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CONTRIBUTION TO DATABASE OF ALIEN/INVASIVE HOMOPTERA INSECTS IN ROMANIA

IRINA TEODORESCU

Through the compilation of bibliographic sources (295 papers) with 47 personal papers (as one author or co-author, published between 1969 and 2010) and some not yet published data, a total of 219 alien Homoptera species, belonging to 27 families (Acanaloniidae, Adelgidae, Aleyrodidae, Aphididae, Asterolecaniidae, Calophyidae, Cercopidae, Cicadellidae, Cixiidae, Coccidae, Cryptococcidae, Delphacidae, Diaspididae, Eriococcidae, Flattidae, Homotomidae, Issidae, Kermesidae, Margarodidae (Monophlebidae), Membracidae, Ortheziidae, Pemphigidae, Phylloxeridae, Pseudococcidae, Psyllidae, Rhizoecidae and Triozidae), were identified in Romania. Their probable origin zone, biogeographic region, first report in Romania (since 1859 till 2018), and in some cases, other subsequent bibliographical references were indicated. The species were found in greenhouses (on vegetables and ornamental plants), in houses or different other controlled temperature conditions buildings, on ornamental plants, on open field vegetables, and other field crops, in orchards, gardens, parks, forests, as well as on imported tropical or subtropical fruits.

Keywords: Homoptera, alien species, non-native, non-indigenous, Romania, origin area.

INTRODUCTION

The unprecedented phenomenon of increase of the alien species introduction represents a very important problem being the consequence of increased trade, travel, transport and globalization; which has as a result the homogenization of all biota elements (flora, fauna, and microbiota).

Alien taxa are species, subspecies or lower taxa introduced outside of their past or present natural range and outside of their natural dispersal potential. This includes any part, gamete or propagule of such species that might survive and subsequently reproduce. To alien species are used different terms as: non-indigenous, non-native, exotic, foreign, new, allochthonous, neobiota (neozoan, neophyta, neomicrobia). **Cryptogenic taxa** are those of unknown origin which cannot be ascribed as being native or alien. **Invasive taxa** are alien species that can cause significant harm to biological diversity, ecosystem functioning, socio-economic values and human health in invaded regions (Pyšek *et al.*, 2009).

The invasive alien species are recognized as a major threat to global biodiversity (at genetic, population, specific, biocenosis and ecosystems level)

representing the cause of habitats loss and degradation. The impact upon biodiversity comprises native species decline or their elimination, through competition for common resources, through predation, and transmission of parasites or pathogens. Many alien species have an economic impact, being dangerous phytophagous pests for important plant categories, causing enormous economic costs through increased costs associated with their prevention, eradication and control measures, but especially through direct production losses.

Alien species that represent a threat to human health are vectors or etiologic agents for many and dangerous viral, bacterial or fungal diseases.

Biological invasion has also an implication in the accelerated evolution of species; therefore the scientific community is interested in the dimension and importance of the invasion process as well as in its evolutionary implications (Rîşnoveanu & Teodorescu, 2009).

Insecta is a main animal group with implications in invasiveness process, favoured by their flying capacity, small dimensions, resistance to different adverse factors, as well as by a lot of defence mechanisms. The Homoptera is a particular order due to their many protective adaptations (the body covered or transformed in scale or covered with wax secretion), high number of annual generations, live in colonies, high density, fecundity and degree of attack intensity, salive toxicity and their nutrition by plants sap suction. Moreover, the Homoptera have a great impact upon the host plants through their vectorial role in transmission of different diseases.

MATERIAL AND METHODS

This report compiles information published by other authors (bibliographic sources) with present author data. As well as, some unpublished new personal data are added, about outdoors and indoors Homoptera species on ornamental and vegetable plant hosts in glasshouses, houses, private gardens, parks, and on imported tropical or subtropical fruits for consumption.

RESULTS AND DISCUSSION

The aim of this paper is to provide a list of Homoptera insect species introduced in Romania since the 19th century, to 2018, indicating their probable origin area, the biogeographic region, their first report in Romania, and in some cases, attaching other subsequent bibliographical references.

The present list with Homoptera allochthonous species is based on three sources: the collation of bibliographic information (295 papers), the author's publications (47 papers referring to 64 alien species), and some recent personal observations (2010–2018). To collate the bibliographic sources was not easy for me, but I intended to complete the gaps in knowledge about the Romanian alien Homoptera species, adding new information in general database.

A total of 219 species, belonging to 27 families (Acanaloniidae, Adelgidae, Aleyrodidae, Aphididae, Asterolecaniidae, Calophyidae, Cercopidae, Cicadellidae, Cixiidae, Coccidae, Cryptococcidae, Delphacidae, Diaspididae, Eriococcidae, Flattidae, Homotomidae, Issidae, Kermesidae, Margarodidae, Membracidae, Ortheziidae, Pemphigidae, Phylloxeridae, Pseudococcidae, Psyllidae, Rhizoecidae and Triozidae), are presented (Table 1). In function of the species richness (Table 2), the Aphididae, Diaspididae, Coccidae, Eriococcidae, Pseudococcidae and Adelgidae are the largest families (75.34% from the total 219 species).

An almost insurmountable problem for me was to indicate the species origin area, the data being largely different between the bibliographic sources. Therefore, the present table contains unclear or conflicting information on this status (for example unknown, probably, uncertain, doubtful), or underlines the cryptic origin. I deliberately introduced some species in the present table to put in discussion their origin.

We must underline that the data are approximate, as regards the moment of introduction in our country of the Homoptera species, especially due to their small dimension, unintentional introductions, and in many cases, due to the long time interval between the first arrival date and that of detection and report.

According to the published data, only 11 alien species, belonging to Aphididae, Diaspididae and Phylloxeridae families were detected before 1900. The first alien Homoptera species recorded in Romania were *Diaspis echinocacti* (1859) and *Viteus vitifolii* (1864). Between 1900 and 1949, the number increased about fourfold. The biggest number of records was registered in the next period (1950–1999) being tenfold compared to the period before 1900. In the last 18 years the number of recorded species was fivefold comparatively with the period before 1900 (Table 3).

The cases of reported alien species increased after 1950, due to climate changes (global warming) and to different anthropogenic activities. The species with origin in warm zones, especially tropical and subtropical ones, are restricted in greenhouses and in other indoor locations in Romania.

The number of some species reports increased after the first detection dates, due to their certain features (the rapid multiplying, adapting and establishing in new habitat conditions), to spreading capacity in the whole country, and to the special interest of the local researchers and farmers.

Table 1
Alien Homoptera species recorded in Romania between 1859 and 2018

No.	Species	Native area/ Biogeographical region	First record in Romania: years/authors
FAMILY ACANALONIIDAE			
1.	<i>Acanalonia conica</i> (Say, 1830)	North America/ Nearctic	2017b (Chireceanu <i>et al.</i>)
FAMILY ADELGIDAE			
1.	<i>Adelges</i> (<i>Sacchiphantes</i>) <i>abietis</i> (Linnaeus, 1758)	Euro-Siberian / Western Palaeartic	1985b (Lăcătușu <i>et al.</i>); 1997 (Simionescu & Teodorescu); 1998 (Gusic); 2001 (Teodorescu & Simionescu); 2017b (Ciceoi Roxana <i>et al.</i>)
2.	<i>Adelges</i> (<i>Gilletteella</i>) <i>cooleyi</i> (Gillette, 1907)	Western North America / Nearctic	1964 (Simionescu, Mihalache <i>et al.</i> , 2000); 1971 (Simionescu <i>et al.</i>); 1973 (Nanu); 1998 (Gusic); 2006 (Teodorescu et al.); 2008 (Ciochia <i>et al.</i>)
3.	<i>Adelges</i> (<i>Adelges</i>) <i>laricis</i> Vallot, 1836	Alps and, or Central Europe / Western Palaeartic	1981 (Holman & Pintera); 1982, 1995 (Blada); 1997 (Simionescu & Teodorescu); 1998 (Gusic); 2001 (Teodorescu & Simionescu); 2010 (Brudea & Rîșca); 2011 (Vîlcan); 2017b (Ciceoi Roxana <i>et al.</i>)
4.	<i>Adelges</i> (<i>Dreyfusia</i>) <i>nordmannianae</i> (Eckstein, 1890) syn. <i>D. nüsslini</i> (Börner, 1908)	Mountain areas of Caucasus, Northeastern Turkey, Crimea / Western Palaeartic	1973a (Teodorescu); 1975 (Borusiewicz & Capecki); 2008 (Ciochia <i>et al.</i>) http://www.rosilva.ro/articole/daunatori_biotici_ai_padurilor_p_113.htm
5.	<i>Adelges</i> (<i>Dreyfusia</i>) <i>piceae</i> (Ratzeburg, 1844)	Central Europe / Western Palaeartic	1973a, 1974 (Teodorescu); 1975 (Ceianu & Teodorescu); 2008b (Teodorescu); 2012 (CABI/EPPO); 2017b (Ciceoi Roxana <i>et al.</i>) http://www.rosilva.ro/articole/daunatori_biotici_ai_padurilor_p_113.htm
6.	<i>Adelges</i> (<i>Adelges</i>) <i>tardus</i> Dreyfus, 1888	Central and Northern Europe / Western Palaeartic	1998 (Gusic)
7.	<i>Adelges</i> (<i>Aphrastasia</i>) <i>tsugae</i> Annand, 1924	? China, Japan, or North America	2017 (Csóka <i>et al.</i>)
8.	<i>Adelges</i> (<i>Sacchiphantes</i>) <i>viridis</i> Ratzeburg, 1843	Central Europe / Western Palaeartic	1957 (Georgescu <i>et al.</i>); 1985b (Lăcătușu <i>et al.</i>); 1998 (Gusic) http://www.rosilva.ro/articole/daunatori_biotici_ai_padurilor
9.	<i>Pineus</i> (<i>Pineus</i>) <i>abietinus</i> Underwood & Balch, 1964	Western North America / Nearctic	1980 (Drugescu); 2001 (Mihalciuc <i>et al.</i>).
10.	<i>Pineus</i> (<i>Pineus</i>) <i>cembrae</i> (Cholodkovsky, 1888)	? Europe, Japan, China	1998 (Gusic); 2016 (Olenici & Duduman) http://www.rosilva.ro/articole/daunatori_biotici_ai_padurilor_p_113.htm
11.	<i>Pineus</i> (<i>Pineus</i>) <i>pini</i> (Macquart, 1819)	Western and Central Europe / Western Palaeartic Cosmopolitan	1981 (Teodorescu & Ceianu); 1998 (Gusic); 2008b (Teodorescu); 2017b (Ciceoi Roxana <i>et al.</i>)

Table 1 (continued)

