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A new genus and species of Aleocharinae from a cave in Georgia (Coleoptera: Staphylinidae)

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A b s t r a c t : *Speleogona* nov.gen. *cavernicola* nov.sp., an anophthalmous troglobite from Georgia, is described and illustrated.

K e y w o r d s : Coleoptera, Staphylinidae, Aleocharinae, Athetini, *Speleogona*, Georgia, taxonomy, new genus, new species, cave, troglobite.

Introduction

Caves and cave species have always fascinated entomologists. Trogllobiont insects usually have highly restricted distributions and display special - sometimes extreme - morphological adaptations to their habitat. These adaptations not only include reductions of the pigmentation, the eyes, and the wings, but often also affect body size and shape, as well as the length of the legs and antennae. As far as the Staphylinidae are concerned, there has been some confusion regarding the terms trogllobiont, troglobite, etc. Staphylinids typically found in large caverns of cave systems are species inhabiting the dung of bats or other kinds of rotting material or that are associated with moist habitats near water, but they are usually capable of flight and have fully developed eyes, as is the case e. g. in *Atheta spelaea* (ERICHSON 1839), *A. temeris* ASSING & VOGEL 2003 (for illustrations see ASSING & VOGEL 2003), and *Sepedophilus cavicola* (SCRIBA 1870). As far as is currently known, most of the staphylinids referred to as troglobites in the literature (see e.g. BORDONI & OROMÍ 1998, HLAVÁČ et al. 2007) and displaying the adaptations mentioned above are microcavernicolous, i.e. inhabitants of crevices, and they are only accidentally found in the large caverns of cave systems. It seems likely that the extent of morphological adaptations of body size, body shape, and length of appendages has evolved as a response to the width of the crevices and other properties of the respective habitat. This conclusion is supported by a comparison of closely related species associated with a range of substrates characterised by "microcaverns" of different widths or "spaciousness". An impressive example is provided by the species of the genus *Alevonota* THOMSON 1858 in the Canary Islands, which, with all transitions, display the full range of variation from relatively large to minute body size, from slender – almost "stretched" – to compact body shape, and from distinctly elongated to rather short legs and antennae, their respective habitats ranging from volcanic rock with more spacious crevices, the mesocavernous shallow substratum (MSS), to subterranean habitats in deep humus (ASSING 2002). Similar examples of almost continuous ranges of morphological

adaptions to a size gradient of "microcaverns" can be found also in other staphylinid genera such as *Domene* FAUVEL 1873 and *Apteranillus* FAIRMAIRE 1854.

Recently, two specimens of a species of Aleocharinae collected in a cave in Georgia were made available to me by Pavel Stoev, National Museum of Natural History, Sofia. An examination of the completely anophthalmous beetles revealed that they represent a species that is not only undescribed, but also does not seem to have any closer affiliations to other athetine genera known from the Western Palaearctic region, so that it is here referred to a new genus.

***Speleogona* nov.gen.** (Figs 1-16)

T y p e s p e c i e s : *Speleogona cavernicola* nov.sp.

E t y m o l o g y : The name is composed of the Greek words for "cave" (spelaiion) and "born" (gonos).

D e s c r i p t i o n : In general appearance (body size and shape) similar to species of the genus *Leptusa* KRAATZ (Fig. 1).

Head completely anophthalmous, not even eye rudiments present (Fig. 4); genal carinae pronounced, in lateral view conspicuously angled (Fig. 4); maxilla with relatively short lacinia and galea; maxillary palpus 4-jointed, preapical palpomere rather large, almost 3 times as long as wide (Fig. 5); labial palpus 3-jointed, rather slender; ligula very long and slender, apically deeply bifid; mentum moderately transverse and of trapezoid shape (Fig. 6); labrum large, moderately transverse, with long whitish setae, and with weakly convex anterior margin. Antenna distinctly incrassate apically (Fig. 3).

Pronotum transverse, wider than head (Fig. 2); pubescence directed caudad along midline and diagonally latero-caudad in lateral areas; pronotal hypomera broadly visible in lateral view; prosternum with pronounced carina in the middle.

Elytra distinctly sinuate near posterior angles (Fig. 2). Mesosternum without carina; mesosternal process large and long, apically broadly rounded, almost reaching posterior margin of mesocoxae; mesocoxal cavities delimited from metasternum by fine carina. Legs moderately slender; tarsal formula 4, 5, 5.

