

Mitt. Münch. Ent. Ges.	97	5-9	München, 31.10.2007	ISSN 0340-4943
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## A new genus of cyclosomine carabid beetles from Queensland, Australia

(Insecta, Coleoptera, Carabidae, Cyclosominae)

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### Abstract

*Australomasoreus monteithi*, **gen. n., sp. n.** is described from southeastern Queensland, Australia. It is distinguished from all known cyclosomine genera by being flightless and remarkably small-eyed.

### Introduction

Within material of Australian carabid beetles which I recently sorted out from the University of Queensland Insect Collection, Brisbane (UQIC), a small series of beetles was detected that belong to the carabid subfamily Cyclosominae but do not fit any of the named cyclosomine genera throughout the world. Moreover, the specimens are well distinguished by their reduced flying wings, firmly soldered elytra, and remarkably small eyes when compared with other genera of Cyclosominae. Hence the series is herein described as a new genus and species.

Cyclosomine carabid beetles exhibit quite different body shapes and colour patterns, but are at once recognized by the remarkably elongate apical spurs of their metatibia which usually well exceed half the length of the basal tarsomere. They include about 20 genera (LORENZ 1998, 2005) which are distributed worldwide, but are quite rare in temperate regions. Mainly according to the degree of pilosity of the lacinia Cyclosominae are classified in two subgroups: Masoreini or -ina (according to the rank that is attributed to the tribe respective subtribe) which lack this pilosity and Cyclosomini (-ina) which possess a dense tuft of hairs on the outer margin of the lacinia close to the apex.

According to MOORE et al. (1987) in Australia Cyclosominae are mainly represented by numerous species of the arboricolous (corticolous) genus *Sarothrocrepis* CHAUDOIR, apart from one species each of the genera *Aephnidius* MACLEAY and *Caphora* SCHMIDT-GOEBEL, both species and genera being widespread throughout the Oriental Region, and *Tetragonoderus undatus* DEJEAN which was recently introduced from South America. The genus *Sarothrocrepis* is outstanding within Cyclosominae on behalf of its arboricolous habits which is combined with a vivid colour pattern much alike that of a couple of non-cyclosomine arboricolous carabid genera occurring in Australia. At present the genus is subject of a thorough revision by the author. Hence, Australia possesses a quite outstanding population of cyclosomine beetles which is remarkably different from that of southern Asia, in particular due to the poor representation of genera and the extreme dominance of arboricolous species.

### Methods

For the taxonomic treatment standard methods were used. The male and female genitalia were removed from specimens soaked for a night in a jar under wet atmosphere, then cleaned for a short while in hot KOH.

The habitus photograph was obtained with a digital camera using ProgRes Capture Basic and AutoMontage and subsequently was 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. Measurements of body length, therefore, may slightly differ from those taken by other authors. Length of pronotum was taken from the most advanced part of base to the most advanced part of apex, width of apex of pronotum at the most anteriorly projecting point, width of base at the position of the posterior pronotal seta.

The holotype is preserved in Queensland Museum (QMB), paratypes are shared with UQIC and the working collection of the author in Zoologische Staatssammlung, München (CBM).

***Australomasoreus*, gen. n.**

**Diagnosis.** Genus of subfamily Cylosominae and tribe Masoreini, distinguished from all other genera by comparatively small, barely produced eyes and the reduction of the flying wings which is combined with firm soldering of the elytra.

**Type species.** *Australomasoreus monteithi*, **sp. n.**, by monotypy.

**Etymology.** The genus name refers to the external similarity to the Palearctic genus *Masoreus*, and to the southern occurrence of the new genus.

**Description**

Head narrow; eyes small and little produced, with elongate orbits; two suprorbital setae present, clypeus bisetose, labrum six-setose; mentum with unidentate tooth, bisetose at base of tooth; gula bisetose; glossa elongate, bisetose at apex, paraglossae narrow, elongate, apically separated from glossa, impilose; lacinia elongate, apex curved, acute, median border with a double row of elongate, curved setae, upper external margin near apex without tuft of setae; apical palpomeres of both palpi with sparse, very short pilosity; antenna medium sized, 1<sup>st</sup> and 2<sup>nd</sup> antennomeres not pilose, 3<sup>rd</sup> antennomere sparsely pilose near apex; pronotum laterally rounded, basal angles rounded off; both marginal setae present; prosternal process short, asetose; elytra soldered at suture, without discal setae; striation complete though fine; metepisternum very short; lower surface impunctate and impilose, though abdomen rather coriaceous; sternum VII in males bisetose, in females quadrisetose; median tibial spur of metatibia elongate, more than half as long as basal tarsomere; tarsomeres 2-4 of protarsus slightly asymmetric in both sexes, in males three basal tarsomeres widened and biserially squamose; tarsomeres 4 of all legs not bilobate; tarsomeres 5 asetose at lower surface; claws not denticulate; male aedeagus wide and depressed, strongly sclerotized, remarkably curved down, with wide, depressed, spatulate apex; internal sac symmetrical on upper surface, with rather simple folding and an elongate, slightly denticulate, sclerotized rod within; female stylomeres devoid of any setae, stylomere 2 elongate, falciform.

