

New records of zerconid mites (Acari: Mesostigmata) from Mts. Papuk, Croatia, with description of *Zercon kotschani* sp. n.

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Abstract. Nine zerconid mite species belonging to the genera *Prozercon* Sellnick, 1944 and *Zercon* C. L. Koch, 1839 were collected from Papuk Mts., North Croatia. Eight of them – *Prozercon fimbriatus* (C. L. Koch, 1839); *Prozercon rafalskii* Błaszak, 1971; *Prozercon sellnicki* Halašková, 1963; *Prozercon tragardhi* (Halbert, 1923); *Zercon gurensis* Mihelčič, 1962; *Zercon hungaricus* Sellnick, 1958; *Zercon peltatus* C. L. Koch, 1836; *Zercon spatulatus* C. L. Koch, 1839 – are new to the fauna of Croatia, and one, *Zercon kotschani* sp. nov., proved to be new to science as well.

INTRODUCTION

Members of the family Zerconidae (Acari: Mesostigmata) are soil-inhabiting predatory mites. Representatives of this important component of the soil fauna occur mainly in moss and leaf-litter. The group is represented by 35 genera and more than 300 species worldwide.

Our knowledge on the zerconid mites of the Balkan and especially of the former Yugoslavia is scarce. The first data on mesostigmatid mites of Yugoslavia mentioning one species of Zerconidae (*Zercon triangularis* C. L. Koch, 1836) was published in the middle of the last century (Willman, 1941). Later Košir (1974) reported two new species (*Zercon primus* Košir, 1974 and *Prozercon tuberculatus* Košir, 1974) and mentioned one species (*Zercon plumatopilus* Athias-Henriot, 1961) new to the fauna of the country (from the territory of present-day Macedonia and Slovenia). Recently, Kotschán (2006) described a new species from Kosovo, *Zercon kosovina* Kotschán, 2006, and listed some known ones from Serbia-Montenegro.

The Zerconidae fauna of Croatia has not been studied so far. Herewith I report the occurrence of nine species in several locations of Papuk Mts. One of them represents a new species to science and eight are new to the fauna of Croatia.

MATERIALS AND METHODS

Specimens were cleared in lactic acid and impregnated with glycerin. Preparations were examined using a light microscope; drawings were made with camera lucida. Photos were taken by an Olympus Color View I. digital camera. Mites are stored in alcohol and deposited in the Soil Zoology Collections of the Hungarian Natural History Museum. Specimens were identified according to Błaszak (1974) and Mašan & Fend'a (2004). In the description of the new species, terminology of setae follows Sellnick (1958). Measurements were taken – on the basis of microscopic photos – by Adobe Photoshop CS 8.0, and given in micrometers (µm), presented as mean.

TAXONOMIC RESULTS

Prozercon fimbriatus (C. L. Koch, 1839) (Fig. 1)

Material examined. E-1860: Croatia, Papuk, Drenovac, streamside, near a small wooden bridge, 21.04.2004. leg. Kotschán, J. (5 ♀); E-1861: Croatia, Papuk, Strmac, from humid forest, 21.04.2004. leg. Kotschán, J. (6 ♀, 1 ♂, 2 deutonymphs); E-1862: Croatia, Papuk, Novo Zvecevo, streamside, near the village, 22.04.2004. leg. Kotschán, J. (2 ♀); E-1863: Croatia, Papuk, Novo Zvecevo, under the pass, 22.04.2004. leg. Kotschán, J. (1 ♀, 1 deutonymph); E-1864: Croatia, Papuk, Drenovac, streamside, near a small

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wooden bridge, 21.04.2004. leg. Kontschán, J. (3 ♀); E-1867: Croatia, Papuk, 7 kms north Kutjevo, streamside, 20.04.2004. leg. Kontschán, J. (4 ♀); E-1878: Croatia, Papuk, Drenovac, near Velikai road, beech forest, 20.04.2004. leg. Kontschán, J. (3 ♀, 3 ♂); E-1881: Croatia, Papuk, 1 km north of Kutjevo, streamside, 20.04.2004. leg. Kontschán, J. (1 ♀); E-1882: Croatia, Papuk, 7 kms north Kutjevo, streamside, 20.04.2004. leg. Kontschán, J. (3 ♀, 1 ♂).

