

A NEW CAVE-DWELLING SPECIES OF THE GENUS *PARAPROPUS* GANGLBAUER (COLEOPTERA: LEIODIDAE: LEPTODIRINI) FROM BOSNIA AND HERZEGOVINA

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Abstract – A new leptodirine leiodid beetle species, *Parapropus vitorogensis* sp. n., from a cave in the western part of the Republic of Srpska, Bosnia and Herzegovina, is described and diagnosed. Both male and female genitalia and other taxonomically important characters are illustrated. The new species is clearly distinct from its closest congeners. The new taxon is of Tertiary or even pre-Tertiary age and originated during the Alpine Orogeny that affected vast areas of the Balkan Peninsula, including the Dinarides, its terra typica. The new species is both endemic and relict, inhabiting western Bosnia and Herzegovina only.

Key words: Leiodidae, Leptodirini, *Parapropus*, new species, cave-dwelling fauna, Bosnia and Herzegovina

INTRODUCTION

The genus *Parapropus* Ganglbauer, 1899 comprises seven species [*Parapropus brevicollis* Müller from a cave on Mt. Grmeč, Bosnia and Herzegovina; *P. ganglbaueri* Ganglbauer from several caves on Mts. Staretina and Paklina, near Mrkonjić Grad, Čelebić, and Žepče, Bosnia and Herzegovina; *P. insignis* Müller from a cave near Mlinište, Bosnia and Herzegovina; *P. neumanni* Müller from a cave near Bosanski Petrovac, Bosnia and Herzegovina; *P. nonveilleri* Müller from a cave near Mlinište, Bosnia and Herzegovina; *P. pfeiferi* Apfelbeck from a cave near Sanski Most, Bosnia and Herzegovina, and *P. sericeus* (Schmidt) from numerous caves in Lika, Kordun and Gorski Kotar, Croatia, near Ključ and Sitnica, Bosnia and Herzegovina, and from Mt. Snežnik, Slovenia] and 14 subspecies, which are distributed over a Dinaric area in Bosnia and Herzegovina, Croatia, and Slovenia (Perreau, 2000; Löbl and Smetana, 2004).

All *Parapropus* taxa are endemics and inhabit only cave habitats (Jeannel, 1924; Müller, 1937, 1941; Absolon and Mařan, 1943; Perreau, 2000).

A field trip in western Bosnia and Herzegovina, organized by the second author, resulted in the discovery of a new species of the genus *Parapropus* Ganglbauer, *P. vitorogensis* sp. n. The present study gives a description and diagnosis of the new species of the genus *Parapropus*. The diagnosis of *Parapropus vitorogensis* sp. n. is based on a thorough analysis of the type series of three males and two females collected during 2001 in the Vaganska Pećina Cave near Šipovo, Mt. Vitorog, western Republic of Srpska, Bosnia and Herzegovina (Lazarević, 1999).

MATERIAL AND METHODS

The specimens of *Parapropus vitorogensis* sp. n. were collected by hand in the Vaganska Pećina Cave near

Šipovo, Mt. Vitorog, western Republic of Srpska, Bosnia and Herzegovina.

The type specimens were analyzed in the laboratories of the Institute of Zoology, Faculty of Biology, University of Belgrade. They were dissected, thoroughly studied, and illustrated. Dry specimens were stuck onto both paper and plastic labels, while the male and female genital structures were fixed in a medium composed of Canada balsam and xylol.

All taxonomically important morphological characters were studied for comparison. Carl Zeiss - Stemi 2000 and Carl Zeiss - Ergaval binocular stereomicroscopes were used in this study, together with a special monitor and accessories for drawing.

RESULTS AND DISCUSSION

LEIODIDAE FLEMING, 1821

PARAPROPUS GANGLBAUER, 1899

PARAPROPUS VITOROGENSIS

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(Figs. 1-8)

Etymology. – After Mt. Vitorog (western Bosnia and Herzegovina), where the investigated cave locality is situated.

Material examined. – Holotype male, Vaganska Pećina Cave, near Šipovo, Mt. Vitorog, western Republic of Srpska, Bosnia and Herzegovina, 09.08.2001, leg. V. Pešić; two paratype males and two paratype females, same data as for the holotype. The type specimens are deposited in the collection of the Institute of Zoology, Faculty of Biology, University of Belgrade.

