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Two new species of the genus *Adelotopus* Hope, 1834 from North Queensland, Australia.

15th Supplement to the “Revision of the Pseudomorphae of the Australian Region”

(Coleoptera, Carabidae, Pseudomorhini)

Martin Baehr

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Two new species of the predominantly Australian pseudomorphine genus *Adelotopus* Hope, 1834 are described from North Queensland, Australia: *Adelotopus nigerrimus*, spec. nov. of the *obsoletus* group of the revision (Baehr 1997) and *A. mutchilbae*, spec. nov. of a newly erected *mutchilbae* group. The male genitalia are figured and the species are differentiated from related species.

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Introduction

In spite of the previous revisions and the many supplements which included the majority of the material available in collections when they were written (Baehr 1992, 1997, 2002, 2005, 2008, 2009b, and some papers describing single new species), the pseudomorphine fauna of large parts of interior and far northern Australia is not yet satisfactorily recorded. New species are continuously detected and of a great number of species few or even single specimens were ever recorded, or the species are so far known only from a single locality. This deficiency may be simply due to the large size of the country or the remoteness of many parts of Australia which makes reasonable or even systematic sampling of the fauna almost impossible. Moreover, generally pseudomorphine species can be only sampled using specialized methods, either by use of an umbrella, or by fogging tree trunks because they occur under bark or in deep cracks in the bark of various trees. To get a reasonable overview of the fauna, these methods must be carried out systematically at a

great number of localities, and at an even greater number of trees because pseudomorphae apparently tend to concentrate on single trees, or they occur localized in certain areas. Hence collecting is a specialized and time-consuming task, and seasonality probably renders systematic sampling even more difficult. However, when conditions are favourable and sampling methods and efforts are adequate, a surprising great number and diversity of species can be found on a single tree. This was demonstrated, for example, some years ago on a few large Red River Gums (*Eucalyptus camaldulensis*) in northern Australia, that I tried to collect systematically (Baehr 1990). “Rarity” of a species, therefore, does not automatically mean that it is rare in nature, because this denotation may as well mean “rarely collected” on whatever reasons: e.g. caused by seasonality, or geographically scattered occurrence, or special habitats of the species, or inadequate sampling because of too little collecting efforts, or ineffective or inappropriate sampling methods.

During a recent collecting trip to Cape York Peninsula, North Queensland, I detected a single

specimen of another new species of *Adelotopus*. While working on this and on certain other species collected during that trip, I recognized that a specimen from Lower Cape York Peninsula that I had included in *Adelotopus obsoletus* Baehr, 1997 in the revision (Baehr 1997), actually is different from the few other recorded specimens of that species, but matches well a specimen that I now had collected not far from the locality of that mentioned specimen of *A. obsoletus*. So both specimens are described as belonging to another new species.

Material and methods

Dissecting methods and style and format of the descriptions exactly correspond to those in my revision (Baehr 1997) and the following supplements (Baehr 2002, 2005, 2007, 2008, 2009a,b). Measurements were taken using a stereo microscope with an ocular micrometer. Body length was measured from apex of labrum to apex of elytra. Length of pronotum was measured in middle. Length of elytra was measured from the most advanced part of humerus to the very apex.

In the taxonomic survey standard methods are used. For dissecting the genitalia, the specimens were relaxed overnight in a jar under moist atmosphere, then cleaned for a short while in 10 % KOH. The habitus photographs were obtained by a digital camera using ProgRes CapturePro 2.6 and AutoMontage and subsequently were edited with Corel Photo Paint 14.

The types are shared with Queensland Museum, Brisbane (QMB), and the working collection of the author at Zoologische Staatssammlung, München (CBM).

Genus *Adelotopus* Hope

Adelotopus Hope, 1834: 11 – Baehr 1997: 51.

With about 135 described species *Adelotopus* is the second largest genus of Australian Pseudomorphi. Species of *Adelotopus* are more or less elongate, dorsally rather convex, mostly unicolourous black or reddish-brown, but some bear a pale elytral apex or differently shaped, pale discal spots. The head is short and more or less directed ventrad, so that the mouth parts are barely visible from above, and the wide pronotum and the elytra cover most of the usually rather short legs. The chetotaxy is generally very much reduced, the terminal abdominal sternum does not exhibit striking sexual differences, and the male genitalia generally are rather similarly shaped and structured. The female gonocoxites are also very similar in most species, they are foliaceous and bear a few setae. Through the many reductions distinction of species is difficult and, apart from examination of the genitalia, needs measurements and scrutinized

examination of the few remnants of chetotaxy and of the surface structure, i.e. striation of the elytra, punctuation, and microreticulation.

