

New and rare zerconid mites (Acari: Mesostigmata: Zerconidae) from the Crimean Peninsula, Ukraine

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Abstract: Elaborating a recent „Berlese” material collected from different habitats of the Crimean Peninsula (Ukraine) resulted in recording four zerconid mite species of which two, *Zercon bercziki* and *Zercon csuzdii* spp. nov. are new to science. On the basis of the newly identified material a more complete description of *Z. karadaghiensis*, known only from Ukraine, is also given. With 50 figures.

INTRODUCTION

Most of the extensive faunistic and taxonomical studies on the mite family Zerconidae were made in Central Europe (e.g. Halašková, 1969; Błaszak, 1974; Mašán & Fend'a, 2004), however there are several areas – even countries – in this region of the continent, where this group has not been recorded at all. In Ukraine, studying of the zerconid mite fauna started only in the late 20th century. Balan described several new Zerconidae taxa from the Carpathians (Balan & Sergienko, 1990; Balan, 1991 a) to the steppe zone of the country (Balan, 1991 b, 1992 a, 1992 b), but our knowledge on the fauna of Ukraine is still scarce. The Crimean Peninsula is one of the moderately explored regions with three species recorded; *Zercon karadaghiensis* Balan, 1994, *Zercon ovalis* Balan, 1994 and *Zercon disparipila* Athias-Henriot, 1961 (Balan, 1995).

In the spring of 2009, one of my colleagues (G. Szövényi) collected several soil samples from different habitats of the Crimean Peninsula. Elaborating this new material resulted in recording four zerconid mite species including two new to science. Apart from the new species, I also give a detailed description of a little-known species, *Z. karadaghiensis* Balan, 1992 described originally from Russian.

MATERIAL AND METHODS

Soil samples were taken from the forest floor of different forest types of the Crimean Peninsula.

Mites extracted from the samples using Berlese-funnels were cleared with lactic acid and mounted in glycerine. Preparations were examined using a light microscope, drawings were made with the aid of drawing tube. The material stored in 70% ethanol and deposited in the Soil Zoology Collections of the Hungarian Natural History Museum. The terminology of setae follows Sellnick (1958), adopted by Błaszak (1974) and Mašán & Fend'a (2004). Measurements are given as mean, in micrometers. Abbreviations used: DN = deutonymphs.

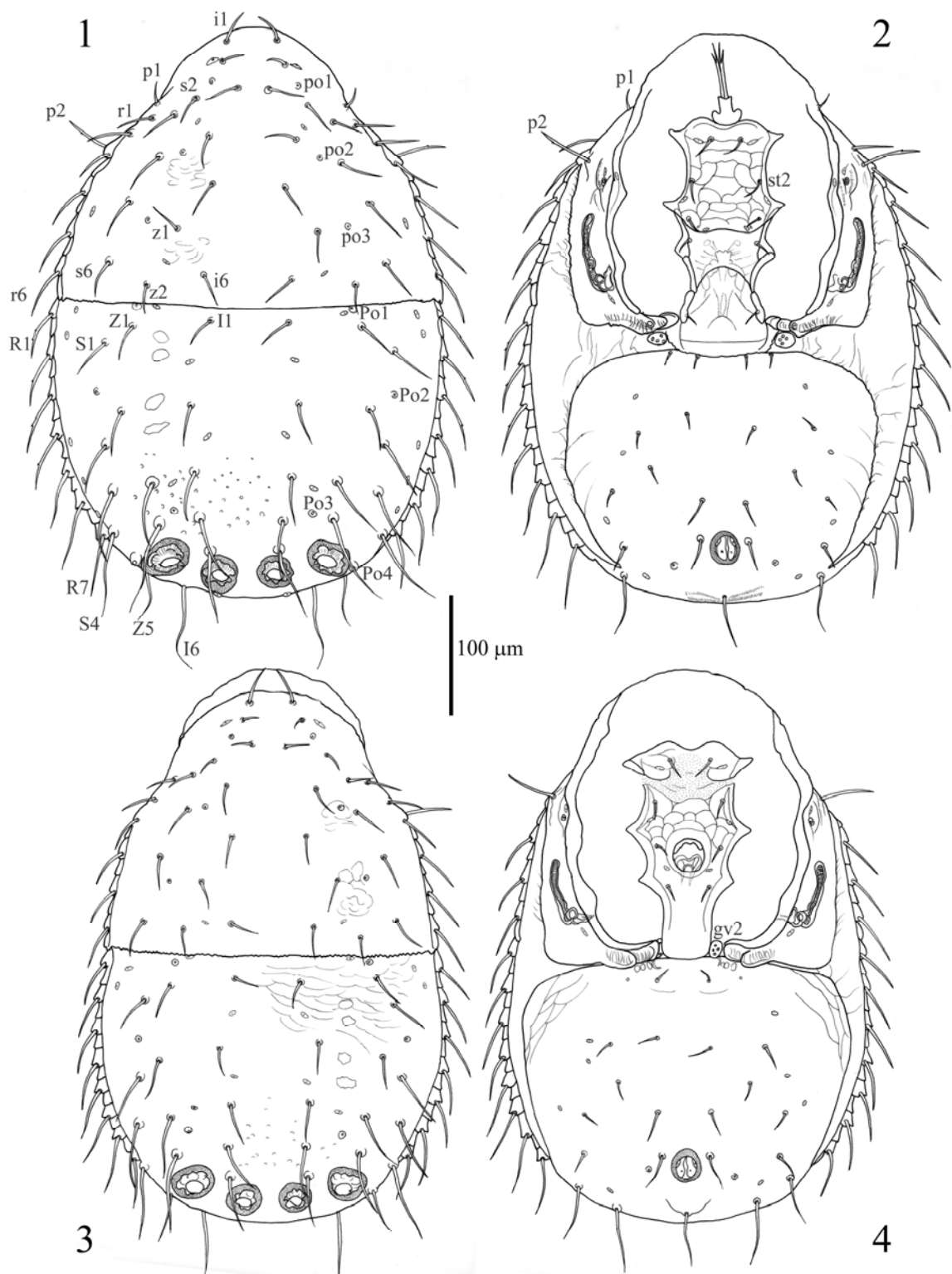
Zercon bercziki sp. nov.

