

Seven new *Rhyparus* Westwood, 1845 (Coleoptera: Scarabaeidae: Aphodiinae) species

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Abstract. Seven new species of the genus *Rhyparus* Westwood, 1845 are described and illustrated: *Rhyparus argopuroensis* sp. nov. from Java Island, *Rhyparus baliensis* sp. nov. from Bali Island, *Rhyparus borneensis* sp. nov. from Borneo Island, *Rhyparus garo* sp. nov. from Meghalaya State (India), *Rhyparus javanus* sp. nov. from Java Island, *Rhyparus kazirangensis* sp. nov. from Assam State and Mizoram State (India) and *Rhyparus obiensis* sp. nov. from Obi Island. New distributional records for *Rhyparus helophoroides* Fairmaire, 1893 are given. Short discussions of correlations between species are given.

INTRODUCTION

During the examination of specimens from the author's collection, among specimens collected mainly by second author, several undescribed species were found, as well as many known species with unknown previous distributions. The manuscript is one of a series planned for publication that refines knowledge of Rhyparini Schmidt, 1910 in Southeast Asia and Oceania. The manuscript will present seven undescribed species listed in the abstract. Two of them: *Rhyparus argopuroensis* sp. nov. and *Rhyparus obiensis* sp. nov. belong to the group of species with a modified pygidium and last abdominal ventrites in females. *Rhyparus baliensis* sp. nov., *Rhyparus borneensis* sp. nov. and *Rhyparus javanus* sp. nov. are representatives of small species with clearly developed, triangular lateral lobes of the pronotum. They all have a similar shape and can be suspected to be more or less closely related. Interestingly, both may be collected together with *R. helophoroides* Fairmaire, 1893, to which they are similar. Thus, the authors provide additional data on the distribution of *R. helophoroides* and point to important information on its morphology.

MATERIAL AND METHODS

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

For morphological terms used in the description of specimens we follow Krikken J. & Huijbregts J. (1987).

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

The following abbreviations (which was taken in square brackets) were used to indicate the depository of specimens:

ISEA Łukasz Minkina private collection, deposited in Institute of Systematics and Evolution of Animals, Kraków, Poland;

SJCP Stanislav Jákl private collection, Prague, Czech Republic.

TAXONOMY

Rhyparus argopuroensis sp. nov.

(Figs. 1-3, 22, 29)

Type locality. Indonesia, Java Island, East Java province, Mt. Argopuro, Bermi.

Type material. Holotype (♀): Indonesia | East Java pr., Mt. Argopuro, | Bermi vill. env. | xii.2018, 1000m. | local collector (SJCP).

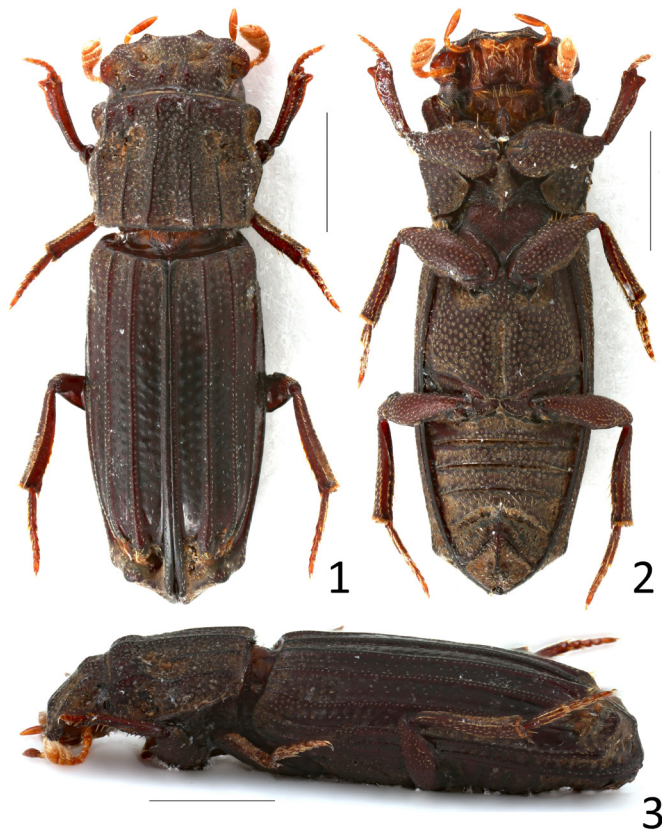
Description of the holotype. Dorsum (Fig. 1). Length: 4.7 mm; maximum width: 1.5 mm. Body small-sized for members of this genus, elongate, not so distinctly convex, flattened in central part; almost matt; apparently almost glabrous, though partly clothed with very small yellowish macrosetae on head and all longitudinal costae on pronotum and elytra. Brownish to dark brown; antennae, tarsomeres and mouth parts pale brown.

Head (Fig. 22) matt, tops of costae distinctly shiny; transversely sub-hexagonal; clypeus trapezoidal in outline, anteriorly truncate, 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 deep groove; convexity with a pair of indistinct, very low ridges; nearly on whole surface with distinct, fine punctures bearing small macrosetae. Frons with four distinct, longitudinal ridges with similar structure to the ridges on clypeal convexity. Head covered by quite regularly spaced, quite dense, not fine punctures bearing small macrosetae.

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

Scutellum almost imperceptible.

Elytra matt, 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



Figs. 1-3. *Rhyparus argopuroensis* sp. nov., ♀, holotype: 1- dorsal view; 2- ventral view; 3- lateral view. Figs. 1-3: scale lines: 1.0 mm.

bearing very small macrosetae. Preapical glandular area relatively small. Intercostae first to fourth with two distinct rows of punctures and with one row of quite irregularly spaced, very fine punctures; on third intercostae there is very short additional costae with very short additional row of punctures here. 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 distinctly divided; medio-internal caudal bulb shortened, visible as rounded bulb.

Pygidium (Fig. 29) with dense, irregularly spaced punctation, with weak longitudinal rib in the middle and deep excision on its sides; with distinctly longitudinal apex in the shape of distinct triangle.

Venter (Fig. 2) matt. 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 macrosetae. Abdominal ventrites matt, on sides with rows of punctures; with an additional punctured furrow in basal part. Last abdominal ventrite with dense punctures, which are about one and half time larger than on last but one ventrite; in basal half in the middle part with very deep cavity that does not

take shape of rows; in apical part in the middle with very deep groove, clearly located much below apex of pygidium. Meso- and metafemora with one very indistinct tubercles on lower border; all femora shiny, with regular, very distinct, rather small, very dense punctation; all punctures bearing small macrosetae.

Sexual dimorphism. Unknown. Probably characteristic of the genus. Shape of the female meso- and metatibiae is characteristic of other females in the genus. Shape of last abdominal ventrite and pygidium are unique.

Variability. Unknown.

Etymology. Toponymic; an adjective derived from the name of Argopuro mount, where the new species was collected.