**Distribution.** So far known only from a single species and from the type locality of the species in south-eastern Queensland, Australia.

***Australomasoreus monteithi*, sp. n.**

(Figs 1-4)

**Types. Holotype:** ♂, Forest Station, 2,000' Bulburin State Forest via Many Peaks, Qld. 12-15.iv.1974 G. B. Monteith / UQIC Reg. #90482 (QMT123808).

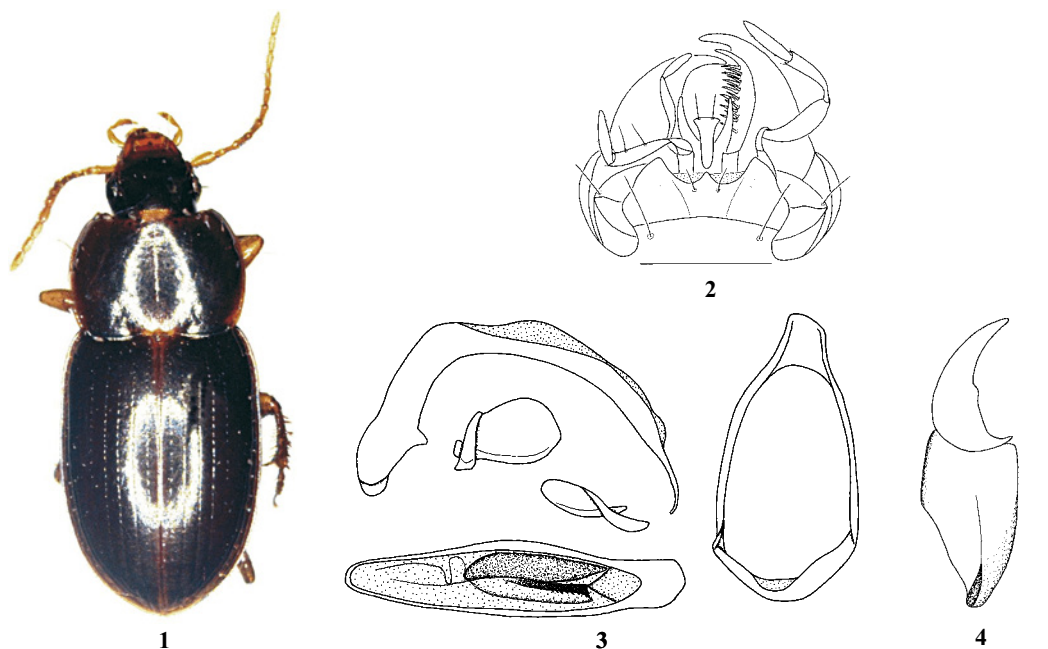
**Paratypes:** 3 ♂♂, 2 ♀♀, same locality and collector but 2-5.iv.1972 (UQIC Reg. #90483-7; 1 paratype in CBM).

**Diagnosis.** As for genus.

**Description**

Measurements. Length: 4.75-5.15 mm; width: 1.85-2.10 mm. Ratios: width/length of pronotum: 1.27-1.33; width base/apex of pronotum: 1.32-1.38; width pronotum/head: 1.82-1.90; length/width of elytra: 1.40-1.45.

Colouration (Fig. 1). Reddish-piceous to piceous, according to age. Lateral margins of pronotum and elytra, and suture of elytra very narrowly and more or less distinctly light reddish. Clypeus reddish, labrum, mandibles, palpi, and antennae light reddish, only apex of mandibles dark. Lower surface reddish. Legs yellow though anterior surface of tibiae slightly darker.



**Figs 1-4** *Australomasoreus monteithi*, sp. n.: **1.** Habitus. Total length: 5.0 mm. **2.** Lower surface of head. Scale: 0.5 mm. **3.** Male genitalia: aedeagus, left side and upper surface; parameres; genital ring. Scales: 0.5 mm. **4.** Female stylomeres 1 and 2. Scale: 0.1 mm.