With respect to the reduced chetotaxy and the unique foliaceous female gonocoxites this genus is apotypic within Pseudomorphi and it shares the ovoviviparous reproduction with all other genera except *Sphallomorpha* Westwood, 1837 and perhaps also *Cryptocephalomorpha* Ritsema, 1875, where it has not been detected due to very rare material, but yet may be present.

The bulk of the species of *Adelotopus* occurs in Australia, few species only were recorded from New Guinea, Solomon Islands, the Moluccas, Java, and southernmost mainland Malaysia. In Australia species of *Adelotopus* occur everywhere, provided some tree growth is present, but apparently not in dense rain forest. Species of this genus are found as well under bark of bark shedding eucalypts as in the cracks of the thick bark of various sorts of trees. The larvae are somewhat physogastric and apparently myrmecophilous, but very few larvae have been detected so far.

Adelotopus nigerrimus, spec. nov.

Figs 1, 3

Types. Holotype: ♂, "Australia, Qld 93/7, Sand Flat Ck., 35 km s. Palmer River, 23.5.1993, M. Baehr / PARATYPE *Adelotopus obsoletus*, sp. nov. det. M. Baehr 1994" (QMB). – Paratype: ♂, "AUS15, QLD45, 5 km sw. Maitland Downs, 125 m 16°14'29.6" S, 144°43'46.5" E 16.5.2015, M. Baehr" (CBM).

Etymology. The name refers to the deep, glossy black colour of the species.

Note. The specimen from Sand Flat Creek originally was included in *A. obsoletus* Baehr, 1997, although it occurs rather north of the other specimens of that species, which are recorded from about Maryborough to Mareeba in eastern, coastal Queensland.

Diagnosis. Species of the *obsoletus* group of the revision because of the narrow labrum, absence of ambulatory setae on the abdomen, and absence of an oblique fold at the apex of the internal sac of the aedeagus. Medium sized, moderately wide and convex, glossy black species, distinguished from the related *A. obsoletus* Baehr by deep black colour, narrower and barely paler lateral margins of pronotum and elytra, slightly longer, apicad more narrowed, and dorsally more convex elytra, far less distinct microreticulation and very fine punctuation of the elytra. The aedeagus is very similar, but the apex is even more sinuate.



Figs 1-2. Habitus. Body lengths in brackets. 1. *Adelotopus nigerrimus*, spec. nov. (5.6 mm). 2. *Adelotopus mutchillbae*, spec. nov. (5.4 mm).

Description

Measurements. Length: 5.5–5.6 mm; width: 2.55–2.6 mm. Ratios. Width/length of pronotum: 1.69–1.78; width base/apex of pronotum: 1.52–1.53; width pronotum/head: 1.60–1.62; length/width of elytra: 1.42; length elytra/pronotum: 2.47–2.58.

Colour (Fig. 1). Glossy black, pronotum and elytra with the lateral margins dark reddish translucent. Palpi dark red with slightly paler apex, antenna and legs piceous. Lower surface black.

Head. Short and wide, moderately depressed. Anterior border gently convex, lateral angle obtusely rounded, laterally slightly projecting, lateral borders distinctly oblique. Clypeal suture very fine, semicircular, in middle interrupted. Labrum very narrow, mostly concealed by the clypeus, apex faintly concave, bisetose. Antennal groove laterally sharply bordered, latero-posteriorly with weakly carinate area. Mental tooth triangular, short, apex acute. Wings of mentum wide, laterally rounded, apex rectangular. Glossa wide, tongue-like, apically convex, ventrally with indistinct keel, at border with

c. 16 elongate setae and additional pilosity on upper and lower surface and along border. Terminal palpomere of maxillary palpus widened apicad, slightly securiform. Terminal palpomere of labial palpus very wide, markedly securiform. Antenna short, 8th–9th antennomeres almost 2× as wide as long. Surface with a shallow sulcus medially of the eye, impilose, with very fine though distinct, isodiametric microreticulation and minute, even at high magnification barely recognizable punctures. Ventro-laterally of the eye with few short setae. Suborbital field impunctate and asetose. Gula apparently asetose.

