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NEOBISIUM BOZIDARCURCICI (NEOBISIIDAE, PSEUDOSCORPIONES), A NEW ENDEMIC CAVE PSEUDOSCORPION FROM MONTENEGRO

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Abstract — A new endemic cavernicolous pseudoscorpion species, *Neobisium bozidarcurcici*, from Vodena Pećina Cave on Mt. Durmitor in Montenegro is described and illustrated. Its morphological characters and diagnostic features are analyzed and compared to those of its phenetically closest congeners, *N. davidbengurioni* Ćurčić & Dimitrijević and *N. mendelssohni* Ćurčić & Ćurčić, from caves on Mt. Durmitor.

Key words: Pseudoscorpions, *Neobisium*, *Neobisium bozidarcurcici,* endemism, phylogeny, Montenegro

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INTRODUCTION

The Montenegrin pseudoscorpion fauna is not sufficiently known. The first investigations were conducted by Beier in the first half of the 20th century (Beier, 1938, 1939). This author established nine mainly cavernicolous species. According to Ćurčić (1974, 2002) and Ćurčić et al. (2002, 2004a, 2004b, 2008), 28 endemic species inhabit Montenegro. Of these, the majority are cavernicolous species. Major advances contributing to a better understanding of pseudoscorpion biodiversity in Montenegro were mainly achieved in the past 10 years by Ćurčić (2002), Ćurčić et al. (1997, 1998a, 1998b, 2002, 2004, 2006, 2008), Ćurčić and Dimitrijević (1998a, 1998b), Dimitrijević (2000), and S. Ćurčić et al. (2008). More than 40 pseudoscorpion species were established as a result.

The turbulent geomorphological past of the Montenegrin karst, a part of the greater Dinaric karst, created numerous different underground habitats (crevices, potholes, caves, ponors). Well developed underground karst relief gave shelter to populations of different epigean (arthropod-arachnid) groups that escaped unfavorable climatic and other changes. Such protected subterranean refugia favored the process of underground speciation, which resulted in a large number of endemics and relicts (Hadži, 1933; Vandel, 1964).

MATERIAL AND METHODS

In a sample of pseudoscorpions collected in Vodena Pećina Cave on Mt. Durmitor in Montenegro (12 July 1980), we discovered a female of a new taxon, *Neobisium bozidarcurcici*. Mounted on a slide in gum chloral medium (Swan's fluid), the studied specimen is presently deposited in the collection of the Institute of Zoology, Faculty of Biology, 11000 Belgrade, Serbia (IZB).

Setal and trichobothrial designations follow Beier (1963).

SYSTEMATIC PART

NEOBISIIDAE J. C. CHAMBERLIN, 1930

NEOBISIUM J. C. CHAMBERLIN, 1930

NEOBISIUM BOZIDARCURCICI R. N. DIMITRIJEVIĆ, NEW SPECIES

(Figs. 1-8; Table 1)

Etymology. - The new species is named after Prof. Dr. Božidar Ćurčić, distinguished Serbian

Table 1. Linear measurements (in mm) and morphometric ratios in *N. bozidarcurcici, N. mendelssohni,* and *N. davidbengurioni* from Montenegro. Main diagnostic features of the new species are bolded.

