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Two new Australian species of the genus *Hexagonia* Kirby, first record of the tribe Hexagoniini from Australia

(Coleoptera, Carabidae)

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Two new species of the carabid genus *Hexagonia* Kirby, 1825 are described from northern Australia: *H. queenslandica* spec. nov. from North Queensland and *H. bilyi* spec. nov. from far Northern Territory. These new species represent the first published records of the genus *Hexagonia* and, at the same time, of the tribe Hexagoniini from Australia. A key to the New Guinean and Australian species of the genus *Hexagonia* is provided.

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Introduction

The small carabid tribe Hexagoniini includes three genera with together about 65 species (Lorenz 1998, 2005) which are distributed through tropical and subtropical parts of Africa, Madagascar, and southern Asia including Japan and the Philippine and Indonesian island belts, and in the south to New Guinea. So far, however, the tribe was not recorded, or at least published, from Australia, although Darlington (1968) mentioned an undescribed species from north Queensland. Of the three genera, the largest one, *Hexagonia* Kirby, 1825, occurs throughout the range of the subfamily, whereas *Dinopelma* Bates, 1889 occurs in tropical Asia, and *Omphreoides* Fairmaire, 1896 is endemic to Madagascar. Some authors regard Hexagoniini as separate tribe, others include it in Ctenodactylini (e. g. Lorenz 2005), but this is a matter of opinion. At any rate, both tribes most probably are closely related.

Species of Hexagoniini are easily recognized by their depressed body, large head commonly bearing cheek-like orbits which are most strongly developed in the Madagassian genus *Omphreoides*, elongate mandibles, elongate, depressed, and rather parallel-sided elytra with evenly rounded apex, and the wide, pad-shaped tarsi. The most distinctive character of Hexagoniini, however, is the movable apical part of the lacinia. The species of *Hexagonia* either are completely black, but more often yellow or reddish with a more or less extended black apical part of the elytra.

The body shape and the structure of their tarsi match well the ecological requirements, because those species of *Hexagonia* of which the habits are known, live on low grassy or reedy vegetation near water and apparently hide in the crevices between the stalk and the narrow leaves. Darlington (1968) says that the species are diurnal, because they rarely fly to the light, but this statement should be verified by direct observations. Nothing else is known about their habits, life history, and diet.

Material and methods

For the taxonomic treatment standard methods were 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 KOH.

For examination of the surface structures a high-resolution stereo microscope with up to 100× magnification was used, supported by a lamp of high intensity

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giving natural light that could be focussed. The habitus photographs were obtained with a digital camera using ProgRes CapturePro 2.6 and AutoMontage and subsequently were edited 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. Length of pronotum was measured along midline. Length of elytra was taken from the most advanced part of the humerus to the very apex of the elytra.

In the reproduction of the label data " / " denotes a new label, a longer space (" ") denotes a new line.

Abbreviations

ANIC Australian National Insect Collection, Canberra, Australia
CBM Working collection M. Baehr in Zoologische Staatssammlung, München, Germany
QM Queensland Museum, Brisbane, Australia
UQIC University of Queensland Insect Collection, Brisbane (now incorporated in Queensland Museum), Australia

Taxonomy

Genus *Hexagonia* Kirby

Kirby, 1825: 563. – Csiki 1932: 1506; Darlington 1968: 202; 1971: 331; Lorenz 1998: 372; Hurka 2003: 407.

Type species: *Hexagonia terminata* Kirby, 1825, by monotypy.

Diagnosis. The genus is characterized by the depressed overall shape, elongate, very depressed elytra with markedly oblique humeri, wide head usually with a cheek-like orbit and a narrow neck which is well separated from the head, elongate mandibles, the movable apical part of the lacinia, rather short legs with very short and wide, pad-like tarsi composed of triangular tarsomeres, very deeply lobate 4th tarsomeres, and glabrous tarsal claws.