Affinity. *R. argopurensis* sp. nov. belongs to the group of species with a modified pygidium and last abdominal ventrite in the females - which makes it unique and easily distinguishable from all other species known in the world. The shape of the pygidium in the female is most similar to *R. bacanensis* Minkina et al., 2022. In any case, it can be very easily distinguished by the shape of the last abdominal ventrite, which, compared to *R. bacanensis* in the basal half, has a very deep depression in the middle part that does not take the shape of the rows. In addition, the medio-internal caudal bulb is quite distinctly separated from the external one. More details and information in the discussion section.

***Rhyparus baliensis* sp. nov.**

(Figs. 4-6, 23, 32)

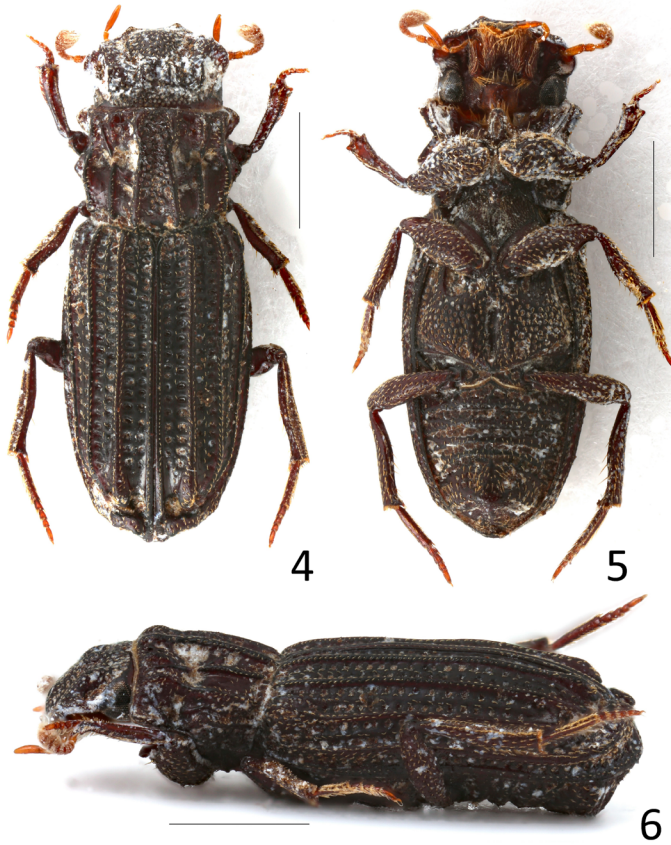
Type locality. Indonesia, Bali Island, Bedugul region, Tamblingan Lakes National Reserve.

Type material. Holotype (♂): Indonesia, Bali | Bedugul reg. | xi.2004, 1200m | Tamblingan Lakes N.R., (ISEA). Paratypes: (4 exx.): data as holotype (2 exx. SJCP, 2 exx. ISEA); (1 ex.): Indonesia, Bali | 2.-17.ii.2004 | Tamblingan Lakes N.R. | St. Jakl lgt. 1000-1500m alt., (SJCP); (1 ex.): Bali Isl, Tamblingan Lake | 18-28.ii.2004, 1200m | St. Jakl lgt., (SJCP).

Description. Dorsum (Fig. 4). Body length of holotype 4.5 mm. Small in size for a member of the genus. Elongate-oval, shiny, brownishblack; except punctures, tops of costae and legs glabrous.

Head (Fig. 23) trapezoidal, clypeus anteriorly truncate, with indistinct teeth on sides, laterally distinctly emarginated and next with widely rounded angles, relatively distinctly separated from distinctly protruding than eyes, rounded genae. Clypeocentral disc distinctly convex, ringed by deep groove, with pair of very indistinct, very weakly convex, somewhat longitudinal tubercles. Clypeocentral disc densely and coarsely punctate. Frons with four short, relatively narrow longitudinal costae. Punctation of head very dense, regular, coarse, all punctures bearing short macrosetae.

Pronotum transverse, with six distinct, costae and seven longitudinal intercostae; on each side of costae there is row of short and small yellowish macrosetae. Lateral margin with two



Figs. 4-6. *Rhyparus baliensis* sp. nov., ♂, holotype: 4- dorsal view; 5- ventral view; 6- lateral view. Figs. 4-6: scale lines: 1.0 mm.

distinctly protruding lobes; anterior and posterior lobes sharply triangular, both similarly developed. Paramedian costae continuous, weakly sinuate in apical half. Discolateral costae relatively widely interrupted in apical half. Median intercosta with very dense, medium sized punctures. Lateral intercostae almost without punctures.

Scutellum almost imperceptible.

Elytra elongate, relatively wide, widest before the middle. Each elytron with five distinct costae and five intercostae; on each side of costae there is row of short and small yellowish macrosetae. Fourth costae widened basally; covered by relatively dense, moderately large punctures. Intercostae flat, all of them with two rows of large sized punctures. Postdiscal bulbs very small. Caudal bulbs weakly developed; external protrusion no divided from median and internal which are fused into one and visible as large elongate bulb with very weak sinuation between them. Pygidium with elevated area basally; medially with relatively deep grooves on sides.

Macropterous.

Venter matt, brownish black (Fig. 5). Meso-metaventral plate flat, with distinct, relatively shallow, wide median impression in basal 2/3; relatively densely covered by medium sized

punctures bearing very thin macrosetae. Abdomal ventrites separated by relatively large, irregular in shape impressed sutures.

Legs sturdy, matt, with a lot of small punctured with erected short setae. Meso- and metafemora without teeth. All femora with dense, not so fine, quite regular punctation bearing very thin macrosetation. Protibia tridentate apically, straight. Meso- and metatibiae narrow at base, next regularly widened, widest before middle of length, and next sinuate to apex, with large, flattened, inwardly bent apical spine there.

Sexual dimorphism. Characteristic of the genus and occur in characteristic shape of the meso- and metatibiae which are more sinuate and bearing large, flattened, inwardly bent apical spine there. Small differences are visible on pygidium and last abdominal ventrite.

Variability. Body length from 4.5 to 6.0 mm. Punctation of head, pronotum and elytral intercostae is weakly variable in size and density. Sinuation between median and internal caudal bulbs can be more or less distinct, but always visible.

Etymology. Toponymic; an adjective derived from the name of Bali Island, where the new species was collected.

Affinity. Due to: small body size and weakly developed caudal bulbs, *R. baliensis* sp. nov. can only be confused with *R. helophoroides* Fairmaire, 1893 and *R. kitanoi* Miyake, 1982 (of the species known till today). It is very easy to distinguish it from *R. helophoroides* due to the different punctation of the pronotum, the more distinctly triangular lateral lobes of the pronotum and the metatibiae in males, which are regularly expanded basally (in *R. helophoroides* the metatibiae have a different shape: the expansion is not regular: in the basal quarter the tibiae becomes much more distinctly expanded, and then there is a distinct cut-off point (compare figures 32 and 33). *R. kitanoi* has a less densely punctate clypeus (especially the clypeocentral disc), more distinctly developed longitudinal costae on the clypeocentral disc, a different, much less dense punctation of the pronotum and slightly less developed caudal bulbs. For more see discussion section.

