the subgenus *Acrogenys* s. str. are tabulated below. The key below covers all species of the genus.

Measurements and ratios of the species of the subgenus *Acrogenys* s. str.

N = number of measured specimens; l = body length (in mm); w/l pr = ratio width/length of pronotum; dia pr = ratio widest/narrowest diameter of pronotum; l/w el = ratio length/width of elytra; l/w ant = ratio length/width of 7th antennomere.

	N	l	w/l pr	dia pr	l/w el	l/w ant
<i>arafurae</i>	3	10.4-10.5	1.07-1.09	1.79-1.83	1.82-1.84	1.85-1.9(♂) 1.7(♀)
<i>canaliculatus</i>	1	11.3	1.06	1.88	1.98	2.0(♀)
<i>centralis</i>	5	12.5-13.8	1.08-1.10	1.85-1.90	1.85-1.90	2.2(♀)-2.3(♂)
<i>curtipennis</i>	1	10.0	1.11	1.77	1.73	1.4(♀)
<i>danielsi</i>	2	10.0-10.2	1.05	1.79-1.82	1.82-1.84	1.4(♀)-1.55(♂)
<i>demarzi</i>	3	9.4-10.7	1.02-1.05	1.96-2.02	1.85-1.90	1.5(♀)-1.6(♂)
<i>heathlandica</i>	2	10.0-10.7	1.04-1.05	1.98-2.00	1.88-1.90	1.5(♂)
<i>hirsuta</i>	6	10.5-12.0	1.01-1.08	1.55-1.63	1.80-1.83	1.45-1.5(♀) 1.5-1.6(♂)
<i>jabiruensis</i>	2	11.3-11.4	1.08-1.10	1.75-1.78	1.80-1.82	1.55(♀)-1.65(♂)
<i>kimberleyanus</i>	4	10.4-11.7	1.05-1.09	1.65-1.75	1.77-1.84	1.55-1.6(♂)
<i>laticollis</i>	2	12.1-12.4	1.23-1.26	1.78-1.80	1.68-1.72	1.5(♀)-1.55(♂)
<i>lucai</i>	1	10.3	1.10	1.63	1.79	1.45(♀)
<i>puncticollis</i>	1	10.4	1.06	1.72	1.85	1.6(♀)
<i>sumlini</i>	3	12.3-12.5	1.05-1.11	1.66-1.74	1.83-1.86	1.55(♀)-1.7(♂)

Revised key to the species of the genus *Acrogenys* Macleay

1. 7th interval distinctly carinate, sutural interval raised; pronotum slightly wider than long; male aedeagus with distinct terminal knob. *Acrogenys* s. str.(2)
- 7th interval not carinate, sutural interval not raised; pronotum considerably longer than wide; male aedeagus without distinct terminal knob, only with upturned apex. *Paracrogenys* Baehr. Eastern Queensland
.....*longicollis* Gestro, 1875
2. Pronotum with very acute, almost spiniform basal angle, angle clearly < 90°, prebasal sinuosity very deep (Figs 5, 6)(3)
- Pronotum with less acute, not spiniform basal angle, angle > 90°, prebasal sinuosity less deep (Fig. 7)(7)
3. Elytra very deeply impressed, sutural and 7th intervals remarkably carinate; lateral margin of pronotum irregularly crenulate and suddenly narrowed shortly behind middle; antenna elongate, 7th antennomere > 2 x as long as wide(4)
- Elytra less deeply impressed, at least sutural interval far less carinate; lateral margin of pronotum not irregular, evenly rounded shortly behind middle; antenna shorter, 7th antennomere < 1.9 x as long as wide, usually shorter(5)
4. Size smaller, body 11.3 mm long; elytra extremely narrow and elongate, ratio length/width 1.98; antenna slightly shorter, 7th antennomere c. 2 x as long as wide; intervals of elytra superficially microreticulate.

