

**Studies on the genus *Rhyssemus* and related genera.
I. A comparison of three closely related species from the Himalaya
including a new species from Nepal
(Coleoptera: Scarabaeoidea: Aphodiidae)**

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Abstract. *Rhyssemus ahrensi* sp. n. from Nepal is described. It is closely related to the species *R. falcatus* Petrovitz, 1961 (Kashmir, Pakistan) and *R. helenae* Pittino, 1983 (Pakistan) due to the presence of the following combination of characters: granulate pronotal furrows, relatively large, considerably depressed areas of anterior pronotal angles, narrowed pronotum in front of posterior corners and inward bent apical calcar of male protibia. Detailed comparison of the three species, relevant drawings and scanning electron micrographs are presented.

Taxonomy. new species, Coleoptera, Scarabaeoidea, Aphodiidae, Psammodiinae, *Rhyssemus ahrensi* sp. n., Palaearctic region

INTRODUCTION

The genus *Rhyssemus* Mulsant, 1842 and related genera, i.e. genera of the tribe *Rhyssemini* having a similar sculpture of the pronotum and/or elytra (*Messyrhus* Rakovič et Král, 1997; *Myrnessus* Balthasar, 1955; *Neorhyssemus* Gordon et Pittino, 1992, *Neotrichioryssemus* Rakovič et Král, 1997; *Pararhyssemus* Balthasar, 1955; *Rhyssemodes* Reitter, 1893; *Rhyssemorphus* Clouët, 1900; *Trichioryssemus*, Clouët, 1901) currently include nearly as much as 250 species distributed in all the zoogeographical regions (Dellacasa 1987, Gordon & Pittino 1992, Rakovič & Král 1997). Their identification is frequently enormously difficult. This particularly holds for species of the genus *Rhyssemus* from Asia and the Afrotropical region. Many tens of species have been described since the time of the appearance of larger keys (Clouët 1901, Schmidt 1922, Balthasar 1964, Endrödi 1964). In addition, some of these keys offered only restricted possibilities of the identification from the very beginning. Original descriptions frequently suffer from a lack of illustrations and particularly from the fact that different authors have different attitudes to the interpretation of certain characters.

In the 1980's and 1990's, several keys to *Rhyssemus* species were published, dealing with certain selected areas, which may be quoted (with disregarding works of rather local importance) as follows: Gordon & Cartwright 1980 (Western Hemisphere), Rakovič 1983 (Australian region), Pittino 1984b (Saudi Arabia), Baraud 1985 (Northern Africa), Nikolajev 1987 (Kazakhstan and Middle Asia), Bordat et al. 1990 (Madagascar), Stebnicka & Howden 1996 (Australia), Baraud 1992 (Europe) and Hollande et al. 1998 (Northern Africa). There are also two relatively recent and very

helpful works in the literature (Pittino 1983a, 1984) including, in addition to descriptions of new species, results of studying and revising certain formerly described species.

Thus, for bridging existing gaps in knowledge of the genus *Rhyssemus* and related genera the present authors consider as useful to study certain groups of these genera with providing relevant drawings and scanning electron micrographs and to compare the species studied with adhering to a uniform manner of the interpretation of their characters.

The work presented here is aimed at a description of a new species from Nepal and comparison of this species with two formerly described, closely related species, all the three species being representatives of the Himalayan fauna.

MATERIAL AND METHODS

The following codes (after Arnett et al. 1993) identify the collections housing the material examined

DACD – Germany, Dresden, Dirk Ahrens collection;

DKCP – Czech Republic, Praha, Charles University, David Král collection;

GDCG – Italy, Genova, Giovanni Dellacasa collection;

MHNG – Switzerland, Genève, Muséum d'histoire naturelle.

MRCO – Czech Republic, Dobručovice, Miloslav Rakovič collection.

Specimens chosen for scanning electron micrographs were cleaned by ultrasound.

Specimens of the newly described species are provided with one red printed label: *Rhyssemus ahrensii* sp. n. HOLOTYPE, ALLOTYPE or PARATYPE with No. xx [symbol for male or female] Miloslav Rakovič & David Král det. 2001. Exact label data are cited for the material, separate labels are indicated by double slash (/). Authors' remarks and complementations are found in square brackets.

