

FAUNISTIC STUDY ON TWO SISTER PLAIN (BAFRA AND ÇARŞAMBA) AQUATIC COLEOPTERA FAUNA IN TURKEY: TWO SIMILAR GEOGRAPHY BUT RATHER DIFFERENT FAUNA, WITH A NEW RECORD

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ABSTRACT: 50 species of aquatic Coleoptera belonging to five families and 24 genera, were collected from the Bafra and Çarşamba plain (Samsun province) in the North part of Turkey, between May 2007-June 2008 have been established and compared faunistically. Rather different fauna have been found in both plain respectively. *Helophorus strigifrons* Thomson, 1868 is recorded from Turkey for the first time. All species are newly recorded from the research area.

KEY WORDS: Aquatic Coleoptera, Faunistics, Samsun Province, Plains, Turkey.

In this study, we identified and compared the fauna of two big plains (lowlands; Bafra and Çarşamba) which are situated closely each other (100 kms) and which have similar climatic and geographic structure.

Kızılırmak river is the longest running water in Turkey which runs down to Bafra district, leaves behind wide and alluvial soil while falling down onto the sea from Bafra bay. This way, Bafra plains of 47727 hectares took shape. Northern parts of the plains are arid land.

The Lakes being basic habitat of water beetles in Bafra plains took shape after the hollows filled up. Among these Lakes are Karaboğaz Liman, Dutdibi, Uzungöl, Hayırlı, İncegöl, Çernek, Tombul and Balık Lakes are noteworthy. Most of these Lakes are quite rich in water products and are economically important.

Liman Lake is at a distance of 20 kms to Bafra. The Lake of 3 km size opens up to sea through several branches. Length of such branches is 2 km at some points. Liman Lake is neighboured by Balık Lake to the south and neighboured by Karaboğaz Lake to the north.

Yeşilirmak River runs down to Çarşamba district and falls down onto Black Sea from Civa Bay and, thus, gives birth to Çarşamba plains, while, at the same time, dividing up the plains in two parts. Surface area of Çarşamba plains is 89.500 hectares. 70% of the land has been rendered fit for agriculture. The remaining 30% is composed of forests, reed-beds and quicksands.

There are many Lakes in the plains, both small and large. Two large Lakes are Simentit and Akgöl. Both Lakes are used for commercial fishing.

Simenit Lake took shape after displacement of the bed of Terme brook. The Lake situated at a distance of 20 kms to Terme looks like two Lakes interconnected by means of a canal. The Lake is fed by rainfalls during winter and, from time to time, during stormy weather, is filled with overrunning sea water. Some of other Lakes of small surface area in the studied area get dry during summer and get water again during winter. Several Lakes combine at times of abundant rainfalls and, thus, turn into a single Lake. These are Dumanlı, Akmaz, Kocagöl, Sazlık, Çilme, Körürmak and Akarcık Lakes.

Both plains exhibit the characteristics of a Black Sea climate. Summer is hot and winter is warm and rainy. The number of days spent under snow is just 2 or 3. Altitude of both plains above the sea level is less than 1 meter at most of the spots. It is difficult to find permanent hydrophilous habitats beyond the Lakes. And most of the temporary habitats are rice fields. No faunistic study on the aquatic Coleoptera has been conducted in the studied area before.

MATERIALS AND METHODS

Specimens of aquatic Coleoptera were collected in various parts of two plain (Bafra ve Çarşamba) (Figs. 1a,b) in different surveys between May 2007-October 2007 and May 2008-June 2008). For collecting aquatic beetles, sweeping the water with a metal sieve or net was the main method; in some cases, a drag-type net was used. All captured samples were separated by forceps. Sorting was performed wet or dry in a flat white tray. The beetles preserved as dry or in 95% alcohol, which was replaced by 75% alcohol and 5% glycerin mix after 24 hours.

A list of species is given. For each species the detailed locality records contains sampling locations, date of sampling and total number of individuals are given. The Lakes placed in the research areas and their being main sampling stations, are indicated in figure I.

LIST OF SPECIES

BAFRA PLAIN

Family HELOPHORIDAE

Helophorus micans Falderman, 1835

Material examined: Ondokuzmayıs, Gernek Lake, 07.V.2008, 41° 38' 50K, 36° 04' 44D, om, 2 males. **Distribution in Turkey:** Aksaray, Antakya, Balıkesir, Burdur, Diyarbakır, Erzurum, İzmir, Rize, Trabzon and Tuz Lake (İncekara, 2001, 2004; Karaman et al. 2008).

Helophorus brevialpis Bedel, 1881

Material examined: Kızılırmak, 30.V.2007, 41° 35' 14K, 35° 53' 66D, 14m, 17 males, 13 females; Arız, 35.VII.2007, 41° 36' 38K, 35° 50' 37D, 2m, 3 males, 7 females. **Distribution in Turkey:** Ankara, Antalya, Artvin, Bursa, Diyarbakır, Erzurum, Erzincan, İstanbul, İzmir, Kahramanmaraş, Kırklareli, Muğla, Niğde, Samsun, Sinop, Trabzon and Van (İncekara et al. 2005; Karaman et al. 2008).

Helophorus daedalus d' Orchymont, 1932

Material examined: Ondokuzmayıs, 26.VI.2007, 41° 35' 31K, 36° 06' 44D, 2m, 1 male.
Distribution in Turkey: Diyarbakır, Erzurum, Erzincan, İzmir and Van (İncekara, 2001, 2004).

Helophorus griseus Herbst, 1793

Material examined: Ondokuzmayıs, 07.V.2008, 41° 29' 51K, 36° 04' 12D, 27 m, 1 male.
Distribution in Turkey: Aydın, Bursa, Edirne, Erzincan Erzurum, Gümüşhane, İstanbul and Kayseri) (İncekara, 2004; Kiyak et al. 2006).

Helophorus strigifrons Thomson, 1868

Material examined: Bafra, Liman Lake, 07.V.2008, 41° 41' 09K, 36° 01' 12D, 0m, 2 males. **Remark:** *H. Strigifrons* is recorded from Turkey for the first time. Additional material also examined from another province (Sivas, Zara, Tödürge Lake, 05.VII.2003, 1 male).