Interior of north Western Australia (Great Sandy Desert)..... *canaliculatus* Baehr, 2008

- Size larger, body > 12.5 mm long; elytra shorter and wider, ratio length/width < 1.90 ; antenna slightly longer, 7th antennomere > 2.2 x as long as wide; intervals of elytra not microreticulate. Northern South Australia..... *centralis* Baehr, 1992

5. Prothorax narrower, ratio width/length < 1.05 , with deeper lateral excision, ratio widest/narrowest diameter > 1.95 (Fig. 5); elytra very elongate, ratio length/width 1.85-1.90; antenna shorter, 7th antennomere in male < 1.6 x, in female < 1.5 x as long as wide; aedeagus smaller, terminal knob narrower (Fig. 1).....(6)

- Prothorax wider, ratio width/length > 1.07 , with less deep lateral excision, ratio widest/narrowest diameter < 1.85 (Fig. 6); elytra shorter, ratio length/width 1.82-1.84; antenna longer, 7th antennomere in male < 1.85 x, in female > 1.7 x as long as wide; aedeagus large, narrow, elongate, with very wide but depressed terminal knob (Fig. 2). Arafura Swamp, far Northern Territory *arafurae* sp. n.

6. Median line of pronotum very deep and sulcate, lateral sulci very deep and in basal half of pronotum straight; elytra at apex with markedly denser pilosity (best seen from anteriorly and dorsally); microreticulation on intervals rather distinct; aedeagus slender, terminal knob small and depressed (see fig. 9 in Baehr 1984). Humpty Doo, far Northern Territory *demarzi* Baehr, 1984

- Median line of pronotum less deep and sulcate, lateral sulci far less deep and in basal half of pronotum somewhat oblique; elytra at apex without denser pilosity; microreticulation on intervals superficial; aedeagus stout, terminal knob large (Fig. 1). Heathlands, northern Cape York Peninsula, Queensland *heathlandica* sp. n.

7. Pronotum very wide, ratio width/length > 1.20 ; elytra relatively short and wide, ratio l/w < 1.72 ; 7th interval only moderately carinate. Northern parts of Northern Territory and of Western Australia *laticollis* Baehr, 1984

- Pronotum less wide, ratio w/l < 1.12 ; elytra longer and narrower, ratio l/w > 1.73 , usually longer; 7th interval varied.....(8)

8. Pronotum little cordiform, ratio widest/narrowest diameter < 1.63 and 7th interval little raised, surface of elytra between sutural and 7th intervals not depressed or concave(9)

- Pronotum more cordiform, ratio widest/narrowest diameter > 1.65 , usually more; if less than 1.7, 7th interval well raised and surface of elytra between sutural and 7th intervals depressed or even concave...(10)

9. Basal angles of pronotum little produced laterad, angle wide; at widest diameter of pronotum between middle and lateral margin c. 15 coarse punctures, surface of pronotum glossier; surface of elytra rather even, sutural interval little raised. Eastern Queensland, ? northern part of Northern Territory *hirsuta* Macleay, 1864

- Basal angles of pronotum more distinctly produced laterad, angle narrower; at widest diameter of pronotum between middle and lateral margin c. 20 finer punctures, surface of pronotum less glossy; surface of elytra uneven, sutural interval in basal half depressed, then suddenly raised. Gregory NP, north-western Northern Territory *lucai* Baehr, 2001

10. Pronotum laterally deeply sinuate, basal angles rectangular or even acute, ratio widest/narrowest diameter > 1.79 ; sutural and 7th intervals well raised; intervals distinctly microreticulate. Near Weipa, northern Cape York Peninsula, Queensland *danielsi* Baehr, 2008

- Pronotum laterally less deeply sinuate, basal angles wider than rectangular, ratio widest/narrowest diameter < 1.78 , usually less; if more than 1.75, then sutural and 7th intervals little raised; size larger, length > 11 mm. Northern Territory and north-western Australia.....(11)

11. Pronotum with visible microreticulation and very dense punctures, surface less glossy; prebasal sinuation of pronotum less deep, basal angles less produced (see fig. 11 in Baehr 2008). Keep River NP, north-western Northern Territory close to the Western Australian border *puncticollis* Baehr, 2008

- Pronotum without microreticulation and with less dense punctures, surface glossy; prebasal sinuation of pronotum deeper, basal angles more produced (Fig. 7).....(12)

12. Elytra shorter, ratio length/width 1.73; 7th interval less raised, ending well in front of the apex of the elytra; small species, body length 10.0 mm; aedeagus unknown. Douglas Daly River, northern part of Northern Territory *curtipennis* sp. n.

