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FIVE NEW SPECIES OF THE GENUS *LEPTOMESON* JEANNEL, 1924 FROM CROATIA AND BOSNIA AND HERZEGOVINA (COLEOPTERA, CHOLEVIDAE, LEPTODIRINAE)

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Giachino, P. M., Bregović, P. & Jalžić, B.: Five new species of the genus *Leptomeson* Jeannel, 1924 from Croatia and Bosnia and Herzegovina (Coleoptera, Cholevidae, Leptodirinae). Nat. Croat., Vol. 20, No. 2., 355–374, 2011, Zagreb.

Five new species of genus *Leptomeson* Jeannel, 1924 are described here, four from Croatia and one from Bosnia and Herzegovina: *L. radjai* n. sp. of from the pit Zvekača, close to Šibenik, *L. dalmatinus* n. sp. from the pit Maravića jama, on the island of Čiovo, *L. bujasi* n. sp. from the pit Jama kod Matešića stana, on the island of Brač, *L. biokovensis* n. sp. from the pit Pretnerova jama, on the Biokovo Mountain and *L. raguzi* n. sp. from the cave Majića ponor, near Grude. Moreover, some new chorological data are given on *L. dombrowskii dombrowskii* (Apfelbeck, 1907), found in the cave Baba špilja, on Biokovo Mountain (Dalmatia).

Key words: *Leptomeson, radjai* n. sp., *dalmatinus* n. sp., *bujasi* n. sp., *biokovensis* n. sp., *raguzi* n. sp., *dombrowskii dombrowskii*, taxonomy, chorology, subterranean beetles, zoogeography

Giachino, P. M., Bregović, P. & Jalžić, B.: Pet novih vrsta roda *Leptomeson* Jeannel, 1924 iz Hrvatske i iz Bosne i Hercegovine (Coleoptera, Cholevidae, Leptodirinae). Nat. Croat., Vol. 20, No. 2., 355–374, 2011, Zagreb.

U radu je opisano pet novih vrsta roda *Leptomeson* Jeannel, 1924, četiri vrste iz Hrvatske i jedna nova vrsta iz Bosne i Hercegovine: *L. radjai* n. sp. iz jame Zvekača, blizu Šibenika, *L. dalmatinus* n. sp. iz Maravića jame, na otoku Čiovu, *L. bujasi* n. sp. iz Jame kod Matešića stana, na otoku Braču, *L. biokovensis* n. sp. iz Pretnerove jame, na planini Biokovo i *L. raguzi* n. sp. iz Majića ponora, blizu Gruda. Osim toga, daje se novi podatak o rasprostranjenosti vrste *L. dombrowskii dombrowskii* (Apfelbeck, 1907), pronađenoj u Baba špilji, na planini Biokovo (Dalmacija).

Ključne riječi: *Leptomeson, radjai* n. sp., *dalmatinus* n. sp., *bujasi* n. sp., *biokovensis* n. sp., *raguzi* n. sp., *dombrowskii dombrowskii*, taksonomija, rasprostranjenost, podzemni kornjaši, zoogeografija

INTRODUCTION

The genus *Leptomeson* Jeannel, 1924, which was originally established as a subgenus of *Anthroherpon* Reitter, 1889 (JEANNEL, 1924) and raised to a distinct genus by GUÉORGUIEV (1990), at present includes four species, two of which are polytypical (PERREAU, 2000). Currently we know four species distributed in Bosnia and Herzegovina: *L. leonhardi* (Reitter, 1902) on Vran Mountain and Muharnica Mountain, *L. loreki* (Zoufal, 1904) around Nevesinje, *L. svircevi svircevi* (G. Müller, 1929) on Prenj Mountain, *L. svircevi knirschi* Guéorguiev, 1990 on Lisac Mountain and *L. dombrowskii pubipenne* (G. Müller, 1941) on Midena Mountain. Another subspecies is known from Croatia: *L. dombrowskii dombrowskii* (Apfelbeck, 1907), which is located on the slopes of Mosor Mountain.

The examination of some interesting material belonging to this genus and collected in the caves of the islands of Brač and Čiovo, the northwest part of Biokovo Mountain, near the city of Šibenik, and one species from the southeastern part of Imotsko polje (Bosnia and Herzegovina) by two of the authors (B. J. and P. B.), Helena Bilandžija, Anđela Ćukušić, Marijana Franičević, Vedran Jalžić, Petra Kutleša, Predrag Rade, Tonči Rađa, Nikolina Raguž and Domagoj Tomašković now enables us to add some interesting chorological data about this genus and to describe five new species close to *L. dombrowskii*.

ACRONYMS

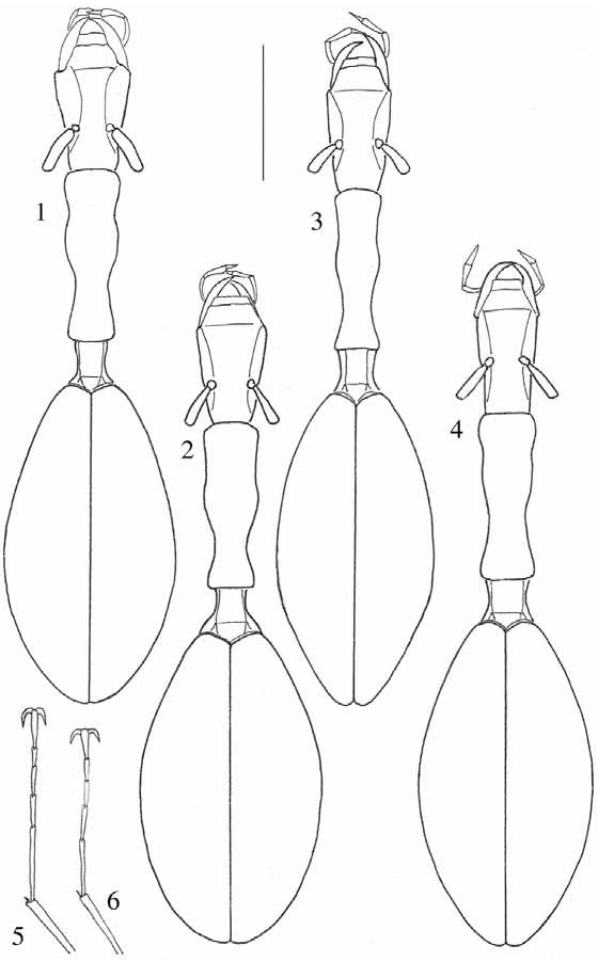
The following acronyms are used for collections, type series and measurements

CNHM	B. Jalžić Collection in Croatian Natural History Museum, Zagreb, Croatia
CGi	P. M. Giachino Collection, Torino, Italia
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
PLA	percentage length of the antennomeres (length of antennomere x 100/length of antenna)

Leptomeson bujasi n. sp. (Figs 3, 6, 8, 12, 13, 21, 23, 24, 33)

LOC. TYP.: Island Brač, Gornji Humac, the pit Jama kod Matešića stana.

