

AUCHENORRHYNCHA (HEMIPTERA: FULGOROMORPHA AND CICADOMORPHA) SPECIES THAT FEED ON WALNUT TREES AND THEIR ECONOMIC IMPORTANCE AS POTENTIAL VECTORS

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ABSTRACT: In this study, Auchenorrhynch (Cicadomorph and Fulgoromorph) species which grow naturally in Turkey and living in a culture walnut trees are listed. Information on the distribution and host plant preference of these species has been updated. Species that may be potentially harmful and potential vectors of important walnut disease agents are discussed.

KEY WORDS: Fulgoromorpha, Cicadomorpha, walnut, potential vectors, Turkey

The walnut whose fruits are consumed fondly in the World and Turkey and used in the production of many food, is a plant with great importance in furniture and wood industry. In addition to features such as yield and quality, the detection, effects and control of insects feeding on walnut are of great importance for healthy tree and fruit production.

For this reason, there are many studies on the insects found and damaged in the walnut. However, when these studies are examined, it is understood that there is no study to determine only Auchenorrhyncha species. Since there is no Auchenorrhyncha species which causes considerable economic damage as a result of feeding on walnuts.

Although some Auchenorrhyncha species feed on walnuts, they do not cause any economic damage, such as *Cydia pomonella* (Linnaeus, 1758) or *Panaphis juglandis* (Goeze, 1778). Diseases caused by some microorganisms are major problem for walnut trees and producers and cause significant economic losses. The most important ones are; *Pseudomonas syringae* pv. *Syringae* (bacterial cancer), *Gnomonia leptostyla* (walnut anthracnose), *Agrobacterium tumefaciens*, *Xanthomonas arboricola* (walnut bacterial blight disease).

Since Auchenorrhyncha species are fed from phloem in the plant, microorganisms are also taken from the plants carrying the disease. It is known that many Auchenorrhyncha species are the vector of a various bacterial, virotic and fungal plant diseases (Wilson & O'Brien, 1987). It is also thought that they are the potential vectors for microorganism-mediated diseases in walnuts. In this study, Auchenorrhynch species found in walnuts in Turkey are listed and their distribution and host plant preferences data are updated. So, it was intended to draw attention to these insects.

Lodos & Kalkandelen (1980-1988) noted that 6 species collected from walnut in the study that have done to determine species list of Turkish Auchenorrhyncha. Güçlü et al. (1995) found 31 species belong to the various insect groups in the study of the phytophagous insects found in walnuts in the vicinity of Erzurum (11 of them are identified as Auchenorrhyncha). Cevik (1996) determined 43 harmful species (15 of them Auchenorrhyncha) and 40 predator species in his study to

determine the beneficial and harmful fauna in walnut areas in the Central Anatolian Region. It was stated that however, only *Cydia pomonella* has caused economic damage and other pests did not reach the economic damage level due to the natural balance as the gardens were not sprayed.

Kaplan (2009), in his study on the genus Cicadidae in cherry orchards determined that two species fed in the roots in the nymphal period. Athihan et al. (2011) in their study on walnut gardens in the Van Lake basin, found 29 phytophagous (3 of them Auchenorrhyncha) belonging to 11 families and 21 predator species belonging to 6 families. Among these, it was observed that *Cydia pomonella* (L., 1758) (Lepidoptera: Tortricidae) was an economically important pest and *Panaphis juglandis* (Goeze, 1778) (Hemiptera: Callaphididae) had a remarkable population level.

MATERIALS AND METHODS

In this study, the literature has been reviewed. List of Auchenorrhyncha species determined from walnut in Turkey has been prepared from known records. Their distributions in Turkey and food plants preference have been listed.

RESULTS

As a result of the reviewing the literature, the following species of Auchenorrhyncha were determined in walnut trees.

Suborder Fulgoromorpha

Family Cixiidae

Hyalesthes mlokosiewiczzi Signoret, 1879

Distribution in Turkey: İçel prov.: Alata (Dlabola, 1957); Adıyaman prov.: Gölbaşı, Aydın prov.: Kuşadası, Bilecik prov.: Gölpaazarı, Burdur prov.: Gölhisar, Diyarbakır prov.: Lice, Silvan, Isparta prov.: Eğirdir, İzmir prov.: Bornova, Şemikler, Malatya prov., Mardin prov.: Ömerli, Muğla prov.: Köyceğiz, Marmaris, Şırnak prov., Tokat prov.: Erba, Urfa prov.: Güverti (Lodos & Kalkandelen, 1980); Topaluşağı, Fırat-Flusses, Malatya prov.: Balaban (Dlabola, 1981); Erzincan prov.: Centre, Üzümlü (Güçlü et al, 1995); Afyon prov.: Centre, Ankara prov.: Ayaş, Nallıhan, Adana prov.: Hasanbeyli, Burdur prov.: Ağlasun, İnsuyu, Çankırı prov.: Şabanözü, Gaziantep prov.: Oğuzeli, Yavuzeli, Kilis prov.: Isparta prov.: Eğirdir, Yakiören, Uluborlu, Maraş prov.: Andırın, Afşin (Kalkandelen, 2000); Antalya prov.: Korkuteli (Korudağı, Kartal Yaylası) (Demir, 2007a, 2008). **Host Plants:** On *Junglans regia*, *Prunus avium*, *P. persica*, *P. armeniaca*, *P. domestica*, *P. amygdalus*, *Pyrus communis*, *Ctataeagus* sp., *Populus* sp., *Salix* sp., *Quercus* sp., *Liquidambar orientalis*, *Elaeagnus* sp., *Tamarix* sp., *Sesamum* sp. and various weeds. (Lodos & Kalkandelen, 1980), on *Salix*, *Tamarix* (Dlabola, 1981), on walnut (Güçlü et al., 1995).

Family Tettigometridae

Tettigometra (Mitricephalus) leucophaea (Preyssl, 1792)

Distribution in Turkey: Ankara prov.: Mogan Gölü, Baraj, Beynam, Edirne, Adana prov.: Bürücek, Toros, Tapan, Gavur Dağı, Mollafeneri as *Tettigometra obliqua* Panzer, 1799 (Dlabola, 1957); Ankara prov., Bolu prov., Silivri as *Tettigometra obliqua* Pan. (Linnavuori, 1965); Adıyaman prov.: Kahta, Ağrı prov.: Hamur, Ankara prov.: Çubuk Barajı I, Çubuk Barajı II, Çubuk, Karagöl, Eymir gölü, Kayaş, Lalahan, Bilecik prov., Burdur prov., Çanakkale prov.: Bayramiç, Çankırı prov.: Ilgaz, Çorum prov.: Dodurga, İskilip, Diyarbakır prov., Elazığ prov.: Karakoçan, İzmir prov.: Tire, Mardin prov.: Midyat, Nevşehir prov.: Göreme, Sivas prov.: Koyulhisar, Tekirdağ prov.: Centre, Şarköy, Urfa prov. (Lodos & Kalkandelen, 1980); Burdur prov.: Ağlasun, Kayadibi (Çevik, 1996); Ankara prov.: Kızılcahamam (Güvem, Belpınar, Salin, Yasin) (Demir, 2006a); Ankara prov.: Çamlıdere (Demir, 2007b); Antalya prov.: Elmalı (Çığlıkara), İbradı (Başlar), Korkuteli (Söğütçük) (Demir, 2007a). **Host Plants:** On *Quercus*, *Castanea vesca*, *Prunus amygdalus*, *Humulus*

lupulus, *Cannabis sativa*, *Medicago sativa*, *Triticum vulgare*, various weeds (Lodos & Kalkandelen, 1980); on walnut (Çevik, 1996).