***Rhyparus borneensis* sp. nov.**

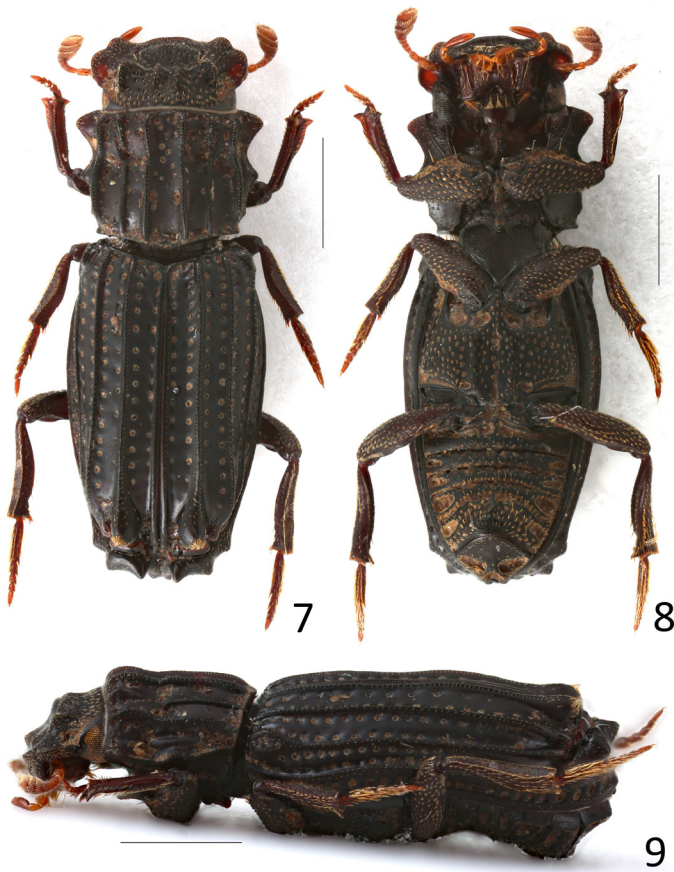
(Figs. 7-9, 24)

Type locality. Indonesia, Borneo Island, S Kalimantan, Kandangan district, 17 km NE Loksado.

Type material. Holotype (♂): Indonesia, S Kalimantan | Kandangan distr. | 17km NE Loksado | 23.ix.-30.x.1997 | St. Jákl lgt., (SJCP).

Description. Dorsum (Fig. 7). Body length of holotype 4.9 mm. Small in size for a member of the genus. Elongate-oval, shiny, brownishblack; except punctures, tops of costae and legs glabrous.

Head (Fig. 24) trapezoidal, clypeus anteriorly distinctly rounded, without teeth on sides, laterally distinctly emarginated and next with widely rounded angles, relatively distinctly



Figs. 7-9. *Rhyparus borneensis* sp. nov., ♂, holotype: 7- dorsal view; 8- ventral view; 9- lateral view. Figs. 7-9: scale lines: 1.0 mm.

separated from distinctly protruding than eyes, rounded genae. Clypeocentral disc distinctly convex, ringed by deep groove, with pair of indistinct, moderately convex, oval tubercles. Clypeocentral disc moderately densely punctate. Frons with four short, relatively narrow longitudinal costae. Punctuation of head moderately dense, regular, all punctures bearing short macrosetae.

Pronotum transverse, with six distinct, costae and seven longitudinal intercostae; on each side of costae there is row of short and small yellowish macrosetae. Lateral margin with two distinctly protruding lobes; anterior lobes sharply triangular, more developed than quite sharply triangular posterior. Paramedian costae continuous, weakly sinuate in apical half. Discolateral costae continuous, almost parallel. All intercostae basally without punctation, apically almost without punctation.

Scutellum almost imperceptible.

Elytra elongate, relatively wide, widest before the middle. Each elytron with five distinct costae and five intercostae; on each side of costae there is row of short and small yellowish macrosetae. Fourth costae widened basally; covered by relatively dense, moderately large

punctures. Intercostae flat, all of them with two rows of medium sized punctures. Postdiscal bulbs moderately large. Caudal bulbs very distinctly developed; external protrusion very distinctly divided from median and internal which are very distinctly divided each other too. Pygidium with elevated area basally; medially with relatively deep grooves on sides.

Macropterous.

Venter matt, brownish black (Fig. 9). Meso-metaventral plate flat, with distinct, relatively shallow, narrow median impression in basal third; relatively densely covered by small sized punctures bearing very thin macrosetae. Abdomal ventrites separated by relatively large, irregular in shape impressed sutures.

Legs sturdy, matt, with a lot of small punctured with erected short setae. Mesofemora with two indistinct teeth on basal border; metafemora without teeth there. All femora with dense, not so fine, quite regular punctation bearing very thin macrosetation. Protibia tridentate apically, straight. Meso- and metatibiae narrow at base, widest before middle of length, and next sinuate to apex, with large, flattened, inwardly bent apical spine there.

Sexual dimorphism. Unknown. Probably characteristic of the genus. Shape of the male meso- and metatibiae is characteristic of other males in the genus.

Variability. Unknown.

Etymology. Toponymic; an adjective derived from the name of Borneo Island, where the new species was collected.

Affinity. Due to: small size of body for a member of the genus, pronotal intercostae basally without punctation and so distinctly developed caudal bulbs it is very characteristic member of the genus. Easily distinguishable from all other known species. For more see the discussion section.

Rhyparus garo sp. nov.

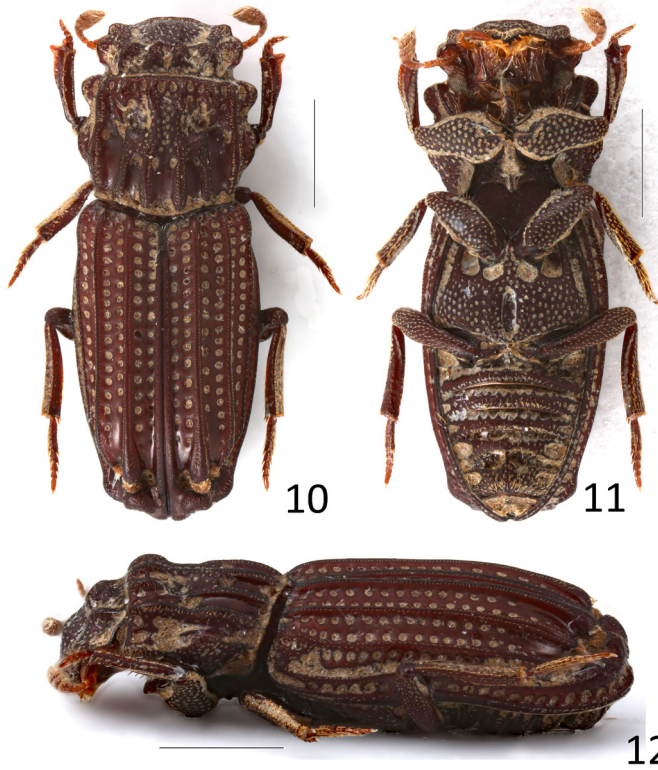
(Figs. 10-12, 25)

Type locality. India, Meghalaya State, West Garo Hills, Nokrek National Park.