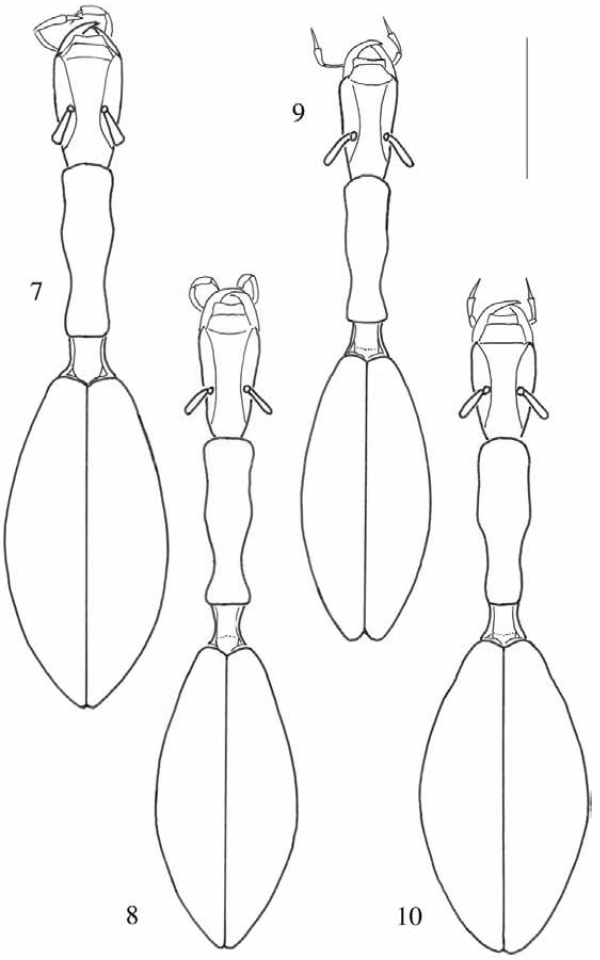
TYPE SERIES: HT ♂, Brač, Gornji Humac, the pit Jama kod Matešića stana, 6.VIII.2004, leg. P. Rade (CNHM). PTT: 1 ♀ Brač, Gornji Humac, the pit Jama kod Matešića stana, 6.VIII.2004, leg. P. Rade (CGi); 6 ♀♀ Brač, Gornji Humac, the pit Jama kod Matešića stana, 12.12.1982, leg. B. Jalžić (CNHM, CGi); 1 ♀ Brač, Gornji Humac, the pit Jama kod Matešića stana, 13.03.2011, leg. A. Ćukušić (CNHM); 1 ♂ 8 ♀♀, Brač, Selca, the pit Ješkalovica, 14.03.2011, leg. B. Jalžić & P. Kutleša (CNHM, CGi); 1 ♀ Brač, Selca, the pit Ješkalovica, 28.02.2010, leg. N. Raguž (CNHM), 1 ♀ Brač, Selca, the pit Ješkalovica, 04.01.2009, leg. B. Jalžić (CNHM).



Figs. 1–6. Habitus (1–4) and male protarsomeres (5, 6) in *Leptomeson* spp.: *Leptomeson biokovensis* ♂ (1, 5); *Leptomeson dombrowskii dombrowskii* ♀ (2); *Leptomeson bujasi* n. sp. HT ♂ (3, 6); *Leptomeson radjai* n. sp. PT ♀ (4). Scale bar: 1 mm.

DIAGNOSIS

A small-sized *Leptomeson* species (mm 4.97–5.06), which resembles *L. dombrowskii* s.l. based on the small body size and the shape of the aedeagus. It differs from *L. dombrowskii dombrowskii* and *L. dombrowskii pubipenne* by the elytral disc being almost completely glabrous and by the much less evident microsculpture of the pronotum, particularly towards the base. It differs from *L. dombrowskii dombrowskii* also by the first protarsomere being shorter in the male, the stockier median lobe of the aedeagus, and the longer parameres (Figs 21–25). It differs from *L. radjai* n. sp. by the much less evident microsculpture of the pronotum, the elytra with a less broadly rounded, more acute tip, the median lobe of the aedeagus being more rounded and by the absent 4th, subapical, seta of the parameres (Figs 21, 23, 26, 29).



Figs. 7–10. Habitus in *Leptomeson* spp.: *Leptomeson dombrowskii dombrowskii* ♂ (7); *Leptomeson radjai* n. sp. HT ♂ (8); *Leptomeson dalmatinus* n. sp. HT ♂ (9); *Leptomeson raguzi* n. sp. HT ♀ (10). Scale bar: 1 mm.

DESCRIPTION

Total length with extended head mm 4.97–5.06 (4.97 HT ♂). Colour testaceous, with legs, palpi, and antennae slightly lighter. Body (Fig. 3) leptodiroid, very elongated, with physogastric and convex elytra, and the pronotum narrow and very elongated. Integuments shiny, with the microsculpture much weaker on head and pronotum, poorly evident and not aligned in transversal strioles on the elytral disc. Integuments completely glabrous on head and pronotum, bearing an extremely sparse, golden, short and upright pubescence on the elytra.

Head hypognathous, very elongated, anophthalmous, without the occipital carina, remarkably widened in front. Mouthparts medium-specialized, with the upper part of the mandibles clearly concave; maxillary palpi elongated, having the penul-

timate palpomere subconical, widened at the distal end, and the last palpomere conical and very elongated. Antennae extremely long, (BAR 0.55 ♂, 0.80 ♀), frail, with the 2nd antennomere shorter than the first one and the 11th one only slightly shorter than the 10th one in the ♀; the 11th one visibly longer than the 10th one in the ♂.

PLA:

♂ 4.80; 4.52; 8.01; 9.36; 12.86; 10.97; 11.24; 9.09; 9.36; 8.55; 11.24

♀ 4.91; 3.64; 10.28; 9.77; 12.83; 13.33; 13.33; 8.24; 7.97; 7.97; 7.73

Pronotum cordiform, very elongated (PW/PL: 0.28 ♂, 0.30 ♀) and bottlenecked before the base at about 1/3 of its length, with the maximum width on the anterior edge, with the base slightly narrower. Sides strongly sinuate on the basal part, slightly concave 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.

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. Prosternum carinate, bearing a long and sharp sagittal carina behind the coxae.

Elytra very elongated (EL/EW: 2.00 ♂, 1.82 ♀), slightly pyriform, slightly more physogastric in the ♀, with the greatest width just beyond the mid-section, separately and briefly rounded apically; disc very convex, with the pubescence extremely sparse (slightly denser along the elytral suture), short and upright. Sutural stria missing.

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 (Figs 21, 23), robust, short and poorly arcuate; median lobe, in dorsal view, stocky, with the apex subtriangular and slightly protruding beak-wise. 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 long sclerified stylet-shaped phanera in the median part.

Spermatheca (Fig. 24) small, poorly sclerified, vaguely C-shaped, with an annexed sacciform and hyaline gland.

ETYMOLOGY

This new species is named after famous speleologist Dr. Ramiro Bujas, who is considered the founder of speleology in Split, at the beginning of the 20th century, together with the speleologist and biospeleologist Umberto Girometta.

DISTRIBUTION AND ECOLOGY

L. bujasi n. sp. is known presently from the type locality, the pit Jama kod Matešića stana, situated near Gornji Humac, on the island of Brač and from the pit Ješkalovica, situated near Selca, again on the island of Brač (Fig. 32). The popula-

tion from the pit Jama kod Matešića stana has already been mentioned under the name *L. dombrowskii* (JALŽIĆ, 1983, 1984), but the greater number of specimens collected afterwards (which include also a male) gave us a better insight into situation resulting with a new species.

