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A NEW CAVE PSEUDOSCORPION FROM SERBIA (PSEUDOSCORPIONES, CHTHONIIDAE)

B. P. M. ĆURČIĆ[1*], T. RAĐA[2], R. N. DIMITRIJEVIĆ[1], S. E. MAKAROV[1], and M. MILINČIĆ[3]

[1] *Institute of Zoology, Faculty of Biology, University of Belgrade,* 11000 Belgrade, Serbia
[2] *Speleological Society "Špiljar",* 21000 Split, Croatia
[3] *Faculty of Geography ,* 11000 Belgrade, Serbia

Abstract. — A new pseudoscorpion from the family Chthoniidae - *Chthonius* (*Chthonius*) *aquasanctae* n. sp. from west Serbia is described. The newly erected taxon is endemic to the area studied. Its taxonomic relationship to its phenetically close congeners *Chthonius* (*Chthonius*) *lesnik* Ćurčić and *Chthonius* (*Chthonius*) *iugoslavicus* Ćurčić, as well as the comparative morphological traits, are described in detail.

Key words: Pseudoscorpions, Chthoniidae, *Chthonius* (*Chthonius*) *aquasanctae* n. sp., endemism, Serbia, Balkan Peninsula.

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INTRODUCTION

A number of species of *Chthonius* C. L. Koch 1843 (subgenus *Chthonius* C. L. Koch 1843) (Chthoniidae) are presently known from Serbia. The majority of these taxa are endemic to Serbia and/or the Balkan Peninsula.

The new species described in this paper is an endemic form, inhabiting cave (and probably epigean) habitats in the central and southern parts of the Balkan Peninsula.

During 2000, the present author visited the Sveta Voda Cave (Holy Water Cave) in southwestern Serbia, near Ivanjica. In this cave two specimens of pseudoscorpions, a female and a male were collected; the description of this new taxa is the subject of this study.

Setal designations follow Beier (1939, 1963).

SYSTEMATIC PART
CHTHONIIDAE DADAY, 1888

CHTHONIUS C. L. KOCH, 1843

CHTHONIUS (*CHTHONIUS*) *AQUASANCTAE* ĆURČIĆ & RAĐA, NEW SPECIES
(Figs. 1-13; Table 1)

Etymology. — After the type locality of the new species.

Material examined. — Holotype female from the Sveta Voda Cave, village Lis - Turica, near Ivanjica, southwestern Serbia; August 16, 2000, collected by B. P. M. Ćurčić; allotype male, from the same cave; same data and collector.

Description. — The carapace (dorsal side of the cephalothorax) is only slightly broader than long and the anterior border is wider than the posterior bor-

der (Figs. 6 and 12; Table 1). The anterior eyes are spot-like and lie less than a diameter from the anterior border (Figs. 6 and 12). The posterior eyes are also spot-like, with reduced and flatten lenses and appear as barely visible spots. The anterior border is slightly convex (Figs. 6 and 12) and with a tiny differentiated epistome, carrying some denticulations, particularly between the two anterior and median setae; however, slight indentations can be seen on the margin almost up to the lateral anterior setae (Figs. 6 and 12).

The carapace is beset with 20 setae arranged in five rows: four anterior, six ocular, four median, two intermedian and four posterior. In the posterior row, only two long setae (macrosetae) are developed centrally, while a single small seta is present lateral to each longer seta (Figs. 6 and 12). In front of the eyes, one or two small setae are carried in each preocular recess (Figs. 6 and 12).

Abdominal tergites I-X with 4 - 4 - 4 - 4 - 6 - 6 - 6 - 6 - 6 - 6 setae in both male and female. Sternite II of the male carries eight posterior and a triangularly arranged group of setae. The next sternite is deeply grooved medially in the form of V and on its interior face carries 14 (7 + 7) setae. In addition, there is a transverse row of 10 setae at the posterior border of this sternite, the median pair of which are placed at the base of the V-shaped opening; anterior to each stigma are three microsetae. Sternite IV of the male has six posterior setae and two suprastigmatic microsetae on either side. In the same sex, sternites V-X carry 8 - 8- 7 - 6 - 7 - 7 setae.

