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BLATTOCHAETA MARIANII KUSIJANOVICI, NEW SUBSPECIES (COLEOPTERA, LEIODIDAE, CHOLEVINAE) FROM CROATIA

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The cave leptodirine beetle species of the genus *Blattochaeta* lives mainly in caves at higher altitudes of Montenegro and on the Herzegovinian side of Orjen Mountain. Previously, 5 species and 3 subspecies of this genus were known. In the present paper a new subspecies from Glogova jama [pit] in Mt Sniježnica in Croatia is described. The new subspecies is the smallest subspecies of *Blattochaeta marianii*, a species that lives in the wider Orjen plateau on the border of Montenegro, Bosnia and Herzegovina and Croatia.

Key words: Coleoptera, Leiodidae, Cholevinae, *Blattochaeta*, new subspecies, Croatia

Polak, S. & Jalžić, B.: *Blattochaeta marianii kusijanovici*, nova podvrsta (Coleoptera, Leiodidae, Cholevinae) iz Hrvatske. Nat. Croat., Vol. 18, No. 1, 15–27, 2009, Zagreb.

Rod špiljskih kornjaša podzemljara *Blattochaeta* uglavnom živi u višim predjelima Crne Gore te na hercegovačkoj strani planine Orjen. Do sada je bilo poznato 5 vrsta i 3 podvrste toga roda. U ovom radu opisana je nova podvrsta iz Glogove jame na Sniježnici u Hrvatskoj. Nova podvrsta je najmanja podvrsta vrste *Blattochaeta marianii*, koja živi na širem području Orjenskog platoa na tromeđi Crne Gore, Bosne i Hercegovine i Hrvatske.

Ključne riječi: Coleoptera, Leiodidae, Cholevinae, *Blattochaeta*, nova podvrsta, Hrvatska

INTRODUCTION

The leptodirine genus *Blattochaeta* was described by REITTER (1910) on the basis of the species *Blattochaeta marianii* from the caves of Krivošije on the Orjen Mountain plateau in south west Montenegro. The type locality given is »Grotte der Crivoscie«,

and »Grotte du Crivoscie donji«. JEANNEL (1924) described a new subspecies *B. marianii paganettii* from SW Orjen and a second species *B. matchai* from the caves in the vicinity of Crkvice, almost the same region as Krivošije. Later Knirsch (1929) described a third, significantly smaller species, *B. hawelkai*, from Mt Ledenica in western Montenegro. In his revision of the genus *Blattochaeta* JEANNEL (1930) described another species *B. montenegrina* from Mt Lovćen and Doškorica southern from the Orjen plateau. In the same revision, Jeannel described a new subspecies, *B. marianii brevipennis*. The latest and smallest species *B. remyi* was described from the caves of Mt Bjelasica near Lubnice in central Montenegro (JEANNEL, 1931). The type localities of some of the taxa are not exact since the collectors at that time did not always use the real names for caves, usually for commercial reasons (PRETNER, 1977). In his overview of the cave beetles of Montenegro, PRETNER (1977) gathered data of *Blattochaeta* genus distribution and referred to contradictions in some of the type locality names. With the exception of *B. marianii brevipennis*, which lives in the Herzegovinian west slopes of Orjen all the taxa have so far been endemic to Montenegro. During the realization of the project »Production of a biospeleology survey, education and popularization leading to protection of the biosphere of the underground of Croatia« carried out by the Croatian Biospeleological Society in Glogova jama on Mt Sniježnica, the second author found a significant number of *Blattochaeta* specimens. The findings provide the first data on the occurrence of this genus in Croatia. In the paper a new subspecies of *Blattochaeta marianii* from Glogova jama is described.

MATERIALS AND METHODS

More than 50 *Blattochaeta* specimens have been collected in the Glogova jama, Mt. Sniježnica, south Dalmatia. A total of 40 type specimens have been studied. All of the specimens were measured and photographed using a Leica MZ7.5 stereomicroscope, a Euromex microscope (10x04, 10x10), a Nikon Coolpix 4500 digital camera and the Image J software program. Five paratype males and five paratype females have been dissected, prepared and mounted in Solakryl BMX on microscope slides, microscopically studied and measured. The drawings have been made on the basis of the digital images. All measurements are in millimetres (mm).

