

Some additional faunistic records on the family Membracidae (Hemiptera: Auchenorrhyncha: Cicadomorpha) in Turkey

Rukiye TANYERİ^{1*}, Ünal ZEYBEKOĞLU²

¹Sinop University, Faculty of Art and Sciences, Sinop, Turkey

²Ondokuz Mayıs University, Faculty of Art and Sciences, Samsun, Turkey

Geliş Tarihi (Received Date): 09.06.2021

Kabul Tarihi (Accepted Date): 05.02.2022

Abstract

In this study, specimens of Membracidae (Hemiptera: Cicadomorpha) collected from Sinop (Turkey) and its surroundings in 2016-2018 were evaluated. 3 species; Centrotus cornutus (Linnaeus, 1758), Gargara genistae (Fabricius, 1775), Stictocephala bisonia Kopp et Yonke, 1977 were identified from the study area. Number of specimens, localities, Turkey and zoogeographical distribution are given. Identified species are the first records for the local fauna of Sinop (Turkey).

Keywords: Sinop, Turkey, Membracidae, fauna.

Türkiye'den Membracidae (Hemiptera: Auchenorrhyncha: Cicadomorpha) familyasına ait bazı ek faunistik kayıtlar

Öz

Bu çalışmada, 2016-2018 yıllarında Sinop ve çevresinden toplanan Membracidae (Hemiptera: Cicadomorpha) örnekleri değerlendirilmiştir. Çalışma alanından 3 tür; Centrotus cornutus (Linnaeus, 1758), Gargara genistae (Fabricius, 1775), Stictocephala bisonia Kopp et Yonke, 1977 tespit edilmiştir. Bölgede dağılım gösteren türlerin toplandığı lokalite bilgileri, Türkiye ve dünya dağılımları verilmiştir. Tespit edilen türler Sinop ili lokal faunası için ilk kayıt niteliğindedir.

Anahtar kelimeler: Sinop, Türkiye, Membracidae, fauna.

*Rukiye TANYERİ, rtanyeri@sinop.edu.tr, <http://orcid.org/0000-0001-9994-8783>

Ünal ZEYBEKOĞLU, unalz@omu.edu.tr, <http://orcid.org/0000-0003-1646-5999>

1. Introduction

The Membracoidea superfamily includes 5 families: Aetalionidae, Melizoderidae, Membracidae they are, known as the treehopper; Cicadellidae and Myerslopiidae they are, known as the leafhopper. Membracidae is the second largest family within this superfamily, with approximately 3450 species of 428 genera identified. It shows distribution in all zoogeographic regions [1].

They are easily distinguished from other insects in the order Hemiptera with their enlarged and showy pronotum [2]. In addition to these remarkable morphological features, they are economically important with the presence of species that cause damage to agricultural products. There are species that can mediate the transmission of various viral diseases to plants [3]. They are generally polyphagous species that feed on phloem and are found in forests and open areas in the forests.

4 species belonging to this family are known distributed in Turkey. Lodos ve Kalkandelen [4] listed *Oxyrhachis capaneri* Izzard, 1953, *Gargara genistae* (Fabricius, 1775), *Centrotus cornutus* (Linnaeus, 1758) and *Ceresa bubalus* (Fabricius, 1794) and referred to the short biological notes of these species in the series works about Auchenorrhyncha of Turkey.

Stictocephala bisonia Kopp et Yonke, 1977 was known in European entomological literature until the mid- 1970s under the names *Ceresa bubalus* (Fabricius, 1794) and *Stictocephala bubalus* (Fabricius, 1794) [2].

There was no study about Sinop Membracidae fauna. With this study, it is aimed to contribute to the local fauna of the region.