The pit Jama kod Matešića stana is characterized by a vertical shape and the depth of –260 meters (Fig. 34). There are few horizontal parts, mostly formed of rocks coming from the upper parts and a soil layer formed by draining water. The pit was formed in a thick layer of Cretaceous carbonate rocks. The draining water forms a lake depth of 16 meters in the deepest part of pit, but stygobitic fauna was not found there. The deepest parts of the pit, from –150 to –200 meters, are richest in *Leptomeson* specimens. Along with them, many specimens of the genus *Spelaeobates* were found, terrestrial isopod species of the genus *Alpioniscus* and examples of pseudoscorpiones of the genus *Neobisium*. The air temperature on March 14th, 2011 was 13.6 °C at –200 m and 14, 2 °C at –240 m and relative humidity was 94.9% at –200 m and 90.9% at –240 m. There is also a high percentage of carbon dioxide, 2.16 % at –200 m. and 2.51 % at –240 m.

Leptomeson radjai n. sp. (Figs 4, 8, 15, 16, 26, 29)

LOC. TYP.: Dalmatia, Šibenik, Perković, the pit Zvekača.

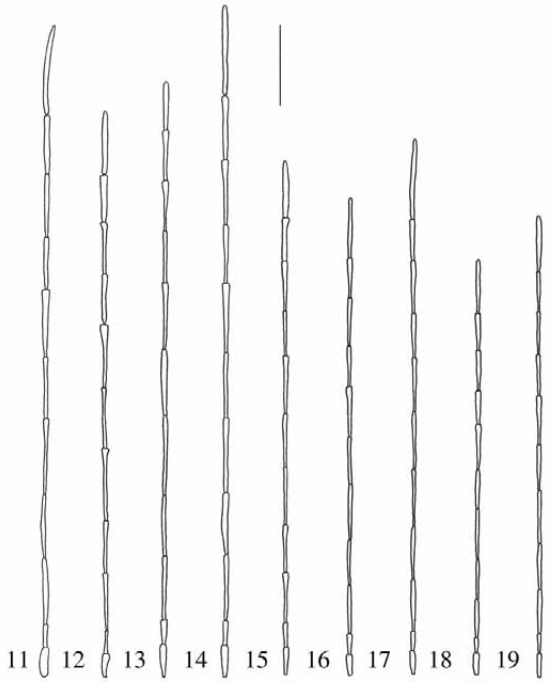
TYPE SERIES: HT ♂, Dalmatia, Šibenik, Perković, the pit Zvekača, 27.02.2010. leg. P. Bregović (CNHM), PTT: 1 ♀, Dalmatia, Šibenik, Perković, the pit Zvekača, 23.02.1997, leg. T. Rađa (CNHM); 3 ♂♂ 16 ♀♀, Dalmatia, Šibenik, Perković, the pit Zvekača, 27.02.2010. leg. P. Bregović (CNHM, CGi); 1 ♀, Krivići, Uble, Zagora, the cave Bunarina, 21.01.1985, T. Rađa leg. (CGi); 1 ♀, Krivići, Uble, Zagora, the cave Bunarina, 26.02.2010. leg. P. Bregović (CNHM).

DIAGNOSIS

A small-sized *Leptomeson* species (mm 4.68–5.13); its small body size and the general body shape place it close to *L. dombrowskii* s.l. and *L. bujasi* n. sp. It differs from *L. dombrowskii dombrowskii* and *L. dombrowskii pubipenne* by the elytral disk being almost completely glabrous, the poorly evident microsculpture of the pronotum, and the elytra with a shiny disk having a very slight microsculpture. It differs from *L. dombrowskii dombrowskii* in the shorter antennae (BAR: 0.58 in *L. dombrowskii dombrowskii*; 0.61 in *L. radjai* n. sp.), with a shorter 11th antennomere, while it differs from *L. bujasi* n. sp. by the much more evident microsculpture of the pronotum and the less physogastric elytra. It differs from all other species of *Leptomeson* in Croatia by the parameres of the aedeagus bearing 4 setae.

DESCRIPTION

Total length with extended head mm 4.68–5.13 (4.68 HT ♂). Colour testaceous, with legs, palpi, and antennae slightly lighter. Body (Figs 4, 8) leptodiroid, very elongated, physogastric and convex elytra, and the pronotum narrow and very elongated. Integuments shiny, with the microsculpture weaker on the head and pronotum, poorly evident and not aligned in the transversal strioles on the elytral disc. Integuments almost completely glabrous on head and pronotum, covered with a very sparse, golden, short and upright pubescence on the elytra.



Figs. 11–19. Antennae in *Leptomeson* spp.: *Leptomeson biokovensis* ♂ (11); *Leptomeson bujasi* n. sp. HT ♂ (12); *Leptomeson bujasi* n. sp. PT ♀ (13); *Leptomeson dombrowskii dombrowskii* ♀ (14); *Leptomeson radjai* n. sp. PT ♀ (15); *Leptomeson radjai* n. sp. HT ♂ (16); *Leptomeson dombrowskii dombrowskii* ♂ (17); *Leptomeson dalmatinus* n. sp. HT ♂ (18); *Leptomeson raguzi* n. sp. HT ♀ (19). Scale bar: 1 mm.

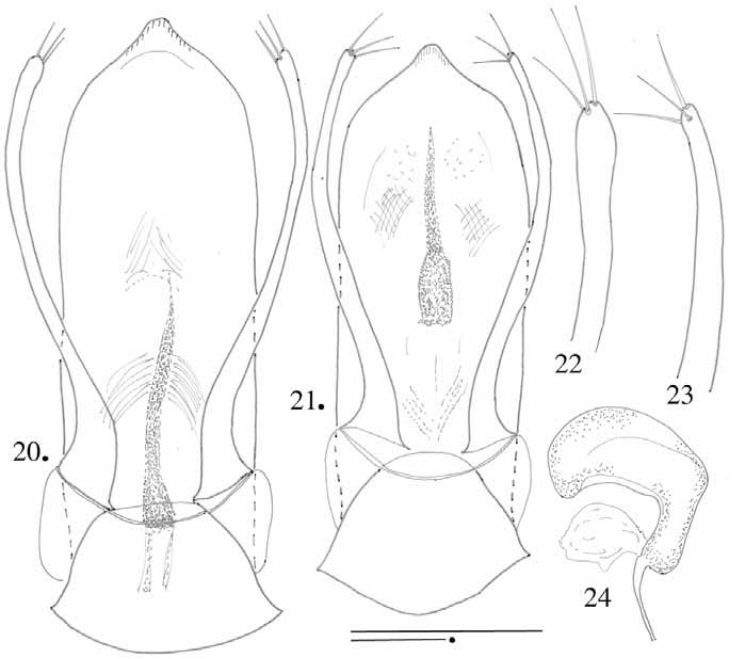
Head hypognathous, very elongated, anophthalmous, without the occipital carina, remarkably widened in front and bearing some sparse, small, short and upright setae in the occipital area. Mouthparts medium specialized, with the upper part of the mandibles clearly concave, maxillary palpi elongated, having the penultimate palpomere subconical, widened at the distal end, with the last palpomere conical and very elongated. Antennae extremely long, (BAR 0.61 ♂, 065 ♀), frail, with the 2nd antennomere shorter than the first one and the 11th one visibly longer than the 10th one.