Helophorus obscurus Mulsant, 1844

Material examined: Kızılırmak, 30.V.2007, 41° 35' 14K, 35° 53' 66D, 14m, 1 male.
Distribution in Turkey: Artvin, Bolu, Bursa, Erzincan, Erzurum, İstanbul, Kırklareli, Sinop and Trabzon (İncekara et al. 2004; Karaman et al. 2008).

Helophorus aquaticus (Linnaeus, 1758)

Material examined: Kızılırmak, 30.V.2007, 41° 35' 14K, 35° 53' 66D, 14m, 2 females.
Distribution in Turkey: Ankara, Bingöl, Bursa, Bolu, Diyarbakır, Erzurum, Erzincan, İstanbul, Kars, Kırklareli, Mardin, Muş, Rize, Sinop and Van (İncekara, 2001, 2004).

Helophorus syriacus Kuwert, 1885

Material examined: Ondokuzmayıs, 07.V.2008, 41° 29' 51K, 36° 04' 12D, 27 m, 3 males.
Distribution in Turkey: Adana, Antakya, Amonos dağları, Denizli, Diyarbakır, Erzincan and Mardin (İncekara, 2004).

Helophorus terminassianae Angus, 1984

Material examined: Liman Lake, 07.V.2007, 41° 41' 09K, 36° 01' 12D, 0m, 1 male, 3 females, 07.V.2008, 41° 41' 09K, 36° 01' 12D, 0m, 2 males. **Distribution in Turkey:** Erzurum, Erzincan, İzmir and Konya (İncekara, 2004).

Family HYDROPHILIDAE

Hydrobius fuscipes (Linnaeus, 1758)

Material examined: Ondokuzmayıs, 07.V.2008, 41° 29' 51K, 36° 04' 12D, 27 m, 1 male.
Distribution in Turkey: Erzincan (İncekara, 2004).

Coleostoma orbiculare (Fabricius, 1775)

Material examined: Ondokuzmayıs, Balık Lake, 41° 33' 08K, 36° 04' 52D, 0m, 3 males, 1 female, 41° 35' 16K, 36° 06' 41D, 0m, 2 males; Bafra, Gernek Lake, 07.V.2008, 41° 38' 50K, 36° 04' 44D, 0m, 2 males, 4 females, Liman Lake, 07.V.2008, 41° 41' 09K, 36° 01' 12D, 0m, 3 males, 3 females. **Distribution in Turkey:** Ankara, Erzurum, Trabzon (İncekara et al. 2003; Karaman et al. 2008).

Berosus signaticollis (Charpentier, 1825)

Material examined: Ondokuzmayıs, Balık Lake, 07.V.2008; 41° 29' 51K, 36° 04' 12D, 0m, 6 males, 11 females; Bafra, Gernek Lake, 07.V.2008, 41° 38' 50K, 36° 04' 44D, 0m, 1 male.
Distribution in Turkey: Amasya, Antalya, Aydın, Erzincan, İzmir, Kastamonu, Kars and Ordu (İncekara et al. 2003; İncekara, 2004).

Berosus affinis Brulle, 1922

Material examined: Ondokuzmayıs, 26.VI.2007, 41° 35' 31K, 36° 06' 44D, 2m, 10 males, 8 females, Balık Lake, 41° 33' 08K, 36° 04' 52D, 0m, 4 males, 4 females, 41° 35' 16K, 36° 06' 41D, 0m, 16males, 21 females, Liman Lake, 29.VII.2007, 41°41' 11K, 36° 01' 09D, 2 males; Bafra, Gernek Lake, 29.VIII.2007, 41° 38' 53K, 36° 04' 42D, 0m, 18 males, 14 females,

26.VI.2007, 41° 38' 49K, 36° 04' 46D, om, 12 males, 17 females, Karaboğaz Lake, 29.VII.2007, 41° 20' 24K, 35° 48' 48D, om, 6 males, 8 females. **Distribution in Turkey:** Adana, Antalya, Burdur, Bursa, Çanakkale, Antakya (Hatay), İçel, Istanbul, Izmir, Kırklareli, Kocaeli, Kastamonu, Konya, Manisa, Muğla, Ordu, Samsun and Sakarya (İncekara et al. 2003).

Berosus sipinosus (Steven, 1808)

Material examined: Ondokuzmayıs, Liman Lake, 41° 41' 11K, 36° 01' 09D, 1♂, 07.V.2008, 41° 41' 09K, 36° 01' 12D, om, 1 male. **Distribution in Turkey:** Adana, Afyon, Ankara, Antalya, Aydın, Denizli, Edirne, Elazığ, Mersin (Erdeмли), İçel, Kars, Malatya, Van (İncekara et al. 2003; Kıyak et al. 2006).

Berosus luridus (Linnaeus, 1761)

Material examined: Bafra, Gernek Lake, 07.V.2008, 41° 38' 50K, 36° 04' 44D, om, 2 males; Çarşamba, İhmal Lake, 07.V.2008, 41° 21' 01K, 36° 36' 47D, om, 1 male; Ondokuzmayıs, Balık Lake, 07.V.2008, 41° 35' 16K, 36° 06' 41D, om, 12 males, 17 females. **Distribution in Turkey:** Erzincan, Hakkari, Ordu, Kars and Kastamonu (İncekara et al. 2003; İncekara, 2004).

Laccobius gracilis Motschulsky, 1855

Material examined: Bafra, derbent dam, 29.VII.2007, 41° 21' 43K, 35° 59' 04D, 70m, 1 male. **Distribution in Turkey:** Adana, Adıyaman, Ankara, Antakya, Antalya, Artvin, Aydın, Bayburt, Balıkesir, Bilecik, Bingöl, Bitlis, Bolu, Burdur, Bursa, Çanakkale, Çorum, Denizli, Diyarbakır, Edirne, Erzincan, Erzurum, Gaziantep, Giresun, Hakkari, Isparta, İstanbul, İzmir, Kars, Kastamonu, Kayseri, Manisa, Mardin, Mersin, Muğla, Muş, Niğde, Ordu, Rize, Sinop, Sivas, Tatvan, Trabzon and Van (İncekara et al. 2003; İncekara, 2004).