Family Dictyopharidae

Dictyophara (s.str.) *europaea* (Linnaeus, 1767)

Distribution in Turkey: Ankara prov.: Çubuk, Karagöl, Lalahan, Denizli prov.: Çardak, Diyarbakır prov.: Centre, Çermik, Eskişehir prov.: Laçın, Isparta prov.: Eğridir, İstanbul prov.: Silivri, İzmir prov.: Narlıdere, Tire, Torbalı-Ayrancılar, Iğdır prov.: Kastamonu prov.: Tosya, Manisa prov.: Salihli, Muğla prov.: Centre, Fethiye, Yatağan, Muş prov.: Ordu prov.: Kumru, Samsun prov.: Siirt prov.: Kozluk, Şırnak, Van prov.: Muradiye (Lodos & Kalkandelen, 1980c), the garden with Citrus and palm (Dlabola, 1981), Erzincan prov.: Centre, Erzurum prov.: Olur (Güçlü et al, 1995). **Host Plants:** On *Medicago sativa*, *Sesamum* sp., *Cannabis sativa*, *Chenopodium* sp., *Oryza sativa*, *Aephionerma* sp. *Prunus* sp., *Pinus* sp., *Verbascum* sp. and various weeds (Lodos & Kalkandelen, 1980); on walnut (Güçlü et al, 1995).

Family Issidae

Agalmatium bilobum (Fieber, 1877)

Distribution in Turkey: Kırşehir prov.: Centre, Kervansaray, Yozgat prov.: Akdağmadeni, Çamlık, Sivas prov.: Işhan, Koyulhisar, Kelkit, (Kartal, 1985); Adana prov.: Pozanti, Hatay prov.: Yayladağ-Belen (Linnavuori, 1965), Adapazarı, Adıyaman prov.: Besni, Centre, Afyon prov.: Sultandağı, Ankara prov.: Centre, Çubuk, Karagöl, Aydın prov.: Nazilli, Söke, Söke-Samsun dağı, Balıkesir prov.: Balya, Burhaniye, İvrindi, Dursunbey, Susurluk, Bilecik prov.: Bozhöyük, Gölpaşarı, Pazaryeri, Burdur prov.: Centre, Gölhisar, Bursa prov.: Centre, Uludağ, Gemlik, İzmit, Mustafakemalpaşa, Çanakakale prov.: Çan. Eceabat, Gelibolu, Gökçeada, Çorum prov.: İskilip, Osmaniye, Denizli prov.: Acıpayam, Acıpayam-Kızıllıhisar, Tavas, Eskişehir prov.: Centre, Çifteler, Mahmudiye, Sarıcakaya, Seyitgazi, Gaziantep prov., Gümüşhane prov.: Şebinkarahisar, İzmir prov.: Çeşme, Selçuk, Kırklareli prov.: Lüleburgaz, Vize, Kütahya prov.: Simav, Malatya prov.: Manisa prov.: Akhisar, Alaşehir, Muğla prov.: Centre, Bodrum, Dalaman, Fethiye-Seki, Köyceğiz, Marmaris, Milas, Tekirdağ prov.: Centre, Hayrabolu, Keşan, Malkara, Tokat prov.: Erbaa, Niksar, Zile, Uşak prov.: Eşme (Lodos & Kalkandelen, 1981a); Sapanca gölü as *Hysteropterum bilobum* Fieber, 1877 (Dlabola, 1981); Balıkesir prov.: Zeytinli (Demir, 2006b); Ankara prov.: Kalecik (Demir, 2007b); Antalya prov.: Alanya (Okurcalar), Alanya (Okurcalar), Akseki (Erenkaya, Murtıçı), Çıglık, Elmalı (Akçay, Gökpınar), Finike (Dağbağ), Gazipaşa (Çalıpınar, Çalıpınar-Kahyalar), Gündoğmuş (Çiçekoluk, Güneycik), Güllükdagi, Kaş (Kemerköy), Korkuteli (Yazır-İmrahor, Söğütçük), Kemer (Centre), Manavgat (Demirciler, Taşağıl, Kilimli, Sağırın, Tilikler, Yukarıışıklar) (Demir, 2007a), Burdur prov.: Gölhisar, Çavdır, Centre, Büğdüz (Çevik, 1996). **Host plants:** On *Pistacia vera*, *Eleagnus* sp., *Fraxinus* sp., *Populus* sp., *Quercus* sp., *Pinus* sp., *Platanus* sp., *Cupressus* sp., *Tamarix* sp., *Styrax* sp., *Pyrus communis*, *Olea europaea*, *Prunus domestica*, *Prunus armeniaca*, *Prunus amygdalus*, *Chenopodium* sp., *Medicago sativa*, *Cannabis sativa*, *Urtica* sp., *Sesamum indicum*, *Verbascum* sp., *Triticum* sp., *Avena sativa*, *Pimpinella anisum*, *Sinapis* sp., *Hypericum* sp. and some grasses (Lodos & Kalkandelen, 1981); on walnut (Çevik, 1996).

Family Flatidae

Metcalfa pruinosa (Say, 1830)

Distribution in Turkey: İzmir prov.: Balçova (Karsavuran and Güçlü, 2004); Sakarya prov.: Geve, Yalova prov.: Center (Hantaş et al., 2014); Ordu prov.: Altınordu, Perşembe, Fatsa, Ünye (Güncan, 2014). **Host plants:** According to EPPO, it is a highly polyphagous insect that can attack such fruit trees, forest trees, ornamental plants and weeds. 173 host plants were recorded in Italy. Damage to citrus fruits, grapevines, fig trees, blackberries, apples, pears, olives, apricots, walnuts, plums, sunflower, soybean and persimmon have been reported. On mandarin trees (Karsavuran & Güçlü, 2004), in quince gardens (Hantaş et al., 2014), on kiwi fruit (Güncan, 2014).

Suborder Cicadomorpha

Family Cicadidae

Cicada mordoganensis Boulard, 1979

Distribution in Turkey: İzmir prov.: Mordoğan (Boulard, 1979); Antalya prov.: Alanya, Side, Ulupınar, Yenice, İzmir prov.: Balıklıova, Gaziemir, Karaburun, Mordoğan, Torbalı, Urla, Muğla prov.: Bodrum (Lodos & Kalkandelen, 1981b); Antalya prov.: Alanya (Keşefli), Manavgat (Demirciler, Değirmenli) (Demir, 2007a). **Host Plants:** On *Olea europaea*,

Prunus amygdalus, *P. domestica*, *Populus* sp., *Vitis vinifera*, *Citrus nobilis*, *Juniperus* sp., *Platanus* sp. (Lodos & Kalkandelen, 1981); nymphs in the roots of cherry and olive trees, adults on cherry, olive, poplar, walnut, sycamore, pine, fig, peach, *Pistacia* sp. (Kaplan, 2009).

***Lyristes plebejus* (Scopoli, 1763)**

Distribution in Turkey: İzmir prov., Bursa prov.: Mudanya Maraş prov.: Yarbaşı as *Cicada plebeja* Scop. (Fahringer, 1922); Ankara prov.: Baraj, Adana prov.: Bürücek (Dlabola, 1957); Gülek (Linnavuori, 1965); Adana prov., Ankara prov.: Centre, Çubuk Barajı I, Antalya prov., Artvin prov., Aydın prov.: Nazilli, Söke-Samsun dağı, Balıkesir prov.: Edremit, Denizli prov.: Acıpayam, Erzincan prov., Gaziantep prov.: Nizip, İzmir prov.: Bayındır, Menemen, İstanbul prov., Kırklareli prov.: Türkgeldi-Lüleburgaz, Manisa prov.: Akhisar, Mardin prov., Muğla prov.: Köyceğiz, Kütahya prov.: Gediz (Lodos & Kalkandelen, 1981b); Manisa prov.: 5 km SW Manisa as *Tibicen plebejus* Scopoli, 1763 (Dlabola, 1981); Antalya prov.: Akseki (Erenkaya, Güneykaya), Alanya, Güllükdagi, Gündoğmuş (Güneycik), Kemer (Sarçınardağı), Korkuteli (Söğütçük), Kaş (Beldibi), Manavgat (Bucakşeyhler, Demirciler, Değirmenli) (Demir, 2007a). **Host Plants:** On *Olea europaea*, *Pinus* sp., *Ligustrum* sp., *Populus* sp., *Citrus* sp., *Prunus* sp., *Vitis vinifera*, *Fraxinus* sp., *Ficus* sp., *Morus* sp., *Styria* sp., *Quercus* sp. and some fruit trees (Lodos & Kalkandelen, 1981); nymphs were found in the roots of cherry, olive, peach, apricot, plum, sour cherry, mahaleb, almond, pear, apple, poplar, mulberry, walnut, fig and pine trees (Kaplan, 2009).

