

Deltocephalinae (Hemiptera, Cicadellidae) species in Southwestern Turkey with new records*

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Summary: In this study, Deltocephalinae (Cicadellidae) species collected from Gevne Valley and surrounding located in south western Turkey are evaluated faunistically, ecologically and zoo geographically. 57 species belonging to 36 genera from 10 tribes in the area have been identified. Determined species contain new records for Mediterranean and Central Anatolia Regions and *Platymetopius* (s. str.) *pseudoguttatus* (ABDUL-NOUR, 1987) species are new record for Turkey. It is determined that the species identified in the study area are belonging to 21 different zoogeographical elements of endemism and the endemism ratio of area is 8.77 %. Also it is determined that Athysanini is the most dominant tribe in the area in terms of individual density with the ratio 46.84%. And 56.14% of species, wich have been determined, were collected from light trap, respectively.

Key words: Deltocephalinae (Cicadellidae), faunistic assessment, zoogeographical assessment, ecological assessment, new records, south western Turkey.

Introduction

Faunistic records belonging to this suborder from Turkey have been given by DEMİR (2008). In the following years, DEMİR and DEMİR SOY (2008, 2016); GÜÇLÜ (2010); ÖNDER et al. (2011); KOÇAK and KEMAL (2012); TEZCAN et al. (2003, 2010, 2013); KARAVIN et al. (2011); ZEYBEKOĞLU (2010), ZEYBEKOĞLU et al. (2015) DURSUN and FENT (2016) have given Deltocephalinae (Cicadellidae), records from Turkey in their works and identified some new species for the scientific world.

According to current literature, Turkey Deltocephalinae fauna is represented by 253 species belonging to 12 tribes.

Research area including Gevne Valley and its surrounding area (including Geyik Mountain, Ak Mountain, Yıldız Mountain and Şeytan Mountain) are located in Southwest Turkey. It is in Antalya Part of the Mediterranean Region (Antalya Part: Burdur, Isparta, Antalya Province) and the Konya Section of the Central Anatolian Region (Konya Part: Konya, Aksaray, Karaman provinces) and located on the north-eastern part of Antalya province and on the southwest part of Konya province. It lies between 31°30' -32°45' east latitudes and 37°30' -36°30' northern latitudes and is 254-2877m above sea level.

The research area is included in Mediterranean plant geography in terms of phytogeographical aspect. According to AKMAN (1995), there are many communities of *Pinus brutia* forests and garrigue or

maquis dominated by 1000m, although the area has been destroyed by humans in many places. Sometimes *P. brutia* occurs at over 1000m. These plant formations are included in the *Quercetalia ilicis* order in the *Quercetea ilicis* class. Forests in 1500m above zone consist of *Cedrus libani*, *Abies cilicica*, *Pinus nigra* ssp. *pallasiana*, *Quercus infectoria* ssp. *boissieri*, *Q. libani*, *Juniperus excelsa*, and *J. drupacea* species. These forest formations are included in the *Quercetalia libani* order of the *Quercetea pubescentis* class.

In the research area, a total of 75 species are known, 59 from Antalya and 16 from Konya (DEMİR, 2008). Although Cicadomorpha is a crowded suborder, the number of species in Turkey has not yet been determined enough. According to the literature information, the available data indicate that the Anatolian records except for some regions are based on specimens obtained from the expeditions to large regions in limited time. For the determination of the Turkish fauna at sufficient levels, detailed work to be carried out in local areas such as this study is needed.

Materials and methods

In the research area, a field expedition was carried out in April-August 2006-2008 and 1061 Deltocephalinae specimens were collected from the region. Flea beetle specimens which were swept away by atrap from plants in different biotopes of the research area in daytime were taken by aspirator.

*The present work includes only Cicadomorpha (excl. Deltocephalinae) (Hemiptera) part of the project

Some specimens were collected by aspiration through the plants or by hand capture. In the night period, light trap was used and the flea beetles on the light trap were collected by aspirator. Collected specimens were taken in ethyl acetate jars and then numbered on standard insect envelopes and the plants collected were noted. Then the specimens in the envelope were classified in the laboratory into standard museum materials. The location from which specimens were collected and the altitude from sea level and the collection date were recorded together with the GPS coordinates.

The chorotype of the identified species were defined by using the following works: Palearctic region lists by NAST (NAST, 1972, 1982, 1987), Cicadomorpha section in the European fauna website, (HOCH, 2013).

Results

Ordo: HEMIPTERA

Subordo: CICADOMORPHA

Familia: CICADELLIDAE

Subfamilia: DELTOCEPHALINAE

Tribus: GRYPOTINI

Grypotes staurus (IVANOFF, 1855)

Material examined: Antalya: Alanya, Sarımut, 36.37N, 32.23E, 12.08.2007, 31♂28♀ on light trap. Chorotype: Mediterranean.

Tribus: GONIAGNATHINI

Goniagnathus bolivari (MELICHAR, 1907)

Material examined: Antalya: Alanya, Sarımut, 1094m, 09.07.2007, 1♂ on herbaceous. Chorotype: S-Europe.

