

A Study on *Helophorus* Fabricius, 1775 (Coleoptera, Hydrophilidae) Species

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Abstract: In this study, a list of *Helophorus* species known in Turkey is presented with their distribution in Turkey and the rest of the world. Of these, *Helophorus (Atracthelophorus) arvernici* Mulsant, 1846 and *Helophorus (Rhopalhelophorus) kirgisicus* Knisch, 1914 are recorded in Turkey for the first time and are reviewed according to our specimens. *H. (Transithelophorus) terminassianae* Angus, 1984, *Helophorus (Empleurus) nubilus* Fabricius, 1776, *H. (Eutrichelophorus) micans* Faldermann, 1835, *H. (A.) abeillei* Guillebeau, 1896 and *H. (Rhopalhelophorus) lapponicus* Thomson, 1854 have been collected in Erzurum for the first time.

Key Words: Coleoptera, Hydrophilidae, *Helophorus*, Systematics, Turkey.

Helophorus Fabricius, 1775 (Coleoptera, Hydrophilidae) Türleri Üzerine Bir Çalışma

Özet: Bu çalışmada, Türkiye'den bilinen *Helophorus* türlerinin listesi ile dünyadaki ve Türkiye'deki dağılımları verilmiştir. Ayrıca Türkiye faunası için yeni kayıt olan *Helophorus (Atracthelophorus) arvernici* Mulsant, 1846 ve *Helophorus (Rhopalhelophorus) kirgisicus* Knisch, 1914'un tanımı örneklerimiz üzerinden gözden geçirilmiştir. *H. (Transithelophorus) terminassianae* Angus, 1984, *Helophorus (Empleurus) nubilus* Fabricius, 1776, *H. (Eutrichelophorus) micans* Faldermann, 1835, *H. (A.) abeillei* Guillebeau, 1896 ve *H. (Rhopalhelophorus) lapponicus* Thomson, 1854 türleri de Erzurum'dan ilk defa kaydedilmiştir.

Anahtar Sözcükler: Coleoptera, Hydrophilidae, *Helophorus*, Sistematik, Türkiye.

Introduction

The Helophorinae is a large subfamily comprising a single genus, *Helophorus*. This genus comprises about 180 species of which about 150 occur in the Palearctic (1). There are 41 species known in the Nearctic (2), 10 of which are Holarctic in distribution. There are about 3 species in the Ethiopian region, and one undescribed species in the Oriental (1).

Most species of *Helophorus* are aquatic and occur in a wide range of aquatic habitats from sea level to the alpine zone of high mountains, where they occur in snow-fed puddles and pools. Most species seem to prefer standing shallow water with plenty of organic debris, such as edges of small to medium sized water bodies; less frequently, species also occur in small, slow flowing streams. Many species occur in the transition zone between water and land, in debris, sand or mud, and in moss or other vegetation as long as the habitat is very wet. Some also occur in wet *Sphagnum* or other moss in

bogs, swamps, marshes, etc. The species belonging to the subgenus *Empleurus* Hope 1838 are strictly terrestrial and live on moist soil in vegetation, under rocks and in or under rotting plant debris. Some even live in the alpine zone under rocks and grass roots at the edges of snowfields or in alpine meadows. Some of these species have been reported as pests feeding on turnips and sugar beet (2, 3).

Thirty-nine species have been recorded belonging to the 6 subgenera known in Turkey (1-14). This study adds two new records.

Materials and Methods

The samples were collected by means of a sieve, ladle and net having a diameter of 1 mm pore from shallow areas of the various running water, springs, streams and ponds. The beetles were killed within 70% alcohol solution and then the clayey and muddy substances on their surfaces were also brushed with a small paint brush

in the laboratory. Then, aedeagophores were dissected out under the stereo microscope and were left to be exposed in 10% KOH solution for nearly 1-2 hours. The figures of aedeagophore were drawn using a Nikon type 104 microscope.