Family Aphrophoridae

***Aphrophora alni* (Fallen, 1805)**

Distribution in Turkey: Afyon (Başmakçı Plateau), Ankara (Beypazarı, Çubuk, Eymir gölü), Artvin (Centre, Fidanlık, Hopa, Kabaca), Aydın (Kuşadası), Balıkesir (Edremit, Kepsut, Manyas), Bitlis (Tatvan), Bolu, Çanakkale (Gökçeada), Çorum, Diyarbakır (Çermik), Erzincan (Centre-Çağlayan, Başköy, Refahiye), Erzurum (Tufanç, Centre), Giresun (Centre, Keşap, Şebinkarahisar), Yalova, İzmir (Bozdağ, Kozak, Yamanlar), Kayseri (Himmethede, Pınarbaşı), Kırklareli (Centre, Domanıç), Konya, Kütahya, Mardin, Muğla (Fethiye-Seki), Manisa (Soma), Ordu (Ünye-Yılanlıkaya, Ünye, Kumru, Mesudiye, Perşembe) Rize (Ardeşen, Kaçkar Mountains, Pazar), Samsun (Kavak), Sinop, Tekirdağ (Barbaros), Trabzon (Centre, Maçka), Yozgat (Çekerek) (Linnavuori, 1965; Lodos & Kalkandelen, 1981c; Kartal et al., 1994; Demir, 2004). Artvin prov.: Yusufeli, Erzincan prov.: Üzümlü, Erzurum prov.: İspir (Güçlü et al, 1995), Kayseri prov.: Yahyalı, Kirazlı (Çevik, 1996). Ankara province: Kızılcahamam: Güvem, Aköz Köyü, Sey Hamamı, Yenimahalle, Soğuksu, it has been collected from weeds and *Salix* trees in *Pinus-Quercus* forest (Demir, 2006). **Host Plants:** On *Oryza sativa*, *Pisum sativum*, *Vitis vinifera*, *Corylus avellana*, *Cornus mas*, *Rubus fruticosus*, *Crataegus*, *Amygdalus communis*, *Junglans regia*, *Prunus domesticus*, *P. avium*, *P. cerasus*, *Rosa* sp., *Cynodon vulgaris*, *Mespilus germanica*, *Salix*, *Populus*, *Alnus*, *Fagus*, *Ulmus*, *Urtica*, *Verbascum* (Lodos & Kalkandelen, 1981); *Alnus incana*, *A. orientalis* (Fahringer, 1922); on walnut (Güçlü et al, 1995); on walnut (Çevik, 1996).

***Lepyronia coleoprata* (Linnaeus, 1758)**

Distribution in Turkey: Adana prov., Maraş prov.: Yarbaşı (Fahringer, 1922); Ankara prov.: Mogan Gölü, Baraj, Beynam, Adana prov.: Bürücek, Karataş, Edirne prov. (Dlabola, 1957); Afyon prov.: Sincanlı, Ankara prov.: Çubuk, Çubuk Barajı I, Eymir gölü, Mogan, Hasanoğlan, Şereflikoçhisar-Tuz gölü, Artvin prov.: Fidanlık, Aydın prov.: Kuşadası, Bilecik prov.: Centre, Bozhöyük, Bursa prov.: Centre, Keleş, Çanakkale prov.: Çan, Gökçeada, Çankırı prov., Çorum prov.: Centre, İskilip, Diyarbakır prov.: Centre, Silvan, Edirne prov.: Centre, Babaeski, İpsala, Erzincan prov., Gümüşhane prov.: Kop, Şiran, İzmir prov.: Ayrancılar, Bornova, Kars prov.: Sarıkamış, Kütahya prov.: Domanıç, Manisa prov.: Akhisar, Mardin prov.: Cizre, Muğla prov.: Köyceğiz, Marmaris, Muş prov., Sakarya prov.: Adapazarı-Sapanca, Siirt prov., Tokat prov.: Zile (Lodos & Kalkandelen, 1981c); Samsun prov.: Kurupelir, Yakakent-Çamgözü, Ayvacı (Kartal et al., 1994); Ankara prov.: Kızılcahamam (Güvem, Aköz, Belpınar, Salın, Sey Hamamı, Soğuksu) (Demir, 2006b); Ankara: Yenimahalle, Kayağdıdağı, Memlik (Demir, 2004); Ankara: Kalecik (Akyurt, İdrisdağı), Sincan Mülk, Çaldağı (Demir, 2007b); Antalya prov.: Aksu (Perge), Alanya (Keşefli, Okurcalar, Yeşilköy), Finike, Gazipaşa (Çalınar-Kahyalar, Macarköy), Gündoğmuş (Güneycik), Korkuteli (Korudağı, Kartal Yaylası, Sülekler), Manavgat (Bucakşeyhler, Centre, Değirmenli, Demirciler, Külcüler, Tilkiler) (Demir, 2007a); Artvin prov.: Yusufeli, Erzurum

prov.: İspir (Güçlü et al., 1995). **Host Plants:** On *Juncus* sp., *Medicago sativa*, *Populus* sp., *Salix* sp. (Lodos & Kalkandelen, 1981); on walnut (Güçlü et al., 1995).

