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RONCUS IVANSTICAE (NEOBISIIDAE, PSEUDOSCORPIONES): A NEW EPIGEAN SPECIES FROM EASTERN SERBIA

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Abstract — A single species of *Roncus* L. Koch, 1873, which was collected in eastern Serbia and is new to science (*R. ivansticae* n. sp.) is described herein; the diagnostic characters are illustrated and their distribution is provided. The possible establishment of two species (or supraspecific?) groups of *Roncus* is presented briefly in view of the importance of some diagnostic characters.

Key words: Pseudoscorpiones, Neobisiidae, *Roncus*, evolution, biogeography, Serbia, Balkan Peninsula.

INTRODUCTION

Over the past four decades there has been a marked increase in our knowledge of the Neobisiidae of southeastern Europe (the Balkan Peninsula), and especially of the representatives of the genus *Roncus* L. Koch, 1873, which occur in leaf litter, soil and caves (Ćurčić, 1988; Ćurčić et al., 2004). Increased interest in the soil/litter and cave ecosystems, and improved sampling techniques have contributed to this knowledge. During a study of the ontogeny and postembryonic development of the pseudoscorpions in Serbia, one hitherto undescribed species of *Roncus* was found.

This paper provides descriptions of *Roncus ivansticae* n. sp., with some details of comparative morphology of this taxon.

All specimens are mounted on slides in Swan's fluid (gum chloral medium) and are deposited in the Institute of Zoology, Faculty of Biology, University of Belgrade, Belgrade, Serbia.

Setal designations follow Beier (1963).

SYSTEMATIC PART

NEOBISIIDAE J. C. CHAMBERLIN, 1930
RONCUS L. KOCH, 1873

RONCUS IVANSTICAE B. ĆURČIĆ
NEW SPECIES
(Figs. 1-16; Table 1; Map 1)

Etymology — After the rivulet Ivanštica, the village of Grza, near Paraćin, eastern Serbia.

Material examined — One male and one female from oak and beech litter on the slopes of the river Ivanštica, Grza, near Paraćin, Eastern Serbia; 12 July 2009; collected by D. Z. Stojanović.

Description — The dorsal side of the cephalothorax (carapace) is distinctly longer than broad (Table 1). The epistome is small, triangular, setal formulae are: 4 + 6 + 8 +6 =24 (male) and 5 + 5 + 8 + 6 = 24 (female). A single pair of eyes removed from the anterior bodyline by about two ocular diameters (Figs. 7 and 16). The disposition of the setae between the anterior and posterior border of the carapace is somewhat variable. Thus, the setae are grouped into four series: anterior, ocular, combined median and intermedian, and posterior. The basic pattern is thus 4 + 6 + 8 + 6 + = 24. The number of setae borne on the tergites I – X is variable. In the male, tergite I carries 6 setae, tergite II – 10, tergite III – 11, tergite IV – 11, tergite V – 12, tergite VI – 11, tergite VII – 12, tergite VIII – 12, tergite IX – 11, and tergite X – 9 setae. In the female, tergite I carries 6 setae, tergite II – 7, tergite III – 9, tergite IV – 11, tergite V – 11, tergite VI – 10, tergite VII – 10, tergite VIII – 10, tergite IX – 10, tergite X – 9 setae.

The first visible sternite represents sternite II. In the male, sternite II carries a dense cluster of 11 setae on its median posterior area thinning out anteriorly; of these, 5 or 6 setae are found on the posterior sternal margin. Sternite III has 4 anterior, 7 posterior setae and 3 suprastigmatic microsetae on either side. Sternite IV carries 7 posterior setae and 3 small setae along each stigmatic plate. Sternite V has 15 setae, sternite VI – 14, sternite VII – 14, sternite VIII – 15, sternite IX – 13, and sternite X – 13 setae.