Type material. Holotype (♀): NE India, Meghalaya state | West Garo Hills, Nokrek Nat. Park | 9-17.v.1996 alt. 1100 +/-150m | GPS N25°29.6', E90°19.5' (WGS 84) | E. Jendek & O. Šauša leg., (SJCP).

Description. Dorsum (Fig. 10). Body length of holotype 4.8 mm Small in size for a member of the genus. Elongate-oval, shiny, reddishbrown; except punctures, tops of costae and legs glabrous.

Head (Fig. 25) trapezoidal, clypeus anteriorly widely rounded, without teeth on sides, laterally distinctly emarginated and next with widely rounded angles, distinctly separated from distinctly more protruding than eyes, rounded genae. Clypeocentral disc distinctly convex, ringed by deep groove, with pair of very indistinct, very weakly convex, somewhat longitudinal tubercles. Clypeocentral disc relatively sparsely, distinctly coarsely punctate.



Figs. 10-12. *Rhyparus garo* sp. nov., ♀, holotype: 10- dorsal view; 11- ventral view; 12- lateral view. Figs. 10-12: scale lines: 1.0 mm.

Frons with four short, relatively narrow longitudinal costae. Punctuation of head regular, all punctures bearing short macrosetae.

Pronotum transverse, with six distinct, costae and seven longitudinal intercostae; on each side of costae there is row of short and small yellowish macrosetae. Lateral margin with two distinctly protruding lobes; anterior lobes distinctly rounded, similarly developed as broadly rounded posterior. Paramedian costae continuous, but much lower in anterior third, before apex, weakly sinuate in lowered part. Discolateral costae relatively widely interrupted in apical half. Median intercosta without punctuation basally, with relatively dense, medium sized punctures in apical part; lateral intercostae almost without punctures.

Scutellum almost imperceptible.

Elytra elongate, relatively wide, widest before the middle. Each elytron with five distinct costae and five intercostae; on each side of costae there is row of short and small yellowish macrosetae. Fourth costae widened basally; covered by relatively dense, moderately large punctures. Intercostae flat, all of them with two rows of large punctures. Postdiscal bulbs relatively small. Caudal bulbs weakly developed; external protrusion weakly divided from median and internal which are fused into one and visible as one transverse, weakly sinuate in the middle bulb. Pygidium with elevated area basally; medially with relatively deep grooves on sides.

Macropterous.

Venter matt, reddish brown (Fig. 11). Meso-metaventral plate flat, with distinct, relatively shallow, wide median impression in basal 2/3; relatively densely covered by medium sized punctures bearing very thin macrosetae. Abdomal ventrites separated by relatively large, irregular in shape impressed sutures.

Legs sturdy, matt, with a lot of small punctured with erect short macrosetae. Mesofemora with two very indistinct teeth on basal border; metafemora without teeth there. All femora with dense, not so fine, regular punctation bearing very thin macrosetation. Protibia tridentate apically, straight. Meso- and metatibiae narrow at base, widest before middle of length, and next parallel till the apex.

Sexual dimorphism. Unknown. Probably characteristic of the genus. Shape of the female meso- and metatibiae is characteristic of other females in the genus.

Variability. Unknown.

Etymology. Toponymic; an adjective derived from the name of Garo Hills in India, where the new species was collected.

Affinity. Due to: the lack of punctation in the basal part of the pronotal intercostae and the weakly developed caudal bulbs among continental Asian species, it is possible to confuse the newly described species only with: *R. chinensis* Balthasar, 1952, *R. semikitanoi* Ochi, Kon & Kawahara, 2018 and *R. nahangensis* Minkina & Král, 2022, all of which form a group of very similar species. It is not easy to distinguish by comparing to the complex of features between species, so we propose a comparison with individual species as below:

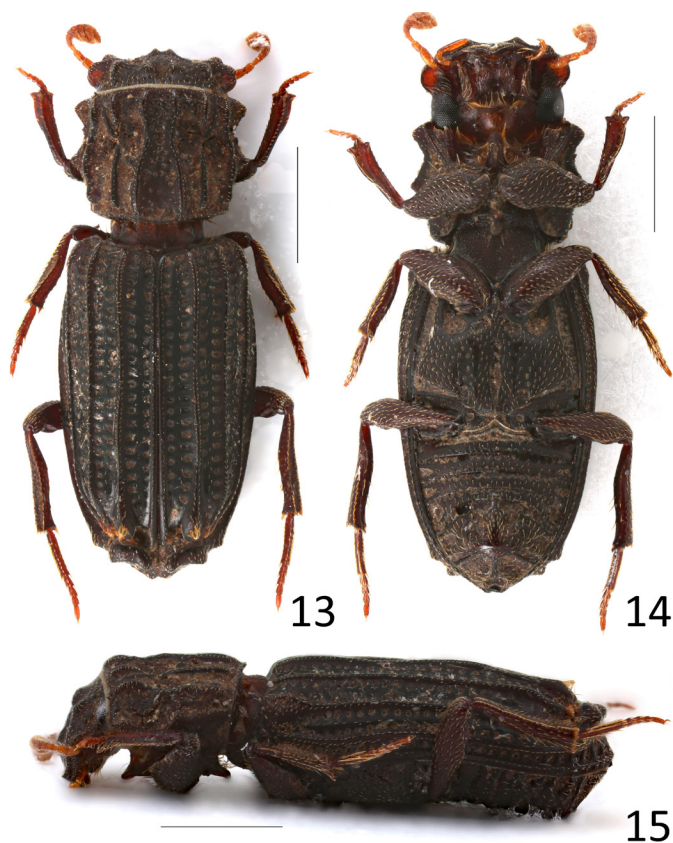
- *Rhyparus garo* sp. nov. from *R. chinensis* can be distinguished by: much more densely and coarsely punctate clypeocentral disc, with much lower longitudinal tubercles there, pronotum proportionally wider, with its lateral lobes with similar width (*R. chinensis* has wider anterior lobes), more distinctly developed caudal bulbs;
- *Rhyparus garo* sp. nov. from *R. semikitanoi* can be distinguished by: pronotum proportionally wider, with lateral lobes widely rounded with not so distinct sinuation between them (vs. lateral lobes sharply, triangularly developed, with distinct sinuation between them);
- *Rhyparus garo* sp. nov. from *R. nahangensis* can be distinguished by: caudal bulbs more distinctly developed, with much more distinct sinuation between external protrusion and weak sinuation between of median and internal protrusion.

***Rhyparus javanus* sp. nov.**

(Figs. 13-15, 26, 33)

Type locality. Indonesia, Java Island, East Java province, Mt. Argopuro, Bermi.

Type material. Holotype (♂): Indonesia | East Java pr., Mt. Argopuro, | Bermi vill. env. | xii.2018, 1000m. | local collector, (SJCP). Paratypes: (2 exx.): the same as holotype, (1 ex. SJCP, 1 ex. ISEA); (1 ex.): Indonesia, West Java | Gede - Panggrango N.P. | Mt. Kencana north slopes | 15-18.iii.2007, St. Jakl lgt., (SJCP).



