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RESEARCH ARTICLE

A new species of the genus *Zercon* (Acari, Mesostigmata, Zerconidae) from Kastamonu, Turkey

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ABSTRACT: A new species, *Zercon kastamonuensis* sp. nov. is described and illustrated based on female specimens collected from Kastamonu, Turkey. The new species is closely related to *Z. hispanicus* Sellnick, 1958, *Z. lepurus* Błaszak, 1979 and *Z. osmaneliensis* Urhan, 2008. The similarities and differences between related species within the same genus are also discussed. Additionally, a key to species of the genus *Zercon* known from Turkey is given.

Keywords: Acari, *Zercon kastamonuensis* sp. nov., description, Kastamonu, Turkey.
Zoobank: http://zoobank.org/4A7EEDAE-96DD-4DCB-9E4A-DA816A8D699D

INTRODUCTION

The family Zerconidae includes about 40 genera and more than 400 species. They are free-living predators and mostly associated with hummus, soil, decomposed litter, leaf mold, plant parts, and mosses. However, there are occasional records in wood substrates, ant-hills, nests of birds and small terrestrial mammals (Mašán and Fend'a, 2004). Turkish zerconid mites are similar to European zerconid species and could be distributed in the whole of European continent. Of the about 40 genera of the family Zerconidae known from the northern hemisphere, only 2 of them (*Prozercon* and *Zercon*) are known from Turkey. *Zercon* is the richest genus in Turkey based on the number of species. The fauna of zerconid mites in Turkey includes 37 *Prozercon* species and 80 *Zercon* species. (Duran et al., 2017; Erman et al., 2007; Karaca and Urhan, 2016; Özkan et al., 1994; Urhan et al., 2016; Urhan and Duran, 2017). During a research on the zerconid mites in Turkey, an undescribed species was found and described in the present paper as a contribution to the acarological fauna of Turkey. So far, there is no study on zerconid mites from Kastamonu, Turkey. This study is the first time on zerconid mites in Kastamonu. The number of zerconid mites species known from Turkey have been raised 118 with this species.

MATERIAL AND METHODS

The new species described in this paper is from litter and soil samples taken by Drs. R. Urhan and M. Karaca of Kastamonu Turkey, placed in plastic bags, labelled, and transferred to the Acarology Laboratory of Pamukkale University, Denizli (Turkey). After that samples were put into combined Berlese funnels, and mites were extracted after 5–7 days according to the humidity of the samples. At the end of this process, the mites were transferred to Petri dishes, and mites were sorted under the stereo microscope (Nikon SMZ 745T) by using forceps. They were placed in 60% lactic acid for clearing and mounted on permanent microscope slides using a glycerine medium. The examination and drawing of the mites were carried out using a light microscope (Olympus CX41) with a DP25 camera. The examined holotype and paratypes were stored in 70% ethanol and deposited in the Acarology Laboratory of Pamukkale University, Denizli (Turkey). Morphological terminology, idiosomal chaetotaxy, and poroidotaxy are used in the descriptions follow that of Sellnick (1958), Halašková (1969), Błaszak (1974), Mašan and Fend'a (2004). All measurements are given in micrometers (μm).

RESULTS

Family: Zerconidae Canestrini, 1891

Genus: *Zercon* C. L. Koch, 1836

Type species: *Zercon triangularis* C. L. Koch, 1836

Zercon kastamonuensis sp. nov. (Figs 1, 2)

Material: Holotype (♀). Kastamonu, Turkey, (41° 24' 53.77'' N, 33° 46' 02.45'' E), 875 m a.s.l., 21.VI.2018, collected by R. Urhan & M. Karaca. Samples of litter and soil underlying *Pinus nigra* and *Juniperus* sp. – Paratypes: 2 ♀♀, same data as holotype.

Diagnosis. Anterior margin of the ventrianal shield with 2 setae. Dorsal cavities general size and appearance, saddle-like, well sclerotized, and axes parallel to that of the body. On podonotum, setae *j1* feathered or finely barbed and r4–r6 pilose. All the remaining setae on podonotum (*j2-j6*, *z1*, z2, *s1-s6* and *r1-r3*) are short, smooth, and needle-like. On opisthonotum, setae *J1*, *J2*, *Z1*, *Z2*, and *S1-3* similar in appearance, all of them short, smooth, and needle-like. Setae *J3, Z3, Z5,* and *R1-3* pilose without hyaline ending. Setae *J3* not reaching the base of setae *J4*. Setae *J4* and *J5* short and barbed with hyaline ending. Setae *J4* not reaching the base of setae *J5*. Setae *J6*, *Z4*, and *S4* similar in appearance and length, all of them elongated, finely barbed, with hyaline ending. Setae *Z3* not reaching the base of setae *Z4* but setae *Z4* reaches posterior margin of opis-

thonotum. Setae *S1-S3* not reaching margin of opisthonotum. Setae *R1-R3* pilose and *R4-R7* short and smooth. Podonotum covered by reticulate pattern. Opisthonotal shield with a distinct reticulate pattern in the anterior region and smooth pattern in the posterior region.

