



Contribution to the Knowledge on Distribution of the Aquatic Beetles (Ordo: Coleoptera) in the Western Black Sea Region and Its Environs of Turkey

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Received 09 January 2009
Accepted 04 March 2010

Abstract

The collected aquatic Coleoptera specimens from inland water of the Western Black Sea Region between 2002-2005 are examined. In this study, 47 taxa belonging to 9 family were determined and their distribution in Turkey are given. Twenty three of them are the first record for the study area.

Keywords: Gyrinidae, Haliplidae, Noteridae, Dytiscidae, Helophoridae, Hydrophilidae, Hydrochidae, Dryopidae, Elmidae.

Türkiye'nin Batı Karadeniz Bölgesi ve Civarının Sucul Koleopterlerinin (Ordo: Coleoptera) Dağılımına Katkılar

Özet

2002-2005 yılları arasında Batı Karadeniz Bölgesi içsularından toplanan sucul Coleoptera örnekleri değerlendirilmiştir. Bu çalışmada, 9 familyaya ait 47 takson tespit edilmiş ve tespit edilen taksonların Türkiye'deki dağılımları verilmiştir. Tespit edilen taksonlardan yirmüçü araştırma bölgesinden ilk kez kaydedilmiştir.

Anahtar Kelimeler: Gyrinidae, Haliplidae, Noteridae, Dytiscidae, Helophoridae, Hydrophilidae, Hydrochidae, Dryopidae, Elmidae.

Introduction

The order Coleoptera is the largest order of insects. The species in this order are terrestrial, semiaquatic or aquatic. Water beetles can be found in a many different water habitats, it inhabits freshwater, brackish and salt waters (Hansen, 1987; Nilsson and Homen, 1995). Most species live in stagnant or slowly and rapid streams or pools, ponds, lakes, marshes, ditches, canals, brooks, rivers etc., however, members of the Elmidae reside in rocky-bottomed rapid streams from high mountain (Ward, 1992).

While some species have good swimmers, most of the aquatic hydrophiloids are rather poor swimmers and occur among vegetation along the shores (Hansen, 1997).

Hitherto, in the systematic studies about the aquatic Coleoptera on our country the members of Gyrinidae (12 taxa), Haliplidae (16 taxa), Hygrobiidae (1 taxa), Noteridae (3 taxa), Dytiscidae (136 taxa), Helophoridae (55 taxa), Hydrophilidae (91

taxa), Hydrochidae (6 taxa), Hydraenidae (almost 200 taxa), Elmidae (28 taxa), Dryopidae (9 taxa) were identified (Angus, 1988, 1992; Audisio *et al.*, 1993; Balfour-Browne, 1963; Bollow, 1937; Brancucci, 1988; Darılmaz and Kıyak, 2009a-b, 2010; Delève, 1963; Dettner, 1997; Erman, 2005; Erman *et al.*, 2005, 2007; Fery and Erman, 2009; Fery and Nilsson, 1993; Gentili, 1979, 1982, 1988, 1991, 2000; Gentili and Chiesa, 1975; Guéorguiev, 1981; Hájek *et al.*, 2005; Hansen, 1987; Hebauer, 1994; Hebauer and Klausnitzer, 2000; Holmen, 1987; İncekara, 2008; Guignot, 1947; İncekara *et al.*, 2002, 2003, 2004, 2005a-b, 2009; Jäch, 1984a-b, 1988a-b, 1989a-b, 1990, 1991a-b, 1992, 1993, 1994a-b, 1997; Jäch and Diaz, 2001; Jäch and Kasapoğlu, 2006; Janssens, 1963a-b, 1965, 1970, 1980; Kasapoğlu and Erman, 2002; Kasapoğlu *et al.*, 2006, 2010; Kıyak *et al.*, 2006a-b, 2007; Makhan, 2005; Mart and Erman, 2001; Nardi, 2001; Olmi, 1976; Toledo, 2004, 2009; Topkara and Balık, 2008; Vondel, 1991, 1992, 1997; Vondel *et al.*, 2006; Zaitsev, 1972).

There are many systematically, ecological and zoogeographical studies, by the native and foreign authors about the water beetles fauna of Turkey but there is not a comprehensive study in the Western Black Sea Region except this work. The aim of this study is to make a contribution to the aquatic Coleoptera fauna of the Western Black Sea Region.

Materials and Methods

All samples were collected with a view to determine on the fauna of inland waters in the Western Black Sea Region and its environs between 2002 and 2005. Specimens were sampled from various aquatic habitats like lake, river, pond and smaller pools, with either a sieve like benthos ladle or aquarium net having a 0.5 mm or 1 mm mesh diameter. The samples were preserved with 4% formalin solution in the field. Then they were dried in Petri dishes and preserved in small sample bottles for storing long periods in the laboratory.

First the samples were investigated under stereomicroscope to take off their aedeagus by dissecting needles. To remove the muscle tissues of aedeagus, they were stored for 1 to 2 hours in 10% NaOH solution. The above sea levels (a.s.l.) of the stations were measured with equipment of GPS. Materials have been deposited at the Museum of Faculty of Fisheries, Ege University, Izmir, Turkey (ESFM).

Research Area

The most northern end of the research area is starting from the east of Adapazarı to Ayancık (Sinop) and includes coastline of the Black Sea. Eastern border of the research area is Kızılırmak River. Most southern point is Çavdarhisar (Kütahya), and Mahmudiye (Eskişehir), Gündül-Kızılcahamam are on the southeastern border. In the most extreme point of western there is Göksu River (Yenişehir-Bursa).

Details of the localities (locality (L), exact locality (provinces), coordinates, altitude, sampling dates) are below:

L01: Karamurat Lake (Mudurnu, Bolu); 40°33'N 30°57'E; 700 m; 15.08.2002.

