

## A revision of the *Entisberus* group (Hemiptera: Heteroptera: Rhyparochromidae)

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**Abstract.** The genus *Entisberus* Distant, 1903, and related genera are revised. *Neoentisberus* Scudder, 1968, syn. nov., is synonymized with *Retoka* China, 1935, and *Entisberus gibbus* Zheng, 1981 is transferred to *Retoka*, which results in the following new combinations: *Retoka brincki* (Slater, 1979) comb. nov., *R. callosa* (Scudder, 1968) comb. nov., *R. esakii* (Slater & Hidaka, 1958) comb. nov., *R. gibba* (Zheng, 1981) comb. nov., and *R. indica* (Scudder, 1968) comb. nov. Five new species belonging to the *Entisberus* group (defined here as a group containing the genera *Entisberus* and *Retoka*) are described: *Entisberus bergrothi* sp. nov. (Philippines), *Retoka hirsuta* sp. nov. (Philippines, Borneo), *R. curvipes* sp. nov. (Malaysia), *R. stysi* sp. nov. (Vietnam), and *R. paraminuta* sp. nov. (India: West Bengal). A key for the identification of species in the *Entisberus* group is presented, and new distributional data of previously described species from India, China, Taiwan, Vietnam, Malaysia, Indonesia and New Guinea are given.

**Key words.** Heteroptera, Rhyparochromidae, Drymini, *Entisberus*, *Neoentisberus*, *Retoka*, taxonomy, new species, key, distribution, Oriental Region

### Introduction

The Drymini are one of most diverse tribes within the family Rhyparochromidae, being especially speciose in the Oriental Region (SLATER 1964, SLATER & O'DONNELL 1995). The numerous genera belonging here are in many cases very dissimilar, and most of them are in need of a modern revision.

One of the most characteristic groups of Oriental Drymini contains the genera *Entisberus* Distant, 1903, *Retoka* China, 1935, and *Neoentisberus* Scudder, 1968. These three genera are morphologically quite similar, and there is little doubt that they are phylogenetically closely related.

SLATER & HIDAKA (1958) discussed the relationships of *Entisberus*. They pointed out that *Entisberus* may be related to *Dudia* Bergroth, 1918, *Rhodiginus* Distant, 1901, and perhaps

*Appoloni* Distant, 1901. However, having studied the above taxa as well as most other Oriental genera of the Drymini, *Appoloni* does not seem to be closely related to *Entisberus*; its close relationships with the other genera seems plausible (E. Kondorosy, unpubl. data). Other Oriental genera, e.g. *Chotekia* China, 1935, *Lemnius* Distant, 1904, *Thebanus* Distant, 1904, and the Ethiopian *Salaciola* Bergroth, 1906, as well as a few Australian ones (e.g. *Paradrymus* Bergroth, 1916) also seem to be related to *Entisberus*. Since the phylogenetic relationships within the Drymini are currently poorly understood, *Entisberus* and the two seemingly most closely related genera are treated in this paper.

The *Entisberus* group is defined here as containing *Entisberus* and *Retoka* (including *Neoentisberus* syn. nov.). These genera share the following characters: body short, strongly punctate, pronotum and scutellum invariably punctate, head small with large and protruding eyes, pronotum strongly declivous and strongly narrowing, with narrowly laminate lateral carina abruptly terminating basally, scutellum with well-developed Y-shaped elevation, clavus with three rows of punctures and fore femora unarmed or armed only with minute spines.

*Entisberus* was established by DISTANT (1903) to accommodate a single species, *E. archetypus* Distant, 1903, from Ceylon. Later SLATER & HIDAKA (1958) described another species, *E. esakii* Slater & Hidaka, 1958, from Japan. Both *E. archetypus* and *E. esakii* were reported and one new species, *E. gibbus* Zheng, 1981, was described from China (ZHENG & ZOU 1981).

*Retoka*, described from Sumatra (CHINA 1935), remained monotypic since its original description, containing only the type species *R. minuta* China, 1935.

SCUDDER (1968) established the genus *Neoentisberus* for *Entisberus esakii* and added two additional species: *N. callosus* Scudder, 1968 (from Sikkim and Burma) and *N. indicus* Scudder, 1968 (from Southern India). SLATER (1979) added *N. brincki* Slater, 1979 (from Sri Lanka).

## Material and methods

The label data are cited verbatim with data on different rows divided by a slash (/) and data on different labels by double slash (//); [hw] = preceding text handwritten, [pr] = preceding text printed (only if part of the label handwritten).

I have seen identified and unidentified specimens of *Entisberus* group from the following museums:

- BMNH Natural History Museum, London, United Kingdom;
- FMNH Finnish Museum of Natural History, Helsinki, Finland;
- HNHM Hungarian Natural History Museum, Budapest, Hungary;
- MMBC Moravian Museum, Brno, Czech Republic;
- NHRS Naturhistoriska Riksmuseet, Stockholm, Sweden;
- NMNS National Museum of Natural Science, Taichung, Taiwan;
- NHMW Naturhistorisches Museum, Wien, Austria;
- RMNH National Museum of Natural History (Naturalis), Leiden, the Netherlands.

## Results

There is no doubt that *Entisberus*, *Retoka*, and *Neoentisberus* are closely related. *Retoka* is very similar to *Neoentisberus* in several characters but is brachypterous with strongly

Table 1. Diagnostic characters for *Entisberus* Distant, 1903 and *Retoka* China, 1935, including *Neoentisberus* Scudder, 1968. Quotes from SCUDDER (1968).

<i>Entisberus</i>	<i>Retoka</i> (including <i>Neoentisberus</i> )
Body slightly less densely and less closely punctate	Body somewhat 'more densely and more closely punctate'.
Y-shaped scutellar elevation pale and impunctate	Y-shaped scutellar elevation 'not pale' ( <i>N. indicus</i> ) or only posterior part pale and impunctate
Costal margin of corium less sinuate	Costal margin of corium more sinuate
Fore femora usually unarmed	Fore femora usually 'armed' with 1-4 minute spines, sometimes (usually in females) unarmed
Abdominal venter with distinct median keel at least on sternites II-V	Abdominal venter without median keel
Pronotal and costal margin with a row of fine tubercles	Pronotal and costal margin usually without a row of fine tubercles
Inner surface of femora with a long row of very minute teeth	Inner surface of femora without a long row of very minute teeth
Distance between eye and base of antenna not more than half as long as length of one eye, antenniferous tubercle projecting outwards	Distance between eye and base of antenna more than half as long as length of one eye, if less than half as long, then antenniferous tubercle not projecting outwards

convex hemelytra and therefore appears almost round. *Retoka paraminuta* sp. nov. as well as *Retoka stysi* sp. nov., described in this paper, are intermediate between *Retoka* and typical members of *Neoentisberus*, and it is therefore impossible to draw a strict line between the two genera. Consequently, the following new synonymy is proposed: *Retoka* China, 1935 = *Neoentisberus* Scudder, 1968, syn. nov.