Laccobius obscuratus aegaeus Gentili, 1974

Material examined: Bafra, Derbent Dam, 29.VII.2007, 41° 21' 43K, 35° 49' 04D, 70m, 7 males, 12 females. **Distribution in Turkey:** Adana, Ankara, Antalya, Artvin, Aydın, Bitlis, Bolu Burdur, Bursa, Çanakkale, Çorum, Denizli, Erzurum, Erzincan, Gümüşhane, İstanbul, İzmir, İzmit, Kastamonu, Kırklareli, Konya, Manisa, Mersin, Muğla, Ordu, Osmaniye, Rize, Sinop, Trabzon and Van (İncekara et al. 2003, Karaman et al. 2008).

Laccobius syriacus Guillebeau, 1896

Material examined: Bafra, Derbent Dam, 29.VII.2007, 41° 21' 43K, 35° 49' 04D, 70m, 16 males, 19 females, 29.VII.2007, 40° 54' 19K, 35° 59' 00D, 868m, 4 males, 7 females; Doğanca, 29.VII.2007, 41° 35' 23K, 35° 56' 00D, 13m, 6 males, 3 females. **Distribution in Turkey:** Adana, Ankara, Antalya, Antakya, Artvin, Aydın, Bayburt, Bitlis, Burdur, Hakkari, Çorum, Denizli, Diyarbakır, Edirne, Eğirdir, Gaziantep, Gümüşhane, Erzurum, Erzincan, Hakkari, Isparta, İzmir, Kars, Kayseri, Kahramanmaraş, Kastamonu, Konya, Mardin, Mersin, Muğla, Ordu, Osmaniye, Rize, Samsun, Sinop, Şanlıurfa, Trabzon and Van (İncekara et al. 2003; İncekara, 2004).

Laccobius striatulus (Fabricius, 1801)

Material examined: Bafra, Derbent Dam, 29.VII.2007, 41° 21' 43K, 35° 49' 04D, 70m, 3 males, 4 females; Liman Lake, 31.V.2007, 41° 41' 11K, 36° 05' 05D, om, 32 males, 13 females. **Distribution in Turkey:** Adapazarı, Ankara, Antakya, Antalya, Artvin, Bayburt, Bitlis, Bolu, Bursa, Çanakkale, Erzurum, Erzincan, Eskişehir, Gümüşhane, Isparta, İstanbul, İzmit, İzmir, Kütahya, Konya, Malatya, Manisa, Muğla, Rize, Sivas, Trabzon and Van (İncekara et al. 2003; İncekara, 2004; Karaman et al. 2008).

Hydrochara dichroma (Fairmaire, 1892)

Material examined: Ondokuzmayıs, Balık Lake, 41° 33' 08K, 36° 04' 52D, om, 1 male; Karaboğaz Lake, 29.VII.2007, 41° 20' 24K, 35° 48' 48D, om, 1 male; Bafra, Gernek Lake, 07.V.2008, 41° 38' 50K, 36° 04' 44D, om, 1 male; Liman Lake, 07.V.2008, 41° 41' 09K, 36° 01' 12D, om, 3 males, 2 females. **Distribution in Turkey:** Adana, Ankara, Erzincan, Erzurum and İstanbul (İncekara et al. 2003; İncekara, 2001, 2004).

Paracymus sucutelleris Rosenhauer, 1856

Material examined: Ondokuzmayıs, Balık Lake, 41° 33' 08K, 36° 04' 52D, Om, 1 male, 26.VI.2007, 41° 35' 31K, 36° 06' 44D, 2m, 3 males, 4 females, 07.V.2008, 41° 35' 16K, 36° 06' 41D, Om, 8 males, 17 females. **Distribution in Turkey:** Bingöl (Mart et al. 2006).

Limnoxenus niger (Gamelin, 1790)

Material examined: Ondokuzmayıs, Balık Lake, 07.V.2008, 41 35 10K, 36 0642D, 4 males, 6 females. **Remark:** Distribution of this species in Turkey was presented by İncekara et al. (2003) without detailed locality. After then, a record was reported from south-west Anatolia by Kiyak et al. (2006). This species was very abundant in the research area (especially in the Çarşamba plain).

Hydrophilus piceus (Linnaeus, 1758)

Material examined: Ondokuzmayıs, Balık Lake, 29.VIII.2007, 41° 35' 15K, 36° 06' 42D, Om, 2 females; Karaboğaz Lake, 29.VII.2007, 41° 20' 24K, 35° 48' 48D, Om, 1 male. **Distribution in Turkey:** Erzurum, Denizli (İncekara et al. 2003; Kiyak et al. 2006).

Helochares obscurus (Müller, 1776)

Material examined: Ondokuzmayıs, 26.VI.2006, 41° 35' 31K, 36° 06' 44D, 2m, 2 males, Balık Lake, 22.VI.2007, 41° 33' 08K, 36° 04' 52D, Om, 3 males, 1 female; Bafra, Gernek Lake, 07.V.2008, 41° 38' 50K, 36° 04' 44D, Om, 6 males, 14 females. **Distribution in Turkey:** Aydın (Kiyak et al. 2006). **Remark:** Besides the research area, we have also examined much additional material from Amasya, Artvin, Bayburt, Bingöl, Çorum, Giresun, Gümüşhane, Erzincan, Erzurum, Ordu, Rize, Tokat and Trabzon provinces.

Family DYTISCIDAE

Hydaticus leander (Rossi, 1790)

Material examined: Bafra, Karaboğaz Lake, 29.7.2007, 41° 40' 24K, 35° 48' 48D, 0 m. **Distribution in Turkey:** İzmir (Guéorguiev, 1981; Nilsson, 2003).

Hydaticus transversalis laevisculptus Zaitzev, 1910

Material examined: Bafra, Karaboğaz Lake, 29.7.2007, 41° 40' 24K, 35° 48' 48D, 0 m. **Distribution in Turkey:** Adana, Denizli, Kütahya (Guéorguiev, 1981; Nilsson, 2003; Kiyak et al., 2007).