2. Material and method

The studied material was collected by sweeping net and a hand aspirator over the plants during the daytime between May 2016 and October 2018 from different localities of Sinop provinces per montly. The collected samples were taken in insect killing jars, labeled and brought to the laboratory and placed in insect storage packages. The material was taken from the insect storage packages and put in 5% acetic acid and softened a few hours. Under the stereomicroscope, the genital capsule of males were separated from the body with the help of a dissecting needle. In the genital capsule, genital structures which have taxonomically reliable characteristics, aedeagus, stylus, connective, pygofer, genital plate, anal tube in males and pregenital sternite VII in females, were separated. Genital structures were examined under the stereomicroscope and they were identified by the first author compared with diagnosed museum materials and literature.

Specimens are deposited in Sinop University, Faculty of Arts and Sciences, Department of Biology, Invertebrata Laboratory.

3. Results

Specimens collected during field work in Sinop and provinces were identified, and it has been determined that three species were found in the region belonging to the Membracidae family; *Centrotus cornutus* (Linnaeus, 1758), *Gargara genistae* (Fabricius, 1775) and *Stictocephala bisonia* Kopp et Yonke, 1977. General view of the species from the dorsal is given in Figure 1.

Subfamily: Centrotinae Amyot & Serville

Centrotus cornutus (Linnaeus, 1758)

Material examined: 24/06/2016: 42° 01' 256" 35° 11' 159" (Sinop, Open forest) (8♂, 6♀). 27/05/2017: 41° 50' 22.0" 35° 03' 02.2" (Sinop, Open forest, on *Rubus* sp.) (4♂, 6♀).

Distribution in Turkey: Adapazarı, Ankara, Antalya, Artvin, Aydın, Balıkesir, Bilecik, Bursa, Çorum, Denizli, Edirne, Erzincan, Giresun, İstanbul, İzmir, Kırklareli, Kocaeli, Kütahya, Ordu, Tekirdağ [5, 6, 7]. New record for Sinop.

Zoogeographic distribution: Albania, Austria, Belarus, Belgium, Bosnia and Herzegovina, Britain I, Bulgaria, Croatia, Czech Republic, East Palearctic, Estonia, Finland, French, Germany, Greek mainland, Hungary, Italy, Latvia, Lithuania, Macedonia, Moldova, Near East, Norwegian, Poland, Portuguese, Romania, Russia, Sicily, Slovakia, Slovenia, Spanish, Sweden, The Netherlands, Turkey, Ukraine, Yugoslavia [7, 8].

Gargara genistae (Fabricius, 1775)

Material examined: 18/06/2016: 41° 56' 676" 34° 45' 433" (Sinop, open forest) (8♂, 10♀), 30/07/2017: 41° 45' 31.9" 34° 40' 12.4" (Sinop, open forest, herbaceous vegetation) (9♂, 6♀).

Distribution in Turkey: Ankara, Antalya, Aydın, Balıkesir, Çorum, Erzincan, Erzurum, İzmir, Muğla [7, 9]. New record for Sinop.

World distribution: Afrotropical region, Albania, Austria, Belgium, Bosnia and Herzegovina, Britain I, Bulgaria, Croatia, Czech Republic, Danish, East Palearctic, French, Germany, Greek, Hungary, Italy, Macedonia, Moldova, Near East, Nearctic region, North Africa, Oriental region, Poland, Portuguese, Romania, Russia, Sicily, Slovakia, Slovenia, Spanish, Switzerland, The Netherlands, Turkey, Ukraine, Yugoslavia [7, 8].

Subfamily: Smiliinae

Stictocephala bisonia Kopp et Yonke, 1977

Material examined: 07/08/2016; 41° 45' 40.7" 34° 58' 32.6" (Sinop) (3♂) ; 01/08/2017: 41° 52' 47.1" 34° 52' 09.3" (Sinop, open forest, herbaceous vegetation) (2♂, 1♀); 41° 56' 702" 34° 44' 506" (Sinop) (2♂, 2♀).

Distribution in Turkey: Ankara, Artvin, Balıkesir, Edirne, Kırklareli, Rize [7]. New record for Sinop.