Character	*N. bozidarcurcici* Female	*N. bengurioni* Female	*N. mendelssohni* Female
Body			
Length (1)	**5.48**	4.20	4.94
Cephalothorax			
Length (2)	1.31	1.12	1.30
Breadth (2a)	**1.06**	0.93	0.96
Abdomen			
Length	**4.17**	3.08	3.64
Chelicerae			
Length (3)	0.76	0.75	0.68
Breadth (4)	0.40	0.37	0.39
Length of movable finger (5)	0.45	0.50	0.49
Ratio 3/5	**1.69**	1.50	1.39
Ratio 3/4	1.90	2.03	1.74
Pedipalps			
Length with coxa (6)	**10.12**	9.25	7.975
Ratio 6/1	1.85	2.20	1.61
Length of coxa	**1.07**	0.95	0.93
Length of trochanter (7)	**0.91**	0.75	0.805
Length of femur (8)	**2.52**	2.17	1.76
Breadth of femur (9)	0.35	0.28	0.315
Ratio 7/8	**7.20**	7.75	5.59
Ratio 7/2	1.92	1.94	1.35
Length of patella (tibia) (9)	**1.96**	1.81	1.41
Breadth of patella (tibia) (10)	0.38	0.34	0.37
Ratio 9/10	5.16	5.32	3.81
Length of chela (11)	3.66	3.535	3.07
Breadth of chela (12)	0.65	0.56	0.69
Ratio 11/12	**5.63**	6.32	4.45
Length of chelal palm (13)	1.60	1.47	1.43
Ratio 13/12	2.46	2.625	2.07
Length of chelal finger (14)	2.06	2.07	1.64
Ratio 14/13	1.29	1.41	1.15
Leg IV			
Total length	**7.10**	6.55	5.385
Length of coxa	0.70	0.62	0.66
Length of trochanter (15)	**0.74**	0.65	0.65
Breadth of trochanter (16)	0.24	0.23	0.24
Ratio 15/16	**3.08**	2.83	2.71
Length of femur (17)	**2.19**	1.98	1.48
Breadth of femur (18)	0.25	0.22	0.36
Ratio 17/18	8.76	9.00	4.11
Length of tibia (19)	1.81	1.70	1.355
Breadth of tibia (20)	0.16	0.13	0.18
Ratio 19/20	**11.31**	13.08	7.53
Length of metatarsus (21)	0.72	0.68	0.54
Breadth of metatarsus (22)	0.14	0.12	0.13
Ratio 21/22	**5.14**	5.67	4.15
Length of tarsus (23)	0.94	0.92	0.70
Breadth of tarsus (24)	0.12	0.11	0.10
Ratio 23/24	**7.83**	8.36	7.00
TS ratio - tibia IV	0.325	0.30	0.315
TS ratio - metatarsus IV	0.15	0.13	0.13
TS ratio - tarsus IV	0.49	0.455	0.49