SCUDDER (1968) discussed the differences between *Entisberus* and *Neoentisberus*. Having studied several species of *Retoka* (including *Neoentisberus*), it is clear that the following Scudder's diagnostic characters of *Neoentisberus* cannot be maintained:

- i) body 'a little more robust' (both genera overlap: body length/width between 2.34 and 2.51 in *Entisberus* and between 1.99 and 2.73 (between 2.44 and 2.73 in four out of 22 investigated specimens) in *Retoka*);
- ii) 'posterior margin of the pronotum sinuate' (sometimes only very shallowly sinuate as in *Entisberus*, not considerably more);
- iii) 'callar areas of the pronotum distinctly punctate' (true in both genera).

Other characters recognized by SCUDDER (1968) as well as additional new diagnostic characters for *Entisberus* and *Retoka* are presented in Table 1.

### ***Entisberus* Distant, 1903**

*Entisberus* Distant, 1903: 74. Type species: *Entisberus archetypus* Distant, 1903 (by monotypy).

*Entisberus*: BERGROTH (1918): 103-105 (redescription).

*Entisberus*: SLATER (1964): 896 (catalogue).

***Entisberus archetypus* Distant, 1903**

(Figs. 1, 3, 14)

*Entisberus archetypus* Distant, 1903: 74. Sri Lanka.*Entisberus archetypus*: SLATER (1964): 896 (catalogue).

**Material examined.** **SRI LANKA:** Kelinkanda, Kukulegama area, 1.vii.1968, CMB-C11, Dr. J. Balogh leg. (♀, HNHM). **INDIA: MEGHALAYA:** West Garo Hills, Nokrek NP, 950-1250 m a.s.l., GPS N25°29'6" E90°19'5" (WGS84), 9.-17.v.1996, E. Jendek & O. Šauša leg. (♂, NHMW). **VIETNAM: NINH BINH PROV.:** Cuc phuong, No. 346, 12.v.1966, Topál leg. (♀, HNHM); **YEN BAI PROV.:** Minh Xuan, 300 m a.s.l., No. 189., 2.xii.1971, Topál & Matskási leg. (♂, HNHM). **MALAYSIA: PAHANG:** Cameron Highlands, Robinson Falls, montane rainforest, swept & beaten, No. 81, 23.iii.1995, O. Merkl leg. (♀, HNHM); **SABAH:** near Danum Valley Field C., ca. 150 m a.s.l., W0, Malaise trap 5, 5.-26.v.1987, RMNH '87, C. v. Achterberg & D. Kennedy leg. (♂, RMNH). **INDONESIA: C-SULAWESI:** 15-25 km S of Pendolo, Mayoa env., 7.-10.iv.1999, Bečvář and Záborský leg (♀, MMBC). **PAPUA NEW GUINEA:** Port Moresby, 6.-8. iv.1965, Nr. 17., Balogh & Szent-Ivány leg. (♀, HNHM).

**Measurements** (all in mm, both sexes, n = 5). Total body length 2.4-3.4. Head: length 0.35-0.52, width 0.60-0.75, interocular space 0.30-0.42. Pronotum: length 0.62-0.9, width at base 0.98-1.45. Scutellum length 0.48-0.70, length of claval commissure 0.15-0.28. Lengths of antennal segments I 0.22-0.38, II 0.38-0.55, III 0.28-0.42, IV 0.30-0.35. Lengths of labial segments I 0.25, II 0.25, III 0.15, IV 0.2.

**Variability.** The examined specimens are rather uniform except of some small differences in the colouration. In the single female from New Guinea, the lateral arms of the scutellar Y-shaped carina are punctate in its whole length while in other specimens the carina is punctate only around the middle. Since there are no other differences, this specimen is identified as *E. archetypus*. The paramere of *E. archetypus* appears to be very variable, e.g. the distal end can be much shorter or the basal lobes developed to a varying extent. This problem needs further investigation on a larger series of specimens.

**Distribution.** The species was originally described from Sri Lanka (DISTANT 1903) and subsequently recorded from Southwest China (ZHENG & ZOU 1981). New to the fauna of India (Meghalaya), Vietnam, Malaysia (Pahang, Sabah), Indonesia (Sulawesi), and New Guinea.

The record from the Philippines (BERGROTH 1918) is clearly based on misidentification (see note under *Entisberus bergrothi* sp. nov.).

***Entisberus bergrothi* sp. nov.**

(Figs. 2, 4, 15)

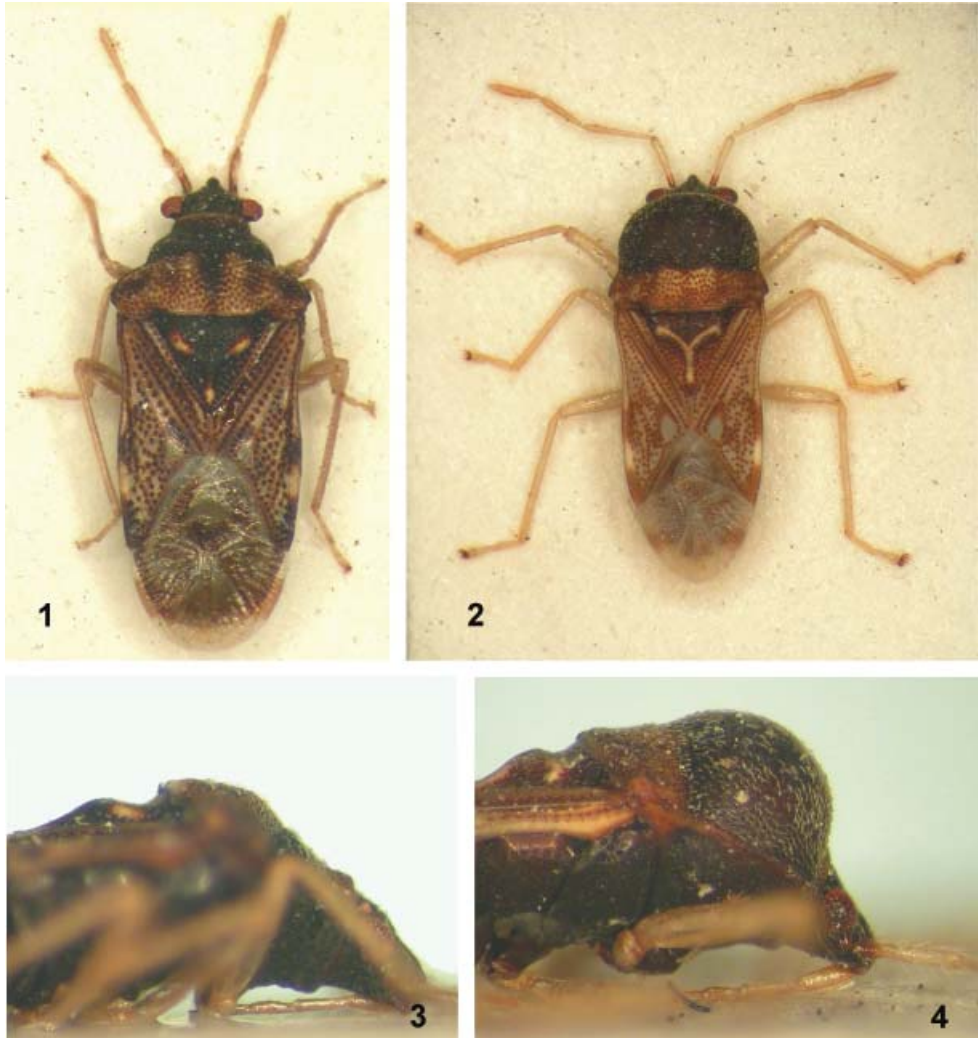
*Entisberus archetypus* (misidentification): BERGROTH (1918): 105 (redescription).**Type locality.** Philippines.