Description. Female (Figs 1A-B, 2A-C). Length of idiosoma of holotype (excluding gnathosoma) 407, width 280. Measurements of 2 paratypes: Mean length 406 (402–410), mean width 278 (276–280).

Dorsum (Figs 1A, 2A). Twenty pairs of different setae present on podonotum's dorsal side: *j*-row with 6 pairs, z-row with 2 pairs, s-row with 6 pairs, *r*-row with 6 pairs. On podonotum, setae *j1* feathered or finely barbed and *r4–r6* pilose. All the remaining setae on podonotum (*j2-j6*, *z1*, *z2*, *s1-s6* and *r1-r3*) are short, smooth, and needle-like. Twenty-two pairs of different setae present on opisthonotum's dorsal side: *J*-row with 6 pairs, *Z*-row with 5 pairs, *S*-row with 4 pairs, *R*-row with 7 pairs. On opisthonotum, setae *J1*, *J2*, *Z1*, *Z2* and *S1-S3* similar in appearance, all of them short, smooth, and needle-like. Setae *J3*, *Z3*, *Z5* and *R1-R3* pilose without hyaline ending. Setae *J3* not reaching the base of setae *J4*. Setae *J4* and *J5* short and barbed with hyaline ending. Setae *J4* not reaching the base of setae *J5*. Setae *J6*, *Z4* and *S4* similar in appearance and length, elongated, finely barbed, with hyaline ending. Setae *Z3* not reaching the base of setae *Z4*, but setae *Z4* reaches posterior margin of opisthonotum. The distances between setae *J6–J6* and *J6–Z5* are 95 (92-98) and 20 (18-22), respectively. Setae *S1-S3* not reaching margin of opisthonotum. But setae *S4* reaches beyond posterior margin of opisthonotum. Setae *R1-R3* pilose and *R4-R7* short and smooth. Average lengths of opisthonotal setae and distances between setae within longitudinal rows are given Table 1.

Pores. Location of pores is shown in Figs 1A and 2A. Three pairs of pores presented on podonotum. Pores *po1* located inside of the base of setae *s1*, *po2* under the line connecting setae *j4* and *s4*, *po3* located inside the line connecting setae *s5* and *s6* (closer to *s5*). Podonotum reticulated. Four pairs of pores present on opisthonotum. Pores *Po1* located anteromedially to the base of setae *Z1*, *Po2* under the line connecting *Z2* and *S2*, *Po3* on the line connecting setae *Z4* and *J4* (closer to *Z4*), *Po4* located below the base of setae *S4*. Opisthonotal shield with a distinct reticulate pattern in the anterior region and smooth pattern in the posterior region. Dorsal cavities general size and appearance saddle-like, well sclerotized, and axes parallel to that of the body (Figs 1A, 2A-B).

Venter (Figs 1B, 2C). Shape, chaetotaxy of ventral shields, and shapes of peritremes typical for the genus *Zercon*. Setae *p1* short, smooth, and needle-like, seta *p2* slightly elongated and finely barbed. Lateral ends of peritremal shield reach setae *R1*. Adgenital shields present, with 3 opening valves. Ventroanal shield with 8 pairs of setae and all of them short, smooth, and needle-like. Anterior margin of ventroanal shield with 2 setae, postanal seta is single.

Male and immature stages. Unknown.

Differential diagnosis. *Zercon kastamonuensis* sp. nov. is closely related to *Z. hispanicus* Sellnick, 1958, *Z. lepurus* Blaszak, 1979 and *Z. osmaneliensis* Urhan, 2008. The similarities and differences between the females of the four species are given in Table 2.

Etymology. Named after the Kastamonu province where the new species was collected.

Key to species of the genus *Zercon* known from Turkey (based on adult females)

1 (48) Anterior margin of ventrianal shield with one pair of setae (*Vm1* present)

2 (17) Seta *S3* not reaching beyond the lateral margins opisthonotum

3 (8) Seta *S3* smooth

4 (5) Setae *J4-J5* short, smooth and needle-like..... ..... ***Z. lepurus* Błaszak, 1979**

5 (4) Setae *J4-J5* long, finely barbed or hyaline ending.

6 (7) Setae *J4-J5* apically barbed ..... ***Z. hispanicus* Sellnick, 1958**

7 (6) Seate *J4-J5* hyaline ending ....***Z. kastamonuensis* sp. nov.**

8 (3) Seta *S3* long, finely barbed with hyaline ending.

9 (16) Setae *Z5* hyaline ending.

10 (11) Marginal setae of opisthonotum smooth and delicately barbed ..... ***Z. osmaneliensis* Urhan, 2008**

11 (10) Marginal setae of opisthonotum long, delicately barbed and hyaline ending.

12 (13) Setae *S1* long, delicately barbed and hyaline ending ..... ***Z. saphenus* Błaszak, 1979**

13 (12) Setae *S1* short and smooth.

14 (15) Setae *J2* long, delicately barbed and hyaline ending..... ***Z. istanbulensis* Duran and Urhan, 2015**

15 (14) Setae *J2* short and smooth .... ***Z. marinae* Ivan and Călugăr, 2004**

16 (9) Setae *Z5* delicately barbed .... ***Z. colligans* Berlese, 1920**

17 (2) Setae *S3* reaching beyond the lateral margins opisthonotum.