The cheliceral spinneret (galea) is represented by a well-developed hyaline tubercle (Fig. 3 and 11). There is no isolated tooth distally on the movable finger. The first large tooth is contiguous of smaller teeth which end below the insertion site of the galeal seta (*gl*). On the fixed finger the teeth extend back, diminishing in size, below those on the movable finger (Figs. 3 and 11).

The movable cheliceral finger carries one large galeal seta (*gl*) and six setae on the palm of the chelicera. In addition, two small accessory setae are carried exterior to *vb* (Figs. 3 and 11). The movable finger is slightly longer than the cheliceral breadth and the ratio of cheliceral length to breadth is 2.21 - 2.29 (Table 1).

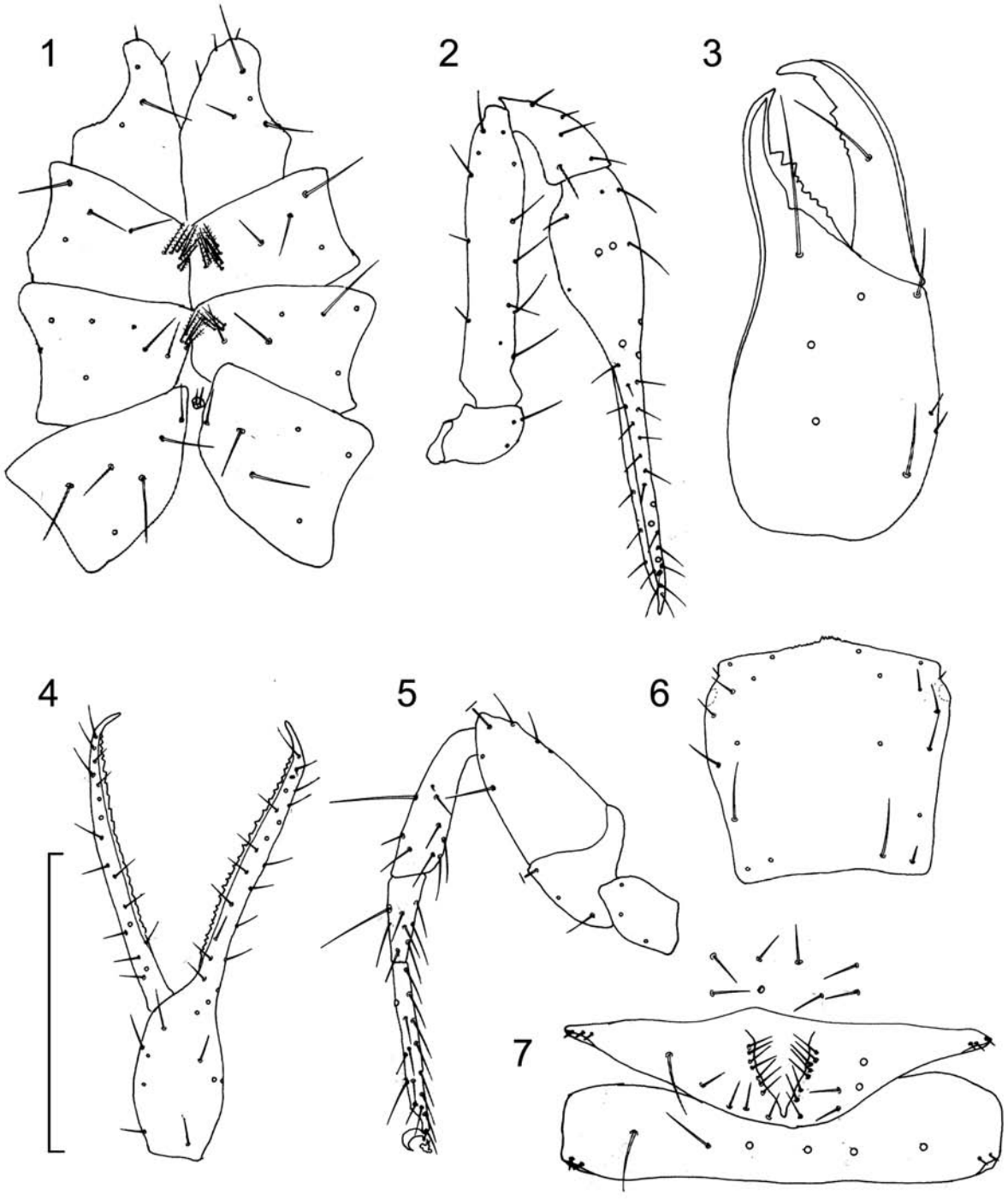
The cheliceral flagellum consists of nine blades, one small blade proximally and eight blades twice this length, more or less in pairs. The most distal members of the series are curved, but all, to some extent, are pinnate on two sides.