**Type material.** HOLOTYPE: ♂, 'Irri [pr], Hortorium [hw] / 14°10' N, 121°15' E. / 4 km., E. Los Banos, / Laguna Prov., PHILIPP. [pr], 31. 10. 1979 [hw] // M. R. Wilson / x. 1979 // Brit. Mus. 1983-172' (BMNH). PARATYPES: **PHILIPPINES:** ♂, 'Luzon / Laguna, Mt. Makiling / 13-18. 11. 1992 / leg. H. Zettel (1)' (NHMW); ♂, 'Mt. Makiling / Luzon, Baker [pr] // Entisberus / archetypus / Dist. [hw]' (HNHM).

**Description.** **Macropterous male.** **Structure.** Body elongate, almost dull, only membrane and part of venter moderately shining; covered with short, decumbent, relatively sparse hairs, rather densely punctate.

Head short, as long as high, conical in lateral view, only very slightly higher than eyes, densely punctate. Eyes large, bare, strongly protruding but not pedunculate, laterally far

surpassing anterolateral angles of pronotum, slightly projecting backwards, touching pronotum. Ocelli well developed, partly covered by pronotal collar. Antenniferous tubercle well developed but short. Bucculae small, apically rounded, gradually narrowing posteriad, parallel with ventral side of head, reaching middle level of eyes. Ventral side of head with a pair of minuscule, hardly visible teeth at base of bucculae. Antennae slender, segments nearly cylindrical, with dense decumbent pubescence and rather sparsely distributed long, prominent hairs; segment I surpassing apex of clypeus by more than half of its length; segment II lon-



Figs. 1-4. Habitus (1-2 – body in dorsal view; 3-4 – head and thorax in lateral view). 1, 3 – *Entisberus archetypus* Distant, 1903; 2, 4 – *E. bergrothi* sp. nov.



Figs. 5-8. Habitus of *Retoka* species, body in dorsal view. 5 – *R. hirsuta* sp. nov.; 6 – *R. gibba* (Zheng, 1981); 7 – *R. esakii* (Slater & Hidaka, 1958); 8 – *R. callosa* (Scudder, 1968).

ger than I; remaining segments usually shorter than segments I and II (their relative lengths highly variable). Labium very short, reaching fore coxae, segment I reaching middle of eyes in lateral view, segment II longest, reaching base of pronotal collar, remaining segments shorter than segments I and II.

Thorax. Pronotum gibbous, anterior part very densely, posterior lobe more sparsely punctate, pronotal collar well delimited. Transverse impression very shallow medially, deeper laterally, situated well behind middle. Lateral margins narrowly explanate but not laminate at level of transverse impression, abruptly terminating before humeral angles, with fine tubercles in anterior half. Anterior lobe of pronotum strongly gibbous, its posterior part horizontal, anterior part vertical. Basal margin of pronotum slightly convex, laterally depressed, anterior margin straight. Scutellum triangular, with very distinct, smooth, and elevated Y-shaped carina, reaching neither apical nor basal angles, its lateral arms directed towards posteriad of basal angles. Clavus with three regular rows of punctures. Corium with two rows of punctures along claval margin, one row along hind margin, mesocorium with dense, irregularly distributed punctures. Costal margin of corium convex at base, concave at level of apex of scutellum, convex apically, basal half with small tubercles, apical margin straight except the slightly concave inner end. Membrane with four well visible veins. Sternum evenly punctate, middle of mesosternum with acute, sometimes small spine at anterior half. Metasternal scent gland area small, occupying less than one third of metasternum. Legs slender, without spines and strong bristles.

Abdominal venter with distinct median keel well visible on sternites II-IV. Intersegmental suture between sternites II-VI longitudinally striolate.

Male genitalia. Genital capsule with opening about half as wide as total pygofer width, on caudal part with two rather small teeth. Paramere with rounded lobes, distal end relatively short (Fig. 15).

Colouration. Body blackish brown, contrasting with light posterior pronotal lobe, hemelytra, and appendages. Posterior pronotal lobe and hemelytra yellowish brown with brown punctures and with faintly delimited darker brown patches. Scutellum rather uniformly yellowish brown or dark basally, scutellar carina bright yellow. Each fore wing with three sharply delimited dark patches on corium: one surrounding a yellowish spot on endocorium at end of clavus, another streak on exocorium at same level, and one at the apex of exocorium. Membrane whitish with dark nebulae. Antennae, labium and legs almost uniformly yellow, with coxae black, basal half of antennal segment I brown.

Measurements (all in mm; holotype ♂ first, paratypes (2♂♂) in parentheses). Total body length 3.60 (3.15-3.30). Head: length 0.45 (0.32-0.42), width 0.82 (0.70-0.75), interocular space 0.42 (0.32-0.40). Pronotum: length 1.15 (1.00-1.05), width at base (= body width) 1.45 (1.28-1.35). Scutellum length 0.75 (0.60-0.65), length of claval commissure 0.30 (0.25-0.30). Length of antennal segments I 0.50 (0.38-0.42), II 0.62 (0.45-0.52), III 0.45 (0.32-0.38), IV 0.50 (0.40). Lengths of labial segments of holotype I 0.30, II 0.30, III 0.20, IV 0.20.

Female. Unknown.

**Differential diagnosis.** The most apparent difference between *Entisberus bergrothi* sp. nov. and *E. archetypus* is the strongly gibbous anterior pronotal lobe of the new species. Other distinctive characters are as follows (character states in *E. archetypus* in parentheses): middle line of mesosternum with an acute spine (unarmed); pronotum and corium with similar

punctures (inner row of corium composed of larger punctures than those of pronotum); anterior part of pronotum without furrows (with a pair of fine oblique impunctate furrows similar to those occurring in the Lygaeinae); Y-shaped carina of scutellum of almost uniform height, impunctate (middle part of the carina higher than lateral parts, partly punctate); hemelytra dull (shining); body with stronger hairs (with finer hairs). *Entisberus archetypus* has a unique shape of the paramere, not similar to the 'Drymini type' (Fig. 14), while the paramere of *E. bergrothi* sp. nov. is similar to parameres of *Retoka* and another drymine genera (Fig. 15). **Etmology.** This species is dedicated to the memory of Ewald Bergroth, who first recorded it from the Philippines but misidentified it as *E. archetypus* (BERGROTH 1918).

