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First record of the Oriental ground beetle genus *Chydaeus* Chaudoir from Australia

(Insecta, Coleoptera, Carabidae, Harpalinae)

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Chydaeus queenslandicus, spec. nov. is described from Atherton Tableland, North Queensland. The species differs from both New Guinean species of *Chydaeus* by its impunctate surface, rather deep striation of the elytra, and presence of wings. It is the first record from Australia of this predominantly Oriental genus and altogether an additional example for the recent immigration of Oriental faunal elements into northeastern Australia.

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Introduction

In the course of sorting, revising, and rearranging Australian carabid beetles captured by the author during several collecting trips in Australia, a harpaline specimen was re-examined that had been left unidentified previously, because it did not seem to belong to anyone of the harpaline genera known to occur in Australia. As the result of ample identification work on Oriental and New Guinean ground beetles this specimen now turned out to belong to the predominantly Oriental genus *Chydaeus* Chaudoir which is widely distributed in the Oriental region and likewise occurs in New Guinea. By comparison with several Oriental species and also with both species recorded from New Guinea (Darlington 1968, 1971) the Australian specimen proved to belong to an yet undescribed species. Although it is a single female, it is described herein, as it represents the first record for this genus from Australia, and it is *per se* interesting enough, because it is another example of an immigration event into Australia of a decidedly Oriental stock.

Methods

For the taxonomic treatment standard methods are used. The female stylomeres were removed, after the specimen was soaked for a night in a jar under wet atmosphere, then cleaned for a short while in hot KOH.

Measurements were taken using a stereo microscope with an ocular micrometer. Length has been measured from apex of labrum to apex of elytra. Lengths, therefore, may slightly differ from those of other authors. Length of pronotum was measured along midline, width of apex of pronotum at the most projecting part of the apical angles, width of base of pronotum at the extreme tips of the basal angles.

The habitus photograph was obtained by a digital camera using SPOT Advanced for Windows 3.5 and subsequently was worked with Corel Photo Paint 10.

Chydaeus queenslandicus, spec. nov.

Fig. 1

Examined types. Holotype: ♀, Australien, Qld, Atherton Tbl. The Crater, 20.8.1972, M. Baehr (Working collection of the author in Zoologische Staatssammlung, München).



Fig. 1. *Chydaeus queenslandicus*, spec. nov. Habitus. Length: 11.3 mm.

Diagnosis. Distinguished from both New Guinean species *Chydaeus papua* Darlington and *C. himnus* Darlington by presence of flying wings, further on by absence of any puncturation on the surface (except on the lateral margins of pronotum), deep striation of the elytra, and larger size which difference in particular applies to the second New Guinean species.

Description

Measurements. Length: 11.3 mm, width: 4.2 mm. **Ratios.** Length/width of pronotum: 1.49; width of base/width of apex of pronotum: 1.20; width of head/width of pronotum: 1.31; length/width of elytra: 1.52; width of elytra/width of pronotum: 1.27

Colour. Upper surface uniformly black, lower surface black to dark piceous. Labrum with narrow reddish margin, mandibles black, palpi piceous with light apex, three basal antennomeres black, rest piceous with light margins. Legs piceous, tarsi slightly lighter.

Head. Of average size, eyes laterally considerably projecting, though orbits large, obliquely convex. Clypeus wide and short, bisetose, with a trans-

verse impression shortly behind apex. Mandibles very stout, apex wide, obtuse. Glossa elongate, narrow, bisetose, paraglossae free, surpassing glossa. Mentum with triangular tooth, bisetose behind the tooth. Gula bisetose, setae very elongate. Antenna attaining base of pronotum, pilose from middle of 3rd antennomere. Frons with a well developed linear, transverse furrow, frontal furrows linear, short, ending halfway to eyes. Surface of head impunctate, almost completely glossy, only extremely fine and highly superficial traces of microreticulation visible under high magnification. Clypeus with superficial, irregular puncturation, surface rugose.

Prothorax. Wide, heart-shaped, widest slightly in front of middle, disk rather convex. Apex straight, rather deeply excised, anterior angles protruding, with rounded apex. Lateral margin in anterior two thirds very convex, posteriorly gently concave. Base almost straight, laterally slightly oblique, basal angles almost rectangular though obtuse at tip. Apex not margined, base margined, though margin very weak in middle. Lateral border prominent, raised throughout, marginal channel narrow anteriorly, explanate towards apex. Median line shallow, linear, not attaining base. Anterior transverse sulcus very shallow, v-shaped, basal transverse sulcus absent. Basal grooves irregularly linear, base on either side with two shallow, obtuse, longitudinal ridges. Posterior marginal seta absent, anterior marginal pore and seta situated at widest part of pronotum, well removed from lateral margin. Disk impunctate, with extremely fine and highly superficial traces of microreticulation that is visible under very high magnification only. Marginal channel and basal explanation coarsely and somewhat irregularly punctate. Disk very glossy.