Diagnosis. – The new species clearly differs from all other congeners. Among the seven existing species there are two species morphologically most similar to it, both from underground habitats in western Bosnia and Herzegovina. However, there are numerous distinctions between the three analyzed species, and these are presented below. *Parapropus vitorogen-*

sis sp. n. clearly differs from both *P. brevicollis* and *P. nonveilleri* in total body length (4.32-4.75 mm vs. 4.00 mm vs. 4.50-5.00 mm), width of the fore tarsi in males (well dilated vs. weakly dilated vs. well dilated), first male protarsomere/protibial apex width ratio (first male protarsomere broader than the apex of protibia vs. first male protarsomere narrower than the apex of protibia vs. first male protarsomere as broad as the apex of protibia), first male protarsomere length/width ratio (2.20 times as long as broad vs. at most twice as long as broad vs. at least three times as long as broad), antennomere VIII/IX length ratio (antennomere VIII shorter than antennomere IX vs. antennomeres VIII and IX of equal length vs. antennomere VIII shorter than antennomere IX), length/width ratio of the pronotum (somewhat longer than wide vs. somewhat longer than wide vs. not longer than wide), anterior pronotal margin/pronotum base length ratio (of almost equal length vs. anterior pronotal margin slightly longer than pronotum base vs. unknown), shape of hind pronotal angles (not prominent, almost right-angled vs. unknown vs. somewhat prominent outwards), and species distribution (Mt. Vitorog vs. Mt. Grmeč vs. near Mlinišće) (Müller, 1911, 1937; Jeannel, 1924) (Fig. 1).

Description. – Medium-sized (total body length: ♂♂ 4.32-4.64 mm; ♀♀ 4.68-4.75 mm), leptodiroid, highly specialized leptodirine beetle (Fig. 1). Color yellow-reddish, integument shiny, pubescent, finely microsculptured.

Head elongate, not retractile, anophthalmous, without occipital carina, narrowing somewhat basally (Fig. 1). Head narrower and somewhat shorter than pronotum; length/width ratio 1.30. Mouthparts pubescent, specialized for filtering water and organic matter (Moldovan et al., 2004). Genae slightly concave. Vertex somewhat impressed. Antennae elongate, slender, exceeding the body length, pubescent, more elongate in males. Antennae inserted at about the mid-head level. Antennomere I wider and somewhat shorter than antennomere II. Antennomere II moderately wide. Antennomeres III-V narrow, III longer than IV, but shorter than V. Antennomere VI shorter than antennomere V. Antennomeres VII,