Distribution. Europe.

***Prozercon rafalskii* Blaszak, 1971**
(Fig. 2)

Material examined. E-1860: Croatia, Papuk, Drenovac, streamside, near a small wooden bridge, 21.04.2004. leg. Kontschán, J. (1 ♀); E-1862: Croatia, Papuk, Novo Zvecevo, streamside, near the village, 22.04.2004. leg. Kontschán, J. (1 ♀).

Distribution. Poland, Slovakia, Turkey.

Remarks. Setae S1 with (postero)lateral position to Z1, in this way the mites collected in Croatia differ from the type described from Poland (S1 with anterolateral position to Z1). On the figure of Mašan & Fend'a (2004) S4 1.5 times longer than S3. At the Croatian species S3 and S4 equal in length.

***Prozercon sellnicki* Halašková, 1963**
(Fig. 3.)

Material examined. E-1860: Croatia, Papuk, Drenovac, streamside, near a small wooden bridge, 21.04.2004. leg. Kontschán, J. (1 ♀).

Distribution. Central Europe.

***Prozercon tragardhi* (Halbert, 1923)**
(Fig. 4)

Material examined. E-1863: Croatia, Papuk, Novo Zvecevo, under the pass, 22.04.2004. leg. Kontschán, J. (1 ♀).

Distribution. From Europe to Turkey.

***Zercon gurensis* Mihelčič, 1962**
(Fig. 5.)

Material examined. E-1860: Croatia, Papuk, Drenovac, streamside, near a small wooden bridge, 21.04.2004. leg. Kontschán, J. (9 ♀ 2 ♂ 10 deutonymphs); E-1880: Croatia, Papuk, Kokocak, alder forest, 20.04.2004. leg. Kontschán, J. (1 ♀ 1 deutonymph)

Distribution. Central Europe.