L02: Melen Lake (Gölyaka, Düzce); 40°46'N 31°03'E; 118 m; 14.08.2002.

L03: Taşkısığı Lake (Taşkısığı village, Sakarya); 40°52'N 30°24'E, 15 m; 24.06.2003.

L04: Abant Lake (Abant, Bolu); 40°35'N 31°16'E; 1325 m; 25.06.2003.

L05: Sünnet Lake (Mudurnu, Bolu); 40°25'N 30°57'E; 820 m; 25.06.2003.

L06: Poyrazlar Lake (Poyrazlar, Sakarya); 40°50'N 30°27'E; 20 m; 24.06.2003.

L07: Karadere (Cumayeri, Düzce); 41°53'56"N 30°52'56"E; 240 m; 29.06.2004.

L08: Bıçkı Stream (Düzce); 40°57'15"N 31°02'10"E; 360 m; 29.06.2004.

L09: Kurukavak Stream (Düzce); 40°58'37"N 31°01'52"E; 300 m; 29.06.2004.

L10: Akçakoca Stream (Akçakoca, Düzce); 41°05'06"N 31°06'07"E; 5 m; 30.06.2004.

L11: Akınçay (Akçakoca, Düzce); 41°05'35"N 31°13'05"E; 10 m; 30.06.2004.

L12: Beyhanlı Stream (Akçakoca, Düzce); 41°06'03"N 31°13'05"E; 5 m; 30.06.2004.

L13: Değirmendere (Akçakoca, Düzce); 41°06'10"N 31°15'07"E; 5 m; 30.06.2004.

L14: Kovukkavlak Stream (Alaplı, Zonguldak); 41°08'30"N 31°21'34"E; 5 m; 30.06.2004.

L15: Salıdere (Ereğli, Zonguldak); 41°16'10"N 31°33'21"E; 20 m; 30.06.2004.

L16: Aydınlar Stream (Ereğli, Zonguldak); 41°14'01"N 31°36'38"E; 60 m; 30.06.2004.

L17: Ilıksu Stream (Zonguldak); 41°23'58"N 31°41'01"E; 20 m; 30.06.2004.

L18: Emir Stream (Zonguldak); 41°31'13"N 31°56'29"E; 20 m; 01.07.2004.

L19: Göbü Stream (Zonguldak); 41°31'51"N 31°57'23"E; 20 m; 01.07.2004.

L20: Yalnızcı Stream (Çaycuma, Zonguldak); 41°28'22"N 32°04'02"E; 20 m; 01.07.2004.

L21: Karadere (Çaycuma, Zonguldak); 41°23'08"N 32°02'26"E; 60 m; 01.07.2004.

L22: Gerdek Stream (Beycuma, Zonguldak); 41°22'01"N 31°59'54"E; 110 m; 01.07.2004.

L23: Döngeller Stream (Devrek, Zonguldak); 41°16'00"N 31°58'43"E; 100 m; 01.07.2004.

L24: Göksu Stream (Yenişehir, Bursa); 40°16'19"N 29°46'52"E; 130 m; 16.08.2004.

L25: Göynük Stream (Göynük, Bolu); 40°23'58"N 30°33'01"E; 380 m; 16.08.2004.

L26: Nallıdere (Nallıhan, Ankara); 40°14'18"N 31°20'40"E; 780 m; 17.08.2004.

L27: Aladağ Stream (Seben, Bolu); 40°24'13"N 31°34'28"E; 840 m; 17.08.2004.

L28: Karaköse Stream (Bolu); 40°35'18"N 31°38'02"E; 1300 m; 17.08.2004.

L29: Ulus Stream (Ulus, Bartın); 41°31'20"N 32°34'04"E; 200 m; 18.08.2004.

L30: Ova Stream (Ulus, Bartın); 41°30'35"N 32°34'13"E; 200 m; 18.08.2004.

L31: Çerkeş Stream (Çerkeş, Çankırı); 40°51'41"N 32°38'20"E; 980 m; 18.08.2004.

L32: Bulak Stream (Kızılcahamam, Ankara); 40°30'05"N 32°36'44"E; 1000 m; 18.08.2004.

L33: Kocaçay (Kızılcahamam, Ankara); 40°25'56"N 32°39'01"E; 980 m; 18.08.2004.

L34: Bayındır Stream (Kızılcahamam, Ankara); 40°19'21"N 32°27'53"E; 880 m; 18.08.2004.

L35: Seydi Stream (Mahmudiye, Eskişehir); 39°30'35"N 30°59'26"E; 900 m; 19.08.2004.

L36: Bardakçı Stream (Çifteler, Eskişehir); 39°22'49"N 31°06'37"E; 930 m; 19.08.2004.

L37: Dereboğazı Stream (Kütahya); 39°10'58"N 29°35'36"E; 19.08.2004.

L38: Bedir Stream (Çavdarhisar, Kütahya); 39°12'02"N 29°36'44"E; 620 m; 20.08.2004.

L39: Çamkışla Stream (Pınarbaşı, Kastamonu); 41°35'04"N 33°05'27"E; 620 m; 14.06.2005.

L40: Karafasil Stream (Pınarbaşı, Kastamonu); 41°39'28"N 33°08'21"E; 360 m; 14.06.2005.

L41: Devrekani Stream (Pınarbaşı, Kastamonu); 41°40'08"N 33°09'40"E; 14.06.2005.

L42: Şehriban Stream (Şenpazar, Kastamonu); 41°47'22"N 33°10'36"E; 250 m; 14.06.2005.

L43: Cide Stream (Cide, Kastamonu); 41°53'50"N 32°59'59"E; 14.06.2005.

L44: Terme Stream (Doğanyurt, Kastamonu); 41°57'33"N 33°12'34"E; 14.06.2005.

