

**Studies on types in the genus *Rhyssemus*. 6. *Rhyssemus procerus* Petrovitz, 1973
(Coleoptera: Scarabaeidae: Aphodiinae: Psammodiini)**

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Abstract. A paratype specimen of *Rhyssemus procerus* Petrovitz, 1973 was studied. Photos (habitus as well as details including the aedeagus) are published for the first time. Most important features differentiating the species from similar members of the genus known from the Oriental Region (and also from Palearctic parts of the Indian Subcontinent) are discussed.

INTRODUCTION

Because of existing problems with the identification of species in the genus *Rhyssemus* Mulsant, 1842, we attempt to stepwise revise type materials with providing the appropriate photographic documentation. In the first work (Rakovič et al. 2016a), we dealt with general considerations and with the Afrotropical species *R. mayeti* Clouët des Pesruches, 1901. The second work (Rakovič et al. 2016b) was focused on the study of further two Afrotropical species: *Rhyssemus keisseri* Bénard, 1910 and *R. rohani* Bénard, 1920. The third and fourth works (Rakovič et al. 2018a, 2018b) concerned further two African species, *R. rothschildi* Bénard 1909 and *R. tschadensis* Petrovitz, 1963, respectively. The fifth work (Rakovič et al. 2018c) dealt with an Indian species, *R. loebli* Petrovitz, 1963.

In the work presented here, we offer results of studying a paratype (kept in the MHNG) of a further species described from India: *Rhyssemus procerus* Petrovitz, 1973.

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, CMEX 5 digital camera and the Helicon Focus programme.

Prior to the study and taking photos, the specimens were kept in a detergent solution for 30 to 60 min and submitted to mechanical cleaning.

The following acronym is employed for the collection, in which the specimen studied here is kept:

MHNG Muséum d'histoire naturelle, Genève, Switzerland.

The description of transversal structural elements of the pronotum is based on a concept proposed by Rakovič (1987), which is also explained, justified and illustrated by a schematic drawing in our recent work (Rakovič et al. 2016a): five transversal ridges, five transversal furrows and accessory swelling present in furrow 4 each side of the posterior longitudinal furrow.

TAXONOMY

Rhyssemus procerus Petrovitz, 1973

(Figs. 1-17)

Rhyssemus procerus Petrovitz, 1973: 306 (original description).

Rhyssemus tschadensis: Dellacasa 1988: 423 (catalogue).

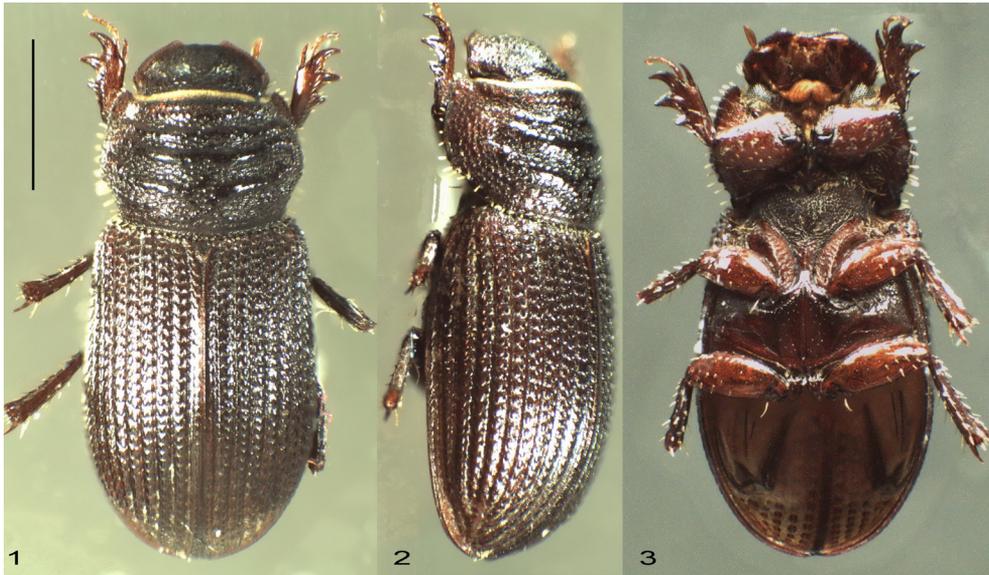
Type locality. “New Delhi, India”.

