

CONTRIBUTIONS TO THE CICADOMORPHA AND FULGOROMORPHA (HEMIPTERA) FAUNA OF TURKISH THRACE REGION

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Abstract: Specimens of Cicadomorpha and Fulgoromorpha were collected in different localities in Thrace region of Turkey during the spring and summer periods of 2014. The collected samples were evaluated taxonomically and *Eupelix cuspidata* (Fabricius, 1775) (Cicadellidae) from Cicadomorpha and *Euides basilinea* (Germar, 1821) (Delphacidae), *Metcalfa pruinosa* (Say, 1830) (Flatidae), *Scorlupella discolor* (Germar, 1821) (Issidae), *Ricania hedenborgi* Stål, 1865 (Ricaniidae) and *Tettigometra laeta* Herrich-Schäffer, 1835 (Tettigometridae) from Fulgoromorpha were recorded for the first time in the study region. *E. cuspidata* have been only known from Anatolia so far. *S. discolor* was recorded in various localities, and *T. laeta* and the exotic species *M. pruinosa* were recorded only in one locality in Anatolia. Records of *E. basilinea* was given from Turkey without any data on the locality. Distributions of the all recorded species in Turkey and inside the Palaearctic Region were given.

Key words: Turkish Thrace, New records, Cicadomorpha, Fulgoromorpha

Trakya Bölgesi Cicadomorpha ve Fulgoromorpha (Hemiptera) Faunasına Katkılar

Özet: Trakya Bölgesi'nde 2014 yılı, İlkbahar-Yaz döneminde, farklı lokalitelerden toplanan Cicadomorpha ve Fulgoromorpha taksonlarına ait çok sayıda örnek değerlendirilmiştir. Toplanan örneklerin teşhis edilmesi sonucundan; Cicadomorpha taksonuna ait *Eupelix cuspidata* (Fabricius, 1775) (Cicadellidae), ve Fulgoromorpha'ya ait *Euides basilinea* (Germar, 1821) (Delphacidae), *Metcalfa pruinosa* (Say, 1830) (Flatidae), *Scorlupella discolor* (Germar, 1821) (Issidae), *Ricania hedenborgi* Stål, 1865 (Ricaniidae) ve *Tettigometra laeta* Herrich-Schäffer, 1835 (Tettigometridae) taksonlarının Türkiye'nin Trakya Bölgesi için yeni kayıt oldukları belirlenmiştir. Bu türlerden, *E. cuspidata* daha önce Anadolu'da çok sayıda lokalitede bilinmesine rağmen, *S. discolor* birkaç lokalitede, *T. laeta* ve ekzotik bir tür olan *M. pruinosa* sadece birer lokalitede kaydedilmiştir. *E. basilinea* ise Türkiye'den herhangi bir lokalite belirtilmeksizin verilmiştir. Bu çalışmada ayrıca türlerin Türkiye ve Palearktik dağılımları verilmiştir.

Anahtar kelimeler: Türkiye Trakyası, Yeni Kayıtlar, Cicadomorpha, Fulgoromorpha

Introduction

The geographical location of Turkey between Asia and Europe makes the country a dispersal corridor for different faunal elements of various origins including elements from Europe, the Balkans, Caucasus, Arabia and North Africa. In addition to the diversifying effect of the geographical on fauna, the richness of the fauna within the country is also an outcome of the different climate types and topographical conditions seen. Several studies have been carried out in order to provide an overview regarding the biological diversity of the country (Demirsoy 2002). Turkish Thrace Region plays a role as a gateway for transition of European fauna elements to Anatolia (Dursun & Fent 2015).

Cicadomorpha and Fulgoromorpha are two most diversified suborders in Hemiptera in terms of species

richness. Cicadomorpha includes today about 35.000 described species worldwide containing the cicadas, leafhoppers, spittlebugs and treehoppers which are exclusively plant-feeders. Fulgoromorpha, including plant-feeder planthoppers, comprises approximately 14.000 described species in 30 families (Bourgoin 2016, Dietrich 2005, Gjonov & Shishiniova 2014). The Hemiptera fauna of Turkey is represented with 2875 species belonging to 4 suborders (Önder et al., 2006, 2011). Studies on the Hemiptera in Turkey revealed that Cicadomorpha in the country is represented by 179 species and 74 genera within 6 families and Fulgoromorpha by 486 species and 174 genera within 11 Families (Önder et al. 2011).



Figure 1. The borders of the study area in Turkish Thrace.