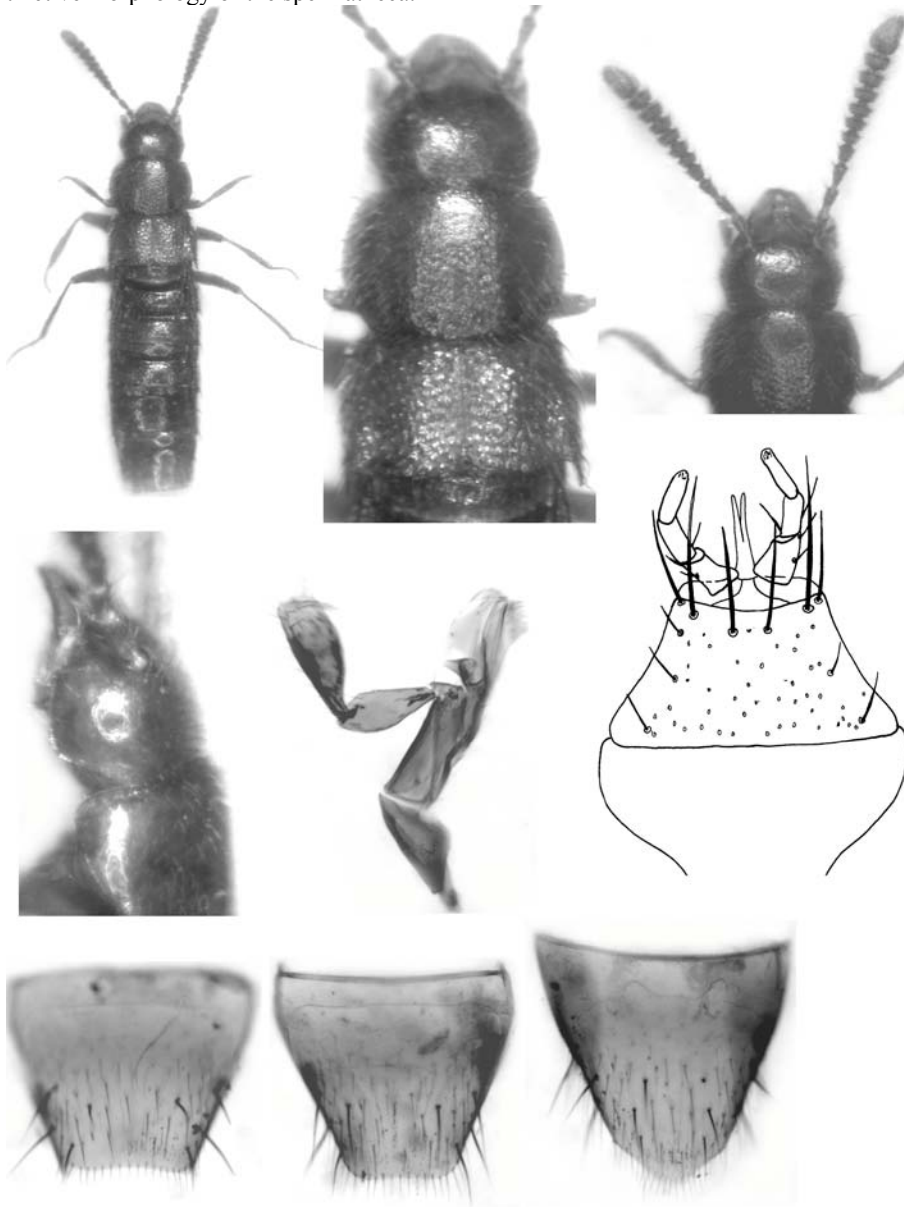
Abdomen widest at segments IV-V (Fig. 1), segments VI-VIII weakly tapering; tergites III-V with distinct anterior impressions; tergite VI without anterior impression; tergite VIII without appreciable sexual dimorphism, its posterior margin truncate to indistinctly concave in both sexes (Figs. 7, 9); sternite VIII with weakly pronounced sexual dimorphism (Figs. 8, 14).

♂: median lobe of aedeagus rather small; internal sac with moderately long flagellum, but without distinctly sclerotised additional structures (Figs 10-11); apical lobe of paramere relatively short, with two very long median and two short apical setae (Fig. 14).

♀: spermathecal duct very long and with numerous helical coils (Figs 15-16).

