

A Faunistic Study of Polyphaga (Helophoridae ve Hydrophilidae) Families in Erzurum Swamps, Turkey

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Abstract

In this study, the specimens belonging to the Helophoridae and Hydrophilidae collected from Erzurum Swamps have been evaluated. The specimens have been collected between May 2016-October 2017. Important taxonomic characters of the described species have been photographed, Turkey and worldwide distribution are presented together.

In the research area, a total of 15 taxa, 8 species belonging to Helophoridae and 7 species belonging to Hydrophilidae, were determined.

Keywords: Helophoridae; Hydrophilidae; Systematics; Fauna; Erzurum Swamps; Turkey.

1. Introduction

The Helophoridae family represented by about 201 species on earth, has a wide distribution area [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18]. 156 species were recorded from the Palearctic region [8, 9, 12], 41 species from the Nearctic region [15, 17] and only 4 from the Ethiopian region [12]. 51 species have been identified from Turkey [19].

The Hydrophilidae family has 172 genera and 2932 species spread on earth [20, 21, 22]. 100 species and 3 subspecies identified from our country have generally similar characteristics with Asian fauna [20, 21, 22].

2. Materials and Methods

Erzurum Marshes selected for the study area is one of the 198 wetlands of international importance in Turkey. This marsh, which is spread over a large area, is an important wetland (KBA) status, as well as an internationally important wetland under the Ramsar Convention and is among the priority areas under the national legislation [23].

Samples were collected from various localities in Erzurum Marshes, taking into account biotopes and

seasons. Adults of our samples are generally encountered from early May to late October. For this reason, samples were collected between May-October 2016 and 2017 using a sieve with a pore diameter of two millimeters.

Samples collected from the study area were brought to the laboratory by killing them with ethyl acetate. Slime and mud on it were cleaned with a watercolor brush. Our samples were separated according to their sizes, then the larger ones were pinned on the peat, while the smaller ones were dried in a petri dish and stored in small storage bottles.

Samples kept previously in storage bottles were taken into the humidification container for 1-2 days, and then the aedeagophores of the softened samples were removed under a stereo microscope using dissection needles.

The muscle tissues of aedeagophores, which were kept in 10% KOH solution for 1-2 hours, were cleaned around the structure of the kit. The cleaned aedeagophores were taken in a drop of glycerin on the slide. Aedeagofores were measured under a Nikon SMZ1500 stereo microscope.

3. Results and Discussion

Helophoridae

Helophorus (*Transithelophorus*) *terminassianae* Angus, 1984 (Figure 3. a1, b1)

Material examined: B1, 5♂, 4♀.

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Distribution in Turkey: Çorum, Erzurum, İzmir, Konya, Samsun, Tokat [11, 12, 24, 25, 26, 27].

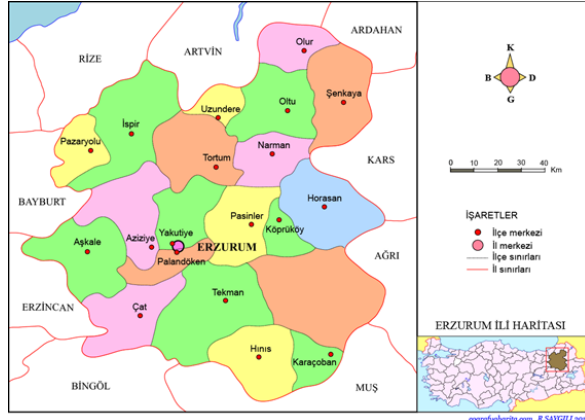


Figure 1. Map of the research area.



Figure 2. Satellite view of Erzurum Marshes.

Helophorus aquaticus (Linnaeus, 1758) (Figure 3. a2, b2)

Material examined: B1, 5♂, 1♀.

Distribution in Turkey: Adana, Adiyaman, Afyon, Aksaray, Ankara, Aydın, Batman, Bayburt, Bilecik, Bingöl, Bolu, Burdur, Bursa, Çorum, Denizli, Diyarbakır, Elazığ, Erzurum, Giresun, Gümüşhane, Hakkâri, Isparta, İstanbul, Kahramanmaraş, Kars, Kastamonu, Kayseri, Kırklareli, Kütahya, Mardin, Mersin, Muş, Ordu, Sakarya, Samsun, Sinop, Şanlıurfa, Şırnak, Uşak, Van [22, 25, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40].