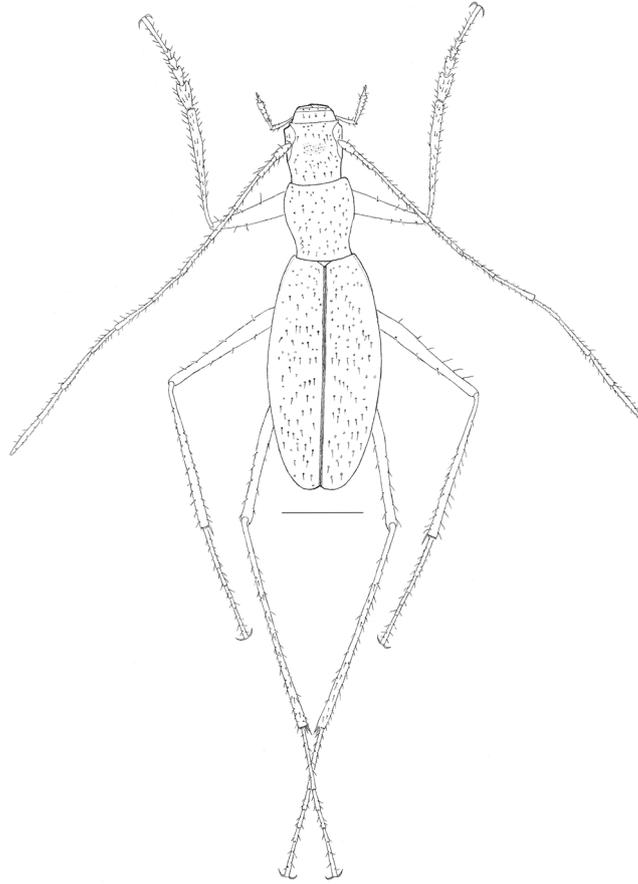


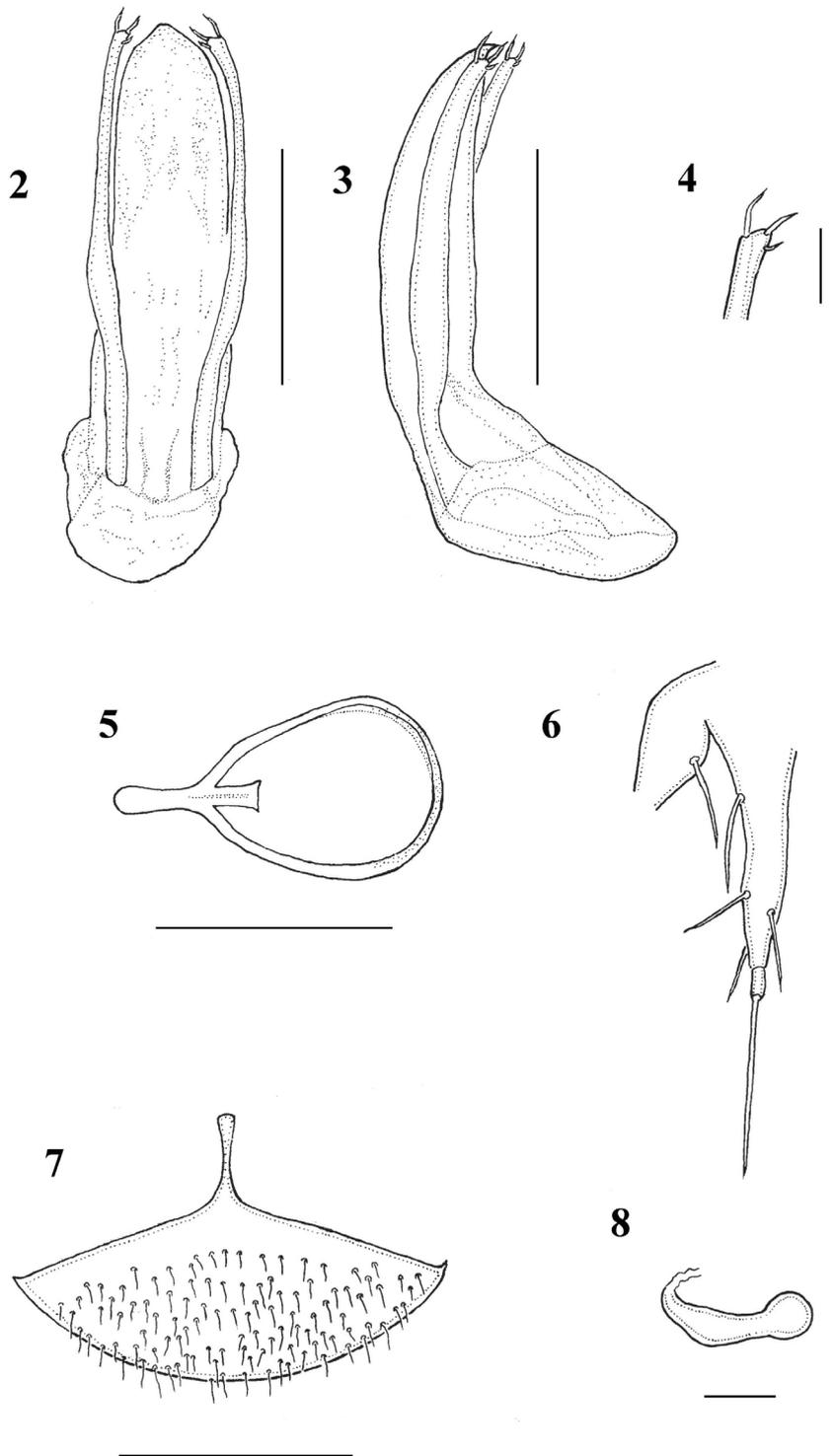
Fig. 1. *Parapropus vitorogensis* sp. n. from the Vaganska Pećina Cave, near Šipovo, western Bosnia and Herzegovina. Holotype male, habitus (dorsal view). Scale line = 1.00 mm.