12.	<i>Pineus (Pineus) strobi</i> (Hartig, 1937) syn. <i>Eopineus strobus</i> (Hartig, 1837)	Eastern North America / Nearctic	1972, 1998 (Gusic); 1973 (Ceianu & Teodorescu); 2008b (Teodorescu); 2008 (Fora & Lauer); 2008 (Ciochia <i>et al.</i>); 2016 (Olenici & Duduman)
FAMILY ALEYRODIDAE			
1.	<i>Aleurothrixus floccosus</i> (Maskell, 1896)	South America / Neotropical	1963 (CIE); 1987 (Ioan <i>et al.</i>)
2.	<i>Aleyrodes proletella</i> (Linnaeus, 1758)	Afrotropical	1969 (Dobreanu & Manolache); 1982 (Manolache <i>et al.</i>); 2006 (Teodorescu <i>et al.</i>)
3.	<i>Bemisia tabaci</i> (Gennadius, 1889)	Unknown, probably Asia-Pacific Cosmopolitan	1969 (Dobreanu & Manolache); 1982 (Manolache <i>et al.</i>); 2006, 2010 (Teodorescu <i>et al.</i>); 2006 (Roman & Glăvan)
4.	<i>Bulgarialeurodes cotesii</i> (Maskell, 1896) syn. <i>B. rosae</i> Corbet, 1936	? Western Palaearctic or Oriental	1969 (Dobreanu & Manolache); 1982 (Manolache <i>et al.</i>); 1997 (Teodorescu & Procheș); 2006 (Teodorescu <i>et al.</i>); 2010 (Teodorescu & Matei)
5.	<i>Trialeurodes vaporariorum</i> (Westwood, 1856)	Central America / Neotropical Cosmopolitan	1929 (Anonymous, according to Pașol, 2007); 1955, 1969 (Dobreanu & Manolache); 1972 (Reus); 1973 (Jurcă & Reus); 1974 (Peiu); 1974 (Lăcătușu <i>et al.</i>); 1975 (Iacob <i>et al.</i>); 1976 (Costache & Mihăilescu); 1977 (Reus); 1977 (Lemeni & Alexandrescu); 1979 (Rogojanu & Perju); 1980 (Costescu, <i>In Boguleanu et al.</i>); 1982 (Raicu & Mihăilescu); 1983a, 1984 (Lăcătușu <i>et al.</i>); 1985a (Lăcătușu <i>et al.</i>); 1989 (Perju <i>et al.</i>); 1990 (Byrne <i>et al.</i>); 1997 (Teodorescu & Procheș); 2006 (Teodorescu <i>et al.</i>); 2006 (Roman & Glăvan); 2006 (Mustață Mariana <i>et al.</i>); 2007 (Pașol <i>et al.</i>); 2008c (Teodorescu); 2008 (Pop-Balea <i>et al.</i>), 2010 (Teodorescu & Matei); 2010 (Tucă <i>et al.</i>); 2017a (Ciceoi Roxana <i>et al.</i>); DAISIE www.europe-aliens.org
FAMILY APHIDIDAE			
1.	<i>Acyrtosiphon caraganae</i> (Cholodkovsky, 1908)	Temperate Asia / Palaearctic	1909 (Henrich); 1981 (Holman & Pintera); 1996 (Ciochia & Boeriu); 1997 (Moglan Veronica); 2000 (Mustață <i>et al.</i>); 2000, 2008 (Ciochia <i>et al.</i>)
2.	<i>Acyrtosiphon ignotum</i> Mordvilko, 1914	Central Asia / Western Palaearctic	1968 (UK CAB International)
3.	<i>Acyrtosiphon loti</i> (Theobald, 1913)	Western Europe / Western Palaearctic	1981 (Holman & Pintera); 2008 (Ciochia <i>et al.</i>)
4.	<i>Acyrtosiphon malvae</i> (Mosley, 1841)	Palaearctic Cosmopolitan	1981 (Holman & Pintera); 2008 (Ciochia <i>et al.</i>)
5.	<i>Acyrtosiphon pisum</i> Harris, 1776	? Supposed European Cosmopolitan	1908 (Borcea); 1909 (Henrich); 1940a (Knechtel & Manolache); 1969 (Manolache <i>et al.</i>); 1974 (Lăcătușu <i>et al.</i>); 1975 (Lăcătușu); 1980 (Teodorescu & Mustață); 1990 (Voicu); 1980 (Perju, <i>in Boguleanu et al.</i>); 1981 (Holman & Pintera); 1982 (Teodorescu); 1982 (CIE); 1991 (Teodorescu); 1992 (Ciochia <i>et al.</i>); 1997 (Teodorescu & Vădineanu); 1997 (Ciochia & Boeriu); 2000 (Mustață <i>et al.</i>) 2006 (Roman & Glăvan); 2008a (Teodorescu); 2008b (Teodorescu); 2008 (Ciochia <i>et al.</i>); 2010 (Fericean <i>et al.</i>)
6.	<i>Aphis craccivora</i> C.L. Koch, 1854	Probable / Western Palaearctic Cosmopolitan	1896 (Henrich); 1897 (Horváth); 1908 (Borcea); 1970 (Ceianu); 1975 (Lăcătușu); 1979 (Rogojanu & Perju); 1981 (Holman & Pintera); 1982 (Săvescu); 1983 (CIE); 1996 (Ciochia & Boeriu); 1998 (Perju); 2000 (Mustață <i>et al.</i>); 2004 (Feraru); 2005 (Barnea <i>et al.</i>); 2005 (Feraru <i>et al.</i>); 2008b (Teodorescu); 2015 (Mărginean Soporan)

Table 1 (continued)

7.	<i>Aphis euphorbiae</i> Kaltenbach, 1843	Unclear ? Europe	1896, 1909 (Henrich); 1897 (Horváth); 1908, 1909 (Borcea); 1981 (Holman & Pintera); 1996 (Ciochia & Boeriu); 2000 (Mustață <i>et al.</i>)
8.	<i>Aphis forbesii</i> Weed, 1889	North America /Nearctic Cosmopolitan	1977 (Holman http://www.naro.affrc.go.jp/archive/niaes/sinfo/publish/bulletin/niaes37-2.pdf); 2008 (Ciochia <i>et al.</i>)
9.	<i>Aphis gossypii</i> Glover, 1877	Unknown Conflicting information Cosmopolitan	1877 (Horvath, 1897); 1968 (UK CAB International); 1969 (Manolache <i>et al.</i>); 1975 (Lăcătușu); 1979 (Rogojanu & Perju); 1980 (Teodorescu & Mustață); 1980 (Costescu, in Boguleanu <i>et al.</i>); 1982 (Săvescu <i>et al.</i>); 1982 (Raicu & Mihăilescu); 1984 (Lăcătușu <i>et al.</i>); 1987 (Miriță <i>et al.</i>); 1987 (Ioan <i>et al.</i>); 1989 (Perju <i>et al.</i>); 1992 (Ciochia <i>et al.</i>); 1997 (Ciochia & Boeriu); 2000 (Mustață <i>et al.</i>); 2005 (Feraru <i>et al.</i>); 2006 (Roman & Glăvan); 2007 (Pașol <i>et al.</i>); 2008b (Teodorescu); 2008 (Ciochia <i>et al.</i>); 2010 (Teodorescu & Matei)
10.	<i>Aphis (Anuraphis) nerii</i> Boyer de Fonscolombe, 1841	Conflicting information ? Eastern Asia ? Mediterranean Cosmopolitan	1940a (Knechtel & Manolache); 1997 (Moglan Veronica); 2007 (Pașol <i>et al.</i>); 2008 (Ciochia <i>et al.</i>); 2009 (Odagiu <i>et al.</i>); DAISIE, www.europe-aliens.org
11.	<i>Aphis pomi</i> DeGeer, 1773	Conflicting information	1969 (CIE); 1969 (Ionescu & Teodorescu); 1972 (Ionescu <i>et al.</i>); 1973a (Teodorescu); 1975 (Lăcătușu); 1980 (Peiu & Filipescu, in Boguleanu <i>et al.</i>); 1985b (Lăcătușu <i>et al.</i>); 1989 (Perju <i>et al.</i>); 1991 (Teodorescu); 2004 (Feraru); 2008a (Teodorescu); 2008b (Teodorescu); 2009 (Bolbose); 2010 (Țucă <i>et al.</i>); 2010 (Bunescu <i>et al.</i>); 2016b (Fericean); 2016 (Fericean & Comeanu)
12.	<i>Aphis spiraecola</i> Patch, 1914	? / Eastern Palaeartic or Oriental	2005 (Feraru & Mustață); 2009 (Odagiu <i>et al.</i>); 2015 (Mărginean Soporan)
13.	<i>Aphis spiraephaga</i> Müller, 1961	Central Asia / Western Palaeartic	1981 (Holman & Pintera); 1982 (Bărbulescu <i>et al.</i> , in Săvescu <i>et al.</i>); 1990 (Mustață); 2006 (Barnea <i>et al.</i>); 2009 (Bărbuceanu & Nicolaescu); 1990 (Mustață); 2000 (Mustață <i>et al.</i>); 2008 (Ciochia <i>et al.</i>); 2009 (Brudea); 2011 (Datamining - Invasive Species Databases); 2015 (Mărginean Soporan) 2017b (Ciceoi Roxana <i>et al.</i>)
14.	<i>Aphis viburni</i> Scopoli, 1763	Northern Europe / Western Palaeartic	1896, 1909 (Henrich); 1897 (Horvath); 1908, 1909 (Borcea); 1920-1921 (Brândză according to Stănescu, 2009); 1938 (Borza & Ghiuță); 1939 (Baudys); 1981 (Holman & Pintera), 1996 (Ciochia & Boeriu); 2000 (Mustață <i>et al.</i>)
15.	<i>Aphis vitalbae</i> Ferrari, 1872	Probably Mediterranean / Western Palaeartic	1981 (Holman & Pintera)
16.	<i>Aulacorthum</i> (<i>Neomyzus</i>) <i>circumflexum</i> (Buckton, 1876)	Probably Eastern Asia / Eastern Palaeartic or Oriental Cosmopolitan	1942 (Knechtel & Manolache); 1973 (Szekely <i>et al.</i>); 1997 (Moglan Veronica); 2007 (Pașol <i>et al.</i>); 2008 (Ciochia <i>et al.</i>); 2010 (Teodorescu & Matei); (DAISIE, www.europe-aliens.org)
17.	<i>Aulacorthum solani</i> (Kaltenbach, 1843)	Doubtful ? Western Palaeartic Cosmopolitan Cryptogenic	1908 (Borcea); 1981 (Holman & Pintera); 1992 (Ciochia <i>et al.</i>); 1997 (Ciochia & Boeriu); 2000 (Mustață <i>et al.</i>); 2004 (Feraru); 2008 (Fericean <i>et al.</i>); 2008 (Ciochia <i>et al.</i>); 1982 (Bărbulescu <i>et al.</i> , in Săvescu); 2004 (Călin <i>et al.</i>); 2005 (Barnea <i>et al.</i>); 2010 (Fericean <i>et al.</i>)
18.	<i>Brachycaudus</i> <i>helichrysi</i> (Kaltenbach, 1843)	Conflicting information Cosmopolitan	1908 (Borcea); 1981 (Holman & Pintera); 1943 (Knechtel & Manolache); 1975 (Minoiu); 1990 (Voicu); 1992 (Ciochia <i>et al.</i>); 1993 (Săpunaru <i>et al.</i>); 1998 (Isac <i>et al.</i>); 2004 (Feraru); 2016a (Fericean <i>et al.</i>)

Table 1 (continued)

