

The diversity of zerconid mites (Acari, Zerconidae) in Giresun province, with a new record for the Turkish fauna

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Abstract. The zerconid mites collected from the Giresun province between December 2009 – April 2011 are evaluated and the following species are recorded: *Prozercon buraki*, *P. demirsoyi*, *P. giresunensis*, *P. mersinensis*, *P. murati*, *P. satapliae*, *P. traegardhi*, *P. turcicus*, *Zercon adoxyphes*, *Z. agnostus*, *Z. berlesei*, *Z. bulancakensis*, *Z. bulgaricus*, *Z. colligans*, *Z. denizliensis*, *Z. imperfectsetosus*, *Z. karadaghiensis*, *Z. mirabilis* and *Z. ozkani*. Of these, *Z. karadaghiensis* is recorded for the first time from Turkey. Description and drawings of the newly recorded species are given. On the basis of the collected specimens, measurements of nineteen species are given and their geographic distributions are discussed. Additionally, altitude and habitat preferences of the zerconid species are presented with 3 figures and 4 tables.

Keywords. Acari, Zerconidae, new record, *Zercon karadaghiensis*, Giresun, Turkey

INTRODUCTION

According to recent molecular systematic studies, the family Zerconidae belongs to the suborder Monogynaspidia, cohort Gamasina and the superfamily Zerconoidea (Sikora 2014).

Zerconid mites are important members of the soil fauna and these free-living mites colonize various soil substrates (Karaca & Urhan 2015a). They are mostly associated with humus, decomposed litter, leaf mold, decaying plant materials, and mosses (Urhan 2010), however, there are rare records from woody substrates, ant-hills, nests of birds and small terrestrial mammals (Mašán & Fend'a 2004) as well. These small, predatory mites feed on the eggs, larvae, and nymphs of other mites and springtails (Shereef *et al.* 1984, Martikainen & Huhta 1990). Their wide range of habitats and diverse functional traits make the zerconid mites suitable as bioindicators of environmental changes (Sikora 2014).

The average body length of a zerconid mite can vary between 200–700 micrometers. Their

dorsal shields are divided into two separate parts: podonotum and opisthonotum. These mites are weakly sclerotized and their life cycle includes four active stages; larva, protonymph, deutonymph and adult. The most important characters distinguishing zerconid mite species are the number of setae situated on the peritremal shield, the shape and length of peritremal setae, the shape of the posterior part of the peritremal shield and its connection with the ventrianal shield, the shape of the slit between the lateral margin of the peritremal shield and the podonotal shield, condition of the adgenital shields and gland openings gv2, the number of setae of the ventrianal shield, the condition of the dorsal cavities, the number of setae in the marginal setal series of the opisthonotum, the setal pattern of opisthonotal setae and the shape of epistome (Sikora 2014).

The members of the family Zerconidae are well known from the Holarctic region (Krantz 1978), however, in recent years there have been reports from the alpine zone of Central Mexico and Thailand (Ma *et al.* 2011, Ujvári 2011a, b, 2012) as well. At present, approximately 40

genera consisting of some 400 species are known worldwide. From Turkey, until now only two genera, *Prozercon* and *Zercon*, and 88 species were recorded (Karaca & Urhan 2014, 2015b).

The first study on Turkish zerconids was published by a Polish acarologist, C. Błaszak (1979) based on samples collected by B. Dominiak and J. Pawlowski in the Amanos Mountains and the surrounding Bolu province. From 1992 to date, further studies on zerconids were published by R. Urhan and his team.

As a contribution to the knowledge of Zerconidae and understanding of the mite faunal richness of Turkey, here we report on nineteen zerconid species belonging to two genera (*Prozercon* and *Zercon*) from the Giresun province. Their localities in Giresun and known distributions in the world are given. Furthermore, detailed description and drawings of the newly recorded *Zercon karadaghiensis* are presented. Altitude and habitat preferences of the zerconid species collected are also discussed.