L45: Gündoğan Stream (Doğanyurt, Kastamonu); 42°00'26"N 33°21'58"E; 14.06.2005.

L46: Düzçay Stream (Doğanyurt, Kastamonu); 42°00'01"N 33°27'11"E; 14.06.2005.

L47: Akçabel Stream (Doğanyurt, Kastamonu); 41°59'28"N 33°31'53"E; 15.06.2005

L48: Karacehennemboğazı Stream (Doğanyurt, Kastamonu); 41°59'00"N 33°36'12"E; 15.06.2005.

L49: Manastır Stream (İnebolu, Kastamonu); 41°58'28"N 33°50'27"E; 15.06.2005.

L50: İlişi Stream (Abana, Kastamonu); 41°58'22"N 33°58'27"E; 15.06.2005.

L51: Kirazlı Stream (Çatalzeytin, Kastamonu); 41°57'22"N 34°11'35"E; 15.06.2005.

L52: Büyükdere (Çatalzeytin, Kastamonu); 41°56'34" N 34°13'38" E; 15.06.2005.

L53: Helaldi Stream (Türkeli, Sinop); 41°56'40"N 34°23'44"E; 15.06.2005.

L54: Zindan Stream (Ayancık, Sinop); 41°52'42"N 34°32'59"E; 15.06.2005.

L55: Taşköprü between Kirazbaşı small stream (Taşköprü, Kastamonu); 41°16'59"N 34°13'13"E; 960 m; 16.06.2005.

L56: Kirazbaşı Stream (Taşköprü, Kastamonu); 41°16'13"N 34°12'10"E; 16.06.2005.

L57: Bavat Stream (Taşköprü, Kastamonu); 41°13'12"N 34°11'39"E; 16.06.2005.

L58: Karadere (Kastamonu); 41°10'01"N 34°04'10"E; 16.06.2005.

L59: Devrez Stream (Tosya, Kastamonu); 40°56'27"N 33°53'52"E; 16.06.2005.

L60: Kırkpınar Pond (İlgaz, Çankırı); 41°00'41"N 33°36'51"E; 16.06.2005.

L61: Acıçay (Çankırı-İskilip cross road); 40°28'42"N 33°39'35"E; 16.06.2005.

Results

This study is conducted to determine inland water Coleoptera fauna of the Western Black Sea Region and its environs. Materials are examined systematically and information of distribution about the determined taxa is given below.

Family Gyrinidae

Gyrinus distinctus Aubé, 1836

Materials: (L7), 2♀♀, ESFM-INS/2004-001;

(L8), 7♀♀, ESFM-INS/2004-003; (L18), 2♂♂ 2♀♀, ESFM-INS/2004-018; (L22), 6♂♂, ESFM-INS/2004-023; (L23), 1♂, ESFM-INS/2004-029; (L45), 1♂, ESFM-INS/2005-037; (L48), 3♀♀, ESFM-INS/2005-041; (L49), 1♀, ESFM-INS/2005-042; (L53), 3♂♂ 3♀♀, ESFM-INS/2005-056.

Distribution in Turkey: Adana, Aksaray, Antalya, Bursa, Denizli, Isparta, İzmir, Konya, Trabzon, Bolkar Mountains, Toros Mountains (Guéorguiev, 1981; Darılmaz and Kıyak, 2006a, 2009a; Karaman *et al.*, 2008; Kıyak *et al.*, 2006b).

Remarks: *Gyrinus distinctus* is new record for the Gyrinidae fauna of the West Black Sea Region.

Gyrinus substriatus Stephens, 1829

Materials: (L13), 5♂♂, ESFM-INS/2004-009; (L60), 1♂, ESFM-INS/2005-080.

Distribution in Turkey: Adana, Bursa, Konya, Kars, Sakarya, Tokat, Erciyes Mountain (Guéorguiev, 1981; Darılmaz and Kıyak, 2009a).

Gyrinus caspius Ménétrés, 1832

Materials: (L36), 7♂♂ 4♀♀, ESFM-INS/2004-070.

Distribution in Turkey: Adana Afyon, Aksaray, Antalya, Edirne, Burdur, Hatay (Guéorguiev, 1981; Darılmaz and Kıyak, 2006a, 2009a; Kıyak *et al.*, 2006b).

Remarks: *Gyrinus caspius* is new record for the Gyrinidae fauna of the West Black Sea Region.

Orectochilus villosus villosus (Müller, 1776)

Materials: (L7), 3♂♂ 1♀, ESFM-INS/2004-002; (L8), 1♀, ESFM-INS/2004-004; (L14), 1♀, ESFM-INS/2004-011; (L15), 1♂, ESFM-INS/2004-012; (L18), 5♂♂ 6♀♀, ESFM-INS/2004-019; (L20), 3♂♂ 5♀♀, ESFM-INS/2004-021; (L22), 1♂ 2♀♀, ESFM-INS/2004-024; (L23), 2♂♂ 1♀, ESFM-INS/2004-030; (L45), 1♀, ESFM-INS/2005-038; (L46), 1♀, ESFM-INS/2005-039; (L47), 42♂♂ 52♀♀, ESFM-INS/2005-040; (L50), 8♂♂ 14♀♀, ESFM-INS/2005-044; (L59), 4♂♂ 5♀♀, ESFM-INS/2005-079.

Distribution in Turkey: Antalya, Malatya (Guéorguiev, 1981; Kıyak *et al.*, 2006b; Darılmaz and Kıyak, 2009a).

Remarks: *Orectochilus villosus villosus* is new record for the Gyrinidae fauna of the West Black Sea Region.

Family Haliplidae

Peltodytes caesus (Duftschmid, 1805)

Materials: (L24), 1♂ 2♀♀, ESFM-INS/2004-031; (L33), 2♀♀, ESFM-INS/2004-054; (L35), 1♂ 1♀, ESFM-INS/2004-064; (L37), 8♀♀, ESFM-INS/2004-071.

