



Contributions of the Anatolian Diagonal effect on Turkish aphid diversity

Anadolu Diyagonalı'nın Türkiye afit çeşitliliğindeki etkisine katkılar

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Abstract

The Anatolian Diagonal, which divide Turkey into two geographical part as East and West start from Hatay province and reaches toward to Rize province, is a mountain range. Therefore, East and West Anatolian part of Turkey has different species composition due to this natural barrier. In this context, results obtained from the study conducted in Inner West Anatolian Part (Afyonkarahisar, Kütahya and Uşak provinces from 2012 to 2013) and East (Adıyaman and Malatya province) and South (Şanlıurfa province) Anatolian Part (from 2015-2018) were compared to possible effects of Anatolian Diagonal on aphid diversity in Turkey. 219 species were determined from Inner West Anatolian Part and 91 aphid species among of them have not been observed in East and South Anatolian Part. Furthermore, 226 aphid species were determined from East and South Anatolian Part and 111 aphid species among of them have not been observed in Inner West Anatolian Part. Preliminary analysis of the derived results indicated strong effects of Anatolian Diagonal on Turkey aphid diversity. There is no detailed study about Anatolian Diagonal effects on aphid biodiversity and further studies should be carried out to see barriers effects on Turkey aphid diversity like Anatolian Diagonal. This study aims to give information about aphid biodiversity of West and East part of Anatolian Diagonal.

Özet

Anadolu Diyagonalı, Hatay bölgesinden Rize bölgesine kadar uzanan ve Türkiye'yi doğu ve batı olmak üzere iki coğrafi bölgeye ayıran sıra dağlardan oluşmaktadır. Türkiye'nin doğusunda ve batısında kalan kesimlerde tür kompozisyonu bu doğal bariyerden dolayı farklıdır. Bu bağlamda, çalışmanın gerçekleştirildiği İç Batı Anadolu Bölgesi (Afyonkarahisar, Kütahya ve Uşak, 2012-2013 yılları) ve Doğu (Şanlıurfa, 2015-2018 yılları) ve Güney Anadolu (Adıyaman ve Malatya, 2015-2018 yılları)'dan elde edilen sonuçlar, Anadolu Diyagonalı'nın Türkiye afit çeşitliliği üzerine olası etkileri için karşılaştırılmıştır. İç Batı Anadolu bölümünden belirlenen 219 türün 91'ine Doğu ve Güney Anadolu bölgesinde rastlanmamıştır. Bununla beraber, Doğu ve Güney Anadolu kesiminden belirlenen 226 türün 111'ine İç Batı Anadolu kesiminde rastlanmamıştır. Elde edilen ilk bulgular Anadolu Diyagonalı'nın Türkiye afit çeşitliliği üzerine güçlü etkileri olduğunu göstermiştir. Anadolu Diyagonalı'nın afit çeşitliliği üzerindeki etkileri hakkında detaylı bir çalışma yoktur ve gelecekte Anadolu Diyagonalı gibi bariyerlerin Türkiye afit çeşitliliği üzerine etkileri üzerine çalışmalar gerçekleştirilmelidir. Bu çalışmanın amacı, Anadolu Diyagonalı'nın doğusunda ve batısında kalan bölgelerindeki afit biyoçeşitliliği hakkında bilgi vermektir.

INTRODUCTION

The floral and faunal composition of Anatolia was affected by geological and climatic differentiation for millions of years. Also, natural barriers have influenced the floral and faunal composition such as Anatolian Diagonal, Sea of Marmara, Central Anatolian Lake system (Gülkaç and Yüksel 1999; Çıplak 2003; Bilgin 2011). The Anatolian Diagonal is one of the significant natural barriers that reaches out from Hatay province to Rize province (Mutun 2016). This natural barrier is shaped by Tandem Mountains, which runs both east-west and south-north. Therefore, Anatolia divided into west and

east part with that natural barrier (Kosswig 1955; Çıplak 2003; Mutun 2010 and 2016). Particularly isolation occurred in species, which has restricted mobility or low ecological tolerance (Gülkoç and Yüksel 1999; Çıplak 2003; Mutun 2010). Aphids are phloem sap insect and they obligate to pass their life at least one host plant species, so aphids' mobility is restricted by their host plant. In this context the Anatolian diagonal effects on aphid species distribution can be informative to general view. This study aims to give information about variations of aphid biodiversity West and East part of Anatolian Diagonal.