Helophorus brevipalpis Bedel, 1881 (Figure 3. a3, b3)

Material examined: B1, 5♂, 2♀; B2, 3♂, 1♀; B3, 4♂, 2♀; B4, 5♂, 1♀; B5, 4♂, 3♀.

Distribution in Turkey: Adiyaman, Afyon, Aksaray, Ankara, Antalya, Artvin, Aydın, Balıkesir, Batman, Bayburt, Burdur, Bursa, Çorum, Denizli, Diyarbakır, Erzincan, Erzurum, Giresun, Gümüşhane, Isparta, İstanbul, İzmir, Kahramanmaraş, Kars, Kayseri, Kırklareli, Kütahya, Manisa, Muğla, Niğde, Ordu, Samsun, Sinop, Şanlıurfa, Trabzon, Uşak, Van [19, 22, 25, 27, 29, 30, 31, 33, 34, 35, 37, 38, 39, 40, 41, 42].

Helophorus montenegrinus Kuwert, 1885 (Figure 3. a4, b4)

Material examined: B6, 4♂, 2♀; B8, 3♂, 2♀; B1, 4♂, 1♀; B2, 5♂, 3♀; B5, 3♂, 2♀.

Distribution in Turkey: Ankara, Balıkesir, Bolu, Burdur, Bursa, Elazığ, Giresun, Isparta, Mersin, İstanbul, İzmir, Kahramanmaraş, Kastamonu, Kırklareli, Kütahya, Ordu, Samsun, Sinop, Tokat, Trabzon [19, 29, 31, 32, 33, 34, 35, 37, 38].

It is the first record from Erzurum.

Table 1. Locality number and coordinates of collected samples in Erzurum.

Locality number	Coordinates, Altitude, Date
B1	40°01'09"K 41°18'52"D, 1756 m, 19.06.2017
B2	39°58'15"K 41°17'57"D, 1748 m, 28.07.2017
B3	39°58'18"K 41°17'59"D, 1761 m, 28.07.2017
B4	39°59'23"K 41°18'20"D, 1756 m, 28.07.2017
B5	39°59'23"K 41°18'20"D, 1756 m, 26.08.2017
B6	39°59'23"K 41°18'20"D, 1753 m, 19.06.2017
B7	39°59'23"K 41°18'20"D, 1756 m, 15.10.2017
B8	39°59'21"K 41°18'19"D, 1756 m, 19.06.2017
B9	39°58'16"K 41°17'57"D, 1756 m, 15.10.2017
B10	39°58'15"K 41°17'59"D, 1756 m, 26.08.2017
B11	39°58'16"K 41°17'57"D, 1756 m, 19.06.2017
B12	39°58'17"K 41°17'59"D, 1756 m, 26.08.2017
B13	39°58'17"K 41°17'59"D, 1756 m, 15.10.2017
B14	39°58'15"K 41°17'59"D, 1756 m, 28.07.2017
B15	39°58'15"K 41°17'59"D, 1756 m, 26.08.2017
B16	39°58'15"K 41°17'59"D, 1756 m, 15.10.2017
B17	39°58'14"K 41°17'59"D, 1761 m, 28.07.2017
B18	39°58'21"K 41°18'00"D, 1762 m, 19.06.2017

Helophorus arvernensis Mulsant, 1846 (Figure 3. a5, b5)

Material examined: B5, 5♂, 2♀; B4, 4♂, 2♀; B7, 5♂, 1♀; B9, 4♂, 3♀.

Distribution in Turkey: Çorum, Diyarbakır, Erzincan, Erzurum, Gümüşhane, Kars, Kayseri, Samsun, Tokat, Van [22, 25, 27, 30, 31, 33, 42, 43].

Helophorus hilaris Sharp, 1916 (Figure 3. a6, b6)

Material examined: B8, 4♂, 4♀; B1, 3♂, 3♀.

Distribution in Turkey: Adiyaman, Aydın, Batman, Bayburt, Burdur, Diyarbakır, Elazığ, Erzincan, Erzurum, Giresun, Gümüşhane, Hakkâri, Kahramanmaraş, Kars, Kayseri, Mardin, Muş, Ordu, Samsun, Şanlıurfa, Şırnak, Tokat, Van [22, 31, 32, 33, 35, 37, 38, 39, 40, 42].

Helophorus similis Kuwert, 1887 (Figure 3. a7, b7)

Material examined: B8, 2♂, 1♀.

Distribution in Turkey: Erzincan, Erzurum, Kayseri [30, 44, 45].