19.	<i>Brachycaudus mordvilkoii</i> Hille Ris Lambers, 1931	Tropical Asia / Oriental regions	1908 (Borcea); 1981 (Holman & Pintera); 1996 (Ciochia & Boeriu); 2000 (Mustață <i>et al.</i>)
20.	<i>Brachycaudus rumexicolens</i> (Patch, 1917)	Uncertain Europe or North America	1996 (Ciochia & Boeriu); 2000 (Mustață <i>et al.</i>); 2008 (Ciochia <i>et al.</i>)
21.	<i>Brachycolus</i> (= <i>Brachycorynella</i>) <i>asparagi</i> (Mordvilko, 1929)	Eastern Mediterranean / Western Palaearctic	2000 (Mustață <i>et al.</i>); 2008 (Ciochia <i>et al.</i>)
22.	<i>Brevicoryne brassicae</i> (Linnaeus, 1758)	Unclear origin; possible Northwestern Europe / Western Palaearctic Cosmopolitan	1897 (Horvath); 1908 (Borcea); 1969 (Ionescu & Teodorescu); 1973a (Teodorescu); 1974 (Peiu); 1974-1975 (Mustață); 1974 (Lăcătușu <i>et al.</i>); 1975 (Constantinescu); 1975 (Lăcătușu); 1977 (Mustață <i>et al.</i>); 1979 (Rogojanu & Perju); 1980 (Teodorescu); 1980 (Teodorescu & Mustață); 1980 (Boguleanu <i>et al.</i>); 1981 (Holman & Pintera); 1984 (Lăcătușu <i>et al.</i>); 1985a (Lăcătușu <i>et al.</i>); 1986 (Mustață); 1986 (Teodorescu & Borcan); 1989 (Perju <i>et al.</i>); 1996 (Mustață); 1997 (Moglan Veronica); 2000 (Mustață <i>et al.</i>); 2001 (Teodorescu & Vădineanu); 2004 (Călin <i>et al.</i>); 2005 (Barnea <i>et al.</i>); 2006 (Teodorescu et al.); 2006 (Antonie & Teodorescu); 2006 (Mustață Mariana <i>et al.</i>); 2006 (Roman & Glăvan); 2007 (Pașol <i>et al.</i>); 2008a (Teodorescu); 2008b (Teodorescu); 2008c (Teodorescu); 2008 (Fericean <i>et al.</i>); 2008 (Ciochia <i>et al.</i>); 2009 (Teodorescu); 2010 (Teodorescu & Matei)
23.	<i>Chaetosiphon fragaefolii</i> (Cockerell, 1901)	Northern America / Nearctic	1958 (Arion); 1982 (Bărbulescu <i>et al.</i> In Săvescu <i>et al.</i>); 2007 (Pașol <i>et al.</i>)
24.	<i>Chromaphis juglandicola</i> (Kaltenbach, 1843)	Temperate Asia / Western Palaearctic	1979 (Rogojanu & Perju); 1996 (Ciochia & Boeriu); 2000 (Mustață <i>et al.</i>); 2014 (Ficker Trif)
25.	<i>Cinara cupressi</i> (Buckton, 1881)	North America / Nearctic Cosmopolitan	2005 (Ciceoi <i>et al.</i>); 2009 (Bărbuceanu & Nicolaescu)
26.	<i>Diuraphis noxia</i> (Kurdjumov, 1913)	Central Asia / Western Palaearctic Cosmopolitan	1981 (Holman & Pintera); 2008 (Ciochia <i>et al.</i>)
27.	<i>Dysaphis apiifolia</i> (Theobald, 1923)	Unclear	1977 (Mustață <i>et al.</i>); 1980 (Teodorescu & Mustață); 2003 (Mitroiu & Andriescu); 2008b (Teodorescu)
28.	<i>Dysaphis plantaginaea</i> (Passerini, 1860)	Irano-Turanian / Palaearctic	1897 (Horváth); 1908, 1909 (Borcea); 1937 (Ghiuță); 1981 (Holman & Pintera); 2004 (Feraru); 2004 (Trandafirescu <i>et al.</i>); 2005 (Feraru & Mustață)
29.	<i>Dysaphis tulipae</i> (Fonscolombe, 1841)	South of Europe / Western Palaearctic Cosmopolitan	2007 (Pașol <i>et al.</i>); 2008 (Ciochia <i>et al.</i>) DAISIE, www.europe-aliens.org
30.	<i>Eriosoma lanigerum</i> (Hausmann, 1802)	Probably Eastern North America / Nearctic Cosmopolitan	1923 (To control the <i>Eriosoma lanigerum</i> , Knechtel imported <i>Aphelinus mali</i> parasitoid, from France); 1911 (Brândză, according to Stănescu, 2009); 1957 (Georgescu <i>et al.</i>); 1960 (Săvescu); 1974 (Lăcătușu <i>et al.</i>); 1974 (Peiu); 1975 (CIE); 1979 (Rogojanu & Perju); 1980 (Peiu & Filipescu, In Boguleanu <i>et al.</i>); 1982 (Duvlea & Gusic, In Săvescu <i>et al.</i>); 1989 (Perju <i>et al.</i>); 1996 (Ciochia & Boeriu); 2000 (Mustață <i>et al.</i>); 2004 (Trandafirescu <i>et al.</i>); 2006 (Teodorescu et al.); 2006 (Mustață Mariana <i>et al.</i>); 2007 2007 (Pașol <i>et al.</i>); 2008 (Teodorescu & Vlad Antonie); 2008 (Ciochia <i>et al.</i>); 2009 (Beșleagă & Cârdei); 2010 (Bunescu <i>et al.</i>); 2015 (Chireceanu <i>et al.</i>)

Table 1 (continued)

31.	<i>Hyalopterus amygdali</i> E. Blanchard, 1840	Eastern Asia / Eastern Palaearctic	1996 (Ciochia & Boeriu); 2000 (Mustață <i>et al.</i>); 2004 (Feraru); 2008 (Ciochia <i>et al.</i>)
32.	<i>Hyalopterus pruni</i> (Geoffroy, 1762) syn. <i>Hyalopterus arundinis</i> (Fabricius, 1775)	Mediterranean / Western Palaearctic Cosmopolitan	1908 (Borcea); 1913 (Brândză, according to Stănescu, 2009); 1943 (Knechtel & Manolache); 1969 (Săvescu, as <i>Hyalopterus arundinis</i>); 1969 (Ionescu & Teodorescu); 1970 (Ceianu); 1972 (Ionescu <i>et al.</i>); 1973a (Teodorescu); 1974 (Peiu); 1974 (Lăcătușu <i>et al.</i>); 1975 (Lăcătușu); 1979 (Rogojanu & Perju); 1980 (Teodorescu & Mustață); 1980 (Peiu & Filipescu, <i>In Boguleanu et al.</i>); 1982 (Teodorescu); 1989 (Perju <i>et al.</i>); 1992, 1997 (Moglan Veronica); 1998 (Isac <i>et al.</i>); 2000 (Mustață <i>et al.</i>); 2004 (Feraru); 2005 (Feraru <i>et al.</i>); 2006 (Feraru & Mustață); 2006 (Mustață Mariana <i>et al.</i>); 2008a (Teodorescu); 2008b (Teodorescu); 2008 (Ciochia <i>et al.</i>); 2008 (Fericean <i>et al.</i>); 2009 (Teodorescu); 2009 (Tomescu <i>et al.</i>); 2010 (Bunescu <i>et al.</i>); 2012 (Țucă)
33.	<i>Illinoia azalea</i> (Mason, 1925)	North America / Nearctic	2008 (Ciochia <i>et al.</i>); 2011 (Datamining Invasive Species Databases)
34.	<i>Impatiens asiaticum</i> Nevsky, 1929	Temperate Asia / Western Palaearctic	2008 (Ciochia <i>et al.</i>); DAISIE, www.europe-aliens.org
35.	<i>Macrosiphoniella sanborni</i> (Gillette, 1908)	Temperate Asia / Western Palaearctic Cosmopolitan	1942 (Knechtel & Manolache); 1973 (Szekely <i>et al.</i>); 1982 (Bărbulescu <i>et al.</i> , <i>In Săvescu et al.</i>); 1997 (Teodorescu & Procheș); 2000 (Mustață <i>et al.</i>); 2007 (Pașol <i>et al.</i>); 2008 (Ciochia <i>et al.</i>); 2010 (Teodorescu & Matei); 2017b (Ciceoi Roxana <i>et al.</i>); DAISIE, www.europe-aliens.org
36.	<i>Macrosiphum chlodkovskyi</i> Mordvilko, 1909	Western Europe / Western Palaearctic Cosmopolitan	2000 (Mustață <i>et al.</i>); 2008 (Ciochia <i>et al.</i>)
37.	<i>Macrosiphum daphnidis</i> (Börner, 1940)	Western Europe / Western Palaearctic	2000 (Mustață <i>et al.</i>)
38.	<i>Macrosiphum euphorbiae</i> (Thomas, 1878)	North America / Nearctic Cosmopolitan	1942 (Koehler, as <i>M. koehleri</i>); 1942 (Knechtel & Manolache, as <i>M. koehleri</i>); 1979 (Rogojanu & Perju); 1981 (Holman & Pintera); 1982 (Raicu & Mihăilescu); 1983a, 1985a, 1996 (Ciochia & Boeriu); 1997 (Teodorescu & Vădineanu); 2000 (Mustață <i>et al.</i>); 2001 (Teodorescu & Vădineanu); 2003 (Tomescu & Negru); 2004 (Călin Maria <i>et al.</i>); 2004 (Feraru); 2006 (Teodorescu <i>et al.</i>); 2006 (Antonie & Teodorescu); 2006 (Roman & Glăvan); 2007 (Pașol <i>et al.</i>); 2008a (Teodorescu); 2008 (Ciochia <i>et al.</i>); 2010 (Fericean <i>et al.</i>) DAISIE, www.europe-aliens.org
39.	<i>Macrosiphum rosae</i> (Linnaeus, 1758)	Western Europe / Western Palaearctic Cosmopolitan	1896 (Henrich); 1908 (Borcea); 1970 (Ceianu); 1973 (Szekely <i>et al.</i>); 1974 (Peiu); 1975 (Lăcătușu); 1979 (Rogojanu & Perju); 1980 (Teodorescu & Mustață); 1980 (Costescu, <i>In Boguleanu et al.</i>); 1981 (Holman & Pintera); 1982 (Bărbulescu <i>et al.</i> , <i>In Săvescu et al.</i>); 1990 (Mustață); 1989 (Perju <i>et al.</i>); 1997 (Teodorescu & Procheș); 2000 (Mustață <i>et al.</i>); 2004 (Feraru); 2007 (Pașol); 2008 (Ciochia <i>et al.</i>); 2008 (Fericean <i>et al.</i>); 2009 (Bărbuceanu & Nicolaescu); 2009 (Odagiu <i>et al.</i>); 2010 (Țucă <i>et al.</i>); 2017a (Ciceoi Roxana <i>et al.</i>)
40.	<i>Metopolophium albidum</i> Hille Ris Lambers, 1947	Western Europe / Western Palaearctic Cosmopolitan	1981 (Holman & Pintera); 2000 (Mustață <i>et al.</i>); 2008 (Ciochia <i>et al.</i>)
41.	<i>Metopolophium dirhodum</i> (Walker, 1848)	? Europe / Western Palaearctic	1981 (Holman & Pintera); 2000 (Mustață <i>et al.</i>); 2004 (Teodorescu & Vilsan); 2006 (Malschi <i>et al.</i>)

Table 1 (continued)

42.	<i>Myzocallis coryli</i> (Goeze, 1778)	? Europe / Western Palaearctic	1979 (Rogojanu & Perju); 1996 (Ciochia & Boeriu); 1997 (Ioachim & Bobârnac); 1997 (Achim & Parnia); 2000 (Mustață <i>et al.</i>)
43.	<i>Myzus ascalonicus</i> Doncaster, 1946	Perhaps South West of Asia / Western Palaearctic Cosmopolitan	2006 (Roman & Glăvan); 2007 (Pașol <i>et al.</i>); 2008 (Ciochia <i>et al.</i>); 2008 (Fericean <i>et al.</i>); (DAISIE, www.europe-liens.org).
44.	<i>Myzus ornatus</i> Laing, 1932 (syn. <i>Myzodes portulacae</i>)	Temperate Asia / Western Palaearctic Cosmopolitan	1942 (Knechtel & Manolache), 1973 (Szekely <i>et al.</i>); 1979 (Rogojanu & Perju); 2006 (Roman & Glăvan); 2007 (Pașol <i>et al.</i>); 2008 (Ciochia <i>et al.</i>); (DAISIE, www.europe-aliens.org)
45.	<i>Myzus persicae</i> Sulzer, 1776	Doubtful is considered to be of East Asian Cryptogenic Cosmopolitan	1896, 1909 (Henrich); 1908, 1909 (Borcea); 1943 (Knechtel & Manolache); 1969 (Ionescu & Teodorescu); 1971 (Duvlea); 1972 (Ionescu <i>et al.</i>); 1973a (Teodorescu); 1973 (Szekely <i>et al.</i>); 1974 (Peiu); 1974 (Lăcătușu <i>et al.</i>); 1975 (Lăcătușu); 1979 (Rogojanu & Perju); 1979 (CIE); 1980 (Teodorescu & Mustață); 1980 (Peiu & Filipescu, <i>In Boguleanu et al.</i>); 1981 (Holman & Pintera); 1982 (Teodorescu); 1982 (Raicu & Mihăilescu); 1983a, (Lăcătușu <i>et al.</i>); 1983b (Lăcătușu <i>et al.</i>); 1984 (Lăcătușu <i>et al.</i>); 1985a (Lăcătușu <i>et al.</i>); 1989 (Perju <i>et al.</i>); 1992 (Ciochia <i>et al.</i>); 1991 (Teodorescu); 1996 (Ciochia & Boeriu); 1997 (Teodorescu & Procheș); 1997 (Moglan Veronica); 1997 (Ciochia & Boeriu); 1998 (Isac <i>et al.</i>); 2000 (Mustață <i>et al.</i>); 2004 (Teodorescu & Vilsan); 2004 (Feraru); 2004 (Trandafirescu <i>et al.</i>); 2006 (Teodorescu <i>et al.</i>); 2006 (Roman & Glăvan); 2008a (Teodorescu); 2008b (Teodorescu); 2008c (Teodorescu); 2008 (Teodorescu & Vlad Antonie); 2008 (Ciochia <i>et al.</i>); 2008 (Ciochia & Stancă-Moise); 2009 (Teodorescu); 2015 (Mărginean Soporan) DAISIE, www.europe-aliens.org)
46.	<i>Myzus varians</i> Davidson, 1912	Eastern Asia / Eastern Palaearctic	2006, 2015 (Chireceanu <i>et al.</i>); 2011 (Sivu)
47.	<i>Neomyzus circumflexus</i> (Buckton, 1876)	Temperate Asia / Western Palaearctic Cosmopolitan	1942 (Knechtel & Manolache); 1982 (Bărbulescu <i>et al.</i> , <i>In Săvescu et al.</i>); 2000 (Mustață <i>et al.</i>); 2008b (Teodorescu)
48.	<i>Panaphis juglandis</i> (Goeze, 1778) syn. <i>Callaphis juglandis</i> (Goeze, 1778)	Eastern Asia / Eastern Palaearctic	2007 (Martin <i>et al.</i>); 2014 (Ficker)
49.	<i>Pterochloroides persicae</i> (Cholodkovsky, 1899)	Eastern Asia / Eastern Palaearctic	1986 (Hondru <i>et al.</i>); 1994 (EPPO), 2008b (Teodorescu); 2008 (Ciochia <i>et al.</i>)
50.	<i>Rhodobium porosum</i> (Sanderson, 1900)	Tropics and subtropics Cryptogenic	1997 (Teodorescu & Procheș); 2006 (Teodorescu et al.); 2008 (Ciochia <i>et al.</i>); 2009 (Odagiu <i>et al.</i>); 2010 (Teodorescu & Matei)
51.	<i>Rhopalosiphoninus latysiphon</i> (Davidson, 1912)	North America / Nearctic	2008 (Ciochia <i>et al.</i>); 2008 (Fericean <i>et al.</i>); DAISIE, www.europe-aliens.org
52.	<i>Rhopalosiphum insertum</i> (Walker, 1849)	North America / Nearctic Cosmopolitan	1908, 1909 (Borcea); 1981 (Holman & Pintera); 1996 (Ciochia & Boeriu); 2000 (Mustață <i>et al.</i>); 2004 (Feraru); 2005 (Feraru & Mustață); 2008 (Ciochia <i>et al.</i>); 2008 (Fericean <i>et al.</i>)