MATERIAL AND METHODS

The study conducted in Inner West Anatolian Part (Afyonkarahisar, Kütahya and Uşak provinces from 2012 to 2013) and East (Adıyaman and Malatya province) and South (Şanlıurfa province) Anatolian Part (from 2015-2018). Aphid species determined based on morphological characters of aptera (wingless) individuals (Blackman and Eastop, 2018). The voucher specimens were deposited in %96 ethanol at Niğde Ömer Halisdemir University, Biotechnology Laboratory.

RESULTS

219 species were determined from Inner West Anatolian Part and 89 aphid species among of them have not been observed in East and South Anatolian Part. Furthermore, 226 aphid species were determined from East and South Anatolian Part and 103 aphid species among of them have not been observed in Inner West Anatolian Part. The list of aphid species was given in table 1.

Table 1. The species differences between Inner West Anatolian Part and East and South-East Part of Turkey ([-]: not observed; [+]: observed)

The aphid species that determined in Inner West Anatolian Part of Turkey	The aphid species that determined in East and South-East Part of Turkey
-	<i>Anoecia corni</i> (Fabricius 1775)
-	<i>Anoecia haupti</i> Börner 1950
+	<i>Aphis althaeae</i> (Nevsky 1929)
-	<i>Aphis aquilonalis</i> Stekolshchikov and Khruleva 2015
-	<i>Aphis asclepiadis</i> Fitch 1851
+	<i>Aphis (Toxoptera) aurantii</i> Boyer de Fonscolombe 1841
<i>Aphis astragalicola</i> Holman and Szelegiewicz 1971	-
<i>Aphis brotericola</i> Mier Durante 1978	-
<i>Aphis carduella</i> Walsh 1863	-
<i>Aphis carduicola</i> Stekolshchikov 2005	-
<i>Aphis catalpae</i> Mamontova 1953	-
-	<i>Aphis cirsiphila</i> Pashtshenko 1992
-	<i>Aphis cracciae</i> Linnaeus 1758
+	<i>Aphis craccivora</i> Koch 1854
-	<i>Aphis euphorbiae</i> Kaltenbach 1843
<i>Aphis eryngiglomerata</i> Bozhko 1963	-
+	<i>Aphis fabae</i> Scopoli 1763
<i>Aphis farinosa</i> Gmelin 1790	-
-	<i>Aphis galiiscabri</i> Schrank 1801
+	<i>Aphis (Pergandeida) glareosae</i> Bozhko 1959
+	<i>Aphis gossypii</i> Glover 1877
<i>Aphis hederæ</i> Kaltenbach 1843	-
+	<i>Aphis hillerislamberti</i> Nieto Nafria and Mier Durante 1976
+	<i>Aphis illinoisensis</i> Shimer 1866
-	<i>Aphis maulensis</i> Mier Durante and Garcia-Tejero 2016
<i>Aphis middletonii</i> (Thomas 1879)	-
+	<i>Aphis myrsinitidis</i> Petrovic-Obradovic and Leclant 1998
<i>Aphis molluginis</i> (Börner 1950)	-
+	<i>Aphis nasturtii</i> Kaltenbach 1843
+	<i>Aphis nerii</i> Boyer de Fonscolombe 1841
-	<i>Aphis nonveilleri</i> Petrovic-Obradovic and Remaudière 2002
+	<i>Aphis pomi</i> De Geer 1773
+	<i>Aphis punicae</i> Passerini 1863
+	<i>Aphis ruborum</i> (Börner 1932)
+	<i>Aphis salviae</i> Walker 1852
+	<i>Aphis sambuci</i> Linnaeus 1758
-	<i>Aphis sanguisorbae</i> Schrank 1801
-	<i>Aphis solanella</i> Theobald 1914
-	<i>Aphis spiraephaga</i> Müller 1961
+	<i>Aphis spiraecola</i> Patch 1914
<i>Aphis thomasi</i> (Börner 1950)	-

