

**PROTONEOBISIUM BASILICE (NEOBISIIDAE, PSEUDOSCORPIONES),
A NEW CAVE FALSE SCORPION FROM MT. BOKOVO, CROATIA**

B. P. M. ČURČIĆ¹, R. N. DIMITRIJEVIĆ¹, and T. RAĐA²

¹*Institute of Zoology, Faculty of Biology, University of Belgrade, 11000 Belgrade, Serbia*

²*Speleological Society «Špiljar», 21000 Split, Croatia*

Abstract — A new species of the endemic pseudoscorpion genus *Protoneobisium* Čurčić, 1988, *P. basilice* sp. n. from Croatia has been found, described and diagnosed. From its phenetically close congener, *P. biokovense* (Müller, 1931), the new taxon differs in many respects of both qualitative and quantitative nature. Both species of *Protoneobisium* have a limited distribution; they inhabit Mt. Biokovo, Croatia, and are probably the remnants of some ancient Mediterranean fauna of pre-Tertiary origin.

Key words: Pseudoscorpions, *Protoneobisium*, *Protoneobisium basilice*, caves, endemism, Mt. Biokovo, Croatia.

UDC 595.47(497.5 Biokovo):591.9

INTRODUCTION

The subterranean fauna of Dinaric karst is extremely rich in pseudoscorpion species, most of which occur in very small areas, so that any search in a new region potentially yields a new taxon or a new set of species.

In 2006, two samples of cave false scorpions were collected in the Šutina Jama Pit and Šutina Jama II Pit on Mt. Biokovo, Croatia. A thorough analysis has shown that both specimens (a male, and a female) belong to the endemic genus *Protoneobisium* Čurčić, 1988, thus representing a new taxon, *P. basilice* sp. n. Its closest relative is *P. biokovense* (Müller, 1931) (Čurčić, 1998).

Here are the results of the study of *P. basilice* n. sp.

SYSTEMATIC PART

PROTONEOBISIUM ČURČIĆ, 1998

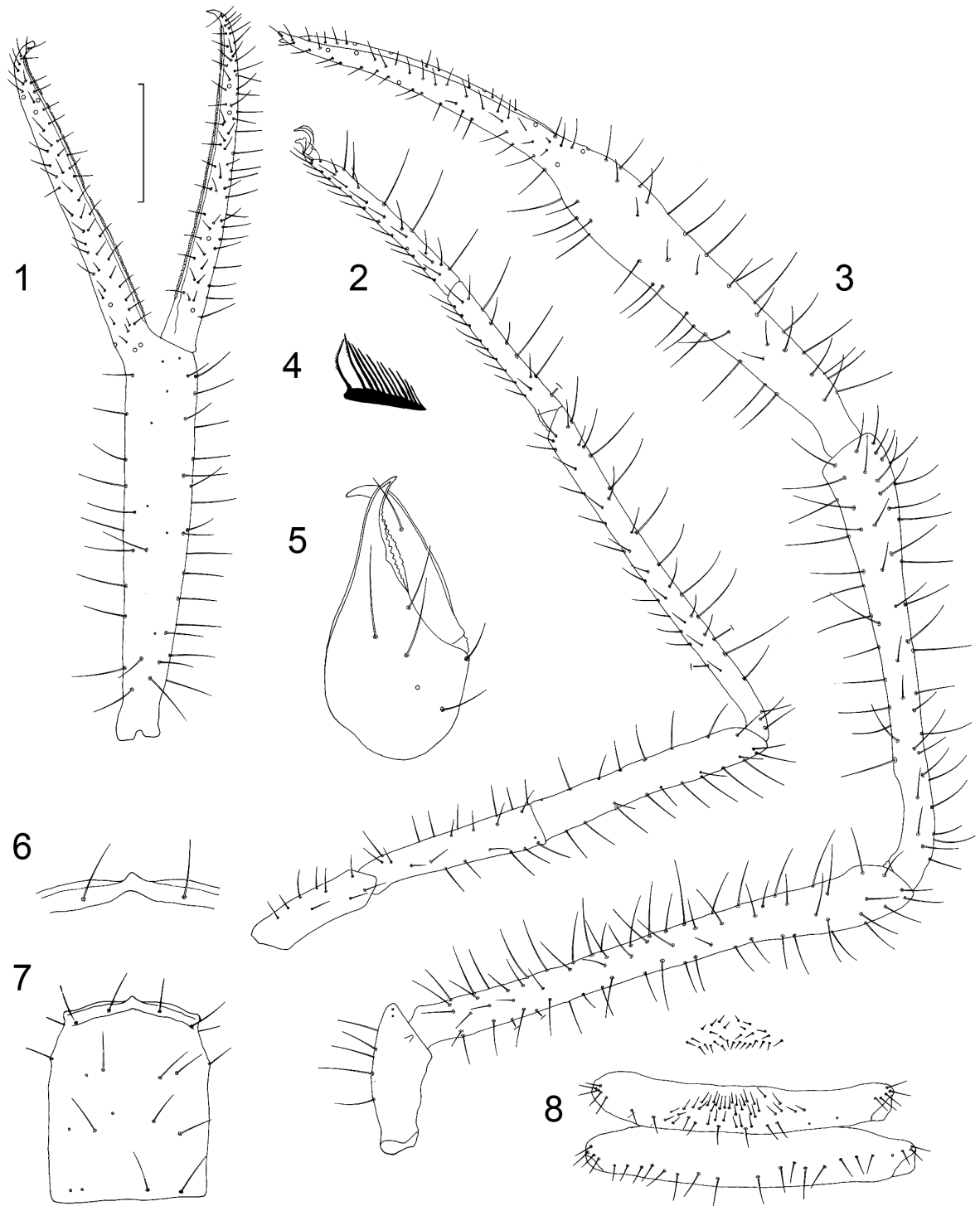
PROTONEOBISIUM BASILICE ČURČIĆ & RAĐA,
NEW SPECIES (Figs. 1-16; Table 1)

