

DOI: 10.2478/cerce-2018-0038

Available online: www.uaiasi.ro/CERCET_AGROMOLD/

Print ISSN 0379-5837; Electronic ISSN 2067-1865

Original Article

Cercetări Agronomice în Moldova

Vol. LI, No. 4 (176) / 2018: 87-95

HETEROPTERA (HEMIPTERA) SPECIES DETERMINED IN PISTACHIO ORCHARDS OF SIİRT PROVINCE WITH A NEW RECORD FOR FAUNA OF TURKEY: *YOTVATA NERGA* LINNAVUORI, 1993

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Received: May 26, 2018. Revised: Oct. 22, 2018. Accepted: Nov. 16, 2018. Published online: Oct. 3, 2019

ABSTRACT. This study was carried out at pistachio orchards of Siirt province (Merkez and Aydınlar) between 2008-2009. The insect species obtained with this study in pistachio orchards were; *Palomena mursili* Linnavuori, 1984, *Stagonomus bipunctatus* Linnaeus, 1758, *Macroscytus brunneus* Fabricius, 1803, *Lethaeus cribratissimus* Stål, 1858, *Stenodema turanica* Reuter, 1904, *Pseudoloxops sangrudanus* Linnavuori, 2006, *Psallus perrisi* Mulsant and Rey, 1852, *Macrolophus glaucescens* Fieber, 1858, *Acrorrhinium atricorne* Linnavuori, 2006, *Campylomma diversicornis* Reuter, 1878, *Nanopsallus carduellus* Horváth, 1888, *Camptocera glaberrima* Walker, 1872, *Anthocoris minki* Dohrn, 1860, *Yotvata nergal*, *Alloeotomus cyprius* Wagner, 1953, *Calocoris roseomaculatus angularis* De Geer, 1773, *Horistus orientalis* Gmelin, 1790, *Deraeocoris serenus* Douglas and Scott, 1868, *Beosus quadripunctatus* Müller, 1766, *Megalonotus maximus* Puton, 1895,

Nysius cymoides Spinola, 1837, *Cantacader quadricornis* Lepeletier and Serville, 1828, *Lethaeus picipes* Herrich-Schäffer, 1853, *Acrorrhinium conspersus* Noualhier, 1895, *Trigonotylus pulchellus* Hahn, 1834 and *Alloeomimus kurdus* Hoberlandt, 1953. *Yotvata nergal* Linnavuori, 1993 is a new record for entomo-fauna of Turkey.

Keywords: pistachio; Heteroptera; fauna; new record; *Yotvata nergal*.

INTRODUCTION

The pistachio has an importance for economy of Turkey. The Southeastern Anatolian Region of Turkey is known as homeland of pistachio. The pistachio production is extensively made in Adıyaman, Batman, Gaziantep, Şanlıurfa, Siirt and Kahramanmaraş provinces of Turkey. Iran is the country which is at

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the top of the pistachio production and it is followed by USA, Turkey, Syria and China, respectively (Anonymous, 2016). Turkey has 170,000 tons of pistachio production in total (Anonymous, 2016).

There are too many insects and diseases, which affect amount of the yield in the pistachio orchards. Due to its economic importance, there are many research studies for determination of beneficial and pest insects associated with the pistachio orchards (Günaydın, 1978; Çelik, 1983; Bolu, 2002; Bolu and Uygun, 2003; Özgen and Karsavuran, 2005; Özgen and Tok, 2009, Özgen and Beyarslan, 2010; Özgen *et al.*, 2010; Özgen *et al.*, 2012; Şimşek and Bolu, 2017). These studies are focused to determine species belong to the Insecta class, in general. The species which are belong to the Heteroptera order were given in some parts of these studies as lists (Bolu, 2002; Şimşek and Bolu, 2017). Bolu (2002) was focused to determine pest and beneficial arthropods related to pistachio orchards of Southeastern Anatolian Region. Bolu (2002) reported that there eight pest species and eight beneficial species of insects belong to the Heteroptera order. Şimşek and Bolu (2017) reported that there were eight species belong to the four families of Heteroptera order in their study. But, there have had no any detailed data about density and population situation of the pests in the study carried out by Şimşek and Bolu (2017). This study presents Heteroptera (Hemiptera) species

associated with pistachio orchards of Siirt province and a new record for entomo-fauna of Turkey.

