

ON THE DIVERSITY OF PSEUDOSCORPIONS IN MACEDONIA: *NEOBISIUM MAKSIMTODOROVICI* N. SP. (NEOBISHIDAE, PSEUDOSCORPIONES)

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Abstract – A new troglobitic species, *Neobisium maksimtodorovici* n. sp. (Neobiidae, Pseudoscorpiones), inhabiting the Momiček Cave, v. Belica, nr. Makedonski Brod, Macedonia, has been discovered and its diagnosis presented. In support of some earlier findings, this novelty points to the pronounced biodiversity of the area studied.

UDC 595.47 (497.17)

INTRODUCTION

The pseudoscorpion fauna of Macedonia is still insufficiently known. Only recently some important papers by Ćurčić and Legg (1994), Ćurčić and Dimitrijević (2001) and Ćurčić *et al.* (1997) were published.

The present study comprises both a description and a diagnosis of *Neobisium maksimtodorovici* n. sp., from a cave in Mt. Dautica, central Macedonia.

SYSTEMATIC PART

NEOBISIIDAE J. C. CHAMBERLIN
NEOBISIUM MAKSIMTODOROVICI
ĆURČIĆ & DIMITRIJEVIĆ, NEW SPECIES

Etymology – After the name of Prof. Maksim Todorović, a noted Serbian ecologist.

Material examined – Holotype tritonymph, and paratype tritonymph, from the Momiček Cave, v. Belica, nr. Makedonski Brod, Mt. Dautica, central Macedonia; June 21, 2002; collected by Dr. S. E. Makarov, S. B. Ćurčić, B. M. Mitić, S. Stanković, E. Stojkoska, and by Nikola Angelov and Kosta Nikolov (from the Speleological Society "Peoni" Skopje, Macedonia); in the collections of the Macedonian Museum of Natural History, Skopje, Macedonia.

Description – The carapace is considerably longer than broad (Fig. 1; Table 1). The epistome is knob-like (Fig. 6). The eyes are absent. Carapacial setae: the anterior series carries 4 setae arranged uniformly along the anterior margin of the cephalothorax. Six setae are borne in the ocular series; six setae are present in the combined median and intermedian rows and four setae on the posterior margin of the carapace (Fig. 1). Thus, the setal carapacial formula is: 4 + 6 + 6 + 4 = 20 setae (Fig. 1).

Holotype tritonymph: the number of setae borne on the tergites I-X is variable; in the holotype, there tergites carry 4-5-6-6-7-8-8-8-7-7 setae. Sternite II carries a cluster of 4 anterior setae (Fig. 7); sternite III has 8 setae arranged uniformly in a single row on the posterior margin and 2 or 3 suprastigmatic microsetae on either side. Sternite IV has 9 posterior setae and 2 or 3 microsetae on each side. Sternite V has 14, sternite VI – 14, sternite VII – 13, sternite VIII – 13, sternite IX – 12, and sternite X – 9 setae.

Paratype tritonymph: tergites I-X carry 4-5-6-6-7-8-8-8-7-8 setae. Sternite II has 4 setae; sternite III carries 8 posterior setae and 2 or 3 suprastigmatic microsetae; sternite IV has 9 posterior setae and 2 or small setae along each stigma. Sternites V-X carry 13-14-14-13-12-9 setae. In both specimens, anal papilla bears two pairs of small setae.

The cheliceral galea is a hyaline convexity (Fig. 8). The movable and fixed cheliceral fingers have 7-12 and 10-15 teeth, respectively, with the proximal and distal members of each series the shortest (Fig. 8). Six setae occur on the palm of the chelicera, and one seta on the movable finger (Fig. 8). The cheliceral flagellum consists of 7 blades; the two distalmost blades are pinnate anteriorly, others are smooth and diminish in size proximally (Fig. 5). The movable finger is longer than the cheliceral breadth (Table 1). In general, the chelicera is almost twice as long as broad (Table 1).

The manducatory process (= the apex of the pedipalpal coxa) carries 7 long setae. The pedipalpal articles are smooth and elongated (Figs. 2, 3).

The movably finger of the pedipalpal chela carries 103-105 teeth, while 123-133 teeth are borne by the fixed chelal finger, respectively.

The teeth of the movable finger are square-topped in the proximal range of the series and are similar to the teeth of the fixed finger. The form of the teeth on the fixed finger is variable; the most distal pointed teeth, slightly asymmetrical, give way to teeth with rounded tops and these are gradually replaced proximally by shortened flattened teeth.

Three trichobothria are carried on the movable chelal finger (*t*, *b*, and *st*; *sb* is missing). The trichobothria of the fixed chelal finger include: *et*, *eb*, *est*, *esb*, *ist*, *it*, and *ib*; *isb* is absent (Fig. 3). The trichobothrium *ist* is closer to the distal than to the proximal group of the sensitive setae (Fig. 3).

The pedipalpal femur is 7.45-8.16 times as long as broad (Table 1). This podomere is somewhat shorter than the double carapacial length. The pedipalpal chela length to breadth ratio is 6.34-6.50 (Table 1). Chelal fingers length to chelal palm length ratio is 1.60-1.65 (Table 1).