MATERIAL AND METHODS

Soil and litter samples were taken from 309 different localities in forestlands of Giresun province. Giresun province is located in the Eastern Black Sea Region of Turkey (Fig. 1). It is surrounded with the Black Sea coasts from the north and the range of North Anatolian Mountains from south. Although the Kelkit valley is covered with steppes, the area between coast and mountains is covered with forests. Total land area of the province is 6934 square kilometers.

The samples collected were placed in plastic bags, labelled and transferred to the laboratory and placed in combined Berlese funnels. Mites were extracted for 5–7 days according to the humidity of the samples. At the end of this process, the contents of the bottles were transferred to Petri dishes and the mites were separated under a stereo-microscope. They were placed in 60% lactic acid for clearing and mounted on permanent microscope slides using a glycerine medium. The examination and drawing of mites were carried out using an Olympus BX50 microscope with

DP25 camera. The examined materials are stored in 70% ethanol and deposited in the Acarology Laboratory of Pamukkale University, Denizli (Turkey). Morphological terminology, idiosomal chaetotaxy and poidotaxy (Fig. 2) used in the description follows that of Mašan & Fend'a (2004). All measurements are given in micrometers (μm).

RESULTS

Family Zerconidae Canestrini, 1891

Genus *Prozercon* Sellnick, 1943

Type species. Zercon fimbriatus C. L. Koch, 1839

Prozercon buraki Urhan, 2008

Material examined. 228 ♀♀ and 78 ♂♂.

Average length and width of idiosoma: 300/238 μm (in females); 245/202 μm (in males).

Localities in Giresun. Centre, Bulancak, Piraziz, Eynesil and Yağlıdere.

Known distribution. Turkey (Urhan 2008).

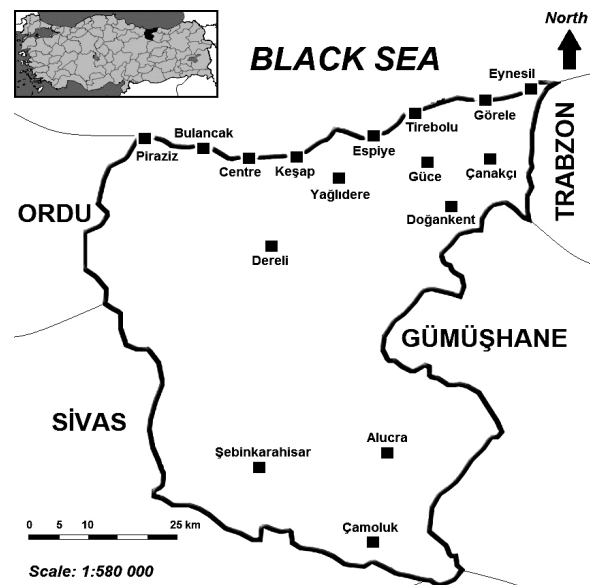


Figure 1. Location of Giresun province and its districts.