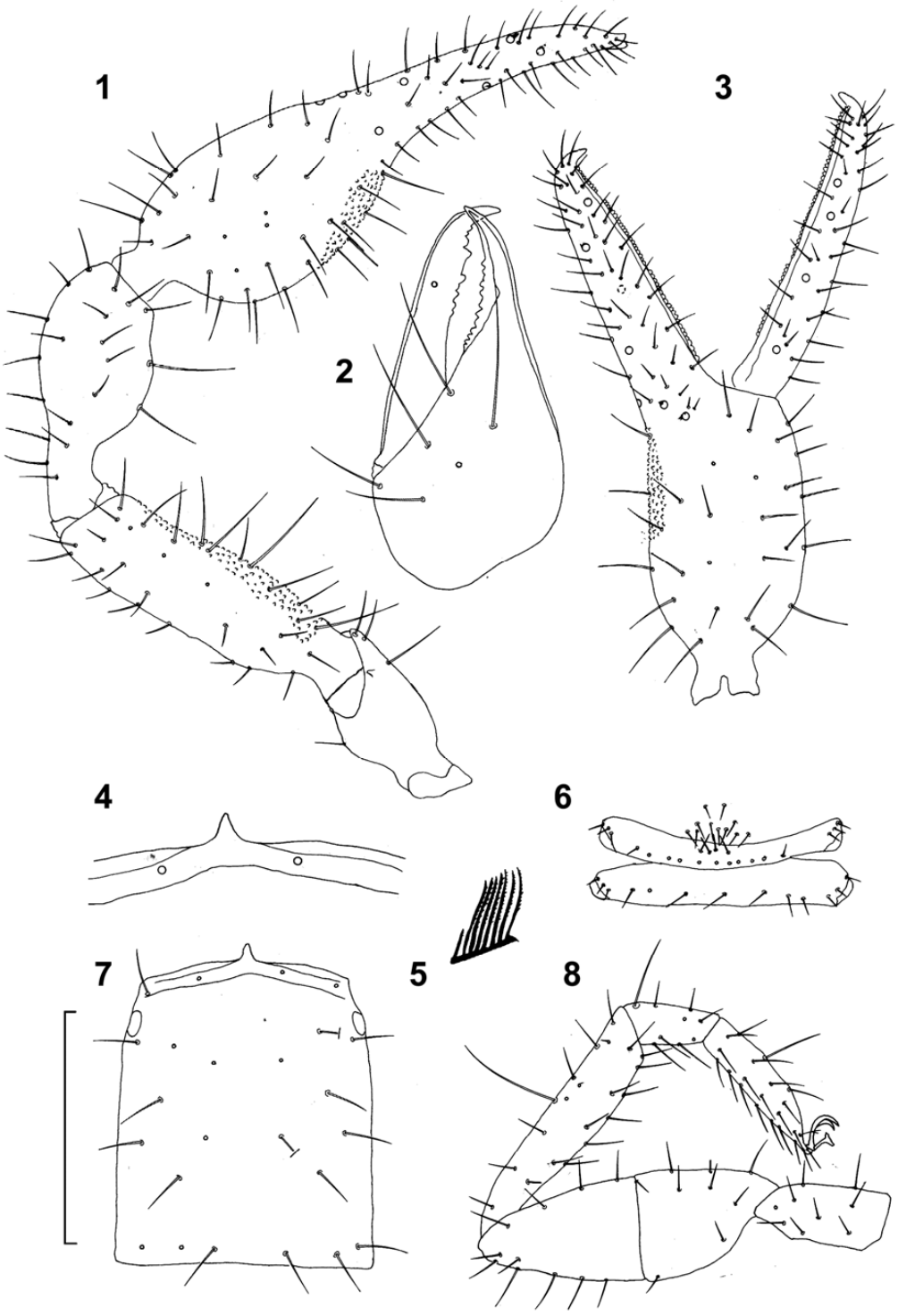
In the female, sternite II carries a group of 5 setae (which belong to two barely distinguishable groups). Sternite III carries 12 setae arranged uniformly in a single row on the posterior margin and 3 suprastigmatic microsetae on either side. Sternite IV has 8 posterior setae and 3 microsetae along each stigma. Sternite V has 13 setae, sternite VI – 14, sternite VII – 12, sternite VIII – 14, sternite IX – 13, and sternite X – 12 setae. Sternite II with two pairs of tiny setae.