PLA:

♂: 4.61; 4,37; 9.95; 9,54; 11.61; 9.95; 10.16; 8.51; 10.16; 8.30; 12.84

♀: 5.08; 4.49; 9.52; 8.93; 11.00; 9.81; 11.00; 11.29; 9.53; 8.34; 11.01

Pronotum cordiform, very elongated (PW/PL: 0.31 ♂, 0.35 ♀) and bottlenecked before the base at about 1/3 of its length, with the maximum width on the anterior edge and with the base slightly narrower. Sides strongly sinuate on the basal part, slightly concave in the distal half and finely rebordered in the basal 2/3; basal angles obtuse and blunted; base remarkably curved posteriorly and not rebordered. Pronotal disc bearing in the basal part, beyond the bottleneck, a very sparse pubescence, made of small, short, and upright setae; anterior part of the disc almost completely glabrous.



Figs. 20–24. Median lobe of the aedeagus, dorsal view (20, 21), left paramere, dorsal view (22, 23) and spermatheca in *Leptomeson* spp.: *Leptomeson biokovensis* (20, 22); *Leptomeson bujasi* n. sp. HT ♂ (21, 23) and PT ♀ (24). Scale bars: 0.1 mm.

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 isodiametrical polygonal mesh.

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

Elytra physogastric, slightly pyriform, very elongated (EL/EW: 2.12 ♂, 1.83 ♀), with the largest width at about the mid-section, separately and briefly rounded apically; disc very convex, with the pubescence extremely sparse (slightly denser along the elytral suture), short and upright. Sutural stria missing.

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.

Aedeagus (Figs 26, 29), robust, short and poorly arcuate; median lobe, in dorsal view, stocky, with the apex not subtriangular, laterally rounded and slightly protruding beak-wise. Basal blade of the median lobe stocky, short, and enlarged. Parameres frail, a little shorter than the median lobe, in dorsal view, regularly curved, bearing three apical setae and one, internal subapical seta. Internal sac bearing a long sclerified stylet-shaped phanera in the median part.

Spermatheca not found.

ETYMOLOGY

We are glad to dedicate this new and interesting species to its collector Tonči Rađa, as a token of esteem for his important contribution to biospeleological research in the Balkan peninsula.

DISTRIBUTION AND ECOLOGY

L. radjai n. sp. is currently known from the type locality pit Zvekača, near the village of Perković, city of Šibenik and the cave Bunarina, situated near Krivići, Uble, behind the mountain massif of Kozjak (Dalmatia). (Fig. 32). This species is likely to be found also in the pit Jama na vrhu Vlaška (Seget Donji, Trogir), but authors do not have enough material to confirm this.

The pit Zvekača is a knee shaped, vertical pit of depth – 79m (Fig. 35). The entrance in the pit is of secondary origin. Along the entire pit there are diverse speleothems. The bottom of the halls is covered with rock fragments and soil deposits. There is a large subterranean space in the middle part of the pit. Small water pools are formed in the middle and bottom parts of the pit. The pit was formed by intensive corrosion along the intersection of two fissures in Upper Cretaceous rudist limestone. The air temperature measured on February 19th, 2010 was 13.5 °C, water temperature was 13.2 °C and relative humidity was 98.9 %. The following fauna was also found in the pit: isopod species of genus *Alpioniscus*, examples of Collembola, Pseudoscorpiones, Araneae and Diplura.

Leptomeson biokovensis n. sp. (Figs 1, 5, 11, 20, 22)

LOC. TYP.: Biokovo Mountain, Lokva, the pit Pretnerova jama.

TYPE MATERIAL: HT ♂, Biokovo, Lokva, the pit Pretnerova jama, 14.01.1984, T. Rađa leg. (CNHM).

DIAGNOSIS

A small-sized *Leptomeson* species (mm 5.12 HT ♂), closely related to *L. dombrowskii* s.l., *L. bujasi* n. sp. and *L. radjai* n. sp. by its small body size and its general body shape. It differs from *L. radjai* n. sp. by the elytral disk being pubescent, the evident microsculpture of the pronotum and the subtriangular apex of the median lobe of the aedeagus. It differs from *L. bujasi* n. sp. by the longer first protarsomere in the male, the longer 11th antennomere and the more physogastric elytra. It differs from *L. dombrowskii dombrowskii* by the more physogastric elytra and the shape of the median lobe of the aedeagus.

DESCRIPTION OF THE HT ♂

Total length with extended head mm 5.12. Colour testaceous, with legs, palpi, and antennae of the same color. Body (Fig. 1) leptodiroid, very elongated, physogastric and convex elytra, and the pronotum narrow and very elongated. Integuments shiny on the elytra and dull on head and pronotum; microsculpture strong on head and pronotum, poorly evident and not aligned in transversal strioles on the elytral disc. Integuments almost completely glabrous on pronotum, covered with a very sparse, upright and long pubescence on head, elytra with a sparse, golden, very long and upright pubescence.

Head hypognathous, very elongated, anophthalmous, without the occipital carina, remarkably widened in front and bearing some sparse and upright setae in the occipital area. Mouthparts medium-specialized, with the upper part of the mandibles clearly concave, maxillary palpi elongated, having the penultimate palpomere subconical, widened at the distal end, and the last palpomere conical and very elongated. Antennae extremely long, (BAR 0.50), frail, with the 2nd antennomere shorter than the first and the 11th considerably longer than the 10th.

PLA:

HT ♂: 4.43; 3.48; 10.24; 9.77; 11.63; 9.31; 10.23; 7.90; 9.76; 9.30; 13.95

Pronotum cordiform, very elongated (PW/PL: 0.31) and bottlenecked before the base at about 1/3 of its length, with the maximum width on the anterior edge and with the base slightly narrower. Sides strongly sinuate on the basal part, slightly concave in the distal half and finely rebordered in the basal 2/3; basal angles obtuse and blunted; base remarkably curved posteriorly and not rebordered. Pronotal disc bearing a very strong microsculpture, with an isodiametrical polygonal mesh.

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 isodiametrical polygonal mesh.

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

Elytra physogastric, slightly pyriform, very elongated (EL/EW: 1.84), with the largest width after the mid-section, briefly rounded apically; disc very convex, with the pubescence sparse, very long and upright. Sutural stria missing.

Legs very long and frail, with femora enlarged and swollen in the basal part, progressively tapering distally. Tibiae straight, not enlarged distally; 1st protarsomere two times longer than the 2nd; claws long and slightly enlarged.

Aedeagus (Figs 20, 22), robust, short and poorly arcuate; median lobe, in dorsal view, stocky, with the apex slightly subtriangular, laterally slightly rounded and protruding beak-wise. Basal blade of the median lobe stocky, short, and enlarged. Parameres frail, shorter than the median lobe, in the dorsal view, regularly curved, tapering, from the middle to the apex and bearing three apical setae. Internal sac bearing a long sclerified stylet-shaped phanera in the median part.