Head (Figs 1, 2). Narrow, little wider than half of width of pronotum. Eyes remarkably small and laterally little projecting, orbits almost as long as eyes, oblique. Both supraorbital setae situated close together, near posterior half of eye, setae elongate. Apical margin of labrum straight. Mandibles short, scrobe at base not deeply hollowed. Mentum with a triangular tooth, bisetose, lateral plates of mentum acute at apex. Gula bisetose, setae elongate. Glossa slightly widened towards apex, bisetose, paraglossae hyaline, narrow, elongate, impilose, apically free and much surpassing glossa. Palpi elongate, apical palpomeres narrowed towards apex, though the very tip slightly transverse. Penultimate palpomere of labial palpus bisetose. Apical palpomeres sparsely and very shortly pilose. Antenna medium sized, three preapical antennomeres c. 1.5 x as long as wide. Two basal antennomeres impilose, antennomere 3 with some pilosity at apex. Surface of head without any sulci or wrinkles, extremely sparsely punctate, with extremely fine, highly superficial, slightly transverse microreticulation, glossy.

Pronotum (Fig. 1). Large and wide, dorsal surface rather convex, in particular towards the lateral parts of apex. Apex deeply excised, apical angles far produced but widely rounded off at tip. Lateral margin evenly convex to the evenly rounded basal angles, base in middle gently concave. Pronotum widest about in middle. Apex not margined, base narrowly margined except in middle, lateral margin very narrow, even narrower in apical half, without any lateral sulcus. Median line gently impressed, neither reaching apex nor base. No transverse impressions present. Anterior marginal seta situated at apical third, slightly removed from margin. Posterior marginal seta situated on margin in middle of the basal marginal curvature. Both setae elongate. Surface almost devoid of any wrinkles, extremely sparsely punctate, with extremely fine, highly superficial, slightly transverse microreticulation, glossy.

Elytra (Fig. 1). Moderately elongate, laterally almost parallel, dorsal surface moderately convex. Both elytra firmly soldered along suture. Humeri obtusely angulate but without any tooth. Basal margin stout, attaining the scutellum. Lateral margin in middle almost straight to very gently convex, evenly convex to apex which is faintly obtuse. Striation complete, striae consisting of gently impressed, slightly elongate punctures, hence striae somewhat crenulate. Intervals depressed. Scutellar stria absent, scutellar pore and seta situated at origin of stria 2. Discal punctures and setae absent. 15-17 umbilical pores and setae present, series

little interrupted in middle, setae of markedly different length, some very elongate. At apex of stria 7 with two additional pores and short setae. Surface with sparse and extremely fine punctures, microreticulation fine, superficial, consisting of irregularly transverse meshes, surface glossy.

Lower surface. Impunctate and impilose, but metepisternum and abdominal sterna laterally with very rugose, even coriaceous microreticulation. Prosternal process short, asetose. Metepisternum very short, considerably shorter than long. Abdominal sterna bisetose. Sternum VII in males bisetose, in females quadrisetose.

Legs. Of moderate size. Adhesive hairs on male protarsus elongate, biseriate. Claws large, not denticulate.

Male genitalia (Fig. 3). Genital ring triangular, rather symmetric, with low base and narrow, obtusely triangular apex. Aedeagus fairly elongate though wide in apical half; markedly depressed and with sharp lateral edges, slightly sinuate, almost semicircularly bent. Lower surface extremely concave in apical half, the tip of the apex again slightly bent down. Apex very wide, remarkably depressed, broadly spatulate, apical margin rounded or more or less convexly transverse. Orificium elongate, almost symmetrically situated on upper surface, with rather simple folding and with an elongate, apically increasingly sclerotized and finely denticulate rod that at apex is slightly turned left. Parameres very dissimilar in size, left one large, rather short, with convex, in middle slightly angulate apex. Right paramere narrower, with convex apex.

Female stylomere (Fig. 4). Small, stylomere 1 without any setae at apex. Stylomere 2 falciform, with acute apex, without any ensiform or nematiform setae.

Variation. Very little variation noted.

**Distribution.** Eastern central Queensland. Known only from type locality.

**Collecting circumstances.** Not specified, but according to the collector, G. MONTEITH, the beetles must have been collected on the ground in subtropical rain forest while digging for large carabid beetles of the pterostichine genus *Nurus* MOTSCHULSKY.

**Etymology.** The name honours the collector of this and of a multitude of other peculiar carabid beetles from Queensland, Dr. G. B. MONTEITH of Queensland Museum.