**Distribution.** Philippines (Luzon (BERGROTH 1918, this paper), Mindanao (BERGROTH 1918)).

**Note.** BERGROTH (1918) accompanied his record of the species with a detailed redescription, erroneously attributing the differences between Distant's original description and his specimen to presumed errors in Distant's paper. Since Bergroth's description does not fit the holotype of *E. archetypus*, he certainly did not examine Distant's type. *Entisberus* specimens collected in the Philippines were found in various museums, however, attempts to locate the specimens identified by Bergroth failed (L. Huldén, FMNH, pers. comm.; G. Lindberg, NHRS, pers. comm.).

### *Retoka* China, 1935

*Retoka* China, 1935: 301. Type species: *Retoka minuta* China, 1935 (by monotypy).

*Retoka*: SLATER (1964): 950 (catalogue).

*Neoentisberus* Scudder, 1968: 585. Type species: *Entisberus esakii* Slater & Hidaka, 1958 (by original designation).

*Neoentisberus*: SLATER & O'DONNELL (1995): 120 (catalogue).

### *Retoka hirsuta* sp. nov.

(Fig. 5, 16)

**Type locality.** Philippines, Luzon, Lagunas, Mt. Makiling, above Mad Springs.

**Type material.** HOLOTYPE: ♂, 'Philippines, Luzon: Lagunas, / Mt. Makiling, above Mad Springs, / 400-700m, degrad. rainforest, / 19.-22. XI. 1995, J. Kodada leg.' (NHMW). PARATYPES: ♂, 'Malaysia, Sabah, / Crocker Range, 17. 6. 1996, / Mawar Waterfall env. (9c) // vegetation debris and / forest litter around / fallen trees' (NHMW); ♂, 'MALAYSIA-SE SABAH nr. / Darum Valley Field C. / E1, c. 150m, Mal. trap 7 / 15-21. III. 1987, RMNH / C. v. Achterberg' (RMNH).

**Description.** Macropterous male. Structure. Body oval, shining, with erect and sparse pilosity. Hairs on dorsum about twice as long as diameter of antennal segment I. Hairs on antennae partly erect, as long as hairs of dorsum of body, partly semi-decumbent, as long as diameter of antennal segments.

Head triangulate with eyes slightly pedunculate, slightly removed from anterior margin of pronotum. Antennal segments spindle-shaped, segment I surpassing apex of clypeus by more than half of its length. Labium reaching mid coxae, segment I reaching about half of length of head, thicker than following segments. Bucculae relatively high, of even height, reaching



almost base of head, posteriorly pointed.

Pronotum trapezoidal, anterior part evenly convex. Anterior margin with distinctly punctate collar. Anterior and posterior parts of pronotum clearly separated by a distinct transverse impression. Anterior margin straight, posterior margin slightly sinuate anterior of scutellum and strongly sinuate anterior of both clavi. Lateral margins of pronotum concave at transverse impression, narrowly and evenly laminate, abruptly terminating at base. Calli impunctate except a few punctures, pronotum strongly punctate between calli. Posterior half of pronotum with broad and shallow median furrow. Posterolateral angles each with impunctate elevation. Scutellum triangular, with elevated impunctate Y-shaped carina; elevation almost as high as posterior part of pronotum; anterior arms well developed, reaching to anterolateral angles of scutellum. Clavus with three indistinctly separated rows of strong punctures. Corium with two rows of punctures along claval suture, endocorium with triangular impunctate area adjacent to the rows, meso- and exocorium evenly punctate. Basal half of costal margin of corium and lateral margin of pronotum with minute teeth. Apical margin of corium sinuate. Mesosternum with smooth depression posterior to fore coxae, delimited with strong tooth-like elevation laterally. Metasternum smooth, with transversal row of punctures at middle. Metasternal scent gland area small, not occupying more than one third of metasternum.

Abdomen. Sutures between abdominal sternites densely striolate longitudinally. Femora unarmed, tibiae straight.

Male genitalia. Paramere thin, with moderately acute lobes, distal part long (Fig. 16).

**Colouration.** Body dark brown, head (except clypeus) blackish, antennae light brown, clavus, basal part of corium to level of end of scutellum, rostrum, and legs stramineous, membrane translucent.

**Measurements** (all in mm; holotype ♂ first, paratypes (2♂♂) in parentheses). Total body length 2.32 (2.18-2.22). Head: length 0.45 (0.42), width 0.65 (0.60), interocular space 0.38 (0.32-0.35). Pronotum: length 0.52 (0.50-0.52), width at base 1.08 (1.05-1.08). Scutellum length 0.48 (0.48), length of claval commissure 0.15 (0.18-0.20). Lengths of antennal segments I 0.38 (0.32-0.38), II 0.38 (0.35-0.40), III 0.28 (0.28-0.30), IV 0.35 (0.35). Lengths of labial segments of holotype I 0.28, II 0.35, III 0.18, IV 0.20.

**Differential diagnosis.** Within *Retoka*, this species is most dissimilar to the type species, *R. minuta*. Its unique characters include slightly pedunculate eyes, body covered with long hairs, well visible and very long bucculae that, almost reach the base of the head, well-developed anterior arms of the Y-shaped scutellar carina, and a depressed mesosternum.

**Etymology.** The species epithet is the Latin adjective *hirsutus* (= hairy), referring to the hairy body of this species.

**Distribution.** Philippines (Luzon), Malaysia (Borneo: Sabah).

### *Retoka brincki* (Slater, 1979) comb. nov.

*Neoentisberus brincki* Slater, 1979: 18. Type locality: Sri Lanka, Sabaragamuwa Prov., Balangoda.

*Neoentisberus brincki*: SLATER & O'DONNELL (1995): 120 (catalogue).

**Distribution.** Sri Lanka (SLATER 1979).

***Retoka indica* (Scudder, 1968) comb. nov.**

*Neoentisberus indicus* Scudder, 1968: 587. Type locality: South India, Kodai Kanal.

*Neoentisberus indicus*: SLATER & O'DONNELL (1995): 120 (catalogue).

**Distribution.** South India (SCUDDER 1968).

***Retoka gibba* (Zheng, 1981) comb. nov.**

(Fig. 6, 17)

*Entisberus gibbus* Zheng, 1981 in ZHENG & ZOU (1981): 134. Type locality: China, Guangxi, Longsheng.