MATERIALS AND METHODS

The study was carried out to determine Heteroptera (Hemiptera) species associated with pistachio orchards of Siirt (Aydınlar and Center) province between 2008-2009. One light trap was constituted to each orchard and trapped species were collected 15 days' intervals. Identification of species was done by second author. Péricart (1972, 1983, 1984, 1987, 1998), Putshkov and Moulet (2009), Wagner (1974-78) and Wyniger (2004) were used for identification species.

RESULTS

Numerical value of species obtained from study is presented in *Fig. 1.* and *Fig. 2.*

PENTATOMIDAE

Palomena mursili Linnavuori, 1984

Material examined: Siirt, Center, 08.08.2008, 8 exc, 07.09.2009, 12 exc. Totally: 20 exc.

Distribution in Turkey: Mersin (Önder *et al.*, 2006)

Remarks: It is rare species in Turkey. This record was firstly in Southeastern Anatolia Region of Turkey.

Stagonomus bipunctatus

Linnaeus, 1758

Material examined: Siirt, Center, 08.08.2008, 8 exc, 07.09.2009, 12 exc. Totally: 20 exc.

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Distribution of Turkey: Adana, Antalya, Bursa, Erzurum, Gaziantep, Hatay, Kahramanmaraş, Mersin, Sivas (Dursun & Fent, 2011, Önder *et al.*, 2006).

CYDINIDAE

Macroscytus brunneus

Fabricius, 1803

Material examined: Siirt, Center, 20.07.2008, 3 exc, 05.08.2008, 5 exc, 07.09.2009, 8 exc. Totally: 16 exc.

Distribution in Turkey: Adana, Antalya, Denizli, Diyarbakır, Gaziantep, Hatay (Önder *et al.*, 2006).

LYGAEIDAE

Lethaeus cribratissimus Stål, 1858

Material examined: Siirt, Center, 20.07.2008, 5 exc, 05.08.2008, 6 exc, 07.09.2009, 3 exc. Totally: 14 exc

Distribution in Turkey: Adana, Antalya, Çanakkale, Gaziantep, Hatay, İstanbul, İzmir, Mersin, Muğla, Sivas (Önder *et al.*, 2006).

MIRIDAE

Acrorrhinium conspersus Noualhier, 1895

Material examined: Siirt, Center, 20.07.2008, 21 exc, 07.09.2009, 6 exc. Totally: 27 exc

Distribution in Turkey: Adana, Ankara, Aydın, Hatay, Isparta, İzmir, Manisa, Şanlıurfa (Önder *et al.*, 2006; Yanık & Yücel., 2001)

Acrorrhinium atricorne Linnavuori, 2006

Material examined: Siirt, Center, 20.07.2008, 11 exc, Siirt, Aydınlar, 07.09.2009, 5 exc, Totally: 16 exc.

Distribution in Turkey: Siirt (Matocq & Özgen, 2010).

Alloeotomus cyprius Wagner, 1953

Material examined: Siirt, Center, 20.07.2008, 5 exc, 05.08.2008, 3 exc, Siirt, Aydınlar, 07.09.2009, 5 exc, Totally: 13 exc.

Distribution in Turkey: Siirt (Aydınlar) and Diyarbakır (Matocq & Özgen, 2010).

Remarks: Entomophagous (Matocq & Özgen, 2010).

Alloeomimus kurdus Hoberlandt, 1953

Material examined: Siirt, Center, 20.07.2008, 3 exc, 05.08.2008, 2 exc, Siirt, Aydınlar, 07.09.2009, 5 exc, Totally: 10 exc.

