

TWO NEW ULTRASPECIALIZED TROGLOMORPHIC LEPTODIRINI FROM CROATIA (COLEOPTERA, LEIODIDAE, CHOLEVINAЕ)

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Two new ultraspecialized troglomorphic Leptodirini (Coleoptera, Leiodidae, Cholevinae) from two Croatian caves are described.

Hygrodromus (new genus) *nikolinae*, a new species from Mladenova cave near Orebić, is a very enigmatic taxon of “tetramerous” Leptodirini, markedly distinct for several morphological features in antennae, mouthparts, male genitalia and the peculiar sexually dimorphic apex of elytra. However, because of some characters, it could be assigned to the phyletic lineage of *Hadesia* and *Nauticiella*, which so far includes only “pentamerous” species.

Leptomeson vuicae from Dragina lipa jama cave near Čelopek in central Dalmatia, owing to its morphological features, is the south-eastern substitutive adelphotaxon of *L. dombrowskii*, from which it differs by its smaller size, longer elytral pubescence and the different shape of the median lobe of the aedeagus with a stouter apex.

Key words: *Hygrodromus* new genus, *nikolinae* new species, *Leptomeson vuicae* new species, hygropetricolous beetles

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U radu se opisuju dva nova ultraspecijalizirana troglomorfna leptodirina (Coleoptera, Leiodidae, Cholevinae) iz dviju hrvatskih špilja.

Hygrodromus (novi rod) *nikolinae* je nova vrsta iz Mladenove jame kraj Orebića, vrlo enigmatična svojta ‘tetramernih’ leptodirina, jasno izraženih morfoloških karakteristika ticala, usnih dijelova, genitalija mužjaka, i osobitog spolnog dimorfizma apeksa pokrila. Zbog određenih osobina mogla bi pak biti pripisana filetičkoj liniji *Hadesia* i *Nauticiella*, koja dosad uključuje samo ‘pentamerne’ vrste.

Leptomeson vuicae iz Dragine lipe jame kraj Čelopeka u središnjoj Dalmaciji zbog svojih morfoloških osobina predstavlja jugoistočnu sestrinsku svojtu *L. dombrowskii*, od koje se razlikuje manjom veličinom, dužim dlačicama na pokrila i različitim oblikom središnjeg reznja eadeagusa s debljim vrhom.

Ključne riječi: novi rod *Hygrodromus*, nova vrsta *nikolinae*, nova vrsta *Leptomeson vuicae*, higropetrikolni kornjaši

INTRODUCTION

The Dinaric range in the Balkan Peninsula is a well known hotspot of subterranean biodiversity. In particular, Coleoptera Leiodidae Leptodirini (PERREAU, 2000; 2015) include a high number of recently described ultraspecialized taxa (CASALE & JALŽIĆ, 1988; CASALE *et al.*, 2000b, 2004; ĆURČIĆ *et al.*, 2019; GIACHINO & VAILATI, 2006; GIACHINO *et al.*, 2011; MLEJNEK & MORAVEC, 2003; MORAVEC & MLEJNEK, 2002; NON-VEILLER & PAVIČEVIĆ, 1999), which have recently been investigated partly from the morphological (PERREAU & PAVIČEVIĆ, 2008) and partly from the molecular point of view (POLAK *et al.*, 2016).

Within the materials collected by the members of the Second Biospeleological Expedition Pelješac 2019 (KUHARIĆ & KIRIN, 2019), we have found an interesting leptodirine beetle living in hygropetric environment (SKET, 2004), which is described in this contribution as type-species of a new genus, together with a new species of the genus *Leptomesson*.

Their relationships with close taxa are illustrated and discussed.

MATERIALS AND METHODS

Morphological analysis was conducted on whole specimens and dissected male genitalia were mounted in Canada balsam and pinned under the specimens. All drawings were made using a drawing tube on a Leitz Dialux biological microscope and Wild M3 stereomicroscope. The photograph of the holotype of *H. nikolinae* was obtained by Gianni Allegro using a Leica DFC295 camera mounted on a Leica M205 C stereomicroscope, using the software Leica Application System V4.0. Images of habitus and male genitalia were made. Live specimens of *Hygrodromus* and *Leptomesson* were photographed in nature using an Olympus TG 4 camera.

ACRONYMS

The following acronyms are used for collections, type series and measurements:

HPM	Cave Coleoptera Collection, Croatian Natural History Museum, Zagreb, Croatia
NMPO	Biological collection of Notranjski Museum Postojna, Postojna, Slovenia
CCa	A. Casale Collection, Turin, Italy
CGi	P. M. Giachino Collection, San Martino Canavese (TO), Italy
HT	Holotype
PT, PTT	Paratype (s)
BAR	Body/Antennae ratio (lengths of pronotum+elytra/antennae)
PW/PL	pronotal width/pronotal length
EL/EW	elytral length/elytral width

TAXONOMY

Hygodromus Giachino, Casale & Jalžić **gen. nov.**

(Figs. 1 – 14)

Type species: *Hygodromus nikolinae* **n. sp.**

Diagnosis and description

A genus of medium sized, tetramere protarsi in both sexes, eyeless, pubescent Leptodirini with phleounoid body shape (Figs. 1, 18), large, subrectangular pronotum, ovate and peculiarly sexually dimorphic elytra, and antennae shorter than the body length.

Head elongate, not retractile, without occipital carina; clypeus and labrum with dense, long pubescence. Penultimate labial palpomere long and apically dilated; apical palpomere very short and stout. Antennae relatively short, inserted on the medium third of head, similar in both sexes and not reaching the elytron apex; first antennomere widened, longer than 2nd antennomere; 11th antennomere as long as the 10th one.

Pronotum large and sexually dimorphic: elongate, longer than wide in the male; shorter and wider in the female, subrectangular in shape, with its maximum width just at the middle in the male, slightly bell-shaped with its maximum width just before the base in the female. Lateral sides more regularly rounded in the female; rounded anteriorly, subrectilinear basally in the male. Hind angles obtuse but evident; basal margin wider than the base of elytra. Anterior margin protruding in the middle in the male.

Pterothorax not pedunculate. Mesosternal carina absent; mesocoxal cavities contiguous.

Metatergal apparatus (Fig. 13) very reduced without posterior apophysis.

Metendosternite (Fig. 12) stout, not V-shaped, with robust furcal arm and short and stout furcal plate. Arm apophysis well developed.