World distribution: Albania, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, French, Germany, Greek, Hungary, Italy, Macedonia, Moldova, Near East, Nearctic region, North Africa, Poland, Romania, Sardinia, Sicily, Slovakia, Slovenia, Spanish, Switzerland, Turkey, Ukraine, Yugoslavia [7, 8].

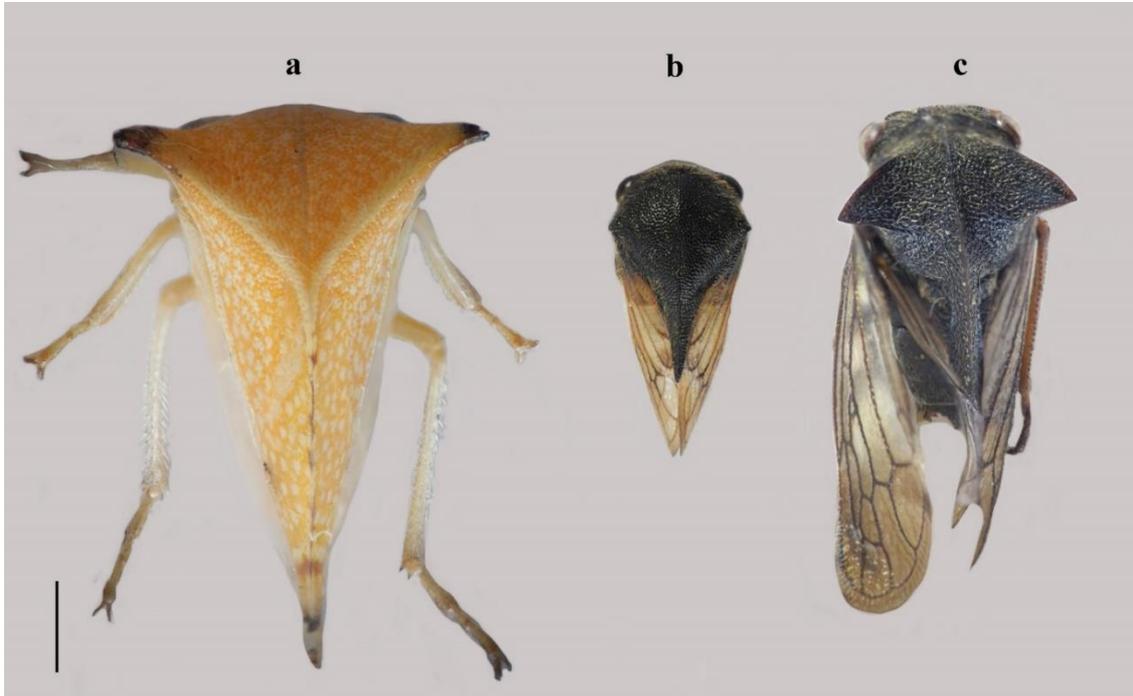


Figure 1 Dorsal view a) *Stictocephala bisonia*, b) *Gargara genistae*, c) *Centrotus cornutus* (Scale: 1mm)

4. Discussion

Membracidae, a remarkable group with their pronotum morphology and economic importance, are also known for behaviors that are not common among insects and are considered as model organisms in areas such as ecology and behavioral science. Collective life in some species, mutualistic relationships with ants and parental protection are examples of these behaviors [2,10]. Most of the species belonging to this family are not considered to be important agricultural or forest pests, it is known that they usually cause injuries by laying eggs in plant tissues. If the population is too large, this behavior can cause serious injury to plant tissues. Besides, there are also species that are vectors. Originating from North America, *S. bisonia* has been accepted as a potential disease vector in Europe for many years [11]. It causes economic damage to fruit trees by damaging the phloem tissue during oviposition or by carrying fungal or bacterial diseases. [12]. In Turkey, it is also known to be harmful in apple and peach trees. It is polyphag and *Alnus* sp., *Medicago sativa* and various herbs are also among the host plants [4].