Type material studied. Paratype (♂) (MHNG), “New Delhi / Lichtfang / lg. H. Franz // PARATYPUS [red printed label] // *Rhyssemus / procerus* nov. / Petrovitz [red printed label] // coll. Petrovitz [white printed label] // 2384 / Dok. L. Mencl, 2017 [pale green printed label]”. See also Fig. 17 for photos of etiquettes.

Redescription based on the paratype. Total body length: 3.55 mm. Subparallel, only slightly broader behind, broadest behind elytra midlength, (Fig. 1); shining, dark brown, head and pronotum slightly darker than elytra and legs.

Head (Fig. 4). Clypeus angulate anteriorly, with lifted angle each side of anteromedian emargination; its sides not sinuate anteriorly when observed in direction strictly perpendicular to plane of head outline; genae obtusely rounded, nearly aligned with clypeus lateral margins (moderately exceeding beyond clypeus outline), protruding more than eyes and bearing few fine acuminate macrosetae; eyes relatively small. Clypeus surface with not very dense, mostly transversal granules (granules present anteriorly more considerably transversal compared to those on middle protuberance); middle protuberance moderately elevated, rather sparsely covered with well distinct, discrete granules, without large, confluent elevated areas (contrastingly to some other species). Head vertex with only one pair of not very high oblique ridge (ridges of second pair indistinct or lost in posterior granulate sculpture); furrow between middle protuberance and anterior pair of oblique ridges not deep, filled with rather dense and round to slightly transversal granules; area behind oblique ridges also with dense, slightly transversal granules.

Pronotum (Figs. 5-6) transversal (its length-to-width ratio of 0.720), widest at about midlength, moderately, nearly straight narrowing forward from there, with short arcuate part of lateral margin before only slightly rounded anterior corners; considerably narrowed posteriorly before short segments producing together with pronotum base nearly right-angled posterior corners. Pronotum lateral edges crenulate, equipped with macrosetae; macrosetae on lateral edges sparser, longer and rather truncate apically (Fig. 9), those on basal edge denser,



Figs. 1-3. *Rhyssemus procerus*, paratype ♂, habitus: 1- dorsal view; 2- dorsolateral view; 3- ventral view. Scale line 1 mm. Photographs by L. Mencl.

shorter and rather slightly dilated apically. Pronotal structure consisting of five transversal ridges, five transversal furrows, posterior longitudinal furrow and accessory swelling present in furrow 4 on each side of longitudinal furrow arranged as follows on disc: ridge 1 flat, moderately granulate and transversally punctate, ridge 2 finely punctate, moderately higher and narrower than ridge 1, mostly continuous, ridges 3 and 4 most convex, moderately higher, wider and more continuous than ridge 2; accessory swelling and ridge 5 vestigial, just indicated by few granules; furrows relatively shallow, considerably transversally punctate, furrows 2 and 3 wider than ridges 2 and 3, respectively.