Leg IV: tibia, metatarsus, and tarsus each with one long tactile seta, respectively (Fig. 4). The measurements of different body structures and morphometric ratios are presented in Table 1.

Diagnosis – Five cave species of the genus *Neobisium* (J. C. Chamberlin) inhabit Macedonia; these are: *Neobisium ohridanum* Hadži, *N. karamani* Hadži, *N. princeps* Ćurčić, *N. korabense* Ćurčić, and *N. golemanskyi* Ćurčić & Dimitrijević. With the exception of *N. korabense*, all other species belong to different phyletic lineages (due to the presence of two long sensitive setae on tarsus IV).

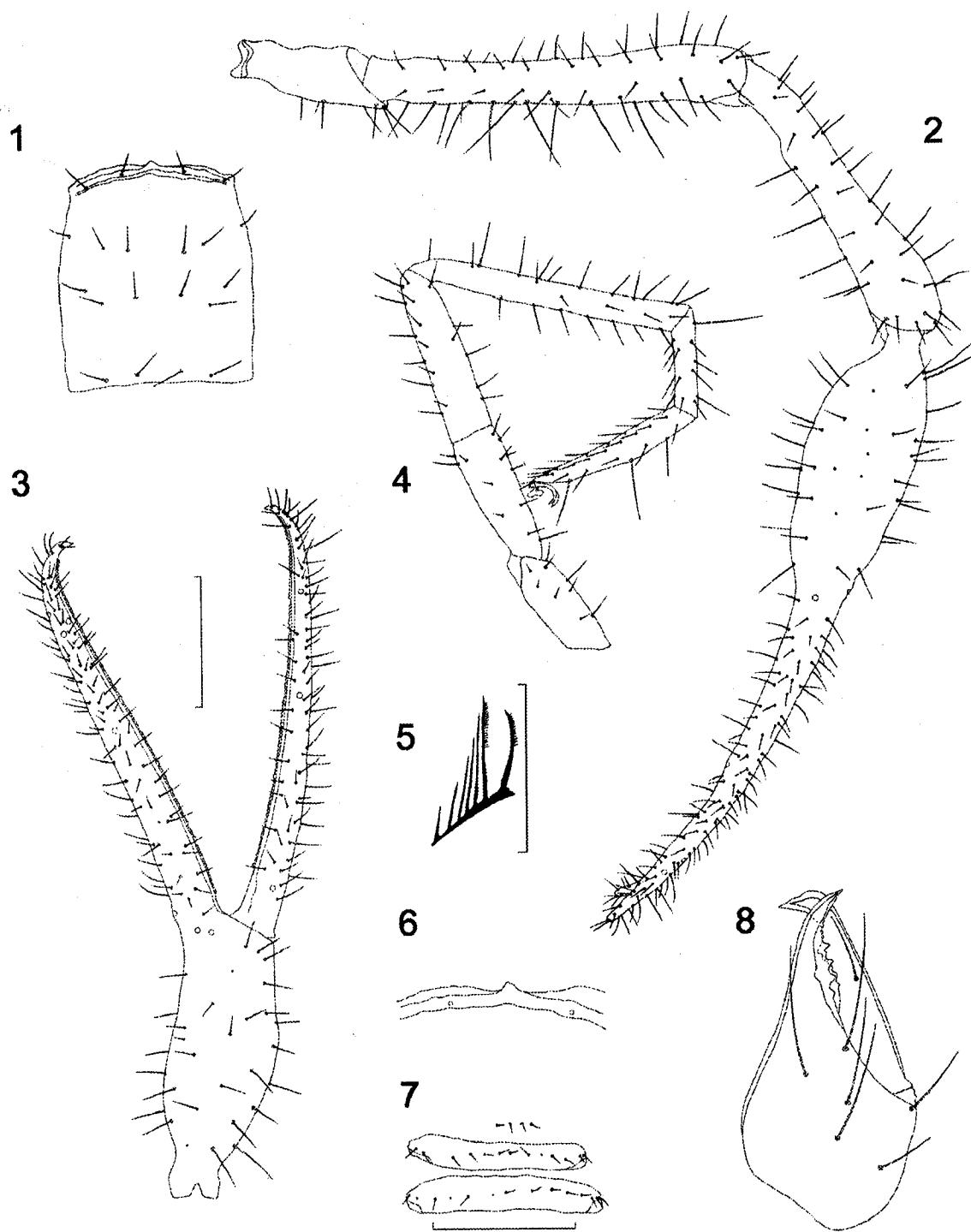
Only *N. korabense* and *N. maksimtodorovici* n. sp. share in common the presence of a single sensitive seta on tarsus IV. Therefore, the new species differs from *N. korabense* in many important features at the tritonymph level: body size (3.45-3.63 mm), pedipalpal length (6.52-6.68 mm vs. 5.665 mm), pedipalpal chela length to breadth ratio (6.34-6.50 mm vs. 4.99 mm), length of leg IV (4.26-4.28 mm vs. 3.24 mm), carapacial setal formula (4+6+4+6=20 vs. 4+9+7+6=26), number of teeth on the movable (103-105 vs. 79) and the fixed chelal finger (123-133 vs. 92), form of pedipalpal and pedal particles (more elongate vs. more stout).

