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Orijinal araştırma (Original article)

A systematic study on water mites (Acari: Hydrachnidia) of Kemaliye district (Erzincan)[1]

Kemaliye ilçesi (Erzincan) su keneleri (Acari: Hydrachnidia) üzerine sistematik bir çalışma

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Summary

In this study, water mites collected from Kemaliye district (Erzincan Province, Turkey) were evaluated Totally, 76 water mite species belonging to 17 families were identified. *Sperchon* (*Hispidosperchon*) *algeriensis* (Lundblad, 1942); *Lebertia* (s.str.) *rivulorum* Viets, 1933; *Atractides* (s.str.) *glandulosus* (Walter, 1918); *A*. (s.str.) *nahavandii* Schwoerbel & Sepasgozarian, 1976 and *A.* (s.str.) *protendens* K. O. Viets, 1955 are new records for the Turkish fauna. The deutonymph of *Brachypoda* (*Hemibrachypoda*) *orientalis* Pešić & Esen, 2013 is described for the first time. The water mites of Kemaliye district and new records for the Turkish fauna are listed.

Key words: Water mite, acari, systematics, Kemaliye district, Turkey

Özet

Bu çalışmada, Kemaliye ilçesinden (Erzincan, Türkiye) toplanan su keneleri değerlendirilmiştir. Toplam 17 familyaya ait 76 tür tespit edilmiştir. *Sperchon* (*Hispidosperchon*) *algeriensis* (Lundblad, 1942); *Lebertia* (s.str.) *rivulorum* Viets, 1933; *Atractides* (s.str.) *glandulosus* (Walter, 1918); *A*. (s.str.) *nahavandii* Schwoerbel & Sepasgozarian, 1976 ve *A.* (s.str.) *protendens* K.O.Viets, 1955 Türkiye faunası için yeni kayıttır. *Brachypoda* (*Hemibrachypoda*) *orientalis* Pešić & Esen, 2013 'in nimfi ilk defa tanımlanmıştır. Tespit edilen türlerin listesi ile Türkiye faunası için yeni kayıt olan türlerin tanımları örneklerimiz üzerinden gözden geçirilmiştir.

Anahtar sözcükler: Su kenesi, acari, sistematik, Kemaliye, Türkiye

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Introduction

Kemaliye, located in a valley between the Munzur Mountains and the Sarıçiçek High Plateau, is one of the important cultural centres of Turkey, with its cold water resources, especially Kadıgölü, Karasu River and Keban Dam, diversity in flora and fauna, landscape beauties, folkloric richness and rich cultural heritage. The climate of Kemaliye, with Siberian and Mediterranean influences, is partly continental. Its climate and mountainous topography, between 600 and 3500 meters in elevation, provides many different habitats. Kemaliye district is very rich in biodiversity and there have been many systematic studies in the area (Orsay, 2001; Mete, 2009; Karagöz, 2010; Allı, 2011). However, there have not been any studies of the water mites in Kemaliye.

Research on water mites has increased in Turkey, with material collected from different provinces examined over the last two decades. To date, 25 families, 57 genera and 266 species of water mites are known from Turkey (Erman et al., 2007; 2010; Esen et al., 2012; Gülle & Boyacı, 2012; Boyacı et al., 2012). During a survey of the freshwater fauna of Kemaliye district of Erzincan Province, 76 species were collected, including 5 species new for the fauna of Turkey. This paper aims to describe this material and contribute to our knowledge of water mite distribution in Turkey.

Materials and Methods

During field work, water mites were collected by hand netting, sorted on the spot from the living material, conserved in Koenike's fluid and dissected as described elsewhere (Gerecke et al., 2007). Water mite species collected from Kemaliye district (Erzincan Province) in 2011–2012 are listed below. All specimens were collected by the authors.

All measurements are given in micrometers (µm). The following abbreviations are used: Ac = acetabulum, Cx-III = third coxae, dL = dorsal length, L = length, mL = median length, W = width, I-L-6 = Leg 1, sixth segment (tarsus), P-3 = palp segment 3.

Systematics

1. Hydrachnidae Leach, 1815

1.1. *Hydrachna* (s.str.) *processifera* (Koenike, 1903): Kemaliye; Kabataş village, Lake Acıkavaklık, 01.VII.2011, ♂.

2. Limnocaridae Grube, 1859

2.1. *Limnochares* (s.str.) *aquatica* (Linnaeus, 1758): Kemaliye; Kabataş village, Lake Acıkavaklık, 07.IX.2011, 2 ♂♂, 15 ♀♀.

3. Eylaidae Leach, 1815

3.1. *Eylais degenerata* Koenike, 1897: Kemaliye; Sarıçiçek Plateau, Lake Subatan, 30.VI.2011, ♂, 3 ♀♀.

3.2. *Eylais megalostoma* Koenike, 1897: Kemaliye; Damlar, stream, 30.VI.2011, ♂, 2 ♀♀.

3.3. *Eylais setosa* Koenike, 1897: Kemaliye; Sarıçiçek Plateau, Lake Subatan, 30.VI.2011, 3 ♂♂, 4 ♀♀.

4. Hydryphantidae Thor, 1900

4.1. *Hydryphantes* (s.str.) *crassipalpis* Koenike, 1914: Kemaliye; Kabataş village, Lake Acıkavaklık, 01.VII.2011, 2 ♂♂, 2 ♀♀.

4.2. *Hydryphantes* (s.str.) *dispar* (Schaub, 1888): Kemaliye; Ağıl village, Lake Kocahaydar, 08.IX.2011, 2 ♂♂, 3 ♀♀.

4.3. *Trichotyas* (*Lundbladia*) *petrophila* (Michael, 1895): Kemaliye; Damlar, stream, 30.VI.2011, 2 ♂♂, 15 ♀♀; 08.IX.2011, 2 ♂♂, 2 ♀♀.

4.4. *Protzia eximia* (Protz, 1896): Kemaliye; Aşağı Mutlu village, spring, 09.IX.2011, 9 ♂♂, 13 ♀♀; Damlar, spring, 30.VI.2011, 13 ♂♂, 18 ♀♀; Kabataş village, spring, 07.IX.2011, 2 ♂♂, ♀; Kadıgölü, spring, 29.VI.2011, ♂, 2 ♀♀; 07.IX.2011, 3 ♂♂, 4 ♀♀; 08.IX.2011, 8 ♂♂, 19 ♀♀; Sırakonak village, stream, 02.VII.2011, ♂, ♀; 17.VII. 2012, 2 ♀♀.

5. Hydrodromidae Viets, 1936

5.1. *Hydrodroma despiciens* (Müller, 1776): Kemaliye; Kabataş village, Lake Acıkavaklık, 01.VII.2011, ♀; 07.IX.2011, 9 ♂♂, 7 ♀♀.

