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Orijinal araştırma (Original article)

Heteroptera (Hemiptera) Fauna of Isparta-Gölcük Natural Park with some rare and peculiar species and new records for Mediterranean Region of Turkey

Bazı nadir, ilginç türler ve Akdeniz Bölgesi için yeni kayıtlarla birlikte Isparta-Gölcük Milli Parkı Heteroptera (Hemiptera) faunası

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Summary

The survey was conducted in Gölcük Natural Park - Isparta province, to determine the biological diversity during March-November of 2008. In total 66 Heteropteran species from 13 families were represented in the study area and among these species, *Picromerus bidens* Linnaeus, *Sciocoris homalonotus* Fieber, *Eurygaster dilaticollis* Dohrn, *Sehirus luctuosus* Mulsant & Rey, *Bothrostethus annulipes* (Herrich-Schaeffer), *Coriomeris alpinus* (Horváth), *Coriomeris scabricornis* (Panzer), *Geocoris grylloides* (Linnaeus), *Eremocoris plebejus* (Fallén), *Holotrichus denudatus* A. Costa and *Himacerus dauricus* (Kiritshenko) are new records for Mediterranean region of Turkey. The activity periods of the collected species were given as a table based on their monthly abundances.

Key words: Heteroptera, fauna, Gölcük Natural Park, Isparta, Turkey

Özet

2008 yılının Mart-Kasım ayları arasında Isparta Gölcük Milli Parkı'nda biyolojik çeşitliliği belirlemeye yönelik yapılan arazi çalışmaları sonucunda Heteroptera alttakımından 13 familyaya bağlı 66 tür tespit edilmiştir. Bu türlerden, *Picromerus bidens* Linnaeus, *Sciocoris homalonotus* Fieber, *Eurygaster dilaticollis* Dohrn, *Sehirus luctuosus* Mulsant & Rey, *Bothrostethus annulipes* (Herrich-Schaeffer), *Coriomeris alpinus* (Horváth), *Coriomeris scabricornis* (Panzer), *Geocoris grylloides* (Linnaeus), *Eremocoris plebejus* (Fallén), *Holotrichus denudatus* A. Costa ve *Himacerus dauricus* (Kiritshenko) Türkiye'nin Akdeniz Bölgesi için yeni kayıttır. Ayrıca türlerin aktif periyotları ve aylık ortaya çıkma durumlarını gösteren bir tablo verilmiştir.

Anahtar sözcükler: Heteroptera, fauna, Gölcük Milli Parkı, Isparta, Türkiye

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Introduction

Studies dealing with Heteropteran fauna of Turkey dated back to 1880s and many researchers, either local or foreigners reported a number of records from both Anatolian and Thracian part of the country. The most recent data showed that 1526 taxa belonging 40 families naturally occurred in Turkey (Önder et al, 2006).

Mediterranean Region, which includes our study area, gained attention of many researchers whose studies contributed to the faunal knowledge of Heteroptera (Hemiptera). The oldest records from the region are those of foreign researchers (Puton, 1892; Puton & Noualhier, 1895; Horváth, 1901, 1916, 1918, 1919; Reuter, 1904, 1913; Seidenstücker, 1954, 1957, 1958, 1960; Hoberlandt, 1955; Linnavuori, 1965) who studied mainly Toros Mountains and Amanos Mountains (=Gavur or Nur Mountains) inside the city borders of Hatay, Adana and Kahramanmaraş. More recently, Lodos *et al*. (1998, 1999, 2003) performed more detailed faunistic studies in the region and Kıyak *et al.* (2006, 2008) recorded some aquatic and semi-aquatic Heteropterans in their studies including Isparta province.

Gölcük Natural Park (GNP) is in an arid region located 8 km southwest of Isparta province and its special characteristics make it an important recreation area. With its diverse vegetation and wildlife, geomorphological structure, aesthetically pleasing landscape and recreational opportunities, GNP is one of the most important areas of the Lakes District in Turkey. This area of 5,925 ha (700 ha lost from intro.), was proclaimed a National Park, but its condition is deteriorating because it has no master plan and minimal management (Gül *et al.*, 2005).

The studies performed around Gölcük Lake showed that 227 plant taxa from 136 genera within 47 families existed there, and among them red pine, black pine, oak, cedar, pseudoacacia and some other shrubs are presented in Gölcük Natural Park. (Fakir & Dutkuner, 1999; Karatepe *et al.*, 2005).