Most of the studies on Turkey Hemiptera were carried out particularly in Anatolian part of the country and the occurrence data of the species of Cicadomorpha and Fulgoromorpha have not been determined completely yet (Demir 2008). The first faunistic records of Cicadomorpha and Fulgoromorpha in Turkey were given by Fahringer (1922), Haupt (1930), Kerville (1939) and Linnavuori (1965). Following these essential studies, Kalkandelen (1972, 1974, 1980, 1985), Lodos & Kalkandelen (1980, 1981a, b, 1983, 1984, 1985, 1986, 1987, 1988), Dlabola (1957, 1981, 1983, 1985, 1986), Kartal (1980, 1981, 1983, 1985, 1986, 1987, 1988), Kartal & Zeybekoğlu (1994, 1997), Kartal et al. (2001), Zeybekoğlu (1993, 1994, 1996, 1998, 2000), Güçlü (1996, 1997), Emeljanov (2003) and Demir (1998, 2004, 2005, 2006a, b, 2007, 2008) contributed huge amount of information to the faunistic records of Cicadomorpha and Fulgoromorpha in Turkey.

It was aimed to give more information about and contribute to Cicadomorpha and Fulgoromorpha fauna of Turkey with this study.

Materials and Methods

The study material was collected in different localities in Thrace Region of Turkey in 2014. Sweeping nets were used to sample the specimens of Cicadomorpha and Fulgoromorpha on plants from various vegetation and habitat types (Fig. 1). External morphological characters and male genitalia - aedeagus, pygophores and paramere - of the specimens were used for identifications. For preparation of the genitalia, samples were softened in hot water, their genitalia were extracted. The following studies were used to identify the collected material; Linnavuori (1965), Lodos & Kalkandelen (1981a, b), Dlabola (1983), Kartal (1985) and Demir (2009). The specimens are deposited in the collections of Biology Departments of Amasya University, Faculty of Science and Arts (Amasya) and Trakya University, Faculty of Science (Edirne), Turkey.

Results

HEMIPTERA

CICADOMORPHA

Cicadellidae Latreille

Eupelix cuspidata (Fabricius, 1775)

Material examined: Edirne, Süloğlu-Gerdelli, 15.06.2014, 1♂.

Distribution in World: Widely distributed in Europe, Israel, Iraq, Iran, Mongolia, Syria, Turkey (Asian part), North Africa and East Palaearctic (Demir 2008, Hoch 2013).

Distribution in Turkey: Adana, Adıyaman, Afyonkarahisar, Ankara, Antalya, Artvin, Balıkesir, Çanakkale, Diyarbakır, Kahramanmaraş, Konya, Malatya, Mardin, Mersin, Nevşehir, Niğde and Şanlıurfa (Demir 2008, Önder et al. 2011).

Comment: *E. cuspidata* has a wide range of distribution in Southern Europe and Anatolia but the first record about its presence in Thrace region was given in the present study.

FULGOROMORPHA

Delphacidae Leach

Euides basilinea (Germar, 1821)

Material examined: Kırklareli, Demirköy-Fidanlık, 21.08.2014, 1♀.

Distribution in World: Balkan Peninsula, Central and Northern Europe, Turkey (Asian part) and East Palaearctic (Hoch 2013).

Comment: *E. basilinea* was recorded in Turkey without a locality data (Önder et al. 2011) and the present record of the species in Kırklareli-Demirköy is the first record of the species with a definite locality information.

Flatidae Spinola

Metcalfa pruinosa (Say, 1830)

Material examined: Edirne, Merkez-Sarayıcı, 30.08.2014, 10 ♀♀, 8 ♂♂; Kırklareli, Demirköy-Kakava Çayırılığı, 20.08.2014, 1 ♀, 3 ♂♂.

Distribution in World: Austria, Bulgaria, Croatia, Czech Republic, France, Italy, Korea, Southern parts of Russia, Slovenia, Switzerland, Turkey (Asian part), Ukraine,

Nearctic region (Mexico, U.S.A, Cuba) and Neotropical region (Mead 2004, Hoch 2013, Gjonov & Shishiniova 2014).

Distribution in Turkey: İzmir and Ordu (Önder et al. 2011, Güncan 2014).

Comment: This exotic polyphagous species causes damages to kiwi fruit and citrus in the world. It was mentioned in Turkey for the first time in İzmir by Karsavuran and Güçlü (2004) and by Güncan (2014) in kiwi production areas of Ordu. The specimens of the species were obtained while resting on a *Populus* sp. (Salicaceae) tree.

Issidae Spinola

***Scorlupella discolor* (Germar, 1821)**

Material examined: Edirne, Merkez-Kavakköy, 01.06.2014, 1 ♂.

Distribution in World: Bulgaria, Italy, Romania, Turkey (Asian part) and Ukraine (Hoch 2013).