5.2. *Hydrodroma torrenticola* (Walter, 1908): Kemaliye; Kabataş village, stream, 01.VII.2011, ♂, ♀; 07.IX.2011, 3 ♂♂, 2 ♀♀.

6. Sperchontidae Thor, 1900

6.1. *Sperchon* (s.str.) *squamosus* Kramer, 1879: Kemaliye; Damlar, spring, 30.VI.2011, 2 ♂♂, 3 ♀♀.

6.2. *Sperchon* (*Hispidosperchon*) *algeriensis* (Lundblad, 1942): Kemaliye; Avcılar village, stream, 09.IX.2011, ♀; Çit village, stream, 02.VII.2011, ♂.

Description. Male: Integument with fine denticles ventrally and dorsally (figure 1A). Idiosoma L/W 692/547, genital field W 210, genital valves L 208, L Ac-1-3 68-70-65. Capitulum L 196, chelicera L 262, basal segment L 191, claw L 71, L ratio chelicerae basal segment/claw 2.69; P-1 without dorsal setae, P-2 distoventrally with a long projection, P-3 bearing 4 setae ventrally, P-4 longer than P-3, proximal ventral tubercules well developed and located halfway of segment; palp (figure 1B, C) total L 697, dL and %L (in parentheses): P-1 32 (4.6); P-2 161 (23.1); P-3 213 (30.6); P-4 250 (35.9); P-5 41 (5.8). IV-Leg: 102-142-210-292-295-250 = 1291.

Female: Idiosoma L/W 962/770, genital field W 192, genital valves L 208, L Ac-1-3 58-60-53 (figure 1D). Capitulum L 212, chelicera L 287, basal segment L 212, claw L 75, L ratio chelicerae basal segment/claw 2.83; palp total L 603, dL and %L (in parentheses): P-1 30 (5.0); P-2 141 (23.4); P-3 175 (29.0); P-4 217 (36.0); P-5 40 (6.6). IV-Leg: 112-120-144-300-272-223 = 1171.

Remarks: *Sperchon algeriensis* Lundblad, 1942 was described as a separate species previously; in subsequent studies it was assigned as a subspecies of *S. papillosus* (Thor, 1901) and by Lundblad (1956; 1962). Later on, Gerecke (1991) compared *S. algeriensis* with *S. papillosus* and *S. setiger* based on Sicilian specimens, and proposed separation of this species. *S. algeriensis* differs from *S. papillosus* with P-3 bearing two pairs of setae ventrally, total length of palp segments (male: 452-488, female: 551-726; in *S. papillosus* male: 381-426, female: 460-562), and ratio dorsal length of P-4 (%36.5-38.0; in *S. papillosus* %33.2-36.4). It differs from *S. setiger* with total length of palp and pattern of the palp. Specimens collected from Kemaliye district agree with *S. algeriensis* in the ratio dorsal length of P-4 (%35.9-36.0; in *S. papillosus* collected from Kemaliye %34.1-34.6) and P-3 bearing two pairs of setae ventrally.

Distribution: Spain (Canary Islands), Italy, Iran, Algeria (K.O. Viets, 1987; Gerecke, 1991; Pešić & Saboori, 2007). New for Turkey.

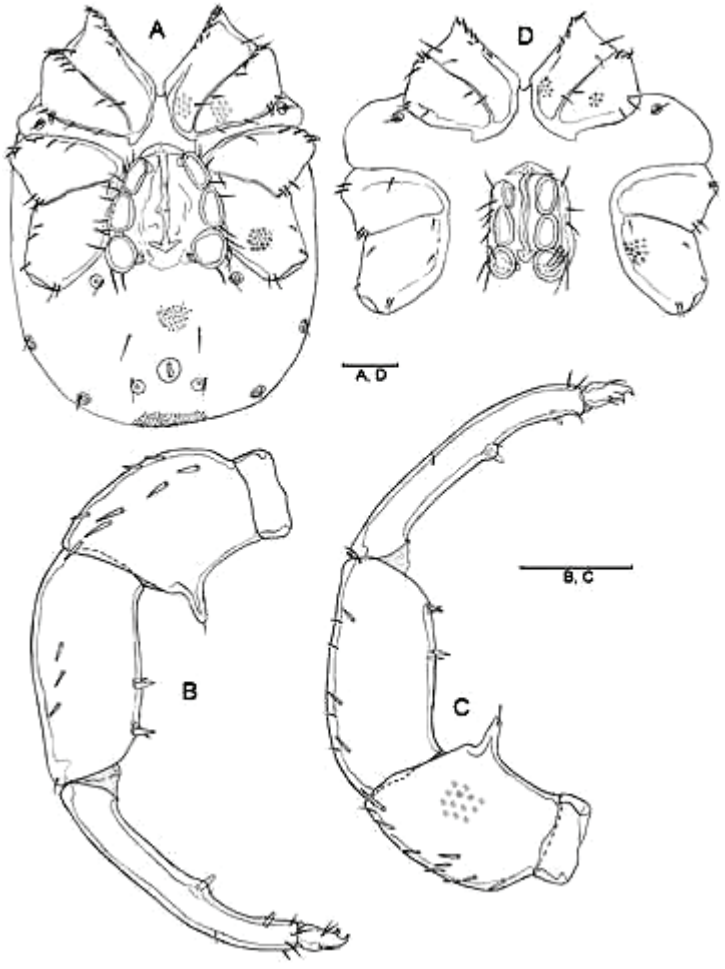

Figure 1. *Sperchon* (*Hispidosperhon*) *algeriensis* male: A = ventral view, B = palp, medial view, C = palp, lateral view, female; D = coxal and genital field (Scale bars = 100 µm).

6.3. *Sperchon* (*Hispidosperchon*) *clupeifer* Piersig, 1896: Kemaliye; Damlar, spring, 30.VI.2011, 11 ♂♂, 16 ♀♀; 08.IX.2011, 2 ♂♂; Kabataş village, stream, 07.IX.2011, ♀; Kadıgölü, spring, 29.VI.2011, 4 ♂♂, 6 ♀♀.

6.4. *Sperchon* (*Hispidosperchon*) *compactilis* (Koenike, 1911): Kemaliye; Damlar, stream, 30.VI.2011, 5 ♂♂, ♀; 08.IX.2011, 6 ♂♂, 4 ♀♀; Kabataş village, stream, 01.VII.2011, 2 ♂♂, 13 ♀♀.

6.5. *Sperchon* (*Hispidosperchon*) *denticulatus* Koenike, 1895: Kemaliye; Çit village, stream, 06.IX.2011, 5 ♀♀; Kabataş village, stream, 01.VII.2011, ♀; Kırkgöze stream, 29.VI.2011, ♀.