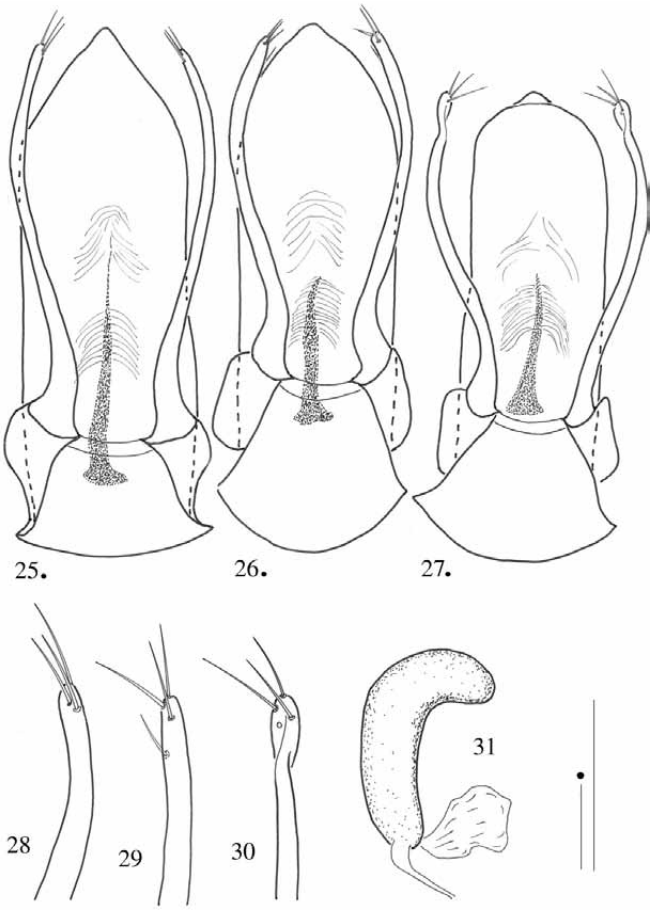
Female unknown.

ETYMOLOGY

From Biokovo Mountain, where the type locality is situated.

DISTRIBUTION AND ECOLOGY

The pit Pretnerova jama is located in the territory known as Lokva, Biokovo Mountain, at an altitude of 1500 m, west of the peak Sveti Jure 1762 m (Fig. 32). It is characterized by a mostly vertical shape and the depth of – 245 m (JALŽIĆ *et al.*, 2010). It was formed by corrosion and erosion processes along tectonic fissures in the Upper Cretaceous limestone. In the deeper parts of the pit a hygropetric habitat is formed. The air temperature on November 27th, 1983 was 7.5 °C at the depth of – 200 m and the water temperature was 6 °C. The fauna of this pit includes the interesting subterranean beetles: *Radziella styx* Casale et Jalžić, 1988 and *Speoplanes giganteus biocovensis* J. Müller, 1934.



Figs. 25–31. Median lobe of the aedeagus, dorsal view (25, 26, 27), left paramere, dorsal view (28, 29, 30) and spermatheca in *Leptomeson* spp.: *Leptomeson dombrowskii dombrowskii* (25, 28); *Leptomeson radjai* n. sp. HT ♂ (26, 29); *Leptomeson dalmatinus* n. sp. HT ♂ (27, 30) and PT ♀ (31). Scale bars: 0.1 mm.

Leptomeson dalmatinus n. sp (Figs 9, 18, 27, 30, 31)

LOC. TYP.: Island Čiovo, Žedno, the pit Maravića jama.

TYPE SERIES: HT ♂, Čiovo, Žedno, the pit Maravića jama, 14.06.2003, leg. T. Rađa (CNHM), PTT: 3 ♂♂ Čiovo, Žedno, the pit Maravića jama, 14.06.2003, leg. T. Rađa (CNHM, CGi); 6 ♀♀ Čiovo, Žedno, the pit Maravića jama, 14.06.2003, leg. T. Rađa (CNHM); 1 ♀, Čiovo, Žedno, the pit Maravića jama, 12.07.2010, leg. P. Bregović (CGi); 1 ♀, Čiovo, Žedno, the pit Maravića jama, 12.07.2010, leg. B. Jalžić (CNHM).

DIAGNOSIS

A small-sized *Leptomeson* species (mm 4.26–5.10), closely related to *L. bujasi* n. sp. and *L. biokovensis* n. sp. by the shape of the median lobe of the aedeagus. It differs

from these two species by twisted apex of the parameres and from *L. biokovensis* n. sp. by the shorter 11th antennomere. It differs from *L. radjai* n. sp. by shorter anntennae and parameres bearing three apical setae.

DESCRIPTION

Total length with extended head mm 4.26–5.10 (4.26 HT ♂). Colour testaceous, with legs, palpi, and antennae slightly lighter. Body (Fig. 9) leptodiroid, very elongated, physogastric and convex elytra, and the pronotum narrow and very elongated. Integuments shiny, with the microsculpture weaker on head and anterior part of the pronotum, poorly evident and not aligned in transversal strioles on the elytral disc. Integuments almost completely glabrous on head and pronotum, covered with a very sparse, golden, short and upright pubescence on the elytra.

Head hypognathous, very elongated, anophthalmous, without the occipital carina, remarkably widened in front and bearing some sparse, small, short and upright setae in the occipital area. Mouthparts medium-specialized, with the upper part of the mandibles clearly concave, maxillary palpi elongated, having the penultimate palpomere subconical, widened at the distal end, and the last palpomere conical and very elongated. Antennae extremely long, (BAR 0.64 ♂, 0.69 ♀), frail, with the 2nd antennomere shorter than the first and the 11th only slightly longer than the 10th.

PLA:

♂: 5.31; 3.87; 9.12; 9.60; 11.17; 9.96; 11.03; 8.17; 10.08; 9.12; 12.93

♀: 6.05; 4.40; 10.71; 9.46; 11.99; 9.46; 11.36; 8.19; 9.46; 8.83; 10.09

Pronotum cordiform, very elongated (PW/PL: 0.30 ♂, 0.37 ♀) and bottlenecked before the base at about 1/3 of its length, with the maximum width on the anterior edge and with the base slightly narrower than it. Sides strongly sinuate on the basal part, slightly concave in the distal half and finely rebordered in the basal 2/3; basal angles obtuse and blunted; base remarkably curved posteriorly and not rebordered. Pronotal disc completely glabrous and bearing in the basal part, beyond the bottleneck, a microsculpture with an isodiametrical polygonal mesh.

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 isodiametrical polygonal mesh.

Mesosternum without a true mesosternal carina; the mesosternum is, ventrally, slightly angled.

Elytra physogastric, slightly pyriform, very elongated (EL/EW: 2.18 ♂, 2.00 ♀), with the largest width at about the mid-section, separately and briefly rounded apically; disc very convex, with the pubescence extremely sparse (slightly denser along the elytral suture), short and upright. Sutural stria missing.

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

Aedeagus (Figs 27, 30), robust, short and poorly arcuate; median lobe, in dorsal view, stocky, with the apex not subtriangular, largely rounded and strongly protruding beak-wise. Basal blade of the median lobe stocky, short, and enlarged. Parameres frail, as long as the median lobe, in dorsal view, regularly curved, spoon-

-shaped and twisted at apex, bearing three apical setae. Internal sac bearing a long sclerified stylet-shaped phanera in the median part.

Spermatheca (Fig. 31) small, poorly sclerified, C-shaped, with an annexed sacciform and hyaline gland.