Bidessus nasutus (Sharp, 1887)

Material examined: Bafra, Liman Lake, 26.6.2007, 41° 41' 10K, 36° 01' 10D, 0 m. **Distribution in Turkey:** Afyon, Konya (Guéorguiev, 1981; Nilsson, 2003).

Hydroglyphus geminus (Fabricius, 1792)

Material examined: Bafra, Karaboğaz Lake, 29.7.2007, 41° 40' 24K, 35° 48' 48D, 0 m; Ondokuzmayıs, Balık Lake, 26.6.2007, 41° 33' 08K, 36° 04' 52D, 0 m, 29.7.2007, 41° 35' 16K, 36° 06' 41D, 0 m; Gernek Lake, 29.7.2007, 41° 38' 50K, 36° 04' 45D, 0 m, 26.6.2007, 41° 38' 49K, 36° 04' 46D, 0 m; Liman Lake, 29.7.2007, 41° 41' 11K, 36° 01' 09D, 0 m, 5.2007, 41° 41' 11K, 36° 01' 05D, 0 m. **Distribution in Turkey:** Adana, Afyon, Aksaray, Ankara, Antalya, Artvin, Aydın, Balıkesir, Bolu, Bursa, Edirne, Eskişehir, Gümüşhane, Isparta, İçel, İzmir, Kastamonu, Kayseri, Kilis, Konya, Manisa, Muğla, Rize, Toros Mountains, Trabzon (Guéorguiev, 1981; Darılmaz & Kiyak, 2006; Kiyak et al., 2007; Erman & Erman, 2008).

Hydroporus marginatus (Duftschmid, 1805)

Material examined: Ondokuzmayıs, Balık Lake, 30.5.2007, 41° 33' 07K, 36° 04' 52K, 0 m. **Distribution in Turkey:** Ankara, Erzurum, Gümüşhane, Kars, Konya, Muğla, Sivas, Trabzon (Guéorguiev, 1981; Kiyak et al. 2007; Erman et al., 2007).

Hydrovatus cuspidatus (Kunze, 1818)

Material examined: Ondokuzmayıs, Balık Lake, 30.5.2007, 41° 33' 07K, 36° 04' 52K, 0 m, 29.7.2007, 41° 35' 16K, 36° 06' 41D, 0 m; Bafra, Gernek Lake, 29.7.2007, 41° 38' 50K, 36° 04' 45D, 0 m; Liman Lake, 30.5.2007, 41° 41' 11K, 36° 01' 05D, 0 m. **Distribution in Turkey:** Afyon, Toros Mountains (Guéorguiev, 1981).

Hygrotus parallelogrammus (Ahrens, 1812)

Material examined: Bafra, Gernek Lake, 26.6.2007, 41° 38' 49K, 36° 04' 46D, 0 m.
Distribution in Turkey: Afyon, Ankara, Erzurum, Konya, Kütahya, Toros Mountains, Tuzgözü (Guéorguiev, 1981; Erman et al., 2007).

Hygrotus inaequalis (Fabricius, 1777)

Material examined: Ondokuzmayıs, Balık Lake, 30.5.2007, 41° 33' 07K, 36° 04' 52K, 0 m, 29.7.2007, 41° 35' 16K, 36° 06' 41D, 0 m; Bafra, Liman Lake, 29.7.2007, 41° 41' 11K, 36° 01' 09D, 0 m, 30.5.2007, 41° 41' 11K, 36° 01' 05D, 0 m; Doğanca, 29.7.2007, 41° 35' 23K, 35° 56' 00D, 10 m. **Distribution in Turkey:** Afyon, Artvin, Bolu, Erzurum, Isparta, Konya, Manisa (Guéorguiev, 1981; Balfour-Browne, 1963; Erman et al., 2007; Erman & Erman, 2008).

Laccophilus minutus (Linnaeus, 1758)

Material examined: Bafra, Karaboğaz Lake, 29.7.2007, 41° 40' 24K, 35° 48' 48D, 0 m, Doğanca, 29.7.2007, 41° 35' 23K, 35° 56' 00D, 10 m; Ondokuzmayıs, Balık Lake, 30.5.2007, 41° 33' 07K, 36° 04' 52K, 0 m. **Distribution in Turkey:** Afyon, Aksaray, Ankara, Antalya, Artvin, Aydın, Balıkesir, Bolu, Burdur, Bursa, Denizli, Erzurum, Gümüşhane, Isparta, İzmir, Kayseri, Konya, Manisa, Rize, Sinop, Sivas, Toros Mountains, Trabzon (Guéorguiev, 1981; Darılmaz & Kiyak, 2006; Kiyak et al., 2007; Erman et al., 2007; Erman & Erman, 2008).

Laccophilus poecilus (Klug, 1834)

Material examined: Bafra, Liman Lake, 29.7.2007, 41° 41' 11K, 36° 01' 09D, 0 m, 26.6.2007, 41° 41' 10K, 36° 01' 10D, 0 m, 30.5.2007, 41° 41' 11K, 36° 01' 05D, 0 m; Ondokuzmayıs, Balık Lake, 29.7.2007, 41° 35' 16K, 36° 06' 41D, 0 m. **Distribution in Turkey:** Adana, Afyon, Antalya, Aydın, Bolu, Erzurum, Isparta, İzmir, Konya, Manisa and Rize (Guéorguiev, 1981; Kiyak et al., 2007; Erman et al., 2007; Erman & Erman, 2008).

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

Material examined: Ondokuzmayıs, Balık Lake, 30.5.2007, 41° 33' 07K, 36° 04' 52K, 0 m, 29.7.2007, 41° 35' 16K, 36° 06' 41D, 0 m; Bafra, Liman Lake, 26.6.2007, 41° 41' 10K, 36° 01' 10D, 0 m, 30.5.2007, 41° 41' 11K, 36° 01' 05D, 0 m, 29.7.2007, 41° 41' 11K, 36° 01' 09D, 0 m; Gernek Lake, 26.6.2007, 41° 38' 49K, 36° 04' 46D, 0 m, 29.7.2007, 41° 38' 50K, 36° 04' 45D, 0 m. **Distribution in Turkey:** Aksaray, Ankara, Antalya, Aydın, Balıkesir, Bilecik, Bolu, Isparta, İzmir, Kayseri, Konya, Manisa (Guéorguiev, 1968, 1981; Balfour-Browne, 1963; Nilsson, 2003; Kiyak et al., 2007).