The form of the chelicerae is similar in males and females (Figs. 2 and 10); the tubercle of the movable cheliceral finger is a low hyaline convexity. The movable and fixed cheliceral fingers have a variable number of teeth with proximal and distal members of each series the smallest. The teeth of the movable finger end just below the galeal seta (*gl*). Six setae occur on the palm of the chelicera (Figs. 2 and 10). The cheliceral flagellum carries one short proximal blade and seven longer distal blades (Figs. 5 and 12). All are pinnate on at least the terminal half of the upper surfaces. The movable finger is longer than the cheliceral breadth (Table 1). In general, the chelicera is almost twice as long as broad (Table 1).

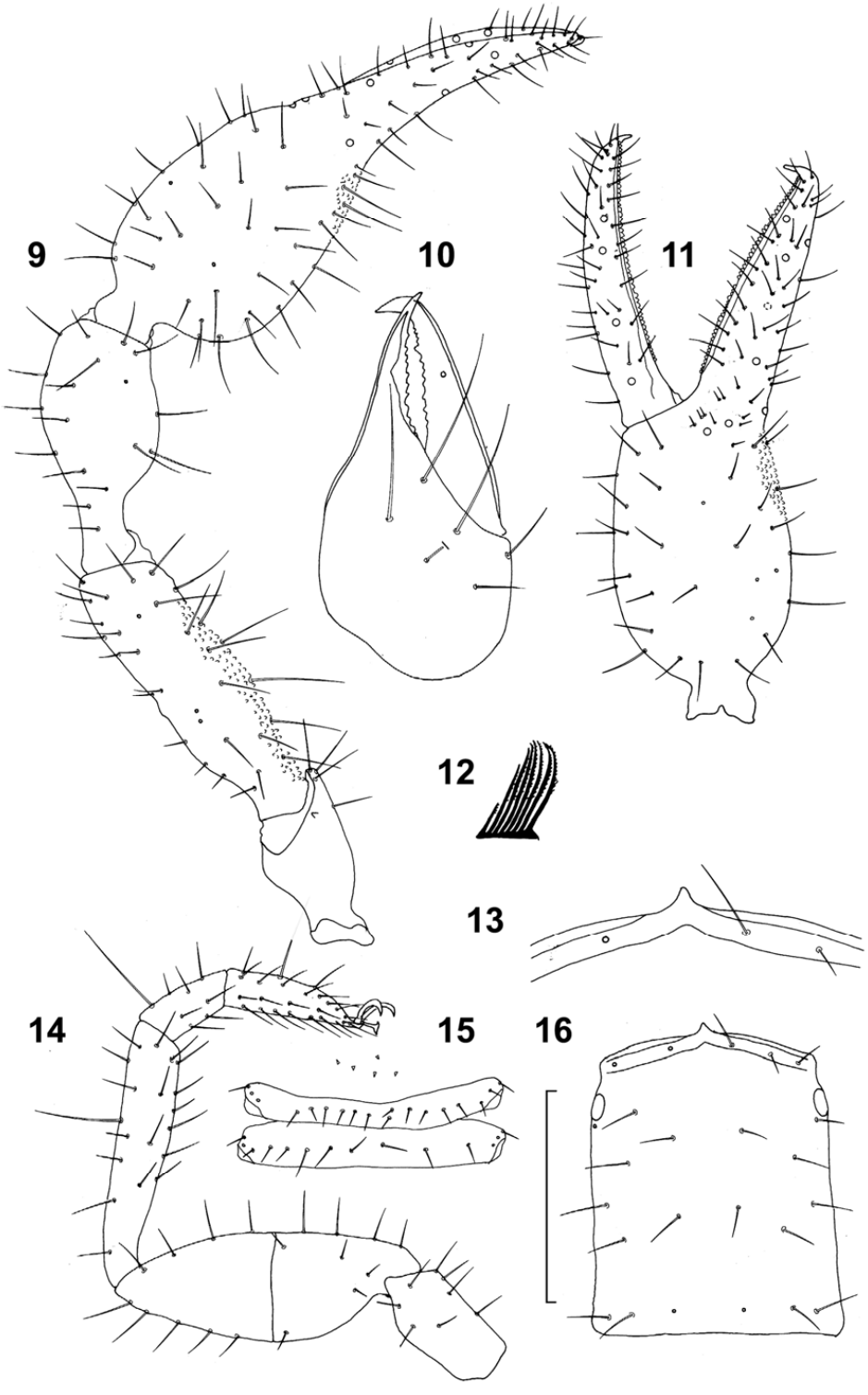
Map 1. Distribution of *Roncus ivansticae* n. sp. in Serbia.