Goniagnathus brevis (HERRICH-SCHAEFFER, 1835)

Material examined: Antalya: Gündoğmuş, 36.47N, 31.45E, 410m, 22.04.2008, 1♀; Akseki, Cevizli, 37.11N, 31.46E, 1051m, 19.05.2008, 2♀; Konya: Seydişehir, Ufacık, 37.39N, 31.58E, 1409m, 13.05.2006, 2♀; Beyreli-Taşkent, 36.53N, 32.22E, 1961m, 17.07.2006, 1♀; Seydişehir, Ağılönü, 37.39N, 31.46E, 1193m, 13.05.2006, 2♀ on herbaceous from all localities. Chorotype: Palearctic.

Tribus: OPSIINI

Opsius cypriacus (LINDBERG, 1958)

Material examined: Konya: Bozkır-Korualan, 37.01N, 32.194E, 1315m, 10.07.2007, 7♂6♀, on *Tamarix*. Chorotype: E-Mediterranean.

Orosius orientalis (MATSUMURA, 1914)

Material examined: Antalya: Akseki, 36.54N, 31.49E, 971m, 13.08.2007, 1♀, on light trap. Chorotype: Mediterranean + E-Palaeartic + Afro-tropical + Oriental.

Circulifer haematoceps (MULSANT & REY, 1855)

Material examined: Antalya: İbradı, 37.07N, 31.34E, 1190m, 10.06.2008, 1♀ on herbaceous; Konya: Taşkent, Afşar, Akçapınar, 36.52N, 32.34E,

1664m, 18.07.2006, 5♂9♀ on light trap; Seydişehir, Tepearası, 37.29N, 31.408E, 1522m, 20.07.2006, 1♀ on herbaceous; Seydişehir, Fasıllar, 37.38N, 31.56E, 1215m, 13.05.2006, 1♂1♀ on herbaceous. Chorotype: Mediterranean + E-Palaeartic.

Neoliturus fenestratus (HERRICH-SCHAEFFER, 1834)

Material examined: Antalya: Akseki-Huğlu, 37.29N, 31.35E, 1357m, 13.05.2006, 1♂ on herbaceous; Konya: Seydişehir, Yenice, 37.31N, 31.45E, 1202m, 20.07.2006, 1♂1♀ on herbaceous. Chorotype: Palearctic.

Neoliturus guttulatus (KIRSCHBAUM, 1868)

Material examined: Antalya: Alanya, Sarımut, 36.38N, 32.23E, 1114m, 24.08.2006, 2♂ on light trap. Chorotype: S-European + E-European.

Neoliturus transversalis (PUTON, 1881)

Material examined: Antalya: Alanya, Sarımut, 36.37N, 32.23E, 12.08.2007, 1♀ on light trap. Chorotype: Turano-Mediterranean.

Concavifer balkarensis (KARTAL, 1981)

Material examined: Antalya: Alanya, Sarımut, 36.38N, 32.23E, 1114m, 24.08.2006, 1♂ on light trap. Chorotype: Turano-Mediterranean

Tribus: MACROSTELINI

Balclutha frontalis (FERRARI, 1882)

Material examined: Antalya: Gündoğmuş, Senir, 36.49N, 31.57E, 1013m, 10.06.2007, 2♀ on herbaceous. Chorotype: Subcosmopolitan.

Balclutha rhenana (WAGNER, 1939)

Material examined: Konya: Huğlu, 37.28N, 31.37E, 1404m, 11.07.2007, 2♀ on light trap; Taşkent, Afşar, Feslikan Yaylası, 36.51N, 32.31E, 1726m, 17.07.2006, 2♂2♀ on herbaceous. Chorotype: European + E-Palaeartic.

Macrosteles forficula (RIBAUT, 1927)

Material examined: Antalya: Alanya, Sarımut, 36.37N, 32.23E, 1113m, 15.06.2007, 1♀ on herbaceous; Alanya, Sarımut, 36.38N, 32.23E, 1114m, 24.08.2006, 1♀ on light trap; Konya: Hadim-Bozkır, 36.58N, 32.24E, 1648m, 12.06.2008, 1♀ on herbaceous; Dikmetaş, 36.36N, 32.25E, 1109m, 11.06.2008, 3♂1♀ on *Juncus*; Huğlu, 37.28N, 31.37E, 1404m, 11.07.2007, 3♀ on light trap. Chorotype: S-European.

Macrosteles quadripunctulatus (KIRSCHBAUM, 1868)

Material examined: Antalya: Alanya, Sarımut, 36.38N, 32.23E, 1114m, 24.08.2006, 6♀ on light trap; Alanya, Sarımut, 09.07.2007, 2♀ on herbaceous; Konya: Seydişehir, Ufacık, 37.39N, 31.58E, 1409m, 13.05.2006, 1♂3♀ on herbaceous. Chorotype: European.

Tribus: DELTOCEPHALINI

Recilia schmidtgeni (WAGNER, 1939)

Material examined: Antalya: Alanya, Sarımut, 36.38N, 32.23E, 1114m, 24.08.2006, 1♂1♀ on light trap. Chorotype: European + E-Palaeartic.

Tribus: DORATURINI

Doratūra homophyla (FLOR, 1871)

Material examined: Antalya: Akseki, 36.54N, 31.49E, 971m, 13.08.2007, 9♂8♀ on light trap; Konya: Huğlu, 37.28N, 31.37E, 1404m, 11.07.2007, 6♀ on light trap; Derebucak, 37.22N, 31.29E, 1222m, 10.06.2008, 1♂2♀ on herbaceous. Chorotype: European + E-Palaeartic.

