

A NEW EPIGEAN PSEUDOSCORPION FROM EAST SERBIA:
CHTHONIUS (EPHIPPIOCHTHONIUS) TIMACENSIS N. SP.
(CHTHONIIDAE, PSEUDOSCORPIONES)

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Abstract — Only five species of *Chthonius* C. L. Koch (subgenus *Ephippiochthonius* Beier, 1930) (Chthoniidae) are presently known from Serbia. Among these, one should mention *Chthonius (Ephippiochthonius) bidentatus* Beier, 1939 (endemic to the Petnička Pećina Cave in Western Serbia), *C. (E.) kemza* Ćurčić, Lee & Makarov, 1993 (from a cave in Eastern Serbia), *C. (E.) microtuberculatus* Hadži, 1937 (distributed in southern Serbia, FYROM, and Bulgaria), *C. (E.) tetrachelatus* (Preyssler), 1970 (widely distributed all over the world), *C. (E.) metohicus* Ćurčić, 2011 (from the UN Administered Province of Kosovo), and *C. (E.) civitatisveti* Ćurčić & Rađa, 2011 (from southern Croatia), respectively. However, a new epigean species belonging to the genus *Chthonius* — *Chthonius (Ephippiochthonius) timacensis* Ćurčić & Stojanović n. sp. is described from eastern Serbia and is endemic to the area studied. Its taxonomic relationships with the phenetically close congeners *C. (E.) metohicus* Ćurčić and *C. (E.) tetrachelatus* (Preyssler), as well as its comparative morphological traits, are described.

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

INTRODUCTION

In the present study, material from a single sample of pseudoscorpions collected by one of us (DS) was examined. The sample from near the Donje Jezero Lake, near Grza, eastern Serbia, contained a new taxon — *Chthonius (Ephippiochthonius) timacensis* n. sp.

The new species described in this paper is an endemic form, inhabiting epigean habitats in the eastern and central parts of Serbia.

Setal designations follow Beier (1963).

SYSTEMATIC PART

CHTHONIIDAE DADAY, 1888

CHTHONIUS C. L. KOCH, 1843

CHTHONIUS (EPHIPPIOCHTHONIUS) TIMACENSIS

B. ĆURČIĆ & STOJANOVIĆ, NEW SPECIES
(Figs. 1-8; Table 1)

Etymology — After its *terra typica* – the valley of the River Grza, near the Donje Jezero Lake, where the ancient Illyrian tribe of the Timaci once lived.

Material examined — Holotype male, from under stones, near Donje Jezero Lake, Grza, eastern Serbia, 10 July 2009, collected by Dalibor Stojanović.

Description — The carapace (dorsal side of the cephalothorax) is somewhat longer than broad and

its anterior border is wider than the posterior border (Fig. 5, Table 1). The anterior eyes (with normal lenses) are distant and lie about a diameter from the anterior carapacial border. The posterior eyes are removed by about half a distance from the anterior eyes, with slightly flattened lenses (Fig. 5). The anterior border carries no differentiated epistome, although there are denticulations, particularly between two anterior and median setae (Fig. 4). However, tiny indentations can be seen along the anterior margin, almost up to the lateral anterior setae (Fig. 4).

The carapace carries 18 setae arranged in five rows – 4 anterior, 10 ocular, 2 median and intermediate, and 2 posterior setae. There are two small pre-ocular setae on each carapacial side (Fig. 5).

The number of setae carried on the abdominal tergites I – X of the holotype male can be expressed as 4 – 4 – 4 – 4 – 6 – 6 – 6 – 6 – 6 – 6. Sternite II of the male carries 10 small setae. The following sternite is deeply grooved in the form of a V and on its interior face carries 17 (9 + 8) setae (Fig. 6). In addition, there is a transverse row of 10 setae on the posterior border of this sternite, the median pair of which are placed at the base of a V-shaped opening: anterior to each stigma, there are three microsetae. Sternite IV has nine posterior setae and two suprastigmatic microsetae on either side. Sternite V carries 7 marginal setae, sternite VI — 6, sternite VII — 6, sternite VIII — 6, sternite IX — 6, and sternite X — 6 posterior setae.

Female genital area: unknown.

The male carries two pairs of small setae on twelfth abdominal segment.