*Entisberus gibbus*: SLATER & O'DONNELL (1995): 115 (catalogue).

**Material examined. TAIWAN:** Kaoshiung county, Shanping Forest Recreation Area, near Liukuei, N 22°58' E 120°41', 19.-21.xi.2002, L. Ronkay & O. Merkl leg. (4 ♂♂ 2 ♀♀, HNHM; 2 ♂ 1 ♀, NMNS); Yilan county, Fushan Botanical Garden, swept, 8.-11.iv.2002, O. Merkl leg. (♂, HNHM); Taichung County, road to Anmashan, 20 km, montane forest, N 24°15'04.4" E 120°55'05.1", 1200 m a.s.l., sifting, 9.ix.2007, D. Rédei & J. F. Tsai leg. (1 ♂, HNHM); Taitung County, Wulu logging road, forest edge, N 23°08'58.1" E 121°02'57.3", 1205 m a.s.l., sweep-netting, 26.ix.2007, D. Rédei & J. F. Tsai leg. (2 ♀♀, HNHM).

**Distribution.** Originally described from China, Guangxi, Sichuan and Yunnan provinces (ZHENG & ZOU 1981). New species for the fauna of Taiwan.

***Retoka esakii* (Slater & Hidaka, 1958) comb. nov.**

(Fig. 7, 18)

*Entisberus esakii* Slater & Hidaka, 1958: 93. Type locality: Japan, Yakushima, Ambo-Kosugidani.

*Entisberus esakii*: SLATER (1964): 896 (catalogue).

*Neoentisberus esakii*: SCUDDER (1968): 586 (as type of *Neoentisberus*, keyed).

*Entisberus esakii*: ZHENG & ZOU (1981): 133 (figs., keyed).

*Neoentisberus esakii*: SLATER & O'DONNELL (1995): 120 (catalogue).

**Material examined. VIETNAM: NINH BINH PROV.:** Cuc Phuong, No. 308, netted in grasses, 3.-10.v.1966, Gy. Topál leg. (♂, HNHM); **YEN BAI PROV.:** Luc Yen, 300 m a.s.l., No. 238, 5.xii.1971, Topál & Matskási leg. (♂, HNHM).

**Distribution.** Known from Japan (SLATER & HIDAKA 1958), China (ZHENG & ZOU 1981). New species for the fauna of Vietnam.

***Retoka callosa* (Scudder, 1968) comb. nov.**

(Fig. 8)

*Neoentisberus callosus* Scudder, 1968: 586. Type locality: Burma, Kambaiti.

*Neoentisberus callosus*: SLATER & O'DONNELL (1995): 120 (catalogue).

**Material examined. CHINA: YUNNAN:** 100 km W Baoshan, Gaolingongshan Nat. Res., 14.-21.vi.1993, E. Jendek & O. Šauša leg. (♂, NHMW). **INDIA: MEGHALAYA:** 3 km E Tura, 1150 m a.s.l., N 25°30' E 90°14', 18.iv.1999, Dembický & Pacholátko leg. (♂, NHMW). **WEST BENGAL:** Darjeeling, North Point, 1300 m a.s.l., No. 843, beaten from bushes, 17.x.1967, Gy. Topál leg. (♀, HNHM).

**Distribution.** Originally described from north India (Sikkim) and Burma (SCUDDER 1968). New for the fauna of the Indian states of Meghalaya and West Bengal and for China (Yunnan).

***Retoka curvipes* sp. nov.**

(Figs. 9-10, 19)

**Type locality.** Malaysia, Pahang, Cameron Highlands, Tanah Rata.**Type material.** HOLOTYPE: ♂, 'MALAYSIA West: PAHANG / Cameron Highlands / TANAH RATA, 1200-1500m / 3. II. – 19. II. 2005, / Cechovsky Petr lgt' (NHMW). PARATYPE: ♀, same label data as holotype (NHMW).**Description. Structure.** Body relatively wide, shining, clavus and endocorium dull; sparsely covered with moderately long hairs and densely with additional very minute hairs; rather densely and strongly punctate.

Head moderately long (about 1.5 times as long as high), in lateral view at base of clypeus strongly declivent, densely punctate, punctures partly confluent (having the appearance of very narrow mesh-like carinae). Eyes large, bare, strongly protruding but not pedunculate, laterally surpassing anterolateral angles of pronotum, not projecting backwards. Hind margins of eyes situated close to pronotum but not touching it. Ocelli well developed, adjacent with pronotum. Antenniferous tubercles well developed, placed far from eyes, projecting laterad. Bucculae small, apically rounded, gradually narrowed posteriad, protruding from ventral outline of head in lateral aspect. Antennae slender, segments nearly cylindrical, with dense decumbent pubescence and rather sparse, long, prominent hairs; segment I surpassing apex of clypeus by less than one fourth of its length; segment II longer than segment I; remaining segments shorter than segment II (relative lengths of segments highly variable). Labium very short, segment I attaining anterior margin of eye, segment II longest, reaching base of pronotal collar, remaining segments shorter than segment I, labium slightly surpassing fore coxae.

Thorax. Pronotum bell-shaped, convex, anterior part with very dense and posterior lobe with sparser punctation. Pronotal surface uneven, posterior lobe with small impunctate tubercles, humeral angles strongly elevated, smooth, median groove shallow and wide. Pronotal collar indistinct, with two indistinct rows of punctures. Transverse impression well visible, situated at middle of pronotum. Lateral margins narrowly explanate, not laminate at level of transverse impression, abruptly terminating posteriorly and forming a tooth-like projection at middle part of humeral angles, reaching collar anteriorly. Basal margin of pronotum convex in front of scutellum, laterally depressed, anterior margin straight. Scutellum triangular with Y-shaped elevation, medially strongly elevated (this part about as high as pronotum, apex about one third of total length of scutellum), reaching neither basal nor apical angles, basal arms weak, directed posteriad towards basal angles, apical arm smooth. Hemelytra well developed, reaching apex of abdomen. Clavus with three regular rows of punctures. Corium with two rows of punctures along claval margin, lateral of them smooth to corial furrow, mesocorium with dense, irregularly distributed punctures, reflexed costal margin impunctate. Costal margin of corium convex at base, concave at level of scutellar apex, convex apically. Apical corial margin S-shaped, strongly concave on inner part. Membrane with four well visible veins. Sternum evenly punctate. Metasternal scent gland area small, occupying less than one third of metasternum. Legs slender, fore femur with two rather strong spines (male) or some fine teeth (female), fore tibia strongly curved around its midlength in male, posterior part with three teeth; straight and simple in female.

Abdominal venter without median keel. Sutures between sternites II-VI longitudinally striolate.

Male genitalia. Paramere of the usual 'Drymini type' with inner lobe relatively wide (Fig. 19). Parameres of the near relative *R. gibba* and *R. esakii* are shown on Figs. 17 and 18.