ETYMOLOGY

From Dalmatia, the region where the type locality is situated.

DISTRIBUTION AND ECOLOGY

The pit Maravića jama (island of Čiovo, near Žedno) (Fig. 32), is –17 m deep, rift – shaped with relatively small underground space. The entrance was formed recently by the collapse of the ceiling. The pit was formed by corrosive water drainage action. The bottom of the pit is covered by soil deposits and rock fragments. This pit is probably a part of a large, inaccessible subterranean space. The air temperature measured on July 12th, 2010 was 13.3 °C and the relative humidity was 97.2%. Beside specimens of genus *Leptomeson*, the collected fauna includes terrestrial isopod species and examples from order Diplura.

Leptomeson raguzi n. sp. (Figs 10, 19)

LOC. TYP.: Bosnia and Herzegovina, Grude, Drinovci, the cave Majića ponor.

TYPE SERIES: HT ♀, Bosnia and Herzegovina, Grude, Drinovci, the cave Majića ponor, 11.08.2010, leg. H. Bilandžija & D. Tomašković, PTT: 1 ♀, Bosnia and Herzegovina, Grude, Drinovci, the cave Majića ponor, 07.08.2009, leg. B. Jalžić (CGi)

DIAGNOSIS

A small-sized *Leptomeson* species (mm 4.63), closely related to *L. dombrowskii dombrowskii* by the general body shape, by the strong microsculpture on the pronotal disc and by the elytral disc with the pubescence sparse, long and upright. It differs from this species by the shorter 11th antennomere (about 1.5 times shorter). From *L. dalmatinus* n. sp. and *L. radjai* n. sp. it differs by the longer elytral pubescence; from *L. bujasi* n. sp. it differs by the short pubescence in the basal part of the pronotum (completely glabrous in *L. bujasi* n. sp.); from *L. biokovensis* n. sp. differs by the smaller body size.

DESCRIPTION OF THE HT ♀

Total length with extended head mm 4.63. Colour testaceous, with legs, palpi, and antennae of the same color. Body (Fig. 10) leptodiroid, very elongated, physogastric and convex elytra, and the pronotum narrow and very elongated. Integuments shiny on the elytra and dull on head and pronotum; microsculpture strong on head and very strong on pronotum, evident and not aligned in transversal strioles on the elytral disc. Integuments almost completely glabrous on the anterior part of the pronotum (basal part of the pronotum bearing a very sparse, short, pubescence), covered with a sparse, upright and long pubescence on head, elytra with a sparse, golden, long and upright pubescence.

Head hypognathous, very elongated, anophthalmous, without the occipital carina, remarkably widened in front and bearing some sparse and upright setae in the occipital area. Mouthparts medium-specialized, with the upper part of the mandibles

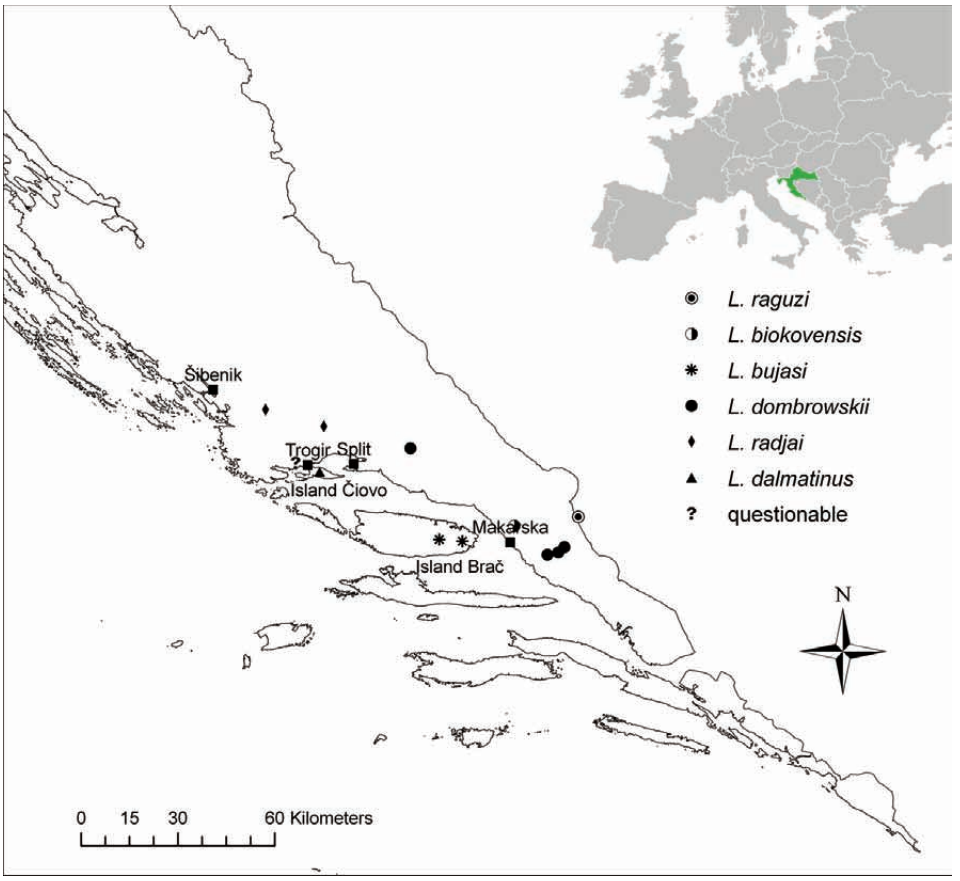


Fig. 32. Distribution map of species of the genus *Leptomeson* mentioned in this work.

Fig. 33. *Leptomeson bujasi* n. sp. from the pit Jama kod Matešića stana. Photo: P. Bregović.

clearly concave, maxillary palpi elongated, with penultimate palpomere subconical, widened at the distal end, and the last palpomere conical and very elongated. Antennae extremely long, (BAR 0.64), frail, with the 2nd antennomere shorter than the first and the 11th visibly longer than the 10th (less than 1.5 times longer than the 10th).

PLA:

HT ♀: 5.17; 4.29; 9.44; 9.87; 11.58; 9.87; 10.72; 9.01; 9.44; 8.60; 12.01

Pronotum cordiform, very elongated (PW/PL: 0.30) and bottlenecked before the base at about 1/3 of its length, with the maximum width at the middle and with the base decidedly narrower than the anterior edge. Sides strongly sinuate on the basal part, slightly concave in the distal half and finely rebordered in the basal 2/3; basal angles obtuse and blunted; base remarkably curved posteriorly and not rebor-