***Philaenus spumarius* (Linnaeus, 1758)**

Distribution in Turkey: İstanbul prov.: Polenezköy, İzmit prov.: Gebze, Eskişehir prov. (Fahringer, 1922); Samsun prov.: Kurupelit, Bafra, Ayvacık, Yakakent-Çamgözü (Kartal et al., 1994); Ankara prov.: Beynam, Mollafeneri, Adana prov.: Kayalı Dağ (Dlabola, 1957); Bartın prov.: Akçakova, İzmit prov. (Linnavuori, 1965); Ağrı prov.: Hamur, Tahir geçidi, Amasya prov., Ankara prov.: Çamkoru, Çubuk, Eymir gölü, Mogan gölü, Hasanoğlan, Karagöl, Artvin prov.: Centre, Fidanlık, Kafkasar, Marsivan, Seyitler, Borçka, Murgul, Aydın prov.: Germencik, Balıkesir prov.: Erdek, Gönen, Bilecik prov.: Pazaryeri, Bitlis prov.: Tatvan, Bursa prov.: Çamlık, Çınarcık, İznik, Mudanya, Orhaneli, Uludağ, Çanakale prov.: Abide, Biga, Gelibolu, Gökçeada, İntepe, Ezine, Elazığ prov.: Gezin, Hazar, Erzincan prov.: Bahçelikköy, Centre, Çağlayan, Dumanlıdağ, Demirpınar, Refahiye, Üzümlü, Erzurum prov.: Tortum, Tufanç köyü, Giresun: Şebinkarahisar, Gümüşhane prov.: Kelkit, Şiran, Centre, Hakkari, İzmir prov.: Balçova, Bornova, Dikili, Kozak, Bozdağ, Tire, Urla, Yamanlar, Kars prov.: Başköy, Gaziler, Kağızman, Iğdır prov., Kırklareli prov.: Pınarhisar, Vize, Kütahya prov., Kocaeli prov.: İzmit, Değirmendere, Malatya prov., Manisa prov.: Gördes, Kırkağaç, Gölarmara, Mardin prov.: Nusaybin, Sultaneşme, Ömerli, Midyat, Mazıdağ, Muğla prov.: Bodrum, Köyceğiz, Ordu prov.: Kumru, Mesudiye, Perşembe, Ünye, Rize prov.: Centre, Fener, Hayrat, Samsun prov.: Centre, Bafra, Çarşamba, Dereköy, Siirt: prov.: Baykan, Sinop prov.: Centre, Gerze, Mertoğlu, Tekirdağ prov.: Şarköy, Saray, Centre, Trabzon prov.: Akçaabat, Derecik, Centre, Sürmene, Kop, Zigana, Maçka, Tokat prov.: Centre, Artova, Van: Çaldıran, Gürpınar, Edremit, Gevaş, Başkala, Elmali, Çatak, Erciş, Tendürek dağı, Akköprü, Beyüzümü, Başkala-Güzelsu (Lodos & Kalkandelen, 1981c); Sapanca gölü, Karahan Pass, Nurhak Mountain, Sivas prov.: Gürün, Malatya prov.: Balaban, Van prov.: Gevaş, Van gölü, Kütahya prov.: 30 km S Kütahya (Dlabola, 1981); Balıkesir prov.: Kazdağı National Park (Demir, 2006a); Ankara prov.: Kızılcahamam (Güvem, Aköz, Sey Hamamı, Yenimahalle, Soğuksu) (Demir, 2006b); Ankara prov.: Yenimahalle, Karyagözü, Memlik (Demir, 2004); Ankara prov.: Kalecik (Akyurt, İdrisdağı) (Demir, 2007b); Antalya prov.: Akseki (Güçlüköy), Alanya (Keşefli, Okurcalar), Gazipaşa (Çalınar, Çalınar-Kahyalar), Gündoğmuş (Güneycik, Çiçekoluk, Serinyaka), Manavgat (Demirciler, Külcüler, Centre-Çeltikçi, Beşkonak, Belenobası, Bucakşeyhler, Seleukeia, Evrenleryavşı, Söylerkale, Hocalı, Saraçlı, Yaylaalan, Tilkiler, Yukarışıklar-Tilkiler) (Demir, 2007a), Van prov.: Van lake basin (Atlıhan et al., 2011). Artvin prov.: Yusufeli, Erzincan prov.: Centre, Üzümlü, Erzurum prov.: İspir, Oltu, Olur (Güçlü et al., 1995), Kayseri prov.: Yahyalı, Kirazlı, Bünyan, Centre, Gezi (Çevik, 1996). **Host Plants:** On *Triticum*, *Oryza sativa*, *Avena sativa*, *Trifolium*, *Medicago sativa*, *Onobrychis viciaefolia*, *Ulmus*, *Fagus*, *Ahıs*, *Cupressus*, *Pinus*, *Corylus avellana*, *Prunus domestica*, *P. amygdalus*, *P. persica*, *Pyrus mormunis*, *P. malus*, *Olea europaea*, *Citrus*, *Vitis nifera*, *melilothus*, *Robinia*, *Pimpinella anisum*, *Daucus carota*, *Apium graveolens* and weeds (Lodos & Kalkandelen, 1981); on walnut garden (Atlıhan et al., 2011); on walnut (Güçlü et al., 1995); on walnut (Çevik, 1996).

Family Membracidae

***Centrotus cornutus* (Linnaeus, 1758)**

Distribution in Turkey: Bilecik prov., İstanbul prov.: Belgrat forest, Kuşçular (Fahringer, 1922); Adapazarı: Hendek, Artvin prov.: Hopa, Aydın prov.: Karacasu, Bilecik prov.: Bozhöyük, Bursa prov.: İznik, Mudanya, Uludağ, Çorum prov., Denizli prov., Erzincan prov.: Başköy, Edirne prov.: Keşan, Giresun prov.: Görele, İzmir prov.: Kozak, Kocaeli prov.: İzmit, Kütahya prov.: Domaniç, Kırklareli prov.: İğneada, Kiyıköy, Pınarhisar, Ordu prov.: Ünye-Yılanlıkaya, Tekirdağ prov.: Saray (Lodos & Kalkandelen, 1981c), Balıkesir prov.: Kazdağı National Park (Demir, 2006a); Ankara prov.: Kızılcahamam (Soğuksu) (Demir, 2006b); Antalya prov.: Güllükdığı (Demir, 2007a). **Host Plants:** On *Rubus fruticosus*, *Rosa canina*, *Crataegus*, *Ulex europaeus*, *Rhododendron flavum*, *Populus*, *Quercus*, *Pinus*, *Junglans regia*, *Pyrus malus*, *P. communis*, *Medicago sativa* (Lodos & Kalkandelen, 1981).

***Stictoccephala bisonia* Kopp et Yonke, 1977**

Distribution in Turkey: Ankara prov.: Çubuk, Artvin prov.: Maradit, Balıkesir prov.: Susurluk, Edirne prov., Kırklareli prov.: Pınarhisar, Lüleburgaz, Türkgeldi, Rize prov.: Kaçkar mountains (Lodos & Kalkandelen, 1981); Artvin prov.: Yusufeli, Erzincan prov.: Centre, Erzurum prov.: İspir, Oltu, Olur (Güçlü et al., 1995). **Host Plants:** On *Pyrus malus*,

Alnus, *Medicago sativa*, *Alfalfa*, *Melilithus alba* and weeds (Lodos & Kalkandelen, 1981); on walnut (Güçlü et al., 1995).

Family Cicadellidae

Ledra aurita (Linnaeus, 1758)

Distribution in Turkey: Ordu prov.: Perşembe, Ünye (Dlabola, 1977), Artvin prov.: Hopa-Sarp, Bursa prov.: Mudanya, Kurşunlu, Gümüshane prov., Ordu prov.: Perşembe-Ünye, Rize prov., Samsun prov., Tekirdağ prov.: Saray, Uşak prov. (Lodos & Kalkandelen, 1981).

Host Plants: *Ulmus*, *Alnus*, *Quercus*, *Junglans regia*, *Corylus avellana*, o weeds (Lodos & Kalkandelen, 1981). The females leave their eggs in the cuts opened with the ovipositor in young shoots. These cuts grow by creating scars and cause damage to the branches (Viggiani, 1970).

Oncopsis flavicollis (Linnaeus, 1761)

Distribution in Turkey: Düzce prov.: Akçakoca (Dlabola, 1971), Artvin prov.: Borçka, Centre), Samsun prov.: Bafra, Sivas prov.: Suşehri-Ortakent, Sakarya prov. (Lodos & Kalkandelen, 1981), Erzurum prov.: Tortum (Güçlü et al., 1995). **Host Plants:** On *Corylus avellana*, *Castanea vesca*, *Tamarix*, *Betula*, *Tilia*, *Alnus*, *Salix*, *Carpinus*, *Pinus* (Lodos & Kalkandelen, 1981), on walnut (Güçlü et al., 1995).

Macropsis graminea (Fabricius, 1798)

Distribution in Turkey: Ankara prov.: Baraj, Beynam, Ayaş (Dlabola, 1957); Adıyaman prov.: Kahta, Ağrı: Taşlıçay, Ankara: Çubuk, Çubuk Barajı II., Karagöl, Eymir gölü, Kayaş, Lalahan, Beypazarı, Bitlis prov.: Tatvan, Çanakkale prov.: Eceabat, Diyarbakır prov.: Lice, Ziyaret köyü, Edirne prov.: Havsa, Lalapaşa, Elazığ prov.: Hazar gölü, Karakoçan, Eskişehir prov.: Mahmudiye, Gümüshane prov.: Şiran, Kırklareli prov.: Pınarhisar, Konya prov.: Akşehir, Kütahya prov.: Domaniç, Manisa prov.: Alaşehir, Sultanyayla, Tokat prov.: Centre, Artova, Trabzon prov., Tunceli prov., Van prov.: Başkale (Lodos & Kalkandelen, 1981d); Karahan Pass, Nurhak Mountain (Dlabola, 1981); Ankara prov.: Kızılcahamam (Güvem, Aköz, Salin, Soğuksu) (Demir, 2006b); Antalya prov.: Elmalı (Akçay) (Demir, 2006); Kayseri prov.: Bünyan, Centre (Çevik, 1996). **Host Plants:** On *Populus*, *Salix* (Lodos & Kalkandelen, 1981), on walnut (Çevik, 1996).