Colouration. Body fuscous. Posterior pronotal lobe, clavus, base and inner margin of hemelytra, five patches on membrane, femora, base of tibiae and antennal segment I except apex dark brown. Antennal segment IV and tubercles on posterior pronotal lobe brown (the latter yellowish in the paratype). Two small spots on base and apex of clavus, three corial patches (a yellowish spot on endocorium at end of clavus, two transversal streaks on corium at one and two thirds of its total length), membrane, antennal segments II and III, labium, apices of tibiae and tarsi yellow.

**Measurements** (all in mm; ♂ holotype first, ♀ paratype in parentheses). Total body length 3.10 (3.20). Head: length 0.50 (0.48), width 0.58 (0.60), interocular space 0.42 (0.45). Pronotum: length 0.85 (0.80), width at base (= total width) 1.30 (1.35). Scutellum length 0.52 (0.60), length of claval commissure 0.30 (0.28). Lengths of antennal segments I 0.30 (0.28), II 0.50 (0.45), III 0.38 (0.35), IV 0.35 (0.40). Lengths of labial segments I 0.28, II 0.32, III 0.28, IV 0.22.

**Differential diagnosis.** *Retoka curvipes* sp. nov. is very similar to *R. callosa* but differs from the latter in the following characters (character states of *R. callosa* are given in parentheses): fore femur of male with two rather strong spines, fore tibia strongly curved, armed with some spines on inner side near apex (male fore femur only with minute spines, fore tibia straight, unarmed); female with a few minute spines on fore femur (female fore femur unarmed).

**Etymology.** The species epithet is composed of the Latin adjectivum *curvus* (= curved, bent) and the Latin noun *pes* (= foot), referring to the very characteristic curved fore tibia of the male.

**Distribution.** Malaysia (Pahang).

### *Retoka stysi* sp. nov.

(Fig. 11, 20)

**Type locality.** North Vietnam, Chua Huong (Huong son), 60 km SW Hanoi.

**Type material.** HOLOTYPE: ♂, 'N. Vietnam 26-29.iv. / CHUA HUONG (Huong son) / 60 km SW Hanoi / leg. E. Jendek 1991' (NHMW). PARATYPES: ♂ 3 ♀♀, same label data as holotype (NHMW); ♀, 'VIETNAM prov. / Nam há, Tuong / linh, nr. Phu ly, // No. 573 / 21-27.v.1966. / leg. Topál [hw]' (HNHM).

**Description. Structure.** Body thick, moderately elongate, shining; head, abdomen, and legs covered with moderately long decumbent hairs, body with further very minute, hardly visible hairs; body (except abdomen) very densely and strongly punctate.

Head short, about as long as high, moderately declivent in lateral view at base of clypeus, very densely punctate, punctures partly confluent (having the appearance of very narrow, low, mesh-like carinae). Eyes large, bare, strongly protruding but not pedunculate, laterally extending far beyond anterolateral angles of pronotum, projecting posteriad. Posterior margin of eyes approaching pronotum but not touching it. Ocelli well developed, touching pronotum. Antenniferous tubercles well developed, far from eyes (distance between anterior margin of eyes and base of antenna only a little shorter than length of eye), slightly projecting inwards.

Bucculae small, rounded, very narrow posteriad, reaching anterior margin of eyes. Antennal segments moderately thickened, with decumbent and prominent hairs; segment I surpassing apex of clypeus by one third of its total length; segment II longer than segment I; remaining segments shorter than II. Labium short, reaching almost base of mid coxae, segment I reaching about middle of eyes, segment II longest, reaching base of pronotal collar, remaining segments shortest.

Male genitalia. Paramere slender (Fig. 20), easily distinguishable from other known species of the genus.

Thorax. Pronotum anteriorly convex, at transverse furrow concave, anterior part very densely and posterior lobe slightly more sparsely punctate. Posterior lobe with small impunctate, seemingly elevated areas, humeral angles smooth, median groove shallow and wide. Pronotal collar indistinct, with two irregular rows of punctures. Transverse impression shallow but well visible in the middle of pronotum. Lateral margins narrowly explanate, not laminate at level of transverse impression, abruptly terminating posteriorly at middle part of humeral angles, reaching collar anteriorly. Basal margin of pronotum protruding posteriad in front of basal angles of scutellum, laterally depressed, apical margin straight. Scutellum triangular with Y-shaped (or T-shaped) elevation with basal arms moderately strongly elevated and not lower at their midlength than the central part of the elevation, the elevation not reaching level of pronotum, arms reaching neither basal nor apical angles, basal arms directed only slightly anteriorly, apical arm smooth; middle of elevation behind one third of total length of scutellum. Hemelytra developed, reaching apex of abdomen. Clavus with three regular rows of punctures. Corium elevated, highest at end of clavus, with two rows along claval margin, lateral of them to corial furrow smooth; mesocorium with dense irregular punctures, reflexed costal margin impunctate. Costal margin of corium convex at base, concave at end of scutellum, convex apically. Apical corial margin S-shaped, strongly concave at inner part. Membrane with four well visible veins. Thoracic sternum evenly punctate except two shallow concavities behind fore coxae on mesosternum. Meso- and metasternum with median ridge. Metasternal scent gland area small, occupying less than one third of metasternum. Legs slender, fore femur with 2-3 fine teeth, fore tibia always straight and simple.

Abdominal venter without median keel. Intersegmental sutures between sternites II-VI finely punctate.

Colouration. Body brown. Head black, anterior pronotal lobe and majority of sternum dark brown. Apex of antennal segment II, whole antennal segments III and IV, and labium yellowish brown; tarsi and apices of tibiae stramineous. Lateral carinae of pronotum, small spots on posterior pronotal lobe, apical arm of scutellar carina, longitudinal streak on inner part of clavus, line between clavus and corium, transversal streak on corium at one-third of its length, three corial patches forming transversal streak at apex of clavus, and majority of membrane whitish.

Measurements (all in mm; ♂ holotype first, ♂♀ paratypes in parentheses). Total body length 2.25 (1.88-2.25), total width (across humeri) 1.10 (0.95-1.12). Head: length 0.45 (0.38-0.45), width 0.6 (0.58-0.62), interocular space 0.32 (0.35-0.40). Pronotum: length 0.62 (0.55-0.62), width at base 0.98 (0.90-1.00). Scutellum length 0.48 (0.38-0.48), length of claval commissure 0.20 (0.20-0.22). Lengths of antennal segments I 0.25 (0.22-0.25), II 0.3 (0.25-0.30), III

0.22 (0.18-0.22), IV 0.3 (0.25-0.30). Lengths of labial segments I 0.28 (0.25-0.28), II 0.28 (0.22-0.28), III 0.18 (0.12-0.18), IV 0.20 (0.20-0.22).

