A NEW GENUS AND SPECIES OF THE FAMILY NEOPYGMEPHORIDAE (ACARI: HETEROSTIGMATA: PYGMEPHOROIDEA) ASSOCIATED WITH GEOTRUPES SPINIGER (COLEOPTERA: GEOTRUPIDAE) FROM UKRAINE

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ABSTRACT: A new genus and species, Pseudokerdabania geotruporum gen. et sp. n., collected under the elytra of the beetle Geotrupes spiniger (Marsham, 1802) (Coleoptera: Geotrupidae) from Ukraine is described.

KEY WORDS: Pygmephoroidea, Neopygmephoridae, new genus, new species, phoresy, Geotrupidae, Ukraine

INTRODUCTION

During a study of mites associated with beetles in Ukraine collected by the junior author, a new genus and species of mite family Neopygmephoridae was found under the elytra of Geotrupes spiniger (Marsham, 1802) (Coleoptera: Geotrupidae). The purpose of this paper is to describe the new genus and species, Pseudokerdabania geotruporum gen. et sp. n. from Ukraine.

MATERIALS AND METHODS

Mites were collected from coleopteran hosts and mounted in Hoyer’s medium. In the description, the terminology of idiosoma and legs follows Lindquist (1986). The nomenclature of subcapitular and cheliceral setae follows Grandjean (1944, 1947), respectively. The systematics of Pygmephoroidea follows Khaustov (2004, 2008). All measurements are given in micrometers (μm) for the holotype and paratype (in parentheses). In descriptions of leg chaetotaxy, the number of solenidia is given in parentheses.

SYSTEMATICS

Family Neopygmephoridae Cross, 1965
Genus Pseudokerdabania Khaustov et Trach gen. n.

Type species: Pseudokerdabania geotruporum Khaustov et Trach gen. n.

Description. Female. Gnathosomal capsule longer than width. Dorsal gnathosoma with two pairs of cheliceral setae (cha and chb) and pair of postpalpal setae (pp). Dorsal medial apodeme well developed. Ventral gnathosoma with one pair of setae m. Palps short, with setae dFe and dGe dorsolaterally, one small solenidion and accessory segeninous structure ventrally, and terminated with small claw. Pharyngeal pump 2 very long, longer than gnathosoma, pharyngeal pump 3 very small, vestigial.

Idiosomal dorsum. Prodorsum with 2 pairs of setae (v1, sc.), a pair of clavate trichobothria (sc.) and pair of oval stigmata. Posterior margin of prodorsal plate straight and distinctly separated from tergite C by area of soft cuticle. Posterior margin of tergites C and D distinctly concave. Two pairs of cupules (ia, ih) present on tergites D and H respectively.


Male and larva unknown.
Diagnosis. By the characteristic shape of the posterior margins of tergites C and D, and the posterior sternal plate, the prodorsal plate separated from tergite C by soft cuticle, and by the relatively short setae of the poststernal plate, the new genus is most similar to genus Kerda Bania Khaustov, 2009. It differs from Kerda Bania by a very large second pharyngeal pump and vestigial third pharyngeal pump (in Kerda Bania third pharyngeal pump is well developed, oval, and only slightly shorter than second pharyngeal pump). The new genus differs also by the modified tibiotarsal claw (simple in Kerda Bania) and by the presence of modified setae \( u' \) on tibiotarsi I, which form a structure opposite to the claw (absent in Kerda Bania). It also differs from Kerda Bania by the presence of two pairs of dorsal cheliceral setae (only one present in Kerda Bania) and by the long, pointed and barbed seta \( k \) on tibiotarsus I (short, blunt-ended, eupathidium-like in Kerda Bania).

By the relatively short setae of the posterior sternal plate, the short tarsus IV, the modified claw on tibiotarsus I, the bifurcate setae \( 1b \), the unmodified setae \( k \) on tibiotarsus I, and the relatively short apodemes 4, the new genus is also similar to the genus Pseudopygmephorus Cross, 1965, but differs by the prominent solenidion \( \phi \) on tibiotarsus I (completely or partially fused with tibiotarsus I) and the large second pharyngeal pump and the vestigial third pharyngeal pump (subequal, oval and third pharyngeal pumps in Pseudopygmephorus).

The new genus is also similar to some species of the genus Bakerdania Sasa, 1961, especially to B. uenoi Kurosa, 1995 and B. loricophila Sevastianov, 1981. Both of these species have similar tripartite posterior margin of the poststernal plate, short and smooth setae of the poststernal plate, the modified claw on tibiotarsus I, short tarsus IV, and are associated with beetles. In our opinion the placement of these species in the genus Bakerdania is doubtful because species of Bakerdania sensu stricto, including the type species Bakerdania culturata (Berlese, 1904) re-described by Rack (1966) have the entire posterior margin of the poststernal plate and the long and thin tarsus IV. Probably B. uenoi and B. loricophila also belong to Pseudokerdabania gen. n., but the structure of the pharyngeal pumps is not described for them and their placement into the genus Pseudokerdabania gen. n. is also unclear.

Species included. The new genus currently includes only one species Pseudokerdabania geotruporum Khaustov et Trach sp. n.

Distribution and habitat. The type species of the genus Pseudokerdabania is known only from Ukraine. Adult females of P. geotruporum are found phoretic under the elytra of earth-boring dung beetle Geotrupes spiniger (Coleoptera: Geotrupidae).

Etymology. The generic name is derived from the name of a closely related genus, Kerda Bania, and the prefix pseudo.