Noterus crassicornis (O.F. Müller, 1776)

Material examined: Ondokuzmayıs, Balık Lake, 30.5.2007, 41° 33' 07K, 36° 04' 52K, 0 m.
Distribution in Turkey: Adana, Isparta (Guéorguiev, 1981; Nilsson, 2003).

ÇARŞAMBA PLAIN**Family HELOPHORIDAE******Helophorus griseus*** Herbst, 1793

Material examined: Terme, Gölünyazı iskelesi, 29.V.2007, 41° 15' 14K, 36° 57' 55D, 0m, 3 males, 4 females; Çarşamba, Kaz Lake, 29.V.2007, 41° 21' 01K, 36° 36' 47D, 0m, 3 males, 1 female.

****Helophorus brevipalpis*** Bedel, 1881

Material examined: Terme, Gölünyazı iskelesi, 29.V.2007, 41° 15' 14K, 36° 57' 55D, 0m, 13 males, 8 females; Dört Yol, 29.V.2007, 41° 12' 43K, 36° 43' 13D, 4m, 8 males, 12 females; Çarşamba, İhmal Lake, 07.V.2008, 41° 21' 01K, 36° 36' 47D, 0m, 2 males, 4 females.

Helophorus minutus Fabricius, 1775

Material examined: Kaz Lake, 29.V.2007, 41° 21' 01K, 36° 36' 47D, om, 8 males, 7 females; Dörtyol, 29.V.2007, 41° 12' 43K, 36° 43' 13D, 4m, 3 males, 7 females.
Distribution in Turkey: Antalya and İstanbul (İncekara et al. 2004).

****Helophorus obscurus*** Mulsant, 1844

Material examined: Terme, Gölünyazı iskelesi, 29.V.2007, 41° 15' 14K, 36° 57' 55D, om, 18 males, 21 females; Dörtyol, 29.V.2007, 41° 12' 43K, 36° 43' 13D, 4m, 7 males, 13 females.

****Helophorus strigifrons*** Thomson, 1868

Material examined: İhmal Lake, 07.V.2008, 41° 21' 01K, 36° 36' 47D, om, 3 males, 2 females.

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

Material examined: Terme, Gölünyazı iskelesi, 29.V.2007, 41° 15' 14K, 36° 57' 55D, om, 4 males, 2 females; Akgöl yanı, 06.V.2008, 41° 14' 18K, 36° 58' 29D, om, 5 male, 3 females.

Family HYDROPHILIDAE

****Hydrobius fuscipes*** (Linnaeus, 1758)

Material examined: Terme, Akgöl yanı, 06.V.2008, 41° 14' 18K, 36° 58' 29D, om, 1 males.

****Coleostoma orbiculare*** (Fabricius, 1775)

Material examined: Çarşamba, İhmal Lake, 26.VI.2007, 41° 21' 01K, 36° 36' 47D, om, 1 female; Terme, Simenit Lake, 26.VI.2007, 41° 17' 42K, 36° 54' 53D, om, 2 males, 1 females, 29.V.2007, 41° 17' 42K, 36° 54' 53D, om, 12 males, 17 females, 29.VIII.2007, 41° 17' 42K, 36° 54' 53D, om, 1 male, 1 female; Akgöl yanı, 06.V.2008, 41° 14' 18K, 36° 58' 29D, om, 1 male, 3 females.

****Berosus signaticollis*** (Charpentier, 1825)

Material examined: Terme, Akgöl, 26.VI.2007, 41° 16' 55K, 36° 56' 14D, om, 3 males, 3 females.

****Berosus affinis*** Brulle, 1922

Material examined: Çarşamba, İhmal Lake, 26.VI.2007, 41° 21' 01K, 36° 36' 47D, om, 26 males, 28 females, Kaz Lake, 08.VII.2007, 41° 23' 17K, 36° 54' 13D, om, 3 males; Terme, Akgöl, 26.VI.2007, 41° 16' 55K, 36° 56' 14D, om, 1 male; Simenit Lake, 26.VI.2007, 41° 17' 42K, 36° 54' 53D, om, 2 males, 3 females.

****Berosus sipinosus*** (Steven, 1808)

Material examined: Çarşamba, İhmal Lake, 26.VI.2007, 41° 21' 01K, 36° 36' 47D, om, 22 males, 30 females, 29.VIII.2007, 41° 21' 08K, 36° 36' 49D, om, 2 males, 5♀, 07.V.2008, 1 female.

****Berosus luridus*** (Linnaeus, 1761)

Material examined: Terme, Simenit Lake, 26.VI.2007, 41° 17' 42K, 36° 54' 53D, om, 1 male; Akgöl yanı, 06.V.2008, 41° 14' 18K, 36° 58' 29D, om, 2 females, 06.V.2008, 41° 16' 54K, 36° 56' 14D, om, 3 males.

****Laccobius gracilis*** Motschulsky, 1855

Material examined: Çarşamba, Dörtyol, 29.V.2007, 41° 12' 43K, 36° 43' 13 D, 4m, 2 males, 2 females.

****Laccobius syriacus*** Guillebeau, 1896

Material examined: Terme, Akgöl, 36.VI.2007, 41° 16' 55K, 36° 56' 14D, om, 2 males, 5 females; Gölünyazı, Balkanlı, 28.VII.2007, 41° 14' 17K, 36° 58' 29D, om, 1 male.

***Hydrochara dichroma** (Fairmaire, 1892)

Material examined: Çarşamba, İhmal Lake, 26.VI.2007, 41° 21' 01K, 36° 36' 47D, om, 1 female.

Paracymus aeneus Germar, 1824

Material examined: Çarşamba, İhmal Lake, 26.VI.2007, 41° 21' 01K, 36° 36' 47D, om, 3 males, 4 females, Kaz Lake, 08.VII.2007, 41° 23' 17K, 36° 54' 13D, om, 3 males; Simenit Lake, 29.VII.2007, 41° 17' 42K, 36° 54' 53D, om, 1 male. **Distribution in Turkey:** without detailed locality (İncekara et al. 2003).