Rhytidodus wagneri Dlabola, 1965

Distribution in Turkey: Adana prov.: Hasanbeyli, Konya prov.: İçeri Çumra, Manisa prov.: Alaşehir, Gördes, Nevşehir prov.: Çat, Niğde prov.: Ulukuşla, Çiftehan, İhlara (Lodos & Kalkandelen, 1982), Kayseri prov.: Yahyalı, Kirazlı (Çevik, 1996). **Host Plants:** On *Populus* ((Lodos & Kalkandelen, 1982), on walnut (Çevik, 1996).

Idiocerus herrichi Kirschbaum, 1868

Distribution in Turkey: Ankara prov.: Çubuk, Elmadağ, Çorum prov., Erzincan prov.: Çağlayan, Erzurum prov.: Uzundere, Kayseri prov.: Himmetdede, Kırşehir prov.: Kaman, Nevşehir prov.: Avanos, Sivas prov.: Suşehri, Tokat prov., Van prov.: Başkale, Akköprü (Lodos & Kalkandelen, 1982), Burdur prov.: Ağlasun, Kayadibi, Kayseri prov.: Centre, Bünyan (Çevik, 1996). **Host Plants:** On *Populus*, *Ulmus*, *Tamarix*, *Alhagi*, *Urtica* (Lodos & Kalkandelen, 1982), on walnut (Çevik, 1996).

Sulamicerus ancorarius (Dlabola, 1964)

Distribution in Turkey: Diyarbakır prov.: Lice, Konya prov.: Ermenek, Siirt prov.: Şirvan (Lodos & Kalkandelen, 1982). **Host Plants:** *Quercus*, *Junglans regia*, *Pistacia vera* (Dlabola, 1981).

Tremulicerus fulgidus (Fabricius, 1775)

Distribution in Turkey: Adana prov.: Pozantı, Ankara prov.: Eymir gölü, Bitlis prov.: Tatvan, Çankırı prov., Gümüshane prov.: Kelkit, İzmir prov.: Ödemiş-Bozdağ, Konya prov.: Meram, Seydişehir, Manisa prov.: Alaşehir, Van prov.: Başkale (Lodos & Kalkandelen, 1982a); Ankara prov.: Kızılcahamam (Işıkdağı, Aköz) (Demir, 2006b); Antalya: Manavgat (Bucakşeyhler, Hacıobası), Elmalı (Çobanisa), Serik (Aspendos) (Demir, 2006), Burdur prov.: Ağlasun, Kayadibi (Çevik, 1996). **Host Plants:** On *Populus*, *Salix*, *Eleagnus* (Lodos & Kalkandelen, 1982), on walnut (Çevik, 1996).

Tremulicerus poecilus (Herrich-Schaeffer, 1835)

Distribution in Turkey: Bitlis prov.: Tatvan, Gümüshane prov.: Centre, Kastamonu prov.: Ilgaz Mountain, Van prov.: Beyüzümü (Lodos & Kalkandelen, 1982), Kayseri prov.: Ağırnas, Bünyan, Centre, Güzelköy, Burdur prov.: Ağlasun, Kayadibi (Çevik, 1996). **Host Plants:** On *Juniperus*, *Salix*, *Populus nigra*, *Carpinus* (Lodos & Kalkandelen, 1982), on walnut (Çevik, 1996).

***Tremulicerus vitreus* (Fabricius, 1803)**

Distribution in Turkey: Ankara prov.: Çubuk, Gümüşhane prov.: Kelkit, Konya prov.: İçeri Çumra, Nevşehir prov.: Nar (Lodos & Kalkandelen, 1982), Erzurum prov.: İspir (Güçlü et al., 1995), Kayseri prov.: Centre, Güzelköy (Çevik, 1996). **Host Plants:** On *Populus*, *Salix*, *Alnus*, *Tilia*, *Juniperus* (Lodos & Kalkandelen, 1982), on walnut (Güçlü et al., 1995), on walnut (Çevik, 1996).

***Edwardsiana flavescens* (Fabricius, 1794)**

Distribution in Turkey: Ankara prov.: Çubuk, Elmadağ, Van prov.: Başkale-Güzelsu, Beyüzümü, Edremit (Lodos & Kalkandelen, 1984). **Host Plants:** *Ulmus*, *Pyrus malus*, *Fagus*, *Carpinus*, *Junglans regia*, *Populus*, *Castanea* (Lodos & Kalkandelen, 1983).

***Empoasca decipiens* Paoli, 1930**

Distribution in Turkey: Adana prov., İçel prov.: Alata (Dlabola, 1957); East Meditteran region (Başpınar & Uygun, 1991); Antalya prov.: Akseki (Güçlüköy), Alanya (Kargıcak, Konaklı), Elmalı (Centre, Gümüşyaka), Finike (Evrenkavak, Turunçova, Yeşilyurt), Gazipaşa (Macarköy), Kaş (İslamlar), Kale (Köşkerler), Kemer (Çamyuva, Karabucak), Kamluca (Kavakköy, Kavakdibi), Manavgat (Bucakşeyhler, Centre, Demirciler, Ilıca, Yukarıışıklar-Tilkiler, Beşkonak, Karaöz), Serik (Aspendos, Camili) (Demir, 2006), Erzincan prov.. Centre, Üzümlü (Güçlü et al., 1995), Kayseri prov.: Yahyalı, Kirazlı, Centre, Güzelköy, Burdur prov.: Centre, Göllhisar (Çevik, 1996). **Host Plants:** On grapevine, cotton, potato, eggplant, tomato, tobacco, okra, broad, bean, french bean, cucumber, sesame, sunflower, fig, hemp, *Citrus* and weeds (Lodos & Kalkandelen, 1983), on walnut (Güçlü et al., 1995), on walnut (Çevik, 1996).

***Empoasca solani* (Curtis, 1846)**

Distribution in Turkey: Ankara prov.: Çubuk, Elmadağ, Lalahan, Eymir gölü, Kayaş, Karagöl, Bilecik prov.: Pazaryeri, Burdur prov.: Ağlasun, Çankırı prov.: Festikhan, Erzincan prov.: Çağlayan, Ilıc, Kuruçay, Refahiye, Gaziantep prov.: Nurgana, Kars prov.: Küllük, Kaçızman, Iğdır prov., Kastamonu prov.: Ilgaz-Belören, Konya prov.: Ereğli, Kasımhan, Meram, Karaman prov., Nevşehir prov.: Boyalı, Çat, Göreme, Nar, Ürgüp, Samsun prov.: Gelemen, Sinop prov.: Ahmetyeri, Durağan, Kanlıçay, Urfa prov.: Ceylanpınar, Van prov.: Beyüzümü, Edremit, Gevaş (Lodos & Kalkandelen, 1983c), Erzincan prov.. Centre (Güçlü et al., 1995). **Host Plants:** On sugar beet, potato, tomato, red pepper, cucurbitaceous plants, Alfalfa, apple tree, cotton, strawberry, hop, Graminaeus plants, mallow, hazelnut, broad bean (Lodos & Kalkandelen, 1983), on walnut (Güçlü et al., 1995).

***Zyginella pulchra* Löw, 1885**

Distribution in Turkey: Diyarbakır prov.: Centre, İzmir prov.: Karaburun, Kemalpaşa, Tire, Konya prov.: Tuz gölü, Aksaray prov., Samsun prov.: Centre (Lodos & Kalkandelen, 1984a); Antalya prov.: Kemer (Çamyuva, Ovacık) (Demir, 2006c), Burdur prov.: Centre, Göllhisar (Çevik, 1996). **Host Plants:** On walnut (Çevik, 1996).