(Figs. 1–4)

Material examined. Holotype: female, Ukraine, Crimean Peninsula, Chatirdag Mts., south of Simferopol, near Mramorne village, N44 47' 09,4" E34 15' 38,6", 875 m a.s.l., beech forest (*Fagus orientalis*), from leaf-litter; leg. Szövényi, G., 19.05.2009. Paratypes: 13 ♀♀, 4 ♂♂ locality and date same that of the holotype. 2 ♀♀, 1 ♂ Ukraine, Crimean Peninsula, Chatirdag Mts., south of Simferopol, near Mramorne village, N44 48' 28,3" E34 14' 54,4", 615 m a.s.l., maple–oak mixed forest, from leaf-litter; leg. Szövényi, G. 19.05.2009.

Diagnosis. Anterior margin of ventroanal shield with two pairs of setae. Peritremes straight. Most of dorsal setae smooth, some of the marginal setae barely pilose. Opisthonotal I-, Z- and S-setae from short to long, growing in length

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Figures 1–4. *Zercon bercziki* sp. n. 1 = dorsal view of female, 2 = ventral view of female, 3 = dorsal view of male, 4 = ventral view of male

posteriorly, setiform, tapering. Pores Po_2 situated on the line connecting S_1 and S_2 , Po_3 above the line connecting I_4 and Z_4 , near Z_4 . Caudal surface of opisthonotum covered by small, depressed spots. Dorsal cavities strongly sclerotized, rotund, the inner pair slightly smaller than the outer pair. Marginal serration shallow, relatively acuminous.

Description. Female. Length of idiosoma: 476 μm ; width: 328 μm ($n = 16$).

Dorsal side (Fig. 1). On podonotum, 21 pairs of different setae: i-row with six pairs, z-row with two pairs, s-row with five pairs, r-row with six pairs, p-row with two pairs. All podonotal setae smooth and setiform, even p_2 only scarcely pilose. Setae s_1 absent. Pores po_1 situated on the line connecting i_2 and s_2 , po_2 on the line connecting i_4 and s_4 , po_3 on the line connecting z_1 and s_5 . Sculpturing pattern of podonotum weakly developed. Almost the whole surface of the shield smooth, only four small, irregularly elevated areas can be observed between setae i_5 – s_4 and i_6 – z_1 . On opisthonotum, 22 pairs of different setae: I-row with six pairs, Z-row with five pairs, S-row with four pairs and R-row with seven (or eight) pairs. I-, Z- and S-setae setiform, smooth, apically tapering, growing in length posteriorly. Setae I_{3-5} , Z_{3-4} and S_{2-3} reaching beyond the insertion of the following setae, I_{5-6} , Z_{4-5} and S_{3-4} expanding beyond the margin of idiosoma. Setae S_2 situated beneath the line of setae Z_2 , S_1 reaching approximately half the distance between insertions of S_{1-2} . The seven or eight pairs of marginal setae elongated, often bearing one pilus on their distal third. Pores Po_1 situated anteromedially to insertions of Z_1 , Po_2 lying on the line connecting S_1 and S_2 , Po_3 above the line connecting I_4 and Z_4 , closer to Z_4 , Po_4 sitting laterally to the insertions of Z_5 . Marginal serration shallow, relatively acuminous. Anterior surface of opisthonotum smooth, only a couple of polygonal depressions can be found between I- and Z setal-rows. Caudal surface of latter shield covered by small, depressed spots. Dorsal cavities large, well sclerotized, their lateral tips fused posteriorly, forming a ring-like structure. These rosettes having smooth outer- and undulate inner margins, lying in a row, often reaching the

caudal margin of idiosoma. The inner pair slightly smaller than the outer pair. The size of setae and the distances between their insertions according to Table 1.

Ventral side (Fig. 2). Peritremal shield considerably narrow, peritremes straight. Both peritremal setae smooth, however p_2 usually show very fine distal pilosity. Sternal shield well sclerotized, 96 μm long and 67 μm wide at the level of setae st_2 . Four openings of glands gv_2 situated on conspicuous adgenital plates. Anterior margin of ventroanal shield with two pairs of setae. All sternal and ventroanal setae smooth, needle-like. Adanal pores gv_3 situated posterolaterally to adanal setae. Anal valves with vestigial euanal setae and a pair of anal lyrifissures. Ventroanal shield caudally fused to the opisthonotal shield. Sternal shield covered by reticulate pattern, surface of ventroanal shield without ornamentation.

Male (Figs 3–4). Length of idiosoma: 395 μm ; width: 253 μm ($n = 5$). Chaetotaxy, poroidotaxy and sculpturing pattern of dorsal shields similar to that of the female. The body-shape much more elongated and narrow than in female, and some of the opisthonotal setae slightly shorter in proportion to the body size. Anterolateral surface of opisthonotum with weakly developed reticulate ornamentation. Sternogenital shield divided by a weakly sclerotized slit behind the first pair of sternogenital setae st_1 , bearing only four pairs of setae (setae st_5 absent). Anterior margin of ventroanal shield bears only one pair of setae, unlike in female. The size of opisthonotal setae and the distances between their insertions according to Table 1.