Specimens examined. — Holotype male, from the Šutina Jama II Pothole, Rastovac, from the northern

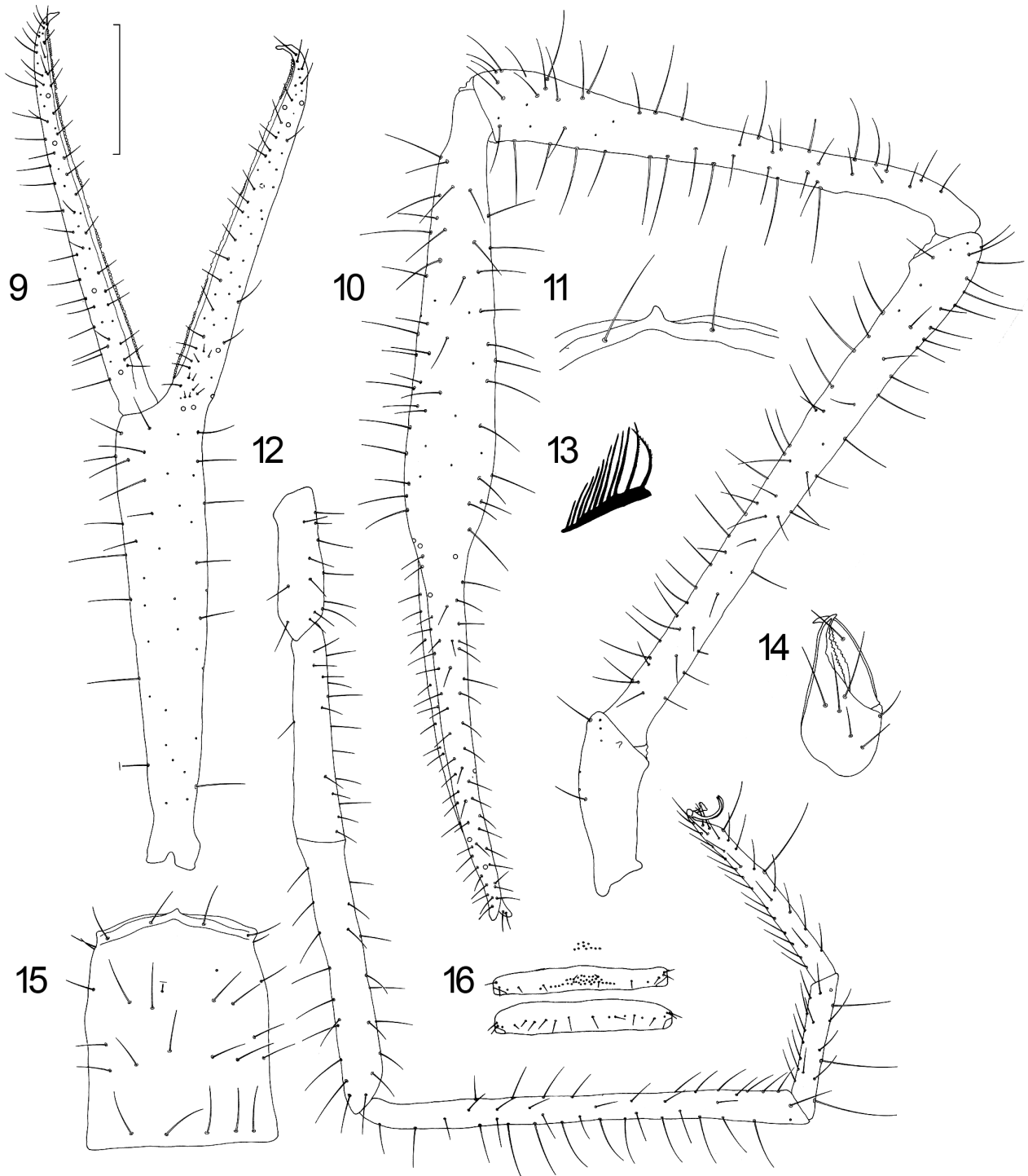
slopes of Mt. Biokovo, Dalmatia (Croatia), 2 June 2006, collected by Sanja Babić; and allotype female, from the Šutina Jama Pothole, Rastovac, northern slopes of Mt. Biokovo, Dalmatia (Croatia), 28 August 2005, collected by Sanja Babić.