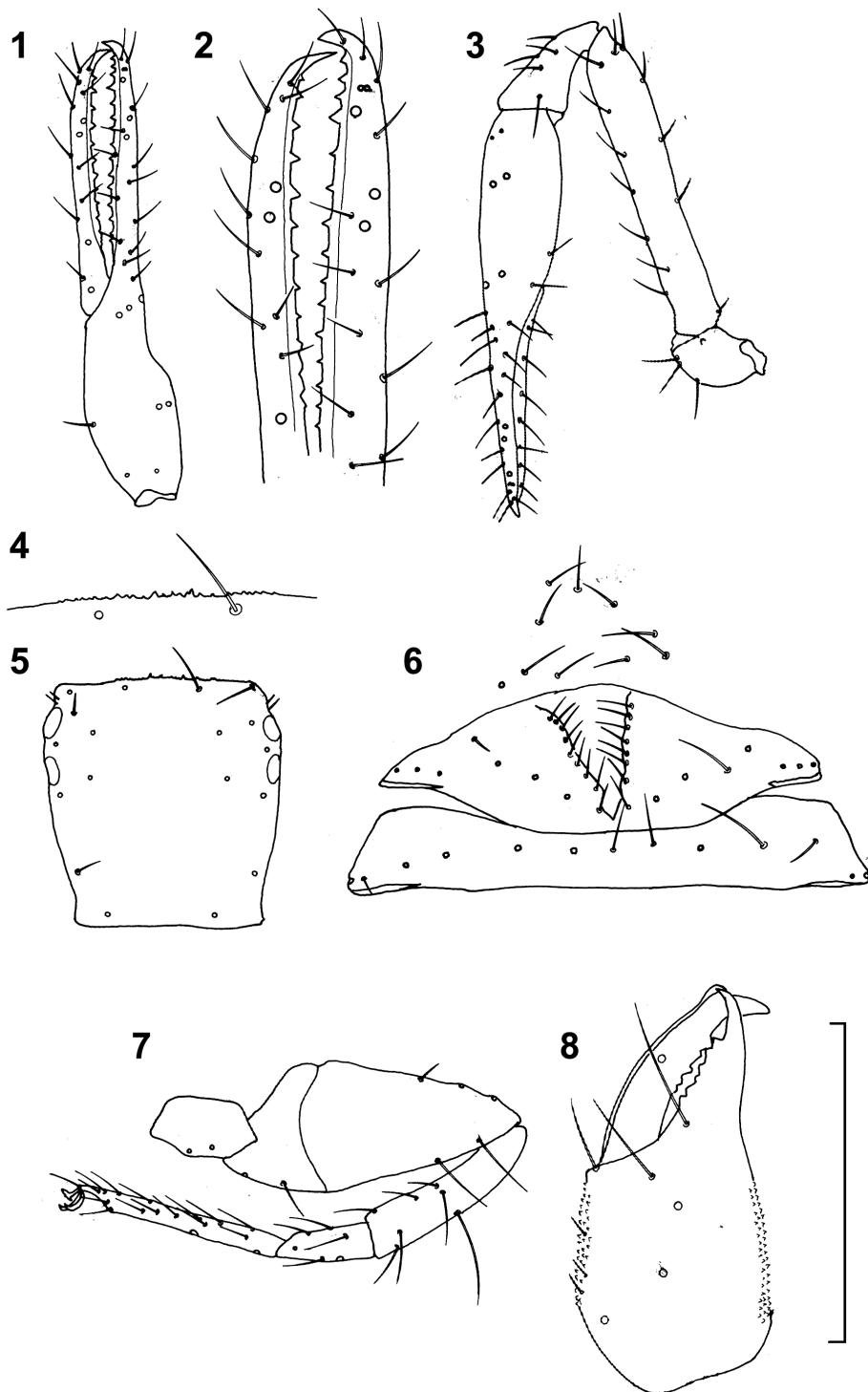
The cheliceral spinneret (galea) is represented by a small hyaline tubercle (Fig. 8). There seems to be no isolated tooth distally on the movable cheliceral finger. The first large tooth is contiguous with a series of smaller teeth that end below the insertion site of the galeal seta (*gl*). On the fixed finger, the teeth extend back, diminishing in size, below those on the movable finger (Fig. 8).

The movable cheliceral finger carries one large seta and six long setae on the palm of the chelicera. In addition, two or three small accessory setae are carried exterior to *vb*. The movable finger is longer than the cheliceral breadth and ratio of chelal length to breadth is 1.24 (Table 1). The cheliceral flagellum consists of nine blades. The most distal members of the series are curved, but all, to some extent, are pinnate on two sides.