C. cornutus is known from such plants: *Rubus fruticosus*, *Rosa canina*, *Crataegus* sp., *Ulex europaeus*, *Rhododendron flavum*, *Populus* sp., *Quercus* sp., *Pinus* sp., *Junglans regia*, *Malus* sp., *Pyrus communis*, *Medicago sativa*, *Corylus* sp. [4, 5].

G. genistae is recorded from such plants as *Quercus* sp., *Tamarix* sp., *Genista tinctoria*, *Caragana* sp., *Cytisus* sp., *Caragana* sp. from Turkey [4].

With this study, Membracidae species distributed in Sinop were determined. It is thought that the local fauna of Sinop has been contributed.

References

- [1] Deitz, L. L. and Wallace M. S., Treehoppers: Aetalionidae, Melizoridae and Membracidae (Hemiptera), <http://treehoppers.insectmuseum.org>. (12/11/2020)
- [2] Swierczewski, D. and Stroinski, A., The first records of the Nearctic treehopper *Stictocephala bisonia* in Poland (Hemiptera: Cicadomorpha: Membracidae) with some comments on this potential pest, **Polish Journal of Entomology**, 80, 13-22, (2011).
- [3] Bick, E. N., Kron, C. R., and Zalom, F. G., Timing the implementation of cultural practices for *Spissistilus festinus* (Hemiptera: Membracidae) in California vineyards using a stage-structured degree-day model, **Journal of Economic Entomology**, 113, 5, 2558-2562, (2020).
- [4] Lodos, N. and Kalkandelen, A., Preliminary list of Auchenorrhyncha with notes on distribution and importance of species in Turkey VI. Families Cercopidae and Membracidae, **Türkiye Bitki Koruma Dergisi**, 5(3), 133-149, (1981).
- [5] Demir, E., and Ünver, H., Türkiye'de findıklarda bulunan Auchenorrhyncha (Hemiptera: Fulgoromorpha ve Cicadomorpha) türleri ve potansiyel vektörler olarak önemi. **Uluslararası Anadolu Ziraat Mühendisliği Bilimleri Dergisi**, 1, 52-59, (2019).
- [6] Demir, E., Contributions to the knowledge of Turkish Auchenorrhyncha (Homoptera) with a new record, *Pentastridius nanus* (Ivanoff, 1885). **Munis Entomology and Zoology**, 1(1), 97-122, (2006).
- [7] Önder, F., Tezcan, S., Karsavuran, Y. ve Zeybekoğlu, Ü., **Türkiye Cicadomorpha, Fulgoromorpha ve Sternorrhyncha Kataloğu**, 157, Meta Basım, İzmir (Türkiye) (2011).
- [8] Anonymous, Fauna Europe (<http://faunaeurope.org>), (2021), (06.02.2021).
- [9] Demir, E., and Demirsoy, A., Preliminary report on the Cicadomorpha (Hemiptera) fauna of Kemaliye (Erzincan Province, East Turkey). **Acta Entomologica Slovenica**, 24(1), 35-54, (2016).
- [10] Coccoft R.B., Antipredator defense as a limited resource: unequal predation risk in broods of an insect with maternal care, **Behavioral Ecology**, 13, 1, 125-133, (2002).
- [11] Mifsud, D., Cocquempot, C., Mühlethaler, R., Wilson, M. and Streito, J.C., Other Hemiptera Sternorrhyncha (Aleyrodidae, Phylloxeroidea, and Psylloidea) and Hemiptera Auchenorrhyncha Chapter 9.4. **Biorisk**, 4 (1), 511-552, (2010).
- [12] Walczak, M., Brożek, J., Junkiert, Ł., Kalandyk-Kołodziejczyk, M., Musik, K., Kaszyca, N., and Gierlasiński, G., *Stictocephala bisonia* KOPP et YONKE, 1977 (Hemiptera: Cicadomorpha, Membracidae) in Poland. **Annals of the Upper Silesian Museum in Bytom Entomology**, 27, 1-13, (2018).