The aphid species that determined in Inner West Anatolian Part of Turkey	The aphid species that determined in East and South-East Part of Turkey
-	Aphis umbrella (Börner 1950)
Aphis vallei Hille Ris Lambers and Stroyan 1959	-
+	Aphis verbasci Schrank 1801
Aphis viburni Scopoli 1763	-
-	Aphis wartanbergii (Börner 1952)
-	Aphis craccivora pseudacaciae Takahashi 1966
-	Brachyunguis tamaricophilus (Nevsky 1928)
+	Hyalopterus amygdali (Blanchard 1840)
+	Hyalopterus arundiformis Eastop and Hille Ris Lambers 1976
+	Hyalopterus pruni (Geoffroy 1762)
Hysteroneura setariae (Thomas 1878)	-
-	Melanaphis bambusae (Fullaway 1910)
-	Melanaphis donacis (Passerini 1861)
-	Melanaphis elizabethae Ossiannilsson 1967
Melanaphis pyraria (Passerini 1861)	-
-	Melanaphis sacchari Zehntner 1897
-	Melanaphis sorini Halbert and Remaudière 2000
-	Protaphis middletonii (Thomas 1879)
+	Rhopalosiphum maidis (Fitch 1856)
-	Rhopalosiphum (nigrum) niger Richards 1960
Rhopalosiphum nymphaeae (Linnaeus 1761)	-
Rhopalosiphum oxyacanthae (Schrank 1801)	-
+	Rhopalosiphum padi (Linnaeus 1758)
Rhopalosiphum rufulum Richards 1960	-
-	*Schizaphis aurea Miyazaki 1988
+	Schizaphis dubia Huculak 1968
+	Schizaphis graminum (Rondani 1852)
-	*Schizaphis palustris Theobald 1929
-	Acyrtosiphon ilka Mordvilko 1914
Acyrtosiphon gossypii Mordvilko 1914	-
-	Acyrtosiphon (Xanthomyzus) lambersi Leclant and Remaudière 1974
-	Acyrtosiphon loti (Theobald 1913)
-	Acyrtosiphon (Acyrtosiphon) papaverisuctum (Zhang, Chen, Zhong and Li 1999)
+	Acyrtosiphon pisum (Harris 1776)
+	Anuraphis cacyros Barbagallo and Stroyan 1982
-	Anuraphis farfarae (Koch 1854)
-	Anuraphis subterranea (Walker 1852)
Aspidaphis adjuvans (Walker 1848)	-
Aulacorthum solani (Kaltenbach 1843)	-
+	Brachycaudus (Thuleaphis) amygdalinus (Schouteden 1905)
+	Brachycaudus (Prunaphis) cardui (Linnaeus 1758)
+	Brachycaudus (Brachycaudus) helichrysi (Kaltenbach 1843)
-	Brachycaudus iranicus Davatchi and Remaudière 1953
+	Brachycaudus lateralis (Walker 1848)
-	Brachycaudus (Acaudus) mordvilkoii Hille Ris Lambers 1931
-	Brachycaudus (Scrophulaphis) persicae (Passerini 1860)
-	Brachycaudus (Appelia) tragopogonis (Kaltenbach 1843)
+	Brachycaudus (Appelia) prunicola schwartzi (Börner 1931)
+	Brevicoryne brassicae (Linnaeus 1758)
-	Brevicoryne nigrisiphunculata Hodjat 1981
+	Capitophorus elaeagni (Del Guercio 1894)
Capitophorus eniwanus Miyazaki 1971	-
Capitophorus similis van der Goot 1915	-
Cavariella aegopodii (Scopoli 1763)	-
Cavariella digitata Hille Ris Lambers 1969	-
+	Cavariella theobaldi (Gillette and Bragg 1918)
+	Chaetosiphon (Pentatrachopus) tetrarhodum (Walker 1849)
-	Coloradoa achilleae Hille Ris Lambers 1939
Corylobium avellanae (Schrank 1801)	-