For comparison we used the dry prepared specimens from the collection of Notranjski muzej Postojna and especially from Egon Pretner's collection (ZCAL – PMSL). We studied and compared the *Blattochaeta remyi* specimens from Velika Bracanovića pećina, Lubnice (31.7.1971, Pretner E. leg.) and Županska pećina, Lubnice (26.7.1976, Sivec I. leg). The studied specimens of *B. montenegrina* were found in the cave Jama Boljanovica, Njeguši (30.8.1959, Pretner E. leg) and in Mala jama na Doškorici, Grahovo (3.9.1967, Pretner E. leg.). The only specimen labelled *B. matchai* from Crkvice (with no other data) that we studied was from Pretner's collection. We studied many specimens of *B. marianii* from different localities since accurate type localities of subspecies are not known. We studied specimens from the caves Pećina u Kučericama, Orjen (5.8.1968, Drovenik B. leg.), Pećina u Bor, Teverići (24.8.1966, Pretner E. leg), Vilina pećina na Podima (28.8.1966, Pretner E. Leg.), from

an inaccurately named cave from Krivošije (Absolon, 1913, Col. E. Pretner) and from Jama Trogrlo, Krivošije (4.9.1967, Pretner E. Leg.). We compared one female of *B. marianii brevipennis* collected in Noćna jama, Ravne Aluge (23.8.2007, Bedek J. leg) and one male labelled Čivin jama, Orjen, Hercegovina, (Weirather leg?, Ex. Col V. B. Gueorguiev in Col. P.M. Giachino) with the described new subspecies.

DESCRIPTION

Blattochaeta marianii kusijanovici, subspecies nov. (Figs 1-19)

Type locality: Glogova jama, 920 m, Mt. Sniježnica, Kuna Konavoska, Dubrovnik, Croatia (Hrvatska)

Type material: Holotype ♂, 20.05.2000, Glogova jama, 920 m, Mt. Sniježnica, Kuna Konavoska, Dubrovnik, south Dalmatia, Croatia (Hrvatska), leg. B. Jalžić. Deposited in the Croatian Natural History Museum, Zagreb, Croatia.

Paratypes: 1 ♂, 9.10.1984; 8 ♂♂ & 4 ♀♀, 20.05.2000; 3 ♂♂ & 3 ♀♀, 28.06.2000; 2 ♂♂ & 6 ♀♀, 24.08.2005 – same locality as holotype, Collection of Croatian Natural History Museum; 5 ♂♂ & 5 ♀♀ – microscope slides, same locality as holotype, Collection of Notranjski muzej Postojna, Slovenia (NMPO: C2768, C2769, C2770, C2771, C2772, C2773, C2774, C2775, C2776, C2777); 1 ♂ & 1 ♀, 24.8.2005, same locality as Holotype, Entomological Collection of National Museum of Bosnia-Herzegovina, Sarajevo, Bosnia and Herzegovina.

Differential diagnosis

Blattochaeta marianii kusijanovici can be distinguished from *B. m. marianii* and *B. m. paganetti* by its significantly smaller body size (body length less than 4.8 mm) and from *B. m. brevipennis* by its slightly smaller body size, shorter antennae and edeagus shape which has median lobe apex beak rounded in dorsal view and paramere apex significantly sinuate before the apex club.

Description

General shape bathyscioid, prolonged oval, habitus in Figs 1 & 19. Color testaceus brown (Fig. 19). Body length measured in natural position as in a Fig. 1, (retractile head retracted, not extended) ♂♂ 4.19–4.57 (mean 4.42), ♀♀ 4.41–4.80 (mean 4.62).

Head is retractile, slightly longer than wide. Sparse recumbent and long haired. Occipital carina is present but not obvious. Lateral carina and temporal angles strong. Antennae reaching the middle part of elytra. Antennal index (body length/ antenna length) is 1.63 at ♂♂, 1.86 at ♀♀.

Antennae total length (measured dissected on the microscopic slide, first antennomere measured without basal appendix) 2.85–2.92 in ♂♂ (Fig. 11), 2.48–2.54 in ♀♀ (Fig.12). All antennomeres longer than wide. 1st antennomere globulose, with small basal globulose appendix, often broken during dissection, 2nd antennomere 1.72 times longer than 1st. 8th antennomere is the smallest, cylindrical, slightly widened at apex, twice longer than wide.