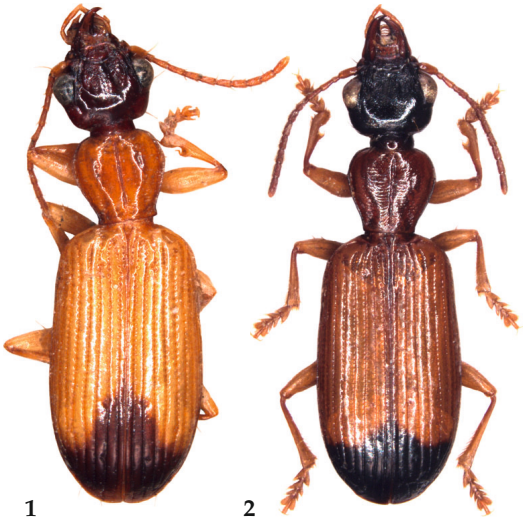
The elytra usually are either unicolourous black or dark piceous, either yellow or red with the apex more or less widely black.

Hexagonia queenslandica spec. nov.

Figs 1, 3, 5, 6

Types. Holotype: ♂, Tully Aug 55 A. J. Cowan / UQIC Reg. #90360 (QMT). – Paratype: 1♀, same data (CBM).

Etymology. The name refers to the occurrence of this species in North Queensland.



Figs 1, 2. Habitus (body size in brackets). **1.** *Hexagonia queenslandica* spec. nov. (7.0 mm). **2.** *H. bilyi* spec. nov. (7.3 mm).

Diagnosis. A small species with wide head and markedly cheek-like orbits; the dark apical spot on the elytra in middle considerably prolonged anteriad. Best distinguished from the second Australian species *H. bilyi* spec. nov. by the smooth head and pronotum, not microreticulate elytra, coarse punctation of the elytral striae, the apical elytral spot which is much more prolonged anteriad, and in the female by larger, narrower, less curved, and more densely setose gonocoxite 2.

Description

Measurements and ratios. Body length: 6.6–7.0 mm; width: 2.15–2.2 mm. Width/length of pronotum: 1.04–1.06; widest diameter/width of base of pronotum: 1.57–1.58; width head/pronotum: 1.09; length/width of elytra: 1.86–1.88.

Colour (Fig. 1). Both specimens perhaps not fully coloured. Head and dark parts of elytra reddish-brown, pronotum and most of elytra pale yellow. The dark part of the elytra markedly prolonged in middle along the three median striae, also laterally slightly prolonged. Mandibles reddish, palpi, antenna, and legs yellow. Lower surface pale yellow.

Head (Fig. 3). Wide and depressed, wider than the prothorax. Eye large and markedly protruded, orbit about as long as the eye, rather cheek-like, oblique and straight, not convex, slightly narrowed towards the neck, posterior border almost perpendicular; neck laterally and dorsally very deeply incised. Mandibles elongate, straight in basal two thirds, incurved

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Figs 3, 4. Head and prothorax. **3.** *Hexagonia queenslandica* spec. nov. **4.** *H. bilyi* spec. nov.

towards apex. Palpi elongate, narrowed towards apex, impilose. Mentum with triangular tooth, bisetose. Glossa at apex excised, bisetose, paraglossae far surpassing glossa. Antenna elongate, attaining the base of the pronotum; three basal antennomeres and basal half of 4th antennomere glabrous. Clypeal suture deeply impressed, clypeus straight at apex, labrum slightly emarginate. Frons with two irregularly shaped, shallow impressions which both bear two circular impressions within. Behind eye a shallow, oblique sulcus with the posterior supraorbital seta located at its end far behind the posterior margin of the eye. Surface with extremely fine, sparse punctures which are visible only at high magnification, without microreticulation, very glossy.