Immature stages. Unknown.

Etymology. The new species is dedicated in honor of Prof. Dr. Árpád Berczik (Budapest) on his 80th birthday.

Remarks. The new species resembles *Zercon cabylus* Athias-Henriot, 1961 and *Zercon navarrensensis* Moraza, 1989 by the chaetotaxy of opisthonotal shield, by the absence of setae s_1 . In case of

Z. navarrensis, it is also similar by the sexual dimorphism in the number of setae on the anterior margin of ventroanal shield furthermore by the absence of sternogenital setae st_5 in male.

The three species can be distinguished by the following features: I-setae growing in length posteriorly (equally to Z- and S-setae) in *Z. bercziki*, in the other two species all I-setae are relatively short. Setae S_2 are situated much closer to S_3 than to S_1 in *Z. bercziki*, unlike in the other two species where S_2 situated equidistantly to S_1 and S_3 . Pores po_2 are found on the line connecting S_2 and S_3 in *Z. bercziki*, however in the other two species it is situated on the line connecting Z_2 and S_2 . Dorsal fossae are large, rotund, almost equal in size in *Z. bercziki*, saddle-like in *Z. navarrensis* and significantly differ in size in *Z. cabylus* (outer ones two times larger than inner ones). The opisthonotum is punctuated in *Z. bercziki* and *Z. cabylus*, but smooth in *Z. navarrensis*. The sternal shield is elongated in *Z. bercziki* but it is much shorter in proportion to the body length in the other two species.

***Zercon csuzdii* sp. nov.**

(Figs. 5–10, 16–33)

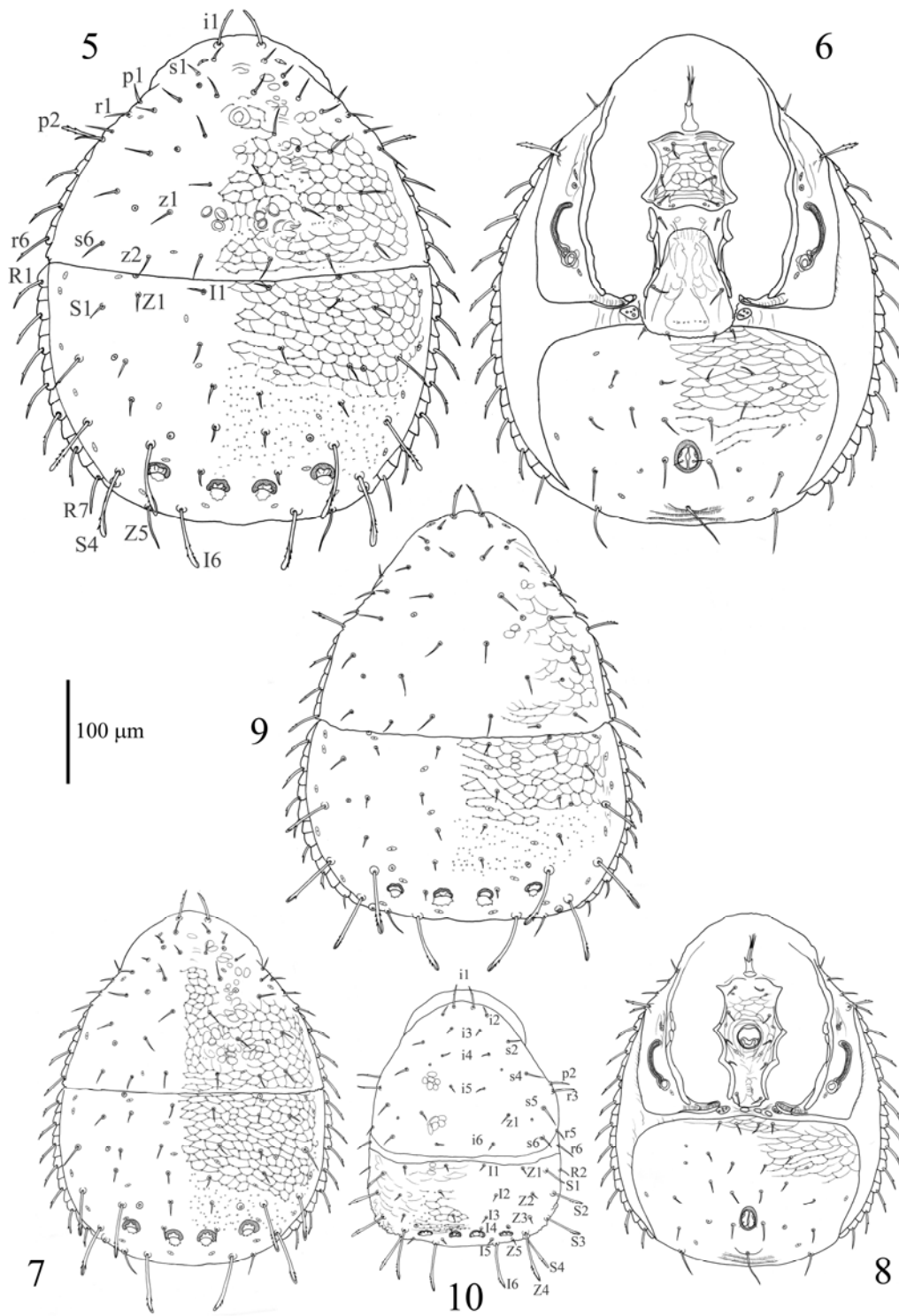
Material examined. Holotype: female, Ukraine, Crimean Peninsula, Chatirdag Mts., south of Simferopol, near Mramorne village, N44 47' 09,4" E34 15' 38,6", 875 m a.s.l., beech forest (*Fagus orientalis*), from leaf-litter. Leg. Szövényi, G., 19.05.2009. Paratypes 10 ♀♀, 8 ♂♂, 9 DN, 1 PN locality and date same as that of the holotype.