The maxillae (coxae of the pedipalp) each carry five setae: two at the anterior end and three on the posterior border of trochantic foramen. The femur is 4.73 - 5.20 times longer than its breadth and 1.30 - 1.33 times longer than carapace (Table 1). The patella (tibia) is tulip-like and its distal end is as broad as the pedipalpal femur. The fixed chelal finger is 1.71 - 1.82 times as long as the chelal palm; the ratio of pedipalpal chelal length to breadth is 4.56 - 5.285 (Table 1). The teeth of the fixed finger (23 - 25) are slightly interspaced (except dorsally and proximally). The movable finger has 19 - 21 teeth which are inclined forwards, but proximally they form a distinct dental lamella (Figs. 4 and 8).

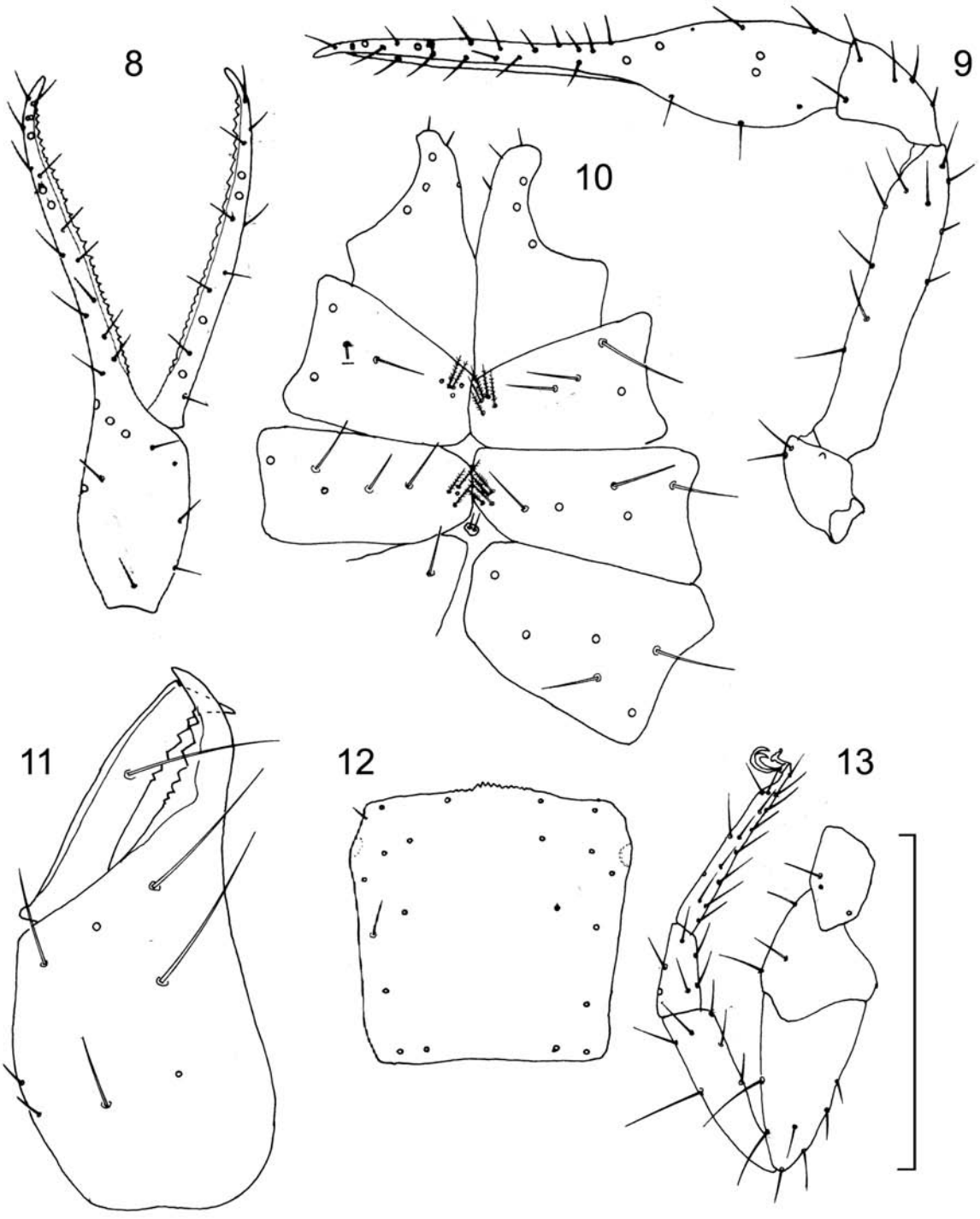
The pedal coxa II carries 4 - 8 spines medially; coxa III has 4 such spines (Figs. 1 and 10). The intercoxal tubercle carries two small setae.