6.6. *Sperchon* (*Hispidosperchon*) *hispidus* Koenike, 1895: Kemaliye; Armağan village, stream, 09.IX.2011, 16 ♂♂, 21 ♀♀; Aşağı Mutlu village, stream, 09.IX.2011, 13 ♂♂, 19 ♀♀; Avcılar village, stream, 09.IX.2011, 11 ♂♂, 15 ♀♀; Damlar, spring, 30.VI.2011, ♂; 08.IX.2011, ♂, 2 ♀♀; Kabataş village, stream, 07.IX.2011, 2 ♂♂; Kadıgölü spring, 29.VI.2011, 4 ♂♂, 12 ♀♀; 07.IX.2011, 13 ♂♂, 11 ♀♀; Kırkgöze stream, 29.VI.2011, 10 ♂♂, 4 ♀♀; 06.IX.2011, 28 ♂♂, 8 ♀♀; Sırakonak village, stream, 06.IX.2011, 7 ♂♂, 2 ♀♀; 17.VII. 2012, 3 ♀♀.

6.7. *Sperchon* (*Hispidosperchon*) *papillosus* Thor, 1901: Kemaliye; Çit village, stream, 23.VII.2011, ♀; Damlar, stream, 30.VI.2011, ♂; Gözaydın village, stream, 30.VI.2011, 2 ♀♀.

6.8. *Sperchon* (*Hispidosperchon*) *senguni* Oezkan, 1982: Kemaliye; Çit village, stream, 06.IX.2011, ♀; Kırkgöze, stream, 06.IX.2011, ♂, ♀.

6.9. *Sperchon* (*Hispidosperchon*) *tarnogradskii* Sokolow, 1927: Kemaliye; Çit village, stream, 02.VII.2011, ♀; Kırkgöze, stream, 29.VI.2011, ♂; Sırakonak village, stream, 06.IX.2011, ♀.

6.10. *Sperchonopsis verrucosa* (Protz, 1896): Kemaliye; Armağan village, stream, 09.IX.2011, 5 ♂♂, 3 ♀♀; Avcılar village, stream, 09.IX.2011, 3 ♂♂, 2 ♀♀; Çit village, stream, 02.VII.2011, 9 ♂♂, 7 ♀♀; 23.VII.2011, ♀; Kabataş village, stream, 01.VII.2011, ♀; 07.IX.2011, ♂, 3 ♀♀; Kırkgöze, spring, 01.VII.2011, ♀; Yeşilyurt village, stream, 29.VI.2011, ♀.

7. Teutoniidae Koenike, 1910

7.1. *Limnolegeria longiseta* Motaş, 1928: Kemaliye; Kabataş village, stream, 01.VII.2011, 2 ♂♂; 07.IX.2011, ♂, 2 ♀♀.

8. Anisitsiellidae Koenike, 1910

8.1. *Nilotonia* (*Dartiella*) *turcica* Özkan & Soysal, 1989: Kemaliye; Damlar, spring, 30.VI.2011, ♂, 5 ♀♀.

8.2. *Nilotonia* (*Manotonia*) *tegulata* (Viets, 1951): Kemaliye; Damlar, spring, 30.VI.2011, 2 ♀♀.

9. Lebertiidae Thor, 1900

9.1. *Lebertia* (s.str.) *fimbriata* Thor, 1899: Kemaliye; Çit village, stream, 02.VII.2011, ♂; 06.IX.2011, ♂.

9.2. *Lebertia* (s.str.) *glabra* Thor, 1897: Kemaliye; Çit village, stream, 02.VII.2011, 6 ♂♂; 06.IX.2011, ♂; Damlar, stream, 08.IX.2011, 2 ♂♂; village, stream, 07.IX.2011, 2 ♂♂, 2 ♀♀; Kabataş Kadıgölü, spring, 29.VI.2011, 19 ♀♀; 07.IX.2011, 6 ♀♀; Sırakonak village, stream, 23.VII.2011, ♀; 06.IX.2011, 4 ♀♀; 02.VII.2011, 2 ♂♂, ♀; 17.VII. 2012, 8 ♂♂, 12 ♀♀; Yaka village, stream, 01.VII.2011, 3 ♂♂.

9.3. *Lebertia* (s.str.) *maculosa* Koenike, 1902: Kemaliye; Armağan village, stream, 09.IX.2011, 8 ♂♂, 16 ♀♀; Çit village, stream, 02.VII.2011, ♂, ♀; Damlar, stream, 30.VI.2011, ♂, ♀; Kabataş village, stream, 01.VII.2011, ♀; Sırakonak village, stream, 02.VII.2011, ♂; Yaka village, stream, 01.VII.2011, ♀; Yeşilyurt village, stream, 29.VI.2011, ♂.

9.4. *Lebertia* (s.str.) *rivulorum* K. Viets, 1933: Kemaliye; Çit village, stream, 06.IX.2011, ♀.

Description. Female: Integument smooth, with fine lines, idiosoma L/W 918/770; Cx-I/II mL 158/144 (ratio 1.1), posterior margin of Cx-II W 34; genital field W 152, genital flap L 194, Ac-1-3 58-54-50. Capitulum L 247, chelicera L 282; P-3 with dorsal setae separated and mediodistal seta nearly in centre of distal margin (figure 2A), P-4 distally distinctly narrowed; palp total L 405, dL of palp segments: P-1 40, P-2 100, P-3 102, P-4 128, P-5 35. Swimming setae on leg: III-L-5 with 3, IV-L-4 without swimming setae, IV-L-5 with 4 swimming setae, IV-L-6 with 2 minute ventral setae (figure 2B). IV-L-4-6: 220-267-263.

Remarks: *Lebertia rivulorum* can be easily distinguished from other species of the genus due to the number and arrangement of swimming setae. II-IV-L-4 are without swimming setae and IV-L-5 bearing 4-5 swimming setae. Furthermore, in shape and setation of the palp, *L. rivulorum* is similar to *L. maglioi*, a species distinguished by the broad posterior margin of Cx-II and the presence of only one, shortened, swimming seta on III/IV-L-5 (Gerecke, 2009). One female specimen collected from Kemaliye district agrees with *L. rivulorum* in the arrangement of the swimming setae, and shape and setation of the palp segments. The difference found in the shorter swimming setae (slightly exceeding 50% length of next segment) and II-L-5 without swimming setae.