Distribution in Turkey: Adana, Afyon, Aksaray, Aydın, Balıkesir, Bolu, Eskişehir, Isparta, Konya, Yozgat, Taurus Mountains (Guéorguiev, 1981; Darılmaz and Kıyak, 2006a, 2009a).

Haliplus (Haliplus) heydeni Wehncke, 1875

Materials: (L28), 1♂ 3♀, ESFM-INS/2004-037: (L32), 52♂♂ 63♀♀, ESFM-INS/2004-051: (L35), 2♂♂ 2♀♀, ESFM-INS/2004-065.

Distribution in Turkey: without detailed locality (Vondel *et al.*, 2006; Darılmaz and Kıyak, 2009a).

Haliplus (Liaphlus) flavicollis Sturm, 1834

Materials: (L1), 1♀, ESFM-INS/2002-002: (L28), 1♀, ESFM-INS/2004-038: (L57), 1♂ 1♀, ESFM-INS/2005-069.

Distribution in Turkey: without detailed locality (Holmen; 1987; Vondel, 1991, 1997; Darılmaz and Kıyak, 2009a).

Haliplus (Neohalipus) lineatocollis (Marshall, 1802)

Materials: (L56), 5♂♂ 19♀♀, ESFM-INS/2005-066: (L57), 1♂ 1♀, ESFM-INS/2005-070.

Distribution in Turkey: Çağırın, Daltaban, Gümüşhane, İskali, İzmir (Guéorguiev, 1981; Darılmaz and Kıyak, 2009a).

Remarks: *Haliplus (N.) lineatocollis* is new record for the Haliplidae fauna of the West Black Sea Region.

Family Noteridae***Noterus clavicornis*** (De Geer, 1774)

Materials: (L2), 5♀♀, ESFM-INS./2002-001: (L3), 32♂♂ 25♀♀, ESFM-INS./2003-002: (L33), 6♂♂ 4♀♀, ESFM-INS./2004-055: (L34), 9♂♂ 7♀♀, ESFM-INS./2004-061: (L35), 3♂♂ 4♀♀, ESFM-INS./2004-063.

Distribution in Turkey: Aksaray, Ankara, Antalya, Aydın, Balıkesir, Bilecik, Bolu, Isparta, İzmir, Kayseri, Konya, Manisa, Trabzon (Balfour-Browne, 1963; Guéorguiev, 1981; Özemi and Önder, 1988; Mermer *et al.*, 1995; Darılmaz and Kıyak, 2006a, 2009a; Karaman *et al.*, 2008; Kıyak *et al.*, 2007).

Family Dytiscidae***Laccophilus minutus*** (Linnaeus, 1758)

Materials: (L28), 1♂ 1♀, ESFM-INS/2004-039: (L33), 12♂♂ 15♀♀, ESFM-INS/2004-056: (L35), 9♂♂ 6♀♀, ESFM-INS/2004-066: (L57), 1♀, ESFM-INS/2005-069.

Distribution in Turkey: Ankara, Artvin, Aydın, Balıkesir, Bolu, Bursa, Erzurum, Isparta, İzmir, Kocaeli, Konya, Manisa, Rize, Sinop, Sivas, Trabzon, Taurus Mountains (Guéorguiev, 1981; Erman *et al.*, 2007; Erman and Erman, 2008; Karaman *et al.*, 2008; Darılmaz and Kıyak, 2009a).

Laccophilus hyalinus (De Geer, 1774)

Materials: (L4), 1♀, ESFM-INS/2003-005: (L5), 1♀, ESFM-INS/2003-006: (L10), 1♀, ESFM-INS/2004-006: (L11), 2♂♂ 5♀♀, ESFM-INS/2004-

007: (L12), 1♂, ESFM-INS/2004-008: (L15), 6♂♂ 3♀♀, ESFM-INS/2004-013: (L16), 2♂♂ 1♀♀, ESFM-INS/2004-014: (L17), 2♂♂ 1♀, ESFM-INS/2004-017: (L19), 16♂♂ 8♀♀, ESFM-INS/2004-020: (L24), 1♀, ESFM-INS/2004-032: (L28), 7♂♂ 8♀♀, ESFM-INS/2004-040: (L32), 53♂♂ 39♀♀, ESFM-INS/2004-052: (L34), 2♀♀, ESFM-INS/2004-062: (L35), 6♂♂ 3♀♀, ESFM-INS/2004-067: (L37), 1♂ 1♀, ESFM-INS/2004-061: (L38), 1♂ 1♀, ESFM-INS/2004-074.

Distribution in Turkey: Artvin, Aydın, Bolu, Bursa, Erzurum, Isparta, İzmir, Kars, Kilis, Kocaeli, Manisa, Sakarya, Trabzon, Toros Mountains, Bolkar Mountains (Guéorguiev, 1981; Erman *et al.*, 2007; Erman and Erman, 2008; Karaman *et al.*, 2008; Darılmaz and Kıyak, 2009a).

Hydroglyphus geminus (Fabricius, 1792)

Materials: (L22), 2♂♂, ESFM-INS/2004-025: (L31), 1♂, ESFM-INS/2004-046: (L39), 1♂, ESFM-INS/2005-003: (L42), 5♂♂, ESFM-INS/2005-012: (L44), 14♂♂ 15♀♀, ESFM-INS/2005-030: (L51), 7♂♂ 4♀♀, ESFM-INS/2005-045: (L52), 1♀, ESFM-INS/2005-053: (L56), 1♂ 1♀, ESFM-INS/2005-061: (L61), 8♂♂ 7♀♀, ESFM-INS/2005-081.