The coxae of the pedipalps each carry six setae: three at the anterior end and three on the posterior border of the trochantic foramen. The femur is 5.67 times longer than its breadth and 1.34 times longer than the carapace (Table 1). The patella is tulip-like and its distal end is slightly broader than the pedipalpal femur (Fig. 3).

Four trichobothria are carried on the movable and eight on the fixed chelal finger (Figs. 1 and 2). Two accessory setae (*ds*) lie immediately in front of the most distal trichobothrium *et*, while *it* and *est* are only slightly proximal to *t* and *st* on the movable finger, just in the distal finger third. Two basal trichobothria lie in the middle of the palm, on the dorsal side at its maximum breadth (Figs. 1 and 3). The contour of the chelal palm on the dorsal side is depressed in front of these two trichobothria (Fig. 1). The fixed chelal finger is 1.31 times as long as the chelal palm: the ratio of the pedipalpal chelal length to breadth is 3.92 (Table 1). The teeth of the fixed finger (15) are distributed evenly along its inner length: these are triangular and interspaced. The movable finger has 12 teeth that resemble the dentition of the fixed finger. Proximally, the teeth decrease in size until the last six are small eruptions at the base of the finger (Figs. 1 and 2). The movable finger has a pronounced apodeme. In addition, the fixed chelal finger carries an obvious small accessory tooth at the extreme distal end (Figs. 1 and 2).

Pedal coxae II each carry 4 setae, pedal coxae III — 5, and pedal coxae IV — 6 setae. The pedal coxa II carries 6 – 7 spines medially: coxa III has 4 spines. Intercoxal tubercle carries 2 small setae.



Figs. 1 – 8. *Chthonius (Ephippiochthonius) timacensis* n. sp., holotype male, from eastern Serbia; 1 – pedipalpal chela, 2 – tips of the pedipalpal chela, 3 – pedipalp, 4 – epistome, 5 – carapace, 6 – male genital area, 7 – leg IV, 8 – chelicera. Scale lines = 0.50 mm (Figs. 1, 5, and 7) and 0.25 mm (Figs. 2, 4, 6, and 8).

Table 1. Linear measurements (in millimeters) and morphometric ratios in *Chthonius (Ephippiochthonius) timacensis* n. sp., *C. (E.) metohicus* B. Ćurčić, and *C. (E.) tetrachelatus* (Preyssler) from Serbia. The distinctive traits of *C. (E.) timacensis* n. sp. are in bold numbers. Abbreviations: M = male, MM = males.

	<i>C. (E.) timacensis</i> n. sp.	<i>C. (E.) metohicus</i>	<i>C. (E.) tetrachelatus</i>
	M	MM	MM
Character			
Body			
Length (1)	1.42	1.41	1.11-1.13
Cephalothorax			
Length (2)	0.39	0.38-0.41	0.33-0.35
Breadth (2a)	0.315	0.36-0.39	0.34-0.36
Ratio 2/2a	1.24	1.05-1.06	1.03-1.11
Abdomen			
Length	1.03	1.00-1.03	-
Chelicerae			
Length (3)	0.315	0.33	0.28
Breadth (4)	0.15	0.15-0.16	0.13
Length of movable finger (5)	0.17	0.16-0.18	0.14-0.15
Ratio 3/5	1.85	1.83-2.06	1.87-2.00
Ratio 3/4	2.10	2.06-2.20	2.15
Pedipalps			
Length with coxa (6)	1.86	2.04	1.61-1.70
Ratio 6/1	1.31	1.45	1.45-1.50
Length of coxa	0.305	0.33-0.34	0.21-0.22
Length of trochanter	0.14	0.11-0.16	0.14-0.15
Length of femur (7)	0.51	0.56-0.58	0.43-0.45
Breadth of femur (8)	0.09	0.09	0.09
Ratio 7/8	5.67	6.22-6.44	4.78-5.00
Ratio 7/2	1.31	1.365-1.53	1.23-1.36
Length of patella (tibia) (9)	0.20	0.21-0.22	0.18-0.20
Breadth of patella (tibia) (10)	0.08	0.10	-
Ratio 9/10	2.50	2.10-2.20	-
Length of chela (11)	0.705	0.77-0.80	0.65-0.68
Breadth of chela (12)	0.18	0.12-0.13	0.11-0.12
Ratio 11/12	3.92	6.15-6.42	5.67-5.91
Length of chelal palm (13)	0.305	0.34-0.37	0.26-0.28
Ratio 13/12	1.69	2.83-2.85	2.33-2.36
Length of chelal finger (14)	0.40	0.43	0.39-0.40
Ratio 14/13	1.31	1.16-1.26	1.43-1.50
Leg IV			
Total length	1.06	1.695-1.715	-
Length of coxa	0.21	0.21	-
Length of trochanter (15)	0.17	0.16-0.17	0.15
Breadth of trochanter (16)	0.10	0.10	-
Ratio 15/16	1.70	1.60-1.70	-
Length of femur + patella (17)	0.47	0.49-0.50	-
Breadth of femur + patella (18)	0.20	0.21-0.22	-
Ratio 17/18	2.35	2.27-2.33	2.05-2.10
Length of tibia (19)	0.305	0.315	-
Breadth of tibia (20)	0.08	0.07-0.08	-
Ratio 19/20	3.81	3.94-4.50	-
Length of metatarsus (21)	0.14	0.18	0.14-0.15
Breadth of metatarsus (22)	0.06	0.05-0.06	-
Ratio 21/22	2.33	3.00-3.60	-
Length of tarsus (23)	0.34	0.34	0.25-0.27
Breadth of tarsus (24)	0.04	0.03	-
Ratio 23/24	8.50	11.33	-
TS ratio - tibia IV	0.53	0.48-0.515	-
TS ratio - metatarsus IV	0.36	0.34-0.39	-
TS ratio - tarsus IV	0.33	0.48	-