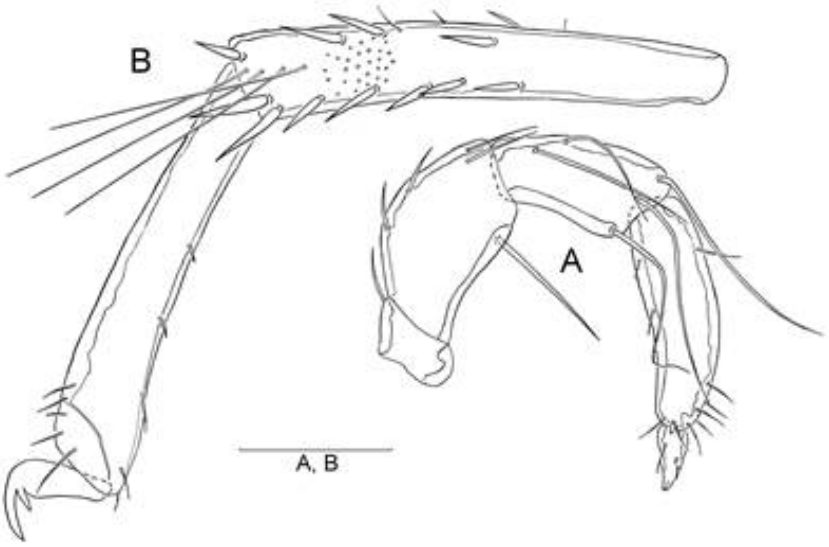

Figure 2. *Lebertia* (s.str.) *rivulorum* female: A = palp, medial view, B = IV-L-5-6 (scale bar = 100 µm).

Distribution: Germany, Belgium, the Netherlands, Spain, Italy, France, Estonia and Caucasus (Gerecke, 2009). New for Turkey.

9.5. *Lebertia* (*Pilolebertia*) *longiseta* Bader, 1955: Kemaliye; Çit village, stream, 02.VII.2011, ♀; 23.VII.2011, ♀; 06.IX.2011, ♀.

9.6. *Lebertia* (*Brentalebertia*) *anatolica* Esen & Dilkaraoğlu, 2013: Kemaliye; Sırakonak village, stream, 06.IX.2011, ♂, ♀.

10. Torrenticolidae Piersig, 1902

10.1. *Monatractides* (s.str.) *lusitanicus* (Lundblad, 1941): Kemaliye; Çit village, stream, 06.IX.2011, ♀; 02.VII.2011, ♀; Damlar, stream, 08.IX.2011, 2 ♂♂, 3 ♀♀; Gözaydın village, stream, 30.VI.2011, ♂, ♀; Reyhan stream, 30.VI.2011, 2 ♂♂, 4 ♀♀.

10.2. *Monatractides* (s.str.) *stadleri* (Walter, 1921): Kemaliye; Avcılar village, stream, 09.IX.2011, ♂; Çit village, stream, 06.IX.2011, 12 ♂♂, 9 ♀♀; 02.VII.2011, 22 ♂♂, 29 ♀♀; 23.VII.2011, 2 ♂♂, 7 ♀♀; 24.VII.2011, 19 ♂♂, 32 ♀♀; Damlar, stream, 30.VI.2011, ♂, ♀; 08.IX.2011, 4 ♂♂, 5 ♀♀; Gözaydın village, stream, 30.VI.2011, 2 ♀♀; Kabataş village, stream, 07.IX.2011, 28 ♂♂, 12 ♀♀; 01.VII.2011, 5 ♂♂, 6 ♀♀; Yeşilyurt village, stream, 29.IX.2011, 3 ♂♂, 4 ♀♀; 06.IX.2011, 10 ♂♂, 6 ♀♀.

10.3. *Torrenticola* (s.str.) *barsica* (Szalay, 1933): Kemaliye; Çit village, stream, 06.IX.2011, ♀; 24.VII.2011, 2 ♀♀; Sırakonak village, stream, 02.VII.2011, ♂.

10.4. *Torrenticola* (s.str.) *brevirostris* (Halbert, 1911): Kemaliye; Çit village, stream, 06.IX.2011, 4 ♂♂; Gözaydın village, stream, 30.VI.2011, 2 ♀♀; 23.VII.2011, ♀; 02.VII.2011, 3 ♂♂, 4 ♀♀; Kabataş village, stream, 07.IX.2011, 3 ♀♀; Yeşilyurt village, stream, 29.VI.2011, 2 ♀♀.

10.5. *Torrenticola* (s.str.) *ungeri* (Szalay, 1927): Kemaliye; Çit village, stream, 06.IX.2011, 2 ♂♂, 2 ♀♀.

10.6. *Torrenticola* (*Megapalpis*) *jasminae* Bader, 1988: Kemaliye; Çit village, stream, 02.VII.2011, ♀; Kabataş village, stream, 01.VII.2011, ♀; Yeşilyurt village, stream, 29.VI.2011, ♀.

11. Limnesiidae Thor, 1900

11.1. *Limnesia* (s.str.) *fulgida* Koch, 1836: Kemaliye; Ağıl village, Lake Kocahaydar, 08.IX.2011, 11 ♂♂, 4 ♀♀; Kabataş village, Lake Acıkavaklık, 01.VII.2011, ♂; 07.IX.2011, 8 ♂♂, 4 ♀♀; Sarıçiçek Plateau, Lake Subatan, 08.IX.2011, ♂, ♀.

12. Hygrobatidae Koch, 1842

12.1. *Atractides* (s.str.) *dentipalpis* (Walter, 1935): Kemaliye; Kırkgöze, stream, 29.VI.2011, 2 ♀♀; Damlar, stream, 30.VI.2011, ♀; 08.IX.2011, ♀.

12.2. *Atractides* (s.str.) *fluviatilis* (Szalay, 1929): Kemaliye; Yeşilyurt village, stream, 29.VI.2011, ♂, ♀; Kabataş village, stream, 07.IX.2011, 2 ♂♂, ♀.

12.3. *Atractides* (s.str.) *fonticolus* (K. Viets, 1920): Kemaliye; Çit village, stream, 06.IX.2011, ♀; Damlar, spring, 30.VI.2011, ♂, 2 ♀♀; 08.IX.2011, 6 ♂♂, 12 ♀♀; Kabataş village, stream, 07.IX.2011, 2 ♀♀.

12.4. *Atractides* (s.str.) *gibberipalpis* Piersig, 1898: Kemaliye; Aşağı Mutlu village, stream, 09.IX.2011, ♂, ♀; Avcılar village, stream, 09.IX.2011, 14 ♂♂, 15 ♀♀; Damlar, stream, 08.IX.2011, 2 ♂♂, 2 ♀♀; Kabataş village, stream, 07.IX.2011, 3 ♂♂, 11 ♀♀; Kırkgöze stream, 06.IX.2011, 16 ♂♂, 34 ♀♀; Sırakonak village, stream, 06.IX.2011, 10 ♂♂, 16 ♀♀; Yeşilyurt village, stream, 06.IX.2011, ♂, ♀;.

12.5. *Atractides* (s.str.) *glandulosus* (Walter, 1918): Kemaliye; Kabataş village, stream, 07.IX.2011, ♂.