The measurements of the different podomeres of leg IV, as well as tactile seta ratios, are presented in Table 1. Tibia IV, metatarsus IV and tarsus IV each carry a long tactile seta. The claws are slender, smooth and sickle shaped (Figs. 5 and 13.)

Remarks. — From its phenetically close congener *Chthonius* (*Chthonius*) *lesnik*, the new species differs considerably in body length (1.215 - 1.35 mm vs. 2.61 mm), in carapace length (0.39 - 0.40 mm vs. 0.55 mm), pedipalpal length (1.92 - 1.99 mm vs. 3.42 mm), chelal finger length (0.47 - 0.50 mm vs. 0.82 mm), and leg IV length (1.49 - 1.51 mm vs. 2.53 mm). Further distinctions are presented in Table 1.



Figs. 1-7. *Chthonius* (*Chthonius*) *aquasanctae* n. sp., from Serbia. Allotype male: 1 - coxal area; 2 - pedipalp; 3 - chelicera; 4 - pedipalpal chela; 5 - leg IV; 6 - carapace; 7 - male genital area. Scale lines = 0.25 mm (Figs. 1, 3 and 7) and 0.50 mm (Figs. 2, 4 - 6).



Figs. 8-13. *Chthonius* (*Chthonius*) *aquasanctae* n. sp., from Serbia. Holotype female: 8 - pedipalpal chela; 9 - pedipalp; 10 - coxal area; 11 - chelicera; 12 - carapace, 13 - leg IV. Scale lines = 0.25 mm (Figs. 10 and 11) and 0.50 mm (Figs. 8, 9, 12 and 13).

Table 1. Linear measurements (in millimeters) and morphometric ratios in *Chthonius* (*Chthonius*) *aquasanctae* n. sp., *C.* (*C.*) *lesnik* Ćurčić, and *C.* (*C.*) *iugoslavicus* Ćurčić. Abbreviations: ♀ = female, ♂ = male, ♂♂ = males.