The manducatory process of the pedipalpal coxa carries 4 long setae. The pedipalpal femur is granulated anteriorly as are the interior and lateral parts of the pedipalpal chela (Figs. 1, 3, 9, and 11). These tubercles are absent on the pedipalpal tibia.

The movable finger of the pedipalpal chela carries 63 (male) and 49 (female) teeth, which are square-topped in the proximal range of the series and are similar on the fixed finger. The form of the teeth on the fixed finger is variable (57 in female, 55 in male); the most distal pointed teeth, slightly asymmetrical, give way to teeth with rounded tops, and these are gradually replaced proximally by shorter flattened teeth.



Figs. 1 – 8. *Roncus ivansticae* n. sp., from Eastern Serbia; male holotype: 1 – pedipalp, 2 – chelicera, 3 – pedipalpal chela, 4 – epistome, 5 – flagellum, 6 – male genital area, 7 – carapace, and 8 – leg IV. Scale lines: 0.50 mm (Figs. 1, 3, 6, 7, and 8) and 0.25 mm (Figs. 2, 4, and 5).



Figs. 9 – 16. *Roncus ivansticae* n. sp., from Eastern Serbia; female allotype: 9 – pedipalp, 10 – chelicera, 11 – pedipalpal chela, 12 – flagellum, 13 – epistome, 14 – leg IV, 15 – female genital area, 16 – epistome. Scale lines: 0.50 mm (Figs. 9, 11, 14, 15, and 16) and 0.25 mm (Figs. 10, 12, and 13).

Table 1. Linear measurements (in millimeters) and morphometric ratios in *Roncus ivansticae* n. sp., *R. tintilin* B. Ćurčić, *R. trojan* B. Ćurčić, and *R. strahor* (B. Ćurčić) from Eastern Serbia. Abbreviations: M = male, F = female, MM = males, FF = females.