Pronotum. Moderately wide, dorsally convex, base wide, markedly narrowed to apex. Apical angle moderately produced, at apex obtusely angulate, somewhat oblique, surpassing the posterior margin of the eye. Apex moderately excised, slightly convex in excision, faintly bordered. Lateral margin gently convex, in basal half almost straight. Marginal sulcus narrow, slightly widened apicad. Basal angle obtusely angulate, but rounded at the very tip. Base almost straight, distinctly bordered. Surface near

base without transverse impression. Microreticulation extremely fine and very superficial, barely perceptible, punctuation very fine, on disk barely recognizable, laterally slightly more distinct, surface impilose, glossy.

Elytra. Rather elongate, dorsally convex, regularly narrowed to apex, sides almost straight. Apex rather wide, slightly oblique, and faintly convex, apical angles rounded off. Humerus rounded, basal margin short, slightly oblique. Marginal channel narrow, but visible even near apex. Basal border incomplete, ending about halfway to suture. Lateral border asetose except for some stiff setae at humerus. Series of umbilical pores consisting of 6 regularly set pores behind humerus, and a single pore in apical half. Setae short. Striae not recognizable. Scutellary pore and stria absent. Microreticulation extremely fine and superficial, isodiametric, visible only at very high magnification, punctuation very fine though distinct, rather dense, surface impilose, very glossy.

Lower surface. Prosternal process rather short, fairly wide, straight, gently convex, apex wide and rather short, margin depressed, slightly convex, feebly setose. Metepisternum moderately elongate, c. 1.5× as long as wide, in posterior third obliquely bent and deeply hollowed. Abdominal sterna without ambulatory. Sternum VI without longer setae along apical border. Lower surface finely punctate and sparsely pilose.

Legs. Rather short, 1st tarsomere of protarsus slightly wider than long, tibial groove of profemur deep, anterior plate widely overlapping the groove for apical third, posterior border of groove sharp. Femur wide. Metatibia medium-sized, c. 4.5× as long as wide, 1st tarsomere of metatarsus c. 1.5× as long as wide. Three basal tarsomeres of male protarsus squamose beneath.

Male genitalia (Fig. 3). Genital ring rather wide, convex, fairly asymmetric, with acute apex and slightly asymmetric, narrow, little excised base. Sternum VII rather narrow, apically convex, with deep excision, basally convex, lateral parts short. Aedeagus rather short, wide, depressed, in middle markedly widened, asymmetric. Lower surface straight, not striped. Apex triangular, at tip slightly obtuse, asymmetric, left side near apex deeply sinuate. Orifice elongate, internal sac complexly shaped, with some folds that at their margins are slightly sclerotized, without a distinct oblique fold near apex. Both parameres large, rather parallel-sided, with widely rounded apex, left paramere considerably larger than the right one.

Female genitalia. Not recorded.

Vivipary. Not recorded.

Variation. Some variation noted in relative width of the pronotum, otherwise very similar.

Distribution. Lower Cape York Peninsula, North Queensland.

Collecting circumstances. Both specimens were collected under bark of Red River Gums, near creek beds.

Relationships. This species is very closely related to *A. obsoletus* Baehr and is the northern sister-species of this species.

mutchilbae group

Diagnosis. Medium-sized, dorsally rather convex, black species with red apical two thirds of the elytra. Whole surface with very fine, superficial microreticulation; labrum narrow, mostly concealed, quadrisetose; lateral margin of pronotum narrow, not explanate, basal angle obtusely angulate; basal border line of elytra incomplete, reaching halfway to suture, at end incurved and sinuate; scutellar pore absent; lateral margin of elytra narrow, without elongate setae behind shoulders; series of lateral pores with 6 subhumeral pores only; abdominal sterna with one ambulatory seta; sternum VI without longer setae at apical margin; tibiae, especially metatibia depressed; all femora including profemur wide and depressed; aedeagus narrow and depressed, straight, slightly asymmetric, with widely rounded apex; internal sac without oblique fold near apex but with several laterally rather sclerotized folds, and a finely denticulate fold at apex (in the inverted state).