Pronotum (Fig. 3). Narrower than the head, somewhat oval-shaped, widest at apical third; dorsal surface rather depressed. Apex in middle almost straight, laterally oblique, apical angles completely rounded off. Lateral margins evenly curved, immediately in front of base slightly excised; base straight, basal angles rectangular and slightly produced laterad. Median line deep, irregularly crenulate, almost attaining apex and base; both transverse sulci barely indicated. Basal grooves shallow, irregularly longitudinal and irregularly punctate and transversely sulcate. Apex and base not margined, lateral borders narrowly margined, marginal sulcus very narrow throughout. Anterior lateral seta situated at widest diameter, posterior lateral seta absent. Dorsal surface with some irregular transverse sulci, with sparse, irregular punctures, without microreticulation, very glossy.

Elytra (Fig. 1). Elongate, markedly depressed, slightly widened towards apex. Base oblique, humeri rounded; lateral margins straight but slightly oblique, in apical fourth regularly convex towards suture. Basal margin ended at position of 4th stria. Scutellary stria situated in 1st interval, short, consisting of about 5 coarse, deeply impressed punctures. All striae, including 7th and 8th, deeply impressed and coarsely punctate. Intervals depressed. Scutellary seta situated at origin of 1st stria. 3rd interval bipunctate, the anterior puncture and seta situated close to apex and near the 3rd stria, the posterior one situated at apical two thirds, near the 2nd stria.

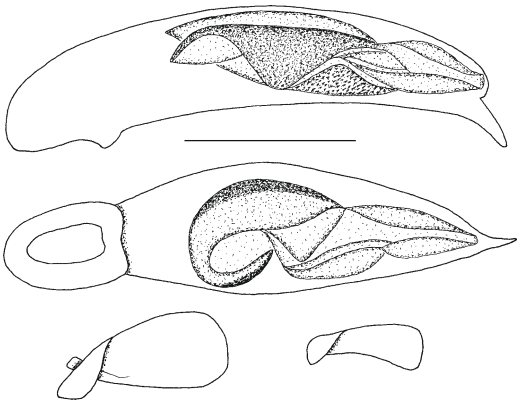

Fig. 5. *Hexagonia queenslandica* spec. nov. Male genitalia: aedeagus, left side, left and right parameres. Scale bar: 0.5 mm.

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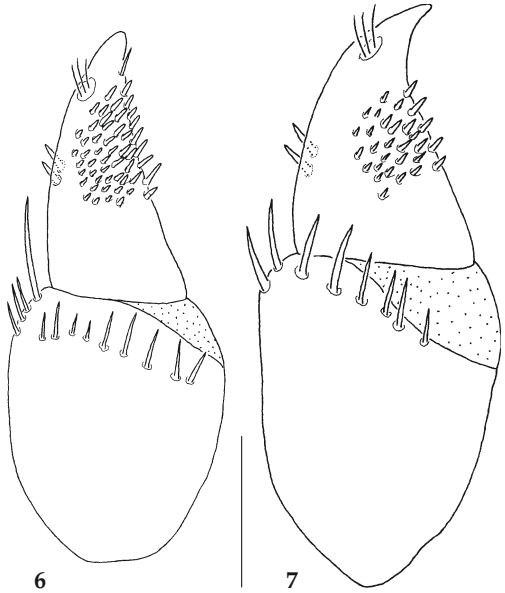

Figs 6, 7. Female gonocoxites 1 and 2. **6.** *Hexagonia queenslandica* spec. nov. **7.** *H. bilyi* spec. nov. Scale bars: 0.1 mm.

One setiferous puncture situated at apical fourth of 5th interval, attached to the 5th stria. Marginal series consiting of 10–11 punctures and setae which are very widely interrupted in middle, but punctures very difficult to distinguish between the coarse punctures of the 8th stria when setae broken. Laterally of end of 4th stria with an additional puncture and seta. Intervals impunctate and without microreticulation, very glossy.

Lower surface. Metepisternum very elongate, almost 3× as long as wide at apex. Terminal abdominal sternite quadrisetose in both sexes.