Diagnosis. Anterior margin of ventroanal shield with two pairs of setae. Peritremes arcuate. Marginal r- and R-setae finely pilose and flared distally. Setae I_6 , Z_4 and S_{3-4} long, thickened, with hyaline ending, other I-, Z-setae and S_1 short, smooth. Pores po_3 lying on the line connecting I_4 and Z_4 . Podonotum and anterior half of opisthonotum covered by tile-like and reticulate ornamentation, posterior half of opisthonotum punctuated. Dorsal fossae of general size and appearance. Marginal serration shallow and obtuse.

Description. Female. Length of idiosoma: 470 μ m; width: 385 μ m (n = 12).

Dorsal side (Fig. 5). On podonotum, 22 pairs of different setae: i-row with six pairs, z-row with two pairs, s-row with six pairs, r-row with six pairs, p-row with two pairs. Setae i_1 and some of the marginal setae thickened, very finely pilose on their distal part, other podonotal setae short, smooth and needle-like. Pores po_1 situated on the line connecting s_1 and s_2 , po_2 below the line connecting i_4 and s_4 , po_3 below the line connecting z_1 and s_5 . Central surface of podonotum with reticulate pattern, ornamented by small depressions in the crossing points, lateral surface covered by tile-like pattern. In the area bordered by setae i_5 , z_1 and z_6 , three pairs of well sclerotized alveolar cavities and a pair of small hillocks can be observed. On opisthonotum, 22 pairs of different setae (Figs 16-33): I-row with six pairs, Z-row with five pairs, S-row with four pairs and R-row with seven pairs. Setae I_{1-5} , Z_{1-3} and S_1 uniform, short and smooth. Setae S_2 two times longer than S_1 , delicately barbed. Setae Z_5 approximately as long as S_2 , smooth. The remaining I-, Z- and S-setae elongated, thickened, apically pilose, bearing hyaline tips and reaching beyond the margin of idiosoma. Marginal R-setae similarly to r-setae thickened, flared, delicately pilose distally. Pores po_1 situated anteriorly to the insertions of Z_1 , po_2 approximately on the line connecting Z_2 and S_2 , closer to Z_2 , po_3 on the line connecting I_4 and Z_4 , near Z_4 , po_4 near the insertions of S_4 , in posterior or posteromedial position to it. Marginal serration shallow and obtuse. Anterior half of opisthonotum covered by tile-like pattern, and ornamented also by small spots in the overlapping points. Posterior half with small, spot-like depressions. Dorsal cavities of general size and appearance, saddle-like, with smooth anterior and undulate posterior margins. The size of setae and the distances between their insertions according to Table 2

Ventral side (Fig. 6). Peritremes arcuate, C-shaped. Chaeto- and poroidotaxy of ventral shields typical for the genus. Sternal shield well sclerotized, 72 μ m long and 65 μ m wide at the level of setae st_2 . Four openings of glands gv_2



Figures 5–10. *Zercon csuzdii* sp. n. 5 = dorsal view of female, 6 = ventral view of female, 7 = dorsal view of male, 8 = ventral view of male, 9 = dorsal view of deutonymph, 10 = dorsal view of protonymph

situated on conspicuous adgenital plates. Anterior margin of ventroanal shield with two pairs of setae. All sternal and ventroanal setae smooth, needle-like. Adanal pores gv_3 situated posterolaterally to adanal setae. Anal valves with a pair of euanal setae and anal lyrifissures. Ventroanal shield caudally fused to the opisthonotal shield. Sternal shield covered by reticulate pattern, surface of ventroanal shield with tile-like ornamentation, caudally punctuated.

Male (Figs 7–8). Length of idiosoma: 340 μm ; width: 260 μm ($n = 8$). Chaetotaxy, poroidotaxy and sculpturing pattern of dorsal shields similar to that of the female, however setae S_2 slightly shorter. The long, hyaline-sheeted setae longer in proportion to the body size than in female. Sternogenital shield with five pairs of smooth setae. Beyond the sternogenital shield a couple of postgenital sclerites can be observed. The size of opisthonotal setae and the distances between their insertions according to Table 2.

Deutonymph (Fig. 9). Length of idiosoma: 395 μm ; width: 320 μm ($n = 9$). Chaetotaxy and poroidotaxy of dorsal shields quite similar to that of the adults, however setae S_2 reaching beyond the margin of idiosoma and having hyaline ending. The ornamentation of dorsal shields and dorsal cavities basically similar to that of the female, but less developed. The size of opisthonotal setae and the distances between their insertions according to Table 2.