***Synophropsis lauri* (Horvath, 1897)**

Distribution in Turkey: Ankara prov.: Centre, İstanbul prov.: Kartal, Cevizli, Rize prov., Samsun prov.: Bafra, Sinop prov.: Aklıman, Trabzon prov.: Akçaabat, Centre (Lodos & Kalkandelen, 1986); İçel prov.: Erdemli (Dlabola, 1981); Yalova prov. (Dlabola, 1971a); Amasya prov., Samsun prov., Sinop prov., Tokat prov. (Zeybekoğlu, 1998); Antalya prov.: Güllükdağı, Kemer (Çamyuva) (Demir, 2006), Artvin prov.: Yusufeli, Erzurum prov.: İspir (Güçlü et al., 1995). **Host Plants:** On *Ligustrum*, *Rhododendron*, *Hedera helix*, *Olea europaea* (Lodos & Kalkandelen, 1986), on walnut (Güçlü et al., 1995).

***Selenocephalus obsoletus* (Germar, 1817)**

Distribution in Turkey: İstanbul prov.: Polenezköy (Fahringer, 1922); Adana prov.: Bürücek, Karataş, Ankara prov.: Baraj, Beynam, Edirne (Dlabola, 1957); İzmit prov. (Linnavuori, 1965); Amasya prov., Giresun prov., Ordu prov., Rize prov., Samsun prov., Tokat prov., Trabzon prov. (Zeybekoğlu, 2000), Burdur prov.: Centre, Büğdüz (Çevik, 1996). **Host Plants:** On *Quercus*, apple, pear, almond, *Trifolium*, sunflower, vine, *Astragalus* (Lodos & Kalkandelen, 1986), on walnut (Çevik, 1996).

***Selenocephalus pallidus* Kirschbaum, 1868**

Distribution in Turkey: Adana prov.: Karataş, Gavur Dağı, Tapan, Ankara prov.: Beynam, Baraj (Dlabola, 1957); Gülek, Ankara prov.: Kızılcahamam (Linnavuori, 1965); Ankara prov.: Çubuk Barajı, Lalahan, Eymir gölü, Çanakkale prov. (Kalkandelen, 1974); Adana prov.: Hasanbeyli, Ankara prov.: Çubuk, Eymir, Lalahan, Kalecik, Kurtboğazi, Nallıhan, Antalya prov.: Alanya, Manavgat, Aydın prov.: Kuşadası, Bolu prov., Burdur prov.:

Güllhisar, Bursa prov.: Centre-Doğanköy, Çanakkale prov., Çankırı prov.: Kurşunlu, Çorum prov.: Centre, Bayat, Denizli prov.: Tavas, Isparta prov.: Eğridir, İzmir prov.: Karaburun, Ödemiş-Samsundagi, Menemen, Kayseri prov.: Hacilar, Kırşehir prov.: Yıladağı, Konya prov.: Ermenek, Seydişehir, Manisa prov.: Gördes, Sinop prov.: Gerze, Tokat prov.: Erbaa, Yozgat prov.: Çekerek (Lodos & Kalkandelen, 1986c); Balıkesir prov.: Zeytinli (Demir, 2006a); Ankara prov.: Sincan Mülk (Demir, 2007b), Antalya prov.: Akseki (Murtiçi), Gündoğmuş (Çiçekoluk, Güneycik, Kalecik), Hisarçandır, İbradı (Ormana), Kaş (Kemerköy), Kemer (Olympos National Park), Kumluca (Altınyaka-Karacağaç), Manavgat (Bucakşeyhler, Beşkonak, Demirciler), Serik (Sarıabalı) (Demir, 2006), Kayseri prov.: Ağırnas, Bünyan, Burdur prov.: Ağlasun, Boğazköy, Centre, Çavuşarığı (Çevik, 1996). **Host Plants:** On walnut (Çevik, 1996).

DISCUSSION

It is determined that among the Auchenorrhyncha species that distributed in Turkey 28 species have been found in walnut. Of these, 5 are belonging to the Fulgoromorpha and 23 are belonging to the Cicadomorpha. Most of these species are polyphase and feed on walnut trees. It has found that the nymphs of *Lyristes plebejus* (Cicadidae) also feed in the roots of walnut trees (Kaplan, 2009).

When populations are intense, Auchenorrhyncha species damage the walnut by feeding. Cicadidae species and *Ledra aurita* from Cicadellidae cause important injuries in tree leaves with their eggs laying by cutting the branches (Viggiani, 1970; Lodos & Tetovo, 1981).

Auchenorrhyncha species feed from phloem, so they take the microorganisms in the plants to their bodies and infect them with healthy plants. Many species are known as the vector of important disease agents. Species that are not identified as vector are considered as potential vector.

Since *Hyaletthes obsoletus* is known as the "stolbur phytoplasma" vector (Sforza, 1998; EPP0, 1999), *Hyaletthes mlokosiewiczzi* determined in this study is considered as the potential vector. *Dictyophara* (s.str.) *europaea* is the vector of "Grapevine flavescence doree phytoplasma (PHYPP64)" (EPP0, 2010; Krstic et al., 2016). *Metcalfa pruinosa* is the vector of "*Pseudomonas syringae* pv. *Actinidiae*". *Aphrophora alni* is the potential vector for "Candidatus phtoplasma". *Philaenus spumarius* is the vector of "Candidatus phtoplasma" and "*Xylella fastidiosa*". Since *Oncopsis alni* is the vector of "elm yellows phytoplasma group 16SrV" (Carraro et al., 2004), *Oncopsis flavicollis* determined in this study is considered as the potential vector. Since *M. mendax* is the vector of "elm yellows phytoplasma" (Carraro et al., 2004), *Macropsis graminea* determined in this study is considered as the potential vector. The *Aphrophora alni*, *Ledra aurita* and *Philaenus spumarius* species determined in this study are the potential vectors of *Xylella fastidiosa* in the United Kingdom according to the Food and Environment Research Agency (2018) report (EPP0 2008). *Empoasca decipiens* is considered as the potential vector for "Candidatus Phytoplasma phoenicium" (EPP0, 2017.) *Lepyronia coleoptrata* is the potential vector of "*Xylella fastidiosa*" (EFSA, 2015).

As a result, among Auchenorrhyncha species found in walnut; *Dictyophara* (s.str.) *europaea* (Linnaeus, 1767); *Metcalfa pruinosa* (Say, 1830); *Aphrophora alni* (Fallen, 1805); *Philaenus spumarius* (Linnaeus, 1758); *Empoasca decipiens* Paoli, 1930 are the vector of the microorganismal diseases above mentioned. Both these species and other Auchenorrhyncha species that have been determined should be considered as potential vectors for important microorganismal diseases in the walnut. Further research is needed in order to reach a final judgment on this issue and to take necessary measures.