Systematics

Genus: *Helophorus* Fabricius, 1775

Body shape rather elongate, contour interrupted between pronotum and elytra. Head and pronotum have a distinct pattern of impressed furrows (1, 2, 4). The upper surface of head bears a distinct "Y" shaped groove (epicranial suture), its base may be either narrow, parallel sided or wider usually expanded anteriorly (1). Antenna 8 or 9 segmented and the club loose (4). Maxillary palpi are approximately the same length as antenna and their terminal segments are longer than penultimate (1-4). Pronotum may be almost flat but it is generally weakly arched transversely. In some cases, it is also arched longitudinally (1-4).

Abdomen with 5 visible sternites, legs are generally rather slender and tarsi 5 segmented. Dorsal face of meso- and metatarsi has fine, sometimes even rather long swimming hairs or small stiff setae. Each elytron bears 10 punctuate striae or at least 10 longitudinal rows of serial punctures separated by intervals (1-3).

Helophorus Species Known From Turkey

1. *Helophorus (Transithelophorus) terminassianae* Angus, 1984
Distribution: Russia, Armenia and Turkey (Konya and İzmir) (1, 5, 6).
Material examined: Ponds, 27.VI.1997, 1 ♂, Ilıca, Erzurum.
2. *H. (Empleurus) hirsutiventris* Angus, 1984
Distribution: Yugoslavia, Albania, Greece and Turkey (İstanbul, Sakarya and Yalova) (1, 3, 5).
3. *H. (E.) nubilus* Fabricius, 1776
Distribution: West Europe, Balkans, Russia, Iran, Sweden, Italy, Finland, Spain, Fennoscandia, Scandinavia, Denmark and Turkey (Kırklareli, İstanbul, Yalova, Muğla, Sakarya, Isparta, Zonguldak, Ankara, Mersin, Toros Mountains, Bitlis, Bingöl and Amanos Mountains) (1-13).
4. *H. (E.) porculus* Bedel, 1881
Distribution: Western Europe, North Africa, Balkans, Netherlands, France, Spain, Germany and Turkey (1, 4, 5, 7-10).
5. *H. (Eutrichelophorus) micans* Faldermann, 1835
Distribution: Transcaucasus, Iran, Afghanistan, Israel, Pakistan and Turkey (İzmir, Balıkesir, Burdur, Antakya, Tuz Lake and Diyarbakır (1, 5, 6, 8-10, 12).
Material examined: Grassy pools, 03.X.1998, 1 ♀, Oltu; 29.V.1999, 1 ♀, Dumlü; 03.VI.1999, 1 ♂, 40 km along the Erzurum-Tortum highway, Erzurum.
6. *H. (Trichelophorus) alternans* Gene, 1836
Distribution: England, Italy, Spain, France, Tunisia, Greece and Turkey (1, 5, 7-10, 12, 13).
7. *H. (s. str.) aquaticus* (Linnaeus, 1758)
Distribution: Europe, Balkans, Asia, Transcaucasus, Spain, France, Germany, Denmark, Britain, Sweden, Finland, Russia, Iran and Turkey (İstanbul, Bursa, Sinop, Isparta, Bolu, Kastamonu, Ankara, Mardin, Şırnak, Diyarbakır, İzmir, Muş, Bingöl, Van, Bitlis, Kars and Erzurum) (4, 6, 8-11, 13).
8. *H. (s. str.) liguricus* Angus, 1970
Distribution: Poland, Austria, Russia, France, Italy, Yugoslavia, Greece and Turkey (Ankara and Tokat) (1, 6).
9. *H. (s. str.) syriacus* Kuwert, 1885
Distribution: Transcaucasus, Saudi Arabia, Iran, Turkmenia, Kazakhstan and Turkey (Adana, Antakya, Diyarbakır, Amanos Mountains and Mardin) (1, 6, 10, 12).
10. *H. (Atracthelophorus) abeillei* Guillebeau, 1896
Distribution: Syria, Lebanon, Armenia, Iran and Turkey (Van and Hakkari) (1, 6, 9, 12, 14).
Material examined: Springs, 12.VI.1999, 1 ♂, Köşk village; Ponds, 24.VI.1999, 1 ♂, Ilıca, Erzurum.
11. *H. (A.) armeniacus* Ganglbauer, 1901
Distribution: Armenia and Turkey (Artvin) (1, 9, 14).