Table 1 (continued)

53.	<i>Rhopalosiphum maidis</i> (Fitch, 1856)	Eastern Asia / Eastern Palaearctic Cosmopolitan	1944 (Knechtel & Manolache); 1969 (Manolache <i>et al.</i>); 1971 (CIE); 1973a (Teodorescu); 1978 (Lăcătușu <i>et al.</i>); 1979 (Rogojanu & Perju); 1980 (Teodorescu); 1980 (Teodorescu & Mustață); 1981 (Holman, & Pintera); 1982 (Teodorescu); 1982 (Bărbulescu <i>et al.</i> , In Săvescu <i>et al.</i>); 1989 (Teodorescu & Cuțaru); 1989 (Voicu & Mureșan); 1990 (Voicu); 1990 (Mustață); 1996 (Ciochia <i>et al.</i>); 1996 (Ciochia & Boeriu); 1997, 1999 (Mustea); 2000 (Mustață <i>et al.</i>); 2001 (Teodorescu & Vădineanu); 2004 (Teodorescu & Vîlsan); 2006 (Teodorescu <i>et al.</i>); 2006 (Antonie & Teodorescu); 2008a (Teodorescu); 2008b (Teodorescu); 2008 (Ciochia <i>et al.</i>); 2009 (Teodorescu).
54.	<i>Rhopalosiphum padi</i> (Linnaeus, 1758)	Unclear Supposed to be European Cosmopolitan	1908 (Borcea); 1979 (Rogojanu & Perju); 1981 (Holman & Pintera); 1997 (Moglan Veronica); 2000 (Mustață <i>et al.</i>); 2003 (Malschi <i>et al.</i>); 2004 (Teodorescu & Vîlsan); 2006 (Teodorescu <i>et al.</i>); 2006, 2013 (Malschi <i>et al.</i>); 2008 (Ciochia <i>et al.</i>); 2008, 2010 (Fericean <i>et al.</i>)
55.	<i>Rhopalosiphum rufiabdominale</i> (Sasaki, 1899)	Eastern Asia / Eastern Palaearctic	2000 (Mustață <i>et al.</i>)
56.	<i>Schizaphis graminum</i> (Rondani, 1852)	Conflicting information Middle Eastern or Central Asia Cosmopolitan	1908 (Borcea); 1965, 1973, 1975 (Bărbulescu); 1979 (Rogojanu & Perju); 1980 (Teodorescu & Mustață); 1980 (Lăcătușu <i>et al.</i>); 1980 (Pașol, In Boguleanu <i>et al.</i>); 1981 (Holman & Pintera); 1982 (Teodorescu); 1987 (Voicu & Nagler); 1989 (Teodorescu & Cuțaru); 1994 (Teodorescu & Stănescu) 1998a (Teodorescu); 1999 (CABI and EPPO); 2000a (Mustață <i>et al.</i>); 2001 (Teodorescu & Vădineanu); 2004 (Teodorescu & Vîlsan); 2006 (Antonie & Teodorescu); 2006 Mustață Mariana <i>et al.</i>); 2006, 2013 (Malschi <i>et al.</i>); 2008a (Teodorescu); 2009 (Mustață & Mustață); 2009 (Malschi); 2010 (Teodorescu)
57.	<i>Tetraneura ulmi</i> (Linnaeus, 1758)	Seems to be northwestern Europe / Western Palaearctic	1907 (Brândză, according to Stănescu, 2009, on <i>Ulmus minor</i>); 1939 (Baudys); 1957 (Georgescu <i>et al.</i>); 1979 (Rogojanu & Perju); 1985b (Lăcătușu <i>et al.</i>); 2008 (Teodorescu & Vlad Antonie); 2008d (Teodorescu); 2008 (Ciochia <i>et al.</i>); 2009 (Teodorescu); 2011 (Ilie & Marinescu); 2015 (Chireceanu <i>et al.</i>); 2017a (Ciceoi Roxana <i>et al.</i>)
58.	<i>Thecabius affinis</i> (Kaltenbach, 1843)	? / Palaearctic	1905 (Brândză, according to Stănescu, 2009); 1939 (Baudys); 1957 (Georgescu); 1998 (Gusic); 2008d (Teodorescu); 2008 (Ciochia <i>et al.</i>); 2009 (Teodorescu); http://www.rosilva.ro/articole/daunatori_biotici_ai_padurilor_p_113.htm
59.	<i>Tinocallis (Eotinocallis) platani</i> (Kaltenbach, 1843)	Japan / Eastern Palaearctic	1996 (Ciochia & Boeriu); 2000 (Mustață <i>et al.</i>)
60.	<i>Tinocallis (Sappocallis) saltans</i> (Nevsky, 1929)	Eastern Asia / Eastern Palaearctic	2008 (Ciochia <i>et al.</i>)
61.	<i>Toxoptera aurantii</i> Boyer de Fonscolombe, 1841	? Eastern Asia / Eastern Palaearctic or Oriental Cosmopolitan	2008 (Ciochia <i>et al.</i>); DAISIE, www.europe-aliens.org
62.	<i>Uroleucon erigeronense</i> (Thomas C., 1878)	North America / Nearctic Cosmopolitan	2008 (Ciochia <i>et al.</i>); 2011 (Datamining-Invasive Species Databases)
63.	<i>Uroleucon telekiaie</i> (Holman, 1965)	Southeastern Europe, Asia Minor and Transcaucasia / Western Palaearctic	2008 (Ciochia <i>et al.</i>); 2011 (Datamining-Invasive Species Databases)

Table 1 (continued)

FAMILY ASTEROLECANIIDAE			
V			
1.	<i>Asterodiaspis variolosa</i> (Ratzeburg, 1870)	Unclear Western Palaeartic or Oriental	1957 (Georgescu <i>et al.</i>); 1972-1973 (Andriescu); 1975 (Rogojanu); 2010 (Fetyko <i>et al.</i>) http://www.rosilva.ro/articole/daunatori_biotici_ai_padurilor_p_113.htm
FAMILY CALOPHYIDAE			
VI			
1.	<i>Calophia rhois</i> (L�w, 1877)	Mediterranean / Western Palaeartic	1962 (Dobreanu & Manolache)
FAMILY CERCOPIIDAE			
VII			
1.	<i>Cercopis sanguinolenta</i> (Scopoli, 1763)	Mediterranean / Western Palaeartic	1975 (Cantoreanu); 1985b (L�c�tu�u <i>et al.</i>); 1999 (Popa & Cojocneanu); 2008 (Orosz)
FAMILY CICADELLIDAE			
VIII			
1.	<i>Empoasca decipiens</i> Paoli, 1930	Central and Southern Europe / Western Palaeartic	1972 (Nast); 1975 (Cantoreanu); 2002 (Popa); 2006 (Orosz); 2013 (Acs <i>et al.</i>)
2.	<i>Empoasca pteridis</i> (Dahlbom, 1850)	Central Europe / Western Palaeartic	1971 (Cantoreanu); 1999 (Popa & Cojocneanu); 2002 (Popa); 2013 (Acs <i>et al.</i>)
3.	<i>Empoasca vitis</i> (G�the, 1875)	Conflicting information	1972 (Nast); 1999 (Popa & Cojocneanu); 2002 (Popa); 2008 (Orosz); 2009 (Stan <i>et al.</i>); 2010, 2011, 2013 (Tomoioag� <i>et al.</i>); 2011 (Chireceanu <i>et al.</i>); 2017 (Ficiu <i>et al.</i>)
4.	<i>Japananus hyalinus</i> Osborn, 1900	Eastern Asia (Japan) / Eastern Palaeartic	1961 (Wagner & Franz, the first European records, from Austria and Romania, published in 1961); 1972, 1987 (Nast); 2002 (Popa); 2011 (Chireceanu & Gutue)
5.	<i>Macropsis elaeagni</i> Emeljanov, 1964	Central Asia Western Palaeartic	1984 (Lauterer); 1987 (Nast); Roques Alain, DAISIE Species Factsheet
6.	<i>Orientalis ishidae</i> (Matsumura, 1902)	Eastern Asia / Eastern Palaeartic	2017b (Chireceanu <i>et al.</i>)
7.	<i>Phlogotettix cyclops</i> (Mulsant et Rey, 1855)	Unclear ?Asia and Russia	1977, 1981 (Diabola); 2017a (Chireceanu <i>et al.</i>)
8.	<i>Scaphoideus titanus</i> Ball, 1932	Northeastern parts of USA and South Canada /Nearctic	2011b (Chireceanu <i>et al.</i>); 2012 (Ploaie & Chireceanu) 2016 (Orosz & T�th); 2017a (Chireceanu <i>et al.</i>)
FAMILY CIXIIDAE			
IX			
1.	<i>Reptalus panzeri</i> (L�w, 1883)	? Central Europe / Western Palaeartic	2009 (Jovi� <i>et al.</i>); 2010 (Bertin <i>et al.</i>); 2011b (Chireceanu <i>et al.</i>); 2012 (EPPPO); 2013 (Acs <i>et al.</i>)
2.	<i>Cixius nervosus</i> (Linnaeus, 1758)	North of Mexic / Neotropical	1975 (Cantoreanu); 2014 (Bartlett <i>et al.</i>)
3.	<i>Cixius pallipes</i> Fieber, 1876	Central and est Mediterranean / Western Palaeartic	1972, 1987 (Nast)
4.	<i>Cixius wagneri</i> China, 1942	? East Mediterranean and Middle East / Western Palaeartic	1987 (Nast)
5.	<i>Hyalesthes obsoletus</i> Signoret, 1865	Middle Asia / Western Palaeartic	1971, 1975 (Cantoreanu); 2011 (Ember <i>et al.</i>)
FAMILY COCCIDAE			
X			
1.	<i>Ceroplastes sinensis</i> Del Guercio, 1900	Central or South America (based on cladistic analysis) / Neotropical	1982 (Tudor); DAISIE Species Factsheet (Giuseppina Pelizzari, Germain Jean-Francois)
2.	<i>Coccus hesperidum</i> Linnaeus, 1758 (syn. <i>Lecanium hesperidum</i>)	Tropical, subtropical Cosmopolitan Cryptogenic	1930 (Knechtel); 1982 (S�vescu); 1974 (Peiu); 1980 (Costescu, <i>In</i> <i>Boguleanu et al.</i>); 1982 (S�vescu <i>et al.</i>); 1985 (Koz�r); 1989 (Perju <i>et al.</i>); 1993 (Ben-Dov); 1997 (Teodorescu & Proche�); 2006 (Teodorescu <i>et al.</i>); 2008c (Teodorescu); 2007 (Pa�ol <i>et al.</i>); 2010 (Teodorescu & Matei); 2010 (Tuc� <i>et al.</i>)