During the studies on Insect diversity of Gölcük Natural Park, series of papers has been published with new records of two genera and 25 species for Turkish fauna and among them five species were described as a new for sciences (Japoshvili 2011; Japoshvili & Anlas, 2011, Japoshvili & Celik 2010; Japoshvili & Ljubomirov, 2011; Japoshvili & Toyganözü, 2011; Japoshvili *et al.* 2009, 2010, 2011).

This study was performed i) to determine the Heteroptera fauna of Gölcük, a region possessing a rich biodiversity character, ii) to contribute to the present data on Heteroptera fauna of Mediterranean Region and Turkey, iii) to put forward an updated distributional range for already know species from the region and iv) to present a preliminary data on activity periods of the collected specimens from March to November.

Material and Methods

Insect samples were collected by second author (Dr. George Japoshvili) from Gölcük Natural Park (Isparta), weekly from March to November 2008 using the pitfall and yellow traps. The lowest altitude for trapping was 1227 m and the highest was 1611 m. Collected materials were preserved according Japoshvili *et al.* (2009).

The identification of the species was made by first author (Dr. Meral Fent) by following, Kerzhner & Jaczewski (1964), Péricart (1983, 1987, 1999abc), Moulet (1995), Lodos & Önder (1980), Abbas & Önder (1990) Derjanschi & Péricart (2005) and Putshkov & Moulet (2009).

In the present study was considere the distributions in Turkey of new recorded species for Mediterranean Region of Turkey and uncommon species.

In addition, activie periods for all species in Table. 1 and the frequencies of distributions of species in per month in Figure.1 were given.

Results

Pentatomidae Leach, 1815

Picromerus bidens Linnaues, 1758

Material examined: 23.VIII.2008, 1♂.

Distribution in Turkey: Artvin, Çanakkale, Çorum, Giresun, Kırklareli, Nevşehir, Ordu, Tekirdağ (Önder *et al*., 2006).

This species, with a wide distributional range in Palaearctic Region, was recorded in Anatolia and Thrace Region in a few localities. This present record represents the first record of the species in Mediterranean Region.

Graphosoma lineatum (Linnaeus, 1758)

Material examined: 24.VII.2008, ♀, ♂; 07.VIII.2008, 2 ♀♀.

Derula flavoguttata Mulsant & Rey, 1856

Material examined: 03.VII.2008, ♀.

Aelia rostrata Boheman, 1852

Material examined: 11.VI.2008, ♀; 23.VI.2008, ♀; 03.VII.2008, ♀; 11.IX.2008, ♀.

Mustha spinusula (Lefebvre, 1831)

Material examined: 11.VIII.2008, ♂; 18.IX.2008, 1 nymph.

Palomena prasina (Linnaues, 1761)

Material examined: 16.VI.2008, ♀.

Dolycoris baccarum (Linnaeus, 1758)

Material examined: 11.VI.2008, ♀; 16.VI.2008, ♀, ♂; 23.VI.2008, ♂; 03.VII.2008, 2 ♀♀, 2 ♂♂; 10.VII.2008, ♀, 2 ♂♂; 24.VII.2008, ♀; 07.VIII.2008, 2 ♂♂; 22.VIII.2008, ♀; 04.IX.2008, ♀.

Piezodorus lituratus (Fabricius, 1794)

Material examined: 04.IX.2008, ♀; 09.X.2008, ♀.

Sciocoris cursitans (Fabricius, 1794)

Material examined: 03.VII.2008, ♀.

Sciocoris homalonotus Fieber, 1851

Material examined: 05.VI.2008, ♀; 23.VI.2008, ♀; 03.VII.2008, ♀, ♂; 24.VII.2008, 2 ♀♀; 07.VIII.2008, 2 ♀♀; 22.VIII.2008, ♀; 04.IX.2008, 4 ♀♀, 3 ♂♂; 18.IX.2008, 2 ♀♀, 1 ♂; 23.X.2008, ♂.

Distribution in Turkey: Ankara, İzmir, Kastamonu, Kayseri, Kırşehir, Mardin (Önder *et al.*, 2006).

This species is a new record for Heteroptera fauna of Mediterranean Region of Turkey.

Sciocoris sulcatus Fieber, 1851

Material examined: 13.IV.2008, ♂.

Scutelleridae Leach, 1815

Eurygaster austriaca Schrank, 1776

Material examined: 03.VII.2008, ♀.

Eurygaster dilaticollis Dohrn, 1860

Material examined: 11.VI.2008, 1 ♀.

