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Rhyparus nahangensis sp. nov. (Coleoptera: Scarabaeidae: Aphodiinae) from Vietnam

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Abstract. Authors described here a new species of the genus *Rhyparus* Westwood, 1845, *Rhyparus nahangensis* sp. nov., from Vietnam. Relevant illustrations and discussion on relationships of newly described species are given. New geographic distribution data for the species *R. kitanoi taiwanus* Ochi, 2001, *R. nepalensis* Balthasar, 1971 and *R. semikitanoi* Ochi, Kon et Kawahara, 2018 are presented.

Key words. Taxonomy, new species, distribution, Coleoptera, Scarabaeoidea, Aphodiinae, Rhyparini, Oriental Region.

INTRODUCTION

In continuing studies of the tribe Rhyparini, the first author had a chance to study a specimen of previously unknown species of genus *Rhyparus* Westwood, 1845. This new species, *Rhyparus nahangensis* sp. nov., is at the first sight because of reduced caudal bulbs morphologically very similar to the following small or medium sized species: *Rhyparus chinensis* Balthasar, 1952 since original description known only from China (Fujian), *R. kitanoi taiwanus* Ochi, 2001 known till today only from Taiwan, *R. nepalensis* Balthasar, 1971 and *R. schachti* Balthasar, 1971 both known only from Nepal and *R. huaphanensis* Ochi, Kon et Kawahara, 2019 and *R. semikitanoi* Ochi, Kon et Kawahara, 2018 both known so far only from Laos. *Rhyparus kitanoi taiwanus* Ochi, 2001 is reported from China (Guangdong and Fujian) for the first time and *R. nepalensis* is reported from India (Meghalaya) for the first time. *R. huaphanensis* is reported from China (Yunnan) for the first time.

MATERIAL AND METODS

Material was observed with a Nikon SMZ-U stereoscopic microscope. Photos published here were taken by the use of the Canon EOS 5D Mark III connected with Canon MP-E 65 mm macro lens and edited in the Helicon Focus 7 and Adobe Photoshop Elements 2018 programs.

For morphological terms used in the description of specimens we follow Krikken & Hujibregts (1987) and Dellacasa et al. (2010).

Holotype 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. Verbatim label data are cited for type material examined. Lines within label are separated by a vertical slash [|]. Information in quotes indicates the original spelling. Authors' remarks and additional comments are placed in brackets [].

The following acronyms stand for collections, in which the specimens studied here are kept:

CNCW – Cezary Nowak private collection, Włoszczowa, Poland;
ISEA – Institute of Systematics and Evolution of Animals in Kraków, Poland;
ŁMCN – Łukasz Minkina collection, Nowy Targ, Poland (deposited in ISEA);
NMPC – National Museum, Prague, Czech Republic.

TAXONOMY

Rhyparus nahangensis sp. nov.
(Figs. 1–6)

Type locality. Vietnam, Tuyen Quang province, Na Hang Nature Reserve.

Type material. **Holotype** (♂): "Vietnam, Tuyen Quang | Prov., Na Hang [Nature] Reserve | 20.–24.v.1997, 360 m | rainforest FITS | [leg.] S. Peck" (ŁMCN).

Description of holotype (♂). Dorsum (Fig. 1). Length: 4.15 mm; maximum width: 1.6 mm. Body small-sized for members of this genus, elongate-oval, distinctly 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) moderately shiny, tops of costae distinctly shiny; transversely sub-hexagonal; clypeus trapezoidal, weakly rounded anteriorly, 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 deep groove; convexity with pair of quite distinct, short, convergent ridges, nearly on whole surface with distinct, fine punctures bearing small setae. Frons with four distinct, longitudinal ridges with similar structure as ridges on clypeal convexity. Head covered by quite regularly spaced, dense, moderate punctures bearing small setae.

Epipharynx (Fig. 6) distinctly transverse, anterior margin weakly sinuate at middle; coryphe with several long celtes; epitorma broadely rectangular, tormae long.