Protonymph (Fig. 10). Length of idiosoma: 395 μm ; width: 320 μm ($n = 1$). On podonotum, setae i_1 , r_3 and p_2 elongated, apically barbed, others shorter, simple and smooth. Podonotal poroidotaxy similar to that of the adults, sculpturing pattern very weakly developed, can only be identified between setae i_4-s_4 and i_6-z_1 . Opisthonotal setae I_{1-5} , Z_{1-3} , Z_5 and R_2 similar in shape and length, short and smooth. Setae S_2 three times longer than the mentioned short setae, apically barbed, reaching beyond the margin of the shield. Other opisthonotal setae 5–7 times longer than the former short setae, apically serrated, bearing hyaline sheets and expanding beyond the margin

of idiosoma. Opisthonotum anteriorly covered by weakly developed tile-like pattern, medially reticulated, bearing small, depressed spots in the crossing points, posteriorly the reticulation disappearing, the surface punctuated. Dorsal cavities weakly sclerotized, with undulate anterior and posterior margins. The size of opisthonotal setae and the distances between their insertions according to Table 2.

Larva. Unknown.

Etymology. The new species is dedicated in honor of the prominent earthworm specialist Dr. Csaba Csuzdi (Budapest).

Remarks. Balan (1995) redescribed the Iberian species *Zercon guadarramicus* var. *disparipila* Athias-Henriot, 1961 on the basis of a Crimean material and elevated the varietas to specific rank. According to the description and illustrations of Balan, the specimens described in the present paper are similar in every important characters to the ones recorded from the Crimean Peninsula in 1995. However, these are completely different from *Z. guadarramicus* var. *disparipila*. Therefore establishing a specific status of *Z. disparipila* is presumably based on a misidentification and Balan's specimens are most likely conspecific with *Zercon csuzdii* sp. n. The characters by which the mites collected from these two distant geographical regions can be distinguished are as follows: every podonotal setae pilose in *Z. guadarramicus* var. *disparipila*, only marginal r-setae and i_1 pilose in the Crimean specimens; the elongated setae bearing hyaline sheet on their distal 35-50% in *Z. guadarramicus* var. *Disparipila*, but only a relatively small hyaline tip is found in the Crimean specimens; dorsal cavities large, strongly sclerotized and situated in a row in *Z. guadarramicus* var. *disparipila*, smaller, saddle-like, and the outer pair situated more anteriorly than the inner pair in the Crimean specimens. However the specific status of *Zercon disparipila* seems to be adequate, confirmed by the shape and size of dorsal cavities, shape of opisthonotal setae and opisthonotal ornamentation.

The new species resembles *Zercon adoxyphes* Błaszak, 1979, *Zercon caucasicus* Błaszak, 1979,

Zercon ignobilis Błaszak, 1979 and *Zercon separatus* Urhan, 2001 by the similar opisthotal chaetotaxy (I_6 , Z_4 and S_{3-4} long, other setae shorter) and the shape and size of dorsal cavities. The five species can be distinguished by the characters listed in Table 4.

***Zercon karadaghiensis* Balan, 1992**

(Figs. 11–15, 34–50)

Zercon karadaghiensis Balan, 1992b: 49.

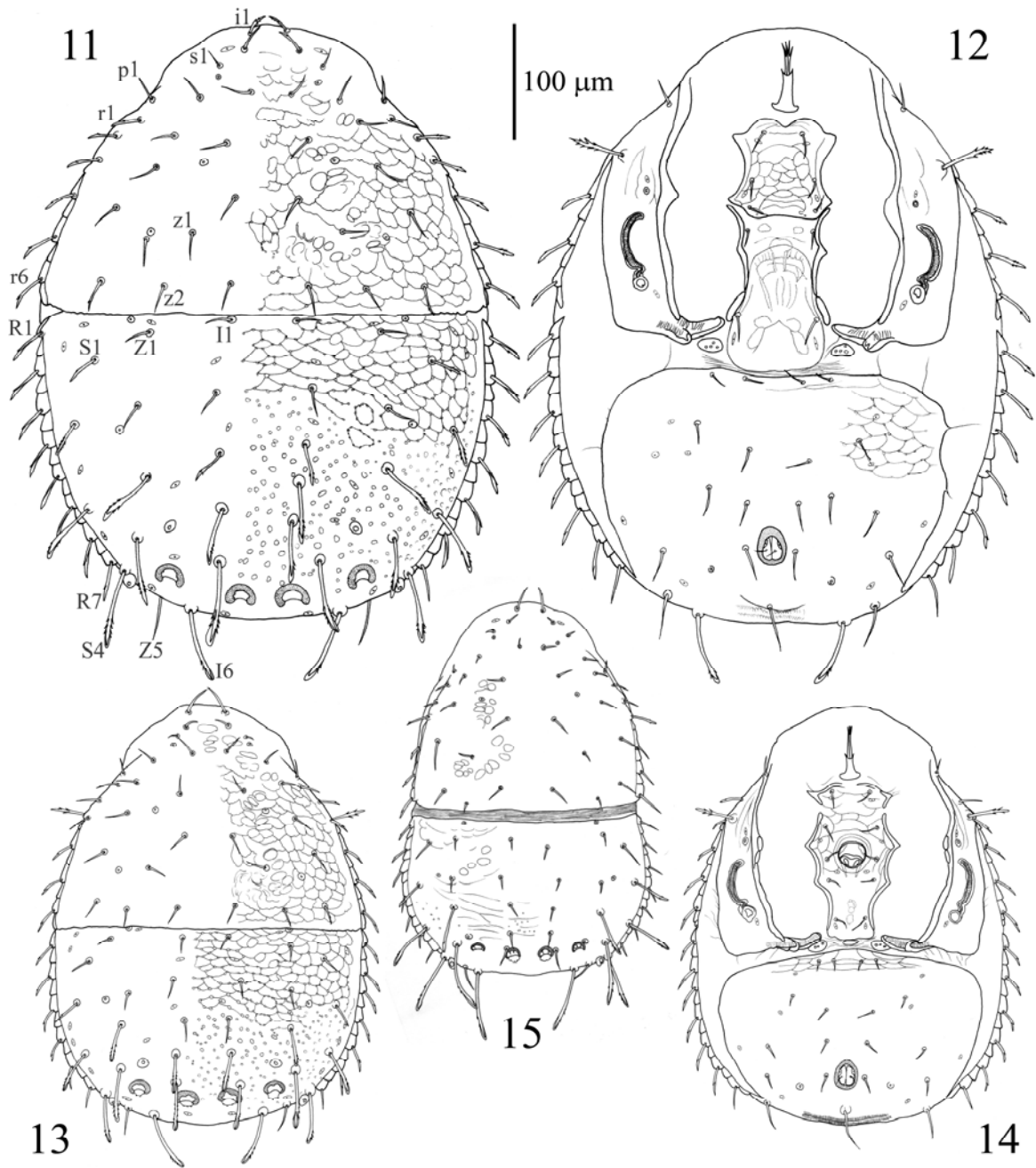
Material examined. Ukraine, Crimean Peninsula, Chatirdag Mts., south of Simferopol, near Mramorne village, N44 47' 09,4" E34 15' 38,6", 875 m a.s.l., beech forest (*Fagus orientalis*), from leaf-litter. Leg. Szövényi, G., 19.05.2009. (1 ♀ 2 ♂♂), Ukraine, Crimean Peninsula, Chatirdag Mts., south of Simferopol, near Mramorne village, N44 48' 28,3" E34 14' 54,4", 615 m a.s.l., maple mixed oak forest, from leaf-litter. leg. Szövényi, G., 19.05.2009. (1 ♀).