***Zercon hungaricus* Sellnick, 1958**
(Fig. 6)

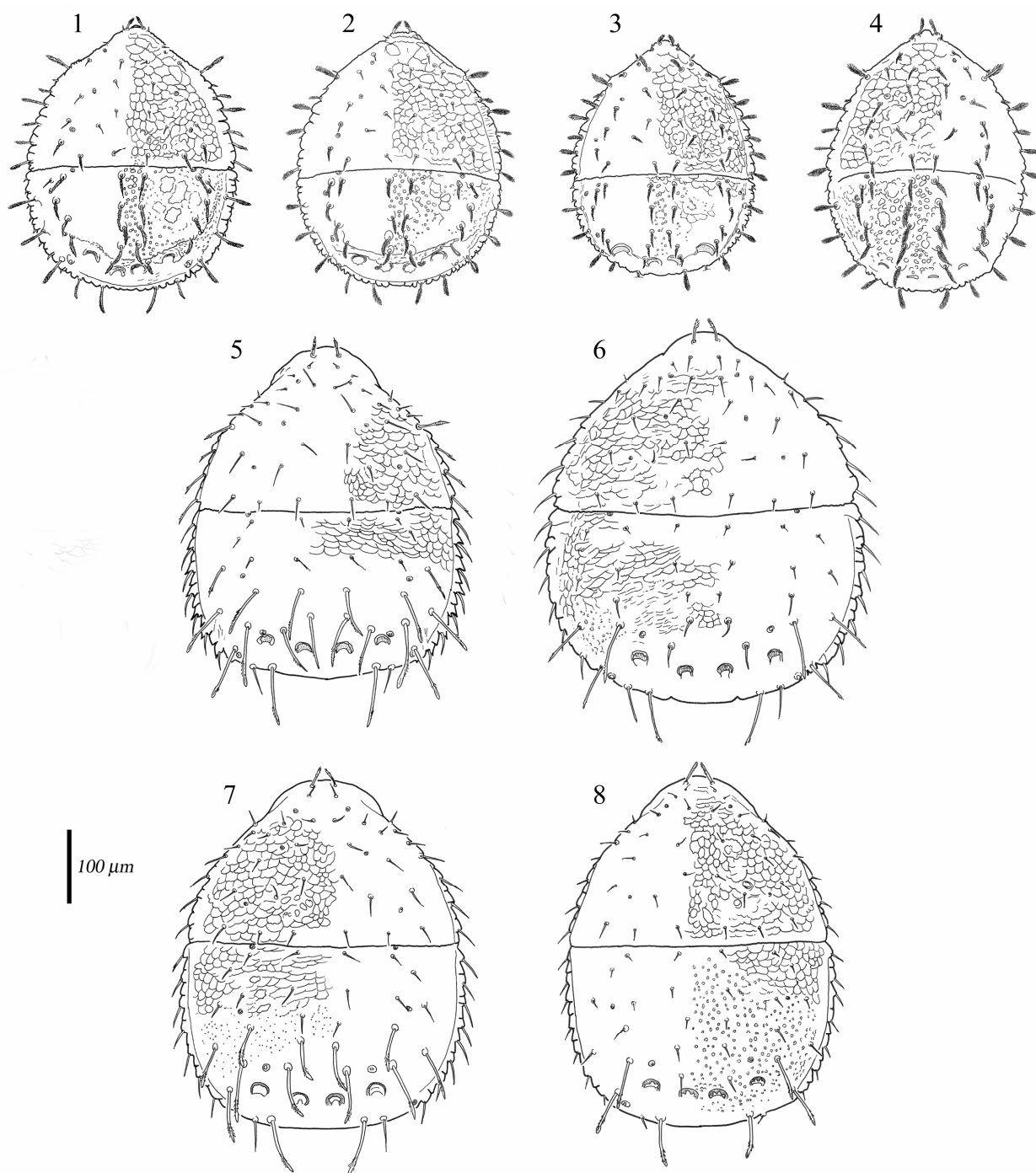
Material examined. E-1863: Croatia, Papuk, Novo Zvecevo, under the pass, 22.04.2004. leg. Kontschán, J. (4 ♀, 3 ♂); E-1864: Croatia, Papuk, Drenovac, streamside, near a small wooden bridge, 21.04.2004. leg. Kontschán, J. (1 deutonymph).

Distribution. Poland, Czech Republic, Austria, Slovakia, Hungary, Romania, Bulgaria, Ukraine.

***Zercon peltatus* C. L. Koch, 1836**
(Fig. 7)

Material examined. E-1861: Croatia, Papuk, Strmac, from humid forest, 21.04.2004. leg. Kontschán, J. (1 ♀); 1864: Croatia, Papuk, Drenovac, streamside, near a small wooden bridge, 21.04.2004. leg. Kontschán, J. (4 ♀, 10 ♂, 3 deutonymphs); E-1867: Croatia, Papuk, 7 kms north Kutjevo, streamside, 20.04.2004. leg. Kontschán, J. (1 ♀); E-1879: Croatia, Papuk, Strmac, humid forest, 21.04.2004. leg. Kontschán, J. (3 ♀, 5 ♂); E-1881: Croatia, Papuk, 1 kms north Kutjevo, streamside, 20.04.2004. leg. Kontschán, J. (3 ♀, 9 ♂, 1 deutonymph).

Distribution. British Isles, Spain, Germany, Poland, Czech Republic, Austria, Slovakia, Ukraine, Hungary, Romania, Bulgaria.