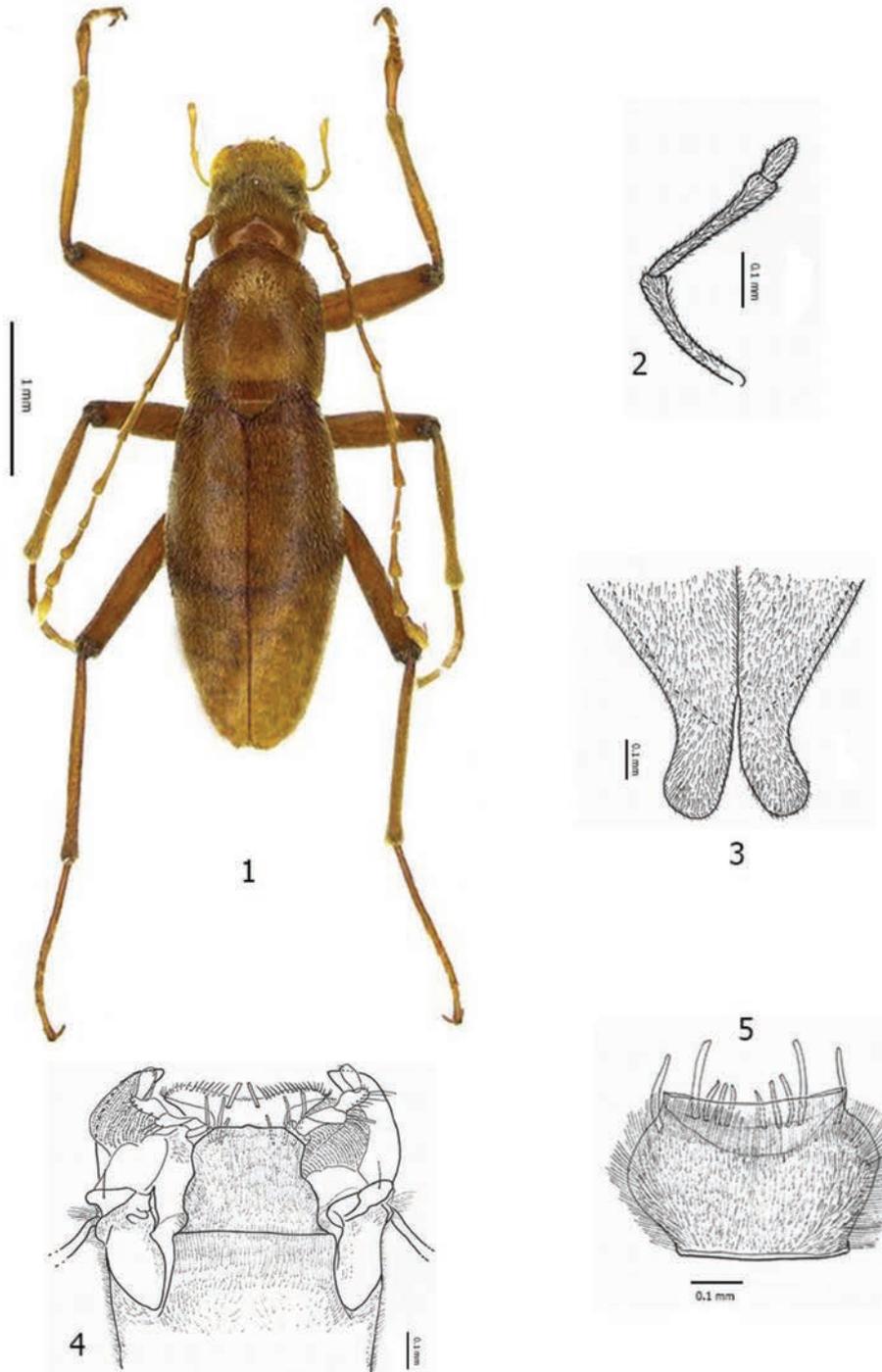
Elytra elongate-ovate, moderately attenuate at apex. Apex separately rounded in the male, expanded in two large, digitiform expansions (Fig. 3) in the female. Microsculpture sparse, not forming transversal rows; disc with thin pubescence; sutural stria absent.

Legs very long and slender, with femora thickened basally. Protibiae widened just at apex, without comb but with an incomplete apical basket of spines and without outer spurs; inner spurs unifid, very small and thin. Male protarsi 4-segmented, with three dilated basal tarsomeres. Meso- and metatibiae with inner, unifid apical spur and apical basket of very short apical spines; tarsal claws long, slightly widened.

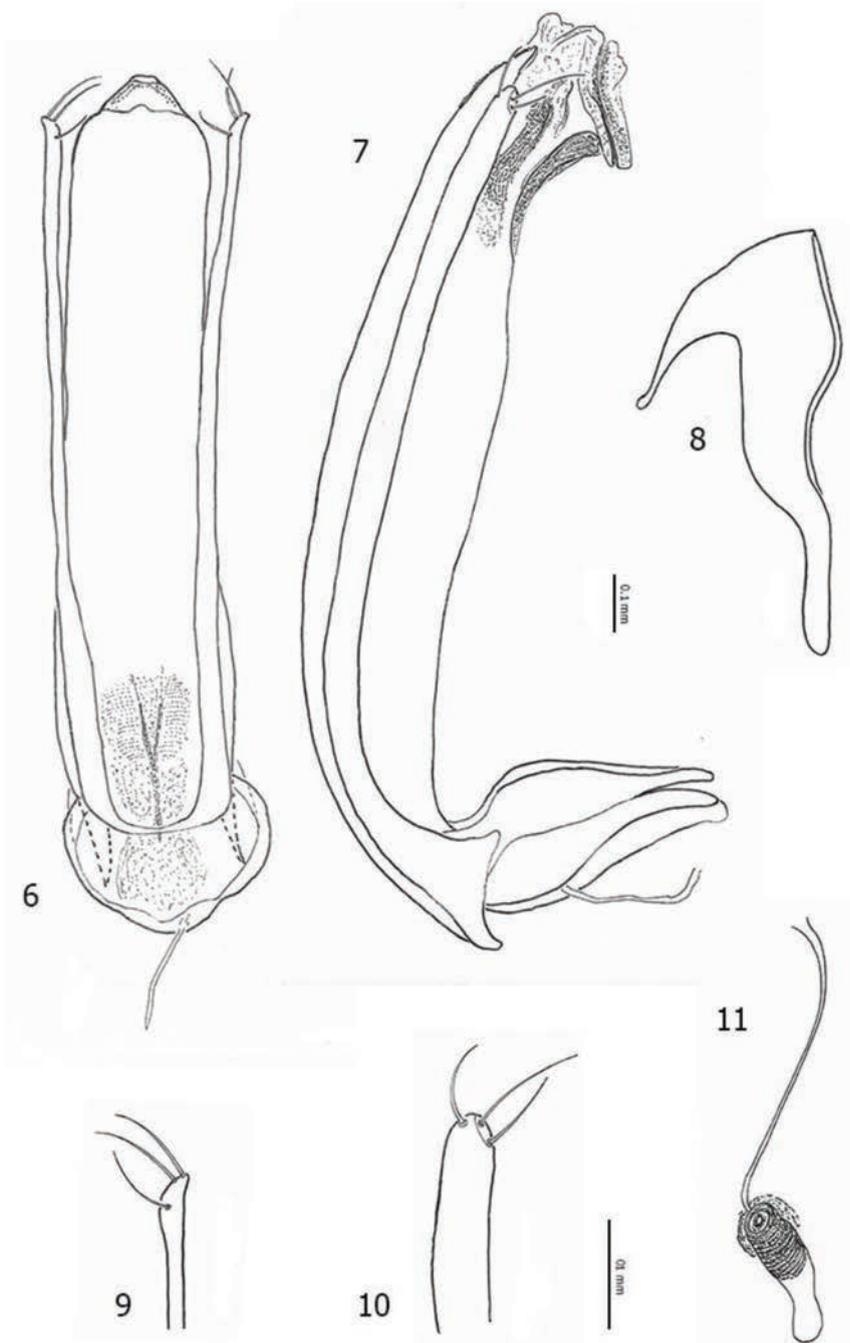
Male genital segment shoe-shaped in lateral view (Fig. 8). Aedeagus (Figs. 6, 7, 9, 10) small sized, slender, abruptly arcuate before the base; basal lamina of median lobe bent, without ventral carina; parameres shorter than the median lobe, each furnished with three setae at apex. Endophallus almost unarmed, with only a short, apical, thorny bundle.