Diagnosis. Anterior margin of ventroanal shield with two pairs of setae. Peritremes arcuate. Marginal r- and R-setae slightly pilose and flared distally. Opisthotal setae I_{4-6} , Z_{3-4} and S_{3-4} long, apically pilose, bearing hyaline sheet, I_3 and S_{1-2} may also be barbed. Pores Po_3 situated on the line connecting I_4 and Z_4 . Anterior surface of opisthonotum covered by tile-like pattern, posterior surface bearing large, depressed spots. Dorsal cavities of general size and appearance, with slightly undulate posterior margins. Marginal serration shallow and obtuse.

Description. Female. Length of idiosoma: 410 μm ; width: 393 μm ($n = 2$).

Dorsal side (Fig. 11). On podonotum, 22 pairs of different setae: i-row with six pairs, z-row with two pairs, s-row with six pairs, r-row with six pairs, p-row with two pairs. Setae i_1 densely, i_2 and s_6 delicately barbed, marginal r-setae scarcely pilose and flared distally. Other podonotal setae smooth and needle-like. Pores po_1 situated on (or inside) the line connecting s_1 and s_2 , po_2 on the line connecting i_4 and s_4 , po_3 below the line connecting z_1 and s_5 . The central surface of podonotum covered by irregular pattern, between setae z_1 two hillocks with some strongly sclerotized structures can be observed, lateral surface of the shield with tile-like ornamentation. On opisthonotum, 22 pairs of different setae (Figs 34–50): I-row with six pairs, Z-row with five pairs, S-row with four pairs and R-row with seven pairs. Setae I_{1-2} and Z_{1-2} uniform, short and smooth, Z_5 also smooth, but longer than the above mentioned ones. Setae I_3 slightly longer than the previous members of the longitudinal row, S_{1-2} similar in shape and length, distally pilose, with very fine hyaline tips. S_2 not reaching the margin of idiosoma. Setae I_{4-6} , Z_{3-4} and S_{3-4} long, distally barbed, apically broadening, with large hyaline endings, I_4 reaching the insertions of I_5 , the tips of I_5 expanding beyond the margin of opisthonotum. Pores Po_1 situated anterolaterally to Z_1 , Po_2 lying slightly below the line connecting Z_2 and S_2 , Po_3 on the line connecting I_4 and Z_4 , approximately equidistantly, Po_4 posteromedially to the insertions of S_4 . Marginal serration shallow and obtuse. Anterior surface of opisthonotum covered by tile-like pattern, and ornamented also by small spots in the overlapping points. Posterior surface with large, spot-like depressions. Dorsal cavities of general size and appearance, saddle-like, with smooth anterior and undulate posterior margins. The size of setae and the distances between their insertions according to Table 3.