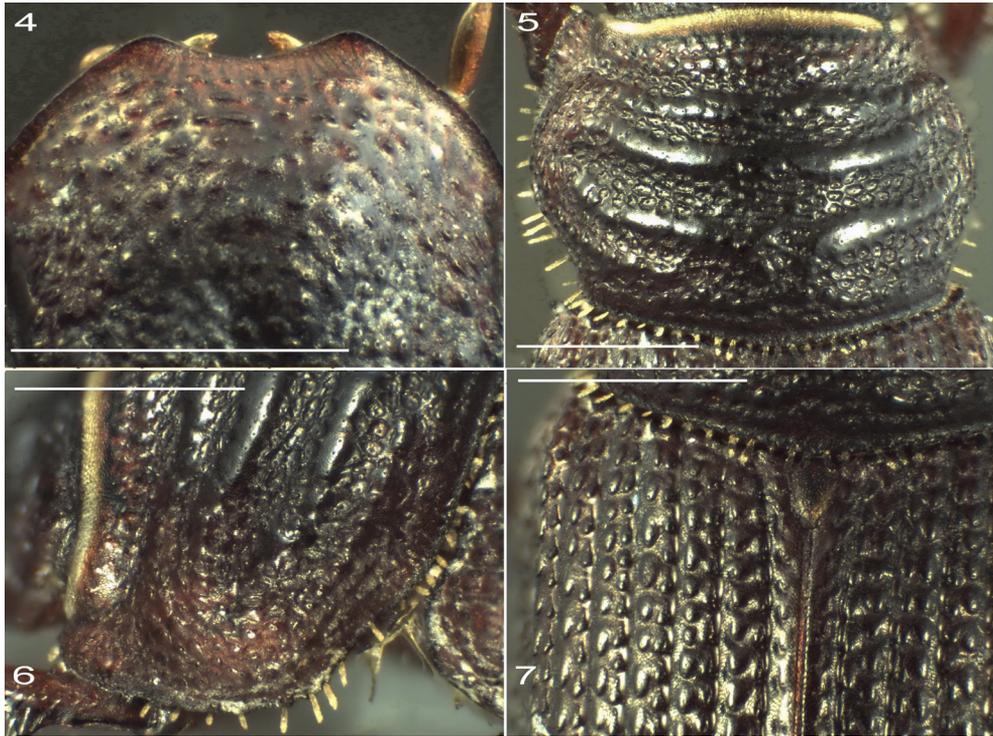
Scutellum alutaceous, small, narrowly ogival, longer than wide.

Elytra (Figs. 1, 2) subparallel, moderately broader behind, widest behind midlength, their length-to-maximum width ratio of 1.47, moderately wider posteriorly than pronotum at midlength, with ten striae and ten intervals; with not very large, but distinct humeral denticles. Individual (oval) granules in discal elytral intervals (Fig. 7) easy to recognize even under low magnification (about 10×), arranged in two rows: outside row of large granules and inside row of small ones in each interval.

Pygidium with 2 pygidial macrosetae (one seta on each side), its basal part macrosetaceous, apical part not markedly scabrous, but bearing few minute granules (Fig. 14).

Legs (in dorsal view). Upper face of protibia impunctate, terminal spur reaching to middle of protarsomere 2. Meso- and metatarsi broken off.

Ventral surfaces (Figs. 3, 13) mostly glabrous, but femora with macrosetae arranged as shown in Figs. 3, 8, 10 and 11. Metaventral plate (Fig. 12) glabrous, with midline furrow complete and narrow anteriorly, moderately dilated and slightly reduced posteriorly; area surrounding midline furrow moderately concave. Serrate lines (“zig-zag” lines) of abdominal



Figs. 4-7. *Rhyssemus procerus*, paratype, ♂, details of head, pronotum and elytra; 4- part of head, dorsal view; 5- pronotum, dorsal view; 6- pronotum, lateral view; 7- part of elytra, dorsal view. Scale lines 0.5 mm. Photographs by L. Mencl.

ventrites poorly distinct medially, moderately distinct laterally; abdominal ventrites 3 and 4 shortly fluted along their anterior margins; ventrite 5 with medium-length flutes and ventrite 6 with long flutes along their posterior margins.

