

**Studies on types in the genus *Rhyssemus*. 4.
Rhyssemus tschadensis Petrovitz, 1963
(Coleoptera: Scarabaeidae: Aphodiinae: Psammodiini)**

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Abstract. Results of studying five paratypes of *Rhyssemus tschadensis* Petrovitz, 1963 are presented. A supplementary redescription is provided with putting emphasize on the pronotal and elytral structures and sculptures, details of which are difficult to describe without appropriate illustrations. Photographs of the species (habitus in different aspects and details) are published for the first time.

INTRODUCTION

The present work is further to our quite recent communications dealing with revisions of types in the genus *Rhyssemus* Mulsant, 1842. In this series of works, the following Afrotropical species of the genus have still been considered: *R. mayeti* Clouët des Pesruches, 1901 (Rakovič et al. 2016a), *R. keisseri* Bénard, 1910 and *R. rohani* Bénard, 1920 (Rakovič et al. 2016b), and *R. rothschildi* Bénard, 1909 (Rakovič et al. 2018).

Results of studying paratypes of a further Afrotropical species, *R. tschadensis* Petrovitz, 1963 are offered below.

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 acronyms stand for the collections, in which the specimens discussed below are kept:

MHNG Muséum d'histoire naturelle, Genève, Switzerland (Giulio Cuccodoro);

MRCD Private collection of Miloslav Rakovič, Dobřichovice, Czech Republic.

The specimens studied are equipped with white, red and pale green printed labels as described below. The pale green labels correspond to a photo-documentation system of the second author.

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. For morphological terms used in the description of epipharyngeal structures we follow Dellacasa et al. (2010).

TAXONOMY

***Rhyssemus tschadensis* Petrovitz, 1963**

(Figs. 1-19)

Rhyssemus tschadensis Petrovitz, 1963: 37.

Rhyssemus tschadensis: Pitino 1984a: 43 (discussion within *R. mayeti* redescription); 1984b: 356 (drawings of aedeagus); Dellacasa 1988: 424 (catalogue).

Type locality. "Tschadrepublik [= Republic of Chad], Ain Galakka [approximately 18°03'N 18°26'E], Borku [= Borkou Region]".

Type material studied. 5 paratypes, (MNHG), "Ain Galakka, Borku / Tschadrepublik / lg. H. Franz 1962 [white printed label] // PARATYPUS [red printed label] // *Rhyssemus / tschadensis / nov. / Petrovitz* [white printed label] // coll. / Petrovitz [white printed label] // 2364 or 2365 or 2366 or 2367 or 2368 / Dok.L.Mencl, 2017 [pale green printed label]". See also Fig. 19 for etiquettes situated under paratype specimens.

Note. The type locality is identical with that mentioned above for the five paratypes studied here. In the original work by Petrovitz (1963), further paratypes (not studied here) are mentioned from further two locations in Chad: "Umgeb. Ft. Lamy" and Deressia bei Lai".

Redescription based on the paratypes studied. Elongate, subparallel (slightly broader behind: broadest slightly behind elytra midlength, total body length - 3.4-3.8 mm, length-to-width ratio of 2.45), shining, dark brown (Fig. 1).

Head (Fig. 14). Clypeus obtusely roundly angulate each side of anteromedian emargination, its sides sinuate anteriorly, then moderately arcuate up to genae; genae separated by small notches anteriorly, but nearly aligned with clypeus lateral margins, protruding more than eyes and bearing few tough, acuminate macrosetae. Clypeus surface with not very dense, low, rather round or at most moderately transversal granules; middle protuberance above the granulate clypeus area distinctly elevated, its small posterior part smooth or at most moderately granulate but forward merging into discrete granules. Head vertex with two pairs of oblique ridges; ridges of anterior pair distinct, convex, having smooth or only slightly uneven (but not granulate) surface, separated by deep, V-shaped furrow from middle protuberance; ridges of posterior pair smaller, sometimes indistinct.

Epipharynx (Fig. 7) transversal, anterior outline almost straight, lateral outlines regularly widely rounded; epitorma subquadrate, well sclerotised; helus with group of somewhat irregularly spaced sensilla (including five remarkably large ones medially) and two irregular longitudinal rows of long microtrichia anteriorly; corypha and zygum absent; phobae weakly sclerotised, glabrous; both chaetopariae with row of 22 long, stout, closely spaced spines, apices of spines in chaetopariae never reach to bases of spines in prophobae; area of prophobae well sclerotised, bearing longitudinal row of five short, stout, densely spaced spines.