	R. ivansticae n. sp.		*R. tintilin*		*R. trojan*		*R. strahor*
	M	F	MM	FF	MM	FF	MM
Character							
Body							
Length (1)	2.66	3.02	2.84-3.35	3.10-3.58	2.415-3.07	2.51-3.215	1.97-2.86
Cephalothorax							
Length (2)	0.68	0.74	0.795-0.88	0.77-0.91	0.67-0.81	0.67-0.76	0.60-0.73
Breadth (2a)	0.52	0.61	0.63-0.79	0.64-0.77	0.50-0.65	0.58-0.63	0.51-0.57
Ratio 2/2a	1.31	1.21	1.11-1.26	1.18-1.20	1.25-1.34	1.16-1.21	1.18-1.28
Abdomen							
Length	1.98	2.28	2.02-2.54	2.26-2.74	1.78-2.33	1.715-2.26	1.37-2.13
Chelicerae							
Length (3)	0.42	0.46	0.48-0.51	0.49-0.58	0.38-0.445	0.41-0.48	0.36-0.41
Breadth (4)	0.21	0.24	0.24-0.27	0.25-0.305	0.195-0.23	0.22-0.25	0.18-0.22
Length of movable finger (5)	0.285	0.315	0.34-0.35	0.34-0.39	0.25-0.325	0.29-0.33	0.22-0.29
Ratio 3/5	1.47	1.46	1.41-1.46	1.43-1.53	1.36-1.56	1.37-1.48	1.36-1.76
Ratio 3/4	2.00	1.92	1.85-2.00	1.69-2.20	1.77-2.05	1.84-2.09	1.82-2.05
Pedipalps							
Length with coxa (6)	3.42	3.73	4.09-4.335	3.97-4.57	3.37-3.79	3.585-3.82	3.01-3.46
Ratio 6/1	1.285	1.235	1.28-1.44	1.13-1.45	1.20-1.42	1.15-1.51	1.15-1.53
Length of coxa	0.51	0.54	0.64-0.71	0.61-0.71	0.51-0.54	0.48-0.60	0.45-0.51
Length of trochanter	0.42	0.46	0.49-0.53	0.47-0.55	0.39-0.44	0.425-0.48	0.37-0.42
Length of femur (7)	0.70	0.76	0.82-0.905	0.82-0.91	0.67-0.75	0.73-0.795	0.61-0.69
Breadth of femur (8)	0.20	0.21	0.24-0.26	0.24-0.27	0.20-0.23	0.21-0.24	0.18-0.21
Ratio 7/8	3.50	3.62	3.19-3.50	3.22-3.58	3.27-3.55	3.24-3.57	3.13-3.63
Ratio 7/2	1.03	1.03	1.00-1.05	0.96-1.08	1.195-1.39	1.255-1.42	0.93-1.06
Length of patella (tibia) (9)	0.53	0.58	0.70-0.75	0.67-0.78	0.535-0.63	0.58-0.64	0.49-0.58
Breadth of patella (tibia) (10)	0.24	0.275	0.315-0.34	0.31-0.36	0.24-0.28	0.26-0.30	0.22-0.25
Ratio 9/10	2.21	2.11	2.205-2.22	2.055-2.23	2.14-2.38	2.03-2.26	1.82-2.39
Length of chela (11)	1.26	1.39	1.42-1.50	1.40-1.65	1.195-1.39	1.255-1.42	1.06-1.27
Breadth of chela (12)	0.36	0.43	0.43-0.48	0.42-0.49	0.34-0.40	0.37-0.44	0.30-0.36
Ratio 11/12	3.50	3.23	3.08-3.30	3.04-4.07	3.27-3.705	3.24-3.45	3.21-3.70
Length of chelal palm (13)	0.57	0.65	0.70-0.75	0.71-0.84	0.53-0.64	0.565-0.67	0.48-0.58
Ratio 13/12	1.58	1.51	1.54-1.65	1.53-2.10	1.465-1.735	1.46-1.64	1.44-1.70
Length of chelal finger (14)	0.69	0.74	0.71-0.75	0.69-0.87	0.64-0.75	0.69-0.75	0.58-0.69
Ratio 14/13	1.24	**1.14**	1.00-1.03	0.95-1.035	1.135-1.31	1.11-1.23	1.16-1.34
Leg IV							
Total length	2.455	2.68	2.675-2.99	2.655-3.00	2.385-2.70	2.43-2.73	2.095-2.46
Length of coxa	0.36	0.39	0.425-0.47	0.45-0.47	0.35-0.44	0.39-0.43	0.315-0.40
Length of trochanter (15)	0.285	0.33	0.34-0.36	0.315-0.38	0.29-0.34	0.28-0.35	0.25-0.30
Breadth of trochanter (16)	0.13	0.15	0.15-0.17	0.15-0.17	0.14-0.17	0.13-0.16	0.12-0.14
Ratio 15/16	2.19	2.20	2.12-2.33	1.89-2.31	1.97-2.36	2.03-2.33	1.93-2.42
Length of femur + patella (17)	0.66	0.72	0.71-0.82	0.69-0.795	0.61-0.71	0.63-0.72	0.55-0.64
Breadth of femur + patella (18)	0.22	0.25	0.26-0.29	0.26-0.31	0.23-0.27	0.24-0.28	0.205-0.26
Ratio 17/18	**3.00**	2.88	2.73-2.87	2.42-2.925	2.33-2.83	2.52-2.82	2.40-2.76
Length of tibia (19)	0.58	0.66	0.62-0.72	0.64-0.75	0.535-0.63	0.57-0.63	0.49-0.57
Breadth of tibia (20)	0.11	0.12	0.12-0.13	0.12-0.14	0.11-0.13	0.11-0.13	0.09-0.12
Ratio 19/20	5.27	5.50	5.17-5.67	5.21-5.615	4.46-5.45	4.85-5.45	4.42-5.44
Length of metatarsus (21)	0.21	0.24	0.22-0.24	0.21-0.25	0.205-0.23	0.22-0.24	0.18-0.21
Breadth of metatarsus (22)	0.09	0.09	0.10	0.09-0.11	0.08-0.09	0.08-0.10	0.07-0.085
Ratio 21/22	2.33	2.67	2.20-2.40	2.27-2.50	2.41-2.625	2.40-2.75	2.31-2.71
Length of tarsus (23)	0.36	0.34	0.36-0.40	0.35-0.39	0.34-0.38	0.34-0.38	0.29-0.34
Breadth of tarsus (24)	0.08	0.09	0.08-0.09	0.085-0.10	0.07-0.08	0.08-0.09	0.07-0.08
Ratio 23/24	4.50	**3.78**	4.22-5.00	3.80-4.33	4.25-5.43	4.22-4.625	3.94-4.40
TS ratio - tibia IV	**0.60**	0.615	0.57-0.595	0.52-0.63	0.525-0.54	0.58-0.61	0.51-0.61
TS ratio - metatarsus IV	0.19	0.21	0.16-0.215	0.16-0.21	0.17-0.24	0.19-0.23	0.155-0.25
TS ratio - tarsus IV	0.34	0.36	0.29-0.38	0.33-0.37	0.31-0.44	0.35-0.39	0.34-0.40