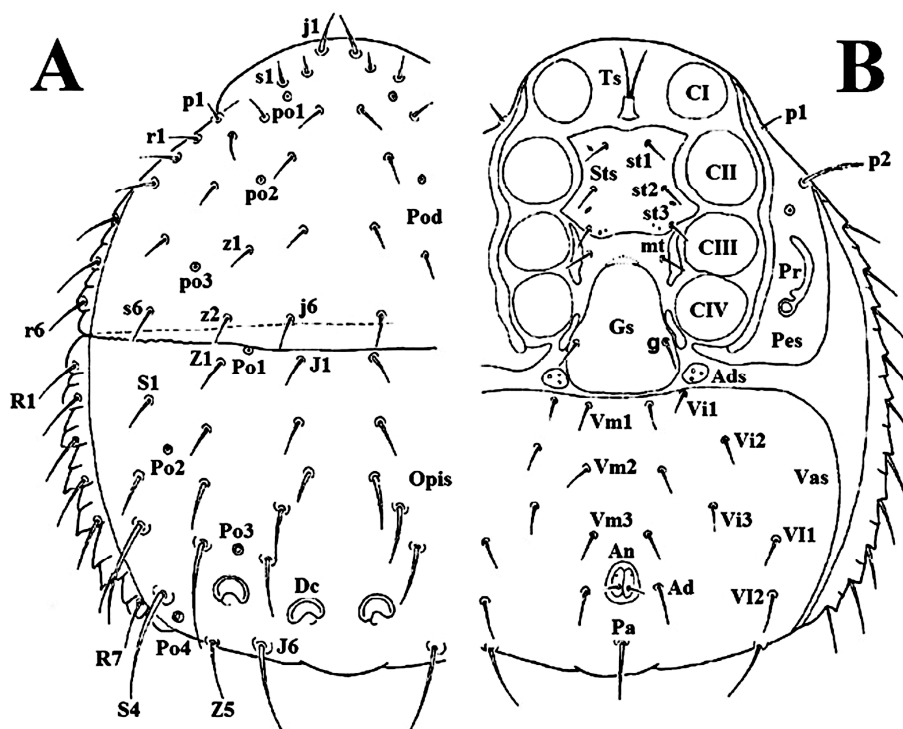


Figure 2. General view of a zerconid mite (female): A) dorsal view, B) ventral view. Abbreviations: (Pod) podonotum, (j1-6, z1-2, s1-6, p1-2 and r1-7) podonotal setae, (po1-3) podonotal glands, (Opis) opisthonotum, (J1-6, Z1-5, S1-4 and R1-7) opisthonotal setae, (Po1-4) opisthonotal glands, (Dc) dorsal cavities, (Ts) tritosternum, (Sts) sternal shield, (st1-st3) sternal setae, (mt) metasternal seta, (Gs) genital shield, (g) genital seta, (CI-CIV) endopodal shields, (Pr) peritreme, (Pes) peritremal shield, (Vas) ventroanal shield, (Vm1-Vm3) ventromediales setae, (Vi1-Vi3) ventrointernales setae, (Vl1-Vl2) ventrolaterales setae, (An) anal orifice, (Ad) adanal setae, (Pa) postanal seta (modified after Masan & Fend'a, 2004).

***Prozercon demirsoyi* Urhan & Ayyıldız, 1996**

Material examined. 779 ♀♀, 1130 ♂♂, 42 deutonymphs and 6 protonymphs.

Average length and width of idiosoma: 344/283 µm (in females); 289/197 µm (in males).

Localities in Giresun. All counties (except Espiye, Şebinkarahisar, Alucra and Çamoluk).

Known distribution. Turkey (Urhan & Ayyıldız 1996d).

***Prozercon giresunensis* Urhan, 2013**

Material examined. 20 ♀♀ and 2 ♂♂.

Average length and width of idiosoma: 343/242 µm (in females); 286/195 µm (in males).

Localities in Giresun. Şebinkarahisar and Doğan kent.

Known distribution. Turkey (Urhan 2013).

Remark. Type materials of this species were collected from Giresun province.

***Prozercon mersinensis* Urhan, 1998**

Material examined. 101 ♀♀ and 35 ♂♂.

Average length and width of idiosoma: 350/252 µm (in females); 289/225 µm (in males).

Recorded localities in Giresun. Şebinkarahisar and Doğankent.

Known distribution. Turkey (Urhan 1998).

***Prozercon murati* Urhan, 2013**

Material examined. 12 ♀♀ and 2 ♂♂.

Average length and width of idiosoma: 308/226 µm (in females); 255/185 µm (in males).

Localities in Giresun. Tirebolu.

Known distribution. Turkey (Urhan 2013).

Remark. Type materials of this species were collected from Giresun province.

***Prozercon satapliae* Petrova, 1977**

Material examined. 57 ♀♀ and 3 ♂♂.

Average length and width of idiosoma: 344/265 µm (in females); 285/214 µm (in males).

Localities in Giresun. Espiye, Eynesil and Doğankent.

Known distribution. Russia and Turkey (Urhan & Ayyıldız, 1996e).