The aphid species that determined in Inner West Anatolian Part of Turkey	The aphid species that determined in East and South-East Part of Turkey
-	<i>Diuraphis muhleii</i> Zhang, Liang and Zhang 1999
+	<i>Diuraphis noxia</i> Kurdjumov 1913
+	<i>Dysaphis affinis</i> Mordvilko 1928
<i>Dysaphis apiifolia</i> (Theobald 1923)	-
+	<i>Dysaphis crataegi</i> (Kaltenbach 1843)
+	<i>Dysaphis devectora</i> (Walker 1849)
+	<i>Dysaphis foeniculus</i> (Theobald 1923)
<i>Dysaphis microsiphon</i> Nevsky 1929	-
+	<i>Dysaphis (Pomaphis) plantaginea</i> (Passerini 1860)
<i>Dysaphis pyrararia</i> Narzikulov 1961	-
-	<i>Dysaphis (Pomaphis) pyri</i> (Boyer de Fonscolombe 1841)
-	<i>Dysaphis radicola</i> (Mordvilko 1897)
-	<i>Dysaphis (Pomaphis) reaumuri</i> (Mordvilko 1928)
<i>Dysaphis tulipae</i> (Boyer de Fonscolombe 1841)	-
<i>Hayhurstia atriplicis</i> (Linnaeus 1761)	-
<i>Hyadaphis coriandri</i> (B. Das 1918)	-
-	<i>Hyadaphis foeniculi</i> (Passerini 1860)
+	<i>Hyadaphis passerini</i> (Del Guercio 1911)
+	<i>Hyperomyzus lactucae</i> (Linnaeus 1758)
-	<i>Hyperomyzus pallidus</i> Hille Ris Lambers 1935
+	<i>Liosomaphis berberidis</i> (Kaltenbach 1843)
-	<i>Liosomaphis himalayensis</i> Basu 1964
+	<i>Lipaphis erysimi</i> (Kaltenbach 1843)
-	<i>Lipaphis (Lipaphidiella) lepidii</i> (Nevsky 1929)
+	<i>Lipaphis pseudobrassicae</i> (Davis 1914)
-	<i>Macrosiphoniella (Papillomyzus) iranica</i> Nieto Nafría and Pérez Hidalgo 2013
-	<i>Macrosiphoniella sanborni</i> (Gillette 1908)
-	<i>Macrosiphoniella staegeri</i> Hille Ris Lambers 1947
-	<i>Macrosiphum centranthi</i> Theobald 1915
+	<i>Macrosiphum euphorbiae</i> (Thomas 1878)
<i>Macrosiphum pachysiphon</i> Hille Ris Lambers 1966	-
+	<i>Macrosiphum rosae</i> (Linnaeus 1758)
-	<i>Macrosiphum symphyti</i> Barjadze and Chakvetadze 2008
-	<i>Metopolophium chandrani</i> (David and Narayanan 1968)
+	<i>Metopolophium dirhodum</i> (Walker 1849)
<i>Microlophium sibiricum</i> (Mordvilko 1914)	-
+	<i>Myzaphis rosarum</i> (Kaltenbach 1843)
<i>Myzaphis turanica</i> Nevsky 1929	-
-	<i>Myzus (Sciomyzus) ascalonicus</i> Doncaster 1946
+	<i>Myzus cerasi</i> (Fabricius 1775)
<i>Myzus certus</i> (Walker 1849)	-
<i>Myzus lythri</i> (Schrank 1801)	-
<i>Myzus padellus</i> Hille Ris Lambers and Rogerson 1946	-
-	<i>Myzus (Nectarosiphon) persicae</i> (Sulzer 1776)
-	<i>Myzus varians</i> Davidson 1912
-	<i>Myzus (Nectarosiphon) persicae nicotianae</i> Blackman 1987
-	<i>Nasonovia ribisnigri</i> (Mosley 1841)
+	<i>Nearctaphis bakeri</i> (Cowen 1895)
-	<i>Ovatus (Ovatus) crataegarius</i> (Walker 1850)
<i>Ovatus insitus</i> (Walker 1849)	-
-	<i>Paczoskia meridionalis</i> Holman 1981
-	<i>Paczoskia obtecta</i> Börner 1950
<i>Phorodon humuli</i> (Schrank 1801)	-
-	<i>Pterocomma groenlandicum</i> Hille Ris Lambers 1952
+	<i>Pterocomma pilosum</i> Buckton 1879
+	<i>Pterocomma populeum</i> (Kaltenbach 1843)
-	<i>Rhodobium porosum</i> (Sanderson 1900)
<i>Roepkea marchali</i> (Börner 1931)	-
-	<i>Sitobion africanum</i> (Hille Ris Lambers 1954)