Figs. 13-15. *Rhyparus javanus* sp. nov., ♂, holotype: 13- dorsal view; 14- ventral view; 15- lateral view. Figs. 13-15: scale lines: 1.0 mm.

Description. Dorsum (Fig. 13). Body length of holotype 4.8 mm. Small in size for a member of the genus. Elongate-oval, except of preapical parts of elytra, inner part of legs and strongly convex elements as costae - weakly matt, brownish black; except punctures, tops of costae and legs glabrous.

Head (Fig. 26) trapezoidal, clypeus anteriorly sinuate, with distinct teeth on sides, laterally distinctly emarginated and next with widely rounded angles, relatively distinctly separated from distinctly protruding than eyes, rounded genae. Clypeocentral disc distinctly convex, ringed by deep groove, with pair of distinct, moderately convex, distinctly longitudinal tubercles. Clypeocentral disc moderately densely punctate. Frons with four short, relatively narrow longitudinal costae. Punctuation of head moderately dense, regular, all punctures bearing short macrosetae.

Pronotum transverse, with six distinct, costae and seven longitudinal intercostae; on each side of costae there is row of short and small yellowish macrosetae. Lateral margin with two distinctly protruding lobes; anterior and posterior lobes sharply triangular, both similarly developed. Paramedian costae continuous, weakly sinuate in apical half. Discolateral costae relatively widely interrupted in apical half, sinuate nearby. Median intercosta with only very few punctures basally; the rest of intercostae without punctures there.

Scutellum almost imperceptible.

Elytra elongate, relatively wide, widest before the middle. Each elytron with five distinct costae and five intercostae; on each side of costae there is row of short and small yellowish macrosetae. Fourth costae widened basally; covered by relatively dense, moderately large punctures. Intercostae flat, all of them with two rows of medium sized punctures. Postdiscal bulbs relatively small. Caudal bulbs distinctly developed; external protrusion distinctly divided from median and internal which are distinctly divided. Pygidium with elevated area basally; medially with relatively deep grooves on sides.

Macropterous.

Venter matt, brownish black (Fig. 14). Meso-metaventral plate flat, with distinct, relatively shallow, wide median impression in basal 2/3; relatively densely covered by medium sized punctures bearing very thin macrosetae. Abdomal ventrites separated by relatively large, irregular in shape impressed sutures.

Legs sturdy, matt, with a lot of small punctured with erect short setae. Meso- and metafemora without teeth on basal border. All femora with dense, not so fine, quite regular punctation bearing very thin macrosetation. Protibia tridentate apically, straight. Meso- and metatibiae narrow at base, next regularly widened, widest before middle of length, and next sinuate to apex, with large, flattened, inwardly bent apical spine there.

Sexual dimorphism. Characteristic of the genus and occurring in the characteristic shape of the meso- and metatibiae which are more sinuate in males and bearing large, flattened, inwardly bent apical spine there. Small differences are visible on pygidium and last abdominal ventrite.

Variability. Body length from 4.8 to 6.0 mm. Punctation in basal part of pronotal median intercosta may be variable: from an almost total lack of punctures to over a dozen punctures there. Punctation of head is very weakly variable. Sinuation between median and internal caudal bulbs can be more or less distinct.

Etymology. Toponymic; an adjective derived from the name of Java Island, where the new species was collected.

Affinity. Due to its small body size and the punctation in basal part of pronotal intercostae (in some specimens) with punctation, *R. javanus* sp. nov. can only be confused with *R. helophoroides* Fairmaire, 1893 (of the species known till today). In any case, it is very easy to distinguish *R. javanus* sp. nov. due to the more distinctly triangular lateral lobes of the pronotum, the clearly developed caudal bulbs and the metatibiae in males, which are regularly expanded basally (in *R. helophoroides* metatibiae have a different shape: the expansion is not regular: in the basal quarter of the tibiae it becomes much more distinctly expanded, and then there is a distinct cut-off point (compare figures 31 and 33)). For more see discussion section.

***Rhyparus kazirangensis* sp. nov.**
(Figs. 16-18, 27)

Type locality. India, Assam State, Kaziranga National Park.

Type material. Holotype (♀): I-Assam 12-15.v. | Kaziranga nat. pres. | 1991, (SJCP). Paratype (♀): NE India, S Mizoram st. | Lawnglai distr., Ngengpuikai vill. | Ngeng Pui N. P., 120 - 350 m alt. | 20.iv. - 9.v.2017, (ISEA).

Description. Dorsum (Fig. 16). Body length of holotype 5.4 mm Small-moderate in size for a member of the genus. Elongate-oval, except of preapical parts of elytra, inner part of legs and strongly convex elements as costae - matt, brownish black; except punctures, tops of costae and legs glabrous.

Head (Fig. 27) trapezoidal, clypeus anteriorly truncate, with indistinct teeth on sides, laterally distinctly emarginated and next with widely rounded angles, relatively distinctly separated from distinctly protruding than eyes, rounded genae. Clypeocentral disc distinctly convex, ringed by deep groove, with pair of very indistinct, weakly convex, somewhat longitudinal tubercles. Clypeocentral disc densely punctate. Frons with four short, relatively narrow longitudinal costae. Punctuation of head dense, regular, all punctures bearing short macrosetae.

Pronotum transverse, with six distinct, costae and seven longitudinal intercostae; on each side of costae there is row of short and small yellowish macrosetae. Lateral margin with two distinctly protruding lobes; anterior lobes sharply triangular, much more developed than broadly triangular posterior. Paramedian costae continuous, weakly sinuate in apical half. Discolateral costae relatively widely interrupted in apical half. All intercostae with dense, medium sized punctures.

Scutellum almost imperceptible.

Elytra elongate, relatively wide, widest before the middle. Each elytron with five distinct costae and five intercostae; on each side of costae there is row of short and small yellowish macrosetae. Fourth costae widened basally; covered by relatively dense, moderately large punctures. Intercostae flat, all of them with two rows of medium sized punctures. Postdiscal bulbs relatively small. Caudal bulbs weakly developed; external protrusion quite distinctly divided from median and internal which are fused into one and visible as large elongate bulb. Pygidium with elevated area basally; medially with relatively deep grooves on sides.

Macropterous.

Venter matt, brownish black (Fig. 17). Meso-metaventral plate flat, with distinct, relatively shallow, wide median impression in basal 2/3; relatively densely covered by small sized punctures bearing very thin macrosetae. Abdomal ventrites separated by relatively large, irregular in shape impressed sutures.

Legs sturdy, matt, with a lot of small punctured with erected short setae. Mesofemora with two distinct teeth on basal border; metafemora without teeth there. All femora with dense, not so fine, quite regular punctation bearing very thin macrosetation. Protibia tridentate apically, straight. Meso- and metatibiae narrow at base, widest before middle of length, and next straight to apex.