- Elytra longer, ratio length/width > 1.77, usually more; 7th interval more raised, ending shortly in front of the apex of the elytra; larger species, body length > 10.4 mm, usually more. Northern parts of Northern Territory and Western Australia (13)

13. Elytral intervals distinctly microreticulate between punctures, duller; 7th interval slightly less raised; median line and lateral basal sulci of pronotum deeper and distinctly sulcate; ratio widest/narrowest diameter of pronotum 1.75-1.78. Northern part of Northern Territory *jabiruensis* Baehr, 2001

- Elytral intervals superficially microreticulate between punctures, glossier; 7th interval slightly more raised; median line and lateral basal sulci of pronotum shallower and less sulcate; ratio widest/narrowest diameter of pronotum 1.65-1.75. Northern part of Western Australia (14)

14. Body size slightly larger, length > 12.3 mm; elytra slightly longer, ratio l/w 1.84-1.87; aedeagus unknown. South-western margin of Kimberley Division, southern Pilbara *sumlini* Baehr, 2001

- Size slightly smaller, length < 11.7 mm; elytra slightly shorter, ratio l/w 1.77-1.84; aedeagus stout, with large apical knob. Northern and north-eastern Kimberley Division *kimberleyanus* Baehr, 2008

Remarks

Two of the new species (*A. arafurae* and *A. heathlandica*) belong to a group of species which possess an extremely cordate prothorax with almost spiniform basal angles, which character probably is apomorphic in comparison with the shape of the prothorax of the third new species (*A. curtipennis*).

The discovery of another species in Cape York Peninsula is particularly interesting, because from Queensland only two species of the nominate subgenus were recorded so far. Apart from the widespread *A. hirsuta* Macleay, 1864 which probably is the most plesiomorphic species of the nominate subgenus (if plesiomorphic, or apomorphic, are used to describe the degree of distance of a taxon from the base of the group-specific cladogram expressed in the number of dichotomies from the base of the cladogram), only one additional species was described (*A. danielsi* Baehr, 2008), likewise from northern Cape York Peninsula, which is a rather apomorphic species.

With the new species described in the present paper, the genus *Acrogenys* is becoming even more diverse in the number of species which corroborates the opinion that tropical northern Australia is home of surprisingly many species of the carabid tribe Zuphiini. In particular it is the semiarid or at least but moderately wet areas in the far north and north-west which apparently are home of more species than the generally wetter areas in eastern and north-eastern Australia. Because the basal species, in terms of their phylogenetic status, mostly live in eastern Queensland (the single species of the plesiomorphic subgenus *Paracrogenys* Baehr and *Acrogenys hirsuta* Macleay of the nominate subgenus), but the apparently more evolved species occur in the far north, the north-west, and in arid areas of Central and Western Australia, the opinion expressed by Baehr (1992b) about the refugial character of far Northern Territory and the Kimberley Division, less so the Pilbara, in northern and north-western Western Australia, is corroborated also with respect to distribution and relationships of the species of *Acrogenys*.

Certainly the loss of the flight ability has favoured the taxonomic diversification in the genus *Acrogenys*, because the very limited dispersal power of the species account for their apparently very restricted ranges. Unfortunately little has been recorded about the habits of any species: therefore, it is uncertain whether their putative secrete and apparently strictly nocturnal life, e.g. in leaf litter or in the ground, also may have favoured their patchy distribution.

Acknowledgements

My sincere thanks are due to Cate Lemann and Tom Weir, Canberra, for the loan of the specimens and their kind assistance during my recent visit at their institution. I am also indebted to the Deutsche Forschungsgemeinschaft (DFG) for supporting the visit at the ANIC by the grant No. BA 856/11-1.