LITERATURE CITED

- Athhan, R., Özgökçe, M. S., Kaydan, M. B., Kasap, İ., Kılınçer, N., Kiyak, S. & Polat, E.** 2011. Vangözü havzası ceviz ağaçlarındaki böcek faunası. *Türk. entomol. derg.*, 35 (2): 349-360.
- Başpınar, H. & Uygun, N.** 1991. Doğu Akdeniz Bölgesi turuncgöl bahçelerindeki Cicadellidae türleri üzerinde faunistik ve sistematik çalışmalar II. *Türkiye entomoloji dergisi*, 15 (3): 157-172.
- Boulard, M.** 1979. Cigales du genre *Cicada* Linne, originaires de Turquie (Hom. Cicadidae). *Türkiye Bitki Koruma Dergisi*, 3 (2): 67-74.
- Carraro, L., Ferrini, F., Ermacora, P., Loi, N., Martini, M. & Osler, R.** 2004. *Macropsis mendax* as a vector of elm yellows phytoplasma of *Ulmus* species. *Plant Pathology*, 53 (1): 90-95.
- Çevik, T.** 1996. Orta Anadolu Bölgesi ceviz ağaçlarında zararlı ve faydalı faunanın tespiti üzerinde araştırmalar. *Bitki Koruma Bülteni*, 36 (1-2): 55-72.
- Demir, E.** 2004. Kayağı Dağı (Ankara) Auchenorrhyncha Faunası Hakkında (Homoptera). *Priamus*, 11 (1/2): 17-27.
- Demir, E.** 2006a. Preliminary report on the Auchenorrhyncha (Hemiptera) fauna of Kazdağı National Park with two new records for Turkey. *Acta entomologica Slovenica*, 14 (1): 89-102.
- Demir, E.** 2006b. Contributions to the knowledge of Turkish Auchenorrhyncha with twelve new records (Homoptera: Cicadellidae). *Munis entomology and zoology*, 1 (2): 215-236.
- Demir, E.** 2007a. Contributions to the Knowledge of Turkish Auchenorrhyncha (Homoptera, Fulgoromorpha and Cicadomorpha, excl. Cicadellidae) with a new record, *Setaptus klapperichianus* Diabola, 1988. *Munis entomology and zoology*, 2 (1): 39-58.
- Demir, E.** 2007b. Auchenorrhyncha (Homoptera) data from Ankara with two new records to Turkey. *Munis entomology and zoology*, 2 (2): 481-492.
- Diabola, J.** 1957. Results of the Zoological Expedition of the National Museum in Prague to Turkey 20. Homoptera, Auchenorrhyncha. *Acta entomologica Musei Nationale Pragae*, 31 (469): 19-68.
- Diabola, J.** 1971. Taxonomische und chorologische Erzeugnisse zur türkischen und iranischen Zikadenfauna (Homoptera, Auchenorrhyncha). *Acta faunistica entomologica Musei Nationale Pragae*, 14 (163): 115-138.
- Diabola, J.** 1977. Neue Zikaden-Taxone von *Mycterodus*, *Erythria*, *Selenocephalus* und *Goldeus* (Homoptera, Auchenorrhyncha). *Acta Zoologica Academiae Scientiarum Hungaricae*, 23 (3-4): 279-292.
- Diabola, J.** 1981. Ergebnisse der Tschechoslowakisch-Iranischen Entomologischen Expeditionen nach dem Iran (1970 und 1973). *Acta entomologica Musei Nationale Pragae*, 40: 127-311.
- EFSA.** 2015. Scientific Opinion on the risks to plant health posed by *Xylella fastidiosa* in the EU territory, with the identification and evaluation of risk reduction options. *EFSA Journal* 2015;13(1):3989 [262 pp.]. DOI: 10.2903/j.efsa.2015.3989.
- EPPO.** 1999. Biology of *Hyalesthes obsoletus*, vector of grapevine bois noir phytoplasma. EPPO Reporting Service no. 06 - 1999 Num. article: 1999/107.
- EPPO.** 2008. Certification scheme for poplar and willow. EPPO Bulletin, 38: 25-30.
- EPPO.** 2010. Flavescence doree phytoplasma detected in *Clematis vitalba* and *Dictyophara europaea*. EPPO Reporting Service no. 07 - 2010 Num. article: 2010/132.
- EPPO.** 1996. *Metcalfa pruinosa*: a new pest in Europe. EPPO Reporting Service no. 02-1996 Num. article.
- EPPO.** 2017. New data on quarantine pests and pests of EPPO Alert List. EPPO Reporting Service no. 02-2017 Num. article: 2017/028.
- EPPO.** 2017. Pest Risk Analysis for 'Candidatus Phytoplasma phoenicium' (Bacteria: Achleoplasmataceae) causing almond witches' broom. EPPO Reporting Service no. 17-23265.
- Fahringer, J.** 1922. Eine Rhynchotenaubeute aus der Türkei, Kleinasien und den benachbarten Gebieten. *Konowia*, 1: 296-307.
- Güçlü, Ş., Hayat, R., Özbek, H.** 1995. Erzurum ve çevre illerdeki ceviz (*Juglans regia* L.)'de bulunan fitofag böcek türlerinin tespiti üzerinde araştırmalar. *Türkiye entomoloji dergisi*, 19 (2): 137-145.
- Güncan, A.** 2014. Türkiye kivi bahçelerinde yeni bir zararlı *Metcalfa pruinosa* (Say, 1830) (Hemiptera: Flatidae). *Akademik ziraat dergisi*, 3 (1): 41-44.
- Hantaş, C., Çetin, G. & Akçay, M. E.** 2014. Marmara Bölgesi ayva bahçelerinde zararlı böcek ve akar türleri ile doğal düşmanlarının saptanması ve önemli zararlı türlerin populasyon değişimi. *Bit. Kor. Bült.*, 54 (3): 283-302.
- Kalkandelen, A.** 1974. Orta Anadolu'da Homoptera: Cicadellidae familyası türlerinin taksonomileri üzerinde araştırmalar. *Zirai Mücadele ve Karantina Genel Müdürlüğü*, Ankara. 220 pp.
- Kalkandelen, A.** 2000. Türkiye Cixiidae (Homoptera) türleri üzerindeki taksonomik çalışmalar-VIII. *Bitki Koruma Bülteni*, 40 (3-4): 91-123.
- Kaplan, C.** 2009. İzmir ilinde kiraz bahçelerinde bulunan ağustosböceği (Homoptera: Cicadidae) türleri ve önemlerinin tarımsal savaşa esas bazı biyolojik özelliklerinin belirlenmesi üzerinde araştırmalar. *Ege Üniversitesi, Fen Bilimleri Enstitüsü, Doktora Tezi*, İzmir, 304 pp.
- Karsavuran, Y. & Güçlü, Ş.** 2004. Türkiye faunası için yeni bir zararlı tür, *Metcalfa pruinosa* (Say, 1830) (Homoptera: Flatidae). *Türk. Entomol. Derg.*, 28 (3): 209-212.
- Kartal, V.** 1985. Türkiye Yukarı Kızılırmak Havzasındaki Issidae (Homoptera, Auchenorrhyncha) Familyası Türlerinin Taksonomik Yönden İncelenmesi. *Doğa*, A2: 64-77.
- Kartal, V., Zeybekoğlu, Ü. & Özdemir, G.** 1994. Samsun Çevresinde Cercopidae (Hom. Auchenorrhyncha) Familyası Türleri Üzerine Taksonomik Bir Araştırma. *Öndokuz Mayıs Üniversitesi Fen Dergisi*, 5 (1): 147-157.
- Krstic, O., Cvrkovic, T., Mitrovic, M., Tosevski, I. & Jovic, J.** 2016. *Dictyophara europaea* (Hemiptera: Fulgoromorpha: Dictyopharidae): description of immatures, biology and host plant associations. *Bulletin of Entomological Research*, 106 (3): 395-405.
- Linnavuori, R.** 1965. Studies on the South and East-Mediterranean Hemipterous fauna. *Acta Entomologica Fennica*, Helsinki, 21: 1-70.
- Lodos, N. & Kalkandelen, A.** 1980a. Preliminary list of Auchenorrhyncha with notes on distribution and importance of species in Turkey I. Family Cixiidae Spinola. *Türkiye Bitki Koruma Dergisi*, 4 (1): 15-27.
- Lodos, N. & Kalkandelen, A.** 1980b. Preliminary list of Auchenorrhyncha with notes on distribution and importance of species in Turkey II. Family Delpacidae Leach. *Türkiye Bitki Koruma Dergisi*, 4 (2): 103-117.
- Lodos, N. & Kalkandelen, A.** 1980c. Preliminary list of Auchenorrhyncha with notes on distribution and importance of species in Turkey III. Families Meenopliidae, Derbidae, Achilidae, Dictyopharidae and Tettigometridae. *Türkiye Bitki Koruma Dergisi*, 4 (3): 161-178.
- Lodos, N. & Kalkandelen, A.** 1981a. Preliminary list of Auchenorrhyncha with notes on distribution and importance of species in Turkey IV. Family Issidae Spinola. *Türkiye Bitki Koruma Dergisi*, 5 (1): 5-21.