12. *H. (A.) brevipalpis* Bedel, 1881
Distribution: Europe, Transcaucasus, North America, North Africa, Mediterranean Islands, Denmark, Sweden, Urals, Finland, Lebanon, Syria, Israel, Iran and Turkey (Kırklareli, İstanbul, İzmir, Muğla, Antalya, Bursa, Ankara, Sinop, Artvin, Kahramanmaraş, Samsun, Diyarbakır and Van) (1, 2, 4, 6-14).
13. *H. (A.) daedalus* d'Orchymont, 1932
Distribution: Iran and Turkey (İzmir, Diyarbakır and Erzurum) (1, 6, 12, 14).
14. *H. (A.) difficilis* Angus, 1988
Distribution: Israel, Lebanon and Turkey (Antakya, Amanos Mountains and Osmaniye) (1, 6, 12).
15. *H. (A.) faustianus* Sharp, 1916
Distribution: Caucasus and Turkey (Tokat) (1, 6, 9, 10, 14).
16. *H. (A.) glacialis* Villa, 1883
Distribution: Europe, Balkans, Caucasus, Scandinavia, Spain, Sweden, Finland, Denmark and Turkey (Bursa) (1, 4, 6, 8, 9, 13, 14).
17. *H. (A.) guttulus* Motschulsky, 1860
Distribution: Caucasus and Turkey (Rize) (1, 9, 10, 14).
18. *H. (A.) lewisi* Angus, 1985
Distribution: USSR, Israel and Turkey (Antakya, Diyarbakır, İzmir, Şırnak, Gümüşhane and Erzincan) (1, 6, 12, 14).
19. *H. (A.) maculatus* Motschulsky, 1860
Distribution: Armenia, Azerbaijan, Iran and Turkey (Van) (1, 6, 14).
20. *H. (A.) montenegrinus* Kuwert, 1885
Distribution: Balkans, Caucasus, Austria, Italy and Turkey (Kırklareli, İstanbul, Bursa, Bolu, Kastamonu, Ankara, Sinop and Trabzon) (1, 6, 8, 10, 14).
21. *H. (A.) ponticus* Angus, 1988
Distribution: Turkey (Kaçkar Mountains, Uludağ and Kars) (1, 6).
Material examined: Ponds, 05.VI.1999, 6 ♂♂, Yedigöller, Tortum, Erzurum.
22. *H. (A.) zagrosicus* Angus, 1988
Distribution: Iran and Turkey (Hakkari) (1, 6).
23. *H. (Rhopalhelophorus) croaticus* Kuwert, 1886
Distribution: Central Europe, Belgium, Scandinavia, Fennoscandia, Germany, USSR and Turkey (1, 4, 8-10).
24. *H. (R.) discrepans* Rey, 1885
Distribution: East Europe, Transcaucasus, Russia, Iran, Finland, Germany, Poland, Caucasus, Greece and Turkey (Bolu, Hakkari, Van, Artvin and Ardahan) (1, 4, 6, 8, 13).
25. *H. (R.) dorsalis* (Marsham, 1802)
Distribution: England, France, Germany, Austria, Ukraine, Caucasus, Scandinavia, British Isles and Turkey (İstanbul) (1, 4, 6, 7, 9, 10).
26. *H. (R.) flavipes* Fabricius, 1792
Distribution: Europe, Scandinavia, Britain, Russia and Turkey (Gümüşhane and Erzincan) (1, 4, 6, 7, 10, 11, 13).
27. *H. (R.) frater* d'Orchymont, 1926
Distribution: Himalayas, China, India, Iran and Turkey (Van) (1, 2, 6).
28. *H. (R.) griseus* Herbst, 1793
Distribution: Europe, England, France, Spain, Scandinavia, Fennoscandia, Denmark, Transcaucasus and Turkey (Edirne, İstanbul, Bursa, Kayseri, Gümüşhane and Erzincan) (1, 4, 6, 10, 11, 13).
29. *H. (R.) hilaris* Sharp, 1916
Distribution: Transcaucasus, Iran, Azerbaijan, Lebanon and Turkey (Kayseri, Diyarbakır, Mardin, Şırnak, Muş, Bingöl and Hakkari) (1, 6, 9, 10, 12).
30. *H. (R.) illustris* Sharp, 1916
Distribution: France, Israel and Turkey (İzmir and Mersin) (1, 6, 8-10, 12).
31. *H. (R.) lapponicus* Thomson, 1854
Distribution: Scandinavia, Finland, Russia, Spain, Caucasus, Lebanon, Israel, Iran, Sweden, Denmark, Fennoscandia and Turkey (Kars and Ardahan) (1, 4, 6, 10-13).
Material examined: Ponds, 24.V.1997, 2 ♂♂ 3 ♀♀, Soğucak village; Grassy pools, 03.VI.1999, 4