Etymology. — In Latin, *basilice* is an adjective meaning: wonderful, dignitious, or imperial.

Description. — Interior carapacial margin slightly convex; epistome small, tubercular (Fig. 6, 7, 15). Neither eyes nor eyespots are present. Setal carapacial formulae: 4+6+5+4 = 19 (male) and 4+8+8+5 = 25 setae (female) (Fig. 15). One or two pre-ocular microsetae are seen on either carapacial side. Carapacial reticulate throughout. Tergite setation: 6-4-4-6-6-6-7-8-8-9 (male) and 7-4-4-5-7-7-7-7-7-8 (female). Sternite II (male) with 29 median and posterior setae or 10 such setae (female) (Fig. 16). Sternite III (male) with 31 anterior, 16 posterior setae and five suprastigmatic microsetae on either side (Fig. 8), or 38 posterior setae and three small setae along each of the stigma (female) (Fig. 16). Sternites IV-X with 16 setae (and three suprastigmatic microsetae on either side) and with 15-14-12-13-14-13 (male) setae and with 13 setae and three small setae on either side of the stigma) and



Figs. 1-8. *Protoneobisium basilice* sp. n., holotype male, from Croatia. 1 – pedipalpal chela; 2 – leg IV; 3 – pedipalp; 4 – flagellum; 5 – chelicera; 6 – epistome; 7 – carapace; 8 – male genital area. Scales = 0.25 mm (Figs. 4, 5, 6, 8) and 0.50 mm (Figs. 1, 2, 3, 7).



Figs. 9-16. *Protoneobisium basilice* sp. n., allotype female, from Croatia. 9 – pedipalpal chela; 10 – pedipalp; 11 – epistome; 12 – leg IV; 13 – flagellum; 14 – chelicera; 15 – carapace; 16 – female genital area. Scales = 0.25 mm (Figs. 11, 13) and 0.50 mm (Figs. 9, 10, 12, 14, 15, 16).

Table 1. Linear measurements (in millimetres) and morphometric ratios in *Protoneobisium basilice* sp. n., from Croatia. Abbreviation: F = female, M = male, FF = females, MM = males. Values marked in bold represent species-specific and sexual distinctions.