Distribution in Turkey: Gaziantep, Kahramanmaraş (Önder *et al.*, 2006).

Remarks: It is rare species in Turkey (Önder *et al.*, 2006).

Campylomma diversicornis Reuter, 1878

Material examined: Siirt, Center, 20.07.2008, 6 exc, 05.08.2008, 22 exc, Siirt, Aydınlar, 07.09.2009, 12 exc, 22.09.2009, 4 exc, 08.10.2009, 4 exc, Totally: 48 exc.

Distribution in Turkey: West, East and Southeastern Anatolia (Önder *et al.*, 2006).

Camptocera glaberrima Walker, 1872

Material examined: Siirt, Center, 20.07.2008, 2 exc, 05.08.2008, 3 exc, Siirt, Aydınlar, 07.09.2009, 4 exc, 22.09.2009, 2 exc, 08.10.2009, 2 exc, Totally: 13 exc.

Distribution in Turkey: Adana, Diyarbakır, Kahramanmaraş, Hatay, Gaziantep, Siirt (Önder & Adiguzel, 1979; Çagatay, 1985; Önder *et al.*, 2006; Matocq & Özgen, 2010).

Calocoris roseomaculatus angularis
De Geer, 1773

Material examined: Siirt, Center, 20.07.2008, 1 exc, 05.08.2008, 2 exc, Siirt, Aydınlar, 07.09.2009, 3 exc, 22.09.2009, 2 exc, 08.10.2009, 1 exc, Totally: 9 exc.

Distribution in Turkey: Widespread (Önder *et al.*, 2006).

Deraeocoris serenus Douglas and Scott, 1868

Material examined: Siirt, Center, 20.07.2008, 7 exc, 05.08.2008, 8 exc, 05.08.2008, 3 exc, Siirt, Aydınlar, 07.09.2009, 2 exc, 22.09.2009, 1 exc, 08.10.2009, 2 exc, Totally: 23 exc.

Distribution in Turkey: Afyon, Ağrı, Artvin, Aydın, Adana, Antalya, Bayburt, Erzincan, Erzurum, Elazığ, Giresun, Iğdır, İstanbul, Kars, Kırklareli, Kütahya, Mersin, Muğla, Tunceli, Hakkâri, Tekirdağ, Uşak, Van and many province (Matocq *et al.*, 2014; Yazıcı & Yıldırım, 2016; Çerçi *et al.*, 2018).

Horistus orientalis Gmelin, 1790

Material examined: Siirt, Center, 20.07.2008, 3 exc, 05.08.2008, 4 exc, Siirt, Aydınlar, 07.09.2009, 3 exc, 22.09.2009, 4 exc, Totally: 14 exc.

Distribution in Turkey: Ankara, Bursa, Diyarbakır, Edirne, Elazığ, Kayseri, Antalya, Çorum, İçel, Kahramanmaraş, Kırıkkale, Kırşehir, Nevşehir, Niğde (Önder *et al.*, 2006; Özgen, 2012; Çerçi *et al.*, 2018)

Stenodema turanica Reuter, 1904

Material examined: Siirt, Center, 05.08.2008, 8 exc, 05.08.2008, 2 exc, Siirt, Aydınlar, 07.09.2009, 1 exc, 22.09.2009, 2 exc, 08.10.2009, 3 exc, Totally: 16 exc.

Distribution in Turkey: Diyarbakır, Siirt (Önder & Adiguzel, 1979; Matocq & Özgen, 2010).

Remarks: It is rare species in Turkey.

Pseudoloxops sangrudanus

Linnavuori, 2006

Material examined: Siirt, Center, 05.08.2008, 1 exc, 05.08.2008, 3 exc, Siirt, Aydınlar, 22.09.2009, 3 exc, 08.10.2009, 2 exc, Totally: 9 exc.

Distribution in Turkey: Siirt (Matocq & Özgen, 2010).

Remarks: It is rare species in Turkey.