♂♂ 6 ♀♀, 40 km along the Erzurum-Tortum highway; Spring, 24.VI.1999, 1 ♂, Köşk village, Erzurum.

32. *H. (R.) longitarsis* Wollaston, 1864

Distribution: Central Europe, North Africa, England, France, Spain, USSR, Kazakhstan, Scandinavia, Britain, Greece, Germany and Turkey (Burdur) (1, 4, 9, 10, 12, 13).

33. *H. (R.) mervensis* Semenov, 1900

Distribution: Central Asia, Arabia, Iran, Afghanistan and Turkey (1, 6, 9, 12).

34. *H. (R.) minutus* Fabricius, 1775

Distribution: Central Europe, Scandinavia, North Africa, Denmark, Sweden, Finland, Russia and Turkey (Istanbul and Antalya) (1, 4, 6-8, 10-13).

35. *H. (R.) nanus* Sturm, 1836

Distribution: Siberia, Transcaucasus and Turkey (Hakkari, Bolu, Gümüşhane and Erzincan) (1, 4, 6-11).

36. *H. (R.) obscurus* Mulsant, 1844

Distribution: Europe, Denmark, Britain, Sweden, Scandinavia, Russia, Italy, Greece and Turkey (Kırklareli, İstanbul, Bursa, Bolu and Sinop) (1, 4, 6, 11, 13).

37. *H. (R.) pallidipennis* Mulsant & Wachanru, 1852

Distribution: Greece, Cyprus and Turkey (Şırnak, Diyarbakır, Karaman, Ankara and Bozcaada) (1, 6, 8-10).

38. *Helophorus (R.) paraminutus* Angus, 1986

Distribution: Balkans, Austria, Germany, Russia and Turkey (Antalya) (1).

39. *H. (R.) subcarinatus* Angus, 1985

Distribution: Lebanon, Israel and Turkey (Konya) (12).

40. *Helophorus (Atracthelophorus) arvernicus* Mulsant, 1846

Body 3.2 mm in length. Head shining blackish bronze. Maxillary palpi dark reddish brown, the last segment symmetrical oval and very wide. Antenna dark red brown or yellowish and 9 segmented. Pronotum is highly arched, the broadest at the base of the anterior third.

Ground colour dark reddish brown with bronze reflections. All intervals are strongly granulate. Elytra are dark brown, strongly striate, interstices convex and flanks visible from below. Legs are light brown. Apical tarsal segment and claws darker. Swimming hairs on dorsal surface of tarsi poorly developed.

Aedeagophore 0.5 mm in length. Parameres tapered. Aedeagal tube as long as parameres. Basal piece longer than parameres (Fig. 1A).

Material examined: Grassy pools, 24.IV.1999, 5 ♂♂ 8 ♀♀; 25.IV.1999, 8 ♂♂ 10 ♀♀, Karakaya, Erzincan.

Distribution: Denmark, Finland, Sweden, Norway, USSR, Spain, Italy, France, Austria, Scandinavia and Scotland (1, 2, 4, 7-9, 11, 14).