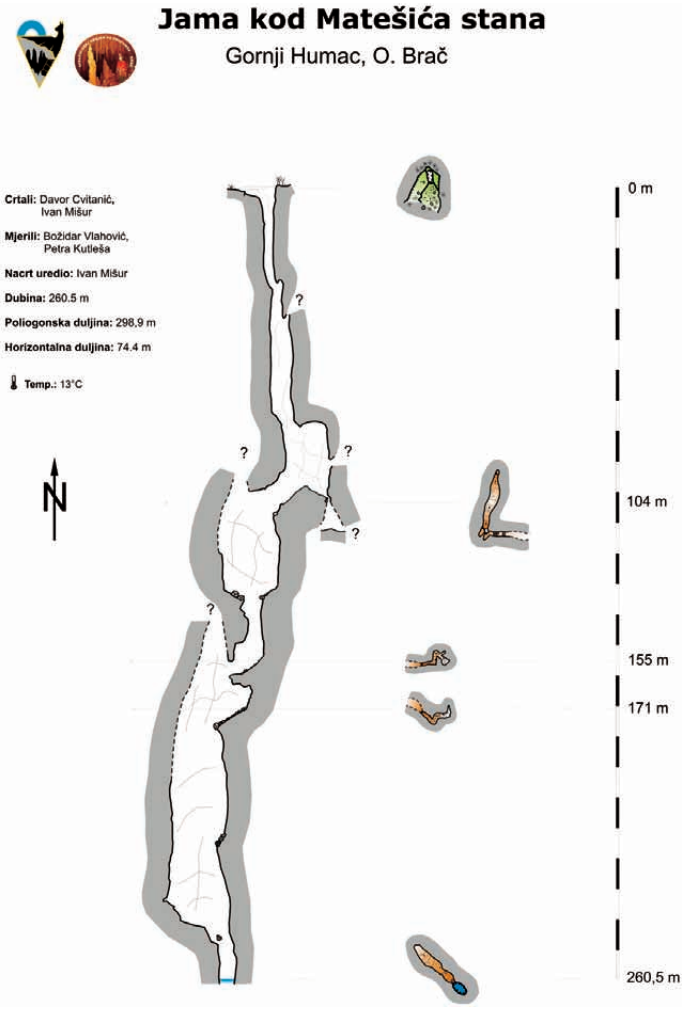


Fig. 34. Map of the pit Jama kod Matešića stana.

dered. Pronotal disc bearing a very strong microsculpture, with an isodiametrical polygonal mesh.

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 isodiametrical polygonal mesh.

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

Elytra physogastric, slightly pyriform, very elongated (EL/EW: 1.85), with the largest width at the mid-section, briefly rounded apically; disc very convex, with the pubescence sparse, long and upright. Sutural stria missing.

Legs very long and frail, with femora enlarged and swollen in the basal part, progressively tapering distally. Tibiae straight, not enlarged distally; 1st protarsomere three times longer than the 2nd; claws long and slightly enlarged.

Male unknown.

ETYMOLOGY

We are glad to dedicate this new and interesting species to a dear friend and biospeleologist Nikolina Raguž, in recognition of her enthusiastic investigations of the subterranean fauna of Croatia.

DISTRIBUTION AND ECOLOGY

The cave Majića ponor (Fig. 32) is periodically hydrologically active and takes some of the water from the Matica River. It is a cave of larger dimensions and to our knowledge it has not been speleologicaly explored or mapped. The channel length is greater than 200 m. The bottom of the channel is covered by large amounts of soil alluvium. In some parts there are larger speleothems. The collected fauna also includes specimens of the genus *Neotrechus*, isopod species of genus *Alpioniscus* and pseudoscorpiones of genus *Neobisium*.

Leptomeson dombrowskii dombrowskii (Apfelbeck, 1907) (Figs 2, 7, 14, 17, 25, 28)

LOC. TYP.: Mosor Mountain, Dugopolje, Kotlenice, the cave Vranjača.

EXAMINED MATERIAL:

1 ♀, Mosor, Dugopolje, Kotlenice, the cave Vranjača, 20.07.2004, leg. M. Franičević (CNHM); 2 ♀♀, Mosor, Dugopolje, Kotlenice, the cave Vranjača, 27.02.2010, leg. H. Bilandžija (CNHM); 5 ♂♂, Mosor, Dugopolje, Kotlenice, the cave Vranjača, 27.02.2010, leg. B. Jalžić & H. Bilandžija (CNHM, CGi); 5 ♀♀, Mosor, Dugopolje, Kotlenice, the cave Vranjača, 27.02.2010, leg. B. Jalžić & H. Bilandžija (CNHM); 2 ♂ 1 ♀, Dalmatia, Kozica, Gornji Antunovići, the cave Velika špilja, 29.VIII.1976, leg. B. Jalžić (CNHM, CGi); 1 ♂ Dalmatia, Kozica, Gornji Antunovići, the cave Velika špilja, 29.11. 2009. leg. B. Jalžić (CNHM); 1 ♀, Dalmatia, Kozica, Gornji Antunovići, the cave Velika špilja, 17.10.2002, leg. V. Jalžić (CNHM); 1 ♀♀, Dalmatia, Kozica, Gornji Antunovići, the cave Mala špilja, 29. 11. 2009, leg. P. Bregović (CNHM); 3 ♀♀, Dalmatia, Kozica, Gornji Antunovići, the cave Mala špilja, 05.12. 2009, leg. B. Jalžić & P. Bregović (CNHM); 4 ♂♂ Dalmatia, Kozica, Gornji Antunovići, the cave Mala špilja, 05.12.

2009, leg. B. Jalžić & P. Bregović (CNHM, CGi); 1 ♀, Biokovo, Šošići, the cave Baba špilja, 27.04. 2002, leg. B. Jalžić (CNHM).

NOTES ON DISTRIBUTION

The finding of *L. dombrowskii dombrowskii* in the cave Baba špilja, on the slopes of Biokovo Mountain, widens the distribution area of this species, known so far from the cave Vranjača, on the slopes of the Mosor Mountain, and the caves Mala špilja and Velika špilja, on the slopes of Mali Šibenik Mountain (JALŽIĆ, 1984) (Fig. 32). This species is likely to be found also in the cave Špila 2 (Jujnovići, Kozica), but the authors do not have material from this locality.

IDENTIFICATION KEY

The following identification key modifies and updates the key given by GUÉORGUIEV (1990).

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 elongated always longer than wide 3
2. Elytra with the largest width at the mid-section, attenuated posteriorly (mm. 6.4–7.0) . . . . . *svircevi* Müller
–. Elytra with the largest width after the mid-section, swollen posteriorly. (mm 6.0 – 6.3) . . . . . *svircevi knirschi* Guéorguiev
3. Pubescence of the elytral disk very long and dense, larger size (mm 6.2 – 7.0) . . . . . *loreki* Zoufal
–. Pubescence of the elytral disk short or long, but always sparse, or sparse on the disk and denser 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 9
6. Pubescence of the elytral disk long 7
–. Pubescence of the elytral disk short 8
7. Pubescence of elytra very long and upright, 1st protarsomere two times longer than the 2nd in the male (mm 5.12) . . . . . *biokovensis* n. sp.
–. Pubescence of elytra long and upright, 1st protarsomere three times longer than the 2nd in the female (mm 4.63) . . . . . *raguzi* n. sp.
8. Pubescence of elytra strong at the base, completely deleted at the apex . . . . . *dombrowskii* Apfelbeck
–. Pubescence of elytra sparse, a little bit denser towards the base . . . . . *dombrowskii pubipenne* Müller
9. Aedeagus with parameres bearing three apical setae and one internal and subapical (mm 4.68–5.13) . . . . . *radjai* n. sp.