Distribution in Turkey: Ankara, Erzincan, Gümüşhane, Kars, Sivas (Hoberlandt, 1955; Kıyak, 2000; Önder *et al.*, 2006, Dursun & Fent, 2010).

This species is distributed in Europe and in only a small part of Asia. It is known from Turkey in few localities and recorded for the first time in Mediterranean Region with this study.

Eurygaster maura (Linnaeus, 1758)

Material examined: 23.III.2008, ♂; 11.VI.2008, 2 ♀♀; 03.VII.2008, ♀, ♂; 24.VII.2008, ♀; 22.VIII.2008, ♀, ♂; 04.IX.2008, ♀; 11.IX.2008, ♀; 23.X.2008, 2 ♂♂.

Irochrotus maculiventris (Germar, 1839)

Material examined: 18.IX.2008, ♂, 06.XI.2008, ♀; 27.XI.2008, ♀.

Distribution in Turkey: Gaziantep, İçel, İstanbul, Kahramanmaraş, Tokat (Önder *et al.*, 2006; Dursun & Fent, 2010).

Odontoscelis fuliginosa (Linnaeus, 1761)

Material examined: 05.VI.2008, ♂; 23.VI.2008, ♂; 07.VIII.2008, 2 ♂♂; 22.VIII.2008, ♀, 5 ♂♂; 28.VIII.2008, 6 ♀♀, 8 ♂♂; 04.IX.2008, 5 ♀♀, 14 ♂♂; 11.IX.2008, ♂; 18.IX.2008, 6 ♀♀, 2 ♂♂; 09.X.2008, ♀, 4 ♂♂; 23.X.2008, ♀.

Odontoscelis minuta Jakovlev, 1881

Material examined: 22.VIII.2008, ♀; 04.IX.2008, 3 ♂♂; 18.IX.2008, ♀; 23.X.2008, ♀, ♂.

Cydnidae Billberg, 1820

Cydnus aterrimus (Forster, 1771)

Material examined: 11.VI.2008, ♀.

Sehirus luctuosus Mulsant & Rey, 1866

Material examined: 17.IV.2008, ♀.

Distribution in Turkey: Kayseri, Bursa, Kars (Horváth, 1883; Kiritshenko, 1918; Hoberlandt, 1955; Önder *et al*., 2006).

This species has very old records in a few localities from Turkey and is recorded in this study in Mediterranean Region for the first time.

Legnotus limbosus (Scopoli, 1763)

Material examined: 13.IV.2008, ♂.

Thyreocoridae Amyot & Serville, 1843

Thyreocoris scarabaeiodes Linnaeus, 1758

Material examined: 11.VI.2008, ♀; 15.VI.2008, 3 ♂♂.

Stenocephalidae Dallas, 1852

Dicranocephalus agilis (Scopoli, 1763)

Material examined: 24.IX.2008, ♀.

Alydidae Amyot & Serville, 1843

Alydus calcaratus (Linnaeus, 1758)

Material examined: 05.VI.2008, ♂; 03.VII.2008, 10 ♂♂; 10.VII.2008, ♂; 24.VII.2008, 5 ♂♂; 07.VIII.2008, ♀, 13 ♂♂; 11.VIII.2008, ♂; 22.VIII.2008, 12 ♂♂; 28.VIII.2008, 5 ♂♂; 04.IX.2008, 7 ♂♂; 11.IX.2008, 2 ♂♂; 18.IX.2008, 3 ♂♂; 25.IX.2008, 2 ♂♂; 09.X.2008, 2 ♀♀, 3 ♂♂; 23.X.2008, 10 ♂♂; 06.XI.2008, 2 ♂♂; 27.XI.2008, ♂.

It is a notable data to obtain only 3 females among the 91 samples collected from June to November with an intense collection effort.

Camptopus lateralis (Germar, 1817)

Material examined: 19.VI.2008, ♂; 03.VII.2008, 6 ♂♂; 24.VII.2008, 3 ♂♂.

Camptopus tragacanthae (Kolenati, 1845)

Material examined: 15.V.2008, ♂; 22.VIII.2008, ♀; 28.VIII.2008, ♀; 04.IX.2008, ♀.

Coreidae Leach, 1815

Anoplocerus elevatus (Fieber, 1861)

Material examined: 03.VII.2008, ♀, ♂; 24.VII.2008, 3 ♂♂.

Distribution in Turkey: Ankara, Niğde, Osmaniye (Hoberlandt, 1955; Seidenstücker, 1960; Moulet, 1995).