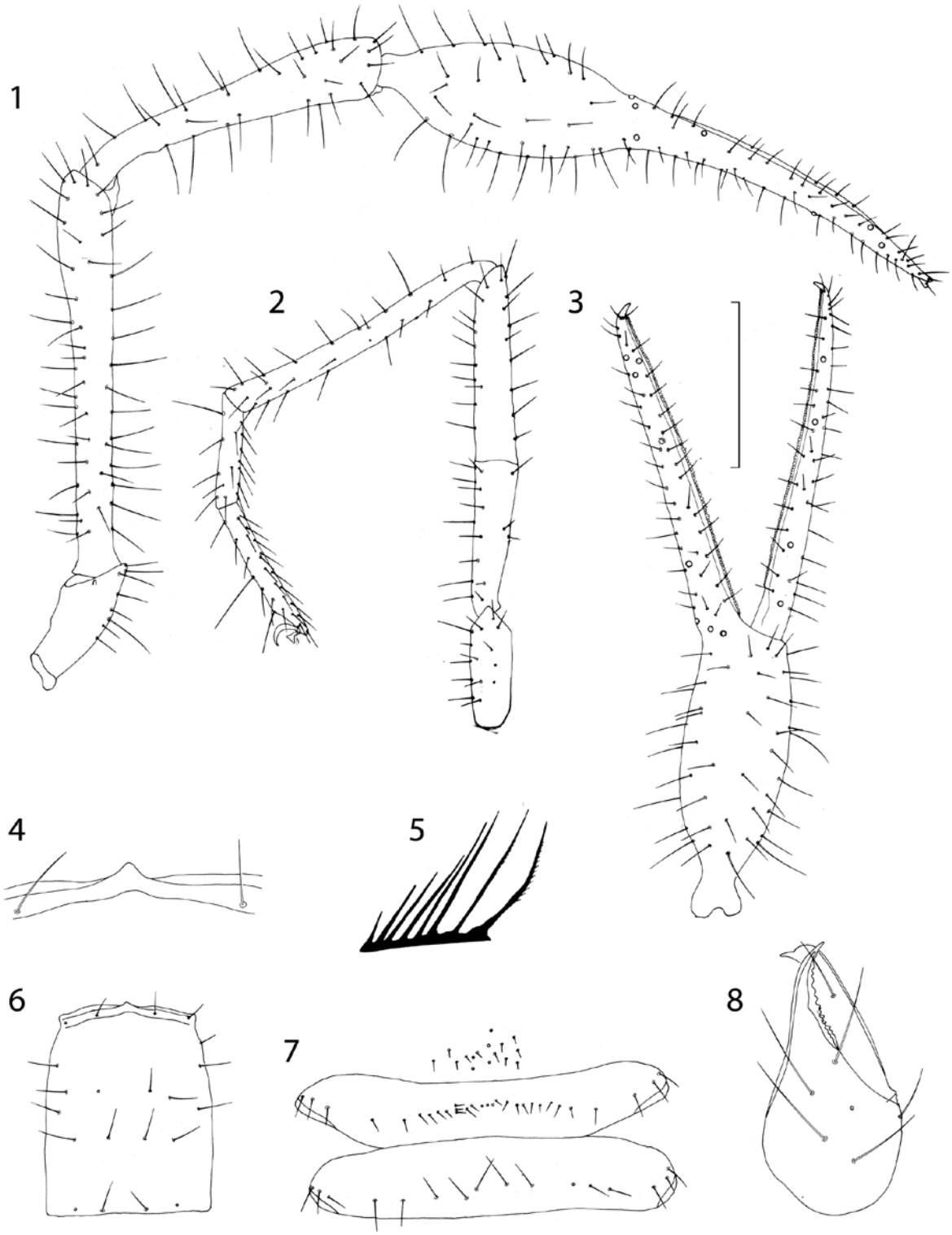

Fig. 1-8. *Neobisium bozidarcurcici* n. sp., holotype female from the Vodena Pećina Cave, Mt. Durmitor, Montenegro. 1 - pedipalp; 2 - leg IV; 3 - pedipalpal chela; 4 - epistome; 5 - flagellum; 6 - carapace; 7 - female genital area; 8 - chelicera. Scales = 1.00 mm (Figs. 1-3, 6 and 8) and 0.50 mm (Figs. 4, 5).

arachnologist, whose immense contribution to the study of pseudoscorpion systematics and phylogeny is immeasureable.

Specimen examined. - Holotype female from Vodena Pećina Cave (Mt. Durmitor, Montenegro), collected on 12 July 1980.

Description. - Carapace longer than broad (Fig. 6, Table 1), with 21 seta. No traces of eyes or eyespots on the carapace. One preocular microseta present on the right carapacal side. Epistome small, with rounded top (Fig. 4). Anterior carapacal row carrying four setae. Both eye and median rows with six setae, but posterior with four. Carapace reticulate throughout.

Abdominal tergites uniseriate and smooth. Setation of tergites I-X as follows: 6-6-6-7-7-7-7-9-9-8. Female genital area: sternite II with 16 median setae; sternite III bearing 24 setae. Sternites III and IV with three short suprastigmatic microsetae along each side of the stigma (Fig. 8). Setation of sternites IV-X: 10-13-15-15-15-14-12. Male genital area: unknown.

Galea well developed, rounded (Fig. 8). Cheliceral palm with six setae, while the movable cheliceral finger carries a single seta. Fixed and movable cheliceral fingers carrying 10-12 small, apically rounded teeth, respectively. Cheliceral flagellum eight-bladed, only the two distal blades being pinnate along the anterior side. All other blades smooth and acuminate, the most proximal blade being the smallest (Fig. 5).

Manducatory process (apex) of pedipalpal coxa with five long and acute setae. Pedipalpal articles smooth, femur and tibia slightly dilated distally (Fig. 1). Fixed chelal finger having 123 teeth with rounded tops. Movable chelal finger bearing 116 mainly triangular close-set teeth.