**Differential diagnosis.** Very small species, much smaller than most other known species of the genus except *R. hirsuta* sp. nov., *R. paraminuta* sp. nov., and *R. minuta*. *Retoka hirsuta* is of similar size but has a long pubescence on the body surface and well-developed bucculae; *R. minuta* is smaller and brachypterous. For differences from *R. paraminuta* sp. nov. see below.

**Etymology.** This species is dedicated to Prof. Pavel Štys in honour of his 75<sup>th</sup> birthday, recognizing his outstanding contributions to the taxonomy, morphology, phylogeny and other aspects of the true bugs.

**Distribution.** Vietnam.

### *Retoka minuta* China, 1935

(Fig. 12)

*Retoka minuta* China, 1935: 302. Type locality: Sumatra, Tobagebiet Hochfläche von Huta Gindjang.

*Retoka minuta*: SLATER (1964): 950 (catalogue).

**Type material examined.** HOLOTYPE: ♀, Sumatra, Tobagebiet Hochfläche von Huta Gindjang (BMNH).

The holotype is in bad condition: it is partially broken with the abdomen, left hemelytron, and legs partly missing. However, it is possible to identify additional specimens by direct comparison.

**Additional material examined.** TAIWAN: 'Formosa, Pilam, ii.1908., Sauter leg.' (♀, HNHM).

**Distribution.** Indonesia (Sumatra) (CHINA 1935), Taiwan. New species for the fauna of Taiwan.

### *Retoka paraminuta* sp. nov.

(Fig. 13, 21)

**Type locality.** India, West Bengal, Darjeeling District, Goomti.

**Type material.** HOLOTYPE: ♂, 'INDIA, W Bengal / Darjeeling Distr. / Goomti, 1200 m / leg. Gy. Topál // netting in under- / growth / 27.v.1980'. (HNHM).

**Description.** Structure. Body oval, shining; dorsum covered by very minute hairs, sparsely distributed long erect hairs present on pronotum and hemelytra; body except abdomen very densely and strongly punctate.

Head short, about 0.8 times as long as high, moderately declivent at base of clypeus in lateral view, very densely punctate (having the appearance of very narrow but high mesh-like carinae). Eyes large, bare, strongly protruding but not pedunculate, laterally far surpassing anterolateral angles of pronotum, projecting posteriad. Posterior margin of eyes approaching pronotum but not touching it. Ocelli well developed, adjacent with pronotum. Base of antenna close to eye (distance between anterior margin of eye and base of antenna a little longer than half of eye length), projecting inwards. Bucculae small, rounded, very narrow posteriorly, reaching anterior margin of eyes. Antennal segments moderately thickened, with decumbent and prominent hairs; segment I surpassing apex of head by one-third of its total length; segment II longer than segment I; remaining segments shorter than segment II. Labium short, reaching apices of anterior coxae, segment I reaching about middle of eyes, segment II subequal in length to segment I, remaining segments shorter than segments I and II.



Figs. 9-12. Habitus of *Retoka* species (9, 11-12 – body in dorsal view; 10 – detail of right anterior leg of male holotype). 9-10 – *R. curvipes* sp. nov.; 11 – *R. stysi* sp. nov.; 12 – *R. minuta* China, 1935.



Fig. 13. Habitus of *Retoka paraminuta* sp. nov.

Thorax. Pronotum convex, only slightly concave at transverse furrow, anterior part very densely and posterior lobe slightly more sparsely punctate. Pronotum with small elevated impunctate areas on posterior lobe, anterior lobe with some impunctate areas, humeral angles smooth. Pronotal collar indistinct, with two irregular rows of punctures. Transverse impression shallow but well visible, situated at middle of pronotum. Lateral margins narrowly explanate, not laminate at level of transverse impression, abruptly terminating posteriorly, reaching collar anteriorly. Basal margin of pronotum protruding posteriad in front of scutellum, laterally depressed, apical margin straight. Scutellum triangular, with well-developed Y-shaped elevation, its median part high, reaching level of pronotum, reaching neither basal nor apical angles, basal arms strong, directed posteriad towards basal angles, apical arm smooth; middle of elevation behind one-third of total length of scutellum. Hemelytra pseudobrachypterous, reaching end of abdomen. Clavus narrow, with three regular rows of punctures. Corium elevated, highest near end of clavus, with two rows of punctures along claval margin, smooth lateral of them to corial furrow, mesocorium with dense irregular punctures, costal margin very narrow, impunctate. Costal margin of corium convex (concavity hardly visible at end of scutellum). Apical corial margin S-shaped, inner part only slightly concave. Membrane with four well visible veins. Sternum evenly punctate. Meso- and metasternum with prominent median ridge. Metasternal scent gland area small, not occupying one third of metasternum.

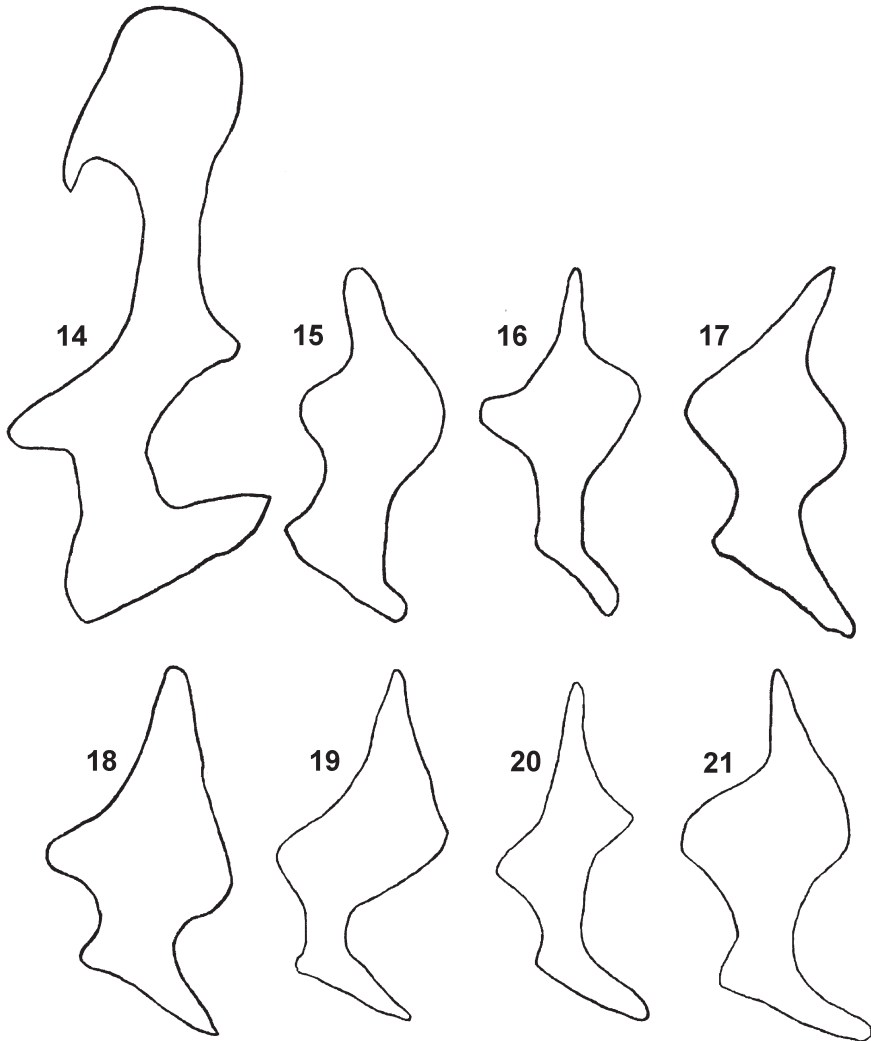


Legs slender, fore femur with 4-5 fine teeth, fore tibia always straight and simple.