Pronotum (Fig. 15) transversal (its length-to-width ratio of 0.782), widest at middle, arcuately narrowed anteriorly, obliquely straight (at most moderately sinuate) narrowed toward round posterior angles, lateral margins crenulate, with macrosetae considerably dilated from base to apex (Fig. 16); macrosetae along basal margin as in Fig. 18. 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: transversal ridges

convex, mostly continuous, sparsely microscopically punctate, ridge 1 wide and rather uneven due to presence of sparse coarse punctures throughout, ridges 2-4 smooth, continuous, accessory swelling granulate, ridge 5 very narrow, consisting of discrete granules; transversal pronotal furrows 1-2 transversally wrinkled, remaining furrows rather transversally punctate than wrinkled.

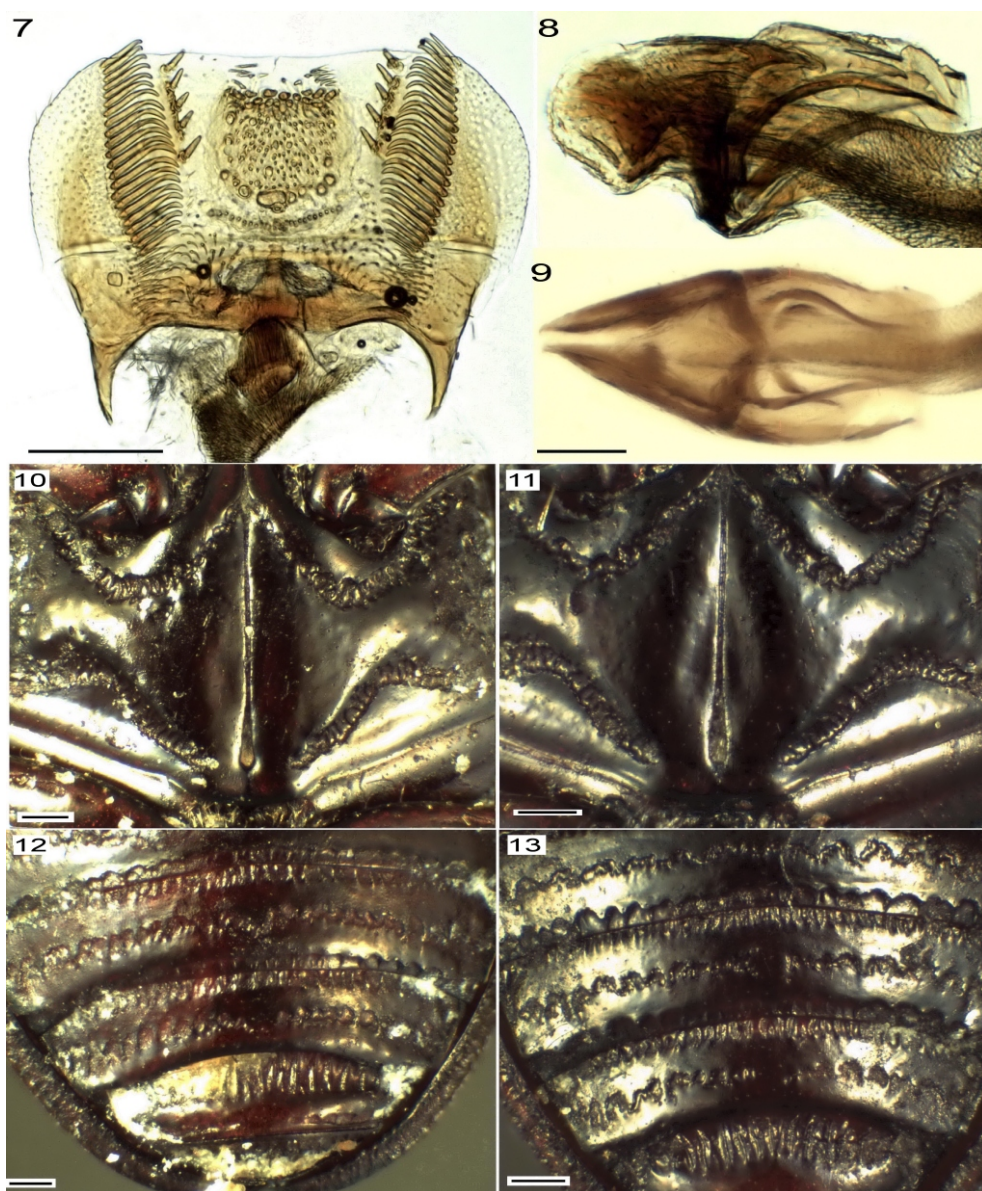
Elytra (Figs. 1, 2) moderately broader behind (their length-to-width ratio of 1.57), with ten striae and ten intervals; humeral denticles well distinct. Granules in discal elytral intervals (not only larger granules in outside rows, but even smaller ones in inside rows) distinct, shaped as shown in Fig. 17.