TAXONOMIC PART

***Rhyssemus falcatus* Petrovitz, 1961**

(Figs 1, 7–14)

Rhyssemus falcatus Petrovitz, 1961: 113; Balhazar 1964: 562, 581 (monograph); Dellacasa 1988: 302, 422 (catalogue).

TYPE LOCALITY. Tasso [Kashmir] (Petrovitz 1961).

TYPE MATERIAL EXAMINED. One paratype (female), labelled: GILGIT, Öster. Karakorum Expedition 1958 // PARATYPE, *Rhyssemus falcatus* m. Petrovitz, coll. Petrovitz, in MHNG.

ADDITIONAL MATERIAL EXAMINED. Two specimens (1 male and 1 female), labelled: PAKISTAN: Chitral/Madagashit 2700 m 26. V. 1983/Besuchet – Löbl; 1 specimen (male), labelled: 26. 6. 1985, leg. S. VIT, à vue, St. Pierres/berges, vers de Gilgit, Gilgit PAKISTAN sept. [Gilgit is in Kashmir – the locality "Gilgit PAKISTAN" is probably due to a mistake] All in MHNG.

Results of the examination are summarized in the table presented below and in Figs 1 and 7–14.

DISTRIBUTION. India: Kashmir; Pakistan.

***Rhyssemus helenae* Pittino, 1983**

(Fig. 2)

Rhyssemus helenae Pittino, 1983: 114: figs 3, 15, 34–37; Dellacasa 1988: 340, 423 (catalogue); Stebnicka 1989: 7, 29 (revision).

TYPE LOCALITY. W-Pakistan (N Sind), Gund (Pittino 1983).

TYPE MATERIAL EXAMINED. One paratype (female), labelled: W-Pakistan (N. Sind), Gund m 2500 // *Rhyssemus helenae* n. sp., Det. R. Pittino, PARATYPE, in GDCG.

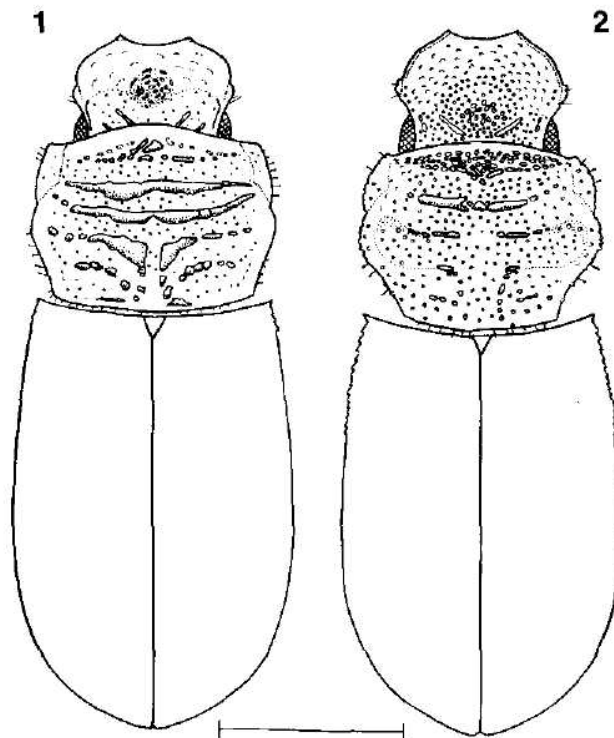
Results of the examination are summarized in the table presented below and in Fig. 2.
DISTRIBUTION. Pakistan.

