Mitt. Münch. Ent. Ges.	**96**	81-85	München, 30.09.2006	ISSN 0340-4943

A new species of the genus *Tachyta* KIRBY from northern Queensland, Australia, with the first record of *T. brunnipennis* (MACLEAY) from New Guinea

(Coleoptera, Carabidae, Bembidiinae)

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Abstract

Tachyta palmerstoni **sp. n.** is described from southern Atherton Tableland in tropical north-eastern Queensland, Australia. The new species differs from the three described Australian species of the genus *Tachyta* KIRBY by the combination of narrow pronotum, elongate elytra, and weak microreticulation and sparse punctuation of the glossy elytra.

Tachyta brunnipennis (MACLEAY) is recorded for the first time from New Guinea, which probably is a result of a more or less recent immigration from northern Australia.

Introduction

Tachyta KIRBY is a genus of small tachyine carabid beetles including about 20 species. The genus occurs almost worldwide but is absent from the Neotropical region. Three species were so far recorded from Australia: *T. brunnipennis* (MACLEAY, 1871), *T. ovata* BAEHR, 1986, and *T. rexensis* MOORE, 2000 (ERWIN 1975, BAEHR 1986, MOORE et al. 1987, MOORE 2000, LORENZ 2005). *T. brunnipennis* is distributed through eastern Queensland and northern parts of Northern Territory and adjacent Western Australia north of Great Sandy Desert. *T. ovata* is so far known from tropical Northern Territory and adjacent extreme northern Western Australia and in its whole range it is sympatric with *T. brunnipennis. T. rexensis* is known only from the Julatten area in north-eastern Queensland. Whereas *T. brunnipennis* and *T. ovata* live under bark of dead timber in open forests and woodland, *T. rexensis* seems to be a rainforest dwelling species that was sampled from under bark of fallen logs in montane rain forest.

During examination of a number of *Tachys*-like carabid specimens from Australian National Insect Collection (ANIC), I detected a single specimen of the genus *Tachyta* that clearly differs from the three species described from Australia and likewise from *T. umbrosa* (MOTSCHULSKY, 1851) which is widespread in the Indo-Australian Region, but was not yet recorded from Australia. Although the new species is so far represented by a single specimen only which, moreover, is a female, the external characters of the new species are so strikingly different from all known species that the description is justified.

Methods

For the taxonomic treatment standard methods were used as exemplified in BAEHR 1995 and 2005. The female stylomeres were removed from the specimen soaked for a night in a jar under wet atmosphere.

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 humerus to the most advanced part of apex.

The habitus photograph was obtained with a digital camera using ProgRes Capture Basic and AutoMontage and subsequently was worked with Corel Photo Paint 11.

Tachyta palmerstoni sp. n.
(Figs 1, 2, 3b, 4)

Types: Holotype: ♀, Palmerston Nat. Pk., N.Q. 1000', 1 mi. E. of Crawford's Lookout under bark 6.xi.66, E. Britton (ANIC).

Diagnosis. Distinguished from *T. brunnipennis* (MACLEAY) by weak microreticulation and sparse and fine punctuation of the markedly glossy upper surface; and from *T. ovata* BAEHR and *T. rexensis* MOORE by narrower pronotum and longer and narrower elytra.

Description

Measurements: Length: 2.45 mm; width: 1.08 mm; ratio width/length of pronotum: 1.57; ratio length/width of elytra: 1.51.

Colour (Fig. 1): Piceous, pronotum very slightly lighter, lateral margins of pronotum and elytra inconspicuously lighter. Labrum and mandibles light reddish, antenna and palpi yellow. Legs dirty yellow, but basal 4/5 of femora infuscate.

Head: Across eyes very slightly narrower than pronotum at apical angles. Eyes large, frons near eyes with a slightly sinuate, oblique ridge. Antenna short, surpassing base of pronotum by the apical antennomere only, median antennomeres about as long as wide. Surface rather glossy, impunctate, with distinct though somewhat superficial, about isodiametric microreticulation, on neck changing into fine transverse lines.

Pronotum (Figs 1, 3b): Comparatively narrow, much narrower than elytra, little cordiform, dorsally moderately convex. Apex very gently sinuate, apical angles slightly protruded, but rounded at tip. Lateral margins in anterior half moderately convex, basal half gently oblique, almost straight and without perceptible sinuation. Basal angles acute, slightly produced laterally and posteriorly. Base in middle slightly produced. Pronotum widest at anterior two fifth. Apex not bordered, lateral margins with narrow lateral sulcus, base only laterally bordered. Anterior marginal seta situated at widest diameter, posterior seta at basal angle. Median line deeply impressed, but incomplete, running from anterior to posterior transverse sulcus. Anterior sulcus very shallow, indistinct, posterior sulcus deeply impressed, oblique. Disk rather glossy, barely punctuate, with superficial, more or less transverse microreticulation that becomes even more superficial and transverse towards the lateral margins. On apical and basal fields, however, microreticulation perceptibly more distinct and almost isodiametric.