This species is a new record for the Turkish fauna.

41. *Helophorus (Rhopalhelophorus) kirgisisus* Knisch, 1914

Body 5.4 mm in length. Head punctuate, the "Y" groove deep and its base widened anteriorly. Ground colour pitchy with green or red bronze reflections, often brighter in the "Y" groove. Maxillary palpi yellowish, 9 segmented. Pronotum generally paler, ground colour as head or dull orange with bronze reflections. Grooves generally dull brown. Elytra yellowish to darker brown, rather strongly striate. Flanks not visible from below. Legs long and tarsi have well-developed swimming hairs. Tibiae have poorly developed yellowish hairs.

Aedeagophore 0.9 mm in length. Parameres are tapered and incurved through the apex. Aedeagal tube shorter than parameres (Fig. 1B).

Material examined: Fresher grassy pools, 3.VI.1999, 1 ♂ 3 ♀♀, 40 km along the Erzurum-Tortum highway, Erzurum.

Distribution: USSR, Kazakhstan, Iran and Siberia (1, 6).

This species is a new record for the Turkish fauna.

Discussion

For the present, forty-one species of *Helophorus* are known in Turkey (1-14). The type localities of *H. (Atracthelophorus) ponticus* Angus, 1988 and *H. (A.)*

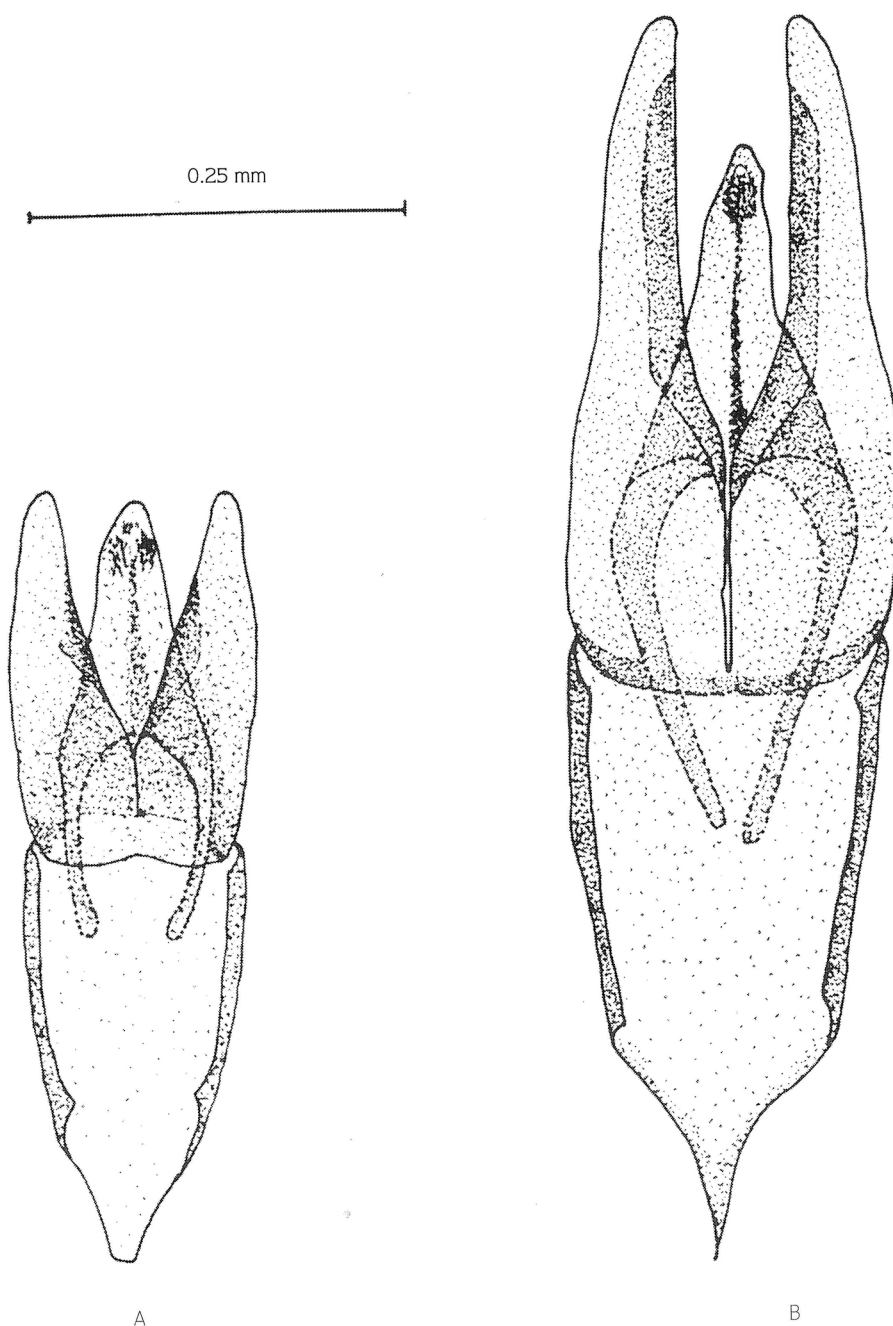


Figure. Aedeagophore, dorsal. A) *Helophorus (Atracthelophorus) arvernicus*. B) *Helophorus (Rhopalhelophorus) kirgisicus*

difficilis Angus, 1988 are in Turkey (1, 6). *H. (Transithelophorus) terminassianae* Angus, 1984, *Helophorus (Empleurus) nubilus* Fabricius, 1776, *H. (Eutrichelophorus) micans* Faldermann, 1835, *H. (A.) abeillei* Guillebeau, 1896 and *H. (Rhopalhelophorus)*

lapponicus Thomson, 1854 have been collected in Erzurum for the first time.

Helophorus (Transithelophorus) terminassianae is so far known only in Soviet Armenia and Anatolia (Konya and İzmir). Therefore, it seems to be a Caucasus species.

It is apparently terrestrial since the Konya specimens were found under a stone (1, 6).