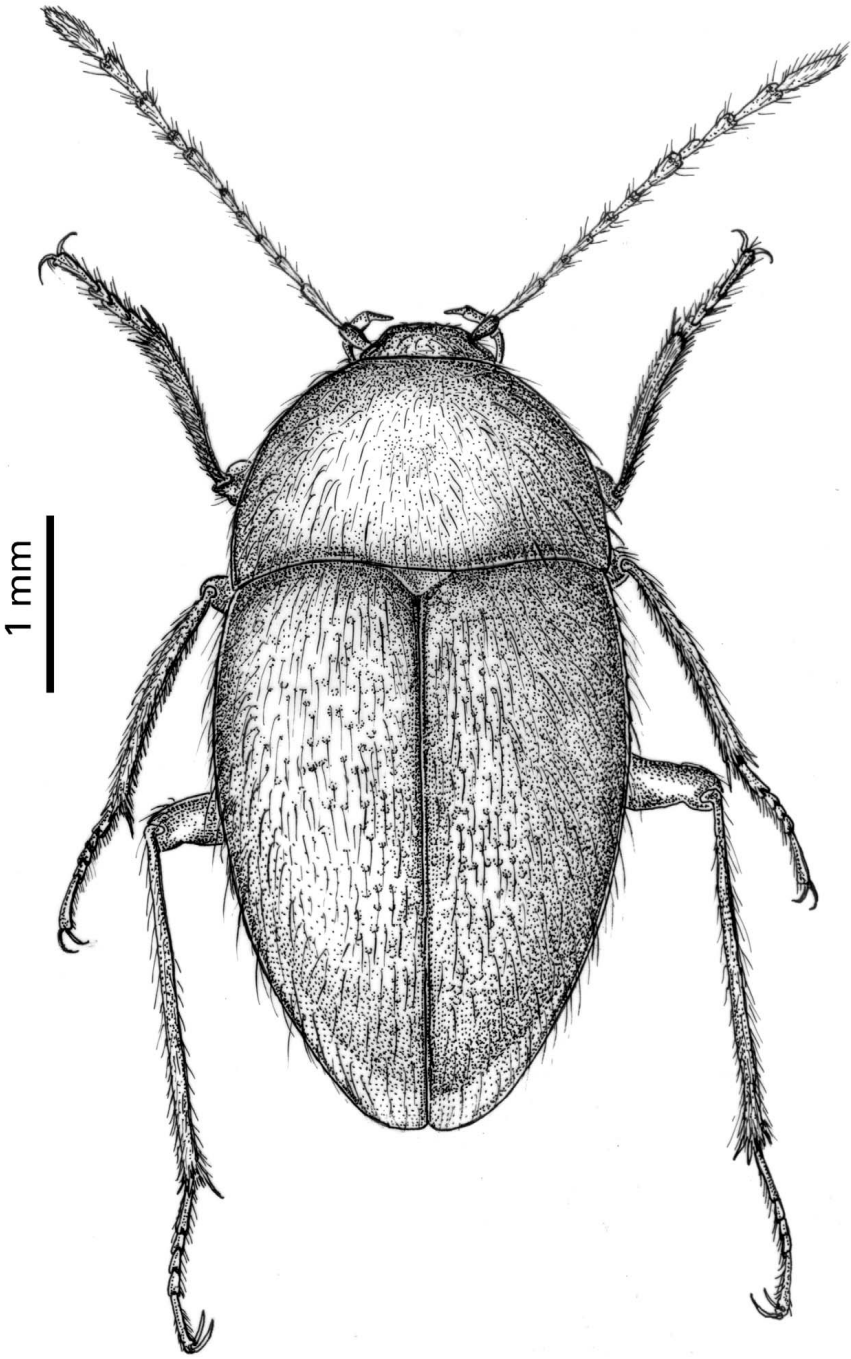
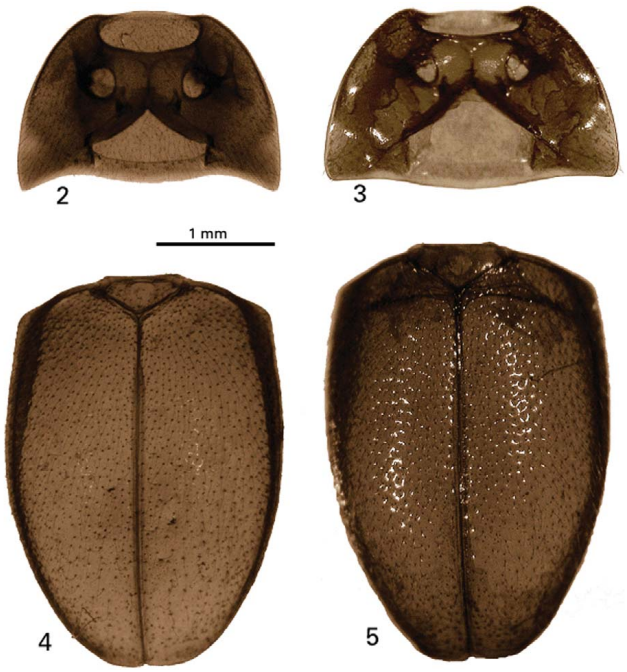


Fig. 1. *Blattochaeta marianii kusijanovici* ssp. n., holotype ♂, habitus.



