

A contribution to knowledge of *Rhyssemus* Mulsant, 1892 species from the Indochinese Subregion with description of a new species from Laos and proposal of two new synonyms (Coleoptera: Aphodiidae: Psammodiinae: Rhyssemini)

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Abstract. A new species of the genus *Rhyssemus* Mulsant, 1892, *Rhyssemus laoticus* sp. nov., from Laos is described and illustrated. The new species can be reliably differentiated from any other Indo-Malayan species of the genus thanks to its peculiar pronotal and elytral structure and sculpture, particularly the presence of two rows of unusually distinctly defined granules on elytral intervals. New synonyms are also proposed concerning two Indo-Malayan *Rhyssemus* taxa. A checklist of the species currently known from the Indochinese Subregion is presented, including valid names and their junior synonyms.

INTRODUCTION

In the course of identification of aphodiid specimens for the National Museum in Prague, the second author encountered five specimens of a *Rhyssemus* Mulsant, 1892 species, which at first sight appeared distinctively different from any known species of the genus.

Description, illustrations and discussion of the new species, *R. laoticus* sp. nov., are presented below.

The species is discussed within the framework of the Indo-Malayan (Oriental) fauna, with a special regard to the species known from the Indochinese Subregion. The concepts of the Indo-Malayan Region and Indochinese Subregion are employed here in agreement with Corbett & Hill (1992).

The previous studies of rich non-type material and relevant types of Indo-Malayan *Rhyssemus* species made us possible to verify two new synonymies which are proposed below.

A checklist of all the known *Rhyssemus* species occurring in the Indochinese Subregion is also presented. Valid names and their junior synonyms are provided.

MATERIAL AND METHODS

The specimens were observed by using the MBS-10 and SZP 1120-T stereoscopic microscopes. The photos published here were taken by the use of the Meopta laboratory microscope, CMOS 5 digital camera and the Helicon Focus programme. The images were managed with the help of the Adobe®Photoshop®CS2 updated software.

RESULTS

Rhyssemus laoticus sp. nov.

(Figs 1-3)

Type material. Holotype (♀) bearing the following printed labels: 1) white: LAOS, Vientiane prov., 55 km NE of Vientiane, LAO PAKO env., 19.-22.v.2004, 200m, J. Bezděk leg.; 2) pale green [related to the photo-documentation system of the third author]: 1492, Dok. L. Mencl; 3) red: HOLOTYPE (♀), *Rhyssemus laoticus* sp. n., R. Pittino, M. Rakovič & L. Mencl det. 2012. Paratype (♀), also bearing three labels as follows: 1) white: same data as with the holotype; 2) pale green [related to the photo-documentation system of the third author]: 1493, Dok. L. Mencl; 3) red: PARATYPE (♀), *Rhyssemus laoticus* sp. n., R. Pittino, M. Rakovič & L. Mencl det. 2012. Holotype (♀) and a paratype (♀) are deposited in National Museum, Prague, Czech Republic. Further three paratypes (♀♀), equipped with the same white and red labels as the paratype mentioned above, are deposited in collections of the present authors (R. Pittino, Milano, Italy; M. Rakovič, Dobřichovice, Czech Republic; and L. Mencl, Týnec nad Labem, Czech Republic: 1 paratype in each collection).

Description. Small (2.7-2.9 mm long) species slightly dilated backward, dorsally glabrous, dark brown, with clypeal margin and pronotal sides reddish brown, legs and most ventral parts lighter; dorsal surface moderately alutaceous, with elevated structures - ridges and granules - considerably shining, ventral surface shiny. Dorsal and ventral habituses as in Figs. 1 and 2, respectively.

Head convex. Clypeus weakly upturned, very broadly, obtusely dentate on each side near distinct anteromedian emargination, clypeal sides slightly arcuate, at most barely notched in front of scarcely produced genae, each gena with 2-4 short acuminate setae. Head granules close, moderately coarse, well defined, fairly uniform in distribution and size, covering the whole surface except genae and clypeal sides, occipital granules somewhat smaller than clypeal and frontal ones. Two pairs of vestigial occipital oblique ridges rather indistinct on the granulate background.