Pronotum very weakly shiny, tops of costae distinctly shiny; with eight distinct ridges and seven longitudinal furrows, with two lateral, rounded lobes on each side. Anterior lobe only slightly smaller than posterior, which on the top are the widest part of pronotum. Ridges of third and fourth pair not interrupted in basal part of apical half, very gently convergent, distinctly convergent in the middle of apical third; middle and second pair of ridges distinctly interrupted in apical part of basal half; ridges on each side with very small punctures bearing very small setae.

All longitudinal furrows, except median, in anterior part with distinct, relatively long additional ridges. Median furrow with irregularly spaced, medium sized, sparse punctures located entirely in apical half, basal part of median furrow and all the rest furrows on whole surface without any punctures.

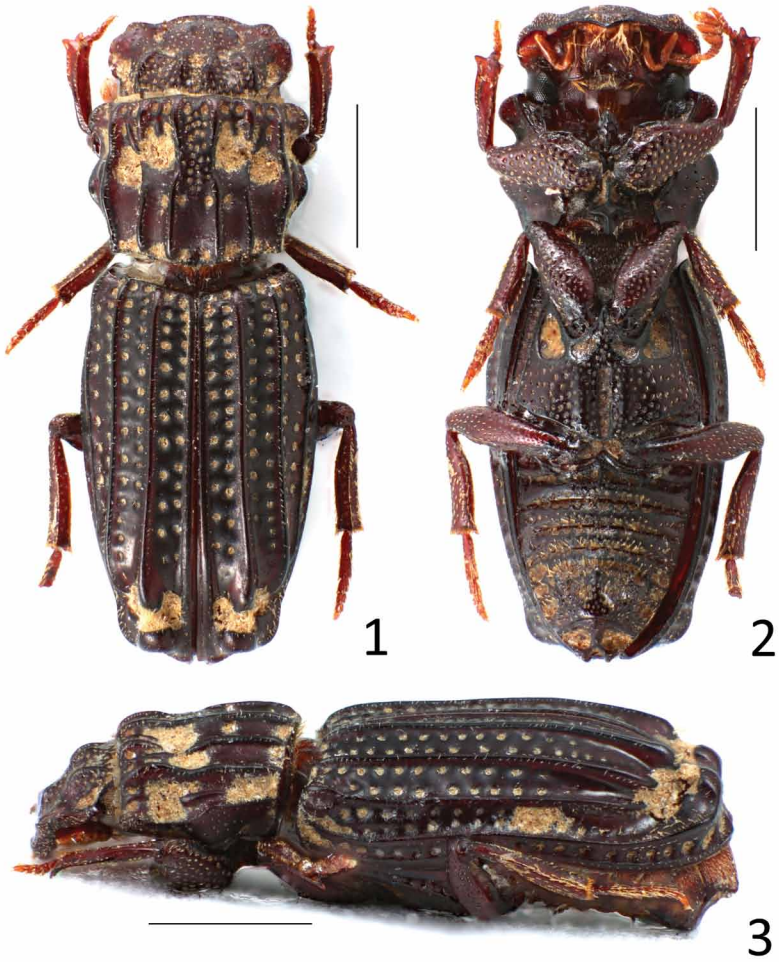
Scutellum almost imperceptible.

Elytra moterately shiny, tops of costae and preapical glandular area more distinctly 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 to fourth with two distinct rows of punctures; fifth intercosta with one row of punctures; in basal part of fourth intercosta there is region with extremally short additional costa, with no additional punctures here. External caudal bulb distinctly reduced, however area between external caudal bulb and sides of elytra distinctly elongate; medio-internal caudal bulb shortened, transversaly rounded, internally stretched.

Pygidium with a vertical center and two lateral impressions. Mesofemora with two very indistinct tubercles on lower border; metafemora without any tubercles on lower border; all femora shiny, with regular, very distinct, rather small, very dense punctation; all punctures bearing small setae.

Venter (Fig. 2) moderately shiny. Meso-metaventral plate flattened in the middle, with distinct, wide, not so deep longitudinal furrow; on sides of furrow there are two rows of realtively small punctures; punctation of meso-metaventral plate dense, quite regularly spaced, irregular in size; all punctures bearing short setae.