Figs 2–5. *Blattochaeta marianii kusijanovici* ssp. n., 2: pronotum shape ♂, 3: pronotum shape ♀, 4: elytra shape ♂, 5 elytra shape ♀.

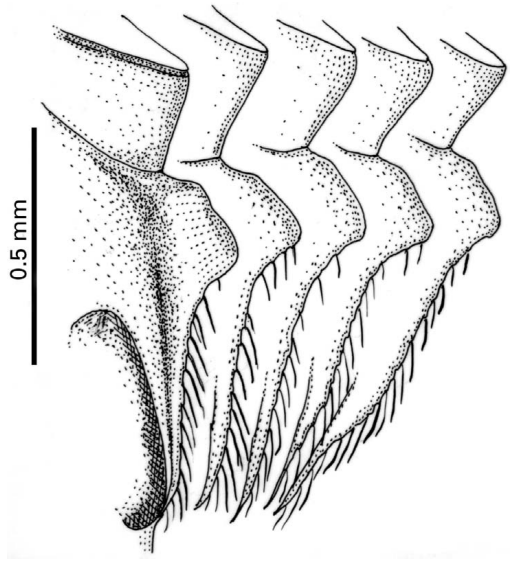


Fig. 6. *Blattochaeta marianii kusijanovici* ssp.n. carina sternalis shape ♂,♀.

Mean lengths of individual antennomeres 1st–11th in mm as follows: 0.18 : 0.34 : 0.22 : 0.17 : 0.21 : 0.18 : 0.33 : 0.18 : 0.32 : 0.23 : 0.44 in ♂♂, 0.18 : 0.31 : 0.19 : 0.15 : 0.20 : 0.17 : 0.29 : 0.16 : 0.26 : 0.25 : 0.33 in ♀♀. Antennomere length/maximal width ratio: 1.46 : 4.50 : 3.32 : 2.61 : 2.91 : 2.24 : 2.77 : 2.00 : 2.53 : 2.34 : 3.60 at ♂♂, 1.47 : 4.11 : 2.99 : 2.42 : 2.77 : 2.19 : 2.41 : 2.02 : 2.06 : 1.93 : 2.75 at ♀♀.

Pronotum is transverse, semicircular, widest at the basal part (Figs 2 & 3). Basal edges almost parallel, slightly protruding backwards. Sparse recumbent and long haired. Pronotum maximal length ♂♂ 1.04–1.22 (mean 1.16), ♀♀ 1.18–1.32 (mean 1.23), maximal width ♂♂ 1.96–2.14 (mean 2.07), ♀♀ 2.10–2.50 (mean 2.19), index maximal length/maximal width ♂♂ 0.57, ♀♀ 0.56.

Elytra as in Figs 4 & 5, sparse recumbent and long haired, very strong and profound, comparatively sparse punctuation, with about 20 punctures (Fig. 4) through the middle width of the one elytra. Maximum (both) elytra width is ♂♂ 2.15–2.29 (mean 2.22), ♀♀ 2.23–2.39 (mean 2.34). Length of elytra (measured in natural position from posterior pronotum edge to the elytra apex) is ♂♂ 3.03–3.22 (mean 3.13), ♀♀ 3.10–3.40 (mean 3.27), index length/width ♂♂ 1.41, ♀♀ 1.40.