	C. (C.) aquasanctae		*C. (C.) lesnik*	*C. (C.) iugoslavicus*	
Character	♀	♂	♀	♀	♂♂
Body					
Length (1)	1.35	1.215	2.61	1.95	1.78-1.90
Cephalothorax					
Length (2)	0.40	0.39	0.55	0.51	0.46-0.48
Breadth (2a)	0.41	0.42	0.555	0.50	0.39-0.43
Ratio 2/2a	0.97	0.93	0.99	1.02	-
Abdomen					
Length	0.95	0.825	2.06	1.44	1.30-1.44
Chelicerae					
Length (3)	0.42	0.39	0.565	0.52	0.42-0.445
Breadth (4)	0.19	0.17	0.24	0.26	0.18-0.20
Length of movable finger (5)	0.21	0.19	0.34	0.23	0.22-0.24
Ratio 3/5	2.00	2.05	1.66	2.00	1.85-1.91
Ratio 3/4	2.21	2.29	2.35	2.26	2.21-2.33
Pedipalps					
Length with coxa (6)	1.99	1.92	3.42	2.925	2.31-2.70
Ratio 6/1	1.47	1.58	1.31	1.50	1.215-1.52
Length of coxa	0.275	0.26	0.60	0.49	0.43-0.48
Length of trochanter	0.19	0.18	0.26	0.23	0.205-0.22
Length of femur (7)	0.52	0.52	0.95	0.78	0.51-0.74
Breadth of femur (8)	0.11	0.10	0.14	0.14	0.11-0.13
Ratio 7/8	4.73	5.20	6.785	5.57	4.64-5.91
Ratio 7/2	1.30	1.33	1.73	1.53	1.11-1.54
Length of patella (tibia) (9)	0.23	0.22	0.34	0.315	0.24-0.27
Breadth of patella (tibia) (10)	0.11	0.09	0.17	0.16	0.13-0.14
Ratio 9/10	2.09	2.44	2.00	1.97	1.85-1.93
Length of chela (11)	0.775	0.74	1.27	1.11	0.91-1.00
Breadth of chela (12)	0.17	0.14	0.20	0.205	0.15-0.17
Ratio 11/12	4.56	5.285	6.35	5.41	5.88-6.06
Length of chelal palm (13)	0.275	0.275	0.45	0.41	0.32-0.37
Ratio 13/12	1.62	1.96	2.25	2.00	2.125-2.18
Length of chelal finger (14)	0.50	0.47	0.82	0.70	0.59-0.67
Ratio 14/13	1.82	1.71	1.82	1.71	1.81-1.85
Leg IV					
Total length	1.49	1.51	2.53	2.15	1.82-1.99
Length of coxa	0.22	0.21	0.34	0.27	0.23-0.24
Length of trochanter (15)	0.17	0.16	0.23	0.21	0.18-0.19
Breadth of trochanter (16)	0.09	0.10	0.14	0.12	0.10-0.11
Ratio 15/16	1.89	1.60	1.64	1.75	1.64-1.80
Length of femur + patella (17)	0.39	0.41	0.73	0.60	0.52-0.58
Breadth of femur + patella (18)	0.16	0.17	0.24	0.21	0.19-0.195
Ratio 17/18	2.44	2.41	3.04	2.86	2.74-2.97
Length of tibia (19)	0.275	0.275	0.48	0.42	0.35-0.38
Breadth of tibia (20)	0.07	0.08	0.10	0.09	0.08-0.09
Ratio 19/20	3.93	3.44	4.80	4.67	4.22-4.375
Length of metatarsus (21)	0.15	0.15	0.25	0.22	0.17-0.20
Breadth of metatarsus (22)	0.06	0.05	0.08	0.07	0.06-0.065
Ratio 21/22	2.50	3.00	3.125	3.14	2.77-3.08
Length of tarsus (23)	0.285	0.305	0.50	0.43	0.36-0.40
Breadth of tarsus (24)	0.03	0.03	0.05	0.04	0.03-0.04
Ratio 23/24	9.50	10.12	10.00	10.75	10.00-13.33
TS ratio - tibia IV	0.55	0.52	0.52	0.52	0.495-0.51
TS ratio - metatarsus IV	0.40	0.40	0.42	0.38	0.40-0.44
TS ratio - tarsus IV	0.25	0.23	0.315	0.38	0.305-0.34

From *Chthonius* (*Chthonius*) *iugoslavicus*, *C.* (*C.*) *aquasanctae* n. sp. differs in body size (1.78 - 1.95 mm vs. 1.215 - 1.35 mm), carapacal length (1.30 - 1.44 mm vs. 0.825 - 0.95 mm), pedipalpal length (2.31 - 2.925 mm vs. 1.92 - 1.99 mm), leg IV length (1.82 - 2.15 mm vs. 1.49 - 1.51 mm), as well as in the presence/absence of eye spots (absent vs. present).

Morphometric ratios and linear measurements are presented in Table 1.

Distribution. — This species lives in Serbia, where it inhabits both epigean and subterranean habitats. It is probably endemic to the area studied.

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The variety of cave living representatives of *Chthonius* in Serbia, as well as in the Balkan Peninsula, supports the observation that the nominal subgenus is taxonomically well-differentiated in the continental belt of southeast Europe (Ćurčić, 1988). The continuity of the continental face in the region integrating its distribution leads to the assumption that its most intense radiation took place on the old Balkanid dry land. This process has also been favored by the origin of the different forms of the underground karst relief, which served as suitable shelter for further divergent differentiation in the frame of the pseudoscorpion genus analyzed (Beier, 1939, 1963; Ćurčić, 1972a, b, 1988, 1994; Ćurčić et al., 1993, 1997a, b, 1999, 2004, 2010, 2011a, b, c, d, e, f, Hadži, 1937).

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