Pronotum convex, nearly 1.4 times as wide as long, broadest at about middle, gently arcuate along sides, gradually, moderately attenuated forward and backward, anterior and posterior angles rounded without emargination, base very poorly arcuate. Lateral margins, including posterior angles, not bordered, visibly crenate, with apically blunt, distinctly dilated, thick setae, base clearly bordered and minutely crenate, with about 12 setae against the 1st to 4th elytral intervals, setae longest at middle, stepwise shortening laterally, absent from against the 5th and 6th intervals. All six transverse ridges moderately convex, first three ones rather wide, distinct, continuous almost throughout, the 1st ridge well defined, with mixed close moderate tubercles and small continuous areas (most typically with three tubercles per ridge width); the 2nd to 4th ones joining together to form lateral callus, all weakly scabrous medially



Figs 1-3. *Rhyssemus laoticus* sp. nov., holotype: 1- habitus (dorsal view); 2- habitus (ventral view); 3- habitus (lateral view). Photos by L. Mencl.

due to closely, shallowly tuberculate surface and rather granulate laterally, the 2nd and 3rd ones irregularly incised medially along anterior and/or posterior margins; last three ridges mostly consisting of discrete granules, the 4th ridge medially shortly continuous, bending back near middle to join indistinct vestige of the 6th on each side, enclosing midline furrow, as well as interrupting and enclosing the (accessory) 5th ridge. All furrows shallowly impressed, first two transverse ones about as wide as or slightly narrower than respective ridges medially, the 3rd furrow considerably, posterior ones moderately wider than respective ridges; midline furrow very wide anteriorly, markedly narrow posteriorly. All transverse furrows closely, minutely granulate and/or transversely wrinkled, posterior longitudinal furrow with close medium-sized punctures.

Scutellum small, triangular, alutaceous.

Elytra convex, subparallel, slightly widened backward, barely more than twice as long as pronotum and nearly 1.46 times wider than long, greatest width and greatest dorsal convexity behind middle; humeral callus distinct, humeral denticle minute but sharp. Intervals wide, scarcely convex anteriorly, subcarinate apically, all subequal in height except apically visibly less elevated the 4th; the three innermost, the 7th and 10th intervals nearly reaching apex, the 1st apically joining epipleural carina, the 2nd and 3rd free, the 7th and 10th joining together; the 4th to 6th, 8th and 9th intervals clearly shortened and free apically. Striae moderately impressed, about one fifth to fourth as wide as intervals, punctures hardly distinguished on the background of the strong elytral sculpture, separated by about twice their diameter, distinctly crenating both inside and outside interstrial edges. Sutural interval with distinct incisions

anteriorly along outside margin, otherwise smooth, the 10th interval indistinctly granulate (Fig. 3). Intervals 2 to 9 - except on the very apex of elytra - each with two rows of unusually distinctly defined, rounded pearl-like granules (inside row of smaller granules and outside row of larger ones), without any tendency to transversal fusion between two neighbouring larger and smaller granules. Metathoracic wings fully developed.

Underside as in Fig. 2. Prosternum strongly shagreened, with long, close, hairlike setae. Mesosternum with rather dense, fine, setigerous punctures, anterior mesosternal projection compact, broad, lanceolate, quite convex, smooth, glabrous, with neither midline costa nor apical tubercle. Metasternum convex and shiny laterally, rough anteriorly at extreme sides, metasternal plate rhomboidal, shiny, flat, with large, very distinct suboval median impression and few shallow, fine to medium-sized, rather obsolete punctures on either side. Sculpture including anterior and posterior transverse grooves, midline furrow, and metasternal triangles; medial furrow quite distinct, deep, rather coarse, anteriorly complete, posteriorly rather wider and slightly shortened; anterior postcoxal grooves arcuate, very coarse and deep medially, joining each other and medial furrow near base of mesosternal projection, metasternal triangles slightly arcuate, deep, very distinct on either side from near middle to extreme sides, posterior antecoxal grooves fine, slight, indistinct. Ventriles shiny, glabrous, each ventrite sparsely, minutely punctate, coarsely fluted anteriorly, finely, indistinctly bordered posteriorly, with central transverse serrate line distinct on each side, widely interrupted at middle; the 5th ventrite distinctly shorter than the 4th and 6th ones medially, anterior fluting on the 6th ventrite very coarse, covering almost its whole anterior half. Pygidium with sharp transverse carina dividing rough eroded apical portion from convex basal one, apical margin slightly convex, with four or more probably six long, thick, erect setae - two or more probably three setae on each side (it is difficult to determine the accurate number since some setae are broken off).