***Prozercon traegardhi* (Halbert, 1923)**

Material examined. 188 ♀♀, 62 ♂♂ and 19 deutonymphs.

Average length and width of idiosoma: 337/242 µm (in females); 272/184 µm (in males).

Localities in Giresun. All counties (except Tirebolu, Şebinkarahisar and Çamoluk).

Known distribution. Cosmopolitan in the Holarctic region (Urhan & Ayyıldız 1992, Karaca 2015).

***Prozercon turcicus* Urhan & Ayyıldız, 1996**

Material examined. 111 ♀♀ and 41 ♂♂.

Average length and width of idiosoma: 331/265 µm (in females); 275/207 µm (in males).

Localities in Giresun. Bulancak and Doğankent.

Known distribution. Turkey (Urhan & Ayyıldız 1996a).

Genus *Zercon* C. L. Koch, 1836

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

***Zercon adoxyphes* Blaszak, 1979**

Material examined. 13 ♂♂ and 40 deutonymphs.

Average length and width of idiosoma: -/- µm (in females); 432/347 µm (in males).

Localities in Giresun. Doğankent.

Known distribution. Iran and Turkey (Urhan & Ayyıldız 1994b).

***Zercon agnostus* Blaszak, 1979**

Material examined. 44 ♀♀, 85 ♂♂ and 66 deutonymphs.

Average length and width of idiosoma: 496/363 µm (in females); 391/284 µm (in males).

Localities in Giresun. Alucra.

Known distribution. Turkey (Urhan *et al.* 2007).

***Zercon berlesei* Sellnick, 1958**

Material examined. 14 ♀♀, 10 ♂♂ and 2 deutonymphs.

Average length and width of idiosoma: 505/365 µm (in females); 396/271 µm (in males).

Localities in Giresun. Yağlıdere, Doğankent.

Known distribution. Iceland, British Isles, Poland, Czech Republic, Slovakia, Hungary, Romania, Italy, Spain and Turkey (Urhan & Ayyıldız 1996c, Mašan & Fend'a 2004).

***Zercon bulancakensis* Urhan, 2012**

Material examined. 579 ♀♀, 126 ♂♂, 34 deutonymphs and 12 protonymphs.

Average length and width of idiosoma: 427/339 µm (in females); 338/255 µm (in males).

Localities in Giresun. Bulancak, Espiye, Görele, Şebinkarahisar and Doğankent.

Known distribution. Turkey (Urhan 2012).

Remark. Type materials of this species were collected from Giresun province.

***Zercon bulgaricus* Balogh, 1961**

Material examined. 7 ♀♀, 5 ♂♂ and 2 deutonymphs.

Average length and width of idiosoma: 448/311 µm (in females); 356/240 µm (in males).

Localities in Giresun. Doğankent.

Known distribution. Albania, Bulgaria, Crimea and Turkey (Urhan & Ayyıldız 1996b, Ujvári 2010).

***Zercon colligans* Berlese, 1920**

Material examined. 396 ♀♀, 539 ♂♂, 229 deutonymphs and 44 protonymphs.

Average length and width of idiosoma: 428/320 µm (in females); 337/232 µm (in males).

Localities in Giresun. Eynesil, Alucra and Çamoluk.

Known distribution. Cosmopolitan in the Holarctic region (Sellnick 1958, Urhan & Ayyıldız 1994b, Karaca 2015).

***Zercon denizliensis* Urhan, 2011**

Material examined. 40 ♀♀, 5 ♂♂ and 3 deutonymphs.

Average length and width of idiosoma: 440/367 µm (in females); 337/263 µm (in males).

Localities in Giresun. Centre and Piraziz.

Known distribution. Turkey (Urhan, 2011).

***Zercon imperfectsetosus* Urhan, 2012**

Material examined. 68 ♀♀, 40 ♂♂ and 7 deutonymphs.

Average length and width of idiosoma: 467/357 µm (in females); 367/278 µm (in males).

Localities in Giresun. Alucra and Çamoluk.

Known distribution. Turkey (Urhan 2012).

Remark. Type materials of this species were collected from Giresun province.

