

A new species of the genus *Rhyparus* Westwood, 1845 (Coleoptera: Scarabaeidae: Aphodiinae) from Papua New Guinea

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The author here describe and illustrate *Rhyparus anichtchenkoi* sp. nov. from Papua New Guinea. The newly described species was carefully compared with the most similar species i.e.: *R. gracilis* Arrow, 1905 and *R. mokaiensis* Stebnicka, 1998. Methods of establishing new species and correlations between them are briefly discussed.

Key words. New species, Scarabaeoidea, Rhyparini, Australian region

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INTRODUCTION

Stebnicka (1998) revised the genus *Rhyparus* from Papua New Guinea for the first time. During this revision, she described 6 new species and put the number of species at 11. In the following paper, I propose a description of the 12-th species for the Papua New Guinea fauna, which is most similar to *R. gracilis* Arrow, 1905 and *R. mokaiensis* Stebnicka, 1998. *R. anichtchenkoi* sp. nov. seems to have intermediate character between both species. The variability of all above mentioned species is compared and discussed.

MATERIAL AND METHODS

The specimen was observed with a Nikon SMZ-U stereoscopic microscope. The

photos published here were taken by the use of the Canon EOS 5D Mark III connected with Canon MP-E 65mm macro lens. Photos were edited in the Helicon Focus 7 and Adobe Photoshop Elements 2018 programs.

For morphological terms used in the description of specimens I follow Krikken and Hujibregts (1987).

Specimens from type series of the new species are indicated by a red, printed label bearing the status of the specimen, its name, name of the authors, and year and month of the designation.

In information about type material sign: “|” symbolized separate lines on labels; “||” symbolized the end of labels.

Places of depository of specimens are given in round brackets „(...)”.

I use the following abbreviations:

DUBC - Institute of Life Sciences and Technologies, Daugavpils University, Daugavpils, Latvia

IRSN - Institut Royal des Sciences naturelles de Belgique, Brussels, Belgium

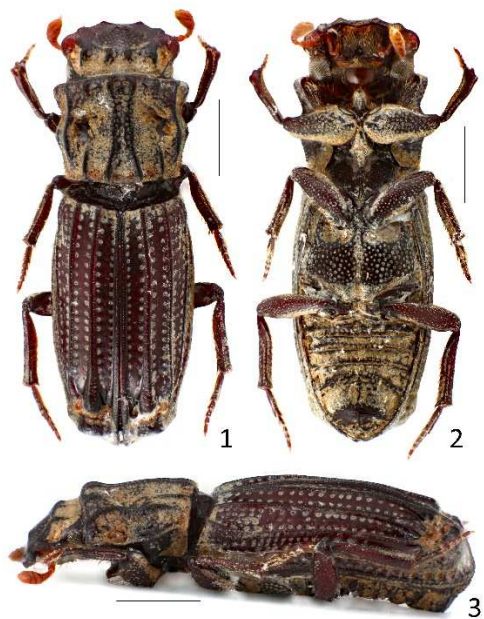
ŁMCN - Łukasz Minkina, collection private, deposited in Institute of Systematics and Evolution of Animals in Kraków, Poland

TAXONOMY

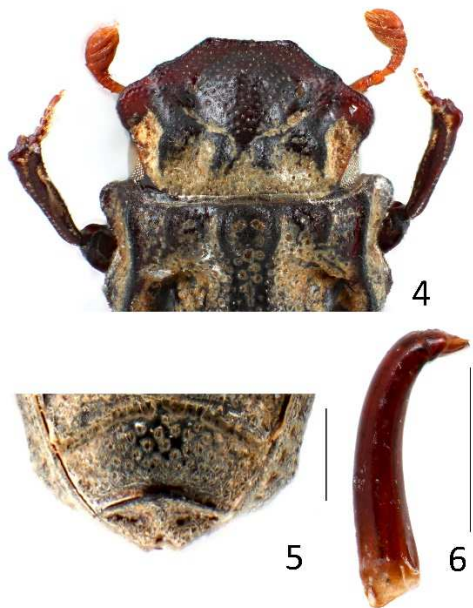
Rhyparus anichtchenkoi sp. nov.

(Figs 1-6)

Type locality. Papua New Guinea, Madang province, Batteta.



Figs 1-3. *Rhyparus anichtchenkoi* sp. nov., ♂, holotype: 1- dorsal view; 2- ventral view; 3- lateral view. Scale lines: 1.0 mm.



Figs 4-6. *Rhyparus anichtchenkoi* sp. nov.: 4- head, ♂, holotype; 5- last abdominal ventrite and pygidium, ♀, paratype; 6- aedeagus, holotype. Scale lines: 1.0 mm.