Bothrostethus annulipes (Herrich-Schaeffer, 1835)

Material examined: 22.V.2008, ♂; 28.VIII.2008, ♀.

Distribution in Turkey: Ankara, Bursa, Gümüşhane, Konya, Niğde (Seidenstücker, 1958; Moulet, 1995; Dursun & Fent, 2009).

This rare species has previously been recorded from a few localities in Turkey and is recorded for the first time in the study area and in Mediterranean Region.

Ceraleptus obtusus (Brullé, 1839)

Material examined: 19.VI.2008, ♂.

Coreus marginatus (Linnaeus, 1758)

Material examined: 18.VI.2008, ♀; 07.VIII.2008, ♀, 2 ♂♂; 11.VIII.2008, 2 ♀♀.

Coriomeris affinis (Herrich-Schaeffer, 1839)

Material examined: 22.V.2008, 3 ♀♀, 5 ♂♂; 03.VII.2008, ♂; 24.VII.2008, ♀; 07.VIII.2008, ♀; 28.VIII.2008, ♀.

Coriomeris alpinus (Horváth, 1895)

Material examined: 24.IV.2008, ♂.

Distribution in Turkey: Ankara, Kayseri (Hoberlandt, 1955; Moulet, 1995; Dursun, 2011a).

This species has so far been recorded from Turkey only from Ankara and Kayseri. The present record is the first for Mediterranean Region of Turkey.

C. alpinus is a species living over altitudes of 800m. The present study area of Gölcük National Park is located between 1227-1611m, thus makes here a suitable habitat for this species and explains for its presence.

Coriomeris scabricornis (Panzer, 1809)

Material examined: 22.V.2008, ♀; 05.VI.2008, ♀; 15.VI.2008, ♀; 03.VII.2008, ♀; 11.IX.2008, ♂.

Distribution in Turkey: Ankara, Kayseri, Sivas (Hoberlandt, 1955; Moulet, 1995; Önder *et al.*, 2006; Dursun & Fent, 2009).

This species has previously been recorded in a few localities in Turkey and is recorded for the first time in the study area in Mediterranean Region.

Coriomeris denticulatus (Scopoli, 1763)

Material examined: 20.IV.2008, ♀, ♂; 24.IV.2008, ♀; 28.IV.2008, ♀; 15.V.2008, ♂; 22.V.2008, 6 ♂♂; 03.VII.2008, ♂; 10.VII.2008, ♂; 24.VII.2008, ♀, ♂; 07.VIII.2008, 3 ♀♀, ♂; 04.IX.2008, ♀.

Strobilotoma typhaecornis (Fabricius, 1803)

Material examined: 05.VI.2008, ♀.

Rhopalidae Amyot & Serville, 1843

Rhopalus parampunctatus Schilling, 1829

Material examined: 24.IV.2008, ♀; 01.V.2008, ♂; 06.VI.2008, ♂.

Pyrrhocoridae Amyot& Serville, 1843

Pyrrhocoris apterus (Linnaeus, 1758)

Material examined: 27.III.2008, ♀; 10.IV.2008, 4 ♀♀, 3 ♂♂; 13.IV.2008, ♀; 17.IV.2008, 2 ♀♀; 01.V.2008, ♀, ♂; 15.V.2008, 3 ♀♀, ♂; 22.V.2008, ♀; 11.VI.2008, ♂; 16.VI.2008, ♀; 19.VI.2008, ♀; 23.VI.2008, ♀; 03.VII.2008, ♀; 10.VII.2008, 7 ♀♀; 23.VII.2008, 2 ♀♀, ♂; 24. VII.2008, 6 ♀♀, ♂; 07.VIII.2008, 3 ♀♀, ♂; 11.VIII.2008, 4 ♀♀, ♂; 22.VIII.2008, 3 ♂♂; 24.VIII.2008, 3 ♀♀, ♂; 28.VIII.2008, 2 ♀♀; 04.IX.2008, 9 ♀♀, 8 ♂♂; 09.X.2008, 6 ♀♀, 2 ♂♂; 22.X.2008, 6 ♀♀, 2 ♂♂; 06.XI.2008, ♂; 27.XI.2008, ♀, ♂.

Lygaeidae Schilling, 1829

Aellopus atratus (Goeze, 1778)

Material examined: 24.VII.2008, ♀.

Beosus maritimus (Scopoli, 1763)

Material examined: 03.VII.2008, ♀; 22.VIII.2008, ♀.