Helophorus (Rhopalhelophorus) lapponicus Thomson, 1853 (Figure 3. a8, b8)

Material examined: B6, 4♂, 1♀; B8, 3♂, 2♀; B1, 3♂, 1♀.

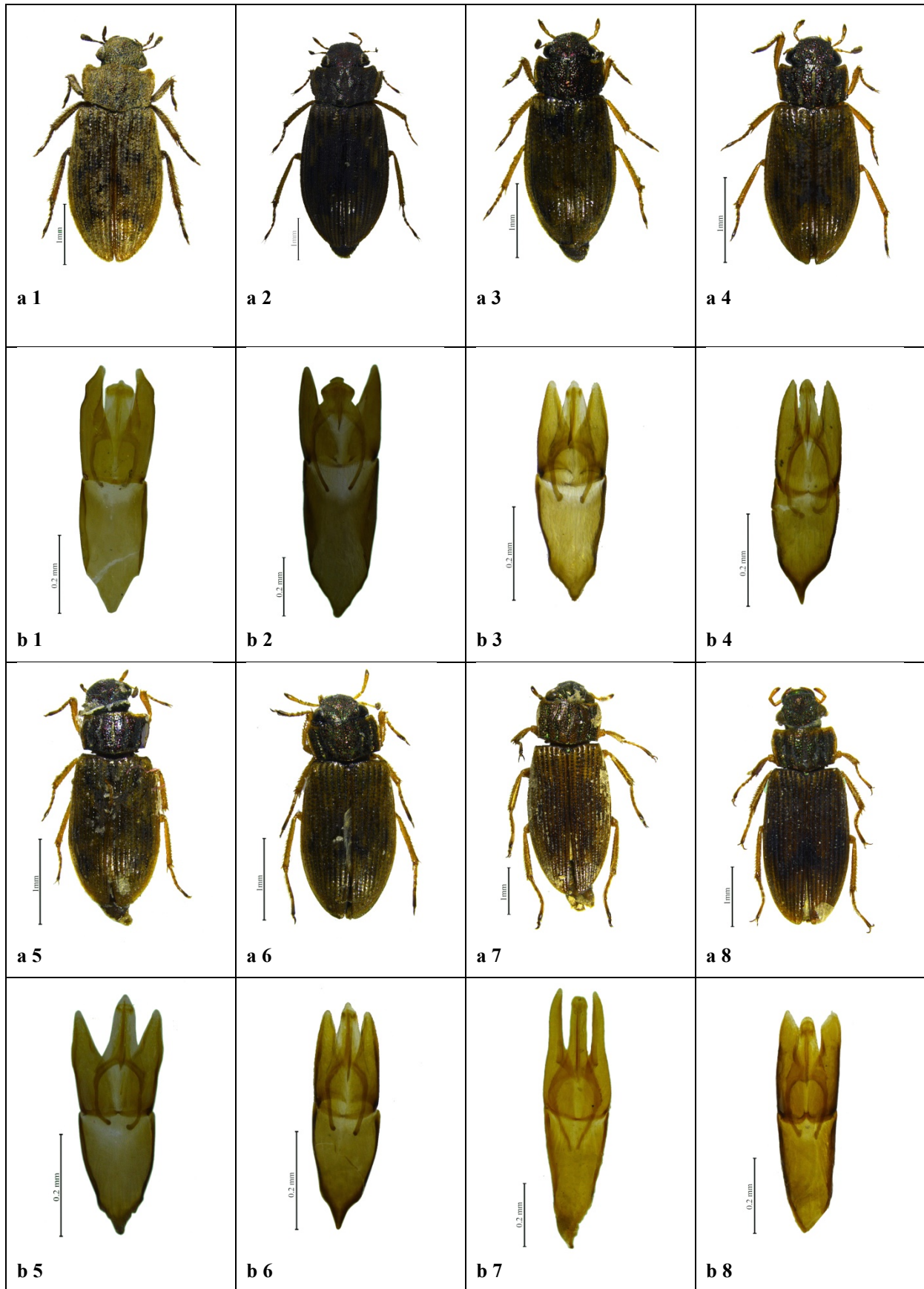


Figure 3. Dorsal view and adegophor images of the species. (a1, b1 *Helophorus terminassianae*, a2, b2 *H. aquaticus* a3, b3 *H. brevipalpis*, a4, b4 *H. montenegrinus*, a5, b5 *H. arvernicus*, a6, b6 *H. hilaris*, a7, b7 *H. similis*, a8, b8 *H. lapponicus*).