VIII ventrite of the female (Fig. 14) without apophysis.

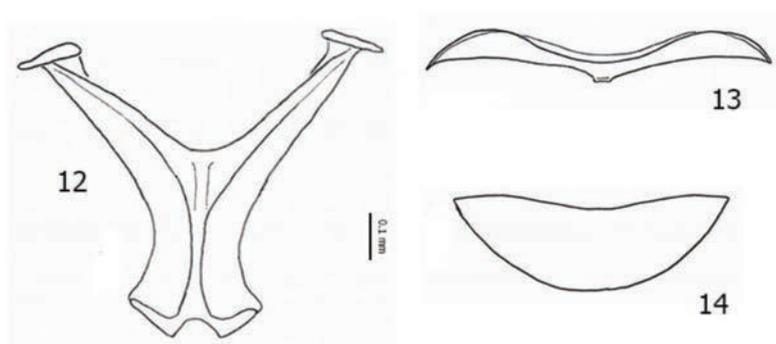
Ovipositor fully atrophied, genital segment membranous. Spermatheca (Fig. 11) membranous, bean-shaped, slightly sclerotized and annulated only in the basal part.



Figs. 1 – 5. *Hygrodromus nikolinae* n. gen. n. sp.: HT ♂ (1), PT ♀ (2 – 5). Habitus (1); maxillary palpomere, ventral view (2); elytral apex in female, dorsal view (3); head, ventral view (4); labrum, dorsal view (5).



Figs. 6 – 11. *Hygrodrromus nikolinae* n. gen. n. sp.: HT ♂ (6, 9), PT ♂ (7, 8, 10), PT ♀ (11). Aedeagus in dorsal view (6) and lateral view (7); apex of left paramere in dorsal view (9) and lateral view; male genital segment in lateral view (8); spermatheca (11).



Figs. 12 – 14. *Hygrodromus nikolinae* n. gen. n. sp.: PT ♀. Metendosternite (12); metatergal apparatus (13); VIII ventrite in female (14).

Etymology

Hygrodromus: similar to *Velebitodromus* and other names of the subterranean taxa, epithet composed by “*hygro*”, meaning wet in ancient Greek, and “*drómos*”, to run in ancient Greek: that “runs in the wet”. The name of the genus is masculine.

Hygrodromus nikolinae Giachino, Casale & Jalžić n. sp.

(Figs. 1 – 14)

Loc. Typ.: Hrvatska, Pelješac, Orebić, Mladenova jama.

Type material: HT ♂, Hrvatska, Pelješac, Orebić, Mladenova jama, 22.VII.2019, B. Jalžić leg. (HPM). PTT: 5 ♂♂ 3 ♀♀, Hrvatska, Pelješac, Orebić, Mladenova jama, 22.VII.2019, B. Jalžić leg. (HPM, NMPO, CCa, CGi); 1 ♂, same data, 1.IV.2019, N. Kuharić leg. (HPM); 2 ♂♂, 3 ♀♀, same data, 30.VIII.2019 B. Jalžić leg. (HPM); 1 ♀, same data, 27.X.2019, B. Jalžić leg. (HPM); 1 ♂ 2 ♀♀, same data, 22.VIII.2020, B. Jalžić leg. (HPM, CCa, CGi); 1 ♂, same data, 30.VIII.2020, B. Jalžić leg. (NMPO).

Description

A medium sized (body length 4.05–4.96 mm; 4.10 mm HT ♂), pholeuonoid, highly specialized leptodirine beetle. Colour dark reddish, integument opaque, pubescent (Figs. 1, 18).

Head elongate, not retractile, anophthalmous, without occipital carina.

Mouth pieces (Figs. 2, 4, 5) taking long setae, i.e. adapted to filtering water and organic matter (see JEANNEL, 1924; CASALE & JALŽIĆ, 1988; NONVEILLER & PAVIČEVIĆ, 1999; CASALE *et al.*, 2000a, 2000b; MORAVEC & MLEJNEK, 2002; MLEJNEK & MORAVEC, 2003; MOLDOVAN *et al.*, 2004; CASALE *et al.*, 2004; GIACHINO & VAILATI, 2006). Labrum (Fig. 5) transverse, with anterior margin slightly concave and lateral margins curved, bearing, in addition to the strong and long pubescence, a set of ten modified thorns. These strong thorns, flattened and apically truncated, start ventrally and are of different lengths. Eight of them are placed along the anterior border (two long, lateral, and six in the central position). Mandibles widened and flattened in the apical half, but not twisted and not toothed on the inner edge. Maxillae short, stipe with the articles bearing tufts of long setae; lacinia reduced, the outer lobe capped by a sort of triangu-

lar membranous and fully striated lobe. Maxillary palpi (Fig. 2) elongate, with the second palpomere thin, the third short and ovoidal. Labium (Fig. 4) fully covered by a dense, long pubescence, with anterior margin protruding in a wide and short tooth; front edge equipped, on the inner side of the mouth, with a set of six modified thorns, similar to those of the labrum. These thorns are arranged laterally in two groups of three, two long and one short. Ligula sub-trapezoidal, with anterior border markedly concave and bearing a complete range of robust setae; central area of anterior border bearing two short modified thorns (Fig. 4).

Antennae slender but not very long, more elongate in the male (BAR: 0.95 ♂; 1.03 ♀).

Length of antennomeres in mm:

HT ♂: 0.31; 0.20; 0.29; 0.32; 0.37; 0.44; 0.37; 0.27; 0.25; 0.29; 0.31

PT ♀: 0.29; 0.24; 0.27; 0.34; 0.41; 0.44; 0.41; 0.34; 0.34; 0.34; 0.37

Pronotum large in size and sexually dimorphic: elongate, longer than wide in ♂ (PW/PL: 0.87), less elongate, more wide in ♀ (PW/PL: 1.0). In the male subrectangular in shape, with its maximum width just at the middle; lateral sides rounded anteriorly, subrectilinear basally; anterior margin protruding in the middle. In the female slightly bell-shaped with the maximum width just before the base; lateral sides more regularly rounded; anterior margin not protruding in the middle. Hind angles obtuse but evident; basal margin wider than the base of elytra. Disc convex, covered by dense, long, decumbent pubescence, absent in the central area.

Elytra elongate-ovate (EL/EW: 2.00 ♂ 2.02 ♀), with apex sexually dimorphic: separately rounded in the male, expanded in two large, digitiform expansions (Fig. 3) in the female. Maximum width at the middle length. Disc with microsculpture sparse, not forming transversal rows; completely covered by medium length, thin and decumbent pubescence; sutural stria absent.

Legs as in the description of the genus; male protarsi tetramerous, with three basal tarsomeres dilated; the basal protarsomere, markedly dilated, is wider than the apex of protibia. First tarsomere of the pro-, meso- and metatibiae as long as the sum of the following. Femora widened at base, tibiae straight.