The aphid species that determined in Inner West Anatolian Part of Turkey	The aphid species that determined in East and South-East Part of Turkey
+	<i>Sitobion avenae</i> (Fabricius 1775)
+	<i>Sitobion fragariae</i> (Walker 1848)
-	<i>Sitobion lambersi</i> David 1950
+	<i>Sitobion miscanthi</i> (Takahashi 1921)
-	<i>Sitobion rosaeiformis</i> (Das 1918)
-	<i>Uroleucon (Uromelan) aeneum</i> (Hille Ris Lambers 1939)
+	<i>Uroleucon ambrosiae</i> (Thomas 1878)
+	<i>Uroleucon cichorii</i> (Koch 1855)
<i>Uroleucon cirsicola</i> (Holman 1962)	-
-	<i>Uroleucon chondrillae</i> Nevsky 1929
-	<i>Uroleucon compositae</i> (Theobald 1915)
+	<i>Uroleucon jaceae</i> (Linnaeus 1758)
<i>Uroleucon hypochoeridis</i> (Fabricius 1779)	-
-	<i>Uroleucon murale</i> (Buckton 1876)
-	<i>Uroleucon pseudambrosiae</i> (Olive 1963)
-	<i>Uroleucon (Uromelan) siculum</i> Barbagallo and Stroyan 1982
+	<i>Uroleucon sonchi</i> (Linnaeus 1767)
-	<i>Uroleucon (Uromelan) jaceae macrosiphon</i> (Hille Ris Lambers 1939)
+	<i>Wahlgreniella nervata</i> Gillette 1908
-	<i>Wahlgreniella ossiannilssonii</i> Hille Ris Lambers 1949
-	<i>Hoplochaitophorus dicksoni</i> Quednau 1999
+	<i>Hoplochaitophorus zachvatkini</i> (Aizenberg and Moravskaya 1959)
-	<i>Indiochaitophorus furcatus</i> Verma 1970
+	<i>Myzocallis boernerii</i> Stroyan 1957
<i>Myzocallis coryli</i> (Goeze 1778)	-
+	<i>Myzocallis glandulosa</i> Hille Ris Lambers 1948
-	<i>Myzocallis (Pasekia) mediterranea</i> Quednau and Remaudière 1994
<i>Myzocallis persica</i> Quednau and Remaudière 1994	-
+	<i>Tuberculatus (Tuberculooides) annulatus</i> (Hartig 1841)
+	<i>Tuberculatus (Tuberculooides) borealis</i> (Krzywiec 1971)
-	<i>Tuberculatus cornutus</i> Richards 1969
-	<i>Tuberculatus (Tuberculooides) maximus</i> Hille Ris Lambers 1974
<i>Tuberculatus pallescens</i> Hille Ris Lambers 1974	-
-	<i>Tuberculatus querceus</i> (Kaltenbach 1843)
+	<i>Chromaphis juglandicola</i> (Kaltenbach 1843)
+	<i>Eucallipterus tiliae</i> (Linnaeus 1758)
+	<i>Panaphis juglandis</i> (Goeze 1778)
+	<i>Shivaphis catalpinari</i> Quednau and Remaudière 1985
+	<i>Shivaphis celti</i> Das 1918
+	<i>Therioaphis (Pterocallidium) luteola</i> (Börner 1949)
<i>Therioaphis rieghi</i> (Börner 1949)	-
<i>Therioaphis subalba</i> Börner 1949	-
<i>Tiliaphis shinjii</i> Higuchi 1972	-
<i>Tinocallis saltans</i> (Nevsky 1929)	-
-	<i>Chaitophorus clarus</i> Tseng and Tao 1936
+	<i>Chaitophorus euphraticus</i> Hodjat 1981
-	<i>Chaitophorus hypogaeus</i> HilleRisLambers 1947
+	<i>Chaitophorus indicus</i> Ghosh AK, Ghosh MR and Raychaudhuri DN 1970
<i>Chaitophorus kapuri</i> Hille Ris Lambers 1966	-
+	<i>Chaitophorus lapponum</i> Ossiannilsson 1959
+	<i>Chaitophorus leucomelas</i> Koch 1854
+	<i>Chaitophorus melanosiphon</i> Pintera 1987
-	<i>Chaitophorus neglectus</i> Hottes and Frison 1931
<i>Chaitophorus niger</i> Mordvillko 1929	-
-	<i>Chaitophorus nigritus</i> Hille Ris Lambers 1966
<i>Chaitophorus populeti</i> (Panzer 1801)	-
+	<i>Chaitophorus populialbae</i> (Boyer de Fonscolombe 1841)
<i>Chaitophorus ramicola</i> (Börner 1949)	-
<i>Chaitophorus saliciniger</i> (Knowlton 1927)	-
+	<i>Chaitophorus salicti</i> (Schrank 1801)