Distribution – Troglobitic form, distributed only in Macedonia.

Remarks – The Macedonian Karst is inhabited by a great number of endemic and relict pseudoscorpions pertaining to different phyletic series. It is already known that the specific aspects of geomorphological and paleoclimatic events in the Balkan Peninsula, together with the peculiarities of the historical development of the fauna there, have caused the Balkans to become the main centre of dispersion and colonization of different species groups, i. e. the main source for the revitalisation and genesis of the biodiversity, not only in the Southeast Europe, but also throughout all of the Mediterranean region (Ćurčić *et al.* 1998).

Table 1. Range in measurements (mm) of various structures, together with selected ratios, in tritonymphs of *Neobisium maksimtodorovici* n. sp. and *N. korabense* Ćurčić.

Character	<i>N. maksimtodorovici</i>	<i>N. korabense</i>
Body		
Length (1)	3.45 – 3.63	3.24
Cephalothorax		
Length (2)	0.845 – 0.85	0.84
Breadth (2a)	0.68 – 0.72	0.72
Abdomen		
Length	2.60 – 2.78	2.40
Breadth	–	–
Chelicerae		
Length (3)	0.60 – 0.62	0.60
Breadth (4)	0.30 – 0.315	0.30
Length of movable finger (5)	0.38 – 0.42	0.40
Ratio 3/5	1.48 – 1.58	1.50
Ratio 3/4	1.87 – 2.00	2.00
Pedipalps		
Length with coxa (6)	6.52 – 6.68	5.665
Ratio 6/1	1.84 – 2.08	1.75
Length of coxa	0.59 – 0.62	0.75
Length of trochanter	0.61 – 0.65	0.61
Length of femur (7)	1.49 – 1.55	1.21
Breadth of femur (8)	0.19 – 0.20	0.25
Ratio 7/8	7.45 – 8.16	4.84
Ratio 7/2	1.41 – 1.82	1.44
Length of patella (tibia) (9)	1.21 – 1.26	1.00
Breadth of patella (tibia) (10)	0.23 – 0.24	0.28
Ratio 9/10	5.25 – 5.35	3.57
Length of chela (11)	2.60	2.095
Breadth of chela (12)	0.40 – 0.41	0.42
Ratio 11/12	6.34 – 6.50	4.99
Length of chelal palm (13)	0.98 – 1.00	0.95
Ratio 13/12	2.44 – 2.45	2.26
Length of chelal finger (14)	1.60 – 1.62	1.145
Ratio 14/13	1.60 – 1.65	1.205
Leg IV		
Total length	4.26 – 4.28	3.475
Length of coxa	0.37 – 0.40	0.55
Length of trochanter (15)	0.46	0.41
Breadth of trochanter (16)	0.16 – 0.17	0.17
Ratio 15/16	2.71 – 2.875	2.41
Length of femur + patella (17)	1.24 – 1.26	0.97
Breadth of femur + patella (18)	0.18	0.20
Ratio 17/18	6.89 – 7.00	4.85
Length of tibia (19)	1.09 – 1.10	0.82
Breadth of tibia (20)	0.10 – 0.11	0.11
Ratio 19/20	10.00 – 10.90	7.45
Length of metatarsus (21)	0.43	0.30
Breadth of metatarsus (22)	0.09	0.10
Ratio 21/22	4.78	3.00
Length of tarsus (23)	0.64 – 0.66	0.425
Breadth of tarsus (24)	0.10	0.11
Ratio 23/24	6.40 – 6.60	3.86
TS ratio - tibia IV	0.25 – 0.35	0.275
TS ratio - metatarsus IV	0.15 – 0.17	0.18
TS ratio - tarsus IV	0.44 – 0.45	0.40



Figs. 1-8. *Neobisium maksimtodorovici* n. sp., from the Momček Cave in Macedonia. Holotype tritonymph: 1 - carapace; 2 - pedipalp; 3 - pedipalpal chela; 4 - leg IV; 5 - flagellum; 6 - epistome; 7 - sternites II-IV; 8 - chelicera.

Scale lines = 0.50 mm (Figs. 1-4, 7, 8) and 0.25 mm (Figs. 5, 6).

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О ДИВЕРЗИТЕТУ МАКЕДОНСКИХ ПСЕУДОСКОРПИЈА:
NEOBISIUM MAKSIMTODOROVICI N. SP. (NEOBISIIDAE, PSEUDOSCORPIONES)

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У овој студији је и дијагностикована нова врста пећинских псеудоскорпија из Македоније, која насељава пећину Момичек, с. Белица код Македонског Брома, на планини Даутици. Анализирана форма се битно разликује од свих до сада познатих врста

каверниколних необизија, који насељавају Македонију и представља терцијарног реликта и ендемита.

Уз раније студије, овај налаз додатно потврђује изражену биоразноврсност проучаваног подручја.