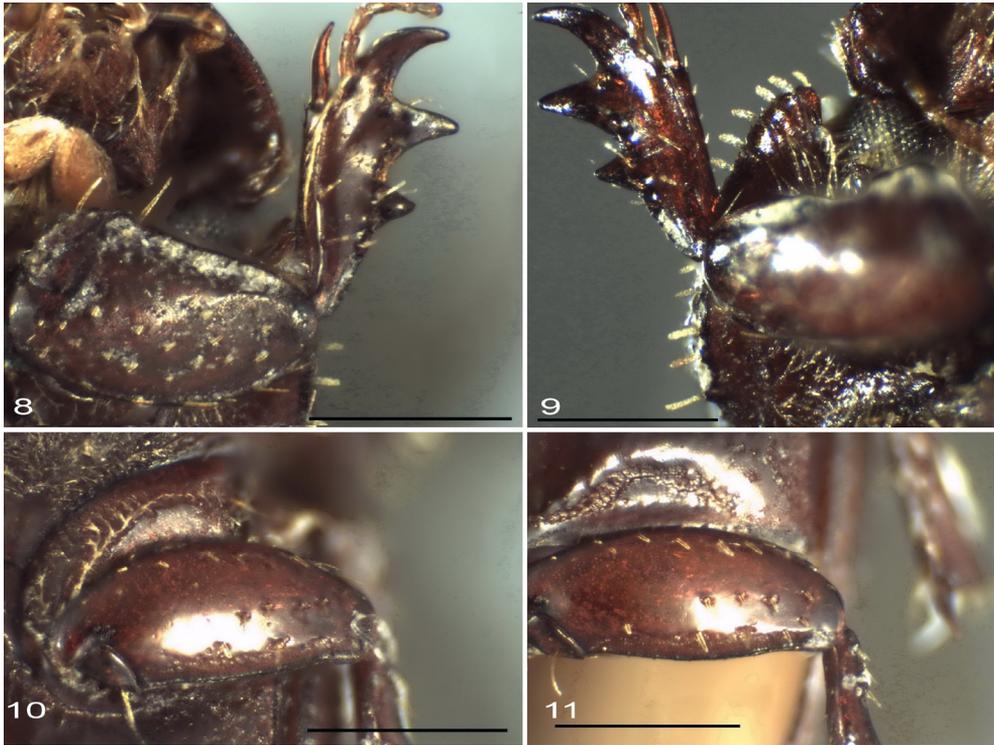
Aedeagus as in Figs. 15-16.

Sexual dimorphism. Not applicable here (only a male specimen was studied). However, the specimen was fortunately a male and thus, the authors are able to state that the species does not belong to a group of *Rhyssemus* species, which exert a considerable sexual dimorphism expressed by inward hooked terminal spurs of their protibiae.

Variability. Not applicable here (only a single paratype was studied).

Distribution. India, New Delhi.

Notes. From other species inhabiting the Indian Subcontinent and/or the Oriental Region, the species *R. procerus* can be reliably differentiated by the following combination of characters as detailed in the description above and depicted in appropriate illustrations. The clypeus