Emblethis brachynotus Horváth, 1897

Material examined: 04.IX.2008, ♀.

Emblethis griseus Wolff, 1802

Material examined: 05.VI.2008, ♂; 11.VI.2008, ♂; 19.VI.2008, ♀.

Emblethis verbasci (Fabricius, 1803)

Material examined: 16.VI.2008, ♂.

Eremocoris plebejus (Fallén, 1807)

Material examined: 17.IV.2008, ♀; 23.VI.2008, 2 ♀♀; 22.VIII.2008, ♀, ♂; 14.IX.2008, ♂; 18.IX.2008, ♀; 09.X.2008, ♂; 23.X.2008, ♀, ♂.

Distribution in Turkey: Ankara, Bursa (Péricart, 1999b; Önder *et al.*, 2006).

This species, which has previously been recorded only Ankara and Bursa in Turkey, is a rare species and was recorded for the first time in the study area and in Mediterranean Region.

Eremocoris fenestratus (Herrich-Schaeffer, 1839)

Material examined: 24.VII.2008, 2 ♀♀, ♂; 04.IX.2008, ♂.

Gastrodes grossipes grossipes (De Geer, 1773)

Material examined: 23.VI.2008, ♂.

Geocoris grylloides (Linnaeus, 1761)

Material examined: 09.X.2008, ♀; 06.XI.2008, 2♀♀; 27.XI.2008, ♀.

Distribution in Turkey: Diyarbakır, Mardin, Muş (Wagner, 1959; Önder *et al.*, 2006).

So far few records for this species have been restricted to southeastern and eastern parts of Turkey, It is recorded from the southern part of the country for the first time within this study.

Graptopeltus lynceus (Fabricius, 1775)

Material examined: 10.VII.2008, ♂.

Graptopeltus validus (Horváth, 1875)

Material examined: 07.VIII.2008, ♀.

Horvathiolus superbus (Pollich, 1794)

Material examined: 24.IV.2008, ♂.

Ischnopeza hirticornis (Herrich-Schaeffer, 1850)

Material examined: 10.V.2008, ♂; 03.VII.2008, ♀.

Lethaeus cribratissimus (Stål, 1859)

Material examined: 10.VII.2008, 2 ♀♀; 11.XI.2008, ♀, ♂; 25.XI.2008, ♂.

Lygaeus equestris (Linnaeus, 1758)

Material examined: 19.VI.2008, ♂.

Macroplax fasciata fasciata (Herrich-Schaeffer, 1835)

Material examined: 05.VI.2008, ♀.

Melanocoryphus albomaculatus (Goeze, 1778)

Material examined: 24.IV.2008, ♂; 06.VI.2008, ♂; 03.VII.2008, ♂.

Melanocoryphus tristrami (Douglas & Scott, 1868)

Material examined: 17.IV.2008, ♀, 2 ♂♂; 11.VI.2008, 3 ♀♀, ♂; 19.VI.2008, 2 ♀♀, 2 ♂♂; 05.VIII.2008, ♀; 07.VIII.2008, ♂; 04.IX.2008, ♀, ♂.

Peritrechus gracilicornis Puton, 1877

Material examined: 11.VI.2008, ♀.

Plinthisus angulatus Horváth, 1876

Material examined: 22.VIII.2008, ♂.

Distribution in Turkey: Ankara, Gazianatep, Hatay Kahramanmaraş (Puton & Noulahier, 1895; Seidestücker, 1958; Péricart, 1999b; Önder *et al.*, 2006).

Rhyparochoromus phoenicus (Rossi, 1794)

Material examined: 17.IV.2008, ♀; 15.V.2008, 2 ♀♀; 11.VI.2008, ♀; 19.VI.2008, ♀; 24.VII.2008, 2 ♀♀, ♂; 23.X.2008, ♀.

Rhyparochromus vulgaris (Schilling, 1829)

Material examined: 10.VII.2008, 4 ♀♀, 25.IX.2008, ♀.

Spilostethus saxatilis (Scopoli, 1763)

Material examined: 11.VI.2008, ♀; 24.VII.2008, ♀.

Tingidae Laporte, 1832

Dictyla echii (Schrank, 1782)

Material examined: 24.IV.2008, 2 ♂♂.

Nabidae A. Costa, 1853

Himacerus dauricus (Kiritschenko, 1911)

Material examined: 23.X.2008, ♀.

Distribution in Turkey: Kayseri (Ali Mountain) [Seidenstücker, 1960 as *Himacerus bihamatus* (Kiritshenko)].