***Zercon karadaghiensis* Balan, 1992**

(Figures 3A–D)

Material examined. 25 ♀♀ and 23 ♂♂.

Average length and width of idiosoma: 446/327 µm (in females); 353/237 µm (in males).

Localities in Giresun. Bulancak.

Known distribution. Ukraine and Turkey (Balan 1992, Ujvári 2009, Urhan *et al.* 2012).

Description. Female.

Dorsal side (Figure 3A). 20 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. 2 pairs of different setae present on podonotum's ventral side: p-row with two pairs. On podonotum, all setae short, smooth and needle-like (except setae j1–2 and r1–6). Setae j1 densely barbed, j2 and r1–6 finely barbed. 22 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, all setae smooth, finely barbed without hyaline ending or finely barbed with hyaline ending. Setae J1–2 and Z1–2 smooth and needle-like. Setae J3–6, Z3–4 and S3–4 long, finely barbed with hyaline endings. Seta J6 longest seta on opisthonotum. On opisthonotum setae J3–5 and Z3–4 reaching base of the following seta in the series. Setae S1–2 finely barbed with hyaline ending. Setae J5 and S2 reaching the margin of opisthonotum but setae Z4 and S3–4 reaching beyond of opisthonotum. Seta Z5 short but finely barbed with hyaline ending. Marginal R setae finely barbed without hyaline ending (except R7). Seta R7 smooth and needle-like, similar in appearance to setae J1–2. The distance between setae J6 and Z5 25–30 µm.

Pores (Fig. 3A). 3 different pores present on podonotum. Pores po1 under base of s1, po2 inside line connecting j4 and s4, po3 on line connecting z1 and s5, closer to s5. Podonotum