The aphid species that determined in Inner West Anatolian Part of Turkey	The aphid species that determined in East and South-East Part of Turkey
	<i>Chaitophorus tremulae sorini</i> Pintera 1987
+	-
<i>Periphyllus aceris</i> (Linnaeus 1761)	-
<i>Sipha elegans</i> Del Guercio 1905	-
+	<i>Sipha (Rungsia) maydis</i> Passerini 1860
-	<i>Sipha (Rungsia) uvarovi</i> Mordvilko 1921
<i>Drepanosiphoniella aceris</i> Davatchi, Lambersi and Remaudiere 1957	-
<i>Drepanosiphum oregonense</i> Granovsky 1939	-
<i>Drepanosiphum platanoidis</i> (Schrank 1801)	-
<i>Eriosoma lanigerum</i> (Hausmann 1802)	-
+	<i>Eriosoma lanuginosum</i> (Hartig 1839)
-	<i>Eriosoma pyricola</i> Baker and Davidson 1916
+	<i>Kaltenbachiella pallida</i> (Haliday 1838)
-	<i>Tetraneura africana</i> van der Goot 1912
+	<i>Tetraneura ulmi</i> (Linnaeus 1758)
+	<i>Baizongia pistaceae</i> (Linnaeus 1767)
+	<i>Forda formicaria</i> von Heyden 1837
-	<i>Forda hirsuta</i> Mordvilko 1928
-	<i>Forda marginata</i> Koch 1857
-	<i>Forda orientalis</i> George 1920
-	<i>Forda riccoboni</i> de Stefani 1899
+	<i>Geoica utricularia</i> (Passerini 1856)
+	<i>Paracletus cimiciformis</i> von Heyden 1837
-	<i>Paracletus donisthorpei</i> Theobald 1929
-	<i>Paracletus subnudus</i> Hille Ris Lambers 1954
+	<i>Pemphigus bursarius</i> (Linnaeus 1758)
+	<i>Pemphigus immunis</i> Buckton 1896
-	<i>Pemphigus phenax</i> Börner and Blunk 1916
+	<i>Pemphigus (Pemphiginus) populi</i> Courcelet 1881
+	<i>Pemphigus protospirae</i> Lichtenstein 1884
+	<i>Pemphigus spyrothecae</i> Passerini 1856
+	<i>Pemphigus (Pemphiginus) vesicarius</i> Passerini 1861
+	<i>Thecabius affinis</i> (Kaltenbach 1843)
<i>Thoracaphis flava</i> Takahashi 1950	-
-	<i>Pseudoregma panicola</i> (Takahashi 1921)
<i>Cinara acutirostris</i> Hille Ris Lambers 1956	-
+	<i>Cinara brauni</i> Börner 1940
+	<i>Cinara cedri</i> Mimeur 1936
+	<i>Cinara confinis</i> (Koch 1856)
+	<i>Cinara curvipes</i> (Patch 1912)
<i>Cinara fresai</i> Blanchard 1939	-
+	<i>Cinara indica</i> Verma 1970
-	<i>Cinara intermedia</i> (Pašek 1953)
<i>Cinara juniperensis</i> (Gillette and Palmer 1925)	-
<i>Cinara laportei</i> (Remaudière 1954)	-
+	<i>Cinara maghrebica</i> Mimeur 1934
-	<i>Cinara nuda</i> (Mordvilko 1895)
<i>Cinara oxycedri</i> Binazzi 1996	-
<i>Cinara palaestinensis</i> Hille Ris Lambers 1948	-
<i>Cinara pilicornis</i> (Hartig 1841)	-
<i>Cinara pini</i> (Linnaeus 1758)	-
<i>Cinara pinihabitans</i> Mordvilko 1895	-
<i>Cinara pinimaritimae</i> (Dufour 1833)	-
<i>Cinara piniphila</i> (Ratzeburg 1844)	-
+	<i>Cinara pinivora</i> (Wilson 1919)
+	<i>Cinara schimitscheki</i> Börner 1940
<i>Cinara setosa</i> (Börner 1950)	-
+	<i>Cinara (Cupressobium) tujaefilina</i> (Del Guercio 1909)
<i>Cinara (Schizolachnus) obscurus</i> Börner 1940	-
<i>Cinara (Schizolachnus) orientalis</i> (Takahashi 1925)	-