Himacerus dauricus was recorded in Turkey for the first time by Seidenstücker (1960) from Kayseri-Ali Mountain as *Himacerus bihamatus* (Kiritshenko). The range of this species in Palaearctic Region includes Asia and some parts of Europe and is recorded here second time in Turkey and first record of the species in Mediterranean Region with this study.

Nabis pseudoferus Remane, 1949

Material examined: 07.VIII.2008, ♀.

Prostemma guttula asiaticum Kerzhner, 1968

Material examined: Isparta-Gölcük, 10.IV.2008, 2 ♀♀; 17.IV.2008, ♂; 24.IV.2008, ♂; 01.V.2008, ♂; 15.V.2008, ♂; 22.V.2008, ♂; 05.VI.2008, 2 ♀♀; 11.VI.2008, ♀; 16.VI.2008, ♀; 19.VI.2008, 2 ♀♀, 2 ♂♂; 23.VI.2008, 4 ♀♀; 03.VII.2008, 2 ♀♀; 10.VII.2008, ♀; 07.VIII.2008, ♀; 28.VIII.2008, ♀, ♂; 04.IX.2008, ♂; 11.IX.2008, ♂; 09.X.2008, 2 ♀♀, 3 ♂♂; 23.X.2008, 3 ♀♀, ♂.

Distribution in Turkey: Adana, Gümüşhane, Hatay, İzmir, Kars, Tokat (Hoberlandt, 1955; Önder *et al.*, 2006; Dursun, 2011b).

While the nominate subspecies *Prostemma guttula guttula* (Fabricius) shows a distribution in Turkey only in Thrace region and within palaearctic in Europe and northern Africa, the subspecies *Prostemma guttula asiaticum* Kerzhner recorded in the study has a distribution in Anatolian part of Turkey and ithin palaearctic in Asia and in Europe in only northern Russia (Caucasus) (Kerzhner, 1996).

Prostemma sanguineum (Rossi, 1790)

Material examined: 17.IV.2008, 3 ♀♀; 05.VI.2008, ♀; 11.VI.2008, ♀, 2 ♂♂; 19.VI.2008, ♀, ♂; 23.VI.2008, 2 ♂♂.

Distribution in Turkey: Adana, Erzurum, Gümüşhane, İzmir, Konya (Önder *et al.*, 2006).

Reduviidae Latreille, 1807

Coranus tuberculifer Reuter, 1881

Material examined: 04.IX.2008, ♀.

Holotrichus denudatus A. Costa, 1841

Distribution in Turkey: Aydın, Çanakkale, Hakkari, İzmir, Niğde, Kahramanmaraş, Konya (Seidenstücker, 1957; Önder *et al.*, 2006, Dursun, 2011b).

Material examined: Isparta-Gölcük, 19.VI.2008, 1♂; 24.VII 2008, 1♀.

The distribution of *Holotrichus denudatus* in Palaearctic Region is rather limited. It is present in Croatia, Greece, Italy and Macedonia in Europe while its presence in Asia is only definite for Asian part of Turkey and in Israel which is not certain (Putshkov & Putshkov, 1996). It was recorded in Turkey in few localities in Anatolia previously and is recorded for the first time in Mediterranean Region of Turkey.

Table 1. Heteropteran species recorded in Gölcük Natural Park (Isparta) and their active periods between March and November in year 2008.

Species	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.
Pentatomidae									
Picromerus bidens Linnaues						+			
Graphosoma lineatum (Linnaeus)					+	+			
Derula flavoguttata Mulsant & Rey					+				
Aelia rostrata Boheman				+	+		+		
Mustha spinusula (Lefebvre)						+	+		
Palomena prasina (Linnaues)				+					
Dolycoris baccarum (Linnaeus)				+	+	+	+		
Piezodorus lituratus (Fabricius)							+	+	
Sciocoris cursitans (Fabricius)				+					
Sciocoris homalonotus Fieber				+	+	+	+	+	
Sciocoris sulcatus Fieber		+							
Scutelleridae									
Eurygaster austriaca Schrank				+					
Eurygaster dilaticollis Dohrn				+	+				
Eurygaster maura (Linnaeus)							+		
Irochrotus maculiventris (Germar)						+		+	
Odontotarsus fuliginosa (Linnaeus)				+		+	+		
Odontoscelis minuta Jakovlev						+	+	+	
Cydnidae									
Cydnus aterrimus (Forster)				+					
Sehirus luctuosus Mulsant & Rey		+							
Legnotus limbosus (Scopoli)		+							
Thyreocoridae									
Thyreocoris scarabeiodes Linnaeus				+					
Stenocephalidae									
Dicranocephalus agilis (Scopoli)						+			
Alydidae									
Alydus calcaratus (Linnaeus)				+	+	+	+	+	+
Camptopus lateralis (Germar)				+	+				
Camptopus tragacanthae (Kolenati)			+			+		+	