Aedeagus (Figs. 6, 7, 9, 10) small sized, slender. Median lobe, in lateral view, abruptly bent at the base, with basal lamina bent, without ventral carina. In dorsal view elongate, with subparallel sides almost to the apex, which is subtriangular and slightly truncate. Parameres shorter than the median lobe, each bearing three setae: two apical and another one subapical, placed on the inner side. Endophallus almost unarmed, with only a short, apical, thorny bundle.

Female genitalia as in the description of the genus.

Etymology

The new species was named in honor of Nikolina Kuharić, member of the Croatian Biospeleological Society who discovered the first specimen.

Distribution and ecology

Topographic location and habitat

Mladenova cave is situated in the Pelješac peninsula (Fig. 15), west of the peak Sv. Ilija (at 961 m asl). It was formed by water draining along numerous tectonic fissures in the Lower Cretaceous rocks in the northern wing of the anticline extending from east to west. Geologists describe these rocks as a unique complex of limestone and breccia sediments (K1, 2–4) (MARINČIĆ *et al.*, 1977; MAGAŠ *et al.*, 1979).

It belongs to the type of vertical cave with numerous verticals following the inclination of the fault surface. Verticals and larger chambers are connected to each other via narrow passages. The middle part is rich in limestone formations, most notably flowstones (Fig. 16). Depending on precipitation, the draining water sinks into the cave and forms a small waterflow at a depth of 100 m. During every investigation, a permanent waterflow was identified at the depth of 190 m. In this part the cave hygropetric habitat is characterized by the presence of a layer of moonmilk. These are the places where the hygropetricolous beetles were found (Fig. 17).

Other species of beetles also inhabit the cave: *Neotrechus dalmatinus*, *Laemostenus cavicola*, *Adriaphaenops* sp. and *Troglamaurops* cf. *leptoderinus*.

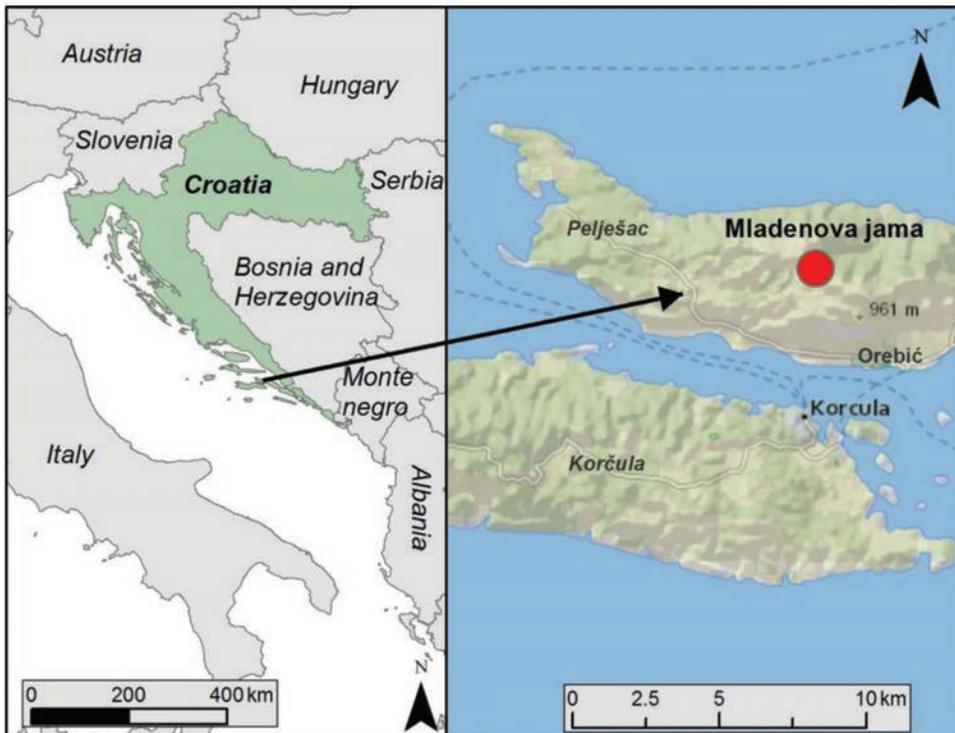


Fig. 15. The map with position of Mladenova jama

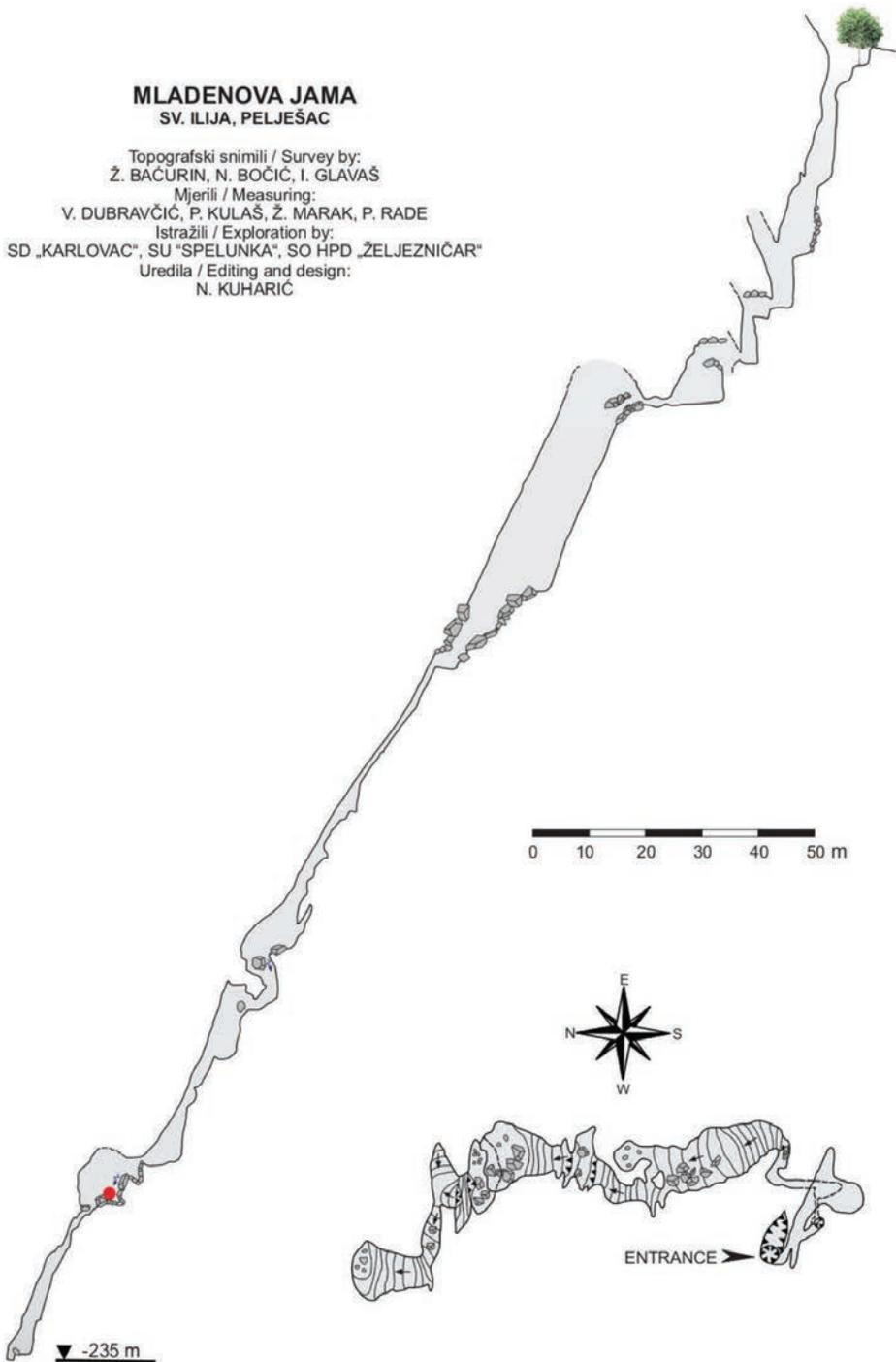


Fig. 16. Topographic plan of Mladenova jama, with marked place of finds.