Doratūra concors (HORVATH, 1903)

Material examined: Konya: Hadim-Bozkır, 36.58N, 32.24E, 1650m, 12.06.2008, 1♂4♀ on herbaceous; Dikmetaş, 36.36N, 32.25E, 1109m, 11.06.2008, 1♂ on herbaceous. Chorotype: Centralasiatic-European.

Doratūra stylata (BOHEMAN, 1847)

Material examined: Konya: Hadim-Bozkır, 36.58N, 32.24E, 1648m, 12.06.2008, 7♂3♀ on herbaceous; Hadim, 36.59N, 32.24E, 1722m, 19.07.2006, 1♀ on herbaceous. Chorotype: W-Palaeartic + Central Asiatic + Nearctic.

Aconurella prolixa (LETHIERRY, 1885)

Material examined: Antalya: Akseki, 36.54N, 31.49E, 971m, 13.08.2007, 3♀ on light trap; Alanya, Sarımut, 36.38N, 32.23E, 1114m, 24.08.2006, 2♀ on light trap. Chorotype: Mediterranean + E-Palaeartic.

Tribus: FIEBERIELLINI

Fieberiella macchiaie (LINNAVUORI, 1962)

Material examined: Antalya: Gündoğmuş, 36.46N, 31.45E, 254m, 22.04.2008 1♂1♀ on herbaceous; Akseki, 37.06N, 31.47E, 1473m, 12.06.2007, 1♀; Akseki, Yarpuz, 37.13N, 31.55E, 1615m, 10.07.2007, 1♂; Konya: Hadim-Bozkır, 36.58N, 32.24E, 1648m, 12.06.2008, 1♀ on herbaceous; Konya: Taşkent-Alanya, Gevne, 1298m, 09.07.2007, 1♂ on *Quercus*. Chorotype: SW-Asiatic + E-Palaeartic.

Fieberiella oenderi (DLABOLA, 1985)

Material examined: Antalya: Akseki-Manavgat, 36.46N, 39.46E, 460m, 11.07.2007, 1♂1♀ on maquis. Korotip: Anatolian.

Docotettix cornutus (RIBAUT, 1948)

Material examined: Antalya: Akseki-Gündoğmuş, 36.46N, 39.46E, 460m, 11.07.2007, 6♂2♀ on maquis. Chorotype: E-Mediterranean.

Tribus: STIRELLINI

Exitianus fasciolatus (MELICHAR, 1911)

Material examined: Antalya: Alanya, Sarımut, 09.07.2007, 1♀; Konya: Huğlu, 37.28N, 31.37E, 1404m, 11.07.2007, 2♀ on light trap. Chorotype: Mediterranean + Afro-tropical.

Tribus: ATHYSANINI

Platymetopius enatus (DLABOLA, 1974)

Material examined: Antalya: Alanya, Sarımut, 36.38N, 32.23E, 1114m, 24.08.2006, 3♂ on light trap; Akseki, Yarpuz, 37.13N, 31.55E, 1615m, 10.07.2007, 1♂; Konya: Huğlu, 37.28N, 31.37E, 1404m, 11.07.2007, 3♂1♀ on light trap; Taşkent, Afşar, Akçapınar, 36.52N, 32.34E, 1664m, 18.07.2006, 2♂ on light

trap. Chorotype: SW-Asiatic (Irano-Anatolian).

Platymetopius (s. str.) guttatus (FIEBER, 1869)

Material examined: Konya: Huğlu, 37.28N, 31.37E, 1404m, 11.07.2007, 1♂ on light trap. Korotip: European + E-Palaeartic.

Platymetopius (Quernus) curvatus (DLABOLA, 1974)

Material examined: Konya: Taşkent-Alanya, Gevne, 36.46N, 32.27E, 1482m, 24.08.2006, 1♂ on *Quercus*. Chorotype: S-European.

Platymetopius (s. str.) pseudoguttatus (ABDUL-NOUR, 1987)

Material examined: Antalya: Alanya, Sarımut, 09.07.2007, 1♀ Akseki, Tınaztepe, 37.21N, 31.52E, 1102m, 20.07.2006, 1♂1♀ on *Acer*. Chorotype: E-Mediterranean (Palaestino-Taurian). New record for Turkey.

Platymetopius quercinus (DLABOLA, 1974)

Material examined: Antalya: Alanya, Sarımut, 36.37N, 32.23E, 12.08.2007 3♂1♀ on light trap; Alanya, Sarımut, 09.07.2007, 5♂2♀; Konya: Huğlu, 37.28N, 31.37E, 1404m, 11.07.2007, 1♂2♀ on light trap. Chorotype: SW-Asiatic (Irano-Anatolian).

Platymetopius rostratus (HERRICH-SCHAEFFER, 1834)

Material examined: Konya: Taşkent, Afşar, Akçapınar, 36.52N, 32.34E, 1664m, 18.07.2006, 2♂1♀ on light trap. Chorotype: Centralasiatic-European.

Anoplotettix kalkandeleni (DLABOLA, 1971)

Material examined: Antalya: Akseki, Güzelsu, 36.47N, 31.45E, 409m, 22.04.2008, 1♂6♀ on herbaceous. Chorotype: Anatolian.