Character	<i>P. biocovense</i>		<i>P. basilice</i>	
	MM	FF	M	F
Body				
Length (1)	5.62-6.465	6.67-6.79	6.86	8.52
Cephalothorax (2)				
Length	1.77-1.865	1.85-1.87	1.78	2.05
Abdomen				
Length	3.84-4.60	4.80-4.94	5.07	6.47
Breadth	1.715-1.92	2.06-2.40	-	-
Chelicerae				
Length (3)	1.22-1.275	1.29-1.33	1.19	1.31
Breadth (4)	0.55-0.61	0.59-0.60	0.60	0.61
Length of movable finger (5)	0.79-0.89	0.83-0.90	0.805	0.825
Ratio 3/5	1.43-1.54	1.48-1.55	1.48	1.59
Ratio 3/4	2.02-2.22	2.19-2.22	1.98	2.15
Pedipalps				
Length with coxa (6)	16.87-17.66	16.92-18.42	16.22	18.69
Ratio 6/1	2.61-3.01	2.49-2.76	2.36	2.19
Length of coxa	1.515-1.58	1.47-1.66	1.45	1.31
Length of trochanter	1.41-1.45	1.42-1.44	1.355	1.45
Length of femur (7)	4.44-4.83	4.84-4.78	4.16	4.82
Breadth of femur (8)	0.46-0.48	0.50-0.52	0.51	0.43
Ratio 7/8	9.65-10.42	9.31-9.56	8.16	11.21
Ratio 7/2	2.51-2.69	2.56-2.62	2.34	2.35
Length of patella (tibia) (9)	3.91-4.15	4.14-4.16	4.045	4.23
Breadth of patella (tibia) (10)	0.53-0.57	0.57-0.58	0.53	0.55
Ratio 9/10	6.86-7.83	7.17-7.26	7.63	7.69
Length of chela (11)	6.32-6.48	6.40-6.45	5.21	6.88
Breadth of chela (12)	0.60-0.62	0.65-0.67	0.67	0.70
Ratio 11/12	10.19-10.63	9.55-9.80	7.78	9.83
Length of chelal palm (13)	3.36-3.42	3.40-3.43	2.38	3.535
Ratio 13/12	5.42-5.70	5.07-5.24	3.55	5.05
Length of chelal finger (14)	2.96-3.08	3.00-3.02	2.83	3.35
Ratio 14/13	0.865-0.905	0.88	1.19	0.95
Leg IV				
Total length	12.04-13.01	12.80-13.10	12.125	12.21
Length of coxa	0.89-1.28	1.17-1.23	0.855	0.98
Length of trochanter (15)	1.14-1.21	1.17-1.20	1.19	1.24
Breadth of trochanter (16)	0.32-0.35	0.34-0.35	0.34	0.37
Ratio 15/16	3.40-3.56	3.43-3.44	3.50	3.35
Length of femur + patella (17)	3.55-3.79	3.88-3.91	3.68	3.80
Breadth of femur + patella (18)	0.33-0.36	0.34-0.36	0.37	0.33
Ratio 17/18	9.86-11.30	10.86-11.41	9.945	11.515
Length of tibia (19)	3.38-3.55	3.495-3.60	3.37	3.03
Breadth of tibia (20)	0.25-0.27	0.27-0.28	0.24	0.24
Ratio 19/20	12.52-13.80	12.48-13.33	14.04	12.625
Length of metatarsus (21)	1.41-1.44	1.45-1.56	1.31	1.46
Breadth of metatarsus (22)	0.205-0.22	0.205-0.22	0.19	0.19
Ratio 21/22	6.45-7.02	6.59-7.61	6.89	7.68
Length of tarsus (23)	1.67-1.82	1.58-1.66	1.72	1.70
Breadth of tarsus (24)	0.17-0.185	0.18-0.185	0.17	0.17
Ratio 23/24	9.62-9.84	8.78-8.97	10.12	10.00
TS ratio - tibia IV	0.24-0.28	0.22-0.32	0.18	0.30
TS ratio - metatarsus IV	0.11-0.13	0.08-0.17	0.12	0.11
	0.26-0.38	0.30-0.31	0.36	0.29
	0.57-0.685	0.49-0.495	0.59	0.48
	0.79-0.86	0.79-0.83	0.80	0.80
TS ratio - tarsus IV	0.19-0.20	0.14-0.19	0.20	0.15
	0.45-0.48	0.54-0.56	0.46	0.305

15-13-11-15-14-14 posterior setae (female). Twelfth abdominal segment with three pairs of small setae (pleural membranes granulostriate).

Cheliceral galea rounded and tubercular (Figs. 5, 14). Fixed cheliceral finger with 10 (male) or nine teeth (female), movable cheliceral finger with 14 (male) and 13 (female) such teeth (Figs. 1, 9). Cheliceral palm with six long setae, movable finger with one such seta (Figs. 5, 14). Flagellum of 11 blades (in both sexes; Figs. 4, 13). Only two distal blades are pinnate anteriorly; other flagellar setae smooth and acuminate, diminishing in size from distal to proximal.

Manducatory process (apex of pedipalpal coxa) with six long setae (in both sexes). Pedipalpal trochanter with two tiny tubercles, all pedipalpal articles smooth and elongated (Figs. 9, 10). Pedipalpal femur and tibia dilated distally, pedipalpal chelal palm widest at the base of the chelal fingers (lateral view) (Figs. 1, 9). Pedipalpal fingers almost as long or somewhat longer than chelal palm (Table 1). Fixed chelal finger with 126 (male) and 139 asymmetrical, small and contiguous teeth (female); movable chelal finger with 112 (male) and 126 (female) small and close teeth which eventually become rounded, low and smaller. Fixed chelal finger with eight trichobothria and movable chelal finger with four such sensitive setae. Trichobothriotaxy as in Figs 1. and 9.