***Rhyssemus ahrensi* sp. n.**
(Figs 3–6, 15–20)

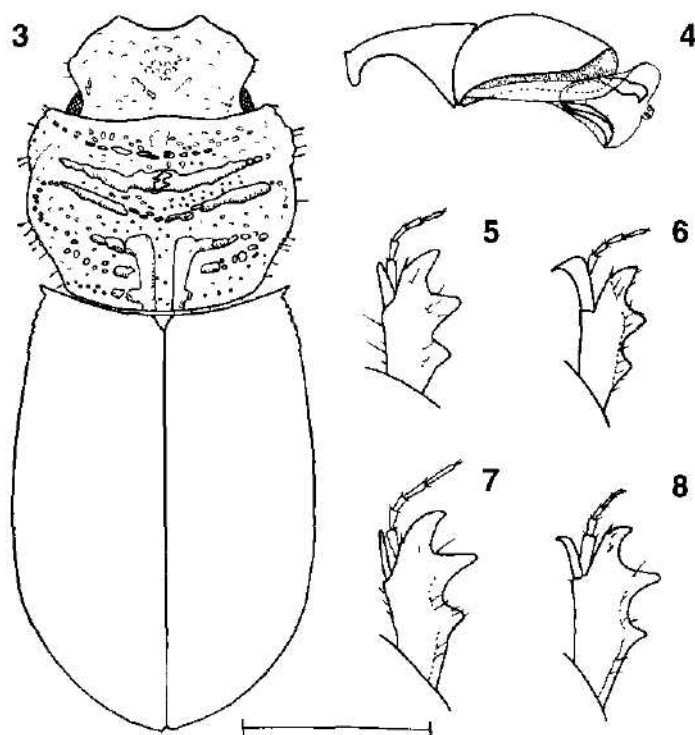
TYPE MATERIAL. Holotype (male), allotype (female), and paratypes Nos 1–50 (males), Nos 51–101 (females), labelled: NEPAL-HIMALAYA 9. 6. 1993 Kagbeni/Dhaulugiri (Mustang-Distr.) Kali Gandaki riv. 2900 m, lg. D. Ahrens; paratypes Nos 102–104 (females), labelled: NEPAL-HIMALAYA, Annapurna-Mts., lg. Ahrens 1993 / Jomsom bis Tukucho, 10. 6. 2500–2700 m; paratypes No. 105 (male), 106–108 (females), labelled: NEPAL-HIMALAYA 3./4. 6: 1993 Kangsar-Schlucht zw. Kangsar u. Tilicho-Lake bas. 4200 m lg. D. Ahrens. Holotype, allotype and paratypes Nos 1–38, 51–90, 102–108 in DACD, Nos 39–44, 45–50 in DKCP and Nos 90–95, 96–101 in MRCD.

DESCRIPTION. Body elongate, oval, convex (Fig. 3), dark brown, nearly black, alutaceous, only elevated formations (granules, ridges) moderately shining.

Body length 2.7–4.1 mm.