Anoplotettix eckerleini (DLABOLA, 1965)

Material examined: Antalya: Alanya, Gökbel Yaylası, 36.39N, 32.22E, 1494m, 09.07.2007, 1♂ on *Berberis*; Akseki-Huğlu, 37.29N, 31.35E, 1357m, 13.05.2006, 1♂ on herbaceous; Konya: Bozkır-Hadim, 37.06N, 32.18E, 1372m, 13.06.2007, 1♂; Taşkent-Alanya, Gevne, 1298m, 09.07.2007, 1♂ on *Quercus*; Huğlu, 37.28N, 31.37E, 1404m, 11.07.2007, 3♂5♀ on light trap; Derebucak, 37.08N, 31.33E, 1319m, 10.06.2008, 1♂1♀ on *Quercus*. Chorotype: E-Mediterranean

Osbornellus (Mavromoustacus) macchiaie (LINDBERG, 1948)

Material examined: Antalya: Akseki, 36.54N, 31.49E, 971m, 13.08.2007, 1♂ on light trap. Chorotype: E-Mediterranean.

Allygus mixtus (FABRICIUS, 1794)

Material examined: Konya: Dikmetaş, 36.36N, 32.25E, 1109m, 11.06.2008, 1♀ on *Juncus*; Taşkent-Alanya, Gevne, 1298m, 12.08.2007, 1♂ on *Quercus*. Chorotype: Holarctic.

Allygidius (s.str.) ecbatanicus (LOGVINENKO, 1975)

Material examined: Antalya: Akseki, Yarpuz, 37.13N, 31.55E, 1615m, 10.07.2007, 1♂; Alanya, Sarımut, 09.07.2007, 5♀; Konya: Huğlu, 37.28N, 31.37E, 1404m, 11.07.2007, 2♂1♀ on light trap; Taşkent, Afşar, Akçapınar, 36.52N, 32.34E, 1664m, 18.07.2006, 1♀ on light trap; Taşkent, Afşar, Çamdibi, 36.53N, 32.32E, 1509m, 17.07.2006, 6♂41♀ on light trap. Chorotype: Pontic.

***Phlepsius ornatus* (PERRIS, 1857)**

Material examined: Antalya: Alanya, Sarımut, 09.07.2007, 5♂3♀; Konya: Huğlu, 37.28N, 31.37E, 1404m, 11.07.2007, 1♂ on light trap; Beyreli, 36.51N, 32.21E, 1776m, 17.07.2006, 1♀ on herbaceous. Chorotype: Centralasiatic-Europeo-Mediterranean.

***Selenocephalus ankarae* (DLABOLA, 1957)**

Material examined: Antalya: Akseki, 36.57N, 31.45E, 681m, 11.07.2007, 1♀ on *Myrthus*; Akseki, Güzelsu, 36.55N, 31.50E, 1154m, 09.06.2008, 1♀ *Phlomis*; Akseki, Güzelsu, 36.47N, 31.45E, 409m, 22.04.2008, 4♀ on herbaceous; Antalya: Akseki-Gündoğmuş, 36.46N, 39.46E, 460m, 11.07.2007, 1♂2♀ on maquis; Akseki, 36.54N, 31.49E, 971m, 13.08.2007, 1♀ on light trap; Konya: Huğlu, 37.28N, 31.37E, 1404m, 11.07.2007, 6♂ on light trap; Bozkır-Korualan, 37.01N, 32.194E, 1315m, 10.07.2007, 1♂ on herbaceous; Bozkır, Yalnızca, 37.09N, 32.15E, 1490m, 12.06.2008, 1♀ on herbaceous; Bozkır-Akseki, Yalılıyük Yaylası, 37.13N, 32.00E, 1736m, 10.07.2007, 1♀ on *Salix*; Beyreli-Taşkent, 36.53N, 32.22E, 1961m, 17.07.2006, 1♂ on herbaceous; Seydişehir, Yenice, 37.31N, 31.45E, 1202m, 20.07.2006, 1♂2♀ on herbaceous; Seydişehir, Tepearası, 37.29N, 31.408E, 1522m, 20.07.2006, 2♂2♀ on herbaceous; Hadim-Bozkır, Korualan, 36.59N, 32.21E, 1489m, 19.07.2006, 1♀; Hadim, 36.59N, 32.24E, 1722m, 19.07.2006, 1♂ on herbaceous. Chorotype: Anatolian.

***Selenocephalus pallidus* (KIRSCHBAUM, 1868)**

Material examined: Antalya: Alanya, Sarımut, 36.38N, 32.23E, 1114m, 24.08.2006, 1♀ on light trap; Alanya, Kozarası, 36.39N, 32.25E, 1133m, 18.07.2006, 1♂ on herbaceous; Konya: Huğlu, 37.28N, 31.37E, 1404m, 11.07.2007, 2♀ on light trap; Bozkır-Korualan, 37.01N, 32.194E, 1315m, 10.07.2007, 1♂1♀ on herbaceous; Karapınar, 36.36N, 32.25E, 1154m, 12.08.2007, 1♀ on *Quercus*; Taşkent-Alanya, Gevne, 1298m, 12.08.2007, 1♂ on *Quercus*; Seydişehir, Yenice, 37.31N, 31.45E, 1202m, 20.07.2006, 2♂6♀ on herbaceous; Taşkent-Alanya, Gevne, 36.46N, 32.27E, 1482m, 24.08.2006, 6♀ on *Quercus*; Hadim-Bozkır, Korualan, 36.59N, 32.21E, 1489m, 19.07.2006, 1♂1♀ on *Acer*; Taşkent-Alanya, Gevne, 1298m, 09.07.2007, 1♀ on *Quercus*; Korualan-Bozkır, 37.02N, 32.19E, 1658m, 19.07.2006, 1♀ on herbaceous; Seydişehir, 37.23N, 31.51E, 1111m, 20.07.2006, 2♀ on herbaceous; Hadim-Bozkır, 36.58N, 32.21E, 1702m, 13.08.2007, 3♀ on herbaceous. Chorotype: E-European.