The measurements of the different podomeres of leg IV, as well as the tactile seta ratios, are presented in Table 1. Tibia IV, metatarsus IV, and tarsus IV each carry a long tactile seta (Fig. 7, Table 1). The claws are slender, smooth, and sickle-shaped.

Differential diagnosis — From its phenetically close congener, *Chthonius (Ephippiochthonius) metolicus*, the new species differs in many important respects: shape of all appendages, body size, cephalothoracic length-to-breadth ratio, pedipalpal length to breadth ratio, pedipalpal-length-to-body-length ratio, pedipalpal femur length-to-breadth ratio, leg IV length-to-breadth ratio, and in many other linear measurements and morphometry (Table 1).

Chthonius (Ephippiochthonius) timacensis n. sp. differs considerably from *Chthonius (Ephippiochthonius) tetrachelatus* in body size (Figs. 1-8, Table 1), segment setation, form of pedipalpal articles (Figs. 1-8), and in the different morphometric ratios and linear measurements of various structures (Figs. 1-3, Table 1).

Remarks — The diversity of forest pseudoscorpions preclude a simplified treatment of its ecology. We are still discovering and establishing, as in this paper, a number of microhabitats of soil pseudoscorpions in these ecosystems (Ćurčić, 1972, 1988; Ćurčić et al., 1993, 2004, 2011a, b, c, d, e, f, g, h; Hadži, 1937). The mechanisms of habitat separation are many and different. The diversity of the pseudoscorpions of the soil fauna can be viewed as the totality of the various effects, although it is clear that the indicated effects operate more restrictively and selectively on the level of individual populations.

Many pseudoscorpions are often limited to one or several sites in a continuous outcrop of soil. Species in soil and leaf litter are separated by nonsoluble rocks such as shales and sandstones. Without exception, their ranges are within continuous outcrops of different layers of soil.

In several areas of evolutionary ecology, the study of soil fauna such as pseudoscorpions, can play

an increasingly important role. It seems to us there is an important question that has received little attention. Are complex systems such as the tropics or organisms with complex life histories, valid cases with which to test the models? In retrospect, the answer is no. A more appropriate place to test many ecological models is in relatively simple situations. To reiterate, soil communities allow a more detailed examination of interactions. Data on area effect and the frequency of various species combinations will never be as extensive as data on, for example birds on islands, because the species pool is much smaller. However, the data can be increased, and when it is it should be "cleaner", because in many cases transient species will be identifiable.

Finally, generally speaking, *C. (E.) timacensis* n. sp. is an endemic form inhabiting soil and leaf litter communities in eastern Serbia, i.e. the central area of the Balkan Peninsula.

Distribution — Serbia (eastern Serbia), under stones; this species is probably an endemic and relict taxon.

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