Figures 1-8. Known species collected in Mts. Papuk (females, dorsal view): 1 = *Prozercon fimbriatus* (C. L. Koch, 1839), 2 = *Prozercon rafalskii* Błazsak, 1971, 3 = *Prozercon sellnicki* Halašková, 1963, 4 = *Prozercon tragardhi* (Halbert, 1923), 5 = *Zercon gurensis* Mihelčič, 1962, 6 = *Zercon hungaricus* Sellnick, 1958, 7 = *Zercon peltatus* C. L. Koch, 1836, 8 = *Zercon spatulatus* C. L. Koch, 1839

***Zercon spatulatus* C. L. Koch, 1839**

(Fig. 8)

Material examined. E-1881: Croatia, Papuk, 1 kms north Kutjevo, streamside, 20.04.2004. leg. Kontschán, J. (1 ♀, 2 ♂, 2 deutonymphs).

Distribution. Europe.

***Zercon kotschani* sp. n.**

(Figs 9-16)

Material examined. Holotype: female, E-1861: Croatia, Papuk, Strmac, from humid forest, 21.04.2004. leg. Kontschán, J. Paratypes: 9 ♀, 10 ♂, 2 deutonymphs, locality same that of the holotype. Other localities: 1862: Croatia, Papuk, Novo Zvecevo, streamside, near the village, 22.04.2004. leg. Kontschán, J. (8 ♀, 5 ♂, 1 deutonymph); E-1865: Croatia, Papuk, Novo Zvecevo, streamside near village, 22.04.2004. leg. Kotschán, J. (8 ♀, 5 ♂, 1 deutonymph); E-1867: Croatia, Papuk, 7 kms north Kutjevo, streamside, 20.04.2004. leg. Kontschán, J. (1 ♀, 2 ♂); E-1878: Croatia, Papuk, Drenovac, near Velikai road, beech forest, 20.04.2004. leg. Kontschán, J. (6 ♀, 5 ♂); E-1881: Croatia, Papuk, 1 kms north Kutjevo, streamside, 20.04.2004. leg. Kontschán, J. (1, ♀).