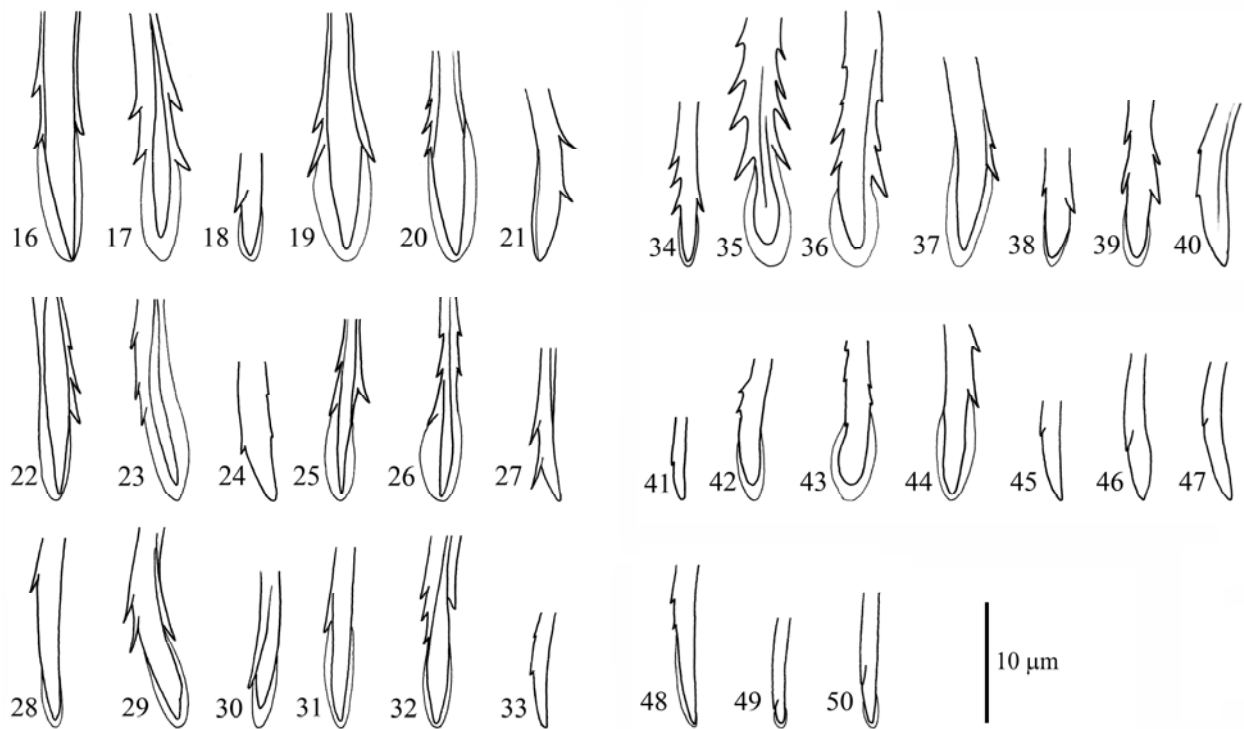
Ventral side (Fig.12). Peritremes arcuate, C-shaped. Chaeto- and poroidotaxy of ventral shields typical for the genus. Sternal shield well sclerotized, 68 μm long and 54 μm wide at the level of setae st_2 . Four openings of glands gv_2 situated on conspicuous adgenital plates. Anterior margin of ventroanal shield with two pairs of setae. All sternal and ventroanal setae smooth, needle-like. Adanal pores gv_3 situated posterolaterally to adanal setae. Anal valves with a pair of euanal setae and anal lyrifissures. Ventroanal shield caudally fused to the opisthotal shield. Sternal shield covered by reticulate pattern, surface of ventroanal shield with tile-like ornamentation and with small depression in the overlapping points.



Figures 11–15. *Zercon karadaghiensis*. 11 = dorsal view of female, 12 = ventral view of female, 13 = dorsal view of male, 14 = ventral view of male, 15 = dorsal view of deutonymph

Male (Figs 13–14). Length of idiosoma: 360 µm; width: 273 µm (n = 2). Chaetotaxy, poroidotaxy and sculpturing pattern of dorsal shields similar to that of the female, except setae I₃ which without any apical structures in male. Smooth, simple, and elongated setae of opisthonotum longer in pro-

portion to the body length than in female. Sternogenital shield divided by a weakly sclerotized slit behind the level of setae st₁, bearing five pairs of setae. The size of opisthonotal setae and the distances between their insertions according to Table 3.



Figures 16–50. Tips of some opisthonotal setae of *Z. csuzdii* sp. n. female (16-21), male (22-27), deutonymph (28-33) and *Z. karadaghiensis* female (34-40), male (41-47) and deutonymph (48-50).

16 = I₆, 17 = Z₄, 18 = S₂, 19 = S₃, 20 = S₄, 21 = R₆, 22 = I₆, 23 = Z₄, 24 = S₂, 25 = S₃, 26 = S₄, 27 = R₆, 28 = I₆, 29 = Z₄, 30 = S₂, 31 = S₃, 32 = S₄, 33 = R₆, 34 = I₃, 35 = I₄, 36 = I₅, 37 = I₆, 38 = S₁, 39 = S₂, 40 = R₅, 41 = I₃, 42 = I₄, 43 = I₅, 44 = I₆, 45 = S₁, 46 = S₂, 47 = R₅, 48 = I₆, 49 = S₁, 50 = S₂

Deutonymph (Fig. 15). Length of idiosoma: 320 μm; width: 200 μm (n = 2). Chaetotaxy and poroidotaxy of podonotum similar to that of the adults. On opisthonotum, setae I₁₋₅ short and smooth, without apical pilosity or hyaline sheets, slightly growing in length posteriorly. Setae Z₁₋₂, Z₅ and S₃ similar in shape to mentioned I-setae, Z₅ and S₁ approximately twice as long as Z₁₋₂. S₂ 1.5 times longer than S₁, apically barbed, with small hyaline tips, expanding beyond the margin of idiosoma. Setae I₆, Z₃₋₄ and S₃₋₄ markedly elongated, reaching beyond the margin of the shield. Poroidotaxy of opisthonotum similar to that of the adults, sculpturing pattern weakly developed, anterior surface covered by a recognizable tile-like structure, posterior regions ornamented by small, depressed spots and an irregular reticulation of fissures. Dorsal cavities smaller and less sclerotized than in mature stage. The size

of opisthonotal setae and the distances between their insertions according to Table 3.