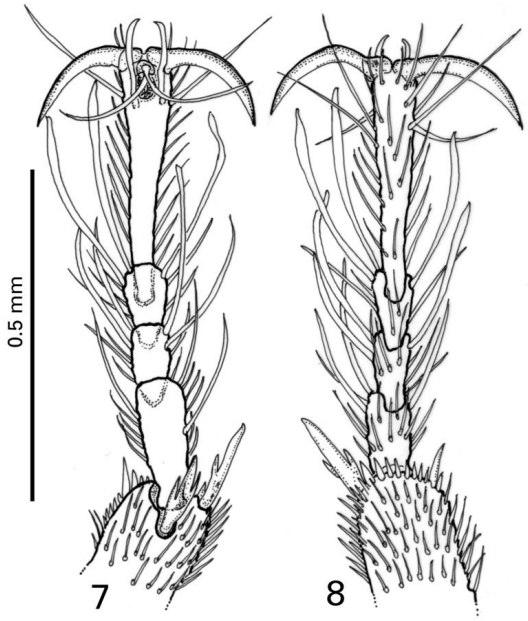
Appendages: Legs of medium size, relatively straight. All femura and tibia with strong dense erected setation. No external tibial spurs present. Protarsomeres are tetramerous and simple, not widened in either sex (Figs 7 & 8). Protarsomeres are armed with numerous long erected bristles and sparse extremely long blade-like flattened and pointed bristles. Claws relatively wide, empodium armed with long forked bisetose seta. Mean lengths of individual protarsomeres 1st–4th in mm as follows: 0.19 : 0.14 : 0.14 : 0.39 in ♂♂ and 0.17 : 0.13 : 0.13 : 0.36 in ♀♀. All protarsomeres are of equal width 0.06–0.07 mm. Mesotarses and metatarses five segmented and not dilated in both sexes.

Mesosternal carina well developed, quadrangular, prolonged posteriorly, slightly variable (Fig. 6). Posterior apophysis low, wide and dentate, haired, not exceed the metasternum.

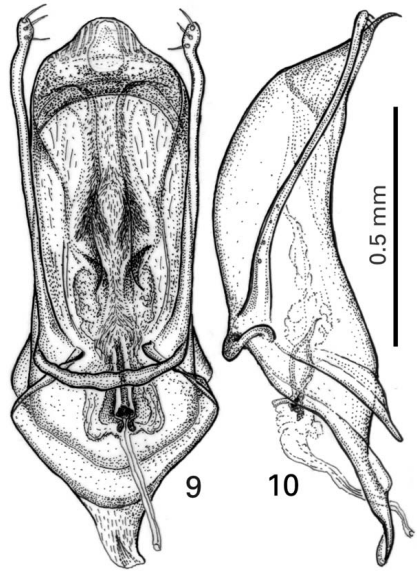
Male genitalia: Aedeagus strongly sclerotised, wide cylindrical and relatively straight (Figs 9 & 10). Median lobe maximal length shorter than 1.19 mm. Apex with wide curved beak, rounded in dorsal view, (Fig. 9), but triangular with concave sides in flattened position on microscopic slide (Fig. 13). Internal sac of median lobe with developed chitinous structures in the basal and in the medial part (Figs 9 & 10). Parameres are narrow and parallel to median lobe. Paramere with small apical club, bearing 1 apical and 2 lateral short setae of equal length. Paramere apex with obvious sinuosity before club (Figs 9, 10 & 14).

Female genitalia: Gonostyles of urite IX well sclerotised as in fig. 15. Spermatheca is saclike, not distinctly bilobed, strongly scletorised at the basal third (Fig.16).

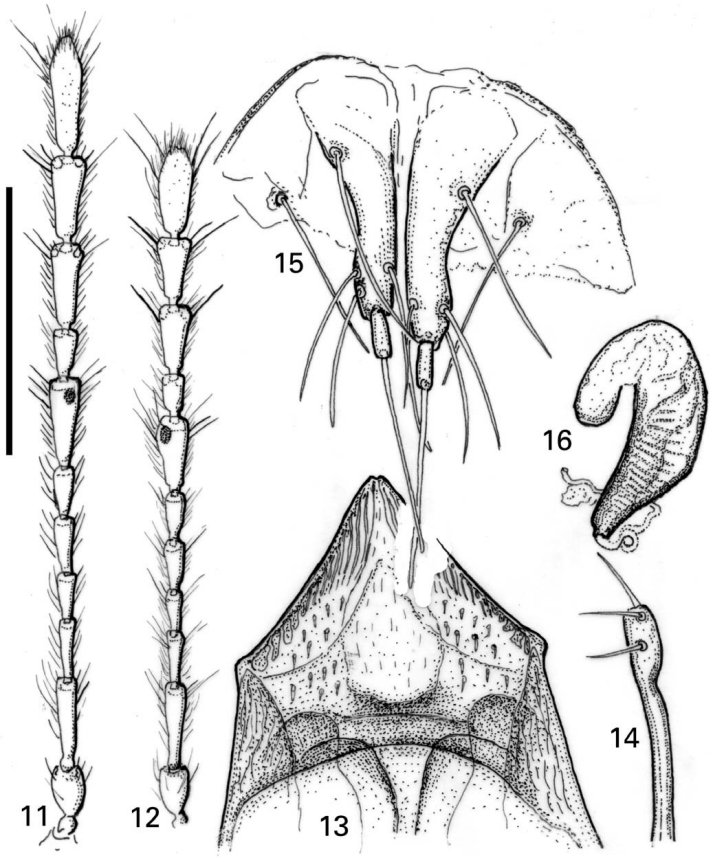
Distribution and ecology: The new subspecies is so far only known from the type locality, Glogova jama. The pit is situated on the calcareous slope of Mt Sniježnica (1234 m) above the settlement of Kuna Konavoska, Croatia UTM: BN81 (Fig. 17). The entrance to Glogova jama is situated at the altitude of 950 m above sea level in a beech (*Fagus sylvatica*) forest. The entrance part is a collapsed pit with a twilight zone to a depth of approximately 100 meters (Fig. 18). On the entrance pit bottom,