T r i b a l p l a c e m e n t a n d c o m p a r a t i v e n o t e s : Based on the morphology of the mouthparts and the tarsal formula, the genus is assigned to the Athetini. It is readily distinguished from all other athetine genera distributed in the Palaearctic region by the resemblance to the homalotine genus *Leptusa*, the pronounced and in lateral view conspicuously angled genal carinae, the complete absence of eyes, the conspicuously long and deeply bifid ligula, the large, long, and apically rounded meso-

sternal process, the chaetotaxy of the apical lobe of the paramere, as well as by the distinctive morphology of the spermatheca.



Figs 1-9: *Speleogona cavernicola* nov.sp.: (1) habitus; (2) forebody; (3) head and pronotum; (4) head in lateral view; (5) maxilla; (6) labium; (7) male tergite VIII; (8) male sternite VIII; (9) female tergite VIII. Scale bars: 1: 1.0 mm; 2-4: 0.5 mm; 7-9: 0.2 mm; 5-6: 0.1 mm.

***Speleogona cavernicola* nov.sp.** (Figs 1-16)

Type material: Holotype ♂: Georgia - Imereti, Terjola distr., Nakhshirghele vill., Navenaheli cave, 42°14.51'N, 42°51.78'E, 275 m, leg. P. Stoev & S. Lazarov / Holotypus ♂ *Speleogona cavernicola* sp.n. det. V. Assing 2008 (National Museum of Natural History, Bulgarian Academy of Sciences, Sofia). Paratype ♀: same data as holotype (coll. Assing).

Etymology: The name (Lat., noun: inhabitant of caves) refers to the habitat where the species was discovered.

Description: Measurements (in mm) and ratios (holotype, paratype): length of antennae: 0.86, 0.80; head length from anterior margin of clypeus to posterior margin of head (HL): 0.41, 0.39; head width (HW): 0.48, 0.44; length of pronotum (PL): 0.46, 0.42; width of pronotum (PW): 0.62, 0.57; length of elytra at suture from apex of scutellum to posterior margin (EL): 0.35, 0.32; combined width of elytra (EW): 0.65, 0.59; width of abdomen at segment V (AW): 0.63, 0.60; length of metatibia (TiL): 0.56, 0.50; length of metatarsus (TaL): 0.39, 0.36; length of median lobe of aedeagus from apex of ventral process to base: 0.32, -; total length: 3.0, 2.8; HL/HW: 0.84, 0.90; PW/HW: 1.28, 1.31; PW/PL: 1.34, 1.36; EL/PL: 0.75, 0.75; EW/PW: 1.05, 1.03; AW/EW: 0.98, 1.03; TiL/TaL: 1.42, 1.38.

Coloration: body almost uniformly pale reddish brown with yellowish abdominal apex; legs dark yellowish.

Head transverse (see measurements and ratio HL/HW); puncturation sparse and extremely fine, barely noticeable; integument with pronounced microreticulation (Fig. 3); pubescence whitish and suberect. Antenna stout; antennomere IV coniform and approximately as wide as long; V distinctly transverse, more than twice as wide as long; VI-X of increasing width and increasingly transverse; X almost 3 times as wide as long; XI rather massive, of ovoid shape, slightly longer than the combined length of IX-X (Fig. 3).