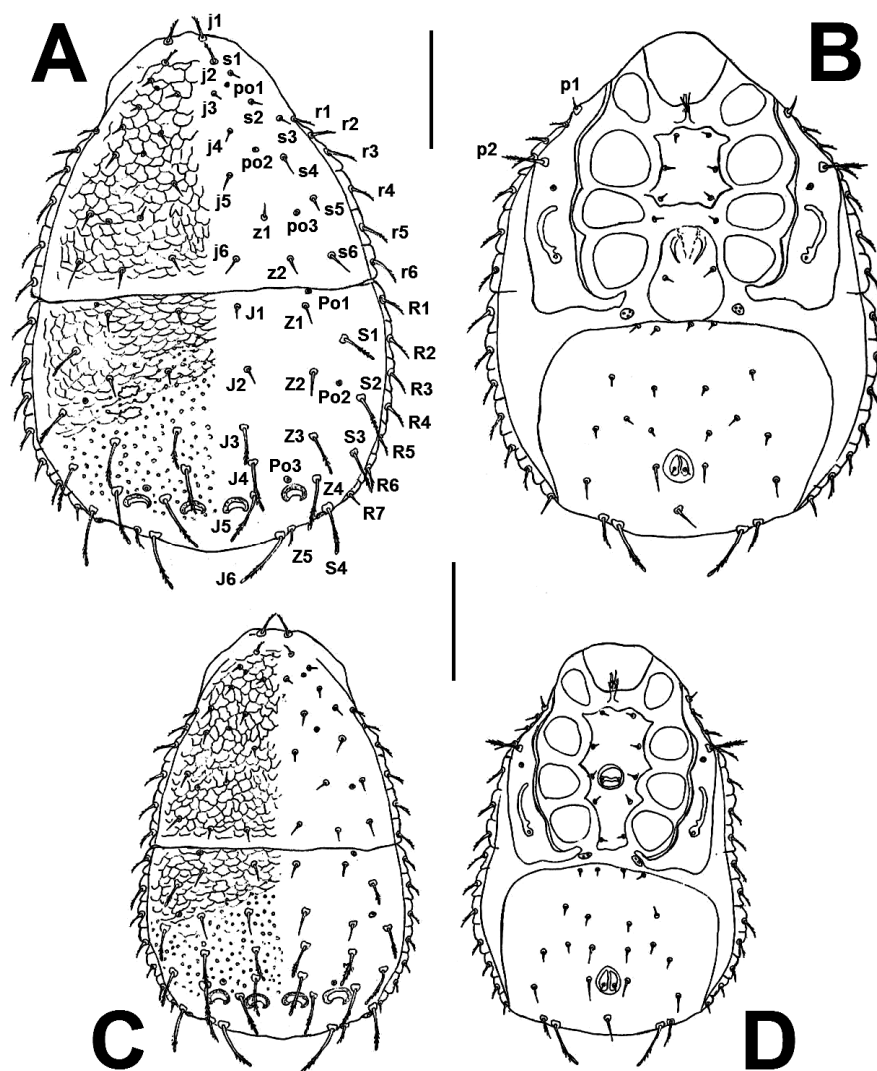


Figure 3. *Zercon karadaghensis*. A) Dorsal view of female, B) Ventral view of female, C) Dorsal view of male, D) Ventral view of male (Scale bars = 100 μ m).

covered by tile-like pattern. 4 different pores present on opisthonotum. Pores Po1 located above base of Z1, Po2 on line connecting Z2 and S2, Po3 outside the line connecting J5 and Z4, Po4 located close to the base of seta S4. Opisthonotal shield with a distinct reticulate pattern in the anterior region and spotted pattern in the posterior region. Dorsal cavities of general size and appearance, saddle-like, axes parallel to that of the body.

Ventral side (Fig. 3B). Ventral shields' shape, chaetotaxy and the shape of peritremes typical for genus *Zercon*. Setae p1 short, smooth and needle-like, seta p2 markedly elongated, finely plumose

and feather-like. The shapes of peritremes bent, comma-like. Lateral ends of peritremal shield reach R1. Adgenital shields present (with three opening valves). Ventroanal shield with 9 pairs of setae. Anterior margin of ventroanal shield with 4 setae and postanal seta is single. All of them smooth and needle-like.

Lengths of opisthonotal setae and distances between setae within longitudinal rows of female and male specimens: see Table 1.

Male. Dorsal side (Fig. 3C), *ventral side* (Fig. 3D), shapes of setae on idiosoma, sculpture of

podonotum and opisthonotum, size and appearance of dorsal cavities basically similar to that of female.

Remarks. Original description of this species was given by Balan (1992) from Ukraine. Ujvári (2009) recorded this species for the second times in the country and provided a detailed redescription.

Distinguishing characters of *Z. karadaghiensis* specimens known from Ukraine and Turkey are compared on the basis of the available literature (Table 2). The negligible different positions of pores may be a result of variation in Zerconidae species.

***Zercon mirabilis* Urhan & Öztaş, 2013**

Material examined. 216 ♀♀, 44 ♂♂, 150 deutonymphs and 83 protonymphs.

Average length and width of idiosoma: 466/354 µm (in females); 378/272 µm (in males).

Localities in Giresun. Şebinkarahisar and Doğan kent.

Known distribution. Turkey (Urhan & Öztaş 2013).

Remark. Type materials of this species were collected from Giresun province.

***Zercon ozkani* Urhan & Ayyıldız, 1994**

Material examined. 30 ♀♀, 9 ♂♂ and 74 deutonymphs.

Average length and width of idiosoma: 491/359 µm (in females); 397/271 µm (in males).

Localities in Giresun. Bulancak, Şebinkarahisar and Doğan kent.

Known distribution. Turkey (Urhan & Ayyıldız, 1994a).

Altitude preferences of zerconids

Samplings was carried out from 0 to 2000 meters. No samples were collected between 600–800 and 1300–1500 meters because of a lack of suitable forestlands. The sampling localities in the research area were grouped according to 100 meter wide elevation ranges. Altitudinal distribution data of the detected zerconid specimens are listed in Table 3.

Habitat preferences of zerconids

According to the sampling localities in the research area, the following habitats were included: alder: *Alnus* sp., chestnut: *Castanea sativa*, common hazel: *Corylus avellana*, common

Table 1. Length intervals of opisthonotal setae and the distances between their bases in J-, Z- and S- rows of *Zercon karadaghiensis*.