Distribution in Turkey: Adana, Afyon, Aksaray, Ankara, Antalya, Artvin, Aydın, Balıkesir, Bolu, Bursa, Çorum, Edirne, Erzurum, Eskişehir, Gümüşhane, Isparta, İçel, İzmir, Kars, Kastamonu, Kilis, Konya, Manisa, Muğla, Nevşehir, Rize, Trabzon, Taurus Mountains (Guéorguiev, 1981; Darılmaz and Kıyak, 2006a, 2009a; Kıyak *et al.*, 2007; Erman *et al.*, 2007; Karaman *et al.*, 2008; Erman and Erman, 2008).

Scarodytes halensis (Fabricius, 1787)

Materials: (L39), 9♂♂ 11♀♀, ESFM-INS/2005-004: (L57), 1♀, ESFM-INS/2005-072.

Distribution in Turkey: Afyon, Aksaray, Ankara, Artvin, Bursa, Erzurum, Eskişehir, Gümüşhane, Isparta, İzmir, Kayseri, Mersin, Trabzon, Van, Yozgat (Guéorguiev, 1981; Darılmaz and Kıyak, 2006a, 2009a; Erman *et al.*, 2007; Karaman *et al.*, 2008).

Remarks: *Scarodytes halensis* is new record for the Dytiscidae fauna of the West Black Sea Region.

Nebrioporus stearinus stearinus (Kolenati, 1845)

Materials: (L49), 1♀, ESFM-INS/2005-043: (L57), 2♂♂ 2♀♀, ESFM-INS/2005-073: (L58), 4♂♂ 4♀♀, ESFM-INS/2005-077.

Distribution in Turkey: Antalya, Artvin, Elazığ, Erzurum, Isparta, İzmir, Konya, Trabzon, Bolkar Mountains (Guéorguiev, 1981; Erman *et al.*, 2007; Kıyak *et al.*, 2007; Erman and Erman, 2008; Darılmaz and Kıyak, 2009a).

Remarks: *Nebrioporus stearinus stearinus* is new record for the Dytiscidae fauna of the West Black Sea Region. Toledo (2009) reported that *Nebrioporus turca* (Seidlitz, 1887) is currently a synonymy of *Nebrioporus stearinus stearinus*.

Platambus maculatus (Linnaeus, 1758)

Materials: (L16), 22♂♂ 12♀♀, ESFM-INS/2004-015: (L25), 2♂♂ 2♀♀, ESFM-INS/2004-033: (L26), 1♂, ESFM-INS/2004-035: (L27), 1♂, ESFM-INS/2004-036: (L31), 1♀, ESFM-INS/2004-047: (L35), 2♂♂ 1♀, ESFM-INS/2004-068: (L38), 3♂♂ 7♀♀, ESFM-INS/2004-075: (L40), 2♂♂, ESFM-INS/2005-010: (L41), 1♂, ESFM-INS/2005-011: (L56), 28♂♂ 36♀♀, ESFM-INS/2005-062: (L58), 6♂♂ 5♀♀, ESFM-INS/2005-078.

Distribution in Turkey: Antalya, Bilecik, Bolu, Burdur, Erzurum, Kars, Muğla, Sakarya, Taurus Mountains (Guéorguiev, 1981; Erman *et al.*, 2007; Kıyak *et al.*, 2007; Darılmaz and Kıyak, 2009a).

Agabus conspersus (Marsham, 1802)

Materials: (L56), 1♂, ESFM-INS/2005-063.

Distribution in Turkey: Afyon, Antalya, Burdur, Bursa, Denizli, Erzurum, Isparta, İzmir, Konya, Taurus Mountains (Guéorguiev, 1981; Erman *et al.*, 2007; Kıyak *et al.*, 2007; Darılmaz and Kıyak, 2009a).

Remarks: *Agabus conspersus* is new record for the Dytiscidae fauna of the research area.

Agabus bipustulatus (Linnaeus, 1767)

Materials: (L43), 2♂♂ 5♀♀, ESFM-INS/2005-023: (L44), 4♂♂ 7♀♀, ESFM-INS/2005-031: (L51), 2♂♂ 2♀♀, ESFM-INS/2005-046: (L56), 2♂♂, ESFM-INS/2005-064.

Distribution in Turkey: Antalya, Artvin, Bursa, Denizli, Erzurum, Isparta, İzmir, Kars, Kayseri, Kocaeli, Konya, Muğla, Rize, Trabzon, Uşak, Van, Ilgaz Mountains, Taurus Mountains (Guéorguiev, 1981; Erman *et al.*, 2007; Erman and Erman, 2008; Darılmaz and Kıyak, 2009a; Karaman *et al.*, 2008; Kıyak *et al.*, 2007).

Ilybius chalconatus (Panzer, 1797)

Materials: (L57), 1♂, ESFM-INS/2005-074.

Distribution in Turkey: Afyon, Ankara, Bolu, Erzurum, Eskişehir, İzmir, Kars, Kastamonu, Konya, Şırnak, Van, Civcan Mountain (Guéorguiev, 1981; Fery *et al.*, 1993; Darılmaz and Kıyak, 2009a).

Remarks: *Agabus chalconatus* was transferred to *Ilybius* genera by Nilsson (2000).

Ilybius fuliginosus (Fabricius, 1792)

Materials: (L56), 11♂♂ 27♀♀, ESFM-INS/2005-065.

Distribution in Turkey: Adana, Artvin, Bingöl, Erzurum, Isparta, Kars, Konya, Rize, Trabzon (Guéorguiev, 1981; Erman *et al.*, 2007; Kıyak *et al.*, 2007; Erman and Erman, 2008; Karaman *et al.*, 2008; Darılmaz and Kıyak, 2009a).

Remarks: *Ilybius fuliginosus* is new record for the Dytiscidae fauna of the West Black Sea Region.