18 (29) Setae *J4* hyaline ending.

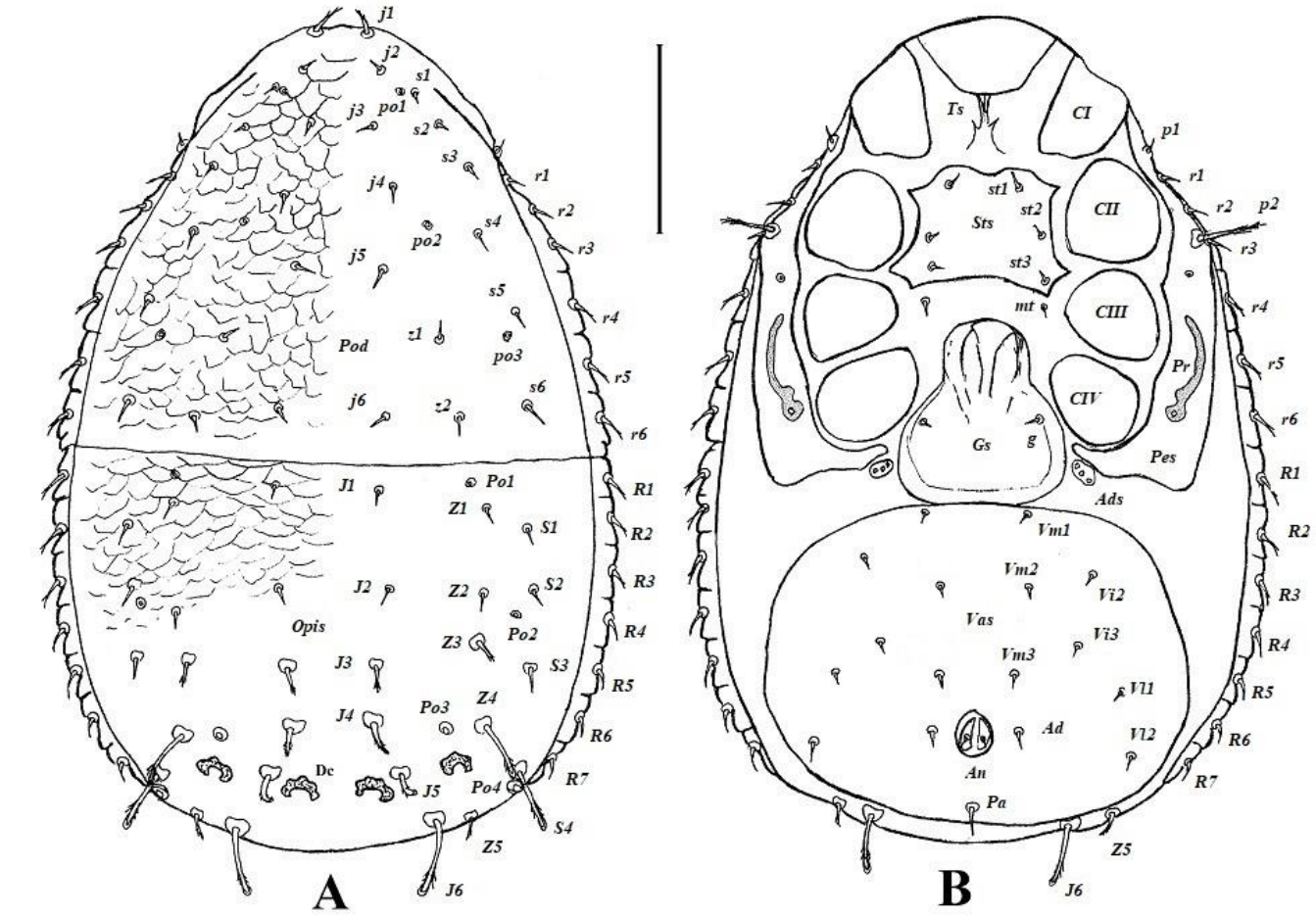

Figure 1. *Zercon kastamonuensis* sp. nov. (female): **A.** Dorsal view, **B.** Ventral view. Abbreviations: (*Pod*) podonotum, (*j1*–6, *z1*–2, *s1*–6, *p1*–2, and *r1*–7) podonotal setae, (*po1*–3) podonotal glands, (*Opis*) opisthonotum, (*J1*–6, *Z1*–5, *S1*–4, and *R1*–7) opisthonotal setae, (*Po1*–4) opisthonotal glands, (*Dc*) dorsal cavities, (*Ts*) tritosternum, (*Sts*) sternal shield, (*st1*–*st3*) sternal setae, (*mt*) metasternal seta, (*Gs*) genital shield, (*g*) genital seta, (*CI*–*CIV*) endopodal shields, (*Ads*) adgenital shield, (*Pr*) peritreme, (*Pes*) peritremal shield, (*Vas*) ventrianal shield, (*Vm1*–*Vm3*) ventromedial setae, (*Vi2*–*Vi3*) ventro-internal setae, (*VI1*–*VI2*) ventrolateral setae, (*An*) anal orifice, (*Ad*) adanal setae, (*Pa*) postanal seta. Scale =100 μm.