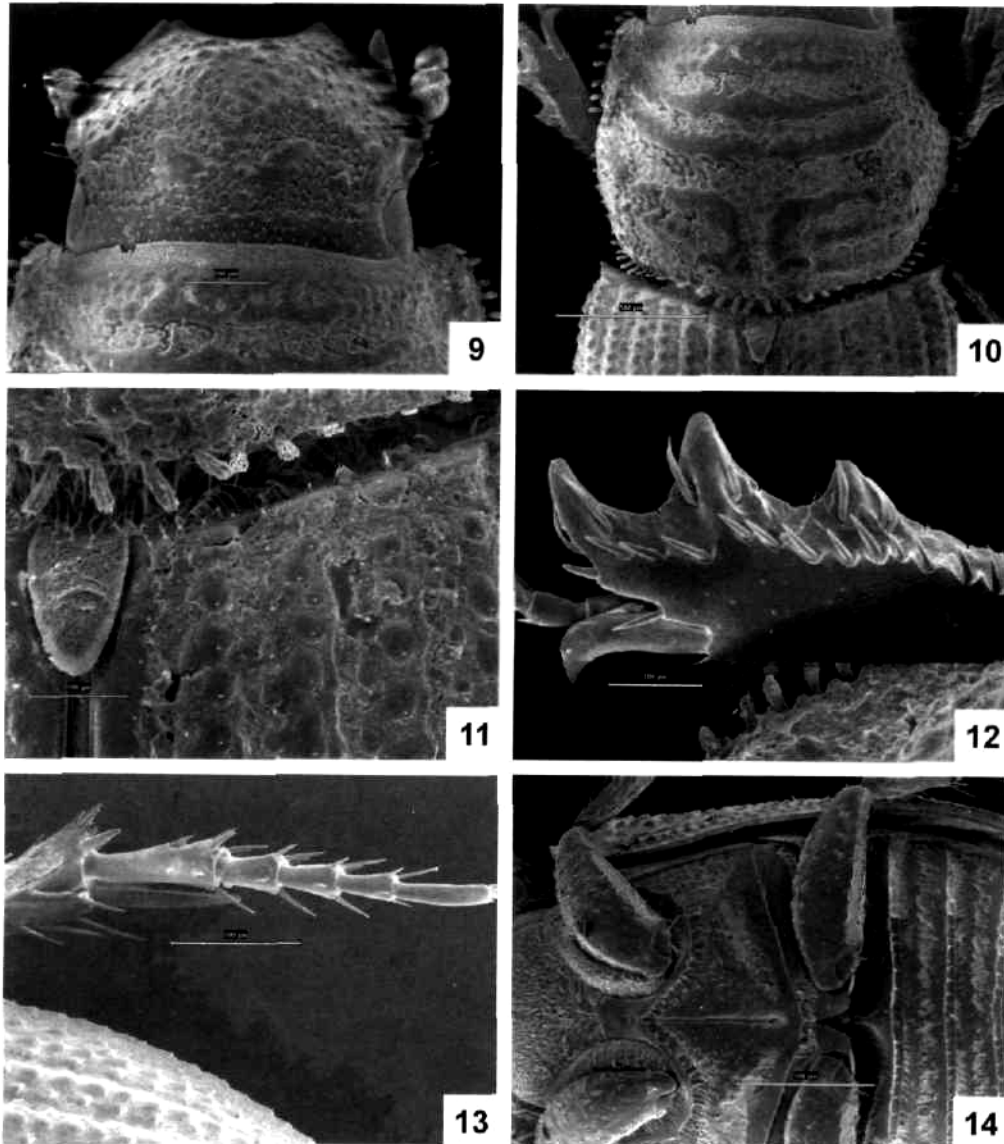
Figs 1, 2. Body shape and sculpture of head and pronotum, dorsal aspect; 1 – *Rhyssemus falcatus* Petrovitz (Kashmir: Gilgit), 2 – *R. helenae* Pittino (Pakistan: Gund, paratype); scale line: 1 mm.