***Selenocephalus uvarovi* (ZACHVATKIN, 1946)**

Material examined: Antalya: İbradı, 37.04N, 31.37E, 920m, 11.07.2007, 1♂ on maquis; Alanya, Gökbel Yaylası, 36.39N, 32.22E, 1494m, 09.07.2007, 1♂ on *Berberis*; Konya: Taşkent, Afşar, Akçapınar, 36.52N, 32.34E, 1664m, 18.07.2006, 2♂1♀ on light trap; Taşkent-Alanya, Gevne, 1298m, 12.08.2007, 1♂ on *Quercus*. Chorotype: Anatolian.

***Hardya anatolica* (ZACHVATKIN, 1946)**

Material examined: Antalya: Alanya, Sarımut, 36.37N, 32.23E, 1113m, 15.06.2007, 1♂2♀; İbradı, 37.07N, 31.34E, 1190m, 10.06.2008, 1♂ on herbaceous; Akseki, Yarpuz, 37.13N, 31.55E, 1615m, 10.07.2007, 1♂; Akseki, Güzelsu, 36.47N, 31.45E, 409m, 22.04.2008, 1♀ on herbaceous; Konya: Beyşehir-Akseki, 37.28N, 31.37E, 1410m, 11.06.2007, 1♂; Hadim-Bozkır, 36.58N, 32.24E, 1648m, 12.06.2008, 2♂; Hadim-Bozkır, 36.58N, 32.24E, 1650m, 12.06.2008, 1♀; Dikmetaş, 36.36N, 32.25E, 1109m, 11.06.2008, 2♀; Taşkent, Afşar, Akçapınar, 36.52N, 32.34E, 1664m, 18.07.2006, 1♀ on light trap; Bozkır-Korualan, 37.01N, 32.194E, 1315m, 10.07.2007, 1♀ on herbaceous. Chorotype: Turano-European.

***Cicadula (Henriana) lineatopunctata* (MATSUMURA, 1908)**

Material examined: Antalya: Alanya, Sarımut, 36.37N, 32.23E, 1113m, 15.06.2007, 1♀; Konya: Huğlu, 37.28N, 31.37E, 1404m, 11.07.2007, 1♀ on light trap. Chorotype: Mediterranean + E-Palaeartic.

***Thamnotettix (s. str.) creticus* (DLABOLA, 1974)**

Material examined: Antalya: Akseki, Güzelsu, 36.55N, 31.48E, 1020m, 16.04.2007, 1♂1♀ on *Avena*; Akseki, Cemerler, 36.57N, 31.45E, 717m, 16.04.2007, 2♂ on Poaceae; Akseki, Güzelbağ, 36.43N, 31.55E, 870m, 15.05.2006, 3♂5♀ on Poaceae; Akseki, Teke Geçidi, 37.20N, 31.43E, 1409m, 14.05.2006, 1♂ on Poaceae; Konya: Derebucak, 37.08N, 31.33E, 1319m, 10.06.2008, 4♂2♀ on Poaceae. Chorotype: E-Mediterranean

***Thamnotettix lutfi* (DEMİR, 2006)**

Material examined: Konya: Karapınar, 36.36N, 32.25E, 1154m, 12.08.2007, 1♂ on herbaceous; Huğlu, 37.28N, 31.37E, 1404m, 11.07.2007, 1♀ on light trap. Chorotype: Anatolian.

***Thamnotettix (s. str.) zelleri* (KIRSCHBAUM, 1868)**

Material examined: Antalya: Gündoğmuş, 36.46N, 32.00E, 627m, 15.05.2006, 2♀; Gündoğmuş, Çiçekoluk, 36.48N, 31.54E, 870m, 14.05.2006, 1♂2♀; Akseki, Güzelbağ, 36.43N, 31.53E, 851m, 15.05.2006, 5♂2♀; Gündoğmuş, 36.48N, 32.00E, 993m, 15.05.2006, 3♂ on *Avena*; Akseki, Güzelbağ, 36.42N, 31.54E, 797m, 15.05.2006, 2♀; Akseki, Güçlüköy, 36.48N, 31.45E, 591m, 14.05.2006, 1♀; Akseki, Güzelsu, 36.47N, 31.45E, 409m, 22.04.2008, 9♂7♀; Manavgat-Gündoğmuş, 36-46N, 31.45E, 254m, 22.04.2008, 1♂1♀; Konya: Huğlu, Bakaran, 37.24N, 31.40E, 1232m, 10.06.2008, 2♀ on herbaceous from all localities. Chorotype: Mediterranean.