19 (20) Setae *J5* reaching beyond posterior margin of opisthonotum ..... ***Z. plumatopilus*** **Athias-Henriot, 1961**

20 (19) Setae *J5* not reaching beyond posterior margin of opisthonotum.

21 (22) Pores *Po2* outside the line connecting setae *S1* and S2 ..... ***Z. huseyini*** **Urhan, 2008**

22 (21) Pores *Po2* inside the line connecting setae *S1* and S2.

23 (24) Setae *S2* barbed ..... ***Z. insperatus*** **Błaszak, 1979**

24 (23) Setae *S2* hyaline ending.

25 (26) Pores *Po1* situated anteroparaxially to bases of setae *Z1*..... ***Z. cretensis*** **Ujvári, 2008**

26 (25) Pores *Po1* situated anteroantiparaxially to bases of setae Z1.

27 (28) Setae *J2* and *S2* smooth ..... ***Z. laczii*** **Ujvári, 2010**

28 (27) Setae *J2* and *S2* hyaline ending .... ***Z. salebrosus*** **Błaszak, 1979**

29 (18) Setae *J4* smooth or delicately barbed.

30 (35) Setae *J3-J5* delicately barbed.

31 (32) Setae *J5* long and reaching beyond posterior margin of opisthonotum..... ***Z. longisetosus*** **Urhan, 2008**

32 (31) Setae *J5* short and not reaching beyond posterior margin of opisthonotum.

33 (34) Setae *Z5* delicately barbed, setae *J3* reaching the bases of setae *J4*..... ***Z. fragilis*** **Urhan, 2001**

34 (33) Setae *Z5* short and smooth, setae *J3* not reaching the bases of setae J4 ..... ***Z. nemoralis*** **Urhan, 2001**

35 (30) Setae *J3-J5* short and smooth.

36 (39) Marginal setae *R1-R3* short and smooth.