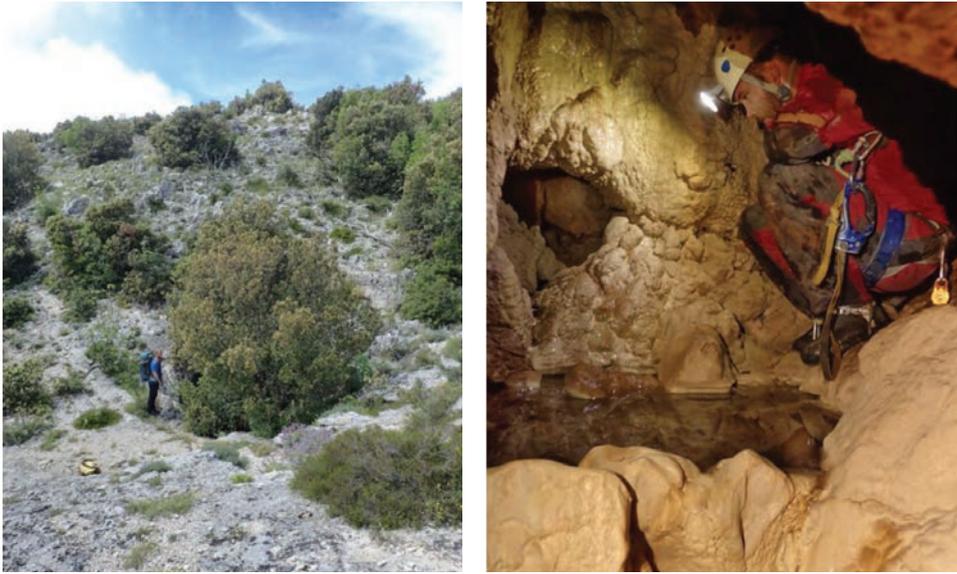


Fig. 17. The entrance and habitat in Mladenova jama (photo B. Jalžić).



Fig. 18. *Hygodromus nikolinae*, female in natural habitat (photo B. Jalžić).

Taxonomy

Subsequently to the excellent monograph by JEANNEL (1924), the taxonomy and phylogeny of Cholevinae Leptodirini (treated by Jeannel as "Bathysciinae") were discussed in many contributions (see, amongst others: FRESNEDA *et al.*, 2011; GIACHINO *et al.*, 1998; GUÉORGUIEV V.B., 1990; PERREAU, 2000, 2015; PERREAU & PAVIČEVIĆ, 2008). Furthermore, thanks to recent speleological explorations in deep and large caves, mostly in the Balkan peninsula, discoveries of ultraspecialized hygropetricolous Leptodirini highly adapted to the peculiar environment described by SKET (2004) ("amphibiontic species" in the sense of MORAVEC & MLEJNEK, 2002, or species with "hadesian behavior" in the sense of NONVEILLER & PAVIČEVIĆ, 1999) have dramatically increased.

Many described taxa exhibit important derived characters in their external morphology, and share with other troglomorphic genera many features of similar appearance, which however seem to be mere homoplastic characters resulting from convergent evolution.

In this context, *Hygrodromus* (new genus) *nikolinae* Giachino, Casale & Jalžić new species is a very enigmatic taxon from the taxonomic and phylogenetic points of view.

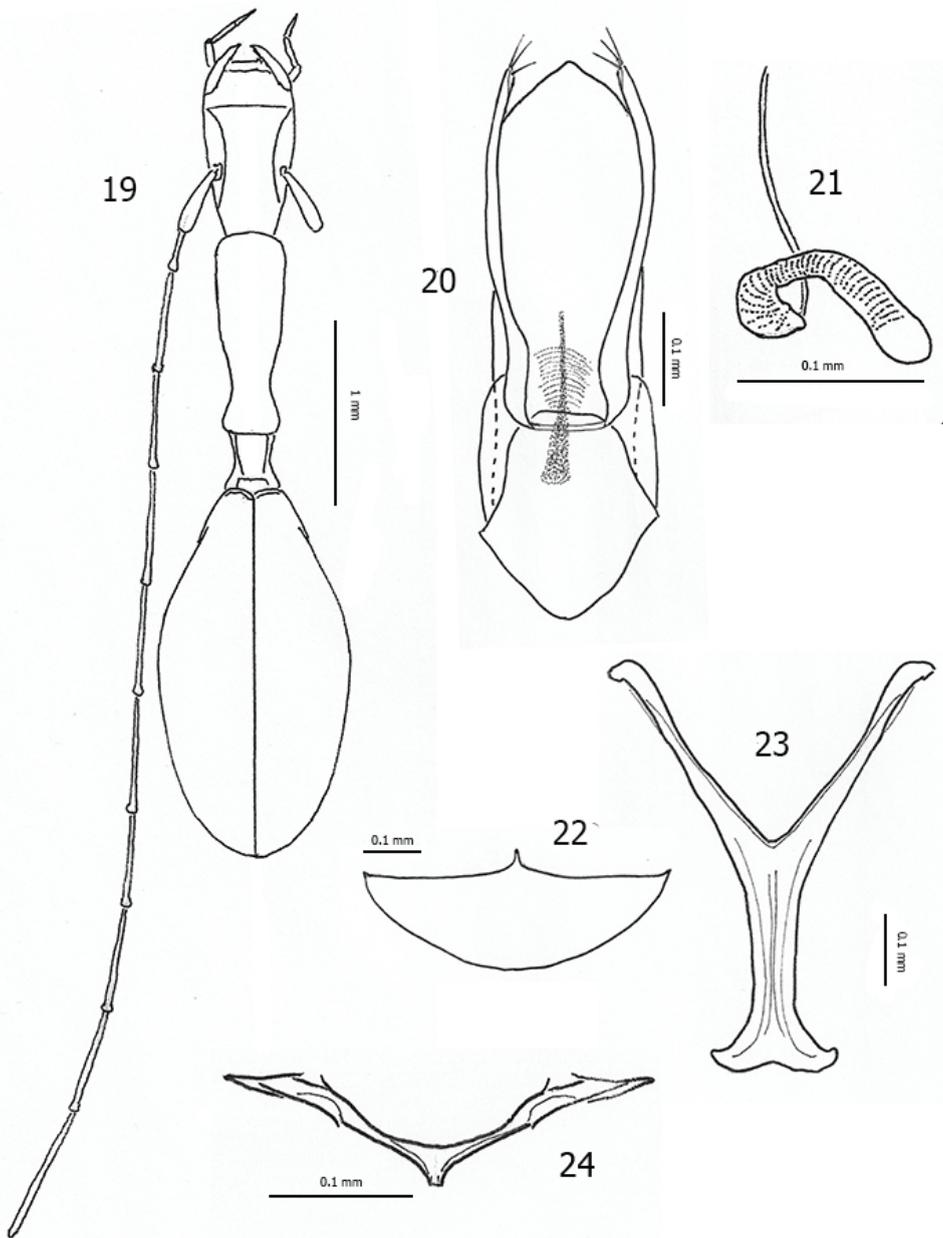
Despite its four-segmented male protarsi, several other morphological features seem to exclude its attribution to the tetramere lineages of PERREAU (2000), including Bathysciotina, Spelaeobatina and Bathysciina. Regarding some characters, such as the sexually dimorphic apical margins of elytra, it is somewhat similar to *Radziella* Casale & Jalžić, 1988, from which it is distinct, however, by the completely different maxillary palpi and female spermatheca. This feature, even if with different degrees of development, appears in different unrelated taxa, of different subtribes and it is clearly a homoplasy. This is also true for *Tartariella* Nonveiller & Pavičević, 1999, another hygropetricolous tetramere genus close to *Leonhardella* Reitter, 1903 (see NONVEILLER & PAVIČEVIĆ, 1999). All other tetramere representatives of the genus *Spelaeobates* in the Dinaric area are completely different in both external and genital features.