Figs 7–8. *Blattochaeta marianii kusijanovici* ssp.n. Left protarsus, 7: ♂ ventral view, 8: ♀ dorsal view.



Figs 9–10. *Blattochaeta marianii kusijanovici* ssp.n. aedeagus shape, 9: dorsal view, 10: lateral view.



Figs 11–16. *Blattochaeta marianii kusijanovici* ssp. n. 11: antennae ♂, 12: antennae ♀, 13: aedeagus apex, 14: left paramere apex, 15: ♀ gonostyles, 16: spermatheca. (scale bar = 1 mm for Figs 11–12, 0.5 mm for Figs 14–15, 0.1 mm for Figs 13 & 16).

the rock screes are partly covered by soil and organic material. In the deeper part the rock scree and rock debris are filled with the washed soil from the surface. Numerous alpine choughs (*Pyrrhocorax graculus*) nest in the cave. This represents an important food vector for the subterranean environment.

So far the cave has been investigated to the depth of 146 meters. The lower parts of the cave consist mostly of smaller tunnels and crevices. Drip water flow is significant. The air temperature on the 20th of August 2005 was 3.7 °C, and the water temperature was 3.4° C. Most of the *Blattochaeta* specimens were found in the summer months. In other periods this cave beetle is hard to fine.

Because of its specific situation and morphology Glogova jama has very unusual ecological and meteorological conditions as compared with other caves in the Konavlje region. The cave represents a refuge, not only for *Blattochaeta* but also for

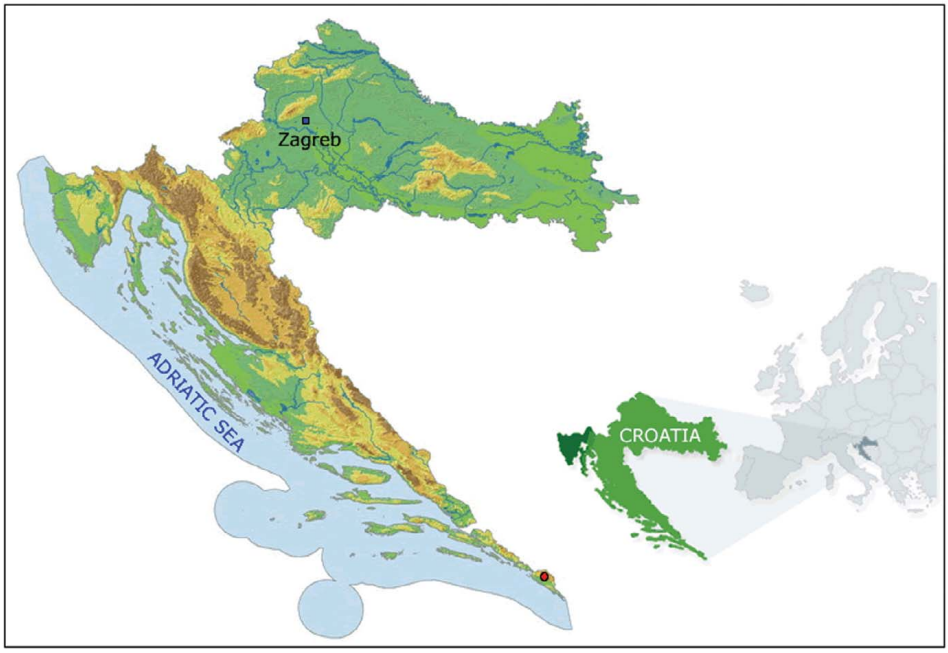


Fig. 17. The position of the Glogova jama pit (red dot).

other subterranean beetles known from more temperate areas in Bosnia and Herzegovina and Montenegro. Besides *Blattocheta marianii* five more cave beetles species (*Antroherpon matulici*, *Neotrechus hilfi*, *Neotrechus suturalis otiosus*, *Minosaphaenops* sp. n. and *Seracamaurops* sp. n.) have been found in this cave. Two of them are new to science.