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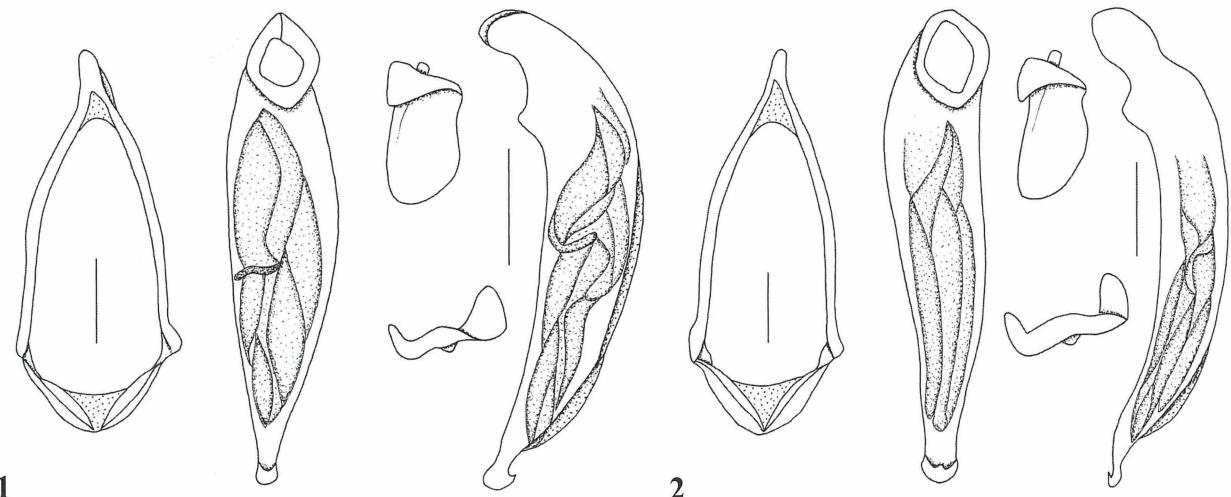
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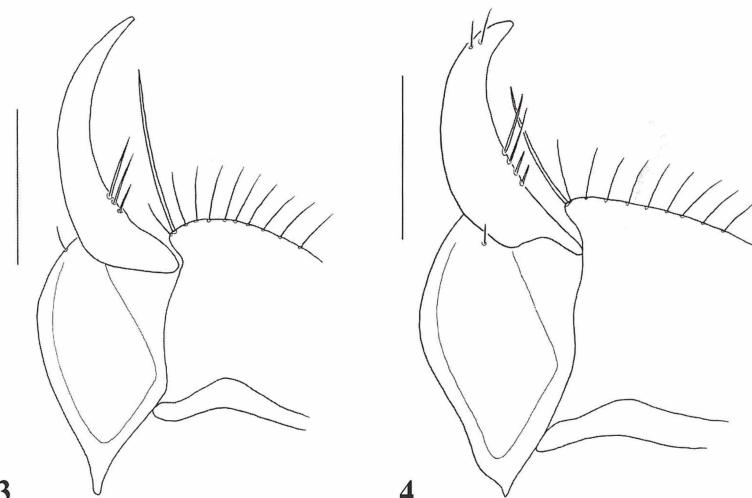
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received: 15.03.2012 ---- accepted: 06.05.2012



Figs 1, 2: Male aedeagus, parameres, and genital ring of *Acrogenys* spp. (scale bars: 0.5 mm). (1) *A. heathlandica* sp. n. (2) *A. arafurae* sp. n.



Figs 3, 4: Female gonocoxites of *Acrogenys* spp. (scale bars: 0.25 mm). (3) *A. arafurae* sp. n. (4) *A. curtipennis* sp. n.



Figs 5-7: Head and pronotum of *Acrogenys* spp. (5) *A. heathlandica* sp. n. (6) *A. arafurae* sp. n. (7) *A. curtipennis* sp. n.

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Artikel/Article: [Three new species of the genus Acrogenys Macleay, 1864 from Australia \(Insecta, Coleoptera, Carabidae, Zuphiini\) 15-24](#)