***Paracymus sucutelleris** Rosenhauer, 1856

Material examined: Terme, Simenit Lake, 29.V.2007, 41° 17' 42K, 36° 54' 53D, om, 3 males, 1 female; 29.V.2007, 41° 21' 01K, 36° 36' 47D, om, 3 males, 4 females; Gölünyazı iskelesi, 29.V.2007, 41° 15' 14K, 36° 57' 55D, om, 38 males, 41 females, Çarşamba, İhmal Lake, 07.V.2008, 41° 21' 01K, 36° 36' 47D, om, 12 males, 3 females.

***Limnoxenus niger** (Gamelin, 1790)

Material examined: Çarşamba, İhmal Lake, 26.VI.2007, 41° 21' 01K, 36° 36' 47D, om, 1 male, 07.V.2008, 13 males, 4 females; Terme, Simenit Lake, 26.VI.2007, 41° 17' 42K, 36° 54' 53D, om, 4 males, 2 females.

***Helochaeres obscurus** (Müller, 1776)

Material examined: Terme, Akgöl, 26.VI.2007, 41° 16' 55K, 36° 56' 14D, om, 6 males, 12 females, 06.V.2008, 41° 16' 54K, 36° 56' 14D, om, 1 male; Gölünyazı iskelesi, 06.V.2008, 41° 15' 14K, 36° 57' 55D, om, 8 males, 12 females; Akgöl yanı, 06.V.2008, 41° 14' 18K, 36° 58' 29D, om, 1 male; Simenit Lake, 29.VII.2007, 41° 17' 42K, 36° 54' 53D, om, 2 males.

***Hydrophilus piceus** (Linnaeus, 1758)

Material examined: Terme, Simenit Lake, 29.V.2007, 41° 17' 42K, 36° 54' 53D, om, 1 male, 29.VII.2007, 41° 17' 42K, 36° 54' 53D, om, 3 male, 2 females.

Hydrophilus atterimus Eschscholtz, 1822

Material examined: Terme, Akgöl, 06.V.2008, 41° 16' 54K, 36° 56' 14D, om, 1 female. **Distribution in Turkey:** Erzurum (İncekara et al. 2003). **Remark:** The first record of *H. atterimus* was given by İncekara et al. (2003). In this study, second record is given for Turkey.

Family DYTISCIDAE

Agabus dilatatus (Brullé, 1832)

Material examined: Çarşamba, Kaz Lake, 29.5.2007, 41° 21' 01K, 36° 36' 47D, o m. **Distribution in Turkey:** Adana, Ankara, Antalya, Bolu, Bursa, Gümüşhane, Isparta, İçel, İzmir, Kocaeli, Konya, Kütahtya, Rize, Toros Mountains, Trabzon, Van (Balfour-Browne, 1963; Guéorguiev, 1968; 1981; Nilsson, 2003).

Agabus nebulosus (Forster, 1771)

Material examined: Terme, Gölünyazı iskelesi, 29.5.2007, 41° 15' 14K, 36° 57' 55D, o m. **Distribution in Turkey:** Afyon, Antalya, Aydın, Burdur, Bursa, Denizli, İstanbul, İzmir, Muğla, Sinop, Toros Mountains, Trabzon (Guéorguiev, 1981; Nilsson, 2003; Kiyak et al., 2007).

Colymbetes fuscus (Linnaeus, 1758)

Material examined: Terme, Simenit Lake, 29.8.2007, 41° 17' 42K, 36° 54' 53D, o m. **Distribution in Turkey:** Afyon, Aksaray, Aydın, Burdur, İzmir, Konya (Guéorguiev, 1981; Nilsson, 2003; Darılmaz & Kiyak, 2006; Kiyak et al., 2007).

Graphoderus cinereus (Linnaeus, 1758)

Material examined: Terme, Simenit Lake, 29.8.2007, 41° 17' 42K, 36° 54' 53D, 0 m.
Distribution in Turkey: Afyon, Ağrı (Guéorguiev, 1981; Nilsson, 2003; Kiyak et.al., 2007).

****Bidessus nasutus*** (Sharp, 1887)

Material examined: Terme, Gölünyazı iskelesi, 29.5.2007, 41° 15' 14K, 36° 57' 55D, 0 m.

****Hydroglyphus geminus*** (Fabricius, 1792)

Material examined: Terme, Gölünyazı iskelesi, 29.5.2007, 41° 15' 14K, 36° 57' 55D, 0 m; Simenit Lake, 26.6.2007, 41° 14' 19K, 36° 58' 29D, 0 m, 29.8.2007, 41° 17' 42K, 36° 54' 53K, 0 m; Çarşamba, İhmal Lake, 26.6.2007, 41° 21' 01K, 36° 36' 47D, 0 m.

****Hydroporus marginatus*** (Duftschmid, 1805)

Material examined: Terme, Gölünyazı iskelesi, 29.5.2007, 41° 15' 14K, 36° 57' 55D, 0 m; Simenit Lake, 26.6.2007, 41° 14' 19K, 36° 58' 29D, 0 m.

Hydroporus palustris (Linnaeus, 1761)

Material examined: Terme, Gölünyazı iskelesi, 29.5.2007, 41° 15' 14K, 36° 57' 55D, 0 m; Ladik, Gölünyazı Lake, 31.5.2007, 40° 54' 17K, 35° 59' 05D, 863 m; Simenit Lake, 29.8.2007, 41° 17' 42K, 36° 54' 53K, 0 m. **Distribution in Turkey:** Asie mineure, Erzurum (Guéorguiev, 1981; Erman et.al, 2007).

Hydroporus planus (Fabricius, 1781)

Material examined: Terme, Gölünyazı iskelesi, 29.5.2007, 41° 15' 14K, 36° 57' 55D, 0 m.
Distribution in Turkey: Antalya, Balıkesir, Bursa, Erzurum, İstanbul, Kars, Toros Mountains, Trabzon (Guéorguiev, 1981; Kiyak et.al, 2007; Erman et.al., 2007).