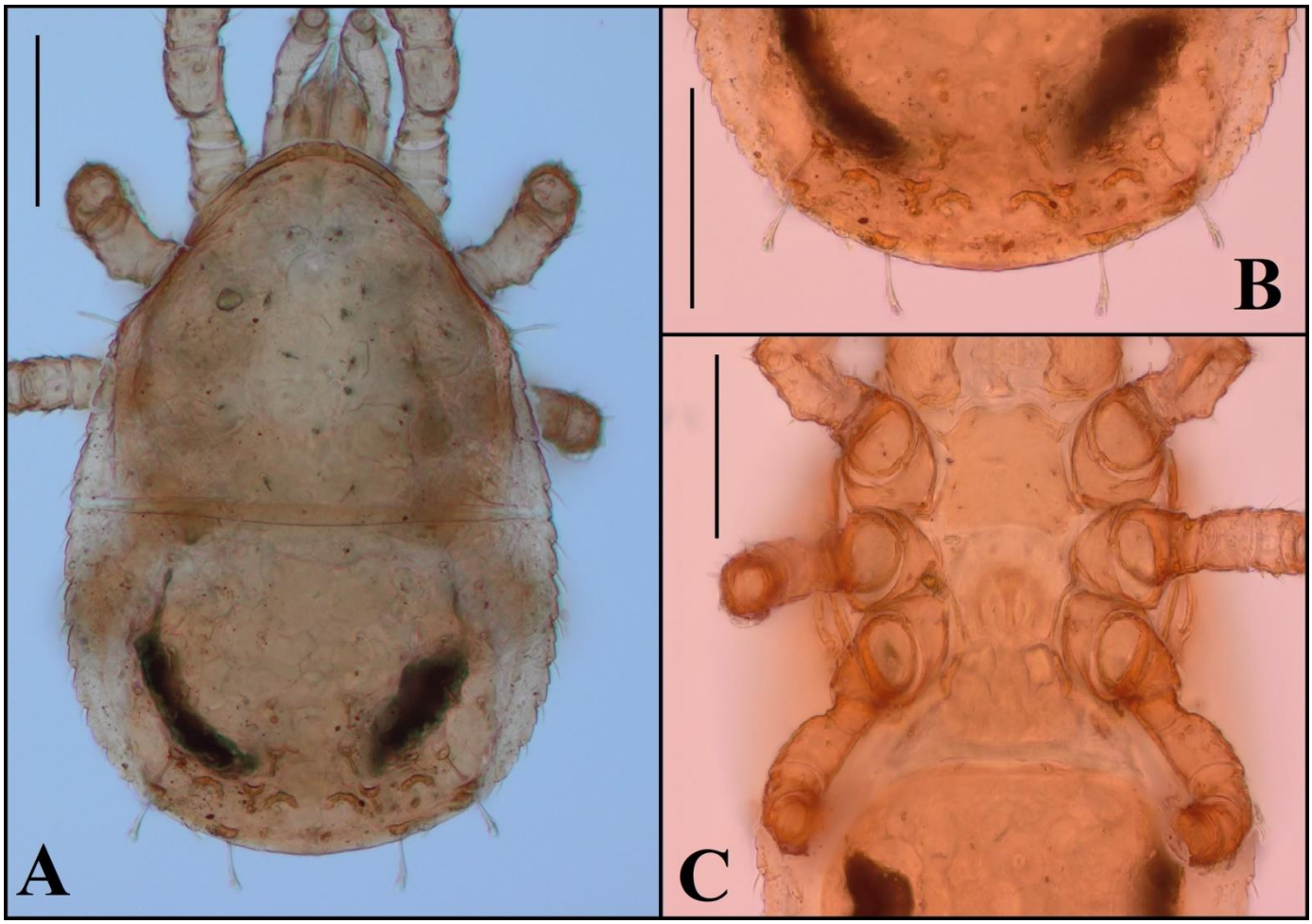

Figure 2. *Zercon kastamonuensis* sp. nov. (female) **A.** Dorsal, **B.** Posterior region of opisthonotum, **C.** Ventral. Scale =100 µm.

37 (38) Setae *Z3* short and smooth, not reaching the bases of setae *Z4* ..... ***Z. ignobilis*** **Błaszak, 1979**

38 (37) Setae *Z3* long, delicately barbed with hyaline ending, reaching the bases of setae *Z4*..... .....***Z. inonuensis*** **Urhan, 2007**

39 (36) Marginal setae *R1-R3* delicately barbed.

40 (41) Setae *S2* long, delicately barbed with hyaline ending ..... ***Z. solenites*** **Haarløv, 1942**

41 (40) Setae *S2* short and smooth.

42 (43) Setae *J6*, *Z4*, *S3* and *S4* with hyaline ending .... ***Z. separatus*** **Urhan, 2001**

43 (42) Setae *J6*, *Z4*, *S3* and *S4* delicately barbed.

44 (45) Setae *j2* and *r1-r3* delicately barbed .... ***Z. caucasicus*** **Błaszak, 1979**

45 (44) Setae *j2* and *r1-r3* short and smooth.

46 (47) Pores *Po3* on the line connecting setae *Z4-J3*, reticulation in posterior part of opisthonotum absent .... ***Z. adoxyphes*** **Błaszak, 1979**

47 (46) Pores *Po3* on the line connecting setae *Z4-J5*, posterior part of opisthonotum densely arranged punctations ..... ***Z. hungaricus*** **Sellnick, 1958**

48 (1) Anterior margin of ventrianal shield with two pairs of setae (*Vm1* and *Vi1* present).

49 (50) Between setal rows *J-J* and *J-Z* 8 extra setae present..... ***Z. trabzonensis*** **Urhan, 1997**

50 (49) Between setal rows *J-J* and *J-Z* extra setae absent.

51 (54) Setae *S2* absent.

52 (53) Setae *J2-J5* short and smooth, bases of opisthonotal setae *J6* and *Z5* adjacent .... ***Z. beleviensis*** **Urhan, 2002**

53 (52) Setae *J2-J5* long, delicately barbed with hyaline ending, bases of opisthonotal setae *J6* and *Z5* well separated..... ***Z. imperfectsetosus*** **Urhan, 2012**

54 (51) Setae *S2* present.

55 (58) Setae *S4* absent.

56 (57) Setae *J3-J5*, *Z3* and *S2* short and smooth .... ***Z. sklari*** **Balan, 1992**

Table 1. Length of opisthonotal seta and the distances between their bases in *J*, *Z*, and *S* rows of *Zercon kastamonuensis* sp. nov.

J Setae	Length	*Z* Setae	Length	*S* Setae	Length
J1	6–8	*Z1*	8	*S1*	8–10
J1–J2	48–53	*Z1–Z2*	46–56	*S1–S2*	28–37
J2	8	*Z2*	8	*S2*	10–12
J2–J3	36–41	*Z2–Z3*	26–32	*S2–S3*	28–36
J3	12	*Z3*	12–15	*S3*	12
J3–J4	25–29	*Z3–Z4*	33–35	*S3–S4*	55–69
J4	14–16	*Z4*	30–36	*S4*	30–36
J4–J5	26–31	*Z4–Z5*	38–44		
J5	12–16	*Z5*	12		
J5–J6	27–30				
J6	36				

57 (56) Setae *J3-J5*, *Z3* and *S2* long, delicately barbed with hyaline ending .. ***Z. sklarsimilis*** **Karaca and Urhan, 2016**

58 (55) Setae *S4* present.

59 (84) Setae *S3* absent.

60 (61) Setae *Z3* absent ..... ***Z. tefenniensis*** **Urhan, 2010**

61 (60) Setae *Z3* present.

62 (71) Setae *J3-J5* short and smooth.

63 (64) Dorsal fossae different size: outer fossae about 5 times larger than inner ones ..... ***Z. domanicensis*** **Urhan, 2010**

64 (63) All dorsal fossae equal in size.

65 (66) Setae *Z3* and *Z4* delicately barbed ..... ***Z. bulancakensis*** **Urhan, 2012**

66 (65) Setae *Z3* short and smooth, setae *Z4* long and hyaline ending.