Pseudokerdabania geotruporum Khaustov et Trach sp. n.

Figs 1–7.

Description. Female. Idiosomal length: 264 (260), maximum width 133 (112).

Gnathosoma (Figs. 1–2). Cheliceral setae subequal, pointed. Postpalpal setae short, peg-like. Dorsal medial apodeme well developed. Posterior margin of gnathosomal capsule ventrally deeply concave. Accessory setigenous structure relatively small. Pharyngeal pumps as on fig. 3.

Idiosomal dorsum (Fig. 1). Stigmata almost round. All tergites with numerous very small dimples. All dorsal setae barbed, except smooth \( v_2 \). Setae \( d \) and \( e \) blunt ended, other dorsal setae pointed. Length of dorsal setae: \( v_2 \) 8 (10), \( sc_1 \) 42 (44), \( c_1 \) 44 (45), \( c_2 \) 57 (54), \( d_2 \) 34 (29), \( e_2 \) 18 (15), \( f_2 \) 55 (46), \( h_1 \) 46 (40), \( h_2 \) 51 (43). Distances between dorsal setae: \( v_2–v_2 \) 26 (22), \( sc_2–sc_2 \) 29 (26), \( c_1–c_1 \) 46 (44), \( c_2–c_2 \) 23 (20), \( d_2–d_2 \) 36 (31), \( e_2–f_2 \) 56 (47), \( h_1–h_1 \) 28 (25), \( h_2–h_2 \) 14 (12). Trichobothrium with thin stem, distally spherical with pointed tip.

Idiosomal venter (Fig. 2). Setae of anterior sternal plate distinctly barbed, other ventral setae smooth and pointed. All ventral plates with numerous very small dimples. Apodemes 1 well developed and joined with pre-sternal apodeme, apodemes 2 very thin medially and well sclerotized laterally; sejugal apodeme weakly developed in medial part and strong laterally; apodemes 3 relatively long, diffuse. Apodemes 4 well sclerotized and joined with post-sternal apodeme. Posterior margin of aggenital plate rounded. Length of ventral setae: \( la \) 29 (24), \( lb \) 22 (17), \( 2a \) 33 (30), \( 2b \) 34 (32), \( 3a \) 21 (16), \( 3b \) 23 (18), \( 3c \) 20 (16), \( 4a \) 22 (13), \( 4b \) 28 (25), \( 4c \) 22 (21), \( ps_1 \) 12 (10), \( ps_2 \) 8 (6), \( ps_3 \) 9 (9).

Legs (Figs. 4–7). Leg I (Fig. 4). Solenidion \( \omega \) 6 (7) finger-shaped, solenidia \( \omega_1 \) 2 (2) and \( \phi \) 3 (3) very small, peg-like. Solenidion \( \phi \) 7 (8) clavate. Setae \( l'FeI \) and \( l'GeI \) blunt-ended. Leg II (Fig. 5).
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Solenidion ω 6 (6) finger-shaped. Leg III as on fig. 6. Leg IV (Fig. 7). Setae v”TIIV blunt-ended.

Type material. Female holotype, slide No. VT280710, UKRAINE, Lugansk prov, Melovskoj distr., vic. of Krinichnoe, branch of Lugansk Natural Reserve “Streltsovskaya steppe”, under elytra of Geotrupes spiniger (Marsham, 1802), 28 July 2010 (coll. V.A. Trach); paratype: 1 females, with same data as holotype.

Type depositories. The holotype deposited at the collection of the Nikita Botanical Gardens — National Scientific Centre, Yalta, Ukraine; the paratype is at the collection of Zoological Museum of I.I. Mechnikov Odessa National University, Ukraine.

Etymology. The name of new species refers to the phoretic association of new species with beetles of the genus Geotrupes.

Differential diagnosis. The new species is most similar to Bakerdania uenoi Kurosa, 1995 and B. loricophila Sevastianov, 1981 (see the generic diagnosis above), but differs from these species by the bifurcate setae 1b (not bifurcate in B. uenoi and B. loricophila) and by the subequal se-
tae $h_1$ and $h_2$ (in $B. uenoi$ and $B. loricophila$ setae $h_1$ are much longer than $h_2$).

**DISCUSSION**


Figs. 4–7. *Pseudokerdabania geotruporum* sp. n., female: 4–7 — legs I–IV, respectively.
neopygmephorid mites lack eupathidion \( p' \) and have 3 setae on femur I. Thus, we classify Sasa-dania in the family Pygmephoridae. Representatives of only 3 genera are known to be associated with scarabaeoid beetles (Coleoptera: Scarabaeoidea). Bakerdania tenuispina Sevastianov, 1974 is phoretic on beetles of the genus Pseudopygmephorus (Coleoptera: Scarabaeidae) (Khaustov and Hajiqanbar 2004; Khaustov 2011). The position of B. tenuispina in the genus Bakerdania is doubtful because females of this species have a short tarsus IV, well developed postpalpal setae and the palps lacking setae dFe, while species of Bakerdania sensu stricto have a long and narrow tarsus IV, the palps always with setae dFe and lacking the postpalpal setae. In our opinion, Bakerdania tenuispina should be placed in separate, monotypic genus. It will be done by the senior author elsewhere. Pseudopygmephorus Bakerdania uniseta sp. n., a new species of mites (Acari: Pygmephoridae) associated with the scarab beetle Pseudopygmephorus anatolicus (Coleoptera: Scarabaeidae) from Iran. Acarina, 12 (2): 109–112.