Ethymology: This subspecies is named after the speleologist Miho Kusijanović from Dubrovnik.

Determination table for the *Blattochaeta* species and subspecies (Improved after JEANNEL, 1930)

1 – Antennomere 8th wider than longer, or body length less than 4.0 mm (central Montenegro) 2

– Body length more than 4.1 mm, thick and wide form. Antennomere 8th always longer than wide 3

2 – Smaller size, body length less than 4.0 mm, with the less convex elytra (Montenegro, Bjelasica planina) . . . . . ***remyi*** Jeannel, 1931

– Bigger size, body length 4.4 mm, narrow and lengthened form. Antennomere 8th wider than longer. Elytra surface with strong and deep punctuation, very uni-

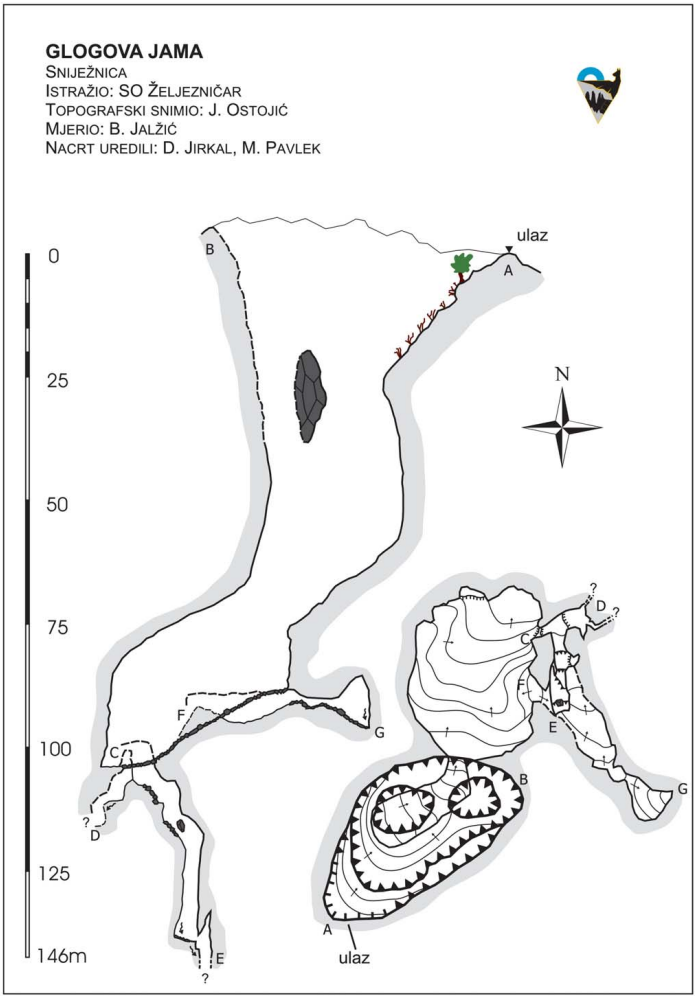


Fig. 18. Plan of the Glogova jama pit.

form on the anterior three quarters, obliterated to the apex (Montenegro, Ledenica planina) . . . . . ***hawelkai*** Knirsch, 1929

3 – Elytra surface with very strong, very profound and comparatively sparse punctuation (about 15 punctures through the middle width of the one elytra). Lateral sides of the pronotum more strongly sinuous posteriorly and raised behind. Body length 5.0–5.5 mm. (Montenegro, Lovćen) . . . . . ***montenegrina*** Jeannel 1930

– Elytra surface with less strong, more superficial and more dense punctuation (about 20 punctures through the middle width of the one elytra). Lateral margins of the pronotum weakly sinuous posteriorly 4

Fig. 19. *Blattochaeta marianii kusijanovici* ssp. n. Photo: B. Jalžić.