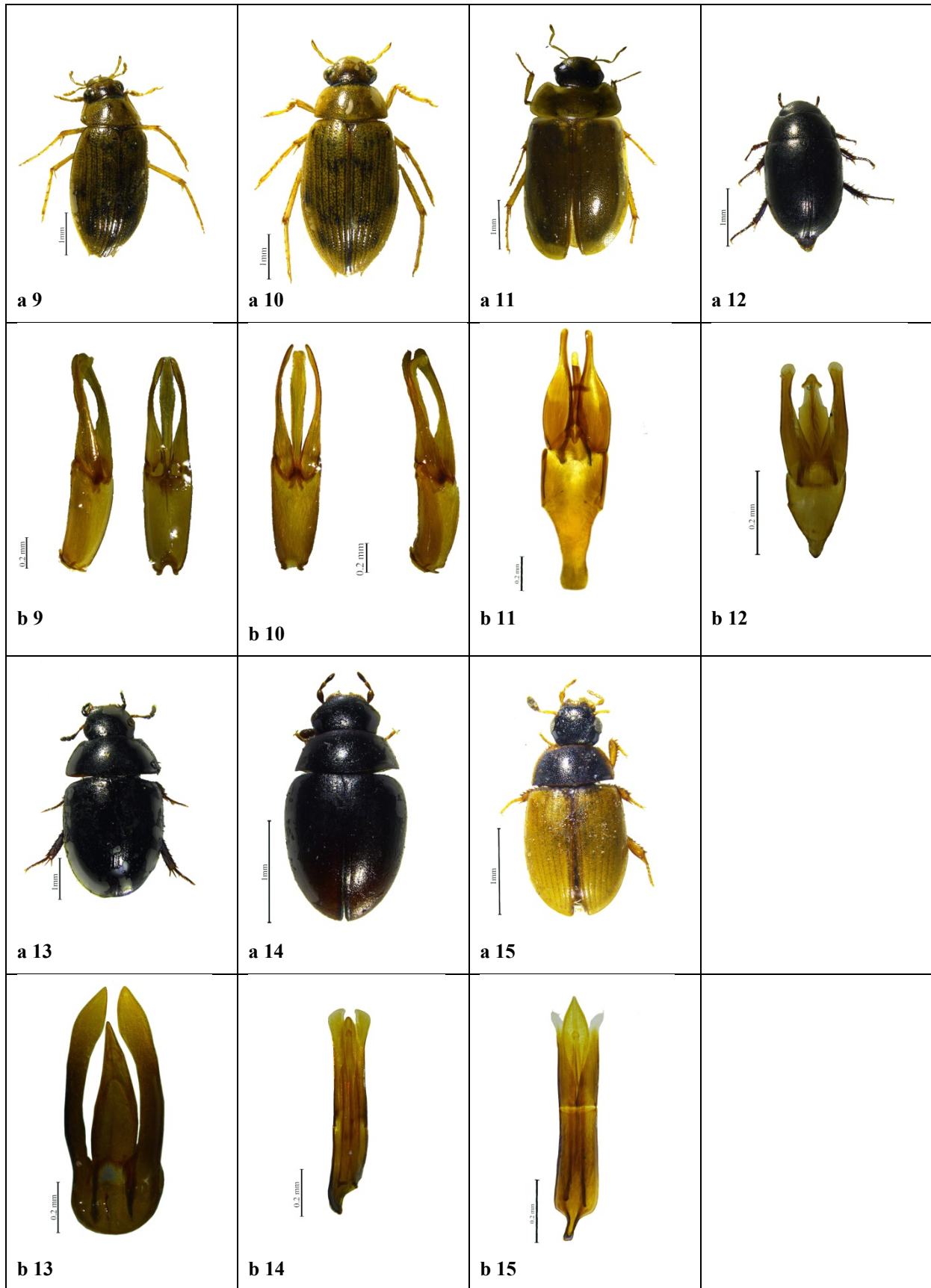


Figure 3. (continued). (a9, b9 *Berosus asiaticus*, a10, b10 *B. fulvus*, a11, b11 *Enochrus bicolor*, a12, b12 *Paracymus chalceolus*, a13, b13 *Coelostoma orbiculare*, a14, b14 *Cercyon tristis*, a15, b15 *C. quisquilius*).

Distribution in Turkey: Afyon, Ardahan, Bayburt, Erzincan, Erzurum, Gümüşhane, Kars, Kütahya, Ordu, Samsun, Tokat, Trabzon, Van [29, 31, 33, 43].