Figs. 1-6. *Rhyssemus tschadensis*, paratype, ♂, habitus and femora: 1- habitus, dorsal view; 2- habitus, dorsolateral view; 3- habitus, ventral view; 4- left profemur, ventral view; 5- left mesofemur, ventral view; 6- left metafemur, ventral view. Scale lines 1 mm for Figs. 1-3, 0.5 mm for Figs. 4-6. Photographs by L. Mencl.

Legs (observed in dorsal view). Superior terminal spurs of meso- and metatibia about as long as or slightly longer than basal meso- and metatarsomere, respectively. Basal meso- and metatarsomere nearly as long as meso- and metatarsomeres 2-4 combined, respectively.

Ventral surfaces (Fig. 3-6 and 10-13) finely alutaceous and thus only moderately shining, mostly glabrous and smooth, but femora with medium-sized (profemora) or relatively finer (meso- and

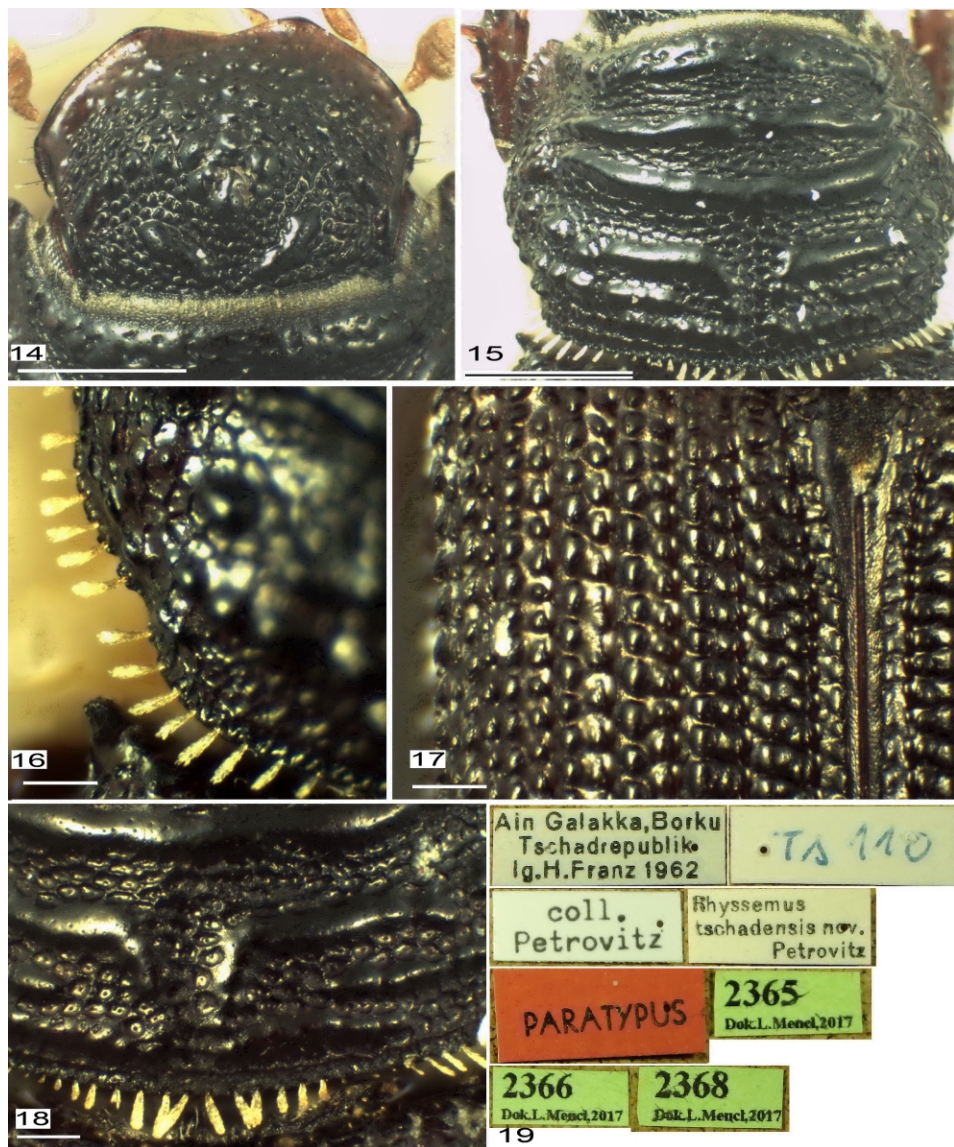


Figs. 7-13. *Rhyssemus tschadensis*, epipharynx, aedeagus, metaventral plate and abdominal ventrites: 7- paratype, ♀, epipharynx; 8- paratype, ♂, aedeagus, lateral view; 9- paratype, ♂, aedeagus, ventral view; 10- paratype, ♂, metaventral plate, ventral view; 11- paratype, ♀, metaventral plate, ventral view; 12- paratype, ♂, abdominal ventrites, ventral view; 13- paratype, ♀, abdominal ventrites, ventral view. Scale lines 0.1 mm. Photographs by L. Mencl.