Table 1. (Continued)

Species	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.
Coreidae									
Anoplocerus elevatus (Fieber)					+				
Bothrostethus annulipes (Her.-Sch.)			+			+			
Ceraleptus obtusus (Brullé)				+					
Coreus marginatus (Linnaeus)				+		+			
Coriomeris affinis (H-S)			+		+	+			
Coriomeris alpinus (Horváth)		+							
Coriomeris scabricornis (Panzer)			+	+	+		+		
Coriomeris denticulatus (Scopoli)		+	+		+	+	+		
Strobilotoma typhaecornis (Fab.)				+					
Rhopalidae									
Rhopalus parampunctatus Schilling		+	+	+					
Pyrrhocoridae									
Pyrrhocoris apterus (Linnaeus)	+	+	+	+	+	+	+	+	+
Lygaeidae									
Aellopus atratus (Goeze)					+				
Beosus maritimus (Scopoli)					+	+			
Emblethis brachynotus Horváth							+		
Emblethis griseus Wolff				+					
Emblethis verbasci (Fabricius)				+					
Eremocoris plebejus (Fallén)		+		+		+	+	+	
Eremocoris fenestratus (H-S)					+		+		
Gastrodes grossipes grossipes (D.G.)				+					
Geocoris grylloides (Linnaeus)								+	+
Graptopeltus lynceus (Fabricius)						+			
Graptopeltus validus (Horváth)					+				
Horvathiolus superbus (Pollich)		+							
Ischnopeza hirticornis (H-S)			+		+				
Lethaeus cribratissimus (Stål)					+		+		
Lygaeus equestris (Linnaeus)				+					
Macroplax fasciata fasciata (H-S)				+					
Melanocoryphus albomaculatus (G)		+		+	+				
Melanocoryphus tristrami (Do. & S)		+		+		+	+		
Peritrechus gracilicornis Puton				+					
Plinthisus angulatus Horváth						+			
Rhyparochoromus phoenicus (Ros.)		+		+	+			+	
Rhyparochromus vulgaris (Schilling)					+		+		
Spilostethus saxatilis (Scopoli)				+	+				
Tingidae									
Dictyla echii (Schrank)		+							
Nabidae									
Himacerus dauricus (Kritschenko)								+	
Nabis pseudoferus Remane						+			
Prostemma guttula asiaticum Kerzhner		+	+	+	+	+	+	+	
Prostemma sanguineum (Rossi)		+		+					
Reduviidae									
Coranus tuberculifer Reuter							+		
Holotrichus denudatus A. Costa				+	+				