Legs. Of average size. Three basal tarsomeres of all legs triangular and very wide, 4th tarsomeres wide and very deeply excised, with dense brush-like pilosity on ventral surface. Male protarsus without additional squamosity. Tarsal claws edentate.

Male genitalia (Fig. 5). Genital ring almost circular but due to incomplete sclerotization very fragile. Aedeagus slightly damaged, straight, in middle wide, obliquely narrowed towards the narrow and acute apex which is considerably curved down. Internal sac with several folds and a large coiled, posteriorly well sclerotized part in middle. Parameres small, right paramere larger than left paramere.

Female genitalia (Fig. 6). Gonocoxite 1 short and compact, at medio-apical rim with one elongate seta and three shorter nematiform setae below, along the ventro-apical rim with 9–10 moderately elongate setae. Gonocoxite 2 rather narrow, triangular, slightly curved, with obtusely rounded apex; on the ventro-lateral surface with many (>40) short and stout ensiform setae and with a longer seta above this setose field, in middle of median margin with two small ensiform setae, and near apex on the medio-ventral surface with three short nematiform setae which originate from a large, almost circular pit. Lateral plate at the medio-apical surface with many (>20) nematiform setae.

Variation. Apart from slight differences of body size very little variation noted.

Distribution. North-eastern Queensland. Known only from type locality.

Collecting circumstances. Not recorded.

Hexagonia bilyi spec. nov.

Figs 2, 4, 7

Types. Holotype: ♀, AUSTRALIA NT.; Kakadu NP, Gunlom, 13°26'S, 132°34'E, 64 m, 11.12.2008, Sv. Bilý leg. (ANIC).

Etymology. The name is a patronym in honour of the collector, S. Bilý, Prague.

Diagnosis. A small species with wide head and markedly cheek-like orbits; the dark apical spot on the elytra in middle but slightly prolonged anteriad. Best distinguished from *H. queenslandica* spec. nov. by the densely punctate head and pronotum, microreticulate elytra, the rather fine punctation of the elytral striae, the apical elytral spot which is much less prolonged anteriad, and in the female by smaller, more compact, more curved, and less densely setose gonocoxite 2.

Description

Measurements and ratios. Body length: 7.3 mm; width: 2.25 mm. Width/length of pronotum: 1.04; widest diameter/width of base of pronotum: 1.69; width head/pronotum: 1.10; length/width of elytra: 1.90.

Colour (Fig. 2). Head black, pronotum brown, elytra pale brown, the apical fifth black, the black colour slightly produced along suture and near the lateral margin. Mandibles and antenna brown, palpi pale reddish. Legs pale brown. Lower surfaces of head black, of thorax and abdomen piceous.

Head (Fig. 4). Wide and depressed, wider than the prothorax. Eye large and rather protruded, orbit about as long as the eye, rather cheek-like, oblique and straight, not convex, slightly narrowed towards

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neck, posterior border almost perpendicular; neck laterally and dorsally very deeply incised. Mandibles elongate, straight in basal two thirds, incurved towards apex. Palpi elongate, narrowed towards apex, impilose. Mentum with triangular tooth, bisetose. Glossa at apex excised, bisetose, paraglossae far surpassing glossa. Antenna elongate, almost attaining the base of the pronotum; three basal antennomeres and basal half of 4th antennomere glabrous. Clypeal suture deeply impressed, clypeus straight at apex, labrum slightly emarginate. Frons with two irregularly shaped, rather deep impressions which at the bottom are irregularly sulcate-striolate. Behind eye a shallow, oblique sulcus with the posterior supraorbital seta located at its end far behind the posterior margin of the eye. Surface with some irregular strioles, with moderately coarse, in middle fairly dense punctures, and with fine traces of microreticulation, in anterior half rather dull, in posterior half rather glossy.