Larva. Unknown.

Distribution. A single species in north-eastern Queensland.

Systematic position. According to body shape, surface structure, number of marginal elytral setae, and shape of aedeagus, the group is nearest related to the *punctulifer* group of the revision, which however, deviates in colouration of the elytra, chetotaxy of the abdomen, and internal structure of the aedeagus.

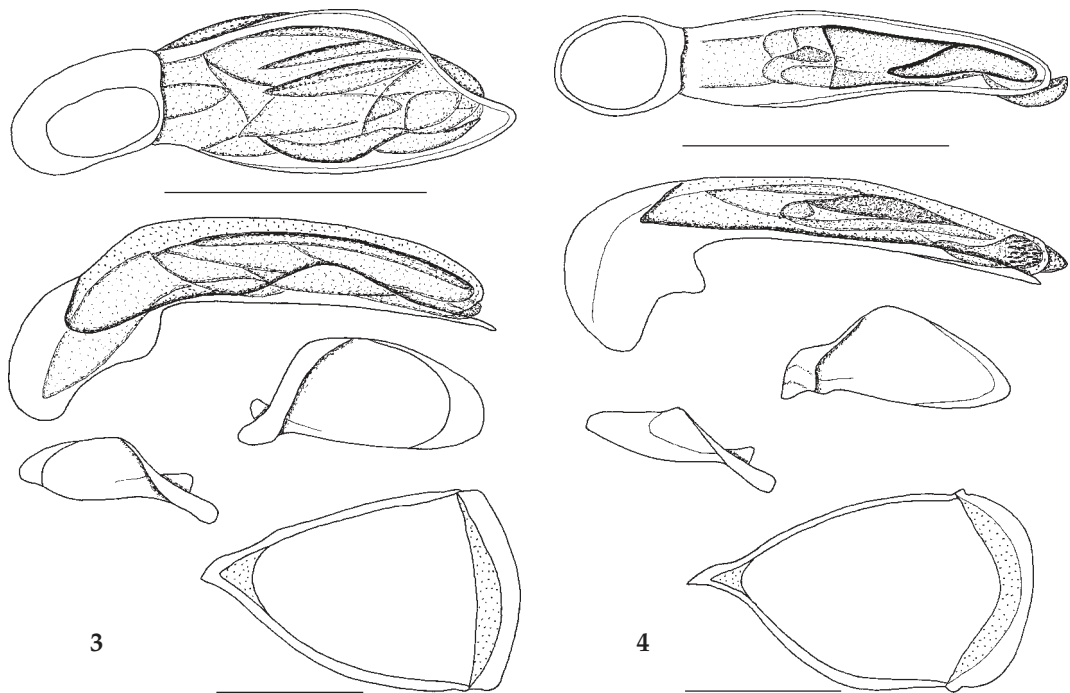
Adelotopus mutchilbae, spec. nov.

Figs 2, 4

Types. Holotype: ♂, "AUS15, QLD4, Walsh R. 1 km e. Mutchilba, 462 m 17°08'21.5"S, 145°13'58.4"E, 12.4.2015, M. Baehr" (QMB).

Etymology. The name refers to the type locality, Mutchilba in north-eastern Queensland.

Diagnosis. As for group. Easily recognized by black colour and the red apical two thirds of the elytra that anteriorly are narrowly bordered black.



Figs. 3–4. Male genitalia. Aedeagus: lower surface, left side, left and right parameres, genital ring. Scale bars: 0.5 mm. 3. *Adelotopus nigerrimus*, spec. nov. 4. *Adelotopus mutchilbae*, spec. nov.

Description

Measurements. Length: 5.4 mm; width: 2.25 mm. Ratios. Width/length of pronotum: 1.68; width base/apex of pronotum: 1.50; width pronotum/head: 1.57; length/width of elytra: 1.64; length elytra/pronotum: 2.72.