Remarks. The female specimens found in the Crimean Peninsula differ in some characters from the others described by Balan in 1992. In the case of the newly found specimens setae S₁ are delicately pilose on their apical part, S₂ do not reach the margin of idiosoma and the posterior margin of dorsal cavities is barely undulate. Even so, the specimens studied here are conspecific with those of Balan (1992), these slight differences may come from the different preparation method and intraspecific variability. The ventral characters are not adequately described in the original description, hence it is not possible to make a particular comparison. The redescription of the species was necessary because of this deficiency and furthermore the language of the original de-

scription adoptable only for a specific group of acarologists.

Distribution. Ukraine.

***Zercon foveolatus* Halašková, 1969**

Zercon foveolatus Halašková, 1969: 252., Petrova 1977: 604., Karg 1993: 315., Mašán & Fend'a 2004: 120., Ujvári & Kontschán 2007: 109.

Material examined. Ukraine, Crimean Peninsula, Chatirdag Mts., south of Simferopol, near Mramorne village, N44 48' 28,3" E34 14' 54,4", 615 m a.s.l., maple mixed oak forest, from leaf-litter. Leg. Szövényi, G, 19.05.2009 (4 ♀♀).

Distribution. Slovakia, Ukraine, Romania and Hungary.

Acknowledgements – The collection trip was supported by the LIFE Plus program, title: „Conservation of Hungarian meadow viper (*Vipera ursinii rakosiensis*) in the Carpathian-basin”. I would like to express my sincere gratitude to Dr. Peter Mašán for the helpful comments during the preparation of the manuscript.

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Table 1. Lengths of opisthonotal setae and distances between setal bases within longitudinal rows in *Zercon bercziki* sp. n.

	♀	♂		♀	♂		♀	♂
I1	28	20	Z1	33	26	S1	37	29
I1-I2	71	50	Z1-Z2	70	58	S1-S2	82	56
I2	35	23	Z2	37	28	S2	47	40
I2-I3	58	44	Z2-Z3	66	44	S2-S3	41	34
I3	42	31	Z3	53	45	S3	59	48
I3-I4	39	32	Z3-Z4	34	28	S3-S4	35	33
I4	52	38	Z4	78	52	S4	70	57
I4-I5	27	23	Z4-Z5	44	29			
I5	60	39	Z5	44	35			
I5-I6	37	31						
I6	71	52						

Table 2. Lengths of opisthonotal setae and distances between setal bases within longitudinal rows in *Zercon csuzdii* sp. n.

	♀	♂	DN	PN		♀	♂	DN	PN		♀	♂	DN	PN
I1	16	13	10	7	Z1	16	9	10	7	S1	17	12	14	22
I1-I2	54	37	46	28	Z1-Z2	64	36	45	26	S1-S2	55	36	45	21
I2	19	13	10	7	Z2	18	9	11	7	S2	39	24	41	31
I2-I3	45	30	36	25	Z2-Z3	36	21	37	21	S2-S3	62	43	54	25
I3	17	11	9	7	Z3	17	11	10	7	S3	59	43	58	36
I3-I4	39	26	31	12	Z3-Z4	44	31	34	15	S3-S4	58	40	46	26
I4	15	12	9	5	Z4	70	50	58	48	S4	66	50	57	37
I4-I5	43	26	31	14	Z4-Z5	60	47	42	12					
I5	13	12	9	6	Z5	42	23	24	8					
I5-I6	40	30	28	7										
I6	58	54	56	44										

Table 3. Lengths of opisthonotal setae and distances between setal bases within longitudinal rows in *Zercon karadaghensis*.

	♀	♂	DN		♀	♂	DN		♀	♂	DN
I1	22	13	10	Z1	23	13	10	S1	28	14	20
I1-I2	61	38	32	Z1-Z2	65	44	38	S1-S2	59	40	35
I2	24	16	10	Z2	23	16	11	S2	31	23	29
I2-I3	50	35	25	Z2-Z3	56	30	25	S2-S3	74	43	36
I3	34	20	12	Z3	54	32	40	S3	56	37	42
I3-I4	58	30	22	Z3-Z4	57	38	29	S3-S4	59	39	33
I4	50	34	14	Z4	55	46	56	S4	65	42	49
I4-I5	43	27	15	Z4-Z5	53	32	22				
I5	69	39	16	Z5	43	23	20				
I5-I6	48	32	27								
I6	64	48	57								

Table 4. Distinguishing characters between *Z. csuzdii* sp. n., *Z. adoxyphes*, *Z. caucasicus*, *Z. ignobilis* and *Z. separatus*

Characters	<i>Z. csuzdii</i>	<i>Z. adoxyphes</i>	<i>Z. caucasicus</i>	<i>Z. ignobilis</i>	<i>Z. separatus</i>
Number of setae on anterior margin of ventroanal shield	two pairs	one pair	one pair	one pair	one pair
Setae S ₂	apically barbed, two times longer than S ₁	smooth, as long as S ₁	smooth, as long as S ₁	smooth, as long as S ₁	smooth, as long as S ₁
Long opisthonotal setae	with hyaline sheets	without hyaline tips	without hyaline tips	without hyaline tips	with hyaline sheets
Caudal surface of opisthonotum	punctuated	smooth	smooth	punctuated	punctuated
Marginal setae	longer, pilose	longer, pilose	longer, pilose	short, smooth	longer, pilose
Pores PO ₃	on the line connecting I ₄ and Z ₄	on the line connecting I ₄ and Z ₄	on the line connecting I ₃ and Z ₄	on the line connecting I ₅ and Z ₄	on the line connecting I ₄ and Z ₄