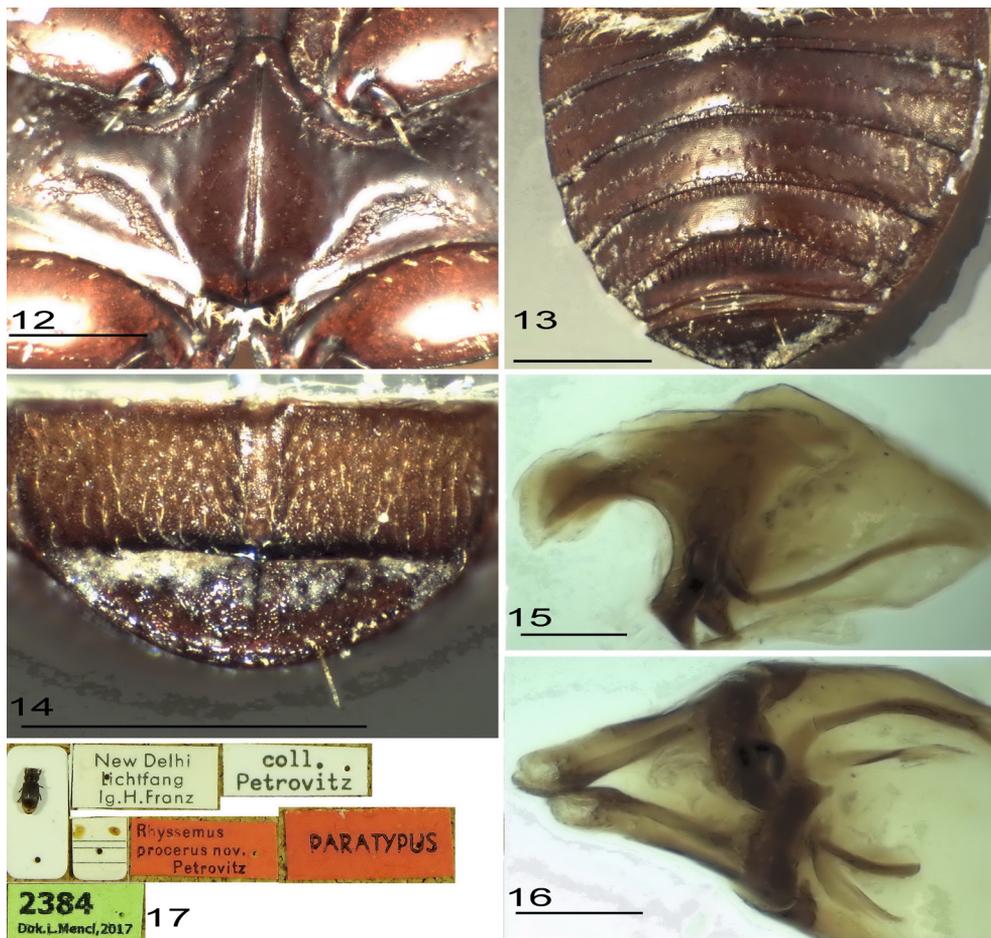


Figs. 8-11. *Rhyssemus procerus*, paratype, ♂, details (ventral views): 8- left anterior leg; 9- right protibia and setae on pronotum lateral margin; 10- left mesofemur; 11- left metafemur. Scale lines 0.5 mm. Photographs by L. Mencl.

with a lifted dentate angle each side of the anteromedian emargination, posterior oblique ridges on the head rather indistinct. Pronotum (when observed from above) narrowed before posterior angles (see also the section Discussion below); pronotal ridge 1 flat, moderately granulate and transversally punctate, ridge 2 finely punctate, moderately higher and narrower than ridge 1, mostly continuous, ridges 3 and 4 most convex, wider and more continuous than ridge 2, accessory swelling and ridge 5 vestigial, just indicated by few granules; pronotal furrows relatively shallow, considerably transversally punctate, furrows 2 and 3 wider than ridges 2 and 3, respectively. Individual granules in elytral intervals easy to recognize even under a low magnification (for example 10×).

DISCUSSION

As to our knowledge, the species *R. procerus* has not been collected since the time of its description. In the literature, the species is noted in the original description (Petrovitz 1973) and in a catalogue (Dellacasa 1988) only. The original description is rather brief and insufficient for reliable identification without a comparison with type material.



Figs. 12-17. *Rhyssalus procerus*, paratype, ♂, details, aedeagus, etiquettes and cards with specimen: 12- metaventral plate; 13- abdomen; 14- pygidium; 15- aedeagus lateral view; 16- aedeagus, ventral view; 17- etiquettes, and cards. Photographs by L. MencI.

The characters most important in the species differentiation are summarized in the paragraph “Notes” (the part “Taxonomy”) above.

Petrovitz (1973) offered a comparison of the species studied here with allopatric *R. granosus* (Klug & Erichson, 1842), which can be found in Egypt, Arab Emirates, Oman, Qatar, Saudi Arabia, Yemen, and is also widely distributed in the Afrotropical Region, but absent in India (Pittino 1984, Rakovič et al. 2016c). This comparison is perhaps relevant due to the narrowed posterior part of the pronotum: a short segment of the pronotum lateral margin before the posterior pronotal angle runs nearly perpendicular to the pronotum basis, the posterior pronotal angles being thus about rectangular. This feature is also found in the species *R. sinuaticollis* Pittino, 1984 known from several states of India, which is larger on

average (body length of 3.6 to 4.3), more subparallel, only quite slightly broader behind, its first pronotal ridge is smoother (at most with transversal punctures, but never granulate), pronotal furrows are granulate (not transversally punctate), and individual granules in elytral intervals are not distinct under low magnification).

No keys to species from the Oriental Region or from the Indian Subcontinent, published after the *R. procerus* description, are available. Under these circumstances, we believe that the data and illustrations presented here will be helpful in this respect.

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