Hydrophilidae

Berosus (Enoplurus) asiaticus (Kuwert, 1888) (Figure 3. a9, b9)

Material examined: B10, 5♂, 2♀; B7, 4♂, 4♀; B12, 2♂, 4♀; B14, 5♂, 1♀; B4 2♂, 2♀.

Distribution in Turkey: Bitlis, Muş, Van [43, 46].

It is the first record from Erzurum.

Berosus (Enoplurus) fulvus (Kuwert, 1888) (Figure 3. a10, b10)

Material examined: B14, 2♂, 1♀.

Distribution in Turkey: Burdur, Van [43, 47, 48].

It is the first record from Erzurum.

Enochrus bicolor (Fabricius, 1792) (Figure 3. a11, b11)

Material examined: B11, 2♂, 1♀.

Distribution in Turkey: Adıyaman, Afyon, Aksaray, Ankara, Antalya, Aydın, Balıkesir, Burdur, Çanakkale, Denizli, Diyarbakır, Edirne, Elazığ, Erzincan, Mersin, İzmir, Kars, Kayseri, Kırşehir, Kütahya, Malatya, Manisa, Ordu, Sivas, Şanlıurfa, Uşak, Van [22, 29, 30, 32, 35, 36, 37, 39, 40, 41, 43, 49, 50, 51, 52].

It is the first record from Erzurum.

Paracymus chalceolus (Solsky, 1874) (Figure 3. a12, b12)

Material examined: B6, 2♂, 2♀; B8, 3♂, 5♀; B16, 5♂, 1♀; B10, 5♂, 4♀; B13, 4♂, 2♀; B15, 5♂, 3♀; B7, 3♂, 2♀; B16, 4♂, 2♀; B12, 4♂, 1♀; B2, 3♂, 2♀; B14, 5♂, 4♀; B17, 5♂, 1♀; B3, 3♂, 3♀; B4, 4♂, 1♀; B18, 2♂, 2♀; B5, 5♂, 3♀.

Distribution in Turkey: Adıyaman, Bayburt, Bingöl, Diyarbakır, Elazığ, Hakkâri, Hatay [21, 32, 39, 40, 50, 53].

It is the first record from Erzurum.

Coelostoma orbiculare (Fabricius, 1775) (Figure 3. a13, b13)

Material examined: B9, 5♂, 5♀.

Distribution in Turkey: Adıyaman, Afyon, Ankara, Antalya, Artvin, Bayburt, Bingöl, Burdur, Bursa, Çanakkale, Çorum, Denizli, Diyarbakır, Elazığ, Erzurum, Giresun, Gümüşhane, Isparta, Manisa, Mersin, Kars, Kayseri, Kütahya, Ordu, Samsun, Sivas, Şanlıurfa, Tokat, Trabzon, Van [22, 25, 27, 29, 30, 32, 33, 34, 35, 37, 39, 40, 42, 43, 51, 53]

Cercyon tristis (Illiger, 1801) (Figure 3. a14, b14)

Material examined: B6, 2♂; B10, 1♂.

Distribution in Turkey: Kayseri [30].

It is the first record from Erzurum and second record for Turkey.

Cercyon quisquilius (Linnaeus, 1760) (Figure 3. a15, b15)

Material examined: B8, 1♂.

Distribution in Turkey: Adana, Çanakkale, Mersin [19].

It is the first record from Erzurum.

4. Conclusions

In this study; 283 specimens, 180 males and 103 females, belonging to the Helophoridae and Hydrophilidae families were collected from various localities of Erzurum Marshes, between May 2016 and October 2016. In the research area; 8 species from Helophoridae (*Helophorus terminassianae*, *H. aquaticus*, *H. brevipalpis*, *H. montenegrinus*, *H. arvernensis*, *H. hilaris*, *H. similis*, *H. lapponicus*), 7 species from Hydrophilidae (*Berosus asiaticus*, *B. fulvus*, *Enochrus bicolor*, *Paracymus chalceolus*, *Coelostoma orbiculare*, *Cercyon tristis*, *C. quisquilius*) a total of 15 taxa have been identified. 7 of these species (*Helophorus montenegrinus*, *Berosus asiaticus*, *B. fulvus*, *Enochrus bicolor*, *Paracymus chalceolus*, *Cercyon tristis*, *C. quisquilius*) defined as a new record for Erzurum, also 1 species (*Cercyon tristis*) has been given a second record for the Turkey fauna.

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Conflict of Interest

The authors declare no conflict of interest.

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