Figs. 16-18. *Rhyparus kazirangensis* sp. nov., ♀, holotype: 16- dorsal view; 17- ventral view; 18- lateral view. Figs. 16-18: scale lines: 1.0 mm.

Sexual dimorphism. Unknown. Probably characteristic of the genus. Shape of the female meso- and metatibiae is characteristic of other females in the genus.

Variability. Punctuation of pronotum is very weakly variable in its density.

Etymology. Toponymic; an adjective derived from the name of Kaziranga National Park in India, where the holotype of the new species was collected.

Affinity. Due to: dense punctuation in basal part of pronotal intercostae and caudal bulb weakly developed (but with still distinctly visible sinuation between external and medio-internal protrusion) there is no similar species in continental Asia. The species, due to anterior lateral lobes of pronotum much more distinctly developed than posterior and dense punctuation in basal part of pronotal intercostae, is most similar (and probably closely related) to *R. merkli* Minkina & Anichtchenko, 2022, *R. denticollis* Fairmaire, 1893 and *R. mindanaoensis* Anichtchenko et al., 2022. In any case, it is slightly smaller than all the others, which are clearly medium-sized species, with much less distinctly developed caudal bulbs (relatively weaker sinuation between external protrusion and lack of sinuation between median and internal protrusion, which are unique). In addition, *R. kazirangensis* sp. nov. has less distinctly developed lateral lobes of pronotum than all the species mentioned.

***Rhyparus obiensis* sp. nov.**
(Figs. 19-21, 28, 30)

Type locality. Indonesia, C Mollucas, Obi Island - southern part, Mts. Seribu, Tapaya, cca 22km N of S coast.

Type material. Holotype (♀): Indonesia, C Mollucas | Obi Isl - south, 950 m alt | Mts. Seribu, Tapaya vill. | cca 22km N of S coast | 22.v-9.vi.2008 St. Jakl lgt., (ISEA). Paratypes: (9 exx.): the same as holotype, (5 exx. SJCP; 4 exx. ISEA); (4 exx.): Indonesia, C. Millucas | Obi Isl - south coast | Seribu Mts, 1200-1500m | 22km N of Tapaya vill | 20.xi-10.xii.2008 st Jakl lgt., (3 exx. SJCP, 1 ex. ISEA).

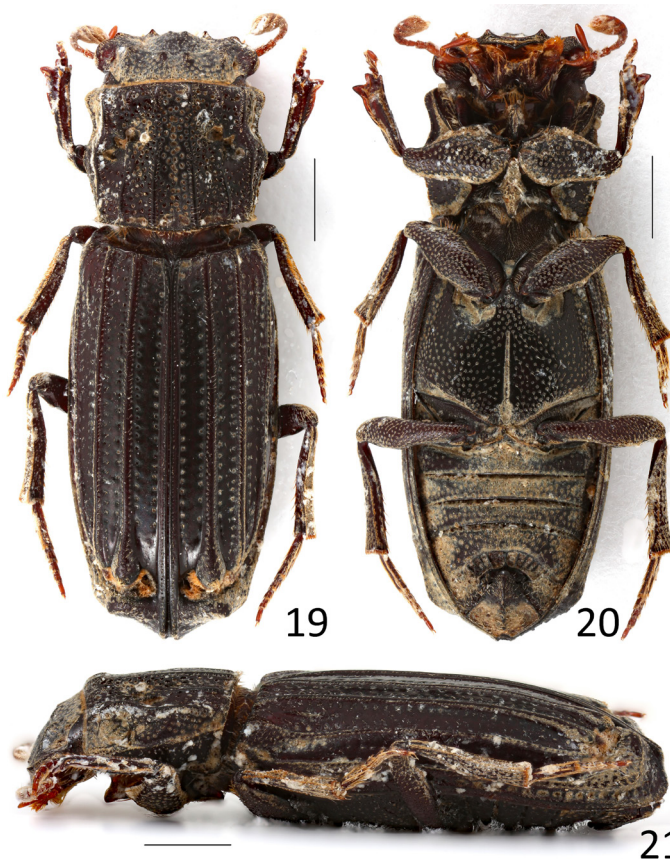
Description of the holotype. Dorsum (Fig. 19). Length: 7.6 mm; maximum width: 2.6 mm. Body large-sized for members of this genus, elongate, not so distinctly convex, flattened in central part; weakly shiny; apparently almost glabrous, though partly clothed with very small yellowish macrosetae on head and all longitudinal costae on pronotum and elytra. Brownish to dark brown; antennae, tarsomeres and mouth parts pale brown.

Head (Fig. 28) weakly shiny, tops of costae distinctly shiny; transversely sub-hexagonal; clypeus trapezoidal in outline, anteriorly truncate, on sides distinctly upturned as obtuse, quite distinct tooth, and later sinuous on either side; genae distinctly more excavate than eyes; clypeal disc distinctly convex, ringed by a deep groove; convexity with a pair of very indistinct, very low ridges; nearly on whole surface with distinct, fine punctures bearing small macrosetae. Frons with four distinct, longitudinal ridges with similar structure as ridges on clypeal convexity. Head covered by quite regularly spaced, not so dense, not fine punctures bearing small macrosetae.

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

Scutellum almost imperceptible.

Elytra weakly 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 macrosetae. Preapical glandular area relatively small. Intercostae first to fourth with two distinct rows of punctures; intercostae second to fourth with one row of quite irregularly spaced, very fine punctures between of rows of distinct punctures; on third intercostae there is very short additional costae with very short additional row of punctures here. 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 mediointernal caudal bulbs distinctly divided; medio-internal caudal bulb shortened, visible as transversely rounded bulb.



Figs. 19-21. *Rhyparus obiensis* sp. nov., ♀, holotype: 19- dorsal view; 20- ventral view; 21- lateral view. Figs. 19-21: scale lines: 1.0 mm.

Pygidium (Fig. 30) with dense, irregularly spaced punctation, with weak longitudinal rib in the

middle and deep excision on its sides; with distinctly longitudinal apex in the shape of volcano with narrow, truncate top.

Venter (Fig. 20) matt. Meso-metaventral plate flattened in the middle, with distinct, narrow, quite deep longitudinal furrow; punctation of meso-metaventral plate dense, quite regularly spaced, medium sized; all punctures bearing short macrosetae. Abdominal ventrites matt, on sides with rows of punctures; with an additional punctured furrow in basal part. Last abdominal ventrite with dense punctures, which are about one and half time larger than on last but one ventrite; in basal half in the middle part with very deep cavity in the shape of longitudinal rows; in apical part in the middle with very deep groove, clearly located much below apex of pygidium. Meso- and metafemora with two very indistinct tubercles on lower border; all femora shiny, with regular, very distinct, rather small, very dense punctation; all punctures bearing small macrosetae.

Sexual dimorphism. Characteristic of the genus and occurring in characteristic shape of the meso- and metatibiae which are more sinuate and bearing large, flattened, inwardly bent apical spine there. Shape of pygidium and last abdominal ventrite in females is unique.