Type material. Holotype (♂): “Coll. R. Isc. N.B. | Canopy mission P.N.G. | Madang province | Batteta 21.iv.1993 | Light T2 | leg. Olivier Missa” (IRSN). **Paratypes** (8exx.): 1ex.: “the same as holotype but: “23.iii.1993 | Light T2””(IRSN); 2exx.: “the same as holotype but: “2.vii.1996 | light AR60””(IRSN; ŁMCN); 1ex.: “the same as holotype but: “2.v.1996 | light AR10””(DUBC); 2exx.: “the same as holotype but: “22.iv.1996 | light M8””(IRSN; ŁMCN); 1ex.: “the same as holotype but: “15.iv.1996 | light AR9””(IRSN); 1ex.: “the same as holotype but: “6.vi.1996 | light AR16””(IRSN).

Description of the holotype. Dorsum (Fig. 1). Length: 6.2 mm; maximum width: 1.95 mm. Body medium-sized for members of this genus, moderately elongate, convex, shiny, apparently almost glabrous, though partly clothed with very small yellowish

setae on head and all longitudinal costae on pronotum and elytra. Brownish to dark brown; antennae, tarsomeres and mouth parts pale brown.

Head (Fig. 4) shiny, transversely sub-hexagonal, clypeus trapezoidal in outline, anteriorly very weakly sinuate, on sides weakly upturned as obtuse, weak tooth, and later sinuous on either side; genae distinctly more excavate than eyes; clypeal disc distinctly convex, ringed by a not so deep groove; convexity with a pair of quite distinct, very short, convergent ridges, nearly on whole surface with distinct, moderately coarse punctures bearing small setae. Frons with four distinct, longitudinal ridges with similar structure as ridges on clypeal convexity. Head covered by quite regularly spaced, quite dense, moderately large punctures bearing small setae.

Pronotum shiny, tops of costae distinctly shiny; with eight distinct costae and seven intercostae, with two lateral, rounded lobes on each side. Anterior and posterior lobes with similar high, anterior lobe somewhat narrower than posterior. Costae of middle, third and fourth pair not interrupted in basal part of apical half, very distinctly convergent in the middle; second pair of costae very distinctly and widely interrupted in the middle; costae on each side with very small punctures bearing very small setae. All intercostae in anterior part without additional short costae. Median intercostae with dense punctures, very distinctly concentrated around median part into longitudinal line, all intercostae in basal part with distinct, dense punctation.

Scutellum almost imperceptible.

Elytra shiny. Each elytron with six elevated costae, and five flat intercostae. Costae on sides with very small punctures bearing very small setae. Preapical glandular area

relatively small. Intercostae first, second and fourth with two distinct rows of punctures; third intercostae with three indistinct rows of punctures; additionally, on third intercostae there is very short additional costae with very short additional rows of punctures on its sides. Fifth intercosta with one row of punctures; in basal part of fourth intercosta there is region with extremely short additional costa, with some additional punctures. External caudal bulb distinctly reduced, area between external caudal bulb and sides of elytra not divided; external and medio-internal caudal bulbs not divided; medio-internal caudal bulb shortened, transversally rounded, internally stretched.

Pygidium with dense, irregularly spaced punctation, with weak longitudinal rib in the middle and deep excision on its sides. Normal developed.

Venter (Fig. 2) moderately shiny. Meso-metaventral plate flattened in the middle, with distinct, narrow, quite deep longitudinal furrow; punctation of meso-metaventral plate dense, quite regularly spaced, irregular in size; all punctures bearing short setae. Abdominal ventrites moderately shiny, very densely and coarsely punctate. Last abdominal ventrite normal developed, with dense punctures, which are very coarse nearby its base; in the middle with longitudinal rib.

Meso- and metafemora without tubercles on lower border; all femora shiny, with regular, very distinct, rather fine, very dense punctation; all punctures bearing small setae.

Aedeagus (Fig. 6) elongate, with parameres very short, with phallobase distinctly elongate, relatively weakly curved.

Table 1. Differential characters of *Rhyparus anichtchenkoi* sp. nov. and the most similar species.