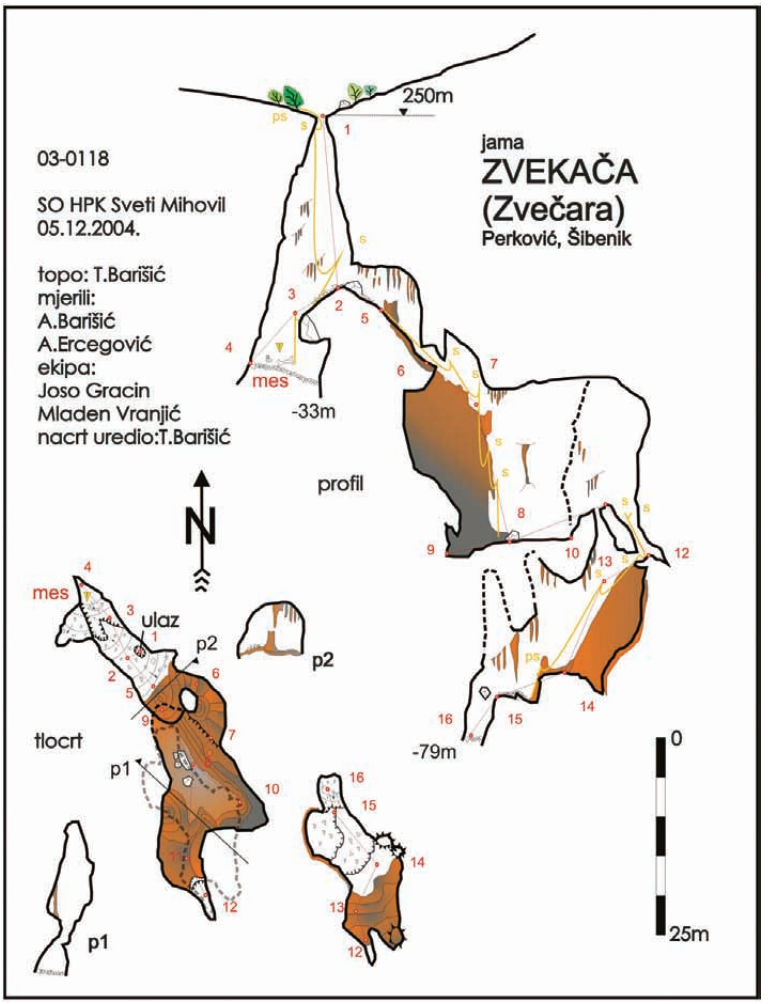


Fig. 35. Map of the pit Zvekača.

–. Aedeagus with parameres bearing three apical setae only. 10

10. Apex of the median lobe of the aedeagus, dorsal view, subtriangular; parameres not twisted at apex (mm 4.97–5.06). . . . . *bujasi* n. sp.

–. Apex of the median lobe of the aedeagus, dorsal view, rounded and strongly protruding beak-wise; parameres twisted at apex (mm 4.26–5.10). . . . . *dalmatinus* n. sp.

Final Remarks

The study of the male genitalia, and in particular of the inner sac of the aedeagus, of *L. bujasi* n. sp., *L. radjai* n. sp., *L. dalmatinus* n. sp. and *L. biokovensis* n. sp. permits us to confirm as a diacritical character at a genus level the presence of two small basal sclerified bands (probably corresponding to the Y basal piece of infra-

flagellates) and of the single dorsal stylet (JEANNEL, 1924). Conversely, at least in *L. dombrowskii dombrowskii*, *L. bujasi* n. sp., *L. dalmatinus* n. sp. and *L. biokovensis* n. sp. the parameres have only 3 apical setae and not 4 as in *L. radjai* n. sp. and *L. loreki* (following as reported by JEANNEL (1924)).

Another diacritical character to be confirmed and used to separate *Leptomeson* from *Anthroherpon* is the presence of a mesothoracic peduncle, very elongated and narrow in the middle. A very elongated peduncle (although not restricted to the middle) is present actually also in *A. apfelbecki lahneri* (Matcha, 1916) (sensu GUÉORGUIEV, 1990) from the caves of Mount Lovćen (Montenegro), that is a taxon showing some very peculiar characteristics when compared to the other species of the genus *Anthroherpon* and whose systematic position should be confirmed. In light of the new taxa described in this contribution, and of the morphological characters identified, based on more abundant material than currently available, the taxonomical status of *L. dombrowskii pubipenne* also should probably be reconsidered and could be upgraded to the species rank.

In zoogeographic terms, the data presented in this paper are of great interest. These data extend the range of distribution of *L. dombrowskii dombrowskii* on Biokovo Mountain and add five other taxa closely related to *L. dombrowskii* s.l. The distribution area of genus *Leptomeson* is widened considerably to the north west. It is important to notice that there are two different species on Biokovo Mountain, *L. dombrowskii dombrowskii* at a lower altitude of the southeast parts of the mountain and *L. biokovensis* at an altitude of 1500 m (southwest parts of the mountain). The air temperature of the pit Pretnerova jama, which is at a much higher altitude, is around 7 °C, while the temperatures of caves in the lower parts of mountains where *L. dombrowskii dombrowskii* is found (Mosor Mountain, Mali Šibenik Mountain and Biokovo Mountain) are always more than 10 °C.

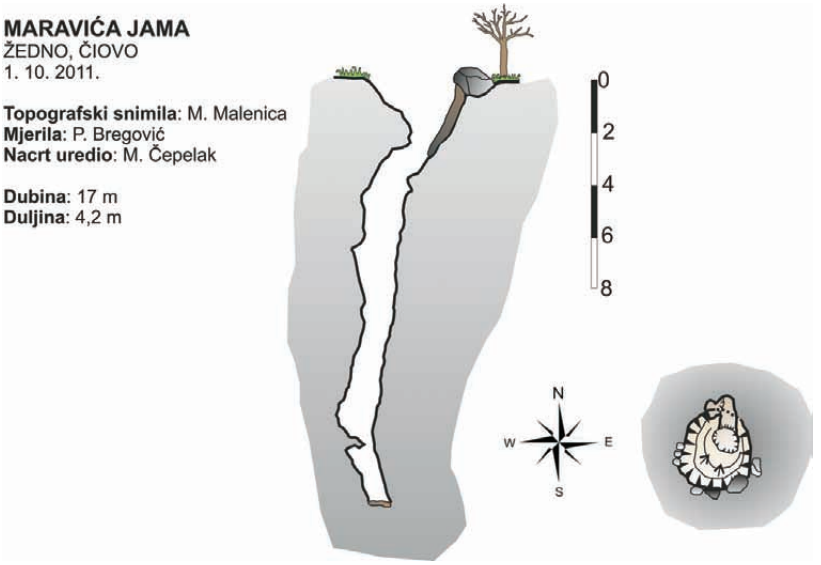


Fig. 36. Map of the pit Maravića jama.

L. bujasi n. sp., which is endemic to the island of Brač and *L. dalmatinus*, which is endemic to the island of Čiovo, neither of them of recent origin, supports a continuity of populations between the Dalmatian coast and the islands from the Mid Late Miocene (8.5–7.0 Ma) to the Late Pliocene (1.8 Ma) (POPOV *et al.*, 2004) by subterranean elements with low dispersal power. This hypothesis is also supported by palaeogeographic data showing that most of the Dalmatian islands were connected to the mainland during the alternating regressive and transgressive marine Pleistocene phases (SHACKLETON *et al.*, 1984; PLUET & PIRAZZOLI, 1991).

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