Table 1 (continued)

3.	<i>Eriopeltis lichtensteini</i> Signoret, 1877	Euro-Siberian / Western Palearctic	2002 (Fusu <i>et al.</i>); 2003 (Fusu & Popescu)
4.	<i>Lecanopsis turcica</i> (Bodenheimer, 1951)	? / Western Palearctic	2016 (Kaydan <i>et al.</i>)
5.	<i>Luzulaspis dactylis</i> Green, 1928	? / Western Palearctic	2010 (Fetyko <i>et al.</i>); 2016 (Kaydan <i>et al.</i>)
6.	<i>Parasaissetia nigra</i> (Nietner, 1861)	Africa /Afrotropical Cosmopolitan	2012 (Ben Dov, 2013)
7.	<i>Parthenolecanium corni</i> (Bouché, 1844)	Doubtful North America or Europe Cosmopolitan	1943, 1944, 1960 (Săvescu); 1957 (Georgescu <i>et al.</i>); 1960 (Suciu); 1971 (Simionescu <i>et al.</i>); 1974 (Lăcătușu <i>et al.</i>); 1974 (Peiu); 1975 (Rogojanu); 1979 (Rogojanu & Perju); 1980 (Peiu & Filipescu, <i>In Boguleanu et al.</i>); 1982 (Săvescu); 1982 (Tudor); 1988 (Kosztarab & Kozár); 1990a (Moglan); 1989 (Perju <i>et al.</i>); 1993 (Ben-Dov); 1997 (Simionescu & Teodorescu); 1997, 2000, 2007 (Moglan); 1999 (CABI & EPP0); 2000 (Simionescu, Mihalache <i>et al.</i>); 2001 (Teodorescu & Simionescu); 2003 (Fusu & Popescu); 2006 (Mustață Mariana <i>et al.</i>); 2012 (Tucă)
8.	<i>Parthenolecanium fletcheri</i> (Cockerell, 1893)	Northern America / Nearctic	1961, 1982 (Săvescu); 2003 (Fusu & Popescu)
9.	<i>Parthenolecanium persicae</i> (Fabricius, 1776)	Unknown ? nemoral and subtropical forests of East Asia Cosmopolitan	1963 (Rogojanu); 1977 (Zahradník); 1975 (Rogojanu); 1979 (Rogojanu & Perju); 1979 (CIE); 1978 (Drugescu); 1997 (Moglan); 1985 (Kozár); 2003 (Fusu & Popescu); 2012 (Tucă)
10.	<i>Parthenolecanium rufulum</i> (Cockerell, 1903)	Central Europe / Western Palearctic	1944 (Săvescu); 1954 (Eliescu & Disescu, according to Săvescu 1982); 1957 (Georgescu <i>et al.</i>); 1971 (Simionescu <i>et al.</i>); 1975 (Rogojanu); 1979 (Rogojanu & Perju); 1979 (CIE); 1982 (Săvescu); 1982 (Tudor); 1985 (Kozár); 1997 (Simionescu & Teodorescu); 1997 (Moglan); 2000 (Simionescu); 2001 (Teodorescu & Simionescu); 2003 (Fusu & Popescu); 2006 (Moglan & Fusu); 2007 (Moglan)
11.	<i>Physokermes hemicyphus</i> (Dalman, 1826)	? Central Europe / Western Palearctic	1985 (Kozár); 2010 (Fetyko <i>et al.</i>)
12.	<i>Physokermes inopinatus</i> Danzig & Kozár, 1973	? Central Europe / Western Palearctic	2010 (Fetykó <i>et al.</i>)
13.	<i>Physokermes piceae</i> (Schrank, 1801)	North America / Nearctic	1961 (Săvescu); 1962, 1975 (Rogojanu); 1982 (Săvescu); 1985b (Lăcătușu <i>et al.</i>); 1985 (Kozar); 2000 (Simionescu <i>et al.</i>); 2007 (Moglan); 2010 (Fetyko <i>et al.</i>)
14.	<i>Pulvinaria floccifera</i> (Westwood, 1870)	Asia temperate (Japan) / Eastern Palearctic Cosmopolitan	1960, 1982 (Săvescu); 1997 (Teodorescu & Procheș); 2006 (Teodorescu et al.); 2010 (Teodorescu & Matei)
15.	<i>Pulvinaria regalis</i> Canard, 1968	?Asia temperate / Eastern Palearctic	1982 (Săvescu); 1993 (Ben-Dov, as <i>Pulvinaria savescui</i>); 2009 (Preda <i>et al.</i>)
16.	<i>Pulvinaria vitis</i> (Linnaeus, 1758) syn. <i>P. betulae</i> (Linnaeus) Signoret, 1873	Apparently Europe / Western Palearctic Cosmopolitan	1960, 1962 (Săvescu); 1975 (Rogojanu); 1978 (Drugescu); 1980 (Teodorescu & Ceianu); 1982 (Tudor); 1986 (Duschin); 1989 (Perju <i>et al.</i>); 2007 (Pașol <i>et al.</i>); 2008b (Teodorescu); 2009 (Stan <i>et al.</i>); 2009 (Mitrea <i>et al.</i>); 2010 (Fetyko <i>et al.</i>); 2017 (Ficiu <i>et al.</i>)
17.	<i>Pulvinariella mesembryanthemi</i> (Vallot, 1829)	South Africa / Afrotropical Cosmopolitan	1997 (Teodorescu & Procheș); 2006 (Teodorescu et al.); 2010 (Teodorescu & Matei)

Table 1 (continued)

18.	<i>Saissetia coffeae</i> (Walker, 1852) syn. <i>Saissetia haemisphaerica</i> Hall, 1922	Afrotropical Cosmopolitan	1930 (Knechtel); 1982 (Săvescu); 1997 (Teodorescu & Procheș); 2006 (Teodorescu et al.); 2007 (Pașol <i>et al.</i>); 2010 (Teodorescu & Matei); 2010 (Fetykó <i>et al.</i>)
19.	<i>Saissetia oleae</i> (Olivier, 1791)	Southern districts of Cape Province, South Africa / Afrotropical Cosmopolitan	1982 (Săvescu); 2003 (Fusu & Popescu); 2006 (Teodorescu et al.); 2010 (Fetykó <i>et al.</i>); DAISIE www.europe-aliens.org
20.	<i>Sphaerolecanium prunastri</i> (Fonscolombe, 1834)	Southern and central Europe / Western Palaearctic	1961 (Săvescu); 1975 (Rogojanu); 1979 (Rogojanu & Perju); 1965 (Boțoc); 1978 (Drugescu); 1982 (Săvescu); 1982 (Tudor); 1988, 1990c, 1994b (Moglan); 1999 (Moglan & Cojocaru); 1995-1997 (Moglan); 1997 (Moglan); 2005, 2007 (Moglan); 2003 (Fusu & Popescu); 2005 (Kozar); 2012 (Tucă)
XI	FAMILY CRYPTOCOCCIDAE		
1.	<i>Cryptococcus fagisuga</i> Lindinger, 1936	Based on studies of mitochondrial DNA, origin can be in south western Asia (Gwiazdowski, 2006)	1957 (Georgescu <i>et al.</i>); 1963 (Hoy); 1975 (Rogojanu); 1979 (CIE); 1988 (Kosztarab & Kozar); 1997 (Simionescu & Teodorescu); 2000 (Simionescu, Mihalache <i>et al.</i>); 2001 (Teodorescu & Simionescu); 1996, 2003 (Chira <i>et al.</i>); 1997, 1998 (Chira & Chira); 2007b (& Cicák); 2011 (Roibu <i>et al.</i>); 2015 (Mihál <i>et al.</i>)
2.	<i>Pseudohermes fraxini</i> (Kaltenbach, 1860)	Sibero-European / Palaearctic	1985 (Kozar); 2010 (Fetyko)
XII	FAMILY DELPHACIDAE		
1.	<i>Conomelus anceps</i> (Germar, 1821)	? / Western Palaearctic	1972, 1987 (Nast); 2008 (Pricop); 2014 (Bartlett <i>et al.</i>)
2.	<i>Conomelus lorifer</i> Ribaut, 1948	? / Western Palaearctic	1972, 1987 (Nast); 2006 (Orosz)
3.	<i>Conomelus odryssi</i> Dlabola, 1965	? / Western Palaearctic	1987 (Nast)
4.	<i>Herbalima eforie</i> (Dlabola, 1961)	? / Western Palaearctic	1972 (Nast)
5.	<i>Unkanodes tanasijevici</i> (Dlabola, 1965)	? / Western Palaearctic	1972 (Nast); 1982 (Asche)
XIII	FAMILY DIASPIDIDAE		
1.	<i>Aonidiella aurantii</i> (Maskell, 1879)	Tropical Asia / Oriental Cosmopolitan	1930 (Knechtel); 1997 (Teodorescu & Procheș); 1998 (Danzig & Pellizzari); 2010 (Teodorescu & Matei)
2.	<i>Aspidiotus nerii</i> (Bouché, 1833) syn. <i>A. hederæ</i> Leonardi, 1898	Afrotropical or Mediterranean Cosmopolitan	1897 (Horvath); 1912 (Arion); 1961 (Săvescu); <1970 (CIE); 1974 (Lăcătușu <i>et al.</i>); 1974 (Peiu); 1997 (Teodorescu & Procheș); 1980 (Costescu, in Boguleanu <i>et al.</i>); 1982 (Săvescu); 2006 (Teodorescu et al.); 2007 (Pașol <i>et al.</i>); 2008c (Teodorescu); 2010 (Teodorescu & Matei); 2010 (Tucă <i>et al.</i>); DAISIE, www.europe-aliens.org
3.	<i>Aulacaspis rosae</i> Bouché, 1833	Unclear origin ?Asia Possible / Eastern Palaearctic Cosmopolitan	1897 (Horvath); 1961 (Săvescu); 1974 (Lăcătușu <i>et al.</i>); 1975 (Rogojanu); 1979 (Rogojanu & Perju); 1980 (Costescu, <i>In</i> Boguleanu <i>et al.</i>); 1982 (Tudor); 1997 (Teodorescu & Procheș); 1998 (Danzig & Pellizzari); 2007 (Pașol <i>et al.</i>); 2010 (Teodorescu & Matei); 2015 (Mărginean Soporan) 2017a (Ciceoi Roxana <i>et al.</i>)
4.	<i>Carulaspis minima</i> (Signoret, 1869)	Mediterranean / Western Palaearctic Cosmopolitan	1988 (Kosztarab & Kozár); 2005 (Miller & Davidson)
5.	<i>Chionaspis salicis</i> (Linnaeus, 1758)	? Palaearctic	1988 (Kosztarab & Kozár); 1998 (Danzig & Pellizzari)

Table 1 (continued)