Seta	♀♀	♂♂	Seta	♀♀	♂♂	Seta	♀♀	♂♂
J1	10-14	11-13	Z1	12-17	11-14	S1	26-31	19-23
↓	51-61	38-45	↓	55-59	40-43	↓	51-61	36-40
J2	14-18	14-17	Z2	16-20	11-16	S2	40-44	29-34
↓	45-49	30-34	↓	50-56	33-39	↓	51-54	32-38
J3	27-35	24-30	Z3	38-46	32-39	S3	49-52	37-42
↓	32-42	23-25	↓	40-44	26-33	↓	43-45	28-32
J4	51-53	39-41	Z4	54-59	48-52	S4	52-55	45-47
↓	24-31	16-19	↓	38-45	23-26			
J5	54-56	43-46	Z5	13-23	13-17			
↓	22-30	24-28						
J6	62-66	56-60						
J6-J6	98-117	91-96						

Table 2. Distinguish characters between Ukrainian and Turkish specimens of *Zercon karadaghensis* (measurements in micrometers, n: number of examined specimens).

	Balan (1992)	Ujvári (2009)	Turkish specimens
Length and width intervals of idiosoma (♀♀)	513–576 x 410–428	410 x 393 (n:2)	421–470 x 314–339 (n:25)
Length and width intervals of idiosoma (♂♂)	416–450 x 296–319	360 x 273 (n:2)	339–367 x 223–250 (n:23)
Setae in r and R series	finely barbed without hyaline ending	finely barbed and flared distally	finely barbed without hyaline ending
Seta J3 (♂♂)	apically hyaline tip	not hyaline tip	apically hyaline tip
Seta J5	not reach beyond of opistonotum	reach beyond of opistonotum	not reach beyond of opistonotum
Seta S1	smooth	finely barbed with hyaline ending	finely barbed with hyaline ending
Seta S2	reach beyond of opistonotum	not reach beyond of opistonotum	not reach beyond of opistonotum
Adgenital shields	?	with 4 valves	with 3 valves

Table 3. Altitudinal ranges of zerconid mite species.

Altitude (meters)	<i>P. buraki</i>	<i>P. demirsoyi</i>	<i>P. giresunensis</i>	<i>P. mersinensis</i>	<i>P. murati</i>	<i>P. satapliae</i>	<i>P. tragardi</i>	<i>P. turcicus</i>	<i>Z. adoxypes</i>	<i>Z. agnostus</i>	<i>Z. berlesei</i>	<i>Z. bulancakensis</i>	<i>Z. bulgaricus</i>	<i>Z. colligans</i>	<i>Z. denizliensis</i>	<i>Z. karadaghensis</i>	<i>Z. mirabilis</i>	<i>Z. ozkani</i>
0–100	+	+			+	+	+					+		+	+			
100–200	+	+					+								+			
200–300		+					+											
300–400		+					+											
400–500	+	+	+				+				+	+			+		+	+
500–600							+											
600–700																		
700–800																		
800–900	+	+									+							
900–1000			+	+			+										+	
1000–1100		+		+		+	+	+			+	+	+				+	+
1100–1200												+					+	+
1200–1300			+	+								+					+	
1300–1400																		
1400–1500																		
1500–1600										+				+		+		
1600–1700							+	+		+		+		+		+		
1700–1800							+	+				+				+		+
1800–1900								+				+		+		+		
1900–2000														+		+		

Table 4. Habitat preferences of zerconid mite species.