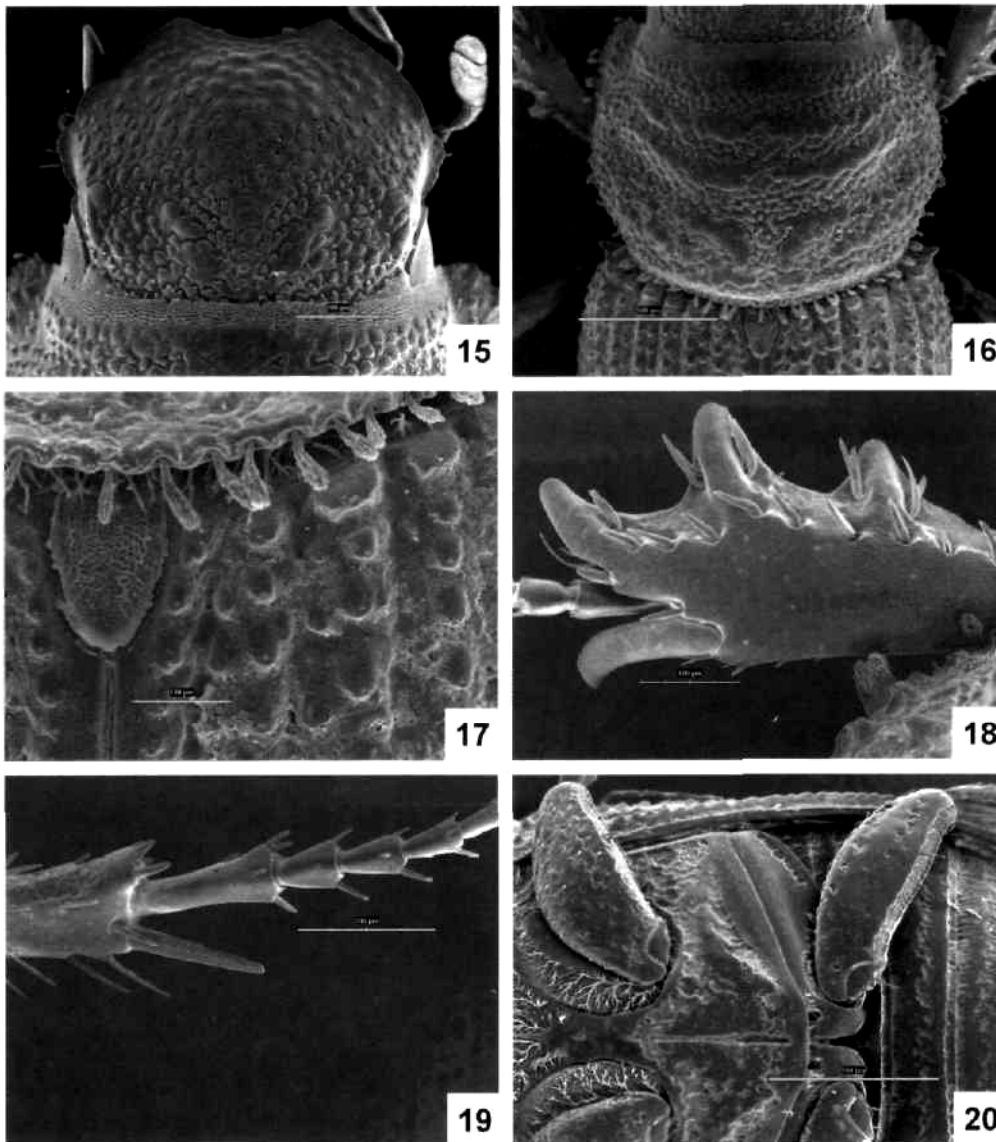
Figs 3-8. *Rhyssalus abrensi* sp. n., holotype (3-6), *R. falcatus* Petrovitz (Kashmir; Gilgit) (7, 8); 3 - body shape and sculpture of head and pronotum, dorsal aspect; 4 - aedeagus, left lateral aspect; 5, 7 - right female protibia, dorsal aspect; 6, 8 - right male protibia, dorsal aspect; scale line: 1 mm for 3, 0.25 mm for 4, 0.5 mm for 5-8.

Head (Figs 3, 15) convex, granulate. Clypeus with acute, upward lifted denticle each side of anterior emargination. Head vertex with only one pair of rather indistinctly delimited oblique ridges. Granules of median gibbosity larger, rather indistinctly delimited, granules on head vertex smaller, these along clypeus margins small, mostly transversal. Genae distinctly protruding, without notches, with few acute setae. Supraorbicular swellings formed by more or less indistinct rows of granules.

Pronotum (Figs 3, 16, 17) transversal, length-to-width ratio 1:1.41, with five transverse ridges, five transverse furrows, posterior longitudinal furrow and pair of accessory swellings. First ridge formed by rather indistinctly delimited, discrete granules; granules along its posterior margin usually larger. Second and third ridges partially continuous, sometimes irregularly incised, however, usually not completely interrupted at middle. Medial parts of fourth ridge as well as longitudinal keels each side of posterior longitudinal furrow mostly continuous. Fifth ridge vestigial medially, passing into rather indistinct arrangement of small granules laterally. Accessory swellings (situated between right and left branches of fourth and fifth ridges) consisting of large, sometimes partially confluent, granules. All transverse furrows as well as posterior longitudinal furrow with small granules. Third furrow considerably wider than third ridge and considerably impressed laterally (at its ends), otherwise furrows narrower than respective ridges. Areas of pronotum anterior corners considerably depressed, pronotum considerably narrowed at posterior angles. Lateral margins very



Figs 9–14. *Rhyssalus falcatus* Petrovitz (Kashmir: Gilgit); 9 – head; 10 – pronotum; 11 – right elytron basis; 12 – right male protibia; 13 – right male metatarsus; 14 – left meso- and metafemur, metasternal plates and ventrites; dorsal aspect (9–13), ventral aspect (14).