Colour (Fig. 2). Glossy black, elytra with large red spot in more than two thirds of the apical part. The anterior border of the spot is almost transverse, in the anterior half the spot is laterally bordered black, in the posterior half it reaches the margin. Lateral margin of pronotum narrowly and indistinctly dull red. Palpi piceous with paler apex, antenna reddish-piceous, legs piceous. Lower surface of head and thorax black, of abdomen dark red.

Head. Short and wide, moderately depressed. Anterior border gently convex, lateral angle obtusely rounded, laterally slightly projecting, lateral borders distinctly oblique. Clypeal suture very fine, semicircular, in middle interrupted. Labrum very narrow, mostly concealed by the clypeus, apex faintly concave, quadrisetose. Antennal groove laterally sharply bordered, latero-posteriorly with weakly carinate area. Mental tooth triangular, short, apex acute. Wings of mentum wide, laterally rounded, apex rectangular. Glossa wide, tongue-like, apically

convex, ventrally with indistinct keel, at border with c. 6 elongate setae and additional pilosity on upper and lower surface and along border. Terminal palpomere of maxillary palpus slightly widened. Terminal palpomere of labial palpus wide, rather securiform. Antenna short, 8th–9th antennomeres almost 2× as wide as long. Surface with a shallow sulcus medially of the eye, impilose, with very fine though distinct, isodiametric microreticulation and minute, even at high magnification barely recognizable punctures. Vento-laterally of the eye with few short setae. Suborbital field impunctate and asetose. Gula apparently asetose.

Pronotum. Moderately wide, dorsally convex, base wide, markedly narrowed to apex. Apical angle moderately produced, at apex obtusely angulate, somewhat oblique, surpassing the posterior margin of the eye. Apex moderately excised, slightly convex in excision, faintly bordered. Lateral margin gently convex, in basal half almost straight. Marginal sulcus very narrow, slightly widened apicad. Basal angle obtusely angulate. Base almost straight, distinctly bordered. Surface near base without transverse impression. Microreticulation extremely superficial and barely perceptible, punctation very fine, on disk barely recognizable, laterally more distinct, surface impilose, glossy.

Elytra. Rather elongate, dorsally convex, regularly narrowed to apex, sides almost straight. Apex rather wide, slightly oblique, and faintly convex, apical angles rounded off. Humerus rounded, basal margin short, slightly oblique. Marginal channel narrow, but visible even near apex. Basal border incomplete, ending about halfway to suture, medial incurved and again redressed towards base. Lateral border asetose except some stiff setae at humerus. Series of umbilical pores consisting of 6 regularly set pores behind humerus, but without postmedian pores. Setae short. Striae not recognizable. Scutellary pore and stria absent. Only extremely superficial traces of isodiametric microreticulation here and there perceptible at very high magnification, punctuation very fine, rather dense, surface impilose, very glossy.

Lower surface. Prosternal process rather short, fairly wide, straight, gently convex, apex wide and rather short, margin depressed, slightly convex, feebly setose. Metepisternum moderately elongate, c. 1.5× as long as wide, in posterior third obliquely bent and deeply hollowed. Abdominal sterna with one short ambulatory seta on either side. Sternum VI without longer setae along apical border. Lower surface finely punctate and sparsely pilose.

Legs. Rather short, 1st tarsomere of protarsus slightly wider than long. Tibial groove of profemur deep, anterior plate widely overlapping the groove for apical third, posterior border of groove sharp. Femur wide. Metatibia medium-sized, c. 4.5× as long as wide, 1st tarsomere of metatarsus c. 1.5× as long as wide. Three basal tarsomeres of male protarsus squamose beneath.

Male genitalia (Fig. 4). Genital ring rather wide, convex, fairly asymmetric, with very acute apex and slightly asymmetric, fairly wide, little excised base. Aedeagus narrow and elongate, depressed, in middle slightly widened, slightly asymmetric. Basal part moderately bent. Lower surface straight, not striped. Apex wide, evenly rounded, rather symmetric. Orifice elongate, internal sac complexly shaped, with some folds that at their margins are rather sclerotized, and with a short, finely denticulate fold at apex (in the inverted state). Both parameres moderately large, rather elongate, convexly triangular, obtusely rounded apex, left paramere considerably larger than right.

Female genitalia. Not recorded.

Vivipary. Not recorded.

Variation. Unknown.

Distribution. North Queensland at the western margin of Atherton Tableland. Known only from type locality.