***Handianus procerus* (HERRICH-SCHAEFFER, 1835)**

Material examined: Konya: Seydişehir, 37.24N, 31.54E, 1108m, 12.06.2007, 1♀ on herbaceous; Hadim-Bozkır, 36.58N, 32.24E, 1648m, 12.06.2008, 2♀ on herbaceous; Huğlu, 37.28N, 31.37E, 1404m, 11.07.2007, 3♂6♀ on light trap; Seydişehir, Yenice, 37.31N, 31.45E, 1202m, 20.07.2006, 1♂1♀ on

herbaceous; Derebucak, 37.22N, 31.29E, 1222m, 10.06.2008, 13♂2♀ on herbaceous. Chorotype: European + E-Palaeartic.

Limotettix striola (FALLEN, 1806)

Material examined: Antalya: Alanya, Sarımut, 36.37N, 32.23E, 1113m, 15.06.2007, 1♂; Konya: Taşkent, Afşar, Feslikan Yaylası, 36.51N, 32.31E, 1726m, 17.07.2006, 4♀ on herbaceous. Chorotype: Holarctic.

Euscelidius mundus (HAUPT, 1927)

Material examined: Antalya: Alanya, Sarımut, 09.07.2007, 2♂; Konya: Huğlu, 37.28N, 31.37E, 1404m, 11.07.2007, 3♀ on light trap. Chorotype: E-Mediterranean + E-Palaeartic.

Euscelis alsius (RIBAUT, 1952)

Material examined: Antalya: Alanya, Sarımut, 09.07.2007, 1♂; Alanya, Sarımut, 36.37N, 32.23E, 12.08.2007, 3♀ on light trap; Akseki, Yarpuz, 37.13N, 31.55E, 1615m, 10.07.2007, 1♀; Akseki-Gündoğmuş, 36.46N, 39.46E, 460m, 11.07.2007, 1♂1♀; Gündoğmuş, Senir, 36.49N, 31.57E, 1013m, 10.06.2007, 7♂12♀; Akseki, Güzelsu, 36.47N, 31.45E, 409m, 22.04.2008, 1♀; Gündoğmuş, 36.46N, 31.45E, 254m, 22.04.2008, 1♂1♀; Alanya, Karapınar-Sarımut, 36.37N, 32.24E, 1094m, 09.07.2007, 1♀; Konya: Dikmetaş, 36.36N, 32.25E, 1109m, 11.06.2008, 5♂2♀; Hadim-Bozkır, 36.58N, 32.24E, 1648m, 12.06.2008, 2♂; Seydişehir, Çavuş, 37.37N, 31.55E, 1186m, 13.05.2006, 1♀; Seydişehir, Yenice, 37.31N, 31.45E, 1202m, 20.07.2006, 2♂5♀; Taşkent-Alanya, Gevne, 36.46N, 32.27E, 1482m, 24.08.2006, 1♂; Beyreli, 36.50N, 32.23E, 1462m, 21.04.2008, 6♀ on herbaceous from all localities. Chorotype: Mediterranean + E-Palaeartic.

Streptanus albanicus (HORVÁTH, 1916)

Material examined: Antalya: Akseki, Cemerler, 36.57N, 31.45E, 717m, 16.04.2007 4♂6♀; Akseki, Büyükalın, 37.00N, 31.45E, 937m, 16.04.2007, 2♀; Akseki, Güzelsu, 36.47N, 31.45E, 409m, 22.04.2008, 1♂3♀ on herbaceous. Chorotype: Turano-European

Artianus mandersjernii (KIRSCHBAUM, 1868).

Material examined: Antalya: Gündoğmuş, Senir, 36.49N, 31.57E, 1013m, 10.06.2007, 24♂17♀; Akseki, Güzelsu, 36.47N, 31.45E, 409m, 22.04.2008, 1♂2♀; Konya: Hadim-Bozkır, 36.58N, 32.24E, 1648m, 12.06.2008, 1♂1♀; Dikmetaş, 36.36N, 32.25E, 1109m, 11.06.2008, 6♂2♀; Seydişehir, Yenice, 37.31N, 31.45E, 1202m, 20.07.2006, 5♂2♀; Taşkent, Afşar, Feslikan Yaylası, 36.51N, 32.31E, 1726m, 17.07.2006, 1♂; Seydişehir, Tepearası, 37.29N, 31.408E, 1522m, 20.07.2006, 1♂1♀; Beyreli-Taşkent, 36.53N, 32.22E, 1961m, 17.07.2006, 1♂; Beyreli, 36.51N, 32.21E, 1776m, 17.07.2006, 1♂; Derebucak, 37.22N, 31.29E, 1222m, 10.06.2008, 41♂19♀; Sorkun, 37.09N, 32.08E, 1289m, 23.08.2006, 3♂2♀; Korualan-Bozkır, 37.02N, 32.19E, 1658m, 19.07.2006, 2♀ on herbaceous from all localities. Chorotype: S-European + E-European.

Zercanus rubroocellatus (DLABOLA, 1965)

Material examined: Antalya: Alanya, Sarımut, 36.38N, 32.23E, 1114m, 24.08.2006, 1♂ on light trap; Konya: Sorkun, 37.09N, 32.08E, 1289m, 23.08.2006, 1♀ on herbaceous. Chorotype: E-Mediterranean

Tribus: PARALIMNINI

Arocephalus longiceps (KIRSCHBAUM, 1868)

Material examined: Konya: Bozkır-Korualan, 37.01N, 32.194E, 1315m, 10.07.2007, 1♀ on herbaceous. Chorotype: European.