species character /	<i>R. gracilis</i> Arrow, 1905	<i>R. anichtchenkoi</i> sp. nov.	<i>R. mokaiensis</i> Stebnicka, 1998
proportions of body	distinctly elongate	moderately elongate	moderately elongate
shine	all intercostae matt, rarely visible specimens with all intercostae shiny	all costae shiny	all intercostae matt, rarely visible specimens with all intercostae shiny
lateral lobes of pronotum	weakly to moderately distinctly developed; usually posterior lobes higher than anterior, rarely anterior and posterior lobes with similar high (especially when both are relatively weakly developed)	moderately distinctly developed; anterior and posterior lobes with similar high	moderately distinctly developed; anterior lobes somewhat higher than posterior
costae of pronotum	relatively weakly to distinctly developed	distinctly to very distinctly developed	distinctly developed
median costae of pronotum	almost parallel to distinctly convergent	very distinctly convergent	more or less distinctly convergent
second pair of costae of pronotum in basal part	Zajmują about 1/3 of length of pronotum	no longer than 1/3 of length of pronotum	Zajmują about 1/3 of length of pronotum
Wgłębienia on pronotum	moderately large and deep	very large and deep	large and deep
punctuation of median intercostae of pronotum	dense, more or less distinctly concentrated in the middle	very dense, very distinctly concentrated in the middle	very dense, distinctly concentrated in the middle
first and second intercostae of elytra	always with two rows of punctures	always with two rows of punctures	in part of specimens with three rows of punctures; in most of specimens with two rows of punctures and some punctures between them; always: with two row of punctures with at least few punctures between them
third intercostae of elytra	usually with three distinct row of punctures, rarely median row of punctures absent	usually third (median) row of punctures indistinct	usually third (median) row of punctures indistinct, not so rarely median row of punctures absent
medio-internal caudal bulbs	distinctly transverse	distinctly transverse	moderately transverse

Variation. Total body length 6.1 mm – 6.8 mm. Punctuation of pronotum can be more or less dense. Second pair of costae of pronotum more or less distinctly shortened basally. Median row of punctures on third intercostae of elytra may be more or less distinctly developed.

Sexual dimorphism. Typical for the members of the genus. Pygidium and last abdominal ventrite of male as in fig. 2. Pygidium and last abdominal ventrite of female not modified, as in fig. 5.

Etymology. I dedicate the name of the new species to Alexander Anichtchenko – entomologist, Carabidae specialist, friend who organized material for me with specimens of undescribed species.

Affinity. The newly described species appears to be intermediate between *Rhyparus gracilis* Arrow, 1905 and *R. mokaiensis* Stebnicka, 1998. *R. gracilis* is one of the most variable species within the genus and for this reason differentiating features are compared in detail in the table below.

DISCUSSION

Former studies on the genus *Rhyparus* Westwood, 1845 (for example: Balthasar, 1964) indicated that the number of denticles (serrations) on femorae or the punctuation of head were important during species identification, which, over time, turned out to be not so important. Nowadays, studies by recent authors (see for example: Ochi *et al.* 2021) focus on the search for unique features with a real role for aedeagi. My studies on the genus *Rhyparus* shows that shape of caudal bulbs can be helpful in identifying species, as well in establishing correlations between them. In addition, recent studies indicate that the shape of the

pygidium and the last abdominal ventrites of females may also be helpful (Minkina *et al.* 2022). Other useful features, in my opinion, are: punctuation of the intercostae of pronotum and (as mentioned earlier) elytra and unique features. To a (lesser) extent, the proportions, body size and shape of lateral lobes of pronotum may also be helpful. Epipharyngi and aedeagi are, in my opinion, almost useless for identification and establishing relationships between species in the genus- in any case they can still serve as evidence in the process of describing new species. *R. anichtchenkoi* sp. nov. due to its reduced caudal bulbs, unmodified pygidium and last abdominal ventrite among all *Rhyparus* species in Papua New Guinea forms one species group with: *R. ediae* Stebnicka, 1998, *R. gracilis* Arrow, 1905, *R. multipunctatus* Paulian, 1984, *R. mokaiensis* Stebnicka, 1998 and *R. sinewatensis* Stebnicka, 1998.

In my opinion, the search for unique features is very important and can very often be helpful in identifying species that are very similar to others, but have this unique feature (such as: *R. sinewatensis* Stebnicka, 1998 or *R. ifugaoensis* Ochi & Kakizoe, 2021). Anyway, in some cases, some features which seem to be unique need to be supported by variation analysis. My study shows that the size of the punctures of intercostae of pronotum or (more commonly) elytra may be extremely variable: the punctures can be very large – but can also be almost absent. Macrosetation and matted „coating” may be stripped off in old specimens – making individuals appear setaeless and shiny. Some specimens may have an uneven, undulate or wrinkled structure of elytral intercostae – which may be caused not only by genetic mutations, but also by the mites leaving specific secretions on their body. A separate issue are population differences – which can be very small, but also of a

nature that is difficult to distinguish. Commonly we cannot say with sure, I am dealing with a species or just a slightly different population. *R. gracilis* is one of these highly variable species that, in addition, can be founded together with other similar species on the same locality. For this reason, despite the relatively well-studied fauna of Papua New Guinea future research on the Rhyparini fauna are highly recommended.

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