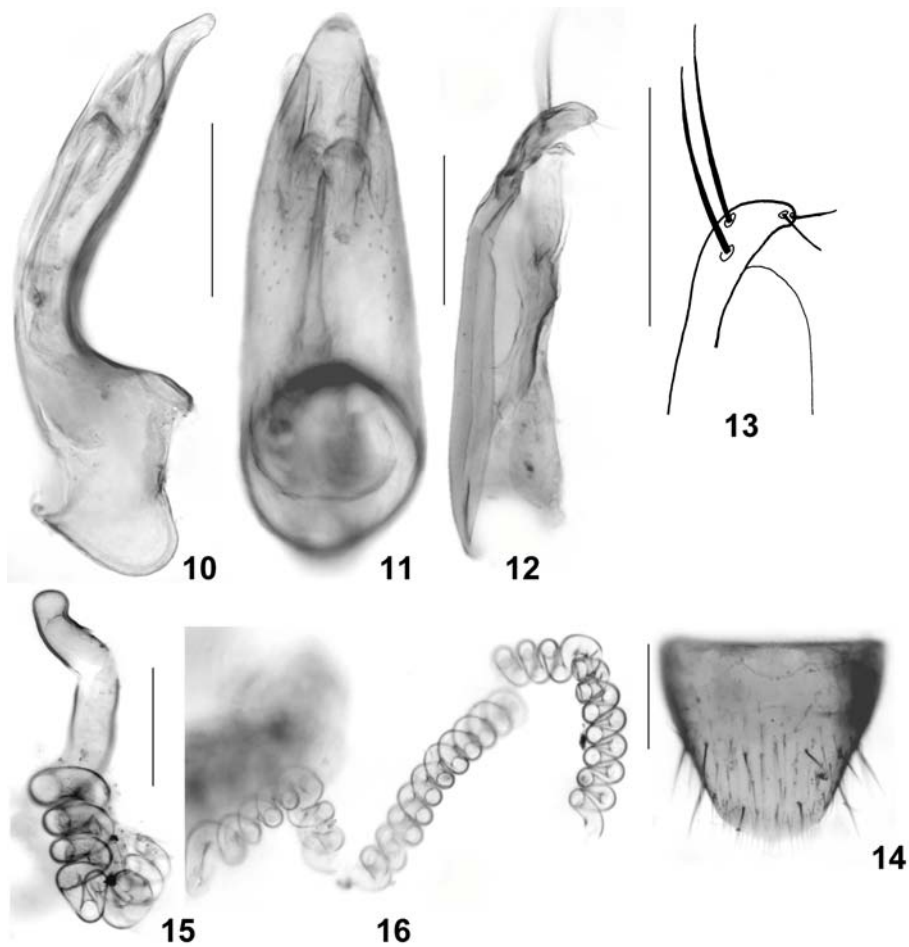
Pronotum distinctly transverse and wider than head (see measurements and ratios PW/PL and PW/HW), maximal width in anterior half (Fig. 2); near posterior angles with shallow impression; puncturation very indistinct in anterior half, slightly more distinct in posterior half; microreticulation as pronounced as that of head; pubescence similar to that of head, but on average less erect and slightly denser; lateral pronotal margins each with four rather long dark setae.

Elytra of reduced length (see ratio EL/PL) and approximately as wide as pronotum (Fig. 2); posterior margin near posterior angles strongly sinuate; area near posterior angles shallowly impressed; puncturation more distinct than that of head and pronotum, somewhat granulose; microsculpture absent or very shallow. Hind wings reduced. Legs with relatively long tibiae (see ratio TiL/TaL); metatarsomere I distinctly longer than II, as long as the combined length of II-III or nearly so.

Abdomen approximately as wide as elytra (see ratio AW/EW); puncturation fine and sparse on anterior tergites, very fine and very sparse on posterior tergites; microsculpture shallow, composed of short transverse meshes on tergites VI and VII; posterior margin of tergite VII without palisade fringe.

♂: posterior margin of sternite VIII pointed in the middle (Fig. 8); median lobe of aedeagus as in Figs 10-11; paramere as in Figs 12-13.

♀: posterior margin of sternite VIII pointed in the middle (Fig. 14), but slightly less so than in ♂; spermathecal duct very long and with numerous helical coils (Figs 15-16).



Figs 10-16: *Speleogona cavernicola* nov.sp.: (10-11) median lobe of aedeagus in lateral and in ventral view; (12) paramere; (13) apical lobe of paramere; (14) female sternite VIII; (15) spermathecal capsule and distal part of duct; (16) proximal part of spermathecal duct. Scale bars: 14: 0.2 mm; 10-13, 15-16: 0.1 mm.

Distribution and bionomics: The Navenahevi Cave (type locality) is situated in the hills to the west of Kutaisi, Georgia, at an altitude of less than 300 m. According to Stoev (pers. comm.) the specimens were collected under stones on humid clay and on walls. Morphological adaptations to its habitat are the completely reduced eyes (not even traces have remained), the reduced pigmentation (especially of the pubescence), the long setae at the lateral margin of the pronotum, as well as the reduced elytra, hind wings, and palisade fringe at the posterior margin of tergite VII.

Acknowledgements

I am most grateful to Dr. Pavel Stoev, Sofia, for making the type material of the new species available. My thanks are extended also to Benedikt Feldmann, Münster, and Michael Schülke, Berlin, for helpful comments.

Zusammenfassung

Speleogona nov.gen. *cavernicola* nov.sp., eine anophthalme höhlenbewohnende Art aus Georgien, wird beschrieben und abgebildet.

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