Psammotettix alienus (DAHLBOM, 1850)

Material examined: Antalya: Alanya, Sarımut, 36.37N, 32.23E, 12.08.2007, 7♂6♀ on light trap; Konya: Seydişehir, Yenice, 37.31N, 31.45E, 1202m, 20.07.2006, 5♂1♀ on herbaceous; Taşkent, Afşar, Akçapınar, 36.52N, 32.34E, 1664m, 18.07.2006, 9♂12♀ on light trap; Taşkent, Afşar, Feslikan Yaylası, 36.51N, 32.31E, 1726m, 17.07.2006, 24♂41♀ on herbaceous. Chorotype: Holarctic.

Psammotettix confinis (DAHLBOM, 1850)

Material examined: Antalya: İbradı, 37.07N, 31.34E, 1190m, 10.06.2008, 7♂9♀ on herbaceous. Chorotype: Holarctic (excl. N-Afrika).

Psammotettix provincialis (RIBAUT, 1925)

Material examined: Antalya: Alanya, Sarımut, 36.38N, 32.23E, 1114m, 24.08.2006, 13♂13♀ on light trap; Konya: Seydişehir, 37.35N, 31.54E, 1144m, 13.05.2006, 1♂1♀ on herbaceous; Beyreli-Taşkent, 36.53N, 32.22E, 1961m, 17.07.2006, 1♂2♀ on herbaceous; Taşkent-Alanya, Gevne, 36.46N, 32.27E, 1096m, 16.05.2006, 1♂3♀ on herbaceous. Chorotype: S-Europe + E-Palaeartic + Oriental.

Psammotettix striatus (LINNAEUS, 1758)

Material examined: Antalya: Gündoğmuş, Senir, 36.49N, 31.57E, 1013m, 10.06.2007, 1♂ on herbaceous; Akseki, Yarpuz, 37.13N, 31.55E, 1615m, 10.07.2007, 7♂4♀ on herbaceous; Alanya, Sarımut, 09.07.2007, 21♂37♀ on herbaceous; Konya: Taşkent, Afşar, Çamdibi, 36.53N, 32.32E, 1509m, 17.07.2006, 8♂10♀ on light trap; Huğlu, 37.28N, 31.37E, 1404m, 11.07.2007, 39♂57♀ on light trap; Yenice-Tepearası, 37.29N, 31.41E, 1560m, 20.07.2006, 1♂3♀ on herbaceous; Sorkun, 37.09N, 32.08E, 1289m, 23.08.2006, 1♂2♀ on herbaceous. Chorotype: Holarctic.

Ebarrius cognatus (FIEBER, 1869)

Material examined: Konya: Seydişehir, Fasıllar, 37.38N, 31.56E, 1215m, 13.05.2006, 1♂ on herbaceous. Chorotype: European.

Mocuellus quadricornis (DLABOLA, 1949)

Material examined: Antalya: Akseki, Güzelsu, 36.47N, 31.45E, 409m, 22.04.2008, 1♂2♀ on herbaceous; Konya: Beyreli, 36.49N, 32.23E, 1524m, 15.06.2007, 1♀ on herbaceous; Beyreli, 36.51N, 32.21E, 1776m, 17.07.2006, 4♂2♀ on herbaceous. Chorotype: E-European.

Discussions

Faunistic evaluation:

In the research area, 1061 Deltocephalinae specimens belonging to 10 tribes of 36 genera of 57 species were examined. Accordingly this examination, specimens belonging to 1 genera (2.77%) from Grypotini tribe, 1 genus (2.77%) from Goniagnathini tribe, 5 genus (13.88%) from Opsini tribe, 2 genus (5.55%) from Macrostelini tribe, 1 genus (2.77%) from Deltocephalini tribe, 2 genus (5.55%) from Doraturini tribe, 2 genus (5.55%) from Fieberiellini tribe, 1 genus (2.77%) from Stirellini tribe, 17 genus (47.22 %) from Athysanini and 4 genus (11.11%) from Paralimini tribe were found (Table 1).

When the distribution of total number of species was examined according to tribe, 1 (1,75%) of Grypotini, 2 (3.50%) of Goniagnathini, 7 (12.28%) of Opsini, 4 (7.01%) of Macrostelini, 1 (1.75%) of Deltocephalini, 4 (7.01%) of Doraturini, 3 (5.26%) of Fieberiellini, 1 (1.75%) of Stirellini, 27 (47.36%) of Athysanini tribe and 7 (12.28%) of Paralimini tribe were identified (Table 1).

Platymetopius (s. str.) pseudoguttatus (ABDUL-NOUR, 1987) for the Turkey are new record. 30 species for the Konya province, 7 species for the Central Anatolian Region and 9 species for the Antalya province, 5 species for the Mediterranean Region are new records.