H. (Atracthelophorus) ponticus was described by Angus (6). It was collected on the snow from Kaçkar Mountain. Later, one male specimen was collected in Kars-Damal and one female in Uludağ (1, 6). Furthermore, we have some doubts whether the female sample is *H. (A.) ponticus* Angus, 1988 or not, because Angus (6) could not decide whether this specimen was *H. (A.) ponticus* or *H. (A.) glacialis* Villa, 1883. Later, he concluded that it was *H. (A.) ponticus* (1). We still believe that this record of identification needs classification by examining much more samples, especially males.

Our specimens were collected from Yedigöller, Tortum at an altitude of about 3000 m. Since the previous samples were also collected from altitudes of 2000-3000 m, it may be considered an alpine species. On the other hand, this species has widespread seasonal distribution as it is present in both spring and autumn.

Helophorus (Atracthelophorus) arvernicus lives in clean, moderately fast running streams, normally in upland areas. It is also found in running fresh water,

particularly at the grassy edges of smaller, soft-bottomed streams in shallow waters among vegetation or in wet mud on the banks. This species shows a very poor ability of dispersal and is perhaps unable to fly, in contrast to most other *Helophorus* spp. Adults are found mainly in spring, but also in summer and autumn (1, 4, 14). Our specimens, collected at the grassy edges of streams in April, agree with both the morphological and ecological features of this species indicated by other authors (1, 2, 4, 7-9, 11, 14).

Helophorus (Rhopalhelophorus) kirgisis is a steppe species, the range of which extends eastwards from Saratov in European Russia, over the southern Urals and the West Siberian steppe to Kazakhstan and Northern Persia. In Western Siberia, it is most abundant in brackish pools with *Salicornia* like vegetation, but also occurs in the fresher grassy pools. Breeding takes place in the spring, and the egg cocoon is placed in the mud at the water's edge (1, 6).

So far, this species has only been recognized in Russia and Persia. Therefore, we can say that is an Asian species. Our specimens were collected from fresh pools. It was found that the yellowish hairs on their tibiae were poorly developed in our specimens.

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