Tibia IV with a single seta, metatarsus IV with four, and tarsus IV with two such long setae (Table 1). The dispositions of these setae are subject to considerable variation (Figs. 9, 12).

Morphometric ratios and linear measurements are presented in Table 1.

Remarks. — From *Protoneobisium biocovense*, this new species differs in the number of carapacial setae [19 vs. 21-23 (male) and 25 vs. 22 (female)], in the number of teeth on movable chelal fingers in both sexes (Beier, 1963) as well as in body length (shorter vs. longer; Table 1), and abdominal length (shorter than longer; Table 1).

Furthermore, *Protoneobisium basilice* sp. n.

clearly differs from *P. biocovense* in many important respects such as: pedipalpal size (shorter than longer vs. longer than shorter in female; Table 1), pedipalpal femur length of the male (4.16 mm vs. 4.44-4.83 mm), pedipalpal femur length to breadth ratio of the males (8.16 vs. 9.65-10.42) and females (11.21 vs. 9.31-9.56), pedipalpal femur length to carapacial length in both sexes (2.34-2.35 vs. 2.51-2.69), pedipalpal patella length to breadth ratio of the female (7.69 vs. 7.17-7.26), pedipalpal chelal palm length (5.21 vs. 6.32-6.48 in males and 6.88 vs. 6.40-6.45 in females), pedipalpal chelal length to breadth ratio of the male (7.78 vs. 10.19-10.63), chelal palm length (2.38 mm vs. 3.36-3.42 mm in males, and 3.535 mm vs. 3.40-3.43 mm in females), chelal palm length to breadth ratio in the male (3.55 vs. 5.42-5.70), chelal finger length (2.83 vs. 2.96-3.08 mm in males, and 3.35 vs. 3.00-3.02 mm in females), and chelal finger length to chelal palm length ratio (1.19 vs. 0.865-0.905 in males and 0.95 vs. 0.88 in females).

In the female *P. basilice* sp. n., leg IV is shorter than in females of *P. biocovense* (12.21 mm vs. 12.80-13.10 mm), as is the coxa IV length (0.98 mm vs. 1.17 mm vs. 1.23 mm). Finally, tibia IV in the female of this species is 3.03 mm long, as opposed to females of *P. biocovense* (3.495-3.60 mm); tarsus IV breadth to length ratio of the female of *P. basilice* sp. n. is considerably greater than that in *P. biocovense* (10.00 vs. 8.78-8.97).

*

This study of the cave pseudoscorpions inhabiting Dinaric karst has offered further proof of their great age and different origin. The *Protoneobisium*-species complex represent the last vestiges of an old (presumably pre-Tertiary) fauna, which found their shelter in the underground domain of the Balkans and elsewhere (Ćurčić, 1998).

REFERENCES

- Beier, M. (1963). Ordnung Pseudoscorpionidea (Afterskorpione). In: *Bestimmungsbücher zur Bodenfauna Europas*, 1, Akademie Verlag, Berlin, 1-313.
- Ćurčić, B. P. M. (1988). Cave-Dwelling Pseudoscorpions of the Dinaric Karst. - *Acad. Sci. Art. Slov., Cl. IV, Hist. Nat., Opera* 26, *Inst. Biol. Ioannis Hadži*, 8, Ljubljana, 1-192.

**PROTONEOBISIUM BASILICE (NEOBISIIDAE, PSEUDOSCORPIONES),
НОВА ПСЕУДОСКОРПИЈА СА БИОКОВА У ХРВАТСКОЈ**

Б. П. М. ЋУРЧИЋ¹, Р. Н. ДИМИТРИЈЕВИЋ¹ и Т. РАЂА²

¹Институт за зоологију, Биолошки факултет, Универзитет у Београду, 11000 Београд, Србија

²Спелеолошко друштво «Шпиљар», 21000 Сплит, Хрватска

У раду је дијагностификована нова ендемична псеудоскорпија *P. basilice* sp. n. из Хрватске, која припада роду *Protoneobisium* Ćurčić, 1988. Од свог најближег сродника *P. biocovense* (Müller, 1931), нова врста се разликује у многобројним

квантитативним и квалитативним карактерима. Обе врсте рода *Protoneobisium* имају ограничену дистрибуцију, те насељавају планину Биоково у Хрватској; вероватно су обе форме остатак старе медитеранске фауне претерцијарног порекла.