Zoogeographical evaluation:

The chorotypes of the species determined in the research area were defined by considering the geographical distribution areas (NAST, 1972, 1982, 1987; HOCH, 2013). Accordingly, 2 species placed into Mediterranean, 10 species into European, 2 species into Palaearctic, 7 species into E-Mediterranean, 5 species into Mediterranean + E-Palaearctic, 2 species into Turano-Mediterranean, 1 species into Subcosmopolitan, 5 species into European +

Table 1. The distribution of Deltocephalinae species and genera by family in the research area

Tribus	Genera		Species	
	Number	%	Number	%
Grypotini	1	2.77	1	1.75
Goniagnathini	1	2.77	2	3.50
Opsini	5	13.88	7	12.28
Macrostelini	2	5.55	4	7.01
Deltocephalini	1	2.77	1	1.75
Doraturini	2	5.55	4	7.01
Fieberiellini	2	5.55	3	5.26
Stirellini	1	2.77	1	1.75
Athysanini	17	47.22	27	47.36
Paralimini	4	11.11	7	12.28

E-Palaearctic, 2 species into Centralasiatic-European, 1 species into SW-Asiatic-E-Palaearctic, 5 species into Anatolian, 1 species into Mediterranean+Afrotropical, 2 species into Irano-Anatolian, 5 species into Holarctic, 1 species into Pontic, 2 species into Turano-European, 1 species into S-European+E-Palaearctic+Oriental, 1 species into Centralasiatic-European+Mediterranean, 1 species into W-Palaearctic+Centralasiatic+Nearctic and 1 species into Mediterranean+E-Palaearctic+Afrotropical+Oriental chorotypes.

Among these species *Fieberiella oenderi* (DLABOLA, 1985), *Anoplotettix kalkandeleni* (DLABOLA, 1971), *Selinocephalus ankarae* (DLABOLA, 1957), *Selinocephalus uvarovi* (ZACHVATKIN, 1946) and *Thamnotettix lutfi* (DEMIR, 2006) are belonging to Anatolian chorotype are endemic and the endemism rate of the region is 8,77 % (Fig.1).

Considering the distribution of species determined from the research area in Turkey, it has been seen that 11 species (19.29%) are distributed in Marmara Region, 30 species (52.63%) in Black Sea Region, 25 species (43.85%) in Aegean Region, 44 species (77.19%) in Central Anatolia Region, 44 species (77.19%) in Mediterranean Region, 25 species (43.85%) in East Anatolia, and 28 species (49.12%) in Southeastern Anatolia.

Ecological evaluation:

Considering the individual density of the species examined it has been seen that Grypotini, Goniagnathini, Opsini, Macrostelini, Deltocephalini, Doraturini, Fieberiellini, Stirellini, Athysanini and Paralimini tribes is represented by 59 (5.56%), 9 (0.84 %), 39 (3.67%), 30 (2.82%), 2 (0.18%), 46 (4.33%), 16 (1.50%), 2 (0.18%), 497 (46.84%), 359 (33.83%) individuals respectively.

11 (19.29%), 10 (17.54%), 21 (36.84%), 38 (66.66%), 25 (43.85%) of the species, which have been determined, in the research area were collected in April, May, June, July and August respectively (Fig.2).

Altitude above sea level of research area is between 254-2877 m. Considering the vertical distribution of determined species, 12 species (21.05%), 9 species

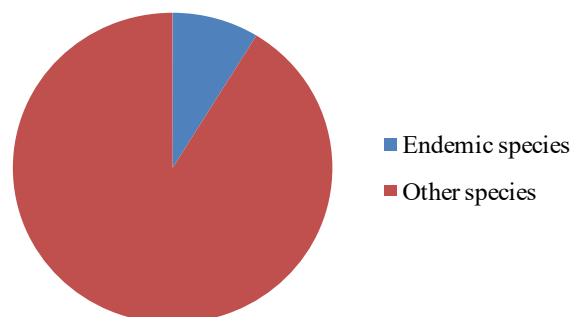


Fig. 1. The endemism rate in the research area.

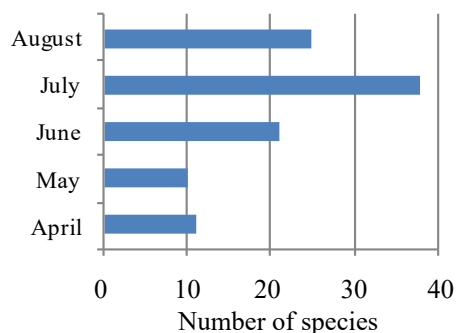


Fig. 2. Phenological distribution of the species determined in the research area.

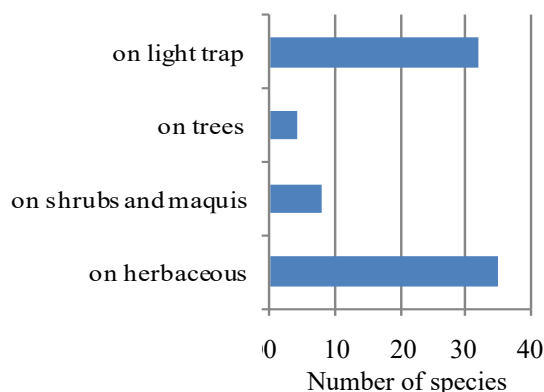


Fig. 3. Distribution of the species determined in the research area by plant groups.

(15.78%), 48 species (84.21%) and 23 species (40.35%) were collected from between 0-500 m, 501-1000m, 1001-1500m and 1501-2000m respectively.

35 (61.40%), 8 (14.03%), 4 (7.01%), 32 (56.14 %) of species, which have been determined, were collected from herbaceous plants, bushes and maquis, trees and light trap, respectively (Fig.3).

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