Description. Male: Dorsal integument striated; dorsum without shield and muscle attachment plates, idiosoma L/W 552/450; coxal field L 320, Cx-I+II mL 120 (figure 3A): Cx-IV with extended caudal and lateral border of secondary sclerotization including the anterior half of Vgl-3; palp total L 218, dL of palp segments: P-1 30, P-2 49, P-3 48, P-4 64, P-5 27; P-2 strongly developed ventrodistal protrusion, P-3 ventral margin straight; P-4 ventral margin 2 - 1- 1, sword seta near the proximoventral hair (figure 3B); excretory pore unsclerotized; Vgl-1 not fused to Vgl-2; genital field L/W 123/150, Ac relatively large, in triangular position, L Ac-1-3 44-48-56; anterior margin convex, posterior margin medially indented. I-L (figure 3C): I-L-5 S-1 and -2 close together, distance 20, S-1 slender, slightly curved, S-2 shorter and thicker, S-1 L 82, S-2 L 60; I-L-6 weakly curved, basally thick, distally equally narrowed. I-L-5-6 dorsal lenght: 154-118, I-L-5 ventral lenght 99, central height 60.

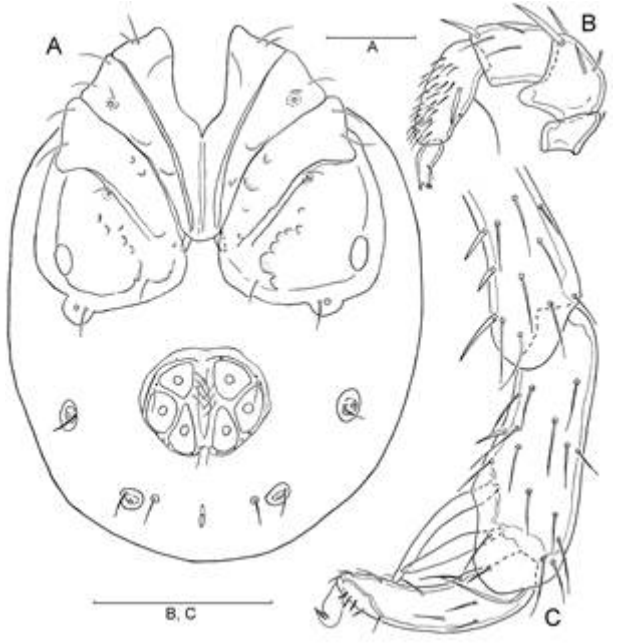

Figure 3. *Atractides* (s.str.) *glandulosus* male: A = idiosoma ventral view, B = palp, medial view, C = I-L-5-6 (scale bars = 100 µm).

Remarks: Due to the Cx-IV extended to the secondary sclerotization including Vgl-3, Ac-3 longish, P-2 protruding ventrodistal protrusion, I-L-5 thickened, S-1 slightly curved and I-L-6 basally thick, distally narrowed, one male specimen collected from Kemaliye district show general conformity with *Atractides* (s.str.) *glandulosus* (Walter, 1918). Differences found in the bigger dimensions (in holotype L 440),

shorter total L of palp (in holotype 302) and P-2 with slightly finger-like ventrodistal protrusion (Gerecke, 2003). In view of the good agreement of other features, these differences are most probably age-dependant or due to geographical variability.

Distribution: Switzerland, France and Austria (Viets, 1956; Smit & Gerecke, 2010). New for Turkey.

12.6. *Atractides* (s.str.) *graecus* K. Viets, 1950: Kemaliye; Has stream, 29.VI.2011, ♀; Kırkgöze, spring, 01.VII.2011, ♀; Yaka village, stream, 01.VII.2011, ♀.

12.7. *Atractides* (s.str.) *nahavandii* Schwoerbel & Sepasgozarian, 1976: Kemaliye; Armağan village, stream, 09.IX.2011, ♂, 2 ♀♀; Aşağı Mutlu village, spring, 09.IX.2011, ♂; Avcılar village, stream, 09.IX.2011, 2 ♂♂, 10 ♀♀; Kırkgöze, stream, 06.IX.2011, ♂, 2 ♀♀; Sırakonak village, stream, 06.IX.2011, 4 ♂♂, ♀.

Description. Male: Integument finely striated, idiosoma L/W 423/282; Coxal field L 247, Cx-I+II mL 100; anterior margin of genital field convex, genital field L/W 92/108, Ac-1-3 L 37-34-38; excretory pore smooth, Vgl-1 not fused to Vgl-2 (figure 4A). Capitulum L 100, chelicera L 124; palp (figure 4B) total L 212, dL of palp segments: P-1 24, P-2 49, P-3 50, P-4 64, P-5 25, sword seta near proximoventral hair; I-L-5-6 (figure 4C): 102-91 (ratio I-L-5/6 1.12); I-L-5 ventral L 77, central height 40, S-1 L 51, S-2 L 48, very close to each other, I-L-6 stout, distally thickened, in the center narrowed.

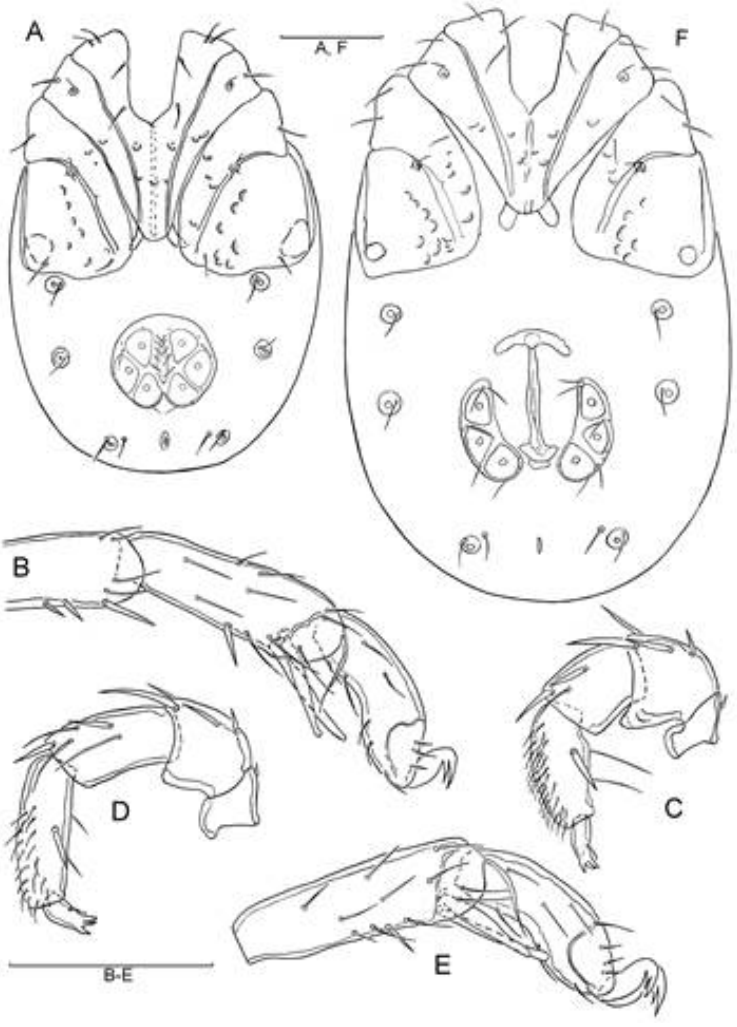

Figure 4. *Atractides* (s.str.) *nahavandii* male: A = idiosoma ventral view, B = palp, medial view, C = I-L-5-6, female: D = idiosoma ventral view, E = palp medial view, F = I-L-5-6 (scale bars = 100 µm).