Macrolophus glaucescens

Fieber, 1858

Material examined: Siirt, Aydınlar, 22.09.2009, 4 exc, 08.10.2009, 7 exc, Totally: 11 exc.

Distribution in Turkey: Nevşehir (Kiyak *et al.*, 2004).

Remarks: It is rare species in Turkey.

Nanopsallus carduellus Horváth, 1888

Material examined: Siirt, Center, 05.08.2008, 4 exc, 05.08.2008, 6 exc, Siirt, Aydınlar, 07.09.2009, 5 exc, 22.09.2009, 7 exc, 08.10.2009, 3 exc, Totally: 25 exc.

Distribution in Turkey: Mardin, Siirt (Matocq & Özgen, 2010; Matocq *et al.*, 2014).

Remarks: It is rare species in Turkey.

Lethaeus picipes Herrich-Schäffer, 1853

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Material examined: Siirt, Center, 05.08.2008, 23 exc, 05.08.2008, 5 exc, Siirt, Aydınlar, 07.09.2009, 2 exc, 22.09.2009, 9 exc, 08.10.2009, 12 exc, Totally: 51 exc.

Distribution in Turkey: Diyarbakır, Hatay, Mardin, Siirt (Önder *et al.*, 2006, Matocq & Özgen, 2010).

Psallus perrisi Mulsant and Rey, 1852

Material examined: Siirt, Center, 05.08.2008, 5 exc, 20.08.2008, 12 exc, Siirt, Aydınlar, 07.09.2009, 2 exc, 22.09.2009, 9 exc, 08.10.2009, 12 exc, Totally: 40 exc.

Distribution in Turkey: Diyarbakır, Elazığ (Matocq *et al.*, 2014).

Trigonotylus pulchellus Hahn, 1834

Material examined: Siirt, Center, 05.08.2008, 4 exc, 20.08.2008, 8 exc, Siirt, Aydınlar, 07.09.2009, 4 exc, 22.09.2009, 3 exc, 08.10.2009, 11 exc, Totally: 30 exc.

Distribution in Turkey: Widespread (inside Siirt province) (Önder *et al.*, 2006; Matocq & Özgen, 2010).

Yotvata nergal Linnavuori, 1993

Material examined: Siirt, Center, 20.08.2013, 5 exc. Totally: 5 exc.

Remarks: New record for Turkey.

Distribution of World: Iraq, Uzbekistan, Turkmenistan (Kerzhner & Kanstantinov, 1997).