Four thrichobothria present on the movable finger, eight on the fixed finger (Fig. 6). Trichobothriotaxy: trichobothria **eb**, **esb**, **ib**, and **isb** positioned on the finger base. Trichobothria **it**, **et**, and **ist** positioned on the finger top, **ist** being closer to **est** than to **ib**. Trichobothria **b** and **sb** in proximal, **t** and **st** in distal finger half (Fig. 3).

Chelal finger (2.06 mm) longer than chelal palm (1.60 mm) (Table 1).

All leg IV articles almost parallel-sided (Fig. 2). Tibia IV, basitarsus IV, and tarsus IV carrying a single long tactile seta (Fig. 2). Subterminal tarsal seta furcate, each branch with a few minute spinnules.

Morphometric ratios and linear measurements (in mm) of different body structures are presented in Table 1.

Differential diagnosis. - The newly established species *Neobisium bozidarcurcici* is easily distinuguished from its two close congeners, *Neobisium davidbengurioni* and *N. medelssohni* (from the Jama u Vjetrenim Brdima Pothole and Arapova Pećina Cave on Mt. Durmitor, respectively) in many important aspects.

Females of *N. bozidarcurcići* differ from females of *N. davidbengurioni* in carapacal setation; setation of abdominal tergites I-X (6-6-6-7-7-7-7-9-9-8 vs. 7-6-6-6-7-7-7-7-7-7); setation of abdominal sternites II-X (16-24-10-13-15-15-15-14-12 vs. 13-23-14-12-14-14-14-14-14); form of the epistome (wide vs. triangular); total body length (5.48 mm vs. 4.20 mm); total pedipalpal length (10.12 mm vs. 9.25 mm); length of all pedipalpal articles (coxa 1.07 mm vs. 0.95 mm; trochanter 0.91 mm vs. 0.7 mm; femur 2.52. mm vs. 2.17 mm; tibia 1.96 mm vs. 1.81 mm); the chelal length/breadth ratio (5.63 vs. 6.31); the pedipalpal chelal finger length/breadth ratio (1.29 vs. 1.41); the pedipalpal femur length/breadth ratio (7.20 vs. 7.75); and the pedipalpal tibia length/breadth ratio (5.16 vs. 5.32).

From females of *N. mendelssohni* (which inhabits two caves on Mt. Durmitor), the new species differs in the absence/presence of eyespots (absent vs. reduced and flattened eyes); carapacal setation; setation of abdominal tergites I-X (6-6-6-7-7-7-7-8-9-8 vs. 7-10-11-12-12-11-11-12-12-12) and sternites II-X (16-24-10-13-15-15-15-14-12 vs. 10-27-14-15-14-15-13-12-10); total pedipalpal length (10.12 mm vs. 7.975 mm); the pedipalpal femur length/breadth ratio (7.20 vs. 5.59); and the chelal length/breadth ratio (5.63 vs. 4.45).

Distribution. - To judge from existing knowledge, the newly established species *Neobisium bozidarcurcici* is an endemic and relict form inhabiting only Vodena Pećina Cave on Mt. Durmitor in Montenegro.

Remarks. - *Neobisium bozidarcurcici* and other underground pseudoscorpion species that dwell in Montenegrin underground habitats are descendants of an old arachnid fauna that evolved in favorable and protected subterranean niches.

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NEOBISIUM BOZIDARCURCICI, НОВА ЕНДЕМИЧНА ПЕЋИНСКА ПСЕУДОСКОРПИЈА (NEOBISIIDAE, PSEUDOSCORPIONES) ИЗ ЦРНЕ ГОРЕ

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У овој студији описана је, промптно илустрована и дијагностификована нова врста ендемичних пећинских псеудоскорпија са планине Дурмитор у Црној Гори. Нека морфолошка својства и дијагностичке одлике су поређене са онима код најсроднијих врста: *N. davidbengurioni* Ćurčić & Dimitrijević и *N. mendelssohni* Ćurčić & Dimitrijević из пећина на Дурмитору.