All femora shiny, ventral surfaces with fine to medium-sized punctures (punctures on profemora larger than those on meso- and metafemora), each puncture bearing short, scale-like, recumbent seta; profemur moderately broad, about 1.9 times as long as wide, widest basally, poorly attenuated apically, strongly margined anteriorly, moderately so posteriorly, surface with sparse medium-sized setigerous punctures, femoral posterior edge with sparse short setae; both meso- and metafemora widest at middle, not margined anteriorly, strongly margined posteriorly, setigerous punctures sparse, restricted to apical third of ventral surface (mesofemur) or just near apex (metafemur), posterior marginal furrow with sparse thick erect setae, anterior edge finely setaceous; metafemur rather slender, 2.6-2.7 times as long as wide, mesofemur moderately broad, 2.1-2.2 times as long as wide. Dorsal surface of protibia with single row of setigerous punctures close to normally tridentate outside margin; apical spur robust, nearly straight, about as long as basal protarsite. Both meso- and metatibiae straight, rather slender, scarcely dilated apically, finely denticulate along outer margins, outer apical angles moderately produced, lower apical margin with few unequal spinules, both apical spurs very slightly bent down- and outward apically. Mesotibia nearly 3.4 times as long as wide, superior apical spur and basal mesotarsite subequal in length, inferior spur half as long as superior spur. Metatibia about 4.2 times longer than wide, upper apical spur distinctly shorter than basal metatarsite, lower spur about one third as long as upper spur. Both meso- and metatarsi slightly exceeding respective tibial lengths, basal tarsites subcylindrical, poorly

widened apically, basal mesotarsite nearly of same length as, basal metatarsite distinctly shorter than next three tarsites combined.

Male unknown.

Variability. The study of type specimens confirmed the consistency and constant nature of the characters described above. Differences in the body length are well within a range characteristic for “small *Rhyssemus* species” (under 3 mm): the lengths of the holotype and paratype kept in the National Museum, Prague are of 2.7 and 2.9 mm, respectively; in paratypes kept in collections of the present authors, they are of 2.7, 2.8 and 2.8 mm, respectively. Some elements of the dorsal structure and sculpture, like the occipital oblique ridges, granulation of the head vertex, tubercles on the top of the first three pronotal ridges, or the last two pronotal ridges are relatively weaker or stronger, but still very characteristic of the species and adhering to the description above.

Distribution. Laos.

Name derivation. Toponymic (adjective derived from the name of the country).

***Rhyssemus feae* Clouët, 1901**

Rhyssemus feae Clouët, 1901: 63, 91.

Rhyssemus tonkineus Balthasar, 1945: 111 **syn. nov.**

Type material. *Rhyssemus feae* Clouët, 1901. Type locality: Burma, Katha. Type material: Lectotype female kept at Natural History Museum “G.Doria” in Genoa, Italy, designated by Pittino (1984).

Rhyssemus tonkineus Balthasar, 1945. Type locality: Tonkin, Hoa Binh. Type material: Holotype female, kept in V. Balthasar Coll. (National Museum, Prague, the Czech Republic), labelled as follows: 1) printed: Hoa-Binh Tonkin VII.1934 A. De Cooman; 2) red, printed: Typus; 3) autographic and printed: *Rhyssemus tonkineus* n. sp. Dr. V. Balthasar Det. 4) white, printed: *Rhyssemus feae* Clouët, 1901 R.Pittino, M.Raković & L.Mencl det. 2012.

Remarks. The study of the respective types and over 450 specimens of *R. feae* of both sexes from several sites across the Indochinese Subregion (Myanmar, Thailand and Vietnam) allowed us to verify the synonymy between the above “*taxa*”, the junior synonym simply being a female of the senior one.

***Rhyssemus inscitus* (Walker, 1858)**

Psammodius inscitus Walker, 1858: 207.

Rhyssemus inscitus, Pittino, 1984: 39, nec *Rhyssemodes inscitus*: Schmidt, 1922: 494, 495.

Rhyssemus philippineus Masumoto, 1980: 21 **syn. nov.**

Type material. *Psammodius inscitus* Walker, 1858. Type locality: Ceylon. Type material: Lectotype, designated by Pittino (1984), kept at Natural History Museum in London.

Rhyssemus philippineus Masumoto, 1980. Type locality: Cebu City, Cebu Is., the Philippines. Type material: holotype, kept at National Science Museum of Japan in Tokyo; one female paratype (the Philippines, Metro-Manila) formerly kept in K. Masumoto Coll. (Yokohama, Japan), studied by the first author in January 1985.

Remarks. The study of both types and over 1300 specimens of *R. inscitus* from throughout its whole range, including 15 individuals of both sexes from the Philippines, allowed us to regard *R. philippineus* as a junior synonym of the former name.

CHECKLIST OF CURRENTLY VALID NAMES OF *RHYSSEMUS* SPECIES
INHABITING THE INDOCHINESE SUBREGION WITH THEIR JUNIOR SYNONYMS

Respective distribution ranges are derived from both the literature and unpublished data.