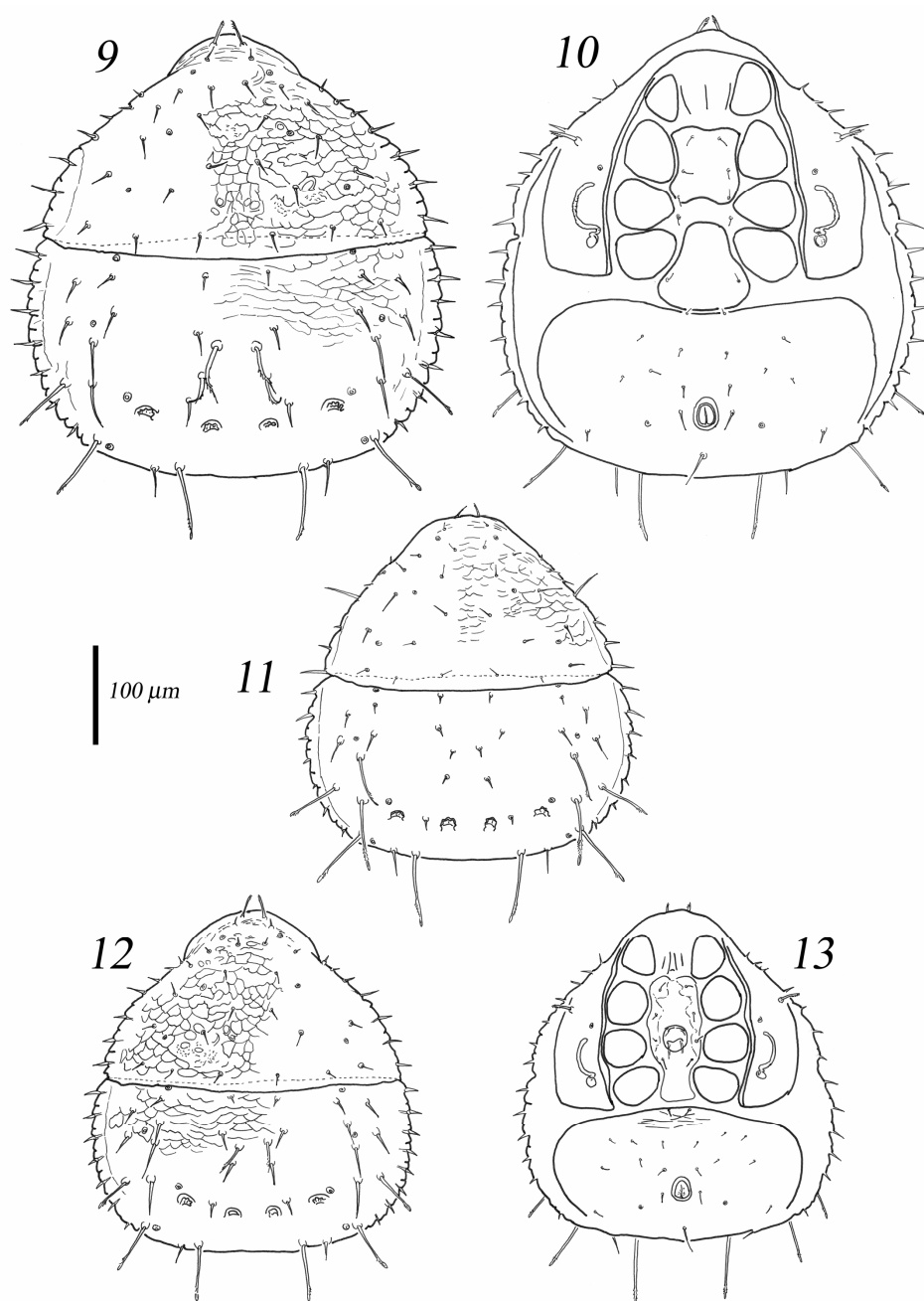
Diagnosis. Podonotal setae short and smooth, except i_1 , which barbed. On opisthonorium, setae I_2 with lateral or anterolateral position to I_3 , short, smooth. I_{3-4} thickened, elongated, slightly pilose, reaching the following's bases. I_3 3-4 times longer than I_2 (size of these two setae varies, but I_3 always much longer) Setae I_6 , S_{3-4} of almost equal size and appearance, long, apically barbed, with hyaline ending. Z_{3-4} medium-sized, smooth. Other opisthonorotal setae short, smooth. Marginal R setae thickened, pointed. Dorsal fossae of general size and appearance. Podonotum with irregular pattern; anterior part of opisthonorium with tile-like pattern (disappearing on posterior part).

Description. Female. Length of idiosoma: 450 μm ; width: 430 μm .

Dorsal side (Fig. 9). On podonotum, 22 pairs of different setae: i-row with 6, z-row with 2, s-row with 5, p-row with 2, and marginal r-row with 7 pairs of setae. i_1 apically barbed, others short and smooth. Members of r-row thickened, thorn-like. Pores po_1 situated on the line connecting the bases of i_2 and s_2 , po_2 between i_4 and s_4 , in mid-position, po_3 under the line connecting the insertions of setae z_1 and s_5 , closer to s_5 . On opisthonorium, 22 pairs of different setae (Figs. 14-16): I-row with 6, Z-row with 5, S-row with 4, R-row with 7 pairs of setae. I_1 short and smooth. I_2 short, smooth and needle like, situated very close to I_3 with (antero)lateral position to it, and far from I_1 . I_2 may vary in length but never thickened or pilose. I_3 elongated, thickened, rarely, finely pilose and reaching far beyond the following's bases. I_4 similar in appearance to I_3 , but always shorter and reaching the following's bases. I_5 short (in general longer than I_2) but thickened. I_6 long, apically barbed and terminated with hyaline ending. Z_{1-4} smooth, Z_{1-2} shorter, Z_2 never reaching the following's insertion, Z_{3-4} longer, Z_3 reaching the bases of Z_4 . Z_5 short and smooth. S_{1-2} similar to Z_{1-2} . S_{3-4} similar to I_6 , but shorter and reaching beyond the margin of idiosoma. Setae of R-row thickened, pointed. Po_1 with anterior position to the insertions of Z_1 , Po_2 just under the line connecting Z_2 and S_2 (usually closer to Z_2), Po_3 between I_5 and Z_4 (closer to setae Z_5), Po_4 next to the insertions of S_4 (medially). Dorsal fossae of general size and appearance. Lateral margins of opisthonorium with normal serration. On podonotum, irregular, tile-like pattern. Anterior part of opisthonorium covered with tile-like pattern, posterior 70 % smooth.