Pronotum (Fig. 4). Narrower than the head, somewhat oval-shaped, widest at apical third; dorsal surface rather depressed. Apex in middle almost straight, laterally oblique, apical angles completely rounded off. Lateral margins evenly curved, immediately in front of base slightly excised; base straight, basal angles almost rectangular but slightly obtuse, not produced laterad. Median line deep and wide, irregularly crenulate, almost attaining apex and base; both transverse sulci barely indicated. Basal grooves shallow, irregularly, longitudinal and irregularly punctate and transversely sulcate. Apex and base not margined, lateral borders narrowly margined, marginal sulcus very narrow throughout. Anterior lateral seta situated at widest diameter, posterior lateral seta absent. Dorsal surface with many irregular transverse sulci, with rather dense and moderately coarse, irregular punctures, here and there with traces of very fine microreticulation, moderately glossy.

Elytra (Fig. 2). Elongate, markedly depressed, slightly widened towards apex. Base oblique, humeri rounded; lateral margins straight but slightly oblique, in apical fourth regularly convex towards suture. Basal margin angulate at position of 4th stria, prolonged to and united with 3rd stria. Scutellary stria situated in 1st interval, elongate, consisting of 7–8 fairly coarse, deeply impressed punctures. All striae, including 7th and 8th, deeply impressed and moderately coarsely punctate. Intervals depressed. Scutellary seta situated at origin of 1st stria. 3rd interval bipunctate, the anterior puncture and seta situated close to apex and near the 3rd stria, the posterior one situated at apical two thirds, near the 2nd stria. One setiferous puncture situated at apical fourth of the 5th interval, attached to the 5th stria. Marginal series consiting of 10–11 punctures and setae which are very widely interrupted in middle. Laterally of end of the 4th stria with an additional puncture and seta. Intervals very sparsely and inconspicuously punctate and with fine, slightly superficial microreticulation which consists of slightly transverse meshes, surface moderately glossy.

Lower surface. Metepisternum very elongate, almost 3 × as long as wide at apex. Terminal abdominal sternite in female quadrisetose.

Legs. Of average size. Three basal tarsomeres of all legs triangular and very wide, 4th tarsomeres wide and very deeply excised, with dense brush-like pilosity on ventral surface. Tarsal claws edentate.

Male genitalia. Unknown.

Female genitalia (Fig. 7). Gonocoxite 1 short and compact, at medio-apical rim with two moderately elongate setae, along the ventro-apical rim with 6–7 moderately elongate setae. Gonocoxite 2 short and wide, triangular, towards apex markedly curved, with acute apex; on the ventro-lateral surface with many (c. 30) short and stout ensiform setae, in middle of median margin with two small ensiform setae, and near apex on the medio-ventral surface with three short nematiform setae which originate from a large, almost circular pit. Lateral plate at the medio-apical surface with several (c. 12) nematiform setae.

Variation. Unknown.

Distribution. Kakadu National Park, northernmost Northern Territory. Known only from type locality.

Collecting circumstances. Not recorded, but probably collected at light.

Key to the Papuan and Australian species of the genus *Hexagonia* Kirby

1. Elytra completely dark; head narrower than prothorax. Papua Indonesia ..... *gressitti* Darlington, 1971

– Elytra yellow or reddish with dark apex; head wider than prothorax ..... 2.

2. About half of the elytra black; head and pronotum rather densely punctate **and** basal angles of pronotum not produced laterad **and** microreticulation of the elytra barely visible. Northwestern Papua New Guinea ..... *papua* Darlington, 1968

– Less than half of the elytra black (Figs 1, 2); **either** head and pronotum barely punctate and very glossy, basal angles of the pronotum distinctly produced laterad (Fig. 3), microreticulation of the elytra absent, and the dark part of the elytra rather large and in middle considerably pro-

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longed anteriad (Fig. 1); **or** head and pronotum distinctly punctate, basal angles of the pronotum not produced laterad (Fig. 4), microreticulation of the elytra distinct, and the dark part of the elytra small and in middle far less prolonged anteriad (Fig. 2). Australia ..... 3.