metafemora) setigerous punctures arranged as in Figs. 4 (left profemur), 5 (left mesofemur) and 6 (left metafemur). Metaventral plate (Figs. 10-11) with narrow longitudinal furrow, which is complete anteriorly, moderately dilated and reduced posteriorly; area around furrow concave

(see also paragraph sexual dimorphism below). Abdominal ventrites 3-5 with quite distinct serrate lines ("zig-zag lines"), ventrite 3 distinctly fluted posteriorly, ventrite 4 fluted anteriorly as well as posteriorly, ventrite 5 fluted anteriorly, ventrite 6 very strongly, scabrously fluted anteriorly (Figs. 12-13).

Aedeagus as in Figs. 8 and 9.



Figs. 14-19. *Rhyssemus tschadensis*, paratype, ♂, details: 14- head, dorsal view; 15- pronotum, dorsal view; 16- pronotum, left posterior angle, dorsal view; 17- left elytron, area at base, dorsal view; 18- posterior part of pronotum, dorsal view; 19- labels pinned under paratypes ("Ts-140" – "reverse side of "Ain Galakka ..."). Scale lines 0.5 mm for Figs. 14-15, 0.1 mm for Figs. 16-18. Photographs by L. Mencl.

Sexual dimorphism. No considerable differences in external characters can be found. The area around the metaventral plate midline furrow is moderately more concave in females (Fig. 11) compared to males (Fig. 10).

Variability. In the five paratypes studied, there is no considerable difference in shapes, structures and sculptures. On the head, oblique ridges of the posterior pair are rather indistinct in some individuals. The transversal nature of punctures in pronotal furrows is rather variable (some nearly round punctures can sometimes be present in posterior furrows).

Distribution. Chad (in western areas from the South to the North of the country).

Differential diagnosis. Differences between *R. tschadensis* and a very similar species *R. mayeti* should be particularly detailed (see also the part Discussion below). The photos quoted here should be compared with corresponding photos concerning *R. mayeti* as published by Rakovič et al. (2016a).

When considering the dorsal aspect, then apically more distinctly dilated macrosetae on pronotum lateral edges (including posterior pronotal angles) in *R. tschadensis* (Figs. 1 and 16) are the most reliable character differentiating it from *R. mayeti*. In addition, the granules present in outside rows of elytral intervals, are higher and more distinct in *R. tschadensis* (Fig. 17) compared to *R. mayeti*.

Very distinct differences can be found on the ventral side, particularly in the arrangement of punctures on femora (Figs. 4-6).

The arrangement of epipharyngeal elements (Fig. 7) is of interest. A higher number of spines in chaetopariae and contrastingly a lower number of spines in prophobae are present in *R. tschadensis* compared *R. mayeti*. In *R. tschadensis*, apices of spines in chaetopariae never reach to bases of spines in prophobae whereas in *R. mayeti*, the apices of spines in chaetopariae definitely come in contact with the bases of spines in prophobae.

DISCUSSION

Rhyssemus tschadensis is very similar to *R. mayeti*. Petrovitz (1963). The differences explained above (in the paragraph Differential diagnosis) with references to particular figures in the present work may be more easily understood in comparison with photos shown in our recent work (Rakovič et al. 2016a) depicting appropriate characters in *R. mayeti*.

Petrovitz (1963) suggested that "*Rh. tschadensis* nov. ist an den auf der Scheibe des Halsschildes auffallend schmalen, kantigen Querwülsten leicht kenntlich", but this cannot be easily accepted; there are also other Afrotropical *Rhyssemus* species having narrow pronotal ridges (including some individuals of *R. mayeti*).

Pittino (1984a) detailed some differences between *R. mayeti* and *R. tschadensis* and also mentioned a comparison with *Trichiorhyssemus congolanus* Clouët des Pesruches, 1901; we believe that *T. congolanus* has smaller and sparser granules between the middle protuberance and clypeus margins. It is to note that the species is currently formally classed in *Trichiorhyssemus* Clouët des Pesruches, 1901 due to allegedly present imperceptible setae on its elytra, but these setae are hard to observe and thus, in certain species, both genera should be taken into accounts for practical purposes, e.g. for differential diagnoses.

The first author of the present work reported *R. tschadensis* from Sudan within the framework of

studying Sudanese Psammodiini (Rakovič 1984), but a thorough lookback at material studied that time (kept in MRCD) revealed that the specimens in question must be actually assigned to *R. mayeti*.

The species *R. tschadensis* has been still reliably known only based on the type series (Petrovitz, 1963) from eastern areas of Chad. Future records from other areas of the country and/or from other African countries can be expected.

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