Porhydrus lineatus (Fabricius, 1775)

Material examined: Terme, Gölünyazı iskelesi, 29.5.2007, 41° 15' 14K, 36° 57' 55D, 0 m; Simenit Lake, 29.8.2007, 41° 17' 42K, 36° 54' 53D, 0 m, 26.6.2007, 41° 14' 19K, 36° 58' 29D, 0 m; Gölyazı, Akgöl, 28.8.2007, 41° 16' 54K, 36° 56' 15D, 0 m. **Distribution in Turkey:** Trabzon (Guéorguiev, 1981).

****Hygrotus inaequalis*** (Fabricius, 1777)

Material examined: Terme, Simenit Lake, 29.8.2007, 41° 17' 42K, 36° 54' 53D, 0 m; Gölünyazı iskelesi, 29.5.2007, 41° 15' 14K, 36° 57' 55D, 0 m; Gölyazı, Akgöl, 28.8.2007, 41° 16' 54K, 36° 56' 15D, 0 m.

Hyphydrus ovatus (Linnaeus, 1761)

Material examined: Terme, Gölünyazı iskelesi, 29.5.2007, 41° 15' 14K, 36° 57' 55D, 0 m.
Distribution in Turkey: Amasya, Bolu, Erzurum (Balfour-Browne, 1963; Guéorguiev, 1981; Biström, 1982; Erman et. al., 2007).

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

Material examined: Terme, Simenit Lake, 29.8.2007, 41° 17' 42K, 36° 54' 53D, 0, 26.6.2007, 41° 17' 14K, 36° 54' 15D, 0 m; m; Terme, Gölyazı, Akgöl, 28.8.2007, 41° 16' 54K, 36° 56' 15D, 0 m.

****Laccophilus poecilus*** (Klug, 1834)

Material examined: Terme, Gölünyazı iskelesi, 29.5.2007, 41° 15' 14K, 36° 57' 55D, 0 m; Simenit Lake, 29.8.2007, 41° 17' 42K, 36° 54' 53D, 0 m, 29.8.2007, 41° 17' 42K, 36° 54' 53K, 0 m; Gölyazı, Akgöl, 28.8.2007, 41° 16' 54K, 36° 56' 15D, 0 m.

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

Material examined: Terme, Simenit Lake, 29.8.2007, 41° 17' 42K, 36° 54' 53K, 0 m, 26.6.2007, 41° 17' 14K, 36° 54' 15D, 0 m, 26.6.2007, 41° 14' 19K, 36° 58' 29D, 0 m.

****Noterus crassicornis*** (O.F. Müller, 1776)

Material examined: Ondokuzmayıs, Balık Lake, 30.5.2007, 41 33 07K, 36 04 52K, 0 m.

Family HALIPLIDAE***Peltodytes caesus*** (Duftschmid, 1805)

Material examined: Terme, Gölyazı, Akgöl, 28.8.2007, 41 16 54K, 36 56 18D, 0 m; Gölyazı, 28.8.2007, 41 15 16K, 365753D, 0 m; Simenit Lake, 29.8.2007, 41 17 42K, 36 54 53K, 0 m, 26.6.2007, 41 14 14K, 36 58 29D, 0 m. **Distribution in Turkey:** Adana, Afyon, Aksaray, Aydın, Balıkesir, Bolu, Eskişehir, Isparta, İzmir, Konya, Toros Mountains (Guéorguiev, 1968, 1981; Vondel, 2003; Darılmaz & Kiyak, 2006).

Haliplus ruficollis (De Geer, 1774)

Material examined: Terme, Gölyazı, Akgöl, 28.8.2007, 41 16 54K, 36 56 18D, 0 m. **Distribution in Turkey:** Without detailed locality data (Guéorguiev, 1981; Vondel, 2003). **Remarks:** This species is confirmed for Turkey and the first detailed records are given.

*Locality information presented in detail before.

DISCUSSION

Totally, 50 species of aquatic Coleoptera belonging to 5 families and 25 genera were determined in the research area. Of these, 22 species are Adephaga and 28 are Polyphaga member. Besides the newly recorded for the Turkish fauna, *H. strigifrons*, all species are recorded from the research area for the first time.

12 genera of the family Dytiscidae were found in both plain. Of these, 7 genera placed in Bafra plain and of 9 in Çarşamba plain. Only 4 genera (*Bidessus*, *Hydroglyphus*, *Hydroporus* and *Laccophilus*) are common for both plains.

1 Noterid genus (*Noterus*) was determined in both plains. Two *Noterus* species (*N. clavicornis* and *N. crassicornis*) were common for both plains.

2 Haliplid genera (*Peltodytes* and *Haliplus*) were found in Çarşamba plain only. Naturally, the species *Peltodytes caesus* and *Haliplus (H.) ruficollis* belonging to these genera were not represented in the Bafra plain.

The Hydrophilidae family was represented with 9 genera and 17 species in the research area. All genera were found in both plain, but species were different. While the species *Laccobius (D.) obscuratus* and *L. striatulus* were not represented in Çarşamba plain, the species *Paracymus aeneus* and *Hydrophilus atterimus* were not represented in Bafra plain.

Although the Helophoridae are a large family consisting of a single subfamily only of a single genus, *Helophorus*, poorly represented in the research area. Totally, 10 species found in both plain. While the species *H. terminassianae*, *H. daedalus*, *H. syriacus*, *H. micans* and *H. griseus* were not represented in Çarşamba plain, the species *H. minutus* was not represented in Bafra plain.

Generally, it is thought that similar geographies and habitats are represented by the similar fauna, but this does not occur in every condition as is seen from this study.