## Remarks

According to the structure of the lacinia and to general body form and structure, the new genus belongs in the tribe (or subtribe) Masoreini (-ina) within Cyclosominae in the sense of LORENZ (1998, 2005). Apart from the small head and eyes, in body shape it is quite similar to certain other masoreine genera, e.g. *Masoreus* DEJEAN or *Aephnidius* MACLEAY, although it differs in a number of additional characters of external morphology. Certainly, within Masoreini *Australomasoreus* is outstanding in many ways, of which the loss of flying ability and the exceptionally small eyes are most conspicuous. These peculiarities, as well as the very peculiar shape of the male aedeagus, obscure the relationships of the new genus which may be nearest related to the Old World tropical genus *Aephnidius* MACLEAY, but without showing any clear affinities.

Both, the loss of flying ability and the small eyes suggest a rather hidden way of life in ground litter or even in the soil, in closed forest. The information kindly given by Geoff MONTEITH, the collector of the series, corroborates this opinion, because the specimens most probably have been either dug out from the uppermost soil stratum or were more accidentally sampled from leaf litter during digging for large carabid beetles of the pterostichine genus *Nurus* MOTSCHULSKY which inhabit shallow burrows in the soil. The habitat where the type series was sampled is a subtropical rain forest at about 700 m altitude in south-eastern Queensland which is renowned for a number of endemic species and for representing one of the most southerly areas where some northern tropical faunal elements occur which generally are known mainly from North Queensland.

As mentioned in the introduction, the occurrence of this peculiar new genus, as well as the very high diversity of the arboricolous species of the genus *Sarothrocrepis*, render the Australian cyclosomine fauna outstanding as compared with the cyclosomine faunas of South Asia and Africa. At the same time, in Australia cyclosomine genera are poorly represented, but the number of species of the genus *Sarothrocrepis* (including the many new ones which have been detected in the course of the forthcoming revision) is very high and at least equals the numbers of species recorded from the other (much larger) continents. In addition, the ecological preferences of the Australian cyclosomines are much more unbalanced than those of the

Cyclosominae in other continents, namely by virtue of the occurrence of almost exclusively arboricolous species in addition to this one peculiar soil-inhabiting species, whereas the many “normal” ground-living species of the many widespread genera (e.g. *Aephnidius* MACLEAY, *Anaulacus* MACLEAY, *Mnuphorus* CHAUDOIR, *Cyclosomus* LATREILLE, *Cyclicus* JEANNEL, and *Tetragonoderus* s.l. DEJEAN) are not or extremely sparsely represented. This deficiency, on the one hand, and the specialized habits of almost all Australian cyclosomines, on the other hand, rather obscure the biogeographical history of this group in Australia.

Both other Australian cyclosomine species (excluding the recently introduced South American *Tetragonoderus undatus* DEJEAN), namely *Aephnidius adeloides* MACLEAY and *Caphora humilis* SCHMIDT-GOEBEL, certainly are fairly recent immigrants into Australia which have reached the continent not before Australia came in contact with the South Asian insular belt, in late Miocene. Much more probably, however, they immigrated considerably later, because both species are very widely distributed in the Oriental Region and do not show any taxonomical differentiation in Australia. For these reasons two main questions must be asked:

1. Why do so few cyclosomine species of clear Oriental origin occur in Australia?
2. Where did the the peculiar genera *Sarothrocrepis* and *Australomasoreus* originate, respectively, where did they come from?

As mentioned above, both questions are still open, mainly because no phylogenetical survey has been attempted so far for the cyclosomine complex and, moreover, because both mentioned genera are highly apomorphic in many respects and seem to occupy utmost degrees of morphological and ecological evolution. Although for the genus *Sarothrocrepis*, of which few species of one species group occur outside of Australia as far north as the Philippine and Greater Sunda Islands, a taxonomical and phylogenetical survey is being worked, no final conclusion at present is possible. But for *Australomasoreus monteithi* the situation is even worse, because no “missing link” between this highly evolved species and any putative relatives is known at present and the morphological differences between this and any other known masoreine genera still are remarkable.

### Acknowledgements

I am most grateful to Greg DANIELS of University of Queensland Insect Collection, Brisbane, for the kind loan of the series, and to Geoff MONTEITH of Queensland Museum, Brisbane, for information about the sampling site and collecting circumstances.

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Jahr/Year: 2007

Band/Volume: [097](#)

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

Artikel/Article: [A new genus of cyclosomine carabid beetles from Queensland, Australia \(Insecta, Coleoptera, Carabidae, Cyclosominiinae\). 5-9](#)