Female: Dorsally the integument is finely striated, idiosoma L/W 592/440; coxal field L 257, Cx-I+II mL 108, genital field W 152, genital plate 110 (figure 4D); capitulum L 184, chelicera L 247; palp (figure 4E) total L 244, dL of palp segments: P-1 29, P-2 53, P-3 64, P-4 72, P-5 26, sword seta inserted halfway beetween ventral hairs. I-L-5-6 (figure 5F) dorsal length: 127-108 (ratio I-L-5/6 1.17); I-L-5 ventral L 94, central height 41, S-1 L 60, S-2 L 54, very close to each other, I-L-6 stout, distally thickened, in the center narrowed.

Remarks: *Atractides* (s.str.) *nahavandii* Schwoerbel & Sepasgozarian, 1976, can be easly distinguished by the homoiomorphic I-L-5-6, in the combination of a rather short, thickened I-L-6, relatively short and little distant setae S-1/2, a weakly developed ventrodistal projection of P-2 in both sexes (Pešić et al., 2004). According to above mentioned features, specimens collected from Kemaliye district are in general agreement with *A. nahavandii*. Differences were found in the P-2 strongly developed ventrodistal projection, bigger Ac (in holotype 24-23-29) and nearly in equal length Ac-1-3.

This record shows that *A. nahavandii*, to date known only from the *locus typicus*, probably has a wider distribution area in the Palaeartic region.

Distribution: Iran (Pešić et al., 2004). New for Turkey.

12.8. *Atractides* (s.str.) *nodipalpis* Thor, 1899: Kemaliye; Avcılar village, stream, 09.IX.2011, 3 ♂♂; Çit village, stream, 23.VII.2011, ♀; Gözaydın village, stream, 30.VI.2011, ♀.

12.9. *Atractides* (s.str.) *panniculatus* (K. Viets, 1925): Kemaliye; Damlar spring, 30.VI.2011, ♂, 5 ♀♀; 08.IX.2011, ♂; Has stream, 29.VI.2011, ♀; Kabataş village, stream, 01.VII.2011, 2 ♀♀; Kadıgölü spring, 29.VI.2011, ♀; 07.IX.2011, 2 ♀♀; Kırkgöze stream, 29.VI.2011, ♀; 06.IX.2011, 2 ♀♀; Sırakonak village, stream, 06.IX.2011, 2 ♀♀; 02.VII.2011, 2 ♂♂, 5 ♀♀; 17.VII. 2012, ♂, 7 ♀♀.

12.10. *Atractides* (s.str.) *protendens* K. O. Viets, 1955: Kemaliye; Has stream, 29.VI.2011, ♀.

Description. Female: Integument lineated, idiosoma L/W 705/538; coxal field L 345, Cx-I+II mL 120, genital field W 205, genital plate L 146 (figure 5A); capitulum L 158, chelicera L 184; palp (figure 5B) total L 333, dL of palp segments: P-1 32, P-2 72, P-3 86, P-4 110, P-5 33, sword seta between ventral hairs but approached to distoventral hair; I-L-5-6 (figure 5C) dorsal lenght: 186-148 (ratio I-L-5/6 1.26), I-L-5 ventral L 136, central height 49; S-1 L 71, S-2 L 69, S-1 and -2 close to each other, distance 9, I-L-6 stout and weakly curved.

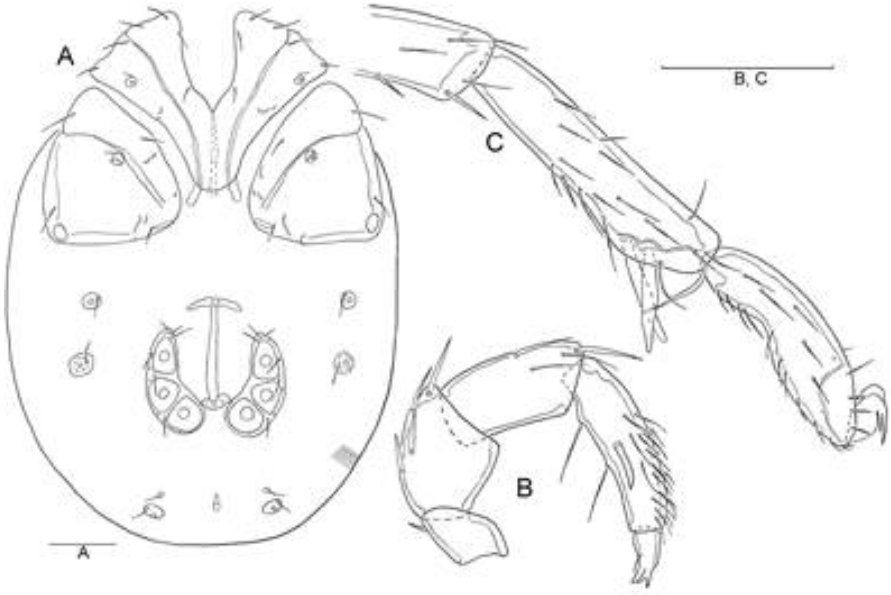

Figure 5. *Atractides* (s.str.) *protendens* female; A = idiosoma ventral view, B = Palp, medial view, C = I-L-5-6 (scale bars = 100 µm).

Remarks: *A. protendens* is unique among all species with lineated integument in the combination of a rather short I-L-5, and as a consequence L ratio I-L-5/6 < 1.20, a thickened I-L-6, short S-1 and -2, equal in shape, and narrow setal interspace (Gerecke, 2003). One female specimen collected from Kemaliye district has longer I-L-5 (ratio I-L-5/6 1.26, in paratype 1.13). We think, there is a mistake in the measurements of dorsal length I-L-5-6. From the drawings (Gerecke, 2003), ratio I-L-5/6 is 1.30 and this ratio is relatively bigger than ratio mentioned (<1.20) in the text. Therefore, the variability of dorsal length of I-L-5-6 should be clarified from type specimens. In other diagnostic features, our specimen completely agrees with *A. protendens*.