Distribution in Turkey: Ankara, Erzincan (Kemaliye) and Yozgat (Dlabola 1957, Kartal 1985, Demir 2006, Demir & Demirsoy 2009, Önder et al. 2011).

Comment: *S. discolor* has been recorded so far in a few localities in Eastern and Central Anatolia Regions but its presence in Turkish Thrace was reported for the first time in the present study.

Ricaniidae Amyot & Serville

***Ricania hedenborgi* Stål, 1865**

Material examined: Kırklareli, Demirköy-Hamamgölü, 20.08.2014, 4 ♀♀, 5 ♂♂.

Distribution in World: Armenia, Afro-tropical region, Crete, Dodecanese Is., Greece, North Aegean Is., Near East, North Africa and Turkey (Anatolia) (Bourgoin & Demir, 2009).

Distribution in Turkey: Diyarbakır (Ergani, Pınarkaya), Elazığ, İzmir (Selçuk), Mardin (Mazıdağı, Nusaybin), Manisa (Muradiye) and Muğla (Marmaris) (Lodos & Kalkandelen 1981a, Tezcan & Zeybekoğlu 2001, Demir 2009, Özgen et al. 2011).

Comment: The family Ricaniidae has been mentioned by Demir (2009) to be mostly distributed in Africa, Asia and in Australia, but *R. hedenborgi* is a native species from Palaearctic region. The specimens of this genus are especially seen on agricultural crops but the specimens of *R. hedenborgi* were obtained while resting on a *Populus* sp. (Salicaceae) tree.

Tettigometridae Germar

***Tettigometra laeta* Herrich-Schäffer, 1835**

Material examined: Kırklareli, Dereköy, 19.08.2014, 1 ♂.

Distribution in World: Central and Southern Europe, Balkan Peninsula and North Africa (Hoch 2013).

Distribution in Turkey: Erzincan (Kemaliye) (Demir & Demirsoy 2009).

Comment: *T. laeta* was recorded in Anatolia for the first time in Eastern Anatolia Region in 2009 (Demir & Demirsoy 2009). The report of this rare species in the present study is the second record of the species in Turkey.

Discussion

In this study, 5 species belonging to 5 families (Delphacidae, Flatidae, Issidae, Ricaniidae, Tettigometridae) within Fulgoromorpha were reported as first records for Thrace Region. *Euides basilinea*, *Metcalfa pruinosa*, *Ricania hedenborgi*, *Scorlupella discolor* and *Tettigometra laeta* (Fulgoromorpha) and *Eupelix cuspidata* (Cicadomorpha), has been found first time in Turkish Thrace. *Eupelix cuspidata* and *Ricania hedenborgi* also have a widespread distribution in Anatolia.

The faunistic studies on Cicadomorpha and Fulgoromorpha fauna in Turkey are mainly focused on Anatolia and while there exists only a few studies performed in Thrace Region. The comparison of the species diversity of the region with Europe as a whole and with the neighboring countries Greece and Bulgaria reveals quite the opposite faunal data. The Cicadomorpha fauna in Greece is represented with 222 species and 105 genera within 7 families and Fulgoromorpha fauna with 209 species and 95 genera within 12 families. The diversity in Bulgaria is also noticeable since Cicadomorpha in Bulgaria is represented with 203 species and 79 genera within 6 families and Fulgoromorpha with 120 species and 67 genera within 9 families. One can conclude from this faunal data of the two neighboring countries that the fauna of Thrace Region is less diverse than that of Greece and Bulgaria based on current available records in the region. However, we believe that further detailed studies in Turkish Thrace are prone to reveal new records not only for the fauna of the region but also for that of Turkey (Hoch 2013).

According to the available data reported so far about the hemipteran fauna of Thrace region of Turkey, Tettigometridae is represented in the region with 3 species whereas Issidae and Cicadellidae are represented with 2 and 15 species, respectively, while Delphacidae, Flatidae and Ricaniidae have no representatives. Within the present study, 1 species for each of the latter three families were determined in Thrace Region and presence of Delphacidae, Flatidae and Ricaniidae in the region were reported for the first time. *Metcalfa pruinosa* ordinarily does very little damage to plants; however, this species was mentioned by Güncan (2014) to decrease quality of kiwi fruit, citrus, persimmon, fig, walnut and apple fruit in Turkey. In the present study, no damage of *M. pruinosa* and *Ricania hedenborgi* was determined inside the study area in Thrace region since the specimens of these species were obtained while resting on a *Populus* sp. (Salicaceae) tree. As a result of the current study, the present records of Cicadomorpha and Fulgoromorpha known in the research area not only increased the number of the species in the region but also help to expand the distributional range of previously known species.

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