3. Head and pronotum barely punctate and very glossy; microreticulation of the elytra absent; basal angles of the pronotum distinctly produced laterad (Fig. 3); the dark part of the elytra rather large and in middle markedly prolonged anteriad (Fig. 1); aedeagus with acute, downcurved apex and a large coiled sclerite in middle of the internal sac (Fig. 5); female gonocoxite 2 larger, narrower, more densely setose (Fig. 6). North Queensland ..... *queenslandica* spec. nov.

– Head and pronotum distinctly punctate and less glossy; microreticulation of elytra distinct; basal angles of pronotum not produced laterad (Fig. 4); the dark part of the elytra small and in middle far less prolonged anteriad (Fig. 2); aedeagus unknown; female gonocoxite 2 smaller, wider, less densely setose (Fig. 7). Northernmost Northern Territory ..... *bilyi* spec. nov.

Remarks

The two species described in the present paper represent the first reliable records of the genus *Hexagonia* and, at the same time, of the whole tribe Hexagoniini, from Australia. The diversity of this tribe is greatest in tropical Africa and southern Asia, but the four species which occur in New Guinea and in northern Australia demonstrate the wide distribution of the genus *Hexagonia*. Apparently the two New Guinean species are different from the Australian ones, which differ likewise "inter se" and may be evidence of two independent immigration events. Only one of the New Guinean species, *H. papua* Darlington, 1968, seems to be closely related to the Australian species, whereas the second New Guinean species, *H. gressitti* Darlington, 1971, probably belongs to another lineage within the genus.

Apparently specimens of *Hexagonia* in Australia are rare, or they are difficult to collect, on whatever reasons, because they escaped the notice of collectors for a very long time. Apart from the two specimens from Tully and from the newly sampled specimen from far Northern Territory, I never saw any specimens in the ample unidentified carabid material present in the large Australian collections.

Nothing is known about the habitats, diet, life histories, etc. of any Australian *Hexagonia*, but it would be an interesting task to find out their ecological requirements and their habits. Special aim therefore should be directed to the grassy or reedy shores of lagoons and billabongs in northern tropical Australia.

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References

Csiki, E. 1932. Carabidae: Harpalinae VII. Pp. 1279–1598 in: Schenkling, S. (ed.) Coleopterorum Catalogus III (Pars 124). Berlin (De Gruyter).

Darlington, P. J. Jr. 1968. The carabid beetles of New Guinea. Part III. Harpalinae (continued): Perigonini to Pseudomorphini. Bulletin of the Museum of Comparative Zoology 137: 1–253.

– – 1971. The carabid beetles of New Guinea. Part IV. General considerations; analysis and history of fauna; taxonomic supplement. Bulletin of the Museum of Comparative Zoology 142: 129–337.

Hurka, K. 2003. Tribe Hexagoniini. P. 407 in: Löbl, I. & Smetana, A. (eds). Catalogue of Palearctic Coleoptera, Vol. 1. Stenstrup (Apollo Books).

Kirby, W. 1825. A description of such genera and species of insects alluded to in the "Introduction to Entomology" of Messrs. Kirby and Spence, as appear not to have been before sufficiently noted or described. Transactions of the Linnean Society of London 14: 563–572.

Lorenz, W. 1998. Systematic list of extant ground beetles of the world (Insecta Coleoptera "Geadephaga": Trachypachidae and Carabidae incl. Paussinae, Cicindelinae, Rhysodinae). 502 pp., Tutzing, Germany (printed by the author).

– – 2005. Systematic list of extant ground beetles of the world (Insecta Coleoptera "Geadephaga": Trachypachidae and Carabidae incl. Paussinae, Cicindelinae, Rhysodinae). 2nd ed., 530 pp., Tutzing, Germany (printed by the author).

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