6.	<i>Chionaspis wistariae</i> Cooley, 1897	Asia (Japan, China) / Eastern Palaearctic	2010 (Pellizzari); 2010 (Pellizzari & Germain)
7.	<i>Chrysomphalus aonidum</i> (Linnaeus, 1758)	Southern America / Neotropical Cosmopolitan	1930 (Knechtel), 1988 (CIE); 1997 (Teodorescu & Procheş); 2006 (Teodorescu <i>et al.</i>); 2010 (Teodorescu & Matei); 2013, 2014 (EPPO)
8.	<i>Chrysomphalus dictyospermi</i> (Morgan, 1889)	Tropical Asia / Oriental Cosmopolitan	1930 (Knechtel); 1982 (Săvescu); 1997 (Teodorescu & Procheş); 1998 (Danzig & Pellizzari); 2006 (Teodorescu <i>et al.</i>); 2007 (Paşol <i>et al.</i>); 2010 (Teodorescu & Matei); 2014 (EPPO); DAISIE, www.europe-aliens.org)
9.	<i>Diaspidiotus gigas</i> (Thiem & Gemeck, 1934a)	? Eurasia Palaearctic	1961 (Săvescu); 1975 (Rogojanu); 1978 (Drugescu); 1982 (Săvescu); 2001a (Moglan)
10.	<i>Diaspidiotus ostreaeformis</i> (Curtis, 1843)	Probably the colder part of Europe / Western Palaearctic Cosmopolitan	1960 (Săvescu); 1974 (Peiu); 1975 (Rogojanu); 1979 (Rogojanu & Perju); 1980 (Peiu & Filipescu, <i>In Boguleanu et al.</i>); 1982 (Săvescu); 1988 (Kosztarab & Kozár); 1985a (Lăcătuşu <i>et al.</i>); 1997 (Moglan); 2012 (Ţucă)
11.	<i>Diaspidiotus perniciosus</i> (Comstock, 1881)	East Asia China, Korea / Eastern Palaearctic Cosmopolitan	1933 (in Arad, Bihor, Timiș district. (http://www.botanistii.ro/blog/insecte-daunatoare-plante-paduchele-din-san-jose/); 1954, 1960 (Săvescu); 1955 (Rogojanu); 1965 (Boţoc); 1966 (Borchsenius); 1969, 1975 (Săvescu & Isac); 1972 (Ciochia, Andriescu <i>et al.</i>); 1972-1973 (Andriescu); 1974 (Lăcătuşu <i>et al.</i>); 1974 (Peiu); 1975 (Rogojanu); 1978 (Ciochia <i>et al.</i>); 1979 (Rogojanu & Perju); 1979-1980 (Ciochia <i>et al.</i>); 1980 (Peiu & Filipescu, <i>In Boguleanu et al.</i>); 1982 (Săvescu); 1982 (Manolache & Boguleanu); 1983 (Perju <i>et al.</i>); 1988 (Kosztarab & Kozár); 1989 (Perju <i>et al.</i>); 1991 (Teodorescu); 1992 (Ciochia <i>et al.</i>); 1997 (Ciochia); 1997 (Ciochia & Boeriu); 1997 (Moglan Veronica); 1997, 2004 (Moglan); 1998b (Teodorescu); 2004 (Trandafirescu <i>et al.</i>); 2006 (Teodorescu <i>et al.</i>); 2006 (Mustaţă Mariana <i>et al.</i>); 2007 (Paşol <i>et al.</i>); 2008c (Teodorescu); 2008 (Teodorescu & Vlad Antonie); 2008 (Ioana & Frasin); 2010 (Fetykó <i>et al.</i>); 2012 (Ţucă); 2014 (EPPO)
12.	<i>Diaspis boisduvalii</i> Signoret, 1869	Southern America / Neotropical	1920 (Leonardi); 1997 (Teodorescu & Procheş); 1982 (Săvescu); 2006 (Teodorescu <i>et al.</i>); 2010 (Teodorescu & Matei); 2010 (Fetykó <i>et al.</i>)
13.	<i>Diaspis bromeliae</i> (Kerner, 1778)	Southern America / Neotropical	2010 (Fetykó <i>et al.</i>); (DAISIE, www.europe-aliens.org)
14.	<i>Diaspis echinocacti</i> (Bouché, 1833)	Central America / Neotropical Cosmopolitan	1859 (according to Paşol, 2007); 2006 (Teodorescu <i>et al.</i>); 1997 (Teodorescu & Procheş); 2007 (Paşol <i>et al.</i>); 2010 (Teodorescu & Matei); 2010 (Fetykó <i>et al.</i>)
15.	<i>Dynaspidiotus abietis</i> (Schränk, 1776) syn. <i>Nuculaspis abietis</i>	Euro Siberian Irano Turanian / Western Palaearctic	1962, 1975 (Rogojanu); 2001 (Simon <i>et al.</i>); 2001 (Dieter <i>et al.</i>); 2010 (Fetykó <i>et al.</i>); 2011 (Isaia)
16.	<i>Epidiaspis leperii</i> (Signoret, 1869)	? Eurasia	1960, 1961 (Săvescu); 1974 (Peiu); 1975, 1979 (Rogojanu & Perju); 1980 (Peiu & Filipescu, <i>In Boguleanu et al.</i>); 1998 (Danzig & Pellizzari); 2007 (Paşol <i>et al.</i>); 2012 (Ţucă)
17.	<i>Fiorinia fiorinae</i> (Targioni-Tozzetti, 1869)	Tropical Asia (Southeast Asia) / Oriental Cosmopolitan	1930 (Knechtel); 1998 (Danzig & Pellizzari); DAISIE, www.europe-aliens.org
18.	<i>Gymnaspidiotus aechmeae</i> Newstead, 1898	Cryptogenic Cosmopolitan	1953 (Balachowsky); 1982 (Nakahara); 2010 (Fetykó <i>et al.</i>); 2011 (Datamining-Invasive Species Databases)
19.	<i>Hemiberlesia lataniae</i> (Signoret, 1869)	Cryptogenic Cosmopolitan	1976 (CIE); 1998 (Danzig & Pellizzari)
20.	<i>Hemiberlesia rapax</i> (Comstock, 1881)	Cryptogenic Cosmopolitan	1998 (Danzig & Pellizzari); DAISIE, www.europe-aliens.org)

Table 1 (continued)

21.	<i>Lepidosaphes beckii</i> (Newman, 1869)	Cryptogenic Cosmopolitan	1998 (Danzig & Pellizzari); 1997 (Teodorescu & Procheș); 2006 (Teodorescu et al.); 2010 (Fetykó <i>et al.</i>); 2010 (Teodorescu & Matei); DAISIE, www.europe-aliens.org; CIE
22.	<i>Lepidosaphes conchiformis</i> (Gmelin, 1790)	Uncertain Probably Asia Cosmopolitan	1961, 1982 (Săvescu); 1985 (Kozar); 2010 (Fetykó <i>et al.</i>)
23.	<i>Lepidosaphes gloverii</i> (Packard, 1869)	Cryptogenic Cosmopolitan	2010 (Fetykó <i>et al.</i>); DAISIE, www.europe-aliens.org)
24.	<i>Lepidosaphes newsteadi</i> (Šulc, 1895)	Central and western Europe /Western Palaeartic	1978 (Drugescu); 1988 (Kosztarab & Kozár)
25.	<i>Lepidosaphes pinnaeformis</i> (Bouche, 1851)	Uncertain Subtropical /Tropical zones, possibly Asia	2010 (Fetykó <i>et al.</i>)
26.	<i>Lepidosaphes ulmi</i> Linnaeus, 1758 syn. <i>Mytilaspis pomorum</i> Signoret, 1870	Uncertain Cosmopolitan	1944 (Săvescu); 1957 (Săvescu, as <i>Lepidosaphes populi</i> and <i>L. tiliae</i>); 1957 (Georgescu <i>et al.</i>); 1961 (Săvescu); 1971 (Simionescu <i>et al.</i>); 1974 (Lăcătușu <i>et al.</i>); 1974 (Peiu); 1978 (Drugescu); 1975 (Rogojanu); 1979 (Rogojanu & Perju); 1982 (Săvescu); 1982 (Tudor); 1985b (Lăcătușu <i>et al.</i>); 1991 (Teodorescu); 1994a, 1997, 2003 (Moglan); 1997 (Simionescu & Teodorescu); 2001 (Teodorescu & Simionescu); 2012 (Țucă)
27.	<i>Leucaspis loewi</i> Colvee, 1882	Mediterranean / Western Palaeartic	1930 (Knechtel); 1975 (Rogojanu); 1998 (Danzig & Pellizzari); 2008 (Isaia & Manea); 2011 (Isaia)
28.	<i>Leucaspis pini</i> (Hartig, 1839)	Mediterranean / Western Palaeartic Cosmopolitan	1930 (Knechtel); 2008 (Isaia & Manea); 2011 (Isaia); 2010 (Fetykó <i>et al.</i>)
29.	<i>Leucaspis pusilla</i> Löw, 1883	Mediterranean / Western Palaeartic	1975 (Rogojanu); 2008 (Isaia & Manea); 2011 (Isaia)
30.	<i>Oceanaspidiotus spinosus</i> (Comstock, 1883)	Cryptogenic Cosmopolitan	2011 (Datamining-Invasive Species Databases DAISIE, www.europe-aliens.org)
31.	<i>Parlatoria oleae</i> (Colvée, 1880)	Middle East or South Africa Cryptogenic Cosmopolitan	1966 (Rogojanu); 1988 (Kosztarab & Kozar); 1998 (Danzig & Pellizzari); 2010 (Fetykó <i>et al.</i>)
32.	<i>Parlatoria ziziphi</i> (Lucas, 1853)	Tropical Asia / Oriental Cosmopolitan	1998 (Danzig & Pellizzari); 2010 (Fetykó <i>et al.</i>) DAISIE, www.europe-aliens.org
33.	<i>Pinnaspis aspidistrae</i> (Signoret, 1869)	Tropical Asia, especially India, Ceylon / Oriental	2010 (Fetyko <i>et al.</i>); (DAISIE, www.europe-aliens.org)
34.	<i>Pinnaspis buxi</i> (Bouche, 1851)	?Cosmopolitan Cryptogenic	2010 (Fetykó <i>et al.</i>)
35.	<i>Pseudaulacaspis pentagona</i> (Targioni-Tozzetti, 1886)	East Asia (Japan or China) / Eastern Palaeartic Cosmopolitan	1982 (Tudor); 1998 (Brăiloiu-Tanase); 2010 (Fetykó <i>et al.</i>); 2017b (Ciceoi Roxana <i>et al.</i>); DAISIE, www.europe-aliens.org
36.	<i>Targionia vitis</i> (Signoret, 1876)	? / Western Palaeartic	1975 (Rogojanu); 1982 (Săvescu); 1993 (Danzig)
37.	<i>Unaspis euonymi</i> (Comstock, 1881)	Temperate Asia / Eastern Palaeartic Cosmopolitan	1988 (Kosztarab & Kozar) 2015 Gutue <i>et al.</i> ; 2017b (Ciceoi Roxana); 2017b (Ciceoi Roxana <i>et al.</i>) (DAISIE, www.europe-aliens.org)
XIV	FAMILY ERIOCOCCIDAE		
1.	<i>Acanthococcus aceris</i> Signoret, 1875	? / Holarctic	1966b (Rogojanu); 1985 (Kozár); 2010 (Fetyko <i>et al.</i>)

Table 1 (continued)