Cybister lateralimarginalis (De Geer, 1774)

Materials: (L6), 4♂♂ 9♀♀, ESFM-INS/2003-

004.

Distribution in Turkey: Adana, Ankara, Burdur, Denizli, Erzurum, Eskişehir, İçel, İzmir, Konya, Van (Guéorguiev, 1981; Özemesi and Önder, 1988; Erman *et al.*, 2007; Kıyak *et al.*, 2007).

Family Helophoridae**Helophorus aquaticus** (Linnaeus, 1758)

Materials: (L42), 2♂♂ 6♀♀, ESFM-INS/2005-013.

Distribution in Turkey: Aksaray, Ankara, Artvin, Bingöl, Bitlis, Bolu, Bursa, Diyarbakır, Erzincan, Ezurum, Isparta, İstanbul, İzmir, Kars, Kastamonu, Kırklareli, Mardin, Muş, Rize, Sinop, Şırnak, Van (Angus, 1988; Mart and Erman, 2001; Kırpık, 2005; Darılmaz and Kıyak, 2006b).

Helophorus syriacus Kuwert, 1885

Materials: (L42), 1♀, ESFM-INS/2005-014.

Distribution in Turkey: Adana, Antakya, Denizli, Diyarbakır, Erzincan, İzmir, Mardin, Amanos Mountains (Angus, 1988, 1992; Hebauer, 1994; Mart and Erman, 2001; Kıyak *et al.*, 2006a).

Remarks: *Helophorus syriacus* is new record for the Helophoridae fauna of the West Black Sea Region.

Helophorus (Atracthelophorus) brevipalpis Bedel, 1881

Materials: (L3), 1♂ 4♀♀, ESFM-INS/2003-004: (L22), 1♂, ESFM-INS/2004-026: (L42), 5♂♂ 5♀♀, ESFM-INS/2005-015: (L43), 2♂♂ 3♀♀, ESFM-INS/2005-024: (L44), 4♂♂ 10♀♀, ESFM-INS/2005-032: (L51), 20♂♂ 20♀♀, ESFM-INS/2005-047: (L52), 3♂♂ 17♀♀, ESFM-INS/2005-054.

Distribution in Turkey: Aksaray, Ankara, Antalya, Artvin, Bursa, Diyarbakır, Erzincan, Erzurum, İstanbul, İzmir, Kahramanmaraş, Kırklareli, Muğla, Samsun, Sinop, Trabzon, Van (Angus, 1988; Mart and Erman, 2001; Darılmaz and Kıyak, 2006b; Karaman *et al.*, 2008).

Helophorus (Atracthelophorus) daedalus d'Orchymont, 1932

Materials: (L28), 2♂♂ 3♀♀, ESFM-INS/2004-041: (L33), 1♂, ESFM-INS/200-057.

Distribution in Turkey: Antalya, Diyarbakır, Erzincan, Erzurum, İzmir, Van (Angus, 1988, 1992; Mart and Erman, 2001).

Remarks: *Helophorus (A.) daedalus* new record for the Helophoridae fauna of the West Black Sea Region.

Helophorus (Atracthelophorus) lewisi Angus, 1985

Materials: (L39), 2♂♂ 9♀♀, ESFM-INS/2005-005.

Distribution in Turkey: Antakya, Bingöl, Diyarbakır, Erzincan, Gümüşhane, İzmir, Şırnak (Angus, 1988, 1992; Hebauer, 1994; Mart and Erman,

2001).

Remarks: *Helophorus* (A.) *lewisi* is new record for the Helophoridae fauna of the West Black Sea Region.

Helophorus* (*Atracthelophorus*) *montenegrinus Kuwert, 1885

Materials: (L39), 6♂♂ 13♀♀, ESFM-INS/2005-006: (L43), 6♂♂ 20♀♀, ESFM-INS/2005-025: (L44), 2♂♂ 5♀♀, ESFM-INS/2005-033: (L51), 1♂ 3♀♀, ESFM-INS/2005-048.

Distribution in Turkey: Ankara, Bolu, Bursa, İzmir, Kastamonu, Kırklareli, Sinop, Trabzon (Angus, 1988, 1992; İncekara *et al.*, 2005a).

Helophorus* (*Rhopalhelophorus*) *discrepans Rey, 1885

Materials: (L32), 1♂, ESFM-INS/2004-053.

Distribution in Turkey: Ardahan, Artvin, Bingöl, Bolu, Erzincan, Erzurum, Hakkari, Van (Chiesa, 1959; Hansen, 1987; Mart and Erman, 2001; Kırpık, 2005).

Helophorus* (*Rhopalhelophorus*) *fulgidicollis Motschulsky, 1860

Materials: (L22), 1♂, ESFM-INS/2004-027.

Distribution in Turkey: Bingöl, Erzincan, Erzurum (İncekara *et al.*, 2002).

Remarks: *Helophorus* (R.) *fulgidicollis* is new record for the Helophoridae fauna of the West Black Sea Region.

Helophorus* (*Rhopalhelophorus*) *minutus Fabricius, 1775

Materials: (L42), 6♂♂ 8♀♀, ESFM-INS/2005-016.

Distribution in Turkey: Antalya, İstanbul (Angus, 1988; Mart and Erman, 2001; İncekara *et al.*, 2004).

Remarks: *Helophorus minutus* is new record for the Helophoridae fauna of the West Black Sea Region.

Helophorus* (*Rhopalhelophorus*) *obscurus Mulsant, 1844

Materials: (L42), 9♂♂ 20♀♀, ESFM-INS/2005-017.

Distribution in Turkey: Artvin, Bolu, Bursa, Erzincan, Erzurum, İstanbul, Kırklareli, Sinop, Trabzon (Mart and Erman, 2001; İncekara *et al.*, 2004; Karaman *et al.*, 2008).