The record from Gönen Plateau (Isparta Province), based on female specimens, remains doubtful because of the different features and measurements (Boyacı et al., 2010). They stated that in females Vgl-1 fused to Vgl-2 and dorsal length of I-L-5-6: 240-205, and in the next sentence, dorsal length of I-L-5 was given as 170.

Distribution: Germany, Austria, Italy, Switzerland, Montenegro, Serbia and Greece (Gerecke, 2003; Pešić et al., 2010). New for Turkey.

12.11. *Atractides* (s.str.) *remotus* Szalay, 1953: Kemaliye; Kabataş village, stream, 07.IX.2011, 3 ♂♂.

12.12. *Atractides* (s.str.) *robustus* (Sokolow, 1940): Kemaliye; Armağan village, stream, 09.IX.2011, 6 ♂♂, 7 ♀♀; Avcılar village, stream, 09.IX.2011, 12 ♂♂, 15 ♀♀; Çit village, stream, 06.IX.2011, 4 ♀♀; 02.VII.2011, 2 ♂♂; Gözaydın village, stream, 30.VI.2011, 7 ♂♂, 19 ♀♀; Has stream, 29.VI.2011, ♀; Kabataş village, stream, 01.VII.2011, 4 ♂♂, ♀; Reyhan stream, 30.VI.2011, ♂, 5 ♀♀; 07.IX.2011, ♂; Yaka village, stream, 01.VII.2011, 9 ♂♂, 12 ♀♀.

12.13. *Atractides* (*Tympanomegapus*) *acutirostris* (Motaş & Angelier, 1927): Kemaliye; Reyhan stream, 30.VI.2011, ♀.

12.14. *Hygrobates* (s.str.) *fluviatilis* (Ström, 1768): Kemaliye; Çit village, stream, 06.IX.2011, ♂; 02.VII.2011, ♀; 23.VII.2011, ♀; Yaka village, stream, 01.VII.2011, ♂, ♀.

13. Feltriidae K. Viets, 1926

13.1. *Feltria* (s.str.) *armata* Koenike, 1902: Kemaliye; Avcılar village, stream, 09.IX.2011, ♀.

13.2. *Feltria* (*Feltriella*) *rubra* Piersig, 1898: Kemaliye; Aşağı Mutlu village, spring, 09.IX.2011, 4 ♂♂, 16 ♀♀; Kadıgölü, spring, 07.IX.2011, ♀.

14. Pionidae Thor, 1900

14.1. *Piona* (s.str.) *carnea* (Koch, 1836): Kemaliye; Kabataş village, Lake Acıkavaklık, 07.IX.2011, 11 ♂♂, ♀.

14.2. *Piona* (*Dispersipiona*) *conglobata* (Koch, 1836): Kemaliye; Sarıçiçek Plateau, Lake Subatan, 30.VI.2011, ♂, 22 ♀♀; 08.IX.2011, 18 ♀♀.

15. Aturidae Thor, 1900

15.1. *Aturus* (s.str.) *crinitus* Thor, 1902: Kemaliye; Armağan village, stream, 09.IX.2011, ♀; Sırakonak village, stream, 06.IX.2011, ♂, 3 ♀♀; 17.VII.2012, 2 ♂♂, ♀; Yeşilyurt village, stream, 29.VI.2011, ♀.

15.2. *Aturus* (s.str.) *intermedius* Protz, 1900: Kemaliye; Armağan village, stream, 09.IX.2011, 2 ♂♂, 2 ♀♀; Çit village, stream, 06.IX.2011, ♀; Sırakonak village, stream, 17.VII. 2012, ♀.

15.3. *Aturus* (s.str.) *scaber* Kramer, 1875: Kemaliye; Armağan village, stream, 09.IX.2011, ♂, 3 ♀♀.

15.4. *Kongsbergia* (s.str.) *materna* Thor, 1899: Kemaliye; Armağan village, stream, 09.IX.2011, 4 ♂♂, 35 ♀♀; Avcılar village, stream, 09.IX.2011, ♂, 3 ♀♀; Çit village, stream, 02.VII.2011, ♀; Kabataş village, stream, 07.IX.2011, 2 ♀♀; Kadıgölü, spring, 29.VI.2011, 2 ♂♂, 2 ♀♀; 07.IX.2011, ♂, 10 ♀♀; Kırkgöze, stream, 06.IX.2011, 2 ♂♂, 8 ♀♀; Sırakonak village, stream, 02.VII.2011, ♂, 3 ♀♀; 06.IX.2011, 7 ♂♂, 16 ♀♀; 07.IX.2011, 3 ♂♂, 5 ♀♀.

15.5. *Brachypoda* (*Hemibrachypoda*) *orientalis* Pešić & Esen, 2013 **:** Kemaliye; Yeşilyurt village, stream, 29.VI.2011, ♀; 06.IX.2011, 4 ♂♂, ♀; Kabataş village, stream, 01.VII.2011, 6 ♂♂, 19 ♀♀, 4 deutonymph; 07.IX.2011, 3 ♂♂, 5 ♀♀.

Description. Deutonymph: Idiosoma rounded, L/W 313-362/291-318, dorsum with a large plate (figure 6A) L/W 200-232/162-170, coxae in 2 groups (figure 6B), coxal field lenght 220-230; gnatozoma L 80-84, chelicera 118-120, palp (figure 6C) total L 168-180, dL of palp segments: P-1 24-26, P-2 40-42, P-3 22-25, P-4 58-60, P-5 24-27; P-2 distoventrally with a small protrusion; genital plates separated and each with two acetabula; excretory pore smooth and extending beyond posterior margin; number of swimming setae on legs: II-L-5 2, II-L-5 3, IV-L-5 2-3.