2.	<i>Acanthococcus roboris</i> (Goux, 1931)	? / Palaearctic	1966a (Rogojanu); 1982 (Tudor); 2010 (Fetyko <i>et al.</i>)
3.	<i>Anophococcus Agropyri</i> (Borchsenius, 1949)	? Central Europe / Western Palaearctic	1966a (Rogojanu); 1982 (Tudor); 1985 (Kozar); 1988 (Kosztarab & Kozár); 2003 (Fusu & Popescu); 2010 (Fetykó <i>et al.</i>)
4.	<i>Anophococcus Cingulatus</i> (Kiritchenko, 1940)	? / Eastern Palaearctic	2010 (Fetyko <i>et al.</i>)
5.	<i>Anophococcus inermis</i> (Green, 1915)	? Central Europe / Western Palaearctic	2010 (Fetyko <i>et al.</i>)
6.	<i>Anophococcus insignis</i> (Newstead, 1891)	? / Holarctic	2010 (Fetyko <i>et al.</i>)
7.	<i>Gossyparia spuria</i> (Modeer, 1778)	? / Cosmopolitan	1930 (Knechtel); 1961 (Săvescu); 1963 (Hoy); 1975 (Rogojanu); 1982 (Tudor); 2010 (Fetyko <i>et al.</i>)
8.	<i>Greenisca brachypodii</i> Borchsenius & Danzig, 1966	? / Western Palaearctic	1998 (Kozár & Nagy); 2010 (Fetyko <i>et al.</i>)
9.	<i>Kaweckia glyceriae</i> (Green, 1921)	? China, Corea, Rusia, Mongolia Kazahstan / Eastern Palaearctic	2010 (Fetyko <i>et al.</i>)
10.	<i>Neoacanthococcus centaurea</i> (Săvescu, 1985)	? Romania / Western Palaearctic	1985 (Săvescu); 2009 (Kozar); 2010 (Fetyko <i>et al.</i>); 2013 (Kozar <i>et al.</i>)
11.	<i>Eriococcus buxi</i> (Boyer de Fonscolombe, 1834)	Turanian-European / Western Palaearctic	1966a (Rogojanu); 1982 (Tudor); 1985 (Kozar); 2010 (Fetyko <i>et al.</i>)
12.	<i>Rhizococcus erinaceus</i> (Kiritchenko, 1940)	? Romania, Ucraina / Western Palaearctic	2010 (Fetyko <i>et al.</i>)
13.	<i>Rhizococcus greeni</i> (Newstead, 1898)	? Central Europe / Western Palaearctic	2003 (Fusu & Popescu); 2010 (Fetyko <i>et al.</i>)
14.	<i>Rhizococcus munroi</i> (Boratynski, 1962)	Sibiric-European / Palaearctic	2013 (Kozár <i>et al.</i>)
15.	<i>Rhizococcus zygophylli</i> (Archangelskaya, 1931)	? / Eastern Palaearctic	2010 (Fetyko <i>et al.</i>)
XV	FAMILY FLATTIDAE		
1.	<i>Metcalfa pruinosa</i> (Say, 1830)	Eastern North America / Nearctic	2009a,b, 2011 (Preda & Skolka); 2009 (Preda <i>et al.</i>); 2009 (Bărbuceanu & Nicolaescu); 2010 (Gogan <i>et al.</i>); 2011, 2014, 2015a,b,c (Grozea <i>et al.</i>); 2011a (Chireceanu & Gutue); 2013 (Cean & Cean); 2014 (Grozea <i>et al.</i>); 2014 (EPP0); 2015, 2016 (Vlad & Grozea); 2015 (Bărbuceanu & Mihăescu); 2015 (Bărbuceanu <i>et al.</i>); 2016 (Vlad); 2013, 2016 (Don <i>et al.</i>); 2017a (Ciceoi Roxana <i>et al.</i>)
XVI	FAMILY HOMOTOMIDAE		
1.	<i>Homotoma ficus</i> (Linnaeus, 1758)	Central-Southern Europe and the Middle East / Western Palaearctic	1962 (Dobreanu & Manolache)
XVII	FAMILY ISSIDAE		
1.	<i>Palaolithium distinguendum</i> (Kirschbaum, 1868)	Mediterranean / Western Palaearctic	1972 (Nast); 2005 (Mazzoni)

Table 1 (continued)

XVIII			
FAMILY KERMESIDAE			
1.	<i>Kermes greeni</i> Bodenheimer, 1931	Mediterranean / Western Palaearctic	2003 (Fusu & Popescu)
2.	<i>Kermes quercus</i> (Linnaeus, 1758)	? Mediterranean / Western Palaearctic	1930 (Knechtel); 1957 (Georgescu <i>et al.</i>); 1961 (Săvescu); 1975 (Rogojanu); 1982 (Tudor); 1988 (Kosztarab & Kozar); 2003 (Fusu & Popescu)
3.	<i>Kermes roboris</i> (Fourcroy, 1785)	? Mediterranean ? Palaearctic or Oriental	1930 (Knechtel); 1961 (Săvescu); 1975 (Rogojanu); 1982 (Tudor); 1990b (Moglan); 2003 (Fusu & Popescu); 2011 (Roșca <i>et al.</i>)
XIX			
FAMILY MARGARODIDAE			
1.	<i>Icerya purchasi</i> (Maskell, 1878)	Australia /Australasian Cosmopolitan	1971 (CIE); 1988 (Kosztarab and Kozár); 1990-1996 (Teodorescu & Simionescu, 1997); 1997 (Simionescu & Teodorescu); 1993, 2014 (EPPO)
XX			
FAMILY MEMBRACIDAE			
1.	<i>Stictocephala bisonia</i> Kopp & Yonke, 1977 (syn. <i>Ceresa bubalus</i> Fabricius, 1794)	North America / Nearctic	1955 (Popescu-Gorj); 1974 (Peiu); 1971, 1975 (Cantoreanu); 1979 (Rogojanu & Perju); 1980 (Peiu & Filipescu, in Boguleanu <i>et al.</i>); 1983 (Stoian); 1985b (Lăcătușu <i>et al.</i>); 2002 (Popa); 2006 (Teodorescu et al.); 2006 (Mustață Mariana <i>et al.</i>); 2007 (Pașol <i>et al.</i>); 2009 (Teodorescu); 2009 (Stan <i>et al.</i>); 2011 (Popa & Roșca); 2011 (Datamining-Invasive Species Databases); 2012 (Țucă); 2014 (Velichi); 2016 (Orosz & Tóth) DAISIE Species Factsheet Roques Alain
2.	<i>Stictocephala alta</i> (Walker, 1851)	Conflicting information	Datamining 2011 - Invasive Species Databases
XXI			
FAMILY ORTHEZIIDAE			
1.	<i>Arctorthesia cataphracta</i> (Olafsen, 1772)	Unknown / boreoarctic des hauts sommets alpins	1958 (Rogojanu); 1978 (Kosztarab & Kozár)
2.	<i>Insignorthesia insignis</i> (Browne, 1887)	South America, probably Guyana and neighbouring countries / Neotropical	1935 (Rogojanu)
3.	<i>Newsteadia floccosa</i> (De Geer, 1778)	Boreal (Eurosiberian) / Palaearctic	1930 (Knechtel); 1952 (Morrison); 1958, 1975 (Rogojanu); 2016 (Kaydan <i>et al.</i>)
4.	<i>Ortheziola marottai</i> Kaydan & Szita, 2014	Turanian-European / Western Palaearctic	2016 (Kaydan <i>et al.</i>)
5.	<i>Ortheziola vejdivkyi</i> Šulc, 1895	Vestern-European and montano-boreal / Palaearctic	1988 (Kosztarab & Kozár); 2014, 2016 (Kaydan <i>et al.</i>)
XXII			
FAMILY PEMPHIGIDAE			
1.	<i>Pemphigus borealis</i> Tullgren, 1909	? / Northern Palaearctic	1939 (Baudys); 1998 (Gusic)
2.	<i>Pemphigus bursarius</i> (Linnaeus, 1758)	Western Palaearctic Cosmopolitan	1909 (Brândză according to Stănescu, 2009); 1940b (Knechtel & Manolache); 1957 (Georgescu); 1975, 1998 (Gusic); 1981 (Holman & Pintera); 2006 (Roman & Glăvan); 2009 (Teodorescu); 2011 (Ilie & Marinescu); 2015 (Ilie).
3.	<i>Pemphigus immunis</i> Buckton, 1896	? North-western Himalayan ?European and Asian	1998 (Gusic)

Table 1 (continued)

4.	<i>Pemphigus populitransversus</i> Riley ex Riley & Monell, 1879	North America / Nearctic	2011 (Roşca & Istrate)
5.	<i>Pemphigus populinigrae</i> (Schrank, 1801)	? / Europe, Asia	2009 (Hac)
XXIII	FAMILY PHYLLOXERIDAE		
1.	<i>Viteus vitifoliae</i> (Fitch, 1855) (syn. <i>Daktulosphaira vitifoliae</i> (Fitch, 1855) <i>Phylloxera vastatrix</i> (Planchon, 1868)	Eastern North America / Nearctic	1864 (Knechtel & Knechtel, 1879, in Satu Mare, 1884); 1880 (Szánisló); 1884 (Chişorani locality, Dealu Mare vineyards, Prahova district, Knechtel & Knechtel 1909), 1891 (Nicolaeu); 1959 (Manolache & Boguleanu); 1972 (Manolache <i>et al.</i>); 1974 (Lăcătuşu <i>et al.</i>); 1974 (Peiu); 1979 (Rogojanu & Perju); 1987 (Dumitru & Mărmureanu); 1989 (Perju <i>et al.</i>); 2006 (Teodorescu <i>et al.</i>); 2006 (Mustaţă Mariana <i>et al.</i>); 2007 (Paşol <i>et al.</i>); 2007 (Perju <i>et al.</i>); 2008c (Teodorescu); 2008 (Teodorescu & Vlad Antonie); 2011 (Popa & Roşca); 2014 (EPP0); 2015 (Ficiu <i>et al.</i>); 2017 (Galan & Petculescu).
XXIV	FAMILY PSEUDOCOCCIDAE		
1.	<i>Balanococcus boratynskii</i> Williams, 1962	Euro-Siberian / Palaeartic	2016 (Kaydan <i>et al.</i>)
2.	<i>Balanococcus orientalis</i> Danzig & Ivanova, 1976	? / Palaeartic	2016 (Kaydan <i>et al.</i>)
3.	<i>Fonscolombia europaea</i> (Newstead, 1897)	? / Palaeartic	2016 (Kaydan <i>et al.</i>)
4.	<i>Heterococcus nudus</i> (Green, 1926) syn. <i>H. agropyri</i> Săvescu	? Cosmopolitan	1985 (Săvescu); 1994 (Ben-Dov); 2013 (Danzig & Gavrilov-Zimin)
5.	<i>Mirococcopsis subterranean</i> (Newstead, 1893)	Euro-Siberian? Palaeartic	2016 (Kaydan <i>et al.</i>)
6.	<i>Peliococcus callumeti</i> (Lindinger, 1912 b)	Boreal (Eurosiberian) / Western Palaeartic	2010 (Fetyko <i>et al.</i> , as <i>Spilococcus nanae</i> Schmutterer, 1957, as <i>Rhizoecus albidus</i> Goux)
7.	<i>Peliococcus turanicus</i> (Kiritshenko, 1932)	? Cosmopolitan	1985 (Săvescu, as <i>Eupeliococcus tragopogoni E. drabae</i>); 1994 (Ben-Dov)
8.	<i>Phenacoccus insularis</i> Danzig, 1971	Far East (Sakhalin and Kuril islands) Palaeartic	1984 (Săvescu, as <i>Phenacoccus prunispinosi</i>)
9.	<i>Phenacoccus aceris</i> (Signoret, 1875)	? / Tanspalaeartic	1975 (Rogojanu); 1978 (Danzig); 1985 (Săvescu, as <i>Paroudablis ulmi</i>); 1994 (Ben-Dov); 2010 (Fetyko <i>et al.</i>)
10.	<i>Phenacoccus piceae</i> (Löw, 1883)	? / Transpalaeartic	???? 1985 (Săvescu); 1985 (Kozar); 1994 (Ben-Dov); 2010 (Fetyko <i>et al.</i>)
11.	<i>Phenacoccus pumilus</i> Kiritshenko, 1936	? Possible Central Asia	1984 (Săvescu, as <i>Phenacoccus rehacekii</i>); 1994 (Ben-Dov)
12.	<i>Planococcus citri</i> (Risso, 1813) syn <i>Pseudococcus citri</i> (Risso, 1813)	Unclear Cosmopolitan Cryptogenic	1960, 1982 (Săvescu); 1997 (Teodorescu & Procheş); 1999 (CABI/EPP0); 2006 (Teodorescu <i>et al.</i>); 2007 (Paşol <i>et al.</i>); 2010 (Teodorescu & Matei), 2010 (Fetykó <i>et al.</i>)

Table 1 (continued)