Abdominal ventrites moderately shiny, in the middle with one transverse row of punctures; with an additional punctured furrow in apical part; last but one abdominal ventrite with rather rounded furrows on sides. Last abdominal ventrite weakly prolonged in the middle, with elevated ridge in the middle, and rather shallow furrows on sides, anteriorly with transverse row of very large and

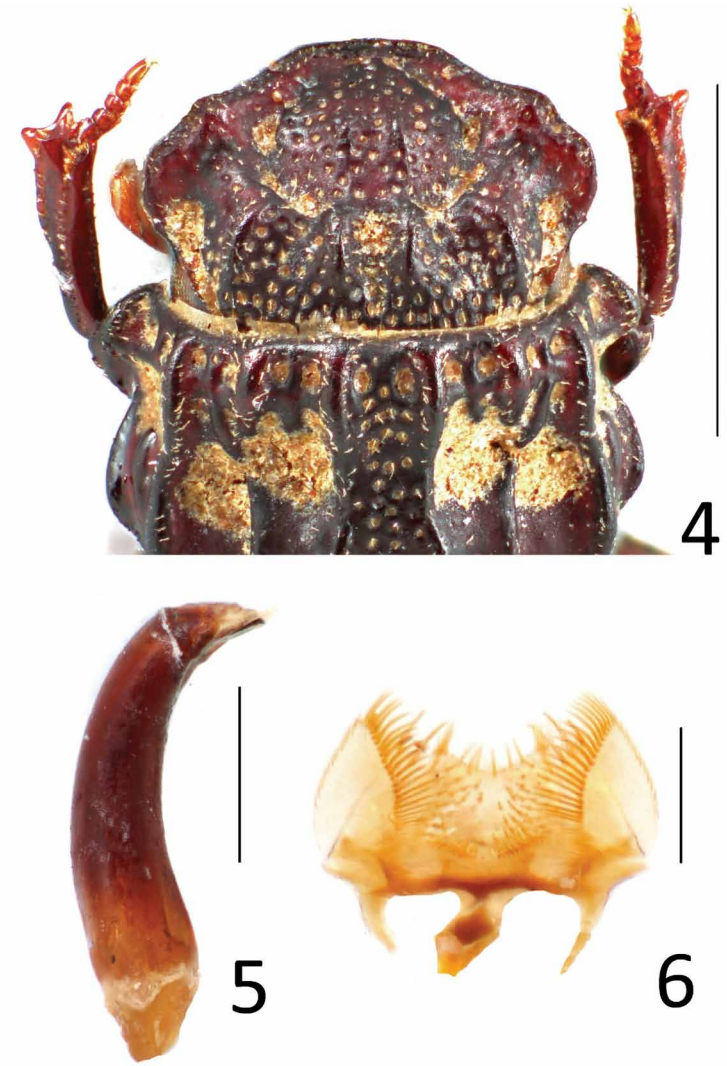


Figs. 1–3. *Rhyparus nahangensis* sp. nov., ♂, holotype. 1 – dorsal view, 2 – ventral view, 3 – lateral view. Scale lines: 1.0 mm.

dense punctures; basaly with rather dense, irregularny spaced, small to medium in size punctures; all punctures except that very large in anterior part of last ventrit bearing rather medium sized setae.

Aedeagus (Fig. 5) elongate. Phallobase about four times longer than parameres, very weakly curved in lateral view. Parameres relatively not so small, with weakly visible pair of hair-like setae on each side of median lobe in dorsal view.

Variability. Unknown.



Figs. 4–6. *Rhyparus nahangensis* sp. nov., ♂, holotype. 4 – head, 5 – aedeagus in lateral view, 6 – epipharynx. Scale lines: 4 – 1.0 mm; 5 – 0.5 mm; 6 – 0.2 mm.