Figure 1 - Habitus of *Yotvata nergal* Linnavuori, 1993

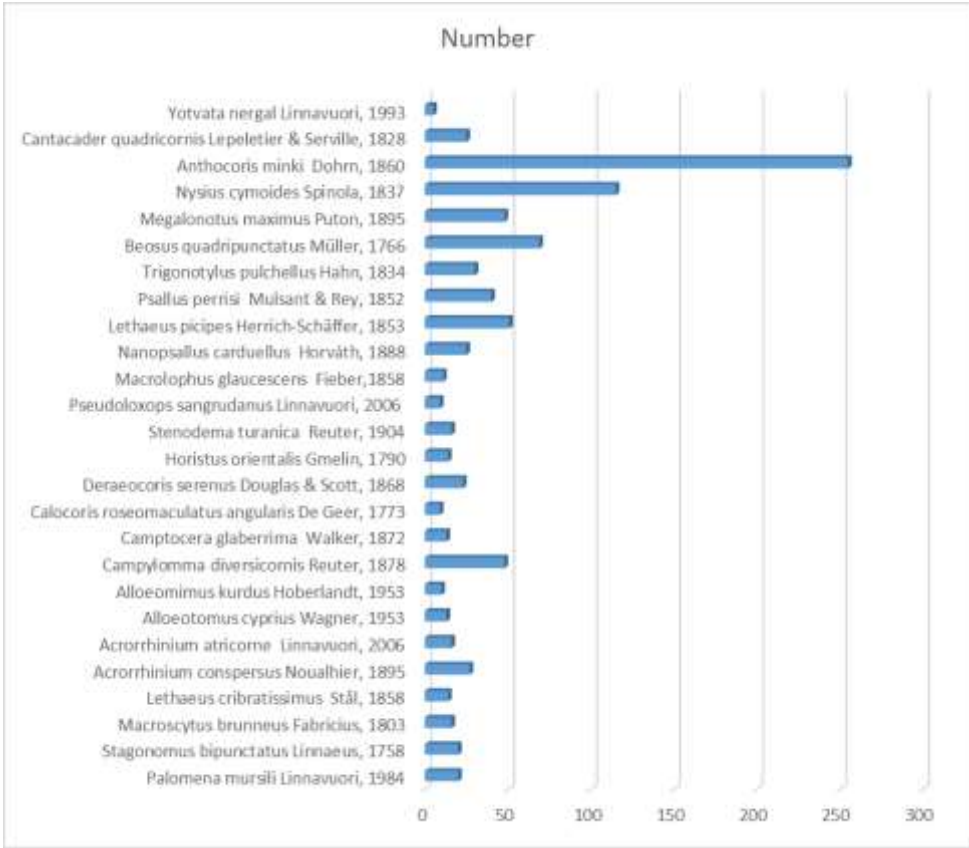


Figure 2 - Diagram of species in the pistachio orchard

LYGAEIDAE

Beosus quadripunctatus Müller, 1766

Distribution in Turkey: Widespread (inside Siirt province) (Önder *et al.*, 2006; Matocq & Özgen, 2010).

Material examined: Siirt, Center, 05.08.2008, 6 exc, 20.08.2008, 4 exc, Siirt, Aydınlar, 07.09.2009, 3 exc, 22.09.2009, 23 exc, 08.10.2009, 11 exc, 23.10.2009, 22 exc. Totally: 69 exc.

Megalonotus maximus Puton, 1895

Material examined: Siirt, Center, 05.08.2008, 13 exc, 20.08.2008, 7 exc,

Siirt, Aydınlar, 07.09.2009, 2 exc, 22.09.2009, 12 exc, 08.10.2009, 8 exc, 23.10.2009, 6 exc. Totally: 48 exc.

Distribution in Turkey: Ankara, Hatay, Konya, Siirt (Önder *et al.*, 2006; Matocq & Özgen, 2010).

Nysius cymoides Spinola, 1837

Distribution in Turkey: Widespread (Önder *et al.*, 2006).

Material examined: Siirt, Center, 20.07.2008, 14 exc, 05.08.2008, 22 exc, 20.08.2008, 12 exc, Siirt, Aydınlar, 23.08.2009, 12 exc, 07.09.2009, 11 exc, 22.09.2009,

14 exc, 08.10.2009, 16 exc,
23.10.2009, 14 exc. Totally: 115 exc.

ANTHOCORIDAE

Anthocoris minki Dohrn, 1860

Distribution in Turkey: Widespread
(Önder *et al.*, 2006).

TINGIDAE

Cantacader quadricornis Lepelletier
and Serville, 1828

Material examined: Siirt, Aydınlar,
12.09.2009, 3 exc., Siirt, Center,
22.08.2009, 22 exc. Totally: 25 exc.

Distribution in Turkey: Adana,
İzmir (Dursun & Fent, 2017), Siirt
(Özgen *et al.*, 2018).

It is obvious that the most dense species found in the study is *Anthocoris minki* when the results of the study is investigated. It is supposed that density of *A. minki* population increased or decreased according population density of *Agonoscena pistaciae*. *Yotvata nergal*, which was determined in the study, was recorded first time fauna of Turkey. The feeding relationships and behaviors of this species in habitat have to be clearly identified. *P. perrisi*, *M. glaucescens*, *H. orientali*, *A. kurdus*, *L. cribratissimus*, *M. brunneus*, *S. bipunctatus*, and *P. mursili* species, which were determined in the study, were first time recorded for Siirt province. Determination behaviors of identified species is very important for IPM studies related pistachio orchards.

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