The aphid species that determined in Inner West Anatolian Part of Turkey	The aphid species that determined in East and South-East Part of Turkey
+	<i>Cinara (Schizolachnus) pineti</i> (Fabricius 1781)
<i>Cinara wahlua</i> Hottes 1952	-
<i>Cinara watanabei</i> Inouye 1970	-
<i>Eulachnus agilis</i> (Kaltenbach 1843)	-
-	<i>Eulachnus cembrae</i> Börner 1950
+	<i>Eulachnus nigricola</i> (Pašek 1953)
+	<i>Eulachnus pumilae</i> Inouye 1939
+	<i>Eulachnus rileyi</i> (Williams 1911)
<i>Eulachnus tauricus</i> Bozhko 1961	-
+	<i>Eulachnus thunbergii</i> Wilson 1919
+	<i>Eulachnus tuberculostemmatus</i> (Theobald 1915)
-	<i>Lachnus crassicornis</i> Hille Ris Lambers 1948
<i>Pseudessigella brachychaete</i> Hille Ris Lambers 1966	-
<i>Lachnus crassicornis</i> Hille Ris Lambers 1948	-
-	<i>Lachnus longirostrum</i> David and Ghosh 1982
-	<i>Lachnus pallipes</i> (Hartig 1841)
-	<i>Lachnus pseudonudus</i> Kanturski and Wieczorek 2014
+	<i>Lachnus roboris</i> (Linnaeus 1758)
<i>Lachnus swirskii</i> Hille Ris Lambers 1954	-
+	<i>Lachnus tuatayae Remaudiere 2005</i>
<i>Maculolachnus submacula</i> (Walker 1848)	-
+	<i>Pterochloroides persicae</i> (Cholodkovsky 1899)
+	<i>Stomaphis bratislavensis</i> Czylok and Blackman 1991
<i>Stomaphis graffii</i> Cholodkovsky 1894	-
-	<i>Stomaphis (Parastomaphis) longirostris</i> (Fabricius 1787)
+	<i>Tuberolachnus salignus</i> (Gmelin 1790)
<i>Mindarus kinseyi</i> Voegtlin 1995	-
+	<i>Phloeomyzus passerinii</i> (Signoret 1875)
+	<i>Diphylaphis mordvilkoii</i> (Aizenberg 1932)
<i>Thelaxes californica</i> (Davidson 1919)	-
+	<i>Thelaxes dryophila</i> (Schrank 1801)
+	<i>Thelaxes suberi</i> (Del Guercio 1911)
<i>Thelaxes valtadorosi</i> Remaudiere 1983	-
-	<i>Phylloxera confusa</i> (Grassi 1912)
+	<i>Phylloxera glabra</i> (von Heyden 1837)
-	<i>Phylloxera quercina</i> (Ferrari 1872)
+	<i>Phylloxera quercus</i> Boyer de Fonscolombe 1834
<i>Phylloxera salicis</i> (Lichtenstein 1884)	-

DISCUSSION

The Anatolian diagonal is important natural barrier that effect faunal composition. Preliminary analysis of the derived results indicated strong effects of Anatolian Diagonal on Turkey aphid diversity. There is no detailed study about Anatolian Diagonal effects on aphid biodiversity and further studies should be carried out to see barriers effects on Turkey aphid diversity like Anatolian Diagonal.

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