Variability. Body length from 6.5 to 9.0 mm. Intercostae are relatively more or less weakly shiny. Punctuation of clypeus and pronotum is more or less variable. Median row of punctures on third elytral intercostae weakly variable in length.

Etymology. Toponymic; an adjective derived from the name of Obi Island, where the new species was collected.

Affinity. *R. obiensis* sp. nov. belongs to a group of species with a modified pygidium and last abdominal ventrite in females - making it unique and easily distinguishable from all other known species worldwide. The shape of the pygidium in the female is most similar to *R. fijiensis* Minkina et al., 2022. *R. obiensis* sp. nov. can be distinguished from the aforementioned species by a much less shiny body, pronotum with slightly more coarse punctuation, more distinctly and frequently developed additional rows of fine punctures on the second and third elytral intercostae, less coarse punctuation of the meso-metaventral plate, two much less developed teeth on the lower border of the mesotibia, etc. See discussion section for more details and information.

FAUNISTIC PART

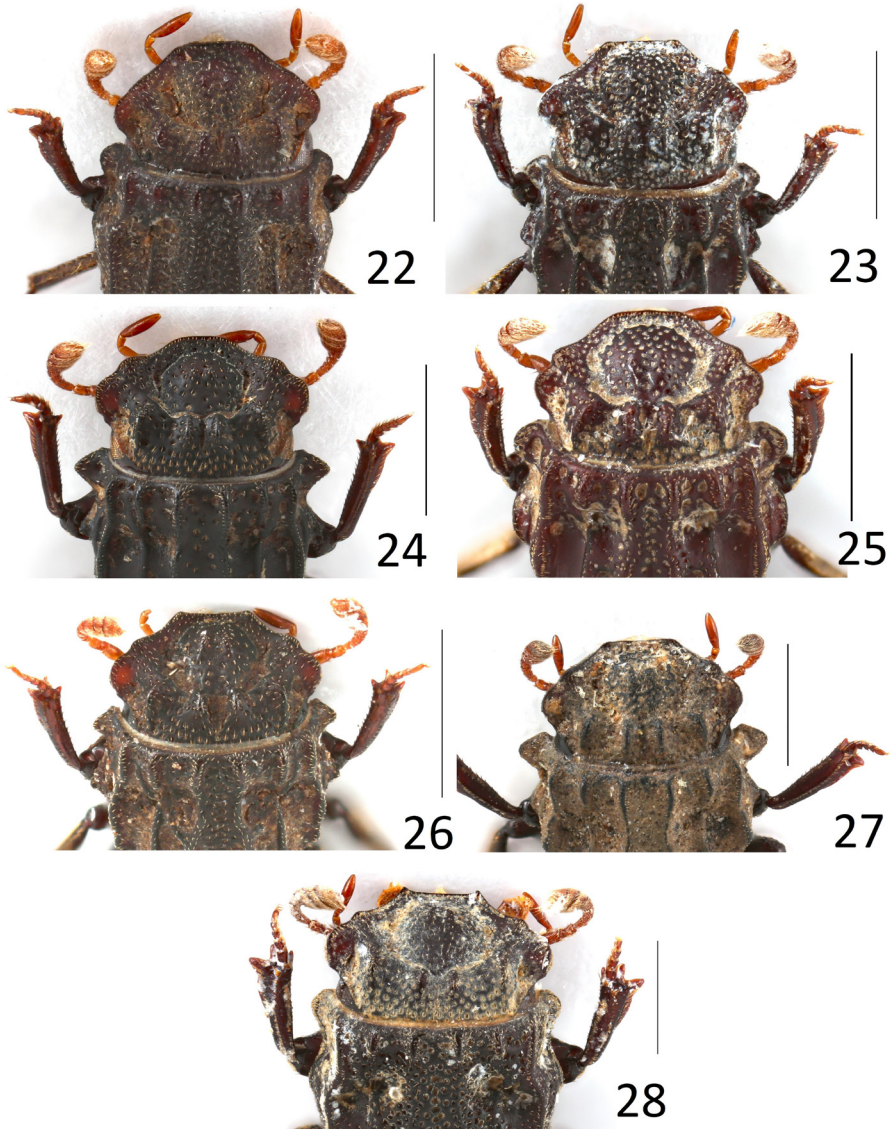
R. helophoroides Fairmaire, 1893

(Fig. 31)

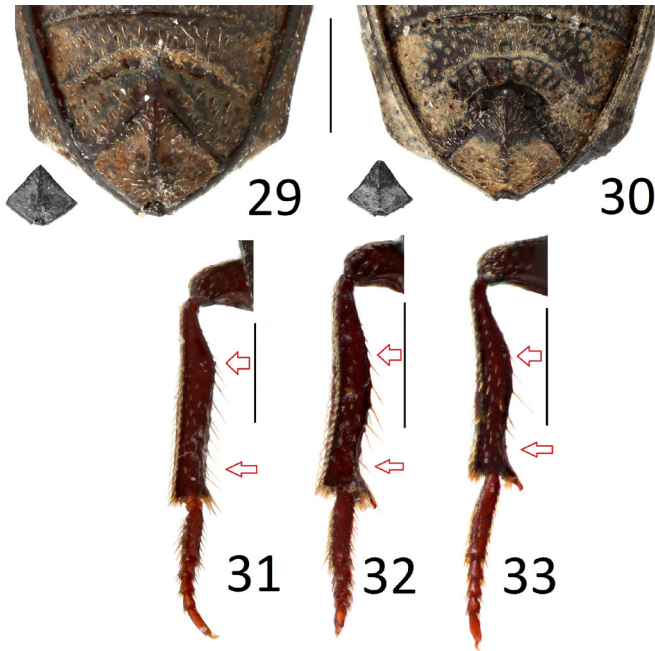
Photographed specimen. Philippines, Mindanao, Dominorog, Bukidnon, iv.2019, local coll., (ISEA).

Additional important material examined: 5 exx.: Indonesia, N Mollucas, Bacan Island, SE slope of Mt. Sibela, 5 km SE of Makian vill., 500-750 m. 2.-12.v.2008, leg. Stanislav Jákl, (4 exx. SJCP, 1 ex. ISEA); 1 ex.: Indonesia, C Millucas, Obi Island - south, Mounts Seribu, Tapaya vill., cca 22 km N of S coast, 950 m., 22.v.-9.vi.2008, leg. Stanislav Jákl, (SJCP); 2 exx.: Indonesia, C Sulawesi, Poso, 7km SW Tambarana, 1-400m., 11.-16.iv.1999, leg. Zábranský, (SJCP, ISEA); 4 exx.: Indonesia, C-Sulawesi, Poso, 5-10km SW Tambarana, 1-400m., leg. Bečvář & Zábranský, (1 ex. SJCP, 1 ex. ABCP, 2 exx. ISEA); 8 exx.: Indonesia, Bali Island, Tamblingan Lakes National Reserve, 1000-1500 m., 2.-17.ii.2004, leg. Stanislav Jákl, (5 exx. SJCP, 3 exx. ISEA); 1 ex.: W Timor, Buraen env., 50 km south of Kupang, 350 m., 26.i-9.ii.2006, lgt. Stanislav Jákl, (SJCP).