- Lodos, N. & Kalkandelen, A.** 1981b. Preliminary list of Auchenorrhyncha with notes on distribution and importance of species in Turkey V. Families Flatidae, Ricanidae and Cicadidae. *Türkiye Bitki Koruma Dergisi*, 5 (2): 67-82.
- Lodos, N. & Kalkandelen, A.** 1981c. 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.
- Lodos, N. & Kalkandelen, A.** 1981. Preliminary list of Auchenorrhyncha with notes on distribution and importance of species in Turkey VII. Family Cicadellidae: Ulopinae, Megophthalminae, Ledrinae, Macropsinae and Agallinae. *Türkiye Bitki Koruma Dergisi*, 5 (4): 215-230.
- Lodos, N. & Kalkandelen, A.** 1982a. Preliminary list of Auchenorrhyncha with notes on distribution and importance of species in Turkey VIII. Family Cicadellidae: Idiocerinae. *Türkiye Bitki Koruma Dergisi*, 6 (1): 15-28.
- Lodos, N. & Kalkandelen, A.** 1982b. Preliminary list of Auchenorrhyncha with notes on distribution and importance of species in Turkey IX. Family Cicadellidae: Iassininae, Penthiminae, Dorycephalinae, Hecalinae and Aphrodinae. *Türkiye Bitki Koruma Dergisi*, 6: 147-159.
- Lodos, N. & Kalkandelen, A.** 1983a. Preliminary list of Auchenorrhyncha with notes on distribution and importance of species in Turkey X. Family Cicadellidae: Xestocephalinae, Stegelytrinae and Cicadellinae. *Türkiye Bitki Koruma Dergisi*, 7: 23-28.
- Lodos, N. & Kalkandelen, A.** 1983b. Preliminary list of Auchenorrhyncha with notes on distribution and importance of species in Turkey XI. Family Cicadellidae, Typhlocybinae: Alebrini and Dikraeureini. *Türkiye Bitki Koruma Dergisi*, 7: 107-115.
- Lodos, N. & Kalkandelen, A.** 1983c. Preliminary list of Auchenorrhyncha with notes on distribution and importance of species in Turkey XII. Family Cicadellidae, Typhlocybinae: Emposcini. *Türkiye Bitki Koruma Dergisi*, 7: 153-165.
- Lodos, N. & Kalkandelen, A.** 1984a. Preliminary list of Auchenorrhyncha with notes on distribution and importance of species in Turkey XIII. Family Cicadellidae, Typhlocybinae: Typhlocybini (Part I). *Türkiye Bitki Koruma Dergisi*, 8: 33-44.
- Lodos, N. & Kalkandelen, A.** 1984b. Preliminary list of Auchenorrhyncha with notes on distribution and importance of species in Turkey XIV. Family Cicadellidae, Typhlocybinae: Typhlocybini (Part II). *Türkiye Bitki Koruma Dergisi*, 8: 87-97.
- Lodos, N. & Kalkandelen, A.** 1984b. Preliminary list of Auchenorrhyncha with notes on distribution and importance of species in Turkey XVI. Family Cicadellidae, Typhlocybinae: Erythroniini (Part II). *Türkiye Bitki Koruma Dergisi*, 8: 201-210.
- Lodos, N. & Kalkandelen, A.** 1984c. Preliminary list of Auchenorrhyncha with notes on distribution and importance of species in Turkey XV. Family Cicadellidae, Typhlocybinae: Erythroniini (Part I). *Türkiye Bitki Koruma Dergisi*, 8: 159-168.
- Lodos, N. & Kalkandelen, A.** 1985a. Preliminary list of Auchenorrhyncha with notes on distribution and importance of species in Turkey XVII. Family Cicadellidae, Deltocephalinae: Grypotini, Goniagnathini and Opsiini (Part I). *Türkiye Bitki Koruma Dergisi*, 9: 79-90.
- Lodos, N. & Kalkandelen, A.** 1985b. Preliminary list of Auchenorrhyncha with notes on distribution and importance of species in Turkey XVIII. Family Cicadellidae, Deltocephalinae: Macrostelini (Part II). *Türkiye Bitki Koruma Dergisi*, 9 (3): 147-161.
- Lodos, N. & Kalkandelen, A.** 1985c. Preliminary list of Auchenorrhyncha with notes on distribution and importance of species in Turkey XIX. Family Cicadellidae, Deltocephalinae: Deltocephalini, Scaphytopiini, Doraturini. *Türkiye Bitki Koruma Dergisi*, 9: 207-215.
- Lodos, N. & Kalkandelen, A.** 1986a. Preliminary list of Auchenorrhyncha with notes on distribution and importance of species in Turkey XX. Family Cicadellidae, Deltocephalinae: Fieberiellini, Stirellini and Tetartostyliini. *Türkiye Bitki Koruma Dergisi*, 10 (1): 25-32.
- Lodos, N. & Kalkandelen, A.** 1986b. Preliminary list of Auchenorrhyncha with notes on distribution and importance of species in Turkey XXI. Family Cicadellidae, Deltocephalinae: Athysanini (Part I). *Türkiye Bitki Koruma Dergisi*, 10 (3): 131-139.
- Lodos, N. & Kalkandelen, A.** 1986c. Preliminary list of Auchenorrhyncha with notes on distribution and importance of species in Turkey XXII. Family Cicadellidae, Deltocephalinae: Athysanini (Part II). *Türkiye Bitki Koruma Dergisi*, 10 (4): 203-211.
- Lodos, N. & Kalkandelen, A.** 1987a. Preliminary list of Auchenorrhyncha with notes on distribution and importance of species in Turkey XXIII. Family Cicadellidae, Deltocephalinae: Athysanini (Part III). *Türkiye Bitki Koruma Dergisi*, 11 (1): 29-40.
- Lodos, N. & Kalkandelen, A.** 1987b. Preliminary list of Auchenorrhyncha with notes on distribution and importance of species in Turkey XXIV. Family Cicadellidae, Deltocephalinae: Athysanini (Part IV). *Türkiye Bitki Koruma Dergisi*, 11 (2): 97-109.
- Lodos, N. & Kalkandelen, A.** 1987c. Preliminary list of Auchenorrhyncha with notes on distribution and importance of species in Turkey XXV. Family Cicadellidae, Deltocephalinae: Paralimnini Distans (Part I). *Türkiye Entomoloji Dergisi*, 11 (3): 151-162.
- Lodos, N. & Kalkandelen, A.** 1987d. Preliminary list of Auchenorrhyncha with notes on distribution and importance of species in Turkey XXVI. Family Cicadellidae, Deltocephalinae: Paralimnini Distans (Part II). *Türkiye Entomoloji Dergisi*, 11 (4): 195-202.
- Lodos, N. & Kalkandelen, A.** 1988. Preliminary list of Auchenorrhyncha with notes on distribution and importance of Turkey XXVII. (Addenda and Corrigenda). *Türkiye Entomoloji Dergisi*, 12 (1): 11-22.
- Pest specific plant health response plan: *Xylella fastidiosa*.** Food and Environment Research Agency, 2018. <https://planthealthportal.defra.gov.uk/pests-and-diseases/contingency-planning/>.
- Sforza, R.** 1998. In: Boudon-Padiou, E. 1998. Le principal vecteur de la maladie du Bois noir - Faisons connaissance avec cet insecte fulguromorphie, *Hyalesthes obsoletus*, depuis le vignoble jusqu'au laboratoire.
- Viggiani, G.** 1970. *Ledra aurita*, injurious to hazel nuts. *Informatore Fitopatologico*, 20 (23/24): 7-8.
- Wilson, S. W. & O'Brien, L. B.** 1987. A survey of planthoppers pests of economically important plants (Homoptera: Fulgoroidea). In Proceedings of 2nd International Workshop on Leafhoppers and Planthoppers of Economic importance, Wilson, M.R. & Nault, L.R., 28th July-1st August 1986, Brigham Young University, Provo, Utah, USA, London, CAB Int. Inst. Ent., pp. 343-360.
- Zeybekoğlu, Ü.**, 2000. Morphological variations in the *Selenocephalus* Germar, 1833 species in the Black Sea Region of Turkey (Homoptera: Auchenorrhyncha: Cicadellidae: Deltocephalinae). *Acta ent. Slovenica*, 8 (1): 49-58.