On the contrary, for several of its morphological features, the new taxon in our opinion could be related to the lineage of *Hadesia* Müller, 1911 and *Nauticiella* Moravec & Mlejnek, 2002, which include so far only pentamere genera (i.e. Leptodirina, Anthroherponina, Pholeuina of PERREAU, 2000). In fact, *Hygrodromus nikolinae* shares with these two genera several apomorphic characters in the antennal features (with second antennomere much shorter than the first), in the shape of maxillary palpi, the structure of tibiae and the shape of both aedeagus and spermatheca. Furthermore, there is also a perceptible diversification of the sexually dimorphic elytral apex in *Hadesia* (see POLAK *et al.*, 2016) and *Nauticiella* (MORAVEC & MLEJNEK, 2002; MLEJNEK & MORAVEC, 2003), even if this feature is present in different subtribes of Leptodirini.

Leptomeson vuicae Giachino, Casale & Jalžić, n. sp. (Figs. 19 – 24, 29)

Loc. Typ.: Hrvatska, Metković, Borovci, Čelopek, Dragina lipa jama.

Type series: HT ♂, Hrvatska, Metković, Borovci, Čelopek, Dragina lipa jama, 5. XI.2019, leg. B. Jalžić (HPM). PTT: 5 ♀♀, Hrvatska, Metković, Borovci, Čelopek, Dragina lipa jama, 5. XI.2019, leg. B. Jalžić (HPM, CCa, CGi); 2 ♂♂, same data, 29. VIII.2020, leg. B. Jalžić (CCa, CGi); 3 ♂♂, 18 ♀♀, same data, 4. IX.2020, leg. B. Jalžić (HPM, CCa, CGi); 2 ♂♂, same data, 21. VIII.2020, leg. P. Visković (HPM).



Figs. 19 – 24. *Leptomeson vuicae* n. sp.: HT ♂ (19, 20), PT ♀ (21 – 24). Habitus (19); aedeagus in dorsal view (20); spermatheca (21); VIII ventrite in female (22); metendosternite (23); metatergal apparatus (24).

Diagnosis

A small-sized *Leptomeson* species (body length 4.30–4.65 mm), which resembles *L. dombrowskii* (Apfelbeck, 1907), *L. raguzi* Giachino, Bregovic & Jalžić, 2011 and *L. biokovensis* Giachino, Bregovic & Jalžić, 2011 based on small body size and the shape of the aedeagus. It differs from *L. dombrowskii* s.l. by the longer elytral pubescence and by the shape of the median lobe of aedeagus with stouter apex. It differs from *L. biokovensis* by the shorter elytral pubescence and by the shape of the median lobe of aedeagus without pointed apex. It differs also from *L. raguzi* by the shorter antennae and by the different shape of pronotum, not restricted in the anterior third.

Description

Total body length with extended head 4.30–4.65 mm (4.37 mm HT ♂). Colour testaceous, with legs, palpi, and antennae slightly lighter. Body (Figs. 19, 28) leptodiroid, very elongate, with physogastric and convex elytra, and the pronotum narrow and very elongate. Integuments shiny, with the microsculpture much weaker on head, evident on pronotum; evident and not aligned in transversal striae on the elytral disc. Integuments covered with a sparse pubescence, upright and long on head; very sparse and very short, on the basal part of pronotum; sparse, golden, long and upright on the elytra.

Head, very elongate, anophthalmous, without occipital carina, remarkably widened in front. Medium specialized mouthparts, with the upper part of the mandibles clearly concave; maxillary palpi elongate, having the penultimate palpomere subconical, widened at the distal end, and the last palpomere conical and very elongate. Antennae very long, (BAR 0.56 ♂, 0.55 ♀), frail, with the 2nd antennomere shorter than the first one and the 11th only slightly longer than the 10th one in ♂ and ♀; 8th visibly shorter in ♂ than in ♀.

Length of antennomeres in mm:

♂ 0.37; 0.20; 0.51; 0.51; 0.62; 0.58; 0.62; 0.51; 0.55; 0.58; 0.75

♀ 0.31; 0.24; 0.62; 0.55; 0.68; 0.58; 0.58; 0.62; 1.03; 0.51; 0.68

Pronotum cordiform, very elongate (PW/PL: 0.35 ♂, 0.35 ♀) and bottlenecked before the base at about one third of its length, with the maximum width just before the anterior edge and with the base slightly narrower than it. Sides strongly sinuate on the basal part, subrectilinear in the distal half and finely rebordered in the basal half; basal angles obtuse and blunted; base subrectilinear and not rebordered. Pronotal disc completely glabrous, with evident microsculpture in the basal half.

Mesothoracic peduncle very elongated, about as long as the basal part of the pronotum, flat and slightly concave dorsally, bearing a very strong microsculpture with an isodiametric polygonal mesh.

Mesosternum without a true mesosternal carina; the mesosternum is ventrally slightly angled anteriorly. Prosternum carinate, bearing a long and sharp sagittal carina behind the coxae.

Metatergal apparatus (Fig. 24) very reduced, with frail lateral arms and posterior apophysis reduced to a stump.

Metendosternite (Fig. 23) V-shaped, with furcal arms thin and furcal trunk long and not particularly stout.

Elytra very elongate (EL/EW: 1.90 ♂, 1.70 ♀), slightly pyriform, more physogastric in the ♀, with the largest width just before the mid-section, separately and briefly rounded apically; disc very convex, with the pubescence extremely sparse (slightly denser along the elytral suture), long and upright. Sutural stria absent.

Legs very long and frail, with femora enlarged and swollen in the basal part, progressively tapering distally. Tibiae straight, not enlarged distally; claws long and slightly enlarged. Anterior tarsi pentamerous and not dilated in the ♂.

Aedeagus (Fig 20), robust, short and poorly arcuate; median lobe, in dorsal view, stocky, with the apex subtriangular and not protruding beakwise. Basal blade of the median lobe stocky, short and enlarged. Parameres frail, about as long as the median lobe, in dorsal view, regularly curved, tapering, from the middle to the apex and bearing three apical setae. Internal sac bearing a short sclerified stylet-shaped flagellum in the basal part.