	<i>Alnus</i> sp.	<i>Castanea sativa</i>	<i>Corylus avellana</i>	<i>Ficus carica</i>	<i>Juglans regia</i>	<i>Mespilus germanica</i>	Moss	<i>Picea orientalis</i>	<i>Pinus brutia</i>	<i>Pinus sylvestris</i>	<i>Platanus orientalis</i>	<i>Populus</i> sp.	<i>Prunus domestica</i>	<i>Prunus</i>	<i>Quercus</i> sp.	<i>Rhododendron</i>	<i>Rosa canina</i>	<i>Rubus caesius</i>
<i>P. buraki</i>	+		+			+	+				+	+		+	+			+
<i>P. demirsoyi</i>	+		+	+			+		+	+		+	+	+	+	+		+
<i>P. giresunensis</i>										+		+						
<i>P. mersinensis</i>	+						+			+		+						+
<i>P. murati</i>	+		+															
<i>P. satapliae</i>	+		+				+		+	+								+
<i>P. tragardhi</i>	+	+	+		+	+	+		+	+	+	+		+	+	+		+
<i>P. turcicus</i>	+						+	+		+								+
<i>Z. adoxypes</i>							+			+								+
<i>Z. agnostus</i>						+				+						+		
<i>Z. berlesei</i>							+											
<i>Z. bulancakensis</i>			+		+		+	+	+	+			+		+	+		
<i>Z. bulgaricus</i>	+						+			+								
<i>Z. colligans</i>						+	+			+		+			+			
<i>Z. denizliensis</i>	+		+			+									+			+
<i>Z. imperfectsetosus</i>						+	+					+			+		+	
<i>Z. karadaghiensis</i>							+	+		+								
<i>Z. mirabilis</i>							+			+		+			+	+		
<i>Z. ozkani</i>							+			+		+			+			

fig: *Ficus carica*, persian walnut: *Juglans regia*, common medlar: *Mespilus germanica*, moss, oriental spruce: *Picea orientalis*, Turkish pine: *Pinus brutia*, scots pine: *Pinus sylvestris*, oriental plane: *Platanus orientalis*, poplar: *Populus* sp., plum: *Prunus domestica*, cherry laurel: *Prunus laurocerasus*, oak: *Quercus* sp., yellow azalea: *Rhododendron luteum*, dog-rose: *Rosa canina* and European dewberry: *Rubus caesius*. The habitats of the different zerconid species are given in Table 4.

DISCUSSION

According to Table 3, the specimens of *P. murati* and *Z. denizliensis* occur only at lower altitudes (0–500 meters). In contrast, *Z. adoxypes*, *Z. imperfectsetosus* and *Z. karadaghiensis* occur only at higher mountain zones (over 1500 meters). *P. tragardhi*, *Z. bulancakensis* and *Z. colligans* show a wide range of occurrences from sea level up to high mountain zone. The remaining species have no clear preference in terms of altitudinal ranges.

According to Table 4, specimens of *P. Tragardhi* show no preferences towards the different forest types occurring in 14 different habitats. *P. murati* however, shows up in only two habitat types, under alder and common hazel.

In terms of species richness, under alder 7 species occurred and in moss pads 6 species belonging to *Prozercon* were determined. Under chestnut, oriental spruce and plum only one species of *Prozercon* is recorded. However, under dog-rose no species of *Prozercon* is observed.

From the species of the genus *Zercon*, *Z. bulancakensis* is the most widespread occurring in 9 different habitats. This shows that *Z. bulancakensis* has a wider tolerance than the other *Zercon* species in the Giresun province. In contrast, *Z. berlesei* occurs only in one habitat type (in moss pads). In terms of species richness, in moss pads 9 species, under scots pine 8 species and under oak 7 species of the genus *Zercon* were recorded. Under chestnut no *Zercon* species were observed.

The unique zoogeographical position of Turkey between Asia, Europe and North Africa, in the western Palearctic region provides a rich biological diversity in terms of both floral and faunal elements. Zerconid mites are closely related to litter types and plant communities which are specific to a particular area, this may allow spreading endemic zerconid species associated with these special floral elements. The type locality of 58 zerconid species are in Turkey, of these, only *Prozercon yavuzi* was recorded out of the country; from Greece (Ujvári 2008, 2011c).

As this vast country is still understudied, with local faunistic investigations (especially in the Black Sea and Mediterranean regions) further new species and new records of zerconids in Turkey are anticipated.

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