Family Hydrophilidae

Anacaena rufipes (Guillebeau, 1896)

Materials: (L57), 1♂, ESFM-INS/2005-076.

Distribution in Turkey: Bingöl, Erzincan, İstanbul (İncekara *et al.*, 2003; İncekara, 2004).

Remarks: *Anacaena rufipes* is new record for the Hydrophilidae fauna of the West Black Sea Region.

Enochrus* (*Lumetus*) *quadripunctatus (Herbst, 1797)

Materials: (L33), 4♂♂ 4♀♀, ESFM-INS/2004-059.

Distribution in Turkey: Antalya, Bingöl, Denizli, Edirne, Erzurum Isparta (Kırpık, 2005; Darılmaz and Kıyak, 2009b).

Remarks: *Enochrus* (L.) *quadripunctatus* is new record for the Hydrophilidae fauna of the West Black Sea Region.

Enochrus* (*Lumetus*) *fuscipennis (Thomson, 1884)

Materials: (L28), 1♂, ESFM-INS/2004-042: (L33), 2♂♂ 3♀♀, ESFM-INS/2004-060.

Distribution in Turkey: Aksaray, Artvin, Bingöl, Denizli, Erzincan, Erzurum, Rize (İncekara *et al.*, 2005b; Darılmaz and Kıyak, 2006b, 2009b).

Remarks: *Enochrus* (L.) *fuscipennis* is new record for the Hydrophilidae fauna of the West Black Sea Region.

Helochares lividus (Forster, 1771)

Materials: (L43), 1♂ 1♀, ESFM-INS/2005-026.

Distribution in Turkey: Aksaray, Bingöl, Trabzon (Darılmaz and Kıyak, 2006b; Karaman *et al.*, 2008).

Remarks: *Helochares lividus* is new record for the Hydrophilidae fauna of the West Black Sea Region.

Laccobius* (*Microlaccobius*) *gracilis gracilis Motschulsky, 1855

Materials: (L29), 1♂ 3♀♀, ESFM-INS/2004-043: (L30), 1♂, ESFM-INS/2004-045: (L31), 2♂♂ 1♀, ESFM-INS/2004-048: (L39), 2♂♂ 2♀♀, ESFM-INS/2005-007: (L42), 1♂ 5♀♀, ESFM-INS/2005-018: (L44), 1♂ 5♀♀, ESFM-INS/2005-034: (L51), 5♂♂, ESFM-INS/2005-049: (L52), 2♂♂, ESFM-INS/2005-055.

Distribution in Turkey: Adana, Adıyaman, Ankara, Antakya, Antalya, Artvin, Aydın, Balıkesir, Bayburt, Bilecik, Bingöl, Bitlis, Bolu, Burdur, Bursa, Çanakkale, Çorum, Denizli, Diyarbakır, Edirne, Erzincan, Erzurum, Gaziantep, Giresun, Hakkari, Isparta, İstanbul, İzmir, İçel, Kars, Kastamonu, Kayseri, Manisa, Mardin, Muğla, Muş, Niğde, Ordu, Rize, Sinop, Sivas, Trabzon, Van (Gentili and Chiesa, 1975; Gentili, 1988, 2000; İncekara *et al.*, 2003; Karaman *et al.*, 2008; Darılmaz and Kıyak, 2010).

Laccobius* (*Dimorpholaccobius*) *simulatrix d'Orchymont, 1932

Materials: (L31), 17♂♂ 14♀♀, ESFM-INS/2004-049: (L33), 1♂, ESFM-INS/2004-058: (L35), 2♂♂ 1♀, ESFM-INS/2004-069: (L37), 3♂♂ 3♀♀, ESFM-INS/2004-073: (L39), 1♂ 2♀♀, ESFM-INS/2005-008: (L42), 8♂♂ 8♀♀, ESFM-INS/2005-019: (L44), 7♂♂ 19♀♀, ESFM-INS/2005-035: (L51), 3♂♂, ESFM-INS/2005-050: (L56), 3♂♂, ESFM-INS/2005-067: (L57), 1♂, ESFM-INS/2005-075.

Distribution in Turkey: Ağrı, Aksaray, Ankara,

Antalya, Artvin, Aydın, Bayburt, Bingöl, Bitlis, Bolu, Bursa, Çanakkale, Çorum, Denizli, Edirne, Erzincan, Erzurum, Hakkari, Isparta, İstanbul, İzmir, Kahramanmaraş, Kars, Kayseri, Kırklareli, Kırşehir, Manisa, Muğla, Niğde, Osmaniye, Samsun, Sivas, Trabzon, Van (Gentili, 2000; İncekara *et al.*, 2003; Darılmaz and Kıyak, 2006a; Karaman *et al.*, 2008).

Laccobius (Dimorpholaccobius) bipunctatus (Fabricius, 1775)

Materials: (L43), 1♂ 3♀♀, ESFM-INS/2005-027.

Distribution in Turkey: Afyon, Bingöl, Bolu, Erzincan, Erzurum, Kastamonu, Trabzon (Gentili, 1988, 2000; İncekara *et al.*, 2003; Kırpık, 2005; Karaman *et al.*, 2008).

Laccobius (Dimorpholaccobius) striatulus (Fabricius, 1801)

Materials: (L13), 1♂ 1♀, ESFM-INS/2004-010: (L16), 1♂ 4♀♀, ESFM-INS/2004-016: (L22), 5♂♂ 3♀♀, ESFM-INS/2004-028: (L39), 1♂ 2♀♀, ESFM-INS/2005-009: (L42), 1♂ 6♀♀, ESFM-INS/2005-020: (L43), 1♂ 2♀♀, ESFM-INS/2005-028: (L44), 5♂♂ 13♀♀, ESFM-INS/2005-036.