Four trichobothria are carried on the movable finger and eight on the fixed finger of the chela (Figs. 3 and 11). Four to seven small setae are found distal to the trichobothria *eb* and *esb* (Figs. 3 and 11). The pedipalpal femur is 3.50 (male) and 3.62 (female) times as long as broad (Table 1). This podomere is only slightly shorter than the carapace (Table 1). The pedipalpal patella (tibia) is 2.21 (male) and 2.11 (female) times as long as broad. The pedipalpal chela length-to-breadth ratio varies between 3.23 (female) and 3.50 (male). The chelal fingers are 0.69 (male) and 0.74 (female) times as long as broad.

Leg IV: the tibia, metatarsus, and tarsus each carry a long tactile seta (Figs. 8 and 14). The measurements of the different body structures and morphometric ratios are shown in Table 1. The tactile seta ratios exceed 0.50 (Table 1).

Remarks and discussion — The discovery of the described representative of *Roncus* in Serbia supports the fact that the taxonomy of this genus is still far from being complete (Ćurčić, 1972, 1984, 1988, 1992a, b; Ćurčić and Beron, 1981; Ćurčić et al., 1993, 2004, 2010a, b, c, d, e, f, g; 2011a, b, c, d, e, f, g, h; Hadži, 1937). The variety of cave-dwelling species of *Roncus* described elsewhere by Ćurčić et al. (2004), offers further proof that this taxon is presently subjected to intensive radiation or divergent differentiation into new species. Furthermore, the diversity of *Roncus* representatives in the Balkan regions bordering on Serbia (Ćurčić, 1984; Ćurčić and Beron, 1981), compared to the same features in other areas, points to the Balkan Peninsula as a center of origin and genesis of numerous forms of the genus. In addition, the occurrence of numerous *Roncus* species with extremely limited distribution areas demonstrates their endemic nature.

With regard to two diagnostic characters, the presence/absence of microsetae proximal to *eb* and *esb*, and the presence/absence of one or two greater tubercles on the interior and lateral side of the pedipalpal femur, leads us to assume that the presence/absence of these characters may be useful in distinguishing representatives of two or three species groups, respectively. It seems that both groups are widespread in Europe (Ćurčić et al., 1992a, b). However, although their precise taxonomic and biogeographic features are sufficiently known, the existence of two or three groups could point to their different taxonomic (generic?) status.

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