67 (68) Setae *r3* and *S2* short and smooth ..... ***Z. soguticus*** **Urhan and Duran, 2017**

68 (67) Setae *r3* and *S2* long, delicately barbed with hyaline ending.

69 (70) Setae *S1* short and smooth, bases of opisthonotal setae *J6* and *Z5* adjacent ..... ***Z. afyonensis*** **Urhan and Duran, 2017**

70 (69) Setae *S1* long and hyaline ending, bases of opisthonotal setae *J6* and *Z5* well separated ..... ***Z. karacamehmeti*** **Urhan and Duran, 2017**

71 (62) Setae *J3-J5* long, delicately barbed or hyaline ending.

72 (75) Setae *J3-J5* hyaline ending.

73 (74) Setae *S1*, *Z2* and *J2* short and smooth, marginal setae *R1-R7* delicately barbed ..... ***Z. cokelezicus*** **Urhan, 2009**

74 (73) Setae *S1*, *Z2* and *J2* barbed, marginal setae *R1-R7* hyaline ending ..... ***Z. magdae*** **Ivan and Călugăr, 2004**

75 (72) Setae *J3-J5* delicately barbed.

76 (77) Setae *S4* short and delicately barbed ..... ***Z. geliboluensis*** **Karaca and Urhan, 2016**

77 (76) Setae *S4* long, delicately barbed with hyaline ending.

78 (79) Setae *S2* hyaline ending . ***Z. alattini*** **Urhan, 2010**

79 (78) Setae *S2* delicately barbed.

80 (81) Setae *Z3* hyaline ending ..... ***Z. tekirdagensis*** **Karaca and Urhan, 2016**

81 (80) Setae *Z3* delicately barbed.

82 (83) Dorsal fossae with star-like anterior margins, setae *J2-J4* not reaching apparently beyond the base of following setae ..... ***Z. uludagicus*** **Urhan, 2008**

83 (82) Dorsal fossae with saddle-like, setae *J2-J4* reaching apparently beyond the base of following setae ..... ***Z. yusufi*** **Urhan, 2010**

84 (59) Setae *S3* present.

85 (96) All podonotal and opisthonotal setae smooth.

86 (89) Setae *J5* long and reaching beyond posterior margin of opisthonotum.

87 (88) Dorsal fossae different size: outer fossae about 3-4 times larger than inner ones ..... ***Z. bulgaricus*** **Balogh, 1961**

88 (87) All dorsal fossae equal in size ..... ***Z. filiformis*** **Karaca and Urhan, 2016**

89 (86) Setae *J5* short and not reaching posterior margin of opisthonotum.

Table 2. Similarities and differences between *Zercon kastamonuensis* sp. nov. and related species.

Setae	*Zercon kastamonuensis* sp. nov.	*Zercon hispanicus* Sellnick, 1958	*Zercon lepurus* Blaszak, 1979	*Zercon osmaneliensis* Urhan, 2008
Setae *J1* and *Z1*	Short and smooth, needle-like	Short and smooth, needle-like	Short and smooth, needle-like	Long and barbed
Setae *J2* and *Z2*	Short and smooth, needle-like	Short and smooth, needle-like	Short and smooth, needle-like	Long and barbed with hyaline ending
Setae *J3*	Pilose, not reaching the base of setae *J4*	Feathered, reaches the base of setae *J4*	Short and smooth, needle-like	Long and barbed with hyaline ending, not reaching the base of setae *J4*
Setae *J4*-J5	Barbed with hyaline ending, setae *J4* not reaching the base of setae *J5*	Feathered, setae *J4* reach the base of setae *J5*	Short and smooth, needle-like, setae *J4* not reaching the base of setae *J5*	Long and barbed with hyaline ending, setae *J4* not reaching the base of setae *J5*
Setae *Z3*	Pilose, not reaching the base of setae *Z4*	Feathered, reaches the base of setae *Z4*	Short and smooth, needle-like, reaches the base of setae *Z4*	Long and barbed with hyaline ending, not reaching the base of setae *Z4*
Setae *Z5*	Pilose	Short and smooth	long and smooth	Barbed with hyaline ending
Setae *S2*	Short and smooth, needle-like	Short and smooth, needle-like	Short and smooth, needle-like	Long and barbed with hyaline ending
Setae *S3*	Short and smooth, needle-like, not reaching margin of opisthonotum	Short and smooth, needle-like, not reaching margin of opisthonotum	Long and smooth, reaches margin of opisthonotum	Long and barbed with hyaline ending, not reaching margin of opisthonotum
Ornamentation of posterior region of opisthonotum	Smooth	Punctate	Smooth	Punctate

90 (91) Setae *s1* absent, dorsal fossae different size: outer fossae about 2 times larger than inner ones ..... ***Z. cabylus*** **Athias-Henriot, 1961**

91 (90) Setae *s1* present, all dorsal fossae equal in size.

92 (93) Pores *Po3* with position between *J* and *Z* setal rows ..... ***Z. berlesei*** **Sellnick, 1958**

93 (92) Pores *Po3* with position between *Z* and *S* setal rows.