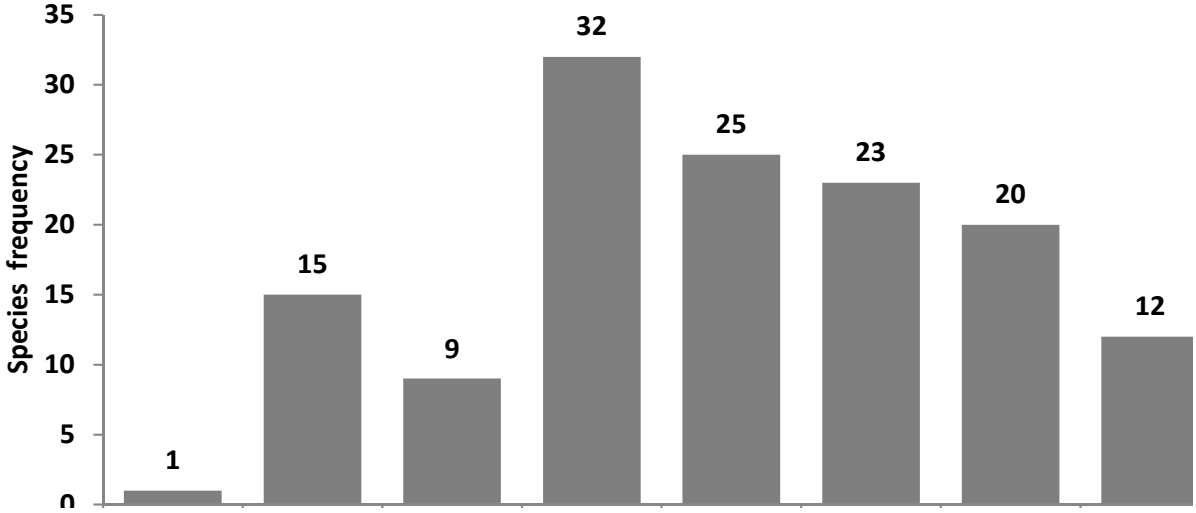

Figure 1. The frequency of Heteropteran species recorded in Gölcük Natural Park during per month between March and November in year 2008.

Discussion

The evaluation of the Material examined sampled from Isparta Gölcük National park with weekly intervals from March to November 2008 revealed 66 species from 13 families of Heteroptera (Hemiptera). The distribution of these species in terms of the families they belong is as follows; Pentatomidae 11 species, Scutelleridae 6 species, Cydnidae 3 species, Thyreocoridae, Stenocephalidae, Rhopalidae, Pyrrhocoridae and Tingidae 1 species each, Alydidae 3 species, Coreidae 9 species, Lygaeidae 23 species, Nabidae 4 species and Reduviidae 2 species.

Among these species *Picromerus bidens* Linnaeus, *Sciocoris homalonotus* Fieber, *Eurygaster dilaticollis* Dohrn, *Sehirus luctuosus* Mulsant & Rey, *Bothrostethus annulipes* (Herrich-Schaeffer) *Coriomeris alpinus* (Horváth), *Coriomeris scabricornis* (Panzer), *Geocoris grylloides* (Linnaeus), *Eremocoris plebejus* (Fallén), *Holotrichus denudatus* A. Costa and *Himacerus dauricus* (Kiritshenko) are new records for Mediterranean region of Turkey. On the other hand, *Irochrotus maculiventris* (Germar) *Plinthisus angulatus* Horváth, *Coriomeris scabricornis* (Panzer), *Anoplocerus elevatus* (Fieber) *Prostemma guttula asiaticum* Kerzhner and *Prostemma sanguineum* (Rossi) are species with rare distributions by being recorded only from a few localities in Turkey.

The most majority of Heteropteran species over winter as adults. In Heteropteran life cycle, adults start to enter overwintering periods by September and leave their shelters in April with increasing temperature to mate and deposit their eggs before they die. May is the period for nymphs emerging from hatching eggs. It is therefore adult population is low compared to June and July numbers. Generally adult activation reaches their peak in June and continues in July and August although at a lower level. Activation also continues in September depending on the climate conditions and on the offspring number of the species, but adults start to find their shelters by the beginning of October. Despite, a few species can still be active in November because November-March period is the wintering period of heteroperans which spend this period as adults. Climate is the most important determinant in Heteroptera diapause and life cycle. Therefore, although other biotic and abiotic factors have influence to some extent, leaving shelters, egg laying, egg hatching and offspring production depend and vary primarily on temperature.

Offspring production with respect to climate can be univoltine, bivoltine and multivoltine. Despite the fact that biology of some species, especially the ones of economical importance, has been revealed in detail, those of most species still remain today to be solved.

According to weekly sampling numbers of the study material examined, only 1 species was obtained in March, while 15 species were obtained in April, 9 in May, 32 in June, 25 in July, 23 in August, 20 in September,12 in October and 3 in November. It is clear that the earlier and the latter of these months were represented with the lowest species numbers. Since adults are at the very beginning of their periods of leaving their shelters, it is quite reasonable to find the lowest number in March. April was represented with an increasing number due to increasing temperature which led adults to rapidly leave their shelters to feed, mate and lay their eggs. During the study period, the highest number of species, whose representatives were adults of the new season, was obtained in June. The activation peak in June continues also in July and August but declined in September and October, the beginning of sheltering, and reached it's lowest in November.

When the species were evaluated in terms of their occurrences with respect to the sampling months, *Pyrrhocoris apterus* appeared to be represented in each month from November to March. On the orher hand, *Sciocoris homalonotus*, *Alydus calcaratus*, *Coriomeris scabricornis*, *Coriomeris denticulatus*, *Eremocoris plebejus*, *Melanocoryphus tristrami*, *Rhyparochoromus phoenicus* and *Prostemma guttula asiaticum* were represented in 4 to 6 months of the sapmling period. In addition, most of the species could be sampled only in a single, but mostly different month.

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