Sexual dimorphism. Unknown. When we look at shape of meso-metaventral plate and apex of mesotibiae we can suppose that sexual dimorphism it is like typical for a whole genus.
Etymology. Toponymic; an adjective derived from the name of the Na Hang National Reserve (Vietnam) where the new species was collected.
Distribution. Known only from the type locality, Na Hang Nature Reserve in Vietnam (Tuyen Quang province).
Differential diagnosis. Based on combination of morphological characters species from Continental Asia (body elongate-oval, basal part of pronotal furrows impunctate and caudal bulbs reduced), *Rhyparus nahangensis* sp. nov. can be confused with: *Rhyparus chinensis*, *R. huaphanensis*, *R. kitanoi taiwanus*, *R. nepalensis*, *R. semikitanoi* and *R. schachti*. From insular Asia there is one more similar species: *R. helophoroides* Fairmaire, 1893 – but it can be easily distinguished by at least presence of punctures on basal part of median pronotal furrow which are always visible in all populations or always more or less distinct sinuation between external and medio-internal caudal bulb. Among of the remaining, continental species from *R. nepalensis* and *R. schachti* the new species can be distingished by lack of punctures in basal part of median furrow of pronotum (both have here at least few punctures), much smaller size of body, much less distinct ridges on clypeal disc. From *R. kitanoi taiwanus* and *R. huaphanensis* it can be distinguished by weak but relatively distinct sinuation between external and medio-internal caudal bulb (*R. nahangensis* sp. nov. has no rounded sinuation here) and triangular lateral lobes of pronotum (*R. nahangensis* sp. nov. has rounded lateral lobes of pronotum). Additionaly *R. huaphanensis* is larger species, with three rows of punctures in third intercostae. *R. kitanoi taiwanus* have body less convex, very weak additional ridge in apical half of fourth pronotal furrows (*R. nahangensis* sp. nov. has a very distnct ridges here), lateral lobes triangular, and rows of punctures in fourth elytral intercostae distinctly convergent (*R. nahangensis* sp. nov. has distinctly paralell rows of punctures here). *R. chinensis* is larger species, less convex, with elytra proportionaly more elongate, with punctation in apical part of median furrow of pronotum sparser, less distinct, less regular and anterior lobes of pronotum slightly more developed than posteriori (in *R. nahangensis* sp. nov. that proportions are in the opposite).

MATERIAL FOR COMPARISON

Rhyparus huaphanensis Ochi, Kon et Kawahara, 2019

Rhyparus huaphanensis Ochi, Kon et Kawahara, 2019: 1, figs 1–4. (Type locality: "Laos, Huaphane Prov., Mt. Phupane".)

Additional material. **China, Yunnan**: Zizhi vill., 25°43.7'N 98°34.1'E , 1995 m, 29.vi.–2.vii.2016, at light in village, J. Hájek & J. Růžička lgt. (4 spec. NMPC; 1 spec. ŁMCN). **Laos, Hua Phan**: Ban Saluei, Phu Phan mt., 20°15'N 104°02'E, 1500–2000m., 26.iv.–11.v.2001, D. Hauck lgt. (5 spec. NMPC; 1 spec. ŁMCN); Ban Saluei, Phu Phan mt., 20°15'N 104°02'E, 1500–2000m., 26.iv.–11.v.2001, J. Bezděk lgt. (2 spec. NMPC); Phou Pane Mt., 20°11'50"N 104°01'04"E, 1870 m, 14.–24.vi.2012, V. Kubáň lgt. (5 spec. NMPC; 2 spec. ŁMCN).

Distribution. A species described from Laos, additional records of distribution in that country are presented; first country record for China (Yunnan).

Rhyparus kitanoi kitanoi Miyake, 1982

Rhyparus kitanoi Miyake, 1982: 65, fig. 1. (Type locality: "[Japan], Cape Sata, Ohsumi, Kyushu".)

Material examined. **Japan**: Kagoshima-ken, Soo-shi, Osumi-cho, 21.vii.2007, Ryo Noda lgt. (1 spec. ŁMCN).

Distribution. A species described from Japan, additional records of distribution in that country are presented.

Rhyparus kitanoi taiwanus Ochi, 2001

Rhyparus kitanoi taiwanus Ochi, 2001: 3, figs 3–4, 13–15, 32. (Type locality: "Wushe, Natow P., C. Taiwan".)