The size of setae and the distances between their insertions as in Table 2 (measurements are given as mean, in micrometers).

Ventral side (Fig. 10.). The shape and chaetotaxy of the ventroanal shield is typical for the genus *Zercon*. Anterior margin of ventroanal shield with one pair of setae.



Figures 9-13. *Zercon kotschani* sp. n.: 9 = female, dorsal view, 10 = female, ventral view, 11 = deutonymph, dorsal view, 12 = male, dorsal view, 13 = male, ventral view

Male. Length of idiosoma: 345 μm; width: 320 μm.

Dorsal side (Fig. 12). Chaetotaxy, dorsal cavities, situation of pores and pattern as in female, but I₃

₄ shorter, I₄ smooth and reaching only half the distance to the insertions of setae I₅.

The size of setae and the distances between their insertions as in table 3 (measurements are given as mean, in micrometers).

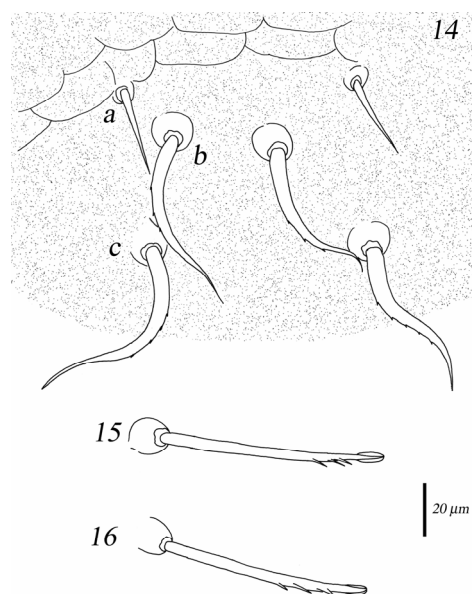
Ventral side (Fig. 12). Typical for the genus *Zercon*, as in female *Deutonymph* (Fig. 11). Podonotum as in adult stage. On opisthonotum, I_{1-5} short, smooth, needle like. I_2 at equal distance from I_1 and I_3 . I_5 situated far from I_4 , between medial and lateral dorsal fossae. Setae Z_{3-4} long, apically barbed, with hyaline tips, just as I_6 , S_3 and S_4 . Other setae, pores and cavities as in adult stage. Podonotum with indistinct irregular pattern, opisthonotum smooth. The size of setae and the distances between their insertions as in table 4 (measurements are given as mean, in micrometers).

Remarks. Setae I_2 , I_3 and I_4 variable in length. The following minimum and maximum values have been measured:

I_2 : 23-34 μm ; I_3 : 47-74 μm ; I_4 : 32- 50 μm

The new species is most similar to *Zercon latissimus* Sellnick, 1944 and *Zercon kosovina* Kontschán, 2006. The females of the three species can be distinguished according to table 1.

Etymology. The new species is dedicated to Dr. Jenő Kontschán, acarologist, who kindly helped me in every aspect of my work.