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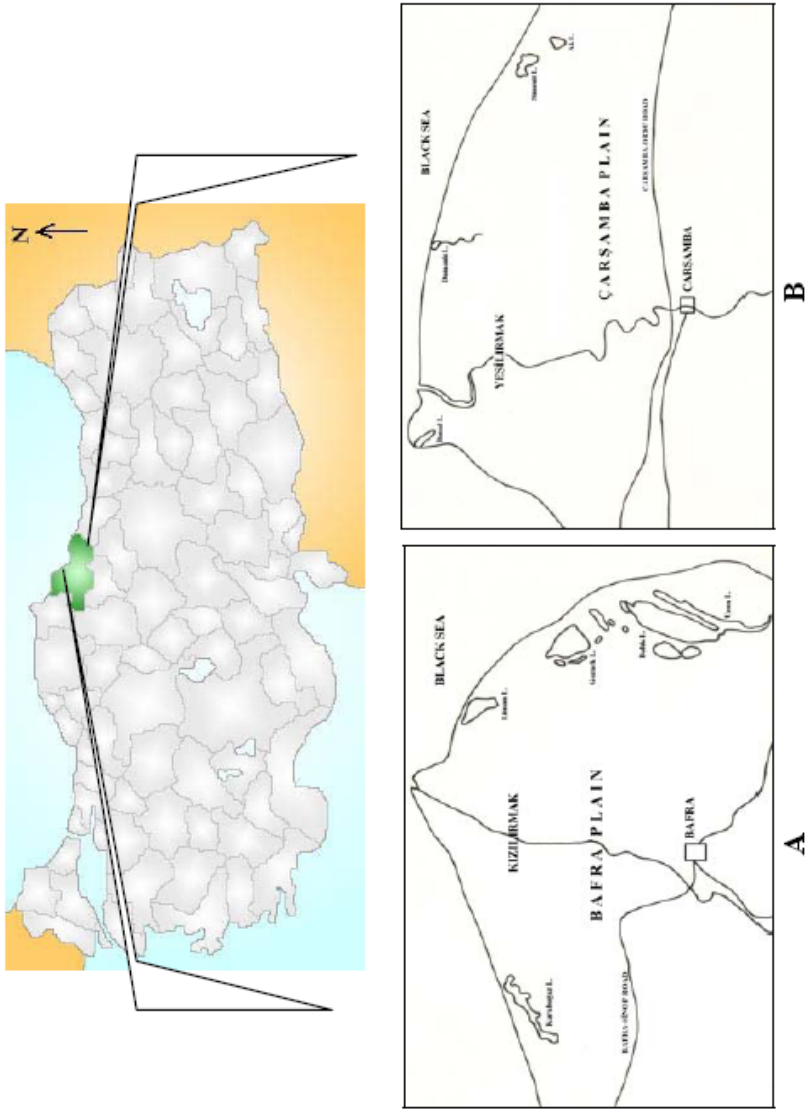


Figure 1. Research area. A) Bafra plain. B) Çarşamba plain.

Table I. Comparison of the species (Adephaga) number and variety of both plains.

DYTISCIDAE		NOTERIDAE		HALIPLIDAE	
BAFRA	ÇARŞAMBA	BAFRA	ÇARŞAMBA	BAFRA	ÇARŞAMBA
<i>Hydaticus leander</i>	<i>Agabus dilatatus</i>	<i>Noterus clavicornis</i>	<i>Noterus clavicornis</i>	-	<i>Peltodytes caesus</i>
<i>H. transversalis laevisculptus</i>	<i>Agabus nebulosus</i>	<i>N. crassicornis</i>	<i>N. crassicornis</i>	-	<i>Haliphus ruficollis</i>
<i>Bidessus nasutus</i>	<i>Colymbetes fuscus</i>	-	-	-	-
<i>Hydroglyphus geminus</i>	<i>Graphoderus cinereus</i>	-	-	-	-
<i>Hydroporus marginatus</i>	<i>Bidessus nasutus</i>	-	-	-	-
<i>Hydrovatus cuspidatus</i>	<i>Hydroglyphus geminus</i>	-	-	-	-
<i>Hygrotus parallelogrammus</i>	<i>Hydroporus marginatus</i>	-	-	-	-
<i>H. inaequalis</i>	<i>H. palustris</i>	-	-	-	-
<i>Laccophilus minutus</i>	<i>H. planus</i>	-	-	-	-
<i>L. poecilus</i>	<i>Porhydrus lineatus</i>	-	-	-	-
-	<i>H. inaequalis</i>	-	-	-	-
-	<i>Hyphidrus ovatus</i>	-	-	-	-
-	<i>Laccophilus minutus</i>	-	-	-	-
-	<i>L. poecilus</i>	-	-	-	-

Table II. Comparison of the species (Polyphaga) number and variety of both plains.

HYDROPHILIDAE		HELOPHORIDAE	
BAFRA	ÇARŞAMBA	BAFRA	ÇARŞAMBA
<i>Hydrobius fuscipes</i>	<i>Hydrobius fuscipes</i>	<i>Helophorus brevipalpis</i>	<i>Helophorus griseus</i>
<i>Coleostoma orbiculare</i>	<i>Coleostoma orbiculare</i>	<i>H. strigifrons</i>	<i>H. minutus</i>
<i>Berosus signaticolis</i>	<i>Berosus signaticolis</i>	<i>H. obscurus</i>	<i>H. brevipalpis</i>
<i>B. affinis</i>	<i>B. affinis</i>	<i>H. aquaticus</i>	<i>H. obscurus</i>
<i>B. sipinosus</i>	<i>B. sipinosus</i>	<i>H. terminassianae</i>	<i>H. strigifrons</i>
<i>B. luridus</i>	<i>B. luridus</i>	<i>H. daedalus</i>	<i>H. aquaticus</i>
<i>Laccobilis gracilis</i>	<i>Laccobilis gracilis</i>	<i>H. syriacus</i>	-
<i>L. syriacus</i>	<i>L. syriacus</i>	<i>H. micans</i>	-
<i>L. striatulus</i>	<i>Hydrochara dichroma</i>	<i>H. griseus</i>	-
<i>Laccobius obscuratus</i>	<i>Paracymus aeneus</i>	-	-
<i>Hydrochara dichroma</i>	<i>P. sucutelleris</i>	-	-
<i>Paracymus sucutelleris</i>	<i>Limnoxenus niger</i>	-	-
<i>Limnoxenus niger</i>	<i>Helochares obscurus</i>	-	-
<i>Hydrophilus piceus</i>	<i>Hydrophilus piceus</i>	-	-
<i>Helochares obscurus</i>	<i>H. atterimus</i>	-	-