Additional material. **China**, **Guangdong**: Xiaokeng, 24°42'N 113°49'E, 240 m, at light, 18.–19.v.2013, at light, Jatua lgt. (16 spec. NMPC; 4 spec. ŁMCN). **Fujian**: Yongan, Mt. Huxinghan, v.2005, local collector (1 spec. ŁMCN; 1 spec. CNCW). **Taiwan**, **Taitung**: Chihpen, 390 m., 10.–11.vi.1997, B. Herczig & L. Ronkay lgt. (1 spec. ŁMCN; 1 spec. ISEA). **Taichung**: Anmashan region, 1650 m, 20.vi.1997, B. Herczig & L. Ronkay lgt. (1 spec. ISEA).

Distribution. A species described from Taiwan, additional records of distribution in that country are presented. First country record from China (Guangdong and Fujian).

Rhyparus nepalensis Balthasar, 1971

Rhyparus nepalensis Balthasar, 1971: 19, fig. 3. (Type locality: "Nepal, Chisapani Garhi, 1600 m".)

Additional material. **India**, **Meghalaya**: Jaintia Hills reg., Jowai, 25°27'N 90°12'E, 1350+/– 100 m., 6.–8.vi.1996, E. Jendek & O. Sausa lgt. (9 spec. NMPC; 2 spec. ŁMCN).

Distribution. A species described from Nepal. First country record form India (Meghalaya).

Rhyparus semikitanoi Ochi, Kon et Kawahara, 2018

Rhyparus semikitanoi Ochi, Kon et Kawahara, 2018: 25, figs 4, 8, 12, 22–24. (Type locality: "Laos, Hue Phane p., Mt. Phu Pane".)

Additional material. **China**, **Yunnan**: Zizhi vill., 25°43.7'N, 98°34,1'E, 29.vi.–2.vii.2016, 1995 m, at light in village, J. Hájek & J. Ržička lgt. (1 spec. NMPC). **Laos, Attapeau:** Annam Higlands, Mts Dong Amphan, NBCA, Nong Fa (crater lake) env., 15°05'9"N 107°25'6"E, ca. 1150 m, 30.iv.–6.v.2010, Stanislav Jakl lgt. (1 spec. CNCW). **Houa Phan**: Phou Pane Mt., 20°11'50"N 104°01'04"E, 1870 m, 14.–24.vi.2012, primary mountain forest, flight intercept trap, Vít Kubáň lgt. (9 spec. NMPC; 2 spec. ŁMCN).

Distribution. A species described from Laos, additional records of distribution in that country are presented. First country record from China (Yunnan).

Rhyparus schachti Balthasar, 1971

Rhyparus schachti Balthasar, 1971: 21, fig. 4. (Type locality: "Nepal, Chisapani Garhi, 1600 m.")

Additional material. **Nepal**: Kosi, Chauki, 27°11'–12'N 87°27'–28'E, 2600–3000 m, 22.–24.vi.2001 (1 spec. NMPC); Arun V Arun R., Hedangan-Num, 800 m., 16.vi.1983, M. Brancucci lgt. (1 spec. ISEA).

Distribution. A species described from Nepal, additional records of distribution in that country are presented.

DISCUSSION

Rhyparini are rarely collected beetles. Usually are atracted to the light or collected in the flight intercept trap and so their geographic distribution is so far poorly understood. One of first records about unexpected distribution published Minkina (2019) for *R. burckhardti* Paulian, 1989 (Thailand) known earlier only from Island part of Asia. The next unexpected data published Ochi et al. (2019) for *R. myslenickorum* Minkina, 2019 (China, Xizang) described from Laos. The last data can be confirmed by authors. In Asia and Oceania there is known a lot of species with very poorly known distribution. Because of it we decided to publish data about so far known species similar to *R. nahangensis* sp. nov. Among so far described species *R. kitanoi taiwanus* is reported

from continental part of Asia for the first time. In this study we have compared *R. kitanoi taiwanus* to nominotypical subspecies. Both subspecies are morphologicaly very similar, at the first sight almost identique. However, *R. kitanoi taiwanus* is somewhat larger in size, with sides of pronotum slightly more triangular and with two distinct rows of punctures in fourth intercostae (nominotypical subspecies has that two rows connected into one in apical half). Both are very similar, in our opinion differences are too small to treat both of them as distinct species. However, because of easily noticeable number of differences, as well very distinct distribution we propose to conservate status of that both populations.

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