Figures 14-16. Opisthonotal setae of *Zercon kotschani* sp. n.: 14 = central part of opisthonotum with setae I_{2-4} (a: setae I_2 , b: setae I_3 , c: setae I_4), 15 = seta I_6 , 16 = seta S_4

Table 1. Distinguishing characters of *Z. kotschani* sp. n., *Z. latissimus* and *Z. kosovina*

<i>Zercon kotschani</i> sp. n.	<i>Zercon latissimus</i> Sellnick, 1944	<i>Zercon kosovina</i> Kontschán, 2006
I_2 short, thin and smooth	I_2 long, thickened, slightly pilose	I_2 short, thin and smooth
I_3 2-3 times longer than I_2	I_2 and I_3 equal in length	I_3 4 times longer than I_2
I_3 1.5 times longer than I_4	I_3 and I_4 equal in length	I_3 and I_4 equal in length
I_5 short, smooth, close to dorsal fossae	I_5 short, slightly pilose, close to dorsal fossae	I_5 long, thickened, smooth, situated laterally to I_4 , far from dorsal fossae
S_3 long, apically barbed, reaching beyond the margin of opisthonotum	S_3 long, apically barbed, reaching beyond the margin of opisthonotum	S_3 medium-sized, smooth, not reaching the margin of opisthonotum
Z_2 not reaching the insertions of Z_3	Z_2 reaching beyond the insertions of Z_3	Z_2 not reaching the insertions of Z_3
Setae s_1 absent	Setae s_1 absent	Setae s_1 present

Table 2. Length of opisthonotal setae and longitudinal distances between their bases in *Zercon kotschani* sp. n., female (values in μm)

Setae and intersetal distances	Length or distance	Setae and intersetal distances	Length or distance	Setae and intersetal distances	Length or distance
I₁	14	Z₁	19	S₁	23
I₁-I₂	56	Z₁-Z₂	36	S₁-S₂	40
I₂	24	Z₂	27	S₂	27
I₂-I₃	25	Z₂-Z₃	35	S₂-S₃	62
I₃	59	Z₃	46	S₃	63
I₃-I₄	35	Z₃-Z₄	45	S₃-S₄	70
I₄	33	Z₄	43	S₄	69
I₄-I₅	31	Z₄-Z₅	100		
I₅	26	Z₅	33		
I₅-I₆	67				
I₆	74				

Table 3. Length of opisthonotal setae and longitudinal distances between their bases in *Zercon kotschani* sp. n., male (values in μm)

Setae and intersetal distances	Length or distance	Setae and intersetal distances	Length or distance	Setae and intersetal distances	Length or distance
I₁	9	Z₁	15	S₁	18
I₁-I₂	37	Z₁-Z₂	25	S₁-S₂	31
I₂	19	Z₂	22	S₂	22
I₂-I₃	20	Z₂-Z₃	24	S₂-S₃	44
I₃	31	Z₃	34	S₃	43
I₃-I₄	19	Z₃-Z₄	36	S₃-S₄	52
I₄	22	Z₄	36	S₄	52
I₄-I₅	43	Z₄-Z₅	71		
I₅	15	Z₅	18		
I₅-I₆	46				
I₆	57				

Table 4. Length of opisthonotal setae and longitudinal distances between their bases in *Zercon kotschani* sp. n., deutonymph (values in μm)

Setae and intersetal distances	Length or distance	Setae and intersetal distances	Length or distance	Setae and intersetal distances	Length or distance
I₁	9	Z₁	9	S₁	15
I₁-I₂	35	Z₁-Z₂	33	S₁-S₂	30
I₂	9	Z₂	18	S₂	25
I₂-I₃	28	Z₂-Z₃	27	S₂-S₃	49
I₃	10	Z₃	52	S₃	54
I₃-I₄	29	Z₃-Z₄	44	S₃-S₄	52
I₄	11	Z₄	70	S₄	66
I₄-I₅	48	Z₄-Z₅	59		
I₅	10	Z₅	26		
I₅-I₆	37				
I₆	73				

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