94 (95) Setae *Z3* long and reaching the bases of setae *Z4*, setae *S2* and *S3* long and reaching beyond lateral margin of opsthonotum..... ***Z. montanus*** **Willmann, 1943**

95 (94) Setae *Z3* short and not reaching the bases of setae *Z4*, setae *S2* and *S3* short and not reaching lateral margin of opsthonotum..... ***Z. perforatulus*** **Berlese, 1904**

96 (85) All podonotal and opisthonotal setae not smooth.

97 (120) All marginal setae (*R*) of opisthonotum smooth.

98 (109) Setae *J4* and *J5* short and smooth.

99 (100) Setae *J6* very long and delicately barbed ..... ***Z. honazicus* Urhan, 2009**

100 (99) Setae *J6* long with hyaline ending.

101 (104) Setae *S3* short and smooth.

102 (103) Dorsal fossae with saddle-like, well sclerotised and on the same horizontal line ..... ***Z. carpathicus* Sellnick, 1958**

103 (102) Dorsal fossae waved star-like, weakly sclerotised and outers located above from inners ..... ***Z. anatolicus* Urhan, 2008**

104 (101) Setae *S3* long with hyaline ending.

105 (106) Setae *S1* and *S2* short and smooth ..... ***Z. emirdagicus* Urhan et al., 2016**

106 (105) Setae *S1* and *S2* long with hyaline ending.

107 (108) Setae *Z3* short and smooth ..... ***Z. ozkani* Urhan and Ayyıldız, 1993**

108 (107) Setae *Z3* long, delicately barbed with hyaline ending ..... ***Z. andrei* Sellnick, 1958**

109 (98) Setae *J4* and *J5* delicately barbed or hyaline ending.

110 (115) Setae *J4* and *J5* delicately barbed.

111 (112) Setae *S2* long with hyaline ending ..... ***Z. septemporus* Urhan, 2001**

112 (111) Setae *S2* short and smooth.

113 (114) Setae *i2* short and smooth, setae *Z3* reaching the bases of setae *Z4* ..... ***Z. foveolatus* Halašková, 1969**

114 (113) Setae *i2* long and delicately barbed, setae *Z3* not reaching the bases of setae *Z4* ..... ***Z. pinicola* Halašková, 1969**

115 (110) Setae *J4* and *J5* hyaline ending.

116 (117) Setae *J2*, *J3*, *Z2*, *S1* and *S2* short and smooth ..... ***Z. similifoveolatus* Ivan and Călugăr, 2004**

117 (116) Setae *J2*, *J3*, *Z2*, *S1* and *S2* long and delicately barbed with hyaline ending.

118 (119) Setae *i2* and *Z5* short and smooth ..... ***Z. delicatus* Urhan and Ekiz, 2002**

119 (118) Setae *i2* delicately barbed, *Z5* delicately barbed with hyaline ending..... ***Z. mehmeturhani* Urhan, 2009**

120 (97) All marginal setae (*R*) of opisthonotum delicately barbed or hyaline ending.

121 (148) All marginal setae (*R*) of opisthonotum delicately barbed.

122 (129) Setae *J3* short and smooth.

123 (124) Setae *S2* long, delicately barbed with hyaline ending..... ***Z. kezbaniremae* Urhan, 2007**

124 (123) Setae *S2* short and smooth.

125 (126) Setae *J4* and *J5* short and smooth ..... ***Z. serratus* Urhan, 2001**

126 (125) Setae *J4* and *J5* delicately barbed or hyaline ending.

127 (128) Setae *Z5* smooth, setae *J3* reaching the bases of setae *J4*..... ***Z. peltatus* C. L. Koch, 1836**

128 (127) Setae Z5 delicately barbed, setae J3 not reaching the bases of setae J4 ..... ***Z. burdurensis* Urhan, 2001**

129 (122) Setae *J3* delicately barbed or hyaline ending.

130 (135) Setae *J3* delicately barbed.

131 (132) Setae *J5* hyaline ending ..... ***Z. thracicus* Karaca and Urhan, 2016**

132 (131) Setae *J5* delicately barbed.

133 (134) Setae *S3* long with hyaline ending ..... ***Z. mirabilis* Urhan, 2013**

134 (133) Setae *S3* short and delicately barbed ..... ***Z. kackaricus* Urhan and Ekiz, 2002**

135 (130) Setae *J3* hyaline ending.

136 (139) Setae *S1* short and smooth.

137 (138) Setae *Z5* hyaline ending, setae *J3* not reaching the base of setae *J4* and setae *Z3* not reaching the base of setae Z4 ..... ***Z. ekizi* Urhan et al., 2015**

138 (137) Setae *Z5* delicately barbed, setae *J3* reaching the base of setae *J4* and setae *Z3* reaching the base of setae *Z4* ..... ***Z. quadricavum* Urhan, 2001**

139 (136) Setae *S1* delicately barbed or hyaline ending.

140 (143) Setae *S1* delicately barbed.

141 (142) Setae *j2* short and smooth, *S2* delicately barbed ..... ***Z. denizliensis* Urhan, 2009**

142 (141) Setae *j2* delicately barbed, *S2* hyaline ending .... ***Z. turcicus* Urhan and Ayyıldız, 1994**

143 (140) Setae *S1* hyaline ending.