Elytra. Of average size, laterally little convex, dorsally rather convex. Humeri wide, subdentate. Marginal channel narrow. Apex rounded, laterally moderately excised. Striae well impressed, impunctate, intervals convex. Scutellar stria elongate, posteriorly united with sutural stria. Scutellar pore and seta present, at base of scutellar stria. Disk without any fixed seta. Marginal series consisting of 8 anterior and 10 posterior setae that are separated by a wide space. Intervals barely punctate, punctures extremely fine and visible only at very high magnification and under inclined illumination, and with very fine, superficial microreticulation consisting of very dense, transverse lines. Surface quite glossy. Wings fully developed.

Lower surface. Lower parts of thorax with sparse, rather coarse puncturation; prosternum, metasternum, and base of abdomen in middle with very short pilosity. Abdomen impunctate and impilose. Metepisternum elongate, slightly more than

twice as long as wide. Terminal sternum in female quadrisetose.

Legs. Of average size. Squamosity of male protarsus unknown.

Male genitalia. Unknown.

Female genitalia. Stylomere 2 of average size, moderately elongate, slightly curved, with two elongate dorsal nematiform setae arising from a groove near apex. Stylomere 1 without any spines or setae at apical margin.

Variation. Unknown.

Distribution. Atherton Tableland, northeastern Queensland. Known only from type locality.

Collecting circumstances. Collected under a log in montane rain forest, at an altitude of about 1000 m.

Etymology. The name refers to the range in northern Queensland.

Remarks

The harpaline genus *Chydaeus* includes about 25 species, most of which occur on the Asiatic mainland from the Nepalese Himalayas in the west to mountains in eastern China and in Japan in the east. Some species inhabit the Indonesian and Philippine islands, and two species even occur in New Guinea. Almost all species are mountain-living and many occur at very high altitudes, even above tree-line. Many species, therefore, have lost their wings, but those species that still are winged and are able to fly demonstrate that the genus probably has achieved its wide range chiefly by mountain or island hopping of originally winged species which, once arrived at their present range, subsequently became wingless. This applies for both New Guinean species that have lost their wings and possess only scale-like remnants, but not for the new Australian species which still possesses wings that are but slightly shortened. However, I doubt, whether *C. queenslandicus* is still able to fly.

As no phylogenetic study of the genus *Chydaeus* is available, the relationships of the new Australian species are difficult to determine, the more, because in this genus the majority of the species is quite similar, at least with respect to external morphology. Unfortunately, the male genitalia of the single Australian species are unknown so far, which could give a better clue to its relationships. Certainly, the new species differs considerably from both New Guinean species, but this does neither exclude, nor advocate any close relationship. Thus, at the present state of knowledge, it can be only stated that North Queensland has been colonized by a single species

of a prevalent Oriental genus; further on that this species is still winged which may indicate a rather recent immigration; and finally that it is a montane species in Australia, similar to its congeners in other countries.

Darlington (1971) was the first to discover that northeastern Queensland is an area of interchange between an older Australian fauna of southern origin that was originally adapted to rather cool conditions, and a younger Oriental fauna of northern origin. The latter immigrated into Australia since about late Miocene, when the Australian block came first in contact with the Asian insular belt. This Oriental fauna, therefore, is of tropic origin and, in Australia, it is predominantly a warm preferent one that mainly occurs in the lowland rain forests of eastern, in particular northeastern Australia (Baehr 2003a). During the last decades, when more and more northern intruders, but also a multitude of southern elements were detected in the Queensland rain forests, this interchange more and more turned out to represent the main determinant of the faunal conditions and the biogeographic history in this area.

As Baehr (2001, 2003a, 2003b) pointed out, these two faunas do not compete much, because the Australian ('Bassian') faunal element generally occurs on the cooler mountain tops and tablelands of northeastern Queensland, whereas the Oriental ('Torresian') element mainly is restricted to the warmer lowlands. The newly detected species of *Chydaeus*, however, does not correspond to this rule, as do not certain other harpaline species of Oriental origin that occur in montane areas of north Queensland, e.g. from the genera *Coleolissus* Bates (Moore et al. 1987) and *Trichotichnus* Morawitz (Baehr 1983, 1985, 1990, 1997). However, in all these harpaline species competition with sympatric or even syntopic 'Bassian' species probably is reduced, because they apparently are herbivorous seed- or fruit-eaters (Paarmann, pers. comm.) which is an uncommon feeding habit for any Australian rain forest dwelling ground beetles.

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