VIII ventrite of the female (Fig. 22) with small and pointed apophysis.

Spermatheca (Fig. 21) small, anulated and poorly sclerified, vaguely G-shaped.

Etymology

This new species is named in honor of Markica Vuica, President of the Baštinič Association in Metković.

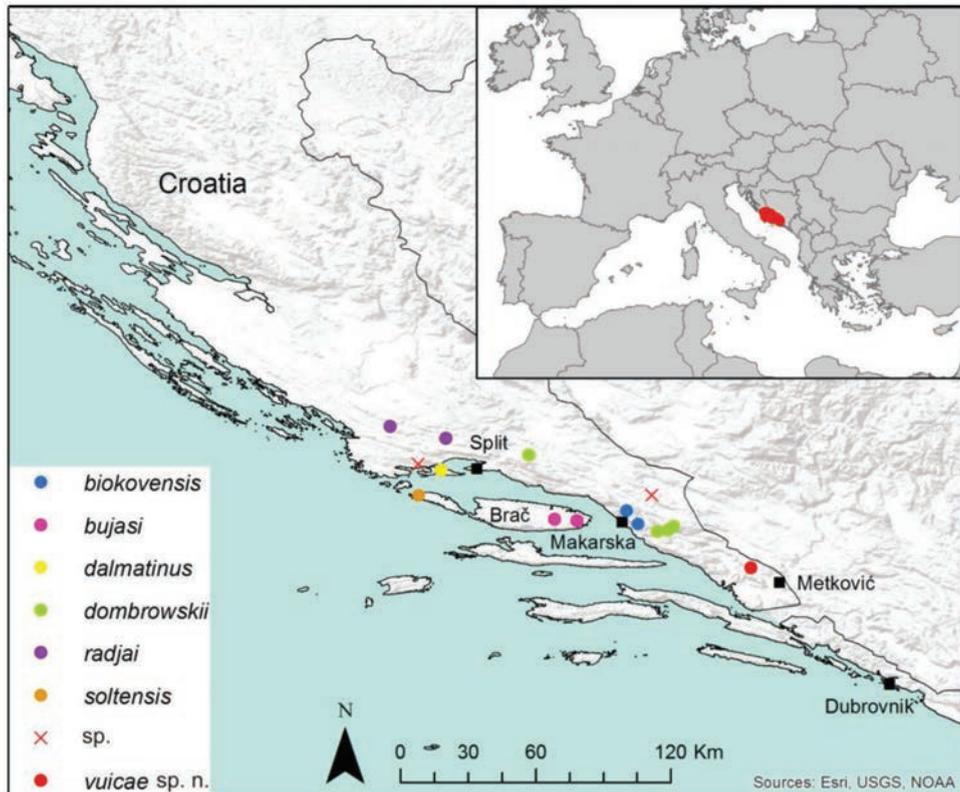


Fig. 25. Distribution map of the genus *Leptomeson* in Croatia.

Distribution and ecology

It is very important to upgrade the distribution map provided by GIACHINO *et al.* (2011), with the inclusion of *Leptomeson soltensis* and also the new species (Fig. 25).

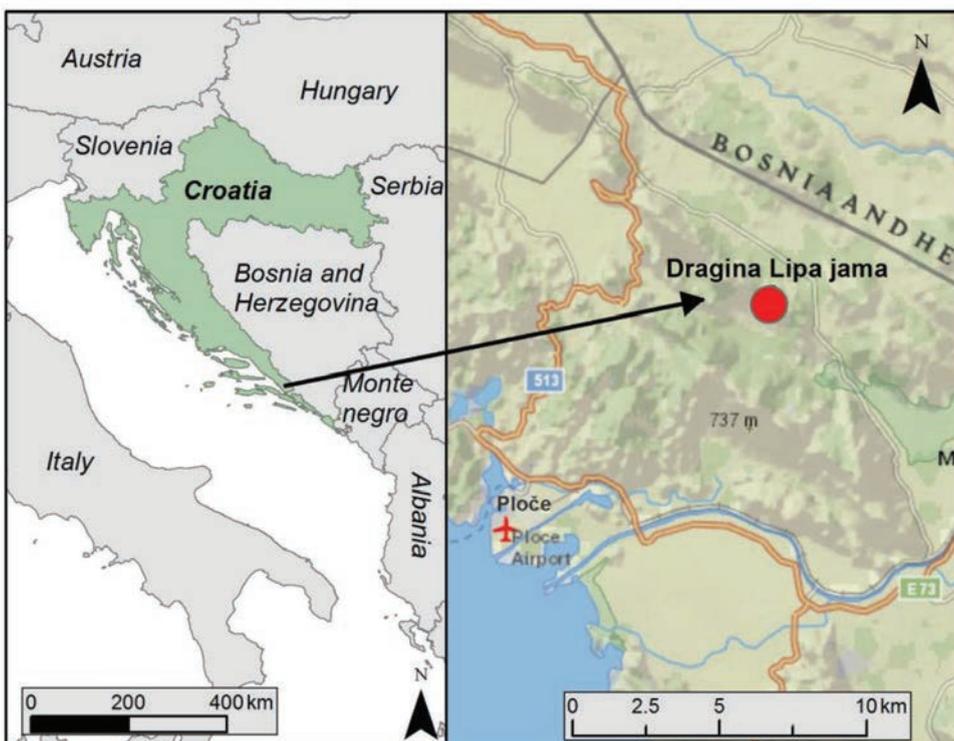
Topographic location and habitat

Dragina lipa jama is situated in central Dalmatia, northwest of the town of Metković, not far from the locality of Borovci, near the village of Čelopek.

The cave is situated rudist limestone sedimented during the Upper Cretaceous at the cross section of two fault zones. The first fault zone of Dinaric spreading of a regional character represents an example of thrust tectonics by which the Upper Cretaceous sediments are found on top of the Paleogene sediments MARINČIĆ *et al.*, 1977; MAGAŠ *et al.*, 1979). The second fault zone spreads from north to south, has a local character and cuts through the first zone.

The entrance is small and was closed by a stone boulder before our arrival. The cave belongs to the type of vertical caves with several smaller verticals and a wide, inclined cave channel. Numerous speleothems are found, throughout the cave (Fig. 27).

Individuals of *L. vuici* were found below a depth of 70 m (Fig. 26).



Figs. 26. The map with position of Dragina lipa jama.