144 (145) Setae *j2* delicately barbed, *Z5* hyaline ending .... ***Z. kallimcii* Urhan, 2009**

145 (144) Setae *j2* short and smooth, *Z5* delicately barbed.

146 (147) Setae *J2* short and smooth, setae *J3* not reaching the base of setae *J4* ..... ***Z. encarpatus* Athias-Henriot, 1961**

147 (146) Setae *J2* delicately barbed, *J3* reaching the base of setae *J4* ..... ***Z. apladellus* Błaszak, 1979**

148 (121) All marginal setae (*R*) of opisthonotum hyaline ending.

149 (150) Pores *Po3* with position between *Z* and *S* setal rows ..... ***Z. notabilis* Błaszak, 1979**

150 (149) Pores *Po3* with position between *J* and *Z* setal rows.

151 (154) Setae *s6*, *J1* and *Z1* long with hyaline ending.

152 (153) Setae *j3-j6*, *z1*, *z2*, *s2-s5* delicately barbed ..... ***Z. arslani* Duran et al., 2016**

153 (152) Setae j3-j6, z1, z2, s2-s5 short and smooth ..... ***Z. ayyildizi* Urhan, 1997**

154 (151) Setae *s6*, *J1* and *Z1* short and smooth.

155 (156) Setae *J2* and *Z5* smooth ..... ***Z. karadaghiensis* Balan, 1992**

156 (155) Setae *J2* and *Z5* delicately barbed with hyaline ending.

157 (158) Pores *Po3* under the line connecting setae *Z4-J5*, the bases of setae *J4* above the line connecting setae *Z4-Z4* ..... ***Z. juvarae* Ivan and Călugăr, 2004**

158 (157) Pores *Po3* on the line connecting setae *Z4-J4*, the bases of setae *J4* under the line connecting setae *Z4-Z4*.

159 (160) Setae *S3* not reaching lateral margin of opsthonotum, setae *J2* reaching the base of setae *J3* ..... ***Z. agnostus* Błaszak, 1979**

160 (159) Setae *S3* reaching beyond lateral margin of opsthonotum, *J2* not reaching the base of setae *J3* ..... ***Z. salmani* Urhan, 2001**

REFERENCES

Błaszak, C. 1974. Monografie fauny Polski. Tom 3. Zerconidae (Acari, Mesostigmata) Polski. Polska Akademia Nauk, Zaklad zoologii systematycznej i doswiadczalnej, Panstwowe Wydawnicztwo Naukowe, Warszawa, Krakow, 315 p.

Błaszak, C. 1979. Systematic studies on the family Zerconidae, IV. Asian Zerconidae (Acari, Mesostigmata). Acta Zoologica Cracoviensia, 24: 3-112.

Duran, E.H., Karaca, M., and Urhan, R. 2017. A new species of soil mites (Acari: Mesostigmata: Zerconidae) from Afyonkarahisar province, Turkey. Zoology in the Middle East, 63: 86-92.
doi: 10.1080/09397140.2017.1290760

Erman, O., Özkan, M., Ayyıldız, N. and Doğan, S. 2007. Checklist of the mites (Arachnida: Acari) of Turkey. Second Supplement. Zootaxa, 1632: 1-21.

Halašková, V. 1969. Zerconidae of Czechoslovakia (Acari: Mesostigmata). Acta Universitatis Carolinae-Biologica, 3-4: 175-352.

Karaca, M. and Urhan, R. 2016. Five new species of *Zercon* C. L. Koch, 1836 (Acari: Zerconidae) from northwestern Turkey. Zootaxa, 4127: 31-59.
doi: 10.11646/zootaxa.4127.1.2

Mašan, P. and Fend'a, P. 2004. Zerconid Mites of Slovakia (Acari, Mesostigmata, Zerconidae). Bratislava, Slovakia: Institute of Zoology, Slovak Academy of Sciences, 238 p.

Özkan, M., Ayyıldız, N. and Erman, O. 1994. Checklist of the Acari of Turkey. First supplement. EURAAC (European Association of Acarologists) Newsletter, 7: 4-12.

Sellnick, M. 1958. Die Familie Zerconidae Berlese. Acta Zoologica Academiae Scientiarum Hungaricae, 3: 313-368.

Urhan, R. 2008. Two new species of *Zercon* C. L. Koch (Acari, Mesostigmata, Zerconidae) from Turkey: *Zercon longisetosus* sp. n. and *Zercon osmanelinensis* sp. n., Turkish Journal of Zoology, 32: 217-224.

Urhan, R., Duran, E. H. and Karaca, M. 2016. Two new species of the genus *Zercon* C. L. Koch from the Inner Aegean Region of Turkey (Acari: Mesostigmata: Zerconidae). Zoology in the Middle East, 62: 164-170.
doi: 10.1080/09397140.2016.1182780

Urhan, R. and Duran, E. H. 2017. Three new species of Zerconidae (Acari: Mesostigmata) from Turkey. Zoology in the Middle East, 63: 269-276.
doi: 10.1080/09397140.2017.1349206

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