Abdominal venter without median keel. Intersegmental sutures between sternites II-VI punctate.

Male genitalia. Paramere thick with widely rounded outer lobe (Fig. 21).

**Colouration.** Body dark brown. Head fuscous, tibiae, antennal segment I, and abdomen reddish brown. Posterior pronotal lobe, antennal segments II-IV, scutellum, and hemelytra



Figs. 14-21. Parameres. 14 – *Entisberus archetypus* Distant, 1903 (specimen from Vietnam: Yen Bai Province); 15 – *E. bergrothi* sp. nov.; 16 – *Retoka hirsuta* sp. nov.; 17 – *R. gibba* (Zheng, 1981); 18 – *R. esakii* (Slater & Hidaka, 1958); 19 – *R. curvipes* sp. nov.; 20 – *R. stysi* sp. nov.; 21 – *R. paraminuta* sp. nov.

yellowish brown. Pronotal lateral carinae, apical arm of scutellar carina, two obscure spots on costal margin of hemelytra, tarsi, and labium stramineous. Membrane whitish.

**Measurements** (all in mm; ♂ holotype). Total body length 1.60, total width (across humeri) 0.85. Head: length 0.30, width 0.50, interocular space 0.28. Pronotum: length 0.45, width at base 0.75. Scutellum length 0.32, length of claval commissure 0.20. Lengths of antennal segments I 0.20, II 0.20, III 0.18, IV 0.25. Lengths of labial segments I 0.18, II 0.18, III 0.10, IV 0.15.

**Differential diagnosis.** The smallest species of the genus, distinctly smaller than all other species except of *R. minuta* and *R. stysi* sp. nov., which are only slightly larger than *R. paraminuta* sp. nov. *Retoka minuta* differs from the new species mainly in the following characters: hemelytra semicircular; body without long hairs; clavus wide, apical part with a few additional punctures between the two inner rows of punctures; corium totally punctate, anterior pronotal lobe without impunctate elevations. *Retoka stysi* sp. nov. differs from *R. paraminuta* sp. nov. in the following characters (character states of *R. paraminuta* sp. nov. given in parentheses): anterior pronotal lobe and first antennal segment black (brown), second antennal segment brown (yellow); clavus with some additional punctures outside the rows (without additional punctures); scutellar elevation very high in the middle, surpassing level of pronotum, anterior part steeper than 45° in lateral view (basal arms only slightly lower than medial part, elevation not surpassing level of pronotum, anterior part never steeper than 45° in lateral view).

**Etymology.** The species epithet refers to the strong resemblance to *R. minuta*.

**Distribution.** India (West Bengal).

### Key to the species of *Entisberus* group

- 1 (4) Body relatively slender (body length/width ratio 2.3-2.5). Y-shaped scutellar elevation totally impunctate. Abdomen with median keel on sternites II-V. Inner surface of fore and hind femora with a long row of minuscule tubercles. .... *Entisberus* Distant, 1903.
- 2 (3) Anterior pronotal lobe not gibbous, with a pair of fine oblique impunctate furrows. Scutellar carina partly punctate, its middle part higher than lateral parts. Mesosternum without median spine. .... *E. archetypus* Distant, 1903
- 3 (2) Anterior pronotal lobe of males strongly gibbous (female unknown), without impunctate furrows. Scutellar carina impunctate, evenly high. Mesosternum with acute median spine. .... *E. bergrothi* sp. nov.
- 4 (1) Body usually oval (body length/width ratio about 1.4-2.3, exceptionally in *R. indica* 2.7). Only basal arm of Y-shaped scutellar elevation impunctate. Abdomen without median keel. Inner surface of hind femora without rows of tubercles (fore femora sometimes with tubercles). .... *Retoka* China, 1935
- 5 (6) Body with long erect hairs. Bucculae relatively high, almost reaching base of head. .... *R. hirsuta* sp. nov.
- 6 (5) Body only with relatively short hairs. Bucculae short, weakly developed.
- 7 (18) Macropterous, body longer than 2.7 mm. Corium not strongly elevated. Median carina

- present only on metasternum. Bucculae reaching only level of base of antennae.
- 8 (11) Scutellum without smooth, pale median keel.
- 9 (10) Antennae rusty brown, apical half of segment III stramineous. Hemelytra mostly dark. .... ***R. brincki*** (Slater, 1979)
- 10 (9) Antennae stramineous, segments I and IV dark. Hemelytra mostly light. ....  
..... ***R. indica*** (Scudder, 1968)
- 11 (8) Scutellum with smooth, pale median keel.
- 12 (15) Posterior part of pronotum with small pale callosities (impunctate, slightly elevated areas).
- 13 (14) Male with curved fore tibiae, fore femora with relatively strong teeth, female with small spines on fore femora. .... ***R. curvipes sp. nov.***
- 14 (13) Fore tibiae straight, fore femora armed with minute spines in male, unarmed in female. .... ***R. callosa*** (Scudder, 1968)
- 15 (12) Posterior part of pronotum evenly punctate, without light impunctate areas.
- 16 (17) Eyes transverse, head about 1.5 times as long as high. ....  
..... ***R. esakii*** (Slater & Hidaka, 1958)
- 17 (16) Eyes not transverse, head about as long as high. .... ***R. gibba*** (Zheng, 1981)
- 18 (7) Body length less than 2.3 mm. Meso- and metasternum with median ridge. Usually brachypterous. Bucculae very narrowly reaching level of anterior margin of eyes.
- 19 (20) Macropterous, body length above 1.8 mm. Scutellum not higher than pronotum. ...  
..... ***R. stysi sp. nov.***
- 20 (19) Slightly brachypterous, body rounded, smaller than 1.7 mm. Scutellum slightly higher than pronotum.
- 21 (22) Hemelytra semicircular, apical part of clavus with a few additional punctures between two inner rows, corium fully punctate. .... ***R. minuta*** China, 1935
- 22 (21) Hemelytra moderately convex (elevated), clavus narrow, without extra punctures, endocorium impunctate between two rows of punctures. ... ***R. paraminuta sp. nov.***

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