Elytra (Fig. 1): Comparatively elongate, widest about at middle, surface depressed. Inner three striae impressed, 4th stria distinctly punctuate but not impressed, outer striae very inconspicuous. Anterior discal pore and seta situated immediately inside of 4th stria and close to basis, clearly in front of 4th marginal pore and seta. Posterior discal seta likewise situated near 4th stria, at apical fourth of elytra. Recurrent stria short. Four inner striae distinctly punctuate. Inner four intervals very gently convex, with an irregular series of sparse and fine punctures. Surface with superficial microreticulation that consists of very transverse meshes and lines, remarkably glossy. Marginal setae, when present, very elongate.

Male genitalia: Unknown.

Female stylomeres (fig. 2): Both stylomeres of average size and shape. Stylomere 1 without any setae at apical margin. Stylomere 2 curved and moderately acute at apex, with two rather large ensiform setae on ventro-lateral margin, of which the upper one is clearly larger than the lower one; one ensiform seta in middle of dorso-median margin; and a very elongate nematiform seta on median rim near apex.

Variation: Unknown.

Distribution (Fig. 4)**:** Palmerston National Park at the southern margin of Atherton Tableland, north-eastern Queensland. Known only from type locality.

Etymology: The name refers to the type locality of this species.

Biology: Little known. According to the label, the holotype was collected "under bark".

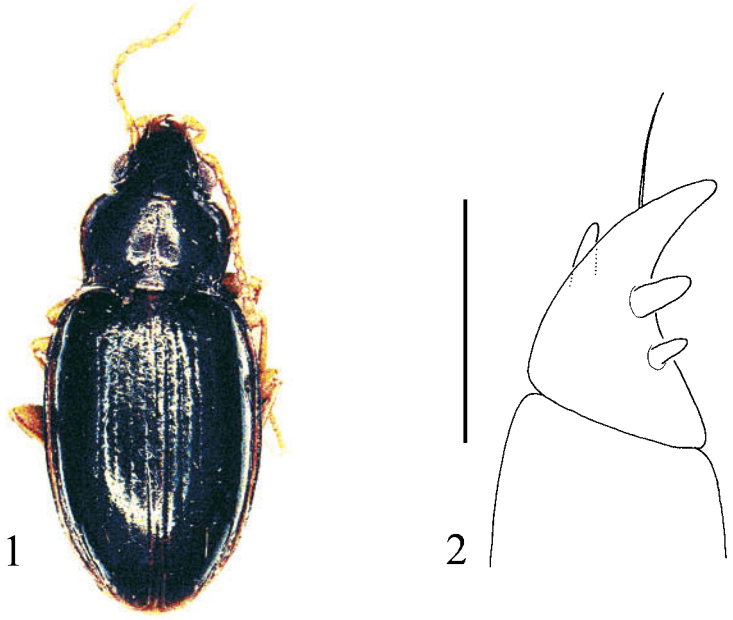
Tachyta brunnipennis (MACLEAY)
(Figs 3a, 4)

Bembidium brunnipenne MACLEAY, 1871: 118.
Tachyta brunnipennis, ERWIN 1975: 21; MOORE et al. 1987:142; BAEHR 1986: 307; MOORE 2000: 97; LORENZ 2005: 207.

This species is distributed in Australia through eastern Queensland and the northern parts of Northern Territory and adjacent northern Western Australia (fig. 3) (BAEHR 1986, MOORE et. al 1987), where it occurs in more or less open forest and woodland. Even MOORE (2000) who found it sporadically in the Julatten area in north-eastern Queensland, stated that it occurs there in the more open parts mixed with *Eucalyptus* and *Acacia* woodlands.

A few specimens received some years ago from A. RIEDEL (Karlsruhe) demonstrate that *T. brunnipennis* also occurs in New Guinea, and there apparently likewise in open woodland of rather Australian than New Guinean character, as the specimens were found in lowland open forest south of the Central Range.

New record: Irian Jaya, Merauke-Pr. Dehai, Brazza River, 21.-22.6.1994, leg. A. Riedel.



Figs 1 + 2. *Tachyta palmerstoni* **sp. n.: 1.** Habitus. Length: 2.45 mm. **2.** Female stylomeres. Scale: 0.1 mm.

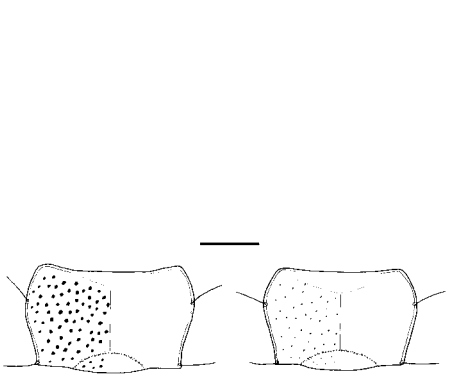
Key to the Australian species of the genus *Tachyta* KIRBY

1. Elongate species, ratio length/width of elytra > 1.4; pronotum less wide, ... ratio width/length < 1.6 . . . . . 2.
- Wider and shorter species, ratio length/width of elytra < 1.35, pronotum wider, ... ratio width/length > 1.65 . . . . . 3.