IX, and X widening distally. Within these, antennomeres VII and IX are of almost equal length, while antennomere X is somewhat shorter. Antennomere VIII narrow, 1/3 longer than antennomere II, shorter than antennomere IX in both sexes. Ultimate antennomere longer than the penultimate one, apically pointed. Head pubescent, covered with fine puncturation and microsculpture.

Pronotum elongate, slightly longer than it is wide (pronotum width/length ratio 0.86), with maximum width at its third length level, constricted towards the base (Fig. 1). Lateral sides rounded anteriorly, while sinuate basally. Posterior pronotal angles almost right-angled. Pronotal base shorter than the base of the elytra. Anterior pronotal margin and base of

pronotum straight, of almost equal length. Disc convex, covered by sparse short hairs directed posteriad, densely and regularly distributed deep punctures, as well as by microsculpture. Mesosternal carina not developed.

Elytra elongate, inversely ovate, about twice as long as broad, slightly wider in females, with maximum width about the mid level, not transversely impressed sub-basally (Fig. 1). Elytral margins not prominent in humeral region, poorly visible while analyzing from above. Elytral shoulders somewhat expressed. Elytral disc convex, in lateral view steeply declining to pronotum, while gently declining posteriorly. Disc with dense pubescence directed poste-



Figs. 2-8. *Parapropus vitorogensis* sp. n. from the Vaganska Pećina Cave, near Šipovo, Bosnia and Herzegovina. 2 - holotype male, aedeagus with inner sac (dorsal view); 3 - holotype male, aedeagus (lateral view); 4 - holotype male, left parameral apex (dorsal view); 5 - holotype male, abdominal sternite IX (urite); 6 - paratype female, left gonostylus (dorsal view); 7 - paratype female, spermatheca (lateral view); 8 - paratype female, abdominal segment VIII. Scale lines = 0.50 mm (Figs. 2, 3, 5, and 8) and 0.10 mm (Figs. 4, 6, and 7).

riad, numerous deep punctures, and microsculpture. Sutural striae present. Scutellum sub-triangular.

Legs long and slender, with femora thickened basally (Fig. 1). Protibiae thickened sub-distally. Each tibia with an apical comb. Tibiae without exterior bristles. Tarsal claws long, pointed apically. Male protarsi 5-segmented, dilated, from which the tarsomeres I and II are wider than the apex of the protibia. Male protarsomere I 2.20 times as long as broad. Female protarsi 4-segmented and narrow.

Aedeagus long, stout (Figs. 2-4). Basal bulbous large, elongately rounded. Median lobe in dorsal view moderately narrowing distally and apically sub-triangularly pointed (Fig. 2). Inner sac mostly colorless and unarmed, only basal U-formed dorsal lamellose appendage and two anterior weakly expressed bands present. Median lobe in lateral view arcuated, with an acuminate bent apex (Fig. 3). Parameres elongate, thin, slightly shorter than the median lobe, abruptly thickening sub-basally and gradually narrowing distally in lateral view (Fig. 3), while sub-basally exteriorly thickened and then narrow, almost parallel distally, with somewhat dilated apex each (Fig. 2). Each paramere with three curved acuminate setae (one strong of medium length in apical position, one inner thin short in pre-apical position, and one outer strong long in pre-apical position) (Figs. 2-4).

Male abdominal sternite IX (urite) well developed, sub-triangular, with both an outer and an inner projection (Fig. 5).

Female gonostyli elongate, somewhat widened basally and narrowing apically, pointed, almost straight (Fig. 6). Each stylus with a single apical seta, three inner setae, and one outer seta. Spermatheca sclerotized, curved, medially constricted, with a spherical top (Fig. 7).

Female abdominal segment VIII large, transverse, with a narrow anterior process, setose (Fig. 8).

Bionomy and distribution. – This species was found under stones and on wet walls in the Vaganska

Pećina Cave, near Šipovo, Mt. Vitorog (western part of the Republic of Srpska, Bosnia and Herzegovina). The type habitat is in the posterior, completely dark, part of the cave, where stones are distributed over the floor. The beetle feeds on filtrated organic matter from the cave's wet walls and floor (Moldovan et al., 2004).

The analyzed species probably belongs to an old phyletic lineage of Tertiary or pre-Tertiary origin and age. This species is both relict and endemic to western Bosnia and Herzegovina.

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