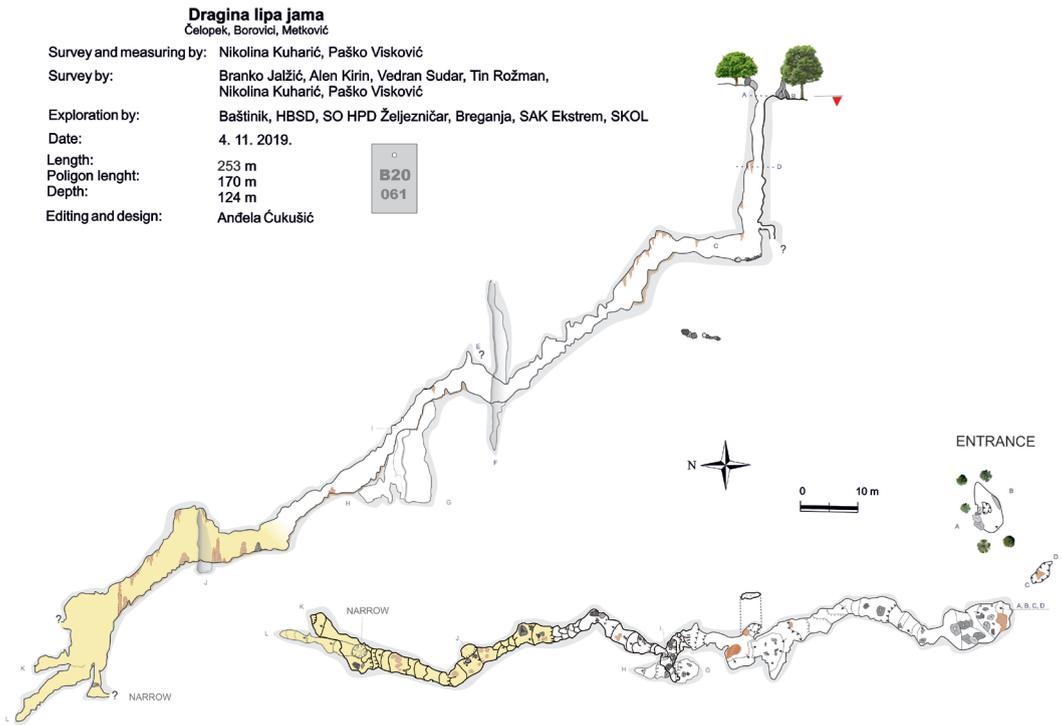


Fig. 27. Topographic plan of Dragina lipa jama, with marked area of finds.

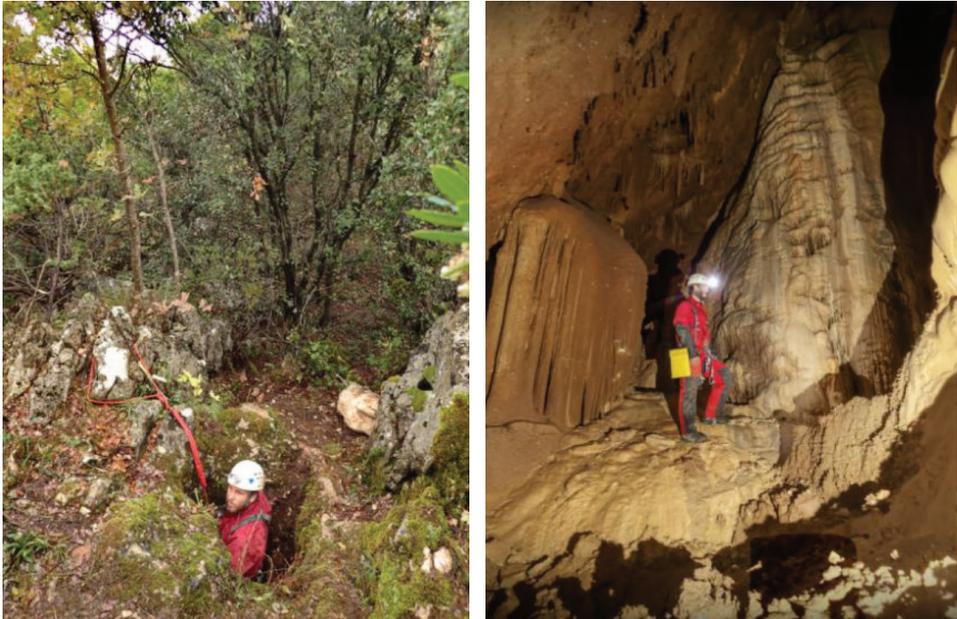


Fig. 28. The entrance and habitat in Dragina lipa jama (photo B. Jalžić).



Fig. 29. *Leptomeson vuicae* in natural habitat (photo B. Jalžić).

Other cave beetles also inhabit the cave, such as *Neotrechus dalmatinus* and *Speonesiotes narentinus*.

The temperature measured on 23rd November 2019 at the bottom of the cave was 14°C.

Taxonomy

Owing to its morphological features, this new species seems to be the south-eastern adelphotaxon of *L. dombrowskii*, from which it differs by the smaller size, the longer elytral pubescence and the different shape of the median lobe of the aedeagus with a stouter apex.

The following identification key, also following the contribution of ČURČIĆ *et al.* (2019), modifies and updates the key provided by GIACHINO *et al.* (2011).

Key to the species of genus *Leptomeson* Jeannel, 1924:

1. Mesothoracic peduncle not narrowed in the middle, wider back. 2
- . Mesothoracic peduncle narrowed in the middle, very elongate, always longer than wide 3
2. Elytra with the largest width at the mid-section, attenuated posteriorly. Larger in size (mm 6.4–7.0) *svircevi svircevi* Müller
- . Elytra with the largest width after the mid-section, swollen posteriorly. Smaller in size (mm 6.0–6.3) *svircevi knirschi* Guéorguiev

3. Pubescence of the elytral disk very long and dense; larger in size species (mm 6.2 – 7.0) *loreki* Zoufal
- . Pubescence of the elytral disk short or long, but always sparse, or sparse on the disk and more dense at least towards the base, or elytral disk almost completely glabrous 4
4. Pubescence of the elytral disk short and sparse. Larger size (mm 5.7 – 6.2) *leonhardi* Müller
- . Pubescence of the elytral disk short or long. Smaller size (mm 4.0 – 5.13) 5
5. Strong evident microsculpture of the pronotum. Pubescence of the elytral disk long or short 6
- . Less evident microsculpture of the pronotum. Pubescence of the elytral disk short 10
6. Pubescence of the elytral disk long 7
- . Pubescence of the elytral disk short 9
7. Pubescence of elytra very long and upright. Larger species (length > mm 5.0) *biokovensis* Giachino, Bregović & Jalžić
- . Pubescence of elytra long and upright. Smaller species (length < mm 5.0) 8
8. Antennae less elongate (BAR: 0.64) *raguzi* Giachino, Bregović & Jalžić
- . Antennae more elongate (BAR: 0.55 – 0.56) *vuicae* n. sp.
9. Pubescence of elytra strong at the base, completely deleted at apex *dombrowskii dombrowskii* Apfelbeck
- . Pubescence of elytra sparse, a little bit denser towards the base *dombrowskii pubipennis* Müller
10. Aedeagus with parameres bearing three apical setae and one internal and subapical (mm 4.68–5.13) *radjai* Giachino, Bregović & Jalžić
- . Aedeagus with parameres bearing three apical setae only 11
11. Apex of the median lobe of the aedeagus, in dorsal view, subtriangular; parameres not twisted at apex (mm 4.97–5.06) *bujasi* Giachino, Bregović & Jalžić
- . Apex of the median lobe of the aedeagus, in dorsal view, subtriangular or rounded and strongly protruding beak shape; parameres twisted at apex 12
12. Apex of the median lobe of the aedeagus, in dorsal view, rounded and strongly protruding beak shape; parameres as long as the median lobe. (mm 4.26–5.10) *dalmatinus* Giachino, Bregović & Jalžić
- . Apex of the median lobe of the aedeagus, in dorsal view, subtriangular; parameres shorter than the median lobe of aedeagus (mm 4.65–5.05) *soltensis* Ćurčić & Rađa

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