2. Surface of pronotum and elytra with very coarse microreticulation and coarse punctuation, remarkably dull; pronotum laterally more convex and with deeper lateral sinuation (fig. 3a). Eastern Queensland, northern part of Northern Territory, Western Australia north of Great Sandy Desert; southern New Guinea . . . . . *brunnipennis* (MACLEAY)

- Surface of pronotum and elytra with superficial microreticulation and fine and sparse punctuation, rather glossy; pronotum laterally less convex and with faint lateral sinuation (fig. 3b). North-eastern Queensland . . . . . *palmerstoni* **sp. n.**

3. Surface with distinct microreticulation, moderately dull; antenna shorter, median antennomeres as long as wide. Northern part of Northern Territory, adjacent northernmost Western Australia . . . . . *ovata* BAEHR
- Surface with superficial microreticulation, rather glossy; antenna longer, median antennomeres clearly longer than wide. North-eastern Queensland . . . . . *rexensis* MOORE



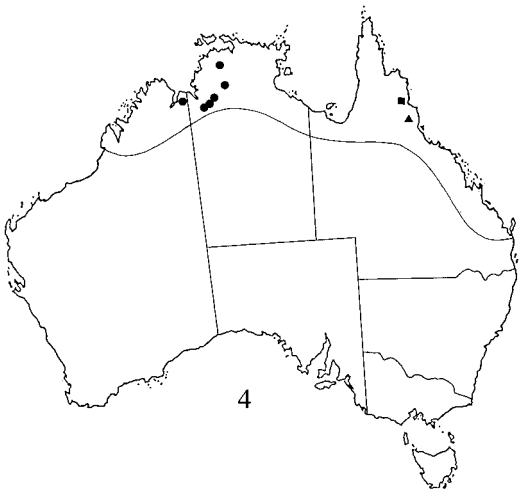


Fig. 3. Pronotum: **a.** *Tachyta brunnipennis* (MACLEAY). **b.** *T. palmerstoni* **sp. n.** Scale: 0.25 mm. **Fig. 4.** Distribution of the Australian species of the genus *Tachyta* KIRBY. *T. brunnipennis* (MACLEAY): entire line; *T. ovata* BAEHR: ● ; *T. rexensis* MOORE: ■ ; *T. palmerstoni* **sp. n.**: ▲ .

Remarks

Although the label of the holotype of *T. palmerstoni* does not explicitly state in which sort of forest the specimen had been collected, the locality record suggests that it was sampled in rain forest. Like its congeners, this species probably lives under bark of dead wood. Provided that this in fact is a rainforest dwelling species, in North Queensland two *Tachyta* species occupy this habitat. As in a number of other rainforest dwelling carabid species occurring in northern Queensland (see BAEHR 1995, 2003, 2005), Atherton Tableland, and the mountains and tablelands to the north, respectively, are inhabited by two different *Tachyta* species which, in contrast to the two Australian *Tachyta* species occurring in open forest, probably are not sympatric. In the rain forest of the Wet Tropics in North Queensland this is a common pattern of distribution of carabid beetles, but also of certain other beetle and non-beetle insect groups (Yeates et al. 2002). Such distribution patterns are dependent on the special structure of the North Queensland rain forests: These are dissected by river and creek valleys or narrow stripes of drier sclerophyll forest to form a number of distinct "rain forest blocks" that are inhabited by a fauna of closely related but different species, each of which just occurs on a single or a few neighbouring mountain top(s) or on a tableland, where they are endemic – in contrast to the fauna of the surrounding open forests which is largely composed of fairly widespread species.

The new record of *T. brunnipennis* demonstrates its occurrence in New Guinea. In view of the habitat which is rather Australian than New Guinean like, this species probably is rather a young invader from northern Australia into suitable areas of New Guinea. Like in other plant and animal species of Australian

origin the immigration most probably occurred via Cape York Peninsula, which during Glacial Period repeatedly offered a firm land bridge between northern Queensland and south-eastern New Guinea, and it very probably took place within this period. Any more exact immigration time is difficult to estimate, but perhaps could be gathered from a genetic survey and by subsequent estimation of the absolute time required to cause the observed genetic differentiation if there is any. Otherwise the immigration would be rather estimated at very recent time, in late Pleistocene or even in early Holocene.

Acknowledgements

My sincere thanks are due to Mr. Tom WEIR (Canberra) for the kind loan of this and a large number of other Australian carabid specimens; to Dr. Alexander RIEDEL (Karlsruhe) for the kind gift of material from New Guinea; and to Dr. Geoffrey MONTEITH (Brisbane) for the possibility to compare a paratype of *T. rexensis*.

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