Rhyssemus birmensis Clouet, 1901: 61, 79. Type locality: Burma from Prome to Minhla.
Distribution: Myanmar.

Rhyssemus feae Clouet, 1901: 63, 91. Type locality: Burma, Katha. Distribution: Myanmar, Vietnam, Thailand.

(= new synonym *Rhyssemus tonkineus* Balthasar, 1945: 111. Type Locality: Hoa-Binh, Tonkin) (see above).

Rhyssemus freyi Petrovitz, 1963: 43. Type locality: Assam, Kaziranga, north of Mikir Hills.
Distribution: East India, Bangladesh, Vietnam.

Rhyssemus hamatus Petrovitz, 1963: 43. Type locality: Bengal [in Bangladesh], Rangpur.
Distribution: N Pakistan, India, Sri Lanka, Nepal, Bangladesh, Myanmar, Thailand.

Rhyssemus inscitus (Walker, 1858: 207). Type locality: Ceylon. Distribution: from the Sinai peninsula and the Madagascan Subregion throughout southern Palaeartic Asia, Indomalaya and Australasia.

(= synonym *Rhyssemus australis* Petrovitz, 1963: 40. Type locality: Australia, Queensland, Kuranda)

(= synonym *Rhyssemus insignicollis* Lea, 1923: 12. Type locality: Australia, Queensland, Cairns)

(= synonym *Rhyssemus malasiacus* Lansberge, 1886: 133. Type locality: Northeastern Sumatra, Tandjong, Morawa Serdang)

(= synonym *Rhyssemus mussardi* Petrovitz, 1975: 618. Type locality: South India, Madras, Coimbatore)

(= synonym *Rhyssemus papuanus* Petrovitz, 1965: 169. Type locality: Papua New Guinea, New Britain, Simpson-Hafen)

(= synonym *Rhyssemus tarsalis* Waterhouse, 1876: 115. Type locality: Rodrigues Island)

(= new synonym *Rhyssemus philippineus* Masumoto, 1980: 21. [Type loc.: the Philippines, Cebu Is., Cebu City]) (see above).

Rhyssemus laoticus sp. nov. Type locality: Laos, Vientiane prov., 55 km northeast of Vientiane, Lao Pako env. Distribution: Laos.

Rhyssemus thailandicus Pittino, 1996: 66. Type locality: China (Guanxi), Guilin. Distribution: China, Thailand, Vietnam, Malaysia, Indonesia, India.

Rhyssemus uncinispinis Pittino, 1984: 35. Type locality: Central Tonkin. Distribution: Vietnam: Tonkin.

DISCUSSION

The last key to species of the genus *Rhyssemus* Mulsant, 1892 from the Oriental (Indo-Malayan) Region was written by Balthasar (1964) and is thus outdated. Over the last thirty years, the authors studied types and numerous specimens from the whole Southeast Asia, increasing the knowledge of species of this and related genera from Indo-Malayan and Australasian Regions (Pittino 1983; Rakovič 1983; Pittino 1984; Rakovič 1987; Pittino 1996; Rakovič & Král 1997), as well as from the neighbouring Himalayan Subregion (Rakovič & Král 2001), which is usually regarded as belonging to the Palaearctic Region. Over the last fifty years, no significant improvement occurred in the number of *Rhyssemus* species known from this area, in spite of the materials more and more available to study thanks to the numerous explorations of formerly inaccessible or unknown territories. As shown in the Checklist above, only 8 species, including the new one described here, are currently known from the Indochinese Subregion. *R. laoticus* sp. nov. can be readily differentiated from any other species occurring in the Indo-Malayan Region based on its structure and sculpture of head, pronotum and elytra: the head is relatively densely and regularly granulate, with only vestigial posterior oblique ridges; the transverse ridges on the pronotum are only moderately convex and mostly narrower than respective furrows discally, furrows are distinctly, closely, transversely granulate; inside row of small and outside row of large granules on each elytral interval are unusually well delimited without tendency to any fusion between two adjacent, large and small, granules, this elytral pattern being sharply distinctive. The presence of more than one pair of apical pygidial setae would relate the new species to all the known Indochinese ones but *R. inscitus* (Walker, 1858). All of them also share pronotal discal furrows more or less distinctly punctate and/or transversely wrinkled, never granulate, similar male genitalia, and a peculiar sexual dimorphism in the shape of the protibial apical spur, which is clearly hooked down and/or inward apically in the male, but very slightly bent down and outward apically in the female. *R. laoticus* might show such a kind of dimorphism, but only a future study of the male, which is currently unknown, could confirm or deny this interpretation, and/or possibly add new elements better explaining its actual relationships.

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