Short comment. This records change almost nothing in the known distribution, in any case we present first records for the islands of: Bacan, Bali, Obi, Sulawesi and Timor. More importantly, *R. helophoroides* can be (and was here) collected with other similar species such as: *R. baliensis* sp. nov. For this reason, the series of *R. helophoroides* from known localities should be reviewed to see if the specimens caught labelled as *R. helophoroides* may in fact represent other, still undescribed species.



Figs. 22-28. Heads of holotypes: 22- *Rhyparus argopuroensis* sp. nov.; 23- *R. baliensis* sp. nov.; 24- *R. borneensis* sp. nov.; 25- *R. garo* sp. nov.; 26- *R. javanus* sp. nov.; 27- *R. kazirangensis* sp. nov.; 28- *R. obiensis* sp. nov.. Figs. 22-28: scale lines: 1.0 mm.



Figs. 29-33. Details of morphology: 29- pygidium of *Rhyparus argopuroensis* sp. nov., ♀, holotype; 30- pygidium of *R. obiensis* sp. nov., ♀, holotype; 31- metatibia of *R. helophoroides* Fairmaire, 1893, ♂; 32- metatibia of *R. baliensis* sp. nov., ♂, holotype; 33- metatibia of *R. javanus* sp. nov., ♂, holotype. Figs. 29-33: scale lines: 0.5 mm.

DISCUSSION

Rhyparus argopuroensis sp. nov. and *R. obiensis* sp. nov. are members of group of species where females have a modified pygidium. Females of those species are immediately distinguishable by the shape of the pygidium and last abdominal ventrites, very often combined with unique features. Males, on the other hand, are very similar to each other and only some of them are easily distinguishable. Therefore, to facilitate species identification, in addition to the most important features included in the affinity section, the authors have taken all important features in the table below. For comparison, use Tables 1 and 2 from: Minkina et al. 2022.

Table 1. Differentiation of *Rhyparus* species with modified pygidium and last ventrite in females.

species / character	<i>R. argopuroensis</i> sp. nov.	<i>R. obiensis</i> sp. nov.
shine	all costae shiny, all intercostae matt	all costae shiny, all intercostae weakly shiny
the degree of elongation of the body	very distinctly elongate	distinctly elongate
lateral lobes of pronotum	weakly developed, situation between them not distinct	weakly developed, situation between them not distinct

anterior lobes of pronotum	rounded, slightly lower than posterior	rounded, with similar high as posterior
posteriori lobes of pronotum	widely, regularly rounded	widely, regularly rounded
punctuation median intercostae of pronotum	dense, distinctly concentrate in the middle into longitudinal line, punctures coarse	dense, distinctly concentrate in the middle into longitudinal line, punctures coarse
convexity and width of elytral costae	distinctly convex, narrow	distinctly convex, narrow
additional rows of fine punctures on elytral intercostae - between main rows	distinct rows observed on all intercostae	additional punctures visible on first intercostae, distinct rows observed on second and third intercostae
median row of punctures on third elytral intercostae	very short, about 1/5 of total length, then sparsely distributed, much smaller punctures till apex	very short, about 1/5 of total length
pygidium of females	with apex in the shape of distinct triangle Fig. 29	with apex in the shape of volcano with narrow, truncate top Fig. 30
additional unique characters	weak sinuation between external and medio-internal elytral caudal bulbs is unique for the group	-
distribution	Indonesia: Java Island	Indonesia: Moluccas: Obi Island

Rhyparus baliensis sp. nov, *R. borneensis* sp. nov, *R. javanus* sp. nov. together with *R. adebratti* Bordat, 1996, *R. denticollis* Fairmaire, 1893, *R. helophoroides* Fairmaire, 1893, *R. kitanoi kitanoi* Miyake, 1982 and *R. kitanoi taiwanus* Ochi, 2001, form a group of small to medium-sized species with distinctly developed, triangular-shaped pronotum lateral lobes found in southeastern insular Asia and Oceania. In addition, *R. minor* Paulian, 1989 and *R. pseudominor* Bordat, 1996 are small species that share the same shape of the pronotum lateral lobes - however, they form a different group, have different body proportions, are much more 'plump', and have much shorter and wider elytra - making them evolutionarily distant from the others, somewhat similar in general appearance to representatives of the genus *Termitodiellus* Nakane, 1961. To facilitate identification between species, all those listed in the tables below have been taken.

Table 2. Differentiation of small/medium sized *Rhyparus* species with distinctly developed triangular lateral lobes of pronotum, which occur on South-East, Island part of Asia and Oceania - part 1.

species / character	<i>R. adebratti</i> Bordat, 1996	<i>R. baliensis</i> sp. nov.	<i>R. borneensis</i> sp. nov.	<i>R. javanus</i> sp. nov.
punctuation of median intercosta of pronotum	densely punctate on whole surface	very densely punctate on almost whole surface; basally with not so high area without punctures	almost without punctures; basally without punctures	with quite dense punctures concentrate mainly in the middle; basally almost without punctures
punctuation of basal part of second and third pairs of intercostae of pronotum	densely punctate	without punctures	without punctures	almost without punctures
sinuation between external and medio-internal caudal bulbs	very distinct	lack of sinuation there	very distinct	distinct
metatibiae of males	regularly sinuate basally and apically	regularly sinuate basally and apically (see Fig. 32)	female unknown	regularly sinuate basally and apically (see Fig. 33)
distribution	Borneo Island	Bali Island	Borneo Island	Java Island

Table 3. Differentiation of small/medium sized *Rhyparus* species with distinctly developed triangular lateral lobes of pronotum, which occur on South-East, Island part of Asia and Oceania - part 2.

species / character	<i>R. denticollis</i> Fairmaire, 1893	<i>R. helophoroides</i> Fairmaire, 1893	<i>R. kitanoi kitanoi</i> Miyake, 1982	<i>R. kitanoi taiwanus</i> Ochi, 2001
punctuation of median intercosta of pronotum	densely punctate on whole surface	with quite dense punctures concentrate mainly in the middle; basally similarly	with quite dense punctures concentrate mainly in the middle; basally without punctures	with quite dense punctures concentrate mainly in the middle; basally without punctures
punctuation of basal part of second and third pairs of intercostae of pronotum	densely punctate	without punctures	without punctures	without punctures

sinuation between external and medio-internal caudal bulbs	distinct	more or less distinct	lack of sinuation there	lack of sinuation there
metatibiae of males	regularly sinuate basally and apically	in the basal quarter distinctly expanded, and then there is a distinct cut-off point; apically straight with no sinuation (see Fig. 31)	regularly sinuate basally and apically (see: Kawai et al. 2005)	regularly sinuate basally and apically
distribution	Java, Sumatra, Borneo	widely distributed, for more see: Anichtchenko et al. 2021	Japan	Taiwan, China (Guangdong, Fujian)

What is important and worth noting - other small species of the genus *Rhyparus* may occur in Oceania simultaneously with *R. helophoroides*, which at first glance may be very similar, making it more necessary to focus on the identification of these small insects.

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