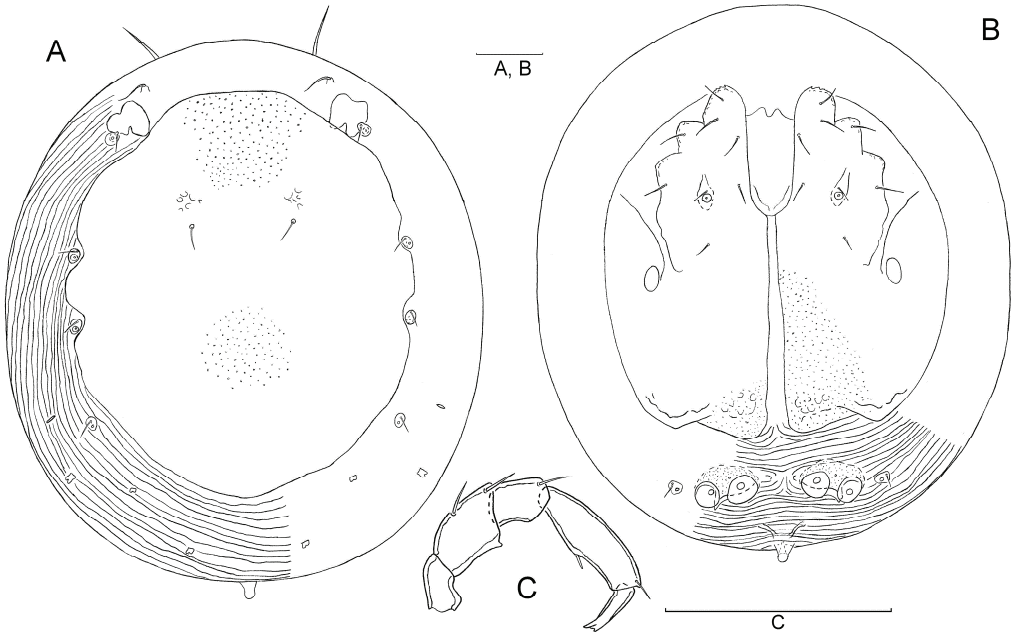

Figure 6. *Brachypoda* (*Hemibrachypoda*) *orientalis* deutonymph: A = idiosoma, dorsal view, B = idiosoma, ventral view, C = palp, medial veiw (scale bars = 100 µm).

Remarks: So far, the description of the deutonymph of *B*. (*Hemibrachypoda*) *orientalis* has not been published. Therefore, the description based on the deutonymph from Kemaliye district is presented for the first time.

Distribution: Caucasus, Turkey (Tuzovskij, 1978; Boyacı & Özkan, 2004; Pešić et al., 2006).

15.6. *Ljania bipapillata* Thor, 1898: Kemaliye; Sırakonak village, stream, 17.VII. 2012, ♀; Yeşilyurt village, stream, 07.IX.2011, 2 ♀♀.

16. Mideopsidae Koenike, 1910

16.1. *Mideopsis* (s.str.) *orbicularis* (Müller, 1776): Kemaliye; Çit village, stream, 02.VII.2011, ♀; Kabataş village, stream, 07.IX.2011, ♂; Yeşilyurt village, stream, 06.IX.2011, 2 ♂♂.

17. Arrenuridae Thor, 1900

17.1. *Arrenurus* (s.str.) *bicuspidator* Berlese, 1885: Kemaliye; Kabataş village, Lake Acıkavaklık, 07.IX.2011, ♂.

17.2. *Arrenurus* (s.str.) *bruzelii* Koenike, 1885: Kemaliye; Ağıl village, Lake Kocahaydar, 08.IX.2011, 44 ♂♂, 20 ♀♀; Kabataş village, Lake Acıkavaklık, 07.IX.2011, 5 ♂♂, 17 ♀♀; Sarıçiçek Plateau, Lake Subatan, 08.IX.2011, 2 ♂♂, ♀.

17.3. *Arrenurus* (s.str.) *claviger* Koenike, 1885: Kemaliye; Kabataş village, Lake Acıkavaklık, 07.IX.2011, 5 ♂♂, 3 ♀♀.

17.4. *Arrenurus* (s.str.) *cuspidator* (Müller, 1776): Kemaliye; Ağıl village, Lake Kocahaydar, 8.IX.2011, 54 ♂♂, 8 ♀♀; Kabataş village, Lake Acıkavaklık, 07.IX.2011, 2 ♂♂; Sarıçiçek Plateau, Lake Subatan, 08.IX.2011, 8 ♂♂, 7 ♀♀.

17.5. *Arrenurus* (s.str.) *cuspidifer* Piersig, 1894: Kemaliye; Sarıçiçek Plateau, Lake Subatan, 08.IX.2011, ♂.

17.6. *Arrenurus* (s.str.) *demirsoyi* Erman, 1993: Kemaliye; Damlar, stream, 30.VI.2011, ♀; 08.IX.2011, 2 ♂♂.

17.7. *Arrenurus* (s.str.) *distans* Walter, 1927: Kemaliye; Ağıl village, Lake Kocahaydar, 08.IX.2011, 3 ♂♂, 3 ♀♀; Sarıçiçek Plateau, Lake Subatan, 08.IX.2011, 5 ♂♂, 5♀♀.

17.8. *Arrenurus* (s.str.) *oezkani* Smit & Erman, 2003: Kemaliye; Ağıl village, Lake Kocahaydar, 08.IX.2011, 47 ♂♂; Kabataş village, Lake Acıkavaklık, 01.VII.2011, ♂, 19 ♀♀; 07.IX.2011, 15 ♂♂, 127 ♀♀; Sarıçiçek Plateau, Lake Subatan, 08.IX.2011, 3 ♂♂, 5 ♀♀.

17.9. *Arrenurus* (s.str.) *robustus* Koenike, 1894: Kemaliye; Sarıçiçek Plateau, Lake Subatan, 08.IX.2011, ♂.

17.10. *Arrenurus* (s.str.) *virens* Neuman, 1880: Kemaliye; Ağıl village, Lake Kocahaydar, 08.IX.2011, 5 ♂♂, 3 ♀♀.

17.11. *Arrenurus* (*Megaluracarus*) *globator* (Müller, 1776): Kemaliye; Kabataş village, Lake Acıkavaklık, 01.VII.2011, 5 ♀♀; 07.IX.2011, ♂, 11 ♀♀.

17.12. *Arrenurus* (*Micruracarus*) *bipapillosus* Halbert, 1911: Kemaliye; Kabataş village, stream, 07.IX.2011, ♂, 3 ♀♀.

17.13. *Arrenurus* (*Micruracarus*) *forpicatus* Neuman, 1880: Kemaliye; Kabataş village, Lake Acıkavaklık, 01.VII.2011, ♂, 8 ♀♀; 07.IX.2011, 17 ♂♂, 46 ♀♀.

17.14. *Arrenurus* (*Truncaturus*) *fontinalis* Viets, 1920: Kemaliye; Damlar, spring, 30.VI.2011, 3 ♀♀; 08.IX.2011, ♀; Kabataş village, stream, 01.VII.2011, ♀.

Conclusions

In Kemaliye district (Erzincan Province), water mites were collected in 2011–2012. Seventy six species (Acari, Hydrachnidia) were systematically assigned to 17 families and 25 genera . The 76 species of water mites were identified represent 28.57% of the 266 (according to latest publications) species reported from Turkey. We assert that the species number of Hydrachnidia in Kemaliye district is high on the basis that Kemaliye district, with a surface area of 1168 km^2, represents only 0.14% of the total area of Turkey.

In the present study, all identified species are new for Kemaliye district, 74 species are recorded for the first time for Erzincan Province, except *Arrenurus* (*Micruracarus*) *forpicatus* Neuman, 1880 and *Arrenurus* (s.str.) *robustus* Koenike, 1894, and 5 are new records for the fauna of Turkey.

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