Figs 15–20. *Rhyssalus ahrensi* sp. n., holotype: 15 – head; 16 – pronotum; 17 – right elytron basis; 18 – right male protibia; 19 – right male metatarsus; 20 – left meso- and metafemur, metasternal plates and ventrites; dorsal aspect (15–19), ventral aspect (20).

Tab 1 Comparison of selected characters of discussed *Rhyssemus* Mulsant species

<i>Rhyssemus falcatus</i> Petrovitz	<i>Rhyssemus helenae</i> Pittino	<i>Rhyssemus ahrensi</i> sp. n.
Dark brown, nearly black, even elevated areas (surfaces of granules and ridges) not quite shining	Shining, head and pronotum dark brown (clypeus margins and pronotum anterior corners reddish brown), elytra reddish brown	Dark brown, nearly black, alutaceous, only elevated structures (granules, ridges) moderately shining.
Head mostly densely granulate. Granules distinctly delimited, larger and of various shapes in the area of median gibbosity, smaller and rounded behind it, transverse and sparsely distributed along clypeus margin (Figs 1, 9)	Head densely granulate, granules relatively uniform, distinct (Fig. 2).	Head sparsely granulate, granules relatively less distinctly delimited, variable, sometimes individual granules transversely elongate (Figs 3, 15).
Two pairs of oblique ridges present on head vertex. Ridges of anterior pair considerably convex, prevalently continuous. Those of posterior pair rather vestigial, however, distinct, each of them formed by one or two granules or by a short swelling (Figs 1, 9)	Only one pair of oblique ridges present on head vertex, convex, prevalently continuous (Fig. 2)	Only one pair of oblique ridges present on head vertex, rather obsolete, frequently broken into discrete granules (Figs 3, 15)
Genae only slightly protruding beyond clypeus lateral margins (Figs 1, 9).	Genae considerably protruding (Fig. 2)	Genae considerably protruding (Figs 3, 15).
Granules of first pronotal ridge distinct, however, some of them confluent with neighbouring ones (Figs 1, 10)	Granules of first pronotal ridge distinct, discrete (Fig. 2)	Granules of first pronotal ridge rather flat and obsolete (Figs 3, 16)
Traces of longitudinal swellings along posterior longitudinal furrow present only at medial interruption of fourth ridge, attenuated in direction of fifth ridge (Figs 1, 10)	Longitudinal swellings along posterior longitudinal furrow formed only by rows of discrete granules (Fig. 2)	Longitudinal swellings along posterior longitudinal furrow mostly continuous, complete (Figs 3, 16)
Elytra subparallel, length-to-width ratio 1:0.636	Elytra slightly widened posteriorly, length-to-width ratio 1.650	Elytra more considerably broader behind, length-to-width ratio 1:0.667
Large granules of elytral intervals essentially flat (Fig. 11)	Large granules of elytral intervals very distinct, acute	Large granules of elytral intervals distinct, however, blunt (Fig. 17)

distinctly crenate anteriorly, lateral and basal margins equipped with apically considerably dilatate setae (Fig. 16).

Elytra broader posteriorly, length-to-width ratio of 1:0.667, with ten striae and ten intervals exerting no differences between neighbouring even and odd ones, with strong, acute humeral teeth. Striae with two rows of granules; granules of lateral rows large, quite distinct even in top view, those of medial rows smaller and less distinct (Fig. 17). Tenth interval lower, however, not quite flat and only slightly shortened apically.

Macropterous.

Ventral surface dark brown. Metasternum surface prevalently granulate, metasternal plate smooth, with complete, essentially uniform, posteriorly slightly widened longitudinal furrow (Fig. 20). Pro-

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