4 – The punctuation of the elytra is finer and denser at the basal part, visible until the elytra apex, although there becoming superficial. Short and wide form, the sides of pronotum very rounded in males. Body length 4.6–4.8 mm. (Montenegro, Krivošije) . . . . . ***matchai*** Jeannel, 1924

– The punctuation of the elytra is stronger and a little less dense at the basal part, almost obliterated on the elytra apex. (Montenegro, Bosnia and Hercegovina, Croatia) . . . . . ***marianii*** Reitter, 1910

– Body length more than 5.1 mm . . . . . A

– Body length less than 5.0 mm . . . . . B

A – The posterior angles of the pronotum are more pointed, the sides less rounded. Antennae thicker at the summit, the antennomere 8th shorter, suboval. Body length 5.5 to 6.0 mm. (Montenegro, Krivošije, Orjen) . . . . . *marianii marianii* Reitter, 1910

– The posterior angles of the pronotum are more rounded, the sides more curved, with the almost parallel sides before the basis. Antennae finer, the antennomere 8th conical, widened at the summit. Body length 5.2 to 5.5 mm. (Montenegro, Krivošje, southern Orjen) . . . . . *marianii paganetti* Jeannel, 1924

B – Body length 4.6 to 5.0 mm, length of the antennae more than 2.7 mm in females and more than 3.0 mm in males, aedeagus longer than 1.22 mm, median lobe apex beak triangular in dorsal view, paramere straight, not sinuate before apex club. (Bosnia and Hercegovina, western Orjen) . . . . . *marianii brevipennis* Jeannel, 1930

– Body length 4.2–4.8 mm, length of antennae less than 2.6 mm in females and less than 2.9 mm in males, aedeagus shorter than 1.19 mm, median lobe apex beak rounded in dorsal view, paramere apex significantly sinuate before the apex club (Croatia, Sniježnica region) . . . . . ***marianii kusijanovici* ssp. nov.**

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S a ž e t a k

Blattochaeta marianii kusijanovici, nova podvrsta (Coleoptera, Leiodidae, Cholevinae) iz Hrvatske

S. Polak & B. Jalžić

Rod špiljskih kornjaša podzemljara *Blattochaeta* uglavnom živi u jamama i špiljama viših područja Crne Gore te na hercegovačkoj strani planine Orjen. Do sada je bilo poznato 5 vrsta i 3 podvrste toga roda. To su *B. hawelkai* poznata s planine Ledenica, *B. remyi* iz špilja Bjelasice u centralnom dijelu Crne Gore, *B. montenegrina* s područja Lovćena te *B. matchai* i *B. marianii* iz šireg područja Orjenskog platoa. Prilikom realizacije projekta 'Izradom biospeleološkog katastra, edukacijom i popularizacijom do zaštite živog svijeta podzemlja Hrvatske' i 'Biospeleološka istraživanja, edukacija i popularizacija za zaštitu biosfere podzemlja Hrvatske', koju je izvodilo Hrvatsko biospeleološko društvo, u Glogovoj jami na području planine Sniježnice iznad mjesta Kuna Konavoska kod Dubrovnika pronađeni su primjerci roda kornjaša podzemljara *Blattochaeta* što predstavlja novi element u fauni Hrvatske. Glogova jama je speleološki istražena do dubine od 146 metara. Ulazni dio je do dubine od 100 metara pod utjecajem dnevnog svjetla. U dubljem dijelu nalazi se sipar od kamenog kršja na dnu kojeg dolazi cijednicama doplavljena zemlja s mnoštvom sitnog organskog materijala. Primjerci roda *Blattochaeta* pojavljuju se u najvećem broju tijekom ljetnih mjeseci. Zbog njenog položaja i morfologije, u Glogovoj jami vladaju različiti ekološki uvjeti od onih u speleološkim objektima u širem zaleđu Konavoskog područja. Temperatura zraka mjerena 20.08.2005. iznosila je 3,7 °C, a temperatura vode 3,4 °C. U ovom radu opisana je nova podvrsta vrste *Blattochaeta marianii* koja živi u širem području Orjenskog platoa na tromeđi Crne Gore, Bosne i Hercegovine i Hrvatske. Podvrsta je najmanja od tri već opisane podvrste te vrste, a i od drugih vrsta u regiji. Njezine su karakteristike cjelokupna dužina od 4,2–4,8 mm, dužina antena manja od 2,6 mm kod ženki i manja od 2,9 mm kod mužjaka. Aedeagus je kraći od 1,19 mm, apeks vrha penisa je u dorzalnom pogledu zaokružen, a vrhovi paramera imaju karakterističnu sinuozitetu prije apikalnog proširenja. Zasada je Glogova jama jedino nalazište te podvrste. Osim nje u Glogovoj jami otkriveno je još 5 drugih vrsta podzemnih kornjaša koji su novi elementi u fauni Hrvatske, od čega su još najmanje dvije nove vrste za znanost.