Collecting circumstances. The holotype was collected under bark of a Red River Gum at the bank of Walsh River.

Relationships. According to a number of special character states, probably nearest related to *A. punctulifer* Baehr, 1997.

Identification

Adelotopus nigerrimus, spec. nov.

For identification the key in the revision (Baehr 1997) leads to couplet 105, which has to be changed as following (figs of the revision as **B97** fig.):

- 105 Surface with microreticulation (at 64). Aedeagus sinuate near apex, apex acute (Fig. 3; **B97** fig. 159g). Gonocoxites, when known, elongate, apex oblique, apical half parallel (**B97** fig. 159l). ce. and ne. Qld. 105a
- Surface without microreticulation (at 64). Aedeagus when known, not sinuate, apex widely rounded (**B97** figs 147g, 148g). Gonocoxites wider, apex not parallel (**B97** figs 147l–149l). 106
- 105a Colour dark piceous to almost black. Lateral margin of pronotum wider and distinctly paler than disk. Elytra apicad less narrowed, dorsally more depressed (**B97** fig. 44), with distinct microreticulation and coarser punctuation. e.Qld north to Atherton Tableland. *obsoletus* Baehr, 1997
- Colour deep black. Lateral margin of pronotum narrower and barely paler than disk. Elytra apicad more narrowed, dorsally more convex (Fig. 1), with faint microreticulation and very fine punctuation. ne. Qld in lower Cape York Peninsula. *nigerrimus*, spec. nov.

Adelotopus mutchilbae, spec. nov.

For identification the key in the revision (Baehr 1997) leads to couplet 44, which has to be changed as following (figs of the revision as **B97** fig.):

- 44 Pronotum and elytra wide, dorsally markedly depressed, ratio w/l of pronotum > 1.90. Aedeagus wide, without oblique spinose band or denticulate fold near apex (**B97** figs 205g,h, 209g,h). 45
- Pronotum and elytra narrower, dorsally less depressed, ratio w/l of pronotum < 1.70. Aedeagus narrow and elongate, either with oblique spinose band or denticulate fold near apex (Fig. 4; **B97** fig. 217g,h). 44a

- 44a Apex of elytra only narrowly red (B97 fig. 63). Aedeagus straight, with oblique spinose band near apex (B97 fig. 217g,h). ne. NSW to ce. Qld. *punctulifer* Baehr, 1997
- Apical two thirds of the elytra red (Fig. 2). Aedeagus slightly sinuate, with denticulate fold at apex (Fig. 4). ne. Qld.
..... *mutchilbae*, spec. nov.

Remarks

As mentioned in the introduction, by careful and systematic sampling additional species may be discovered even in areas that are not too remote and are regarded as reasonably well collected. Thus, since the revisions (Baehr 1992 on *Sphallomorpha* and Baehr 1997 on *Adelotopus*) 19 species of *Sphallomorpha* and 14 species of *Adelotopus* have been added to the then recorded species. Careful collecting in more remote areas of Australia, e.g. in northern parts of Northern Territory and Western Australia, but also in the interior of all states, may yet considerably raise the number of species. The most rewarding areas may be the northern half of the Cape York Peninsula in Queensland, Arnhem Land and surroundings, particularly to the east, in Northern Territory, and the Kimberley Division in far northern Western Australia. However, collecting in these areas is difficult for different reasons: inaccessibility in the wet season, restrictions for the access (as in Arnhem Land), and general remoteness because of few and difficult roads.

Although in the far north the period just before and at the onset of the wet season seems to be the best time for collecting pseudomorphines, seasonality may be also of some importance for sampling results. It would be the duty of Australian explorers to fill the gaps in our knowledge by systematic sampling, in geographical as well as in seasonal sense. This would be particularly desirable because Pseudomorphini are a most important group due to their strange body shape, special habits, and vivipary of most genera. And, moreover, they represent one of the highlights of the Australian fauna.

Both new species seem to represent northern sister species of their southern, more widely distributed relatives, *A. nigerrimus* for *A. obsoletus*, and *A. mutchilbae* for *A. punctulifer*. This may corroborate the suggestion that many pseudomorphine species may possess more restricted areas than believed previously.

Acknowledgement

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