Distribution in Turkey: Adapazarı, Ankara, Antakya, Antalya, Artvin, Bayburt, Bitlis, Bolu, Bursa, Çanakkale, Erzincan, Erzurum, Eskişehir, Gümüşhane, Isparta, İstanbul, İzmir, Kocaeli, Konya, Kütahya, Malatya, Manisa, Muğla, Ordu, Sivas, Trabzon, Van (Gentili and Chiesa, 1975; Gentili, 1991, 2000; İncekara *et al.*, 2003; Kırpık, 2005; Karaman *et al.*, 2008).

Laccobius (Dimorpholaccobius) hindukuschi Chiesa, 1966

Materials: (L42), 6♂♂ 8♀♀, ESFM-INS/2005-021: (L43), 2♂♂, ESFM-INS/2005-029: (L51), 4♂♂, ESFM-INS/2005-051.

Distribution in Turkey: Adıyaman, Ankara, Antakya, Antalya, Artvin, Bayburt, Bingöl, Bitlis, Burdur, Denizli, Diyarbakır, Erzurum, Gaziantep, Gümüşhane, Kastamonu, Kilis, Mardin, Mersin, Muş, Niğde, Tunceli (Gentili, 1988, 1991, 2000; İncekara *et al.*, 2003).

Laccobius (Dimorpholaccobius) obscuratus aegaeus Gentili, 1974

Materials: (L42), 1♂ 6♀♀, ESFM-INS/2005-022: (L51), 2♂♂, ESFM-INS/2005-052: (L56), 1♂, ESFM-INS/2005-068.

Distribution in Turkey: Adana, Ankara, Antalya, Artvin, Aydın, Balıkesir, Bitlis, Bolu, Burdur, Bursa, Çanakkale, Çorum, Denizli, Erzincan, Erzurum, Gümüşhane, Isparta, İstanbul, İzmir, Kırklareli, Kocaeli, Konya, Manisa, Mersin, Muğla, Ordu, Osmaniye, Rize, Sinop, Trabzon, Van, Sultan Mountains, Taurus Mountains (Gentili and Chiesa, 1975; Gentili, 2000; İncekara *et al.*, 2003; Karaman *et al.*, 2008).

Family Hydrochidae

Hydrochus flavipennis Küster, 1852

Materials: (L21), 1♂, ESFM-INS/2004-022.

Distribution in Turkey: Bingöl, Erzurum (Makhan, 2005).

Remarks: *Hydrochus flavipennis* is new record for the Hydrochidae fauna of the West Black Sea Region.

Family Dryopidae

Dryops lutulentus (Erichson, 1847)

Materials: (L29), 6♂♂ 14♀♀, ESFM-INS/2004-044.

Distribution in Turkey: Trabzon (Delève, 1963).

Remarks: *Dryops lutulentus* is new record for the Dryopidae fauna of the West Black Sea Region and the second record is given for Turkey Dryopidae fauna.

Family Elmidae

Elmis maugetii Latreille, 1798

Materials: (L55), 2♂♂, ESFM-INS/2005-058.

Distribution in Turkey: Adana, Bolu, Niğde (Delève, 1963; Jäch, 1984a).

Elmis rioloides (Kuwert, 1890)

Materials: (L25), 6♂♂ 8♀♀, ESFM-INS/2004-034: (L31), 2♂♂, ESFM-INS/2004-050.

Distribution in Turkey: Aydın Muğla, Niğde, Trabzon (Delève, 1963; Olmi, 1976; Berthélemy, 1979; Jäch, 1984a, 1984b).

Remarks: *Elmis rioloides* is new record for the Elmidae fauna of the West Black Sea Region.

Esolus parallelepipedus (Müller, 1806)

Materials: (L54), 1♂, ESFM-INS/2005-057: (L55), 37♂♂ 72♀♀, ESFM-INS/2005-059.

Distribution in Turkey: Adana, Mersin (Jäch, 1984a).

Remarks: *Esolus parallelepipedus* is new record for the Elmidae fauna of the West Black Sea Region.

Limnius opacus Müller, 1806

Materials: (L55), 8♂♂ 18♀♀, ESFM-INS/2005-060.

Distribution in Turkey: Antalya, Trabzon (Delève, 1963).

Remarks: *Limnius opacus* is new record for the Elmidae fauna of the West Black Sea Region.

Limnius volckmari (Panzer, 1793)

Materials: (L9), 2♂♂, ESFM-INS/2004-005.

Distribution in Turkey: Adana, Antalya, Mersin, Niğde, Trabzon (Delève, 1963; Jäch, 1984a).

Remarks: *Limnius volckmari* is new record for the Elmidae fauna of the West Black Sea Region.

Conclusion

As a result of this work, *G. distinctus*, *G. caspius*, *O. villosus*, *H. (N.) lineatocollis*, *S. halensis*, *N. stearinus stearinus*, *A. conspersus*, *I. fuliginosus*, *H. syriacus*, *H. (A.) daedalus*, *H. (A.) lewisi*, *H. (R.) fulgidicollis*, *H. (R.) minutus*, *A. rufipes*, *E. (L.) quadripunctatus*, *E. (L.) fuscipennis*, *H. lividus*, *H. flavipennis*, *D. lutulentus*, *E. rioloides*, *E. parallelepipedus*, *L. opacus*, *L. volckmari* were recorded for the first time in the research area and also *Dryops lutulentus* was found in Ulus stream (Bartın), which was recorded for first time in Maçka (Trabzon) by Delève (1963). The number of species number will be increase with more detailed studies for this area in the future.

Acknowledgements

We are grateful to Prof.Dr.Massimo Olmi (Italy) and Dr.Abdullah Mart (Erzurum, Turkey) for allowing us to use their valuable knowledge on the identification and confirmation of the families Elmidae, Helophoridae and Hydrophilidae.

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