13.	<i>Pseudococcus longispinus</i> Targioni-Tozzetti, 1867) syn. <i>P. adonidum</i> (L.)	Australia / Australasian Cosmopolitan	1930 (Knechtel); 1974 (Lăcătușu <i>et al.</i>); 1982 (Săvescu); 1997 (Teodorescu & Procheș); 2005 (Ecobici <i>et al.</i>); 2004 (Porca & Biró); 2006 (Teodorescu <i>et al.</i>); 2007 (Pașol <i>et al.</i>); 2008c (Teodorescu); 2010 (Teodorescu & Matei); 2010 (Tucă <i>et al.</i>)
14.	<i>Pseudococcus mammillariae</i> (Bouché, 1844) syn. <i>Spilococcus mamillariae</i> (Bouche, 1844)	Subtropical and Mediterranean / Western Palaearctic	1997 (Teodorescu & Procheș); 2006 (Teodorescu <i>et al.</i>); 2010 (Teodorescu & Matei)
15.	<i>Volvicoccus volvifer</i> (Goux, 1945)	West Asia / Palaearctic)	2016 (Kaydan <i>et al.</i>)
XXV	FAMILY PSYLLIDAE		
1.	<i>Cacopsylla bidens</i> (Šulc, 1907) In many paper <i>C. pyricola</i>	? Central Asia / Eastern Palaearctic	1962 (Dobreanu & Manolache); 1992 (Straulea <i>et al.</i>); 1994, 2002 (Branîște <i>et al.</i>); 1999, 2007 (Chireceanu Constantina); 2006 (Mustață Mariana); 2008 (Ploaie <i>et al.</i>); 2008 (Branîște & Militaru); 2009 (Sestras <i>et al.</i>); 2012 (Cean <i>et al.</i>)
XXVI	FAMILY RHIZOECIDAE		
1.	<i>Rhizoecus albidus</i> Goux, 1942	? / Transpalaearctic	1985 (Kozar); 2016 (Kaydan <i>et al.</i>); 2010 (Fetyko <i>et al.</i>)
XXVII	FAMILY TRIOZIDAE		
1.	<i>Trioza neglecta</i> Loginova, 1978	Southeastern and Central Asia / Eastern Palaearctic	1988 (Burckhardt); 1959 (Dobreanu & Manolache); 1998 (Zeidan-Gêze & Burckhardt); 2010 (Mifsud <i>et al.</i>); 1995 (Glowacka <i>et al.</i>); 2002 (Lauterer and Malenovský); DAISIE (Christian Cocquempot)
2.	<i>Trioza schrankii</i> Flor, 1861	Central Europe / Western Palaearctic	1962 (Dobreanu & Manolache); 1996 (Conci <i>et al.</i>); 2002 (Lauterer & Malenovský)
3.	<i>Trioza tatrensis</i> Klimaszewski, 1965	Northern Europe Western Palaearctic	1992 (Ossiannilsson)

Table 2

The species richness of alien Homoptera families reported in Romania

No.	Homoptera families	No. of species	%	No.	Homoptera families	No. of species	%
1	Acanaloniidae	1	0.456	15	Flattidae	1	0.456
2	Adelgidae	12	5.479	16	Homotomidae	1	0.456
3	Aleyrodidae	5	2.283	17	Issidae	1	0.456
4	Aphididae	63	28.767	18	Kermesidae	3	1.369
5	Asterolecaniidae	1	0.456	19	Margarodidae	1	0.456
6	Calophyidae	1	0.456	20	Membracidae	2	0.913
7	Cercopidae	1	0.456	21	Ortheziidae	5	2.283
8	Cicadellidae	8	3.652	22	Pemphigidae	5	2.283
9	Cixiidae	5	2.283	23	Phylloxeridae	1	0.456
10	Coccidae	23	10.502	24	Pseudococcidae	15	6.849
11	Cryptococcidae	2	0.913	25	Psyllidae	1	0.456
12	Delphacidae	5	2.283	26	Rhizoecidae	1	0.456
13	Diaspididae	37	16.894	27	Trioziidae	3	1.369
14	Eriococcidae	15	6.849		Total	219	

Table 3

Dynamics of number of alien Homoptera species reported in Romania

Number of reported Homoptera species			
1859–1889	1900–1949	1950–1999	2000–2018
11	44	112	52

One or few reports do not mean that the species are not established or cannot establish in Romania. The cause of their accidental detection is their low capacity to multiply and spread, or their preference to the wild plants as hosts, their oligophagy or even low peculiar interest of researchers. But it is necessary to confer special attention to these species even if initially they have not a negative effect or only minor impact upon native biodiversity and ecological systems. In the invasiveness process, perhaps in all cases, after establishing in new zones, the alien species can develop rapidly high polyphagy, becoming invasive or pests.

In function of the capacity to carry out their normal vital activities, their adaptation degree to environmental changes (“the ecological valence”) the non-native Homoptera species identified in Romania belong to four main categories: 1. species found only and typically overwinter outdoor; 2. species that live and reproduce only indoors, on ornamental and vegetable plants, in greenhouses, or on ornamental plants in different heated buildings; 3. few species found in indoor conditions but which can escape and develop outdoor during summer, and 4. species that are accidentally introduced with imported fruits. The species that can live, nourish and reproduce outdoor during summer have the possibility to spread and enter in other indoor locations, where they continue to multiply, but they do not resist in winter conditions and do not establish in the Romanian fauna. But, if actual climate change phenomenon continues and the temperature values increase, some of these species will be able to find some outdoor favourable microhabitats, to survive over winter and establish in new outdoor zone.

From the biogeographical point of view, the alien Homoptera species in Romania are included into the following regions: Palaearctic, Nearctic, Neotropical, Oriental, Afrotropical and Australasian, with dominance of the Palaearctic zone (Western and Eastern). Many species (at least 33%) now have a worldwide distribution (cosmopolitan species).

In Romania, similar to other countries, the Homoptera insects were probably introduced with fresh cut flowers, potted flowering plants, seeds, bulbs, grafts, potting mix and other planting materials.

NEW DATA ON ALIEN/INVASIVE HOMOPTERA SPECIES BETWEEN 2000 AND 2018

A number of 33 insect species, which attacked plant, was observed between 2000 and 2018 (Table 4). In five cases, the mean density values, attack intensity, effect on plant hosts were assessed and some control measures were applied.

The *Metcalfa pruinosa* presence and attack were registered in Bucharest, in two private gardens, in 2015–2018. In 2015, the first attack of huge intensity was observed in one garden in the Bucharest centre, on young *Albizia julibrisin* tree (under three meter height and only 8 cm diameter), weakened and stressed by a shadowed place with improper soil. The tree was practically defoliated due to a lot of factors: sap sucking by larvae, decreased photosynthesis rate because the leaves were covered with an abundant wax secretion, with honeydew eliminated by insects and with a black fungus growing on honeydew. The *Metcalfa* larvae were disposed along the main nerve of characteristic, long, bipinnately compound leaves and on the nerve of each leaflet (pinnae) facilitating the access to sap. The wax and honeydew were in so high quantities that they were present not only on the leaves but also even on the ground. The young tree was very seriously damaged, and in a few weeks died. The second attack was registered in 2016 in a northern Bucharest garden on one basal branch of high and vigorously *Albizia* tree (over 10 meters). The moderate attack intensity was solved by chemical control and later by mechanical control (sawing the attacked branch, before the adult insect appearance). This pest was also installed on a high number of cultivated and wild plants (Table 3), but the attack intensity was low or moderate. In 2017, *Metcalfa* was again present in this garden, but the number of attacked plants and the attack intensity decreased, and in 2018 attacks were observed only on few *Rosa*, *Ulmus* and *Parthenocissus quinquefolia*.

A *Hyalopterus pruni* attack was discovered on leaves and sprigs of young *Prunus* tree (four meter high and 12 centimeter diameter) between 2015 and 2017, in the same garden. The pest was extremely abundant, with very high density ($>10/\text{cm}^2$), and attack intensity. The pests were present also on the ground being knocked down by wind. The chemical treatments and washing with water jet under pressure applied in 2015 and 2016 remained without effect, and the tree died.

A high attack of *Cacopsylla bidens* nymphs was registered on two old *Pyrus communis* trees, in May 2018. Following the attack, numerous black spots were observed on the foliage, while the leaves and the young fruits fell down prematurely and an abundant honeydew secretion covered all leaves, branches and stems. The honeydew droplets fell also on the ground, similar to raindrops. In order to decrease this very high level of attack intensity the two trees were washed using water jet under pressure, five weeks consecutively.

An impressively and probably old attack of *Pseudalacaspis pentagona* was registered in 2017 on *Syringa vulgaris* stem and basal branches, with a high density of female scales ($>12/\text{cm}^2$). The attack was stopped with chemical treatment (concentrated soap solution and oil emulsion).

An attack of *Macrosiphum rosae* was registered on about all 70 *Rosa* varieties in the same garden, in 2016–2018. The attack was on young leaves and especially on buds, the very young leaves being rolled (pseudocecidia) and buds not flourished. The older leaves remained unattacked and the varieties with dark red flowers usually remained unattacked or with very low level of attack intensity.

On a little number of *Vitis vinifera* plants, *Viteus vitifolii* aerial galls were present on all young leaves (100% attack frequency) and with a high number of galls on each leaf. To diminish the level of the next generation of pests, all sprigs with attacked leaves were cut and destroyed.

Table 4

New data with alien Homoptera species and their host plants detected between 2000 and 2018

No.	Alien species	Plant hosts species/Families
1	<i>Aspidiotus nerii</i> (<i>A. hederae</i>)	<i>Nerium oleander</i> (Apocynaceae), <i>Hedera helix</i> (Araliaceae), <i>Asparagus acutifolius</i> (Asparagaceae), <i>Bugainvillea glabra</i> (Nyctaginaceae), <i>Buxus sempervirens</i> (Buxaceae), <i>Parthenocissus quinquefolia</i> (Vitaceae)
2	<i>Asterodiaspis variolosa</i>	<i>Quercus robur</i> (Fagaceae)
3	<i>Aulacaspis rosae</i>	<i>Rosa</i> sp. (Rosaceae)
4	<i>Cacopsylla bidens</i>	<i>Pyrus communis</i> (Rosaceae)
5	<i>Chromaphis juglandicola</i>	<i>Juglans regia</i> (Juglandaceae)
6	<i>Chrysomphalus dictyosperni</i>	Fruit of <i>Citrus maxima</i> , <i>C. paradise</i> , <i>C. sinensis</i> (Rutaceae)
7	<i>Cryptococcus fagisuga</i>	<i>Fagus</i> (Fagaceae)
8	<i>Diaspidiotus perniciosus</i>	<i>Malus punila</i> var. <i>domestica</i> (Rosaceae), <i>Parthenocissus tricuspidata</i> (Vitaceae), <i>Vaccinium myrtillus</i> (Ericaceae), <i>Ribes nigrum</i> , <i>Ribes uva-crispa</i> (Grossulariaceae)
9	<i>Epidiaspis leperii</i>	<i>Prunus</i> , <i>Pyrus</i> (Rosaceae)
10	<i>Hyalopterus pruni</i>	<i>Prunus domestica</i> , <i>Prunus armeniaca</i> (Rosaceae)
11	<i>Lecanium hesperidum</i>	Indoor: <i>Citrus limon</i> , <i>Murraya exotica</i> (Rutaceae); <i>Bugainvillea glabra</i> (Nyctaginaceae)
12	<i>Lepidosaphes beckii</i>	<i>Citrus</i> fruits (Rutaceae)
13	<i>Lepidosaphes conchiformis</i>	<i>Pyrus communis</i> (Rosaceae); <i>Syringa vulgaris</i> (Oleaceae); <i>Tilia cordata</i> (Malvaceae)
14	<i>Lepidosaphes gloverii</i>	<i>Murraya</i> (Rutaceae)
15	<i>Lepidosaphes ulmi</i>	<i>Cornus mas</i> (Cornaceae); <i>Malus</i> , <i>Pyrus</i> (Rosaceae); <i>Robinia pseudoacacia</i> (Fabaceae)
16	<i>Macrosiphoniella sanborni</i>	<i>Chrysanthemum</i> (Asteraceae)
17	<i>Macrosiphum rosae</i>	<i>Rosa</i> sp. <i>Aurora</i> , <i>Bonica</i> , <i>First Lady</i> , <i>Floribunda</i> , <i>Fragonard</i> , <i>Honey Vanilla</i> , <i>Ingrid Bergman</i> , <i>Macha</i> , <i>Message</i> , <i>Pauls Scarlet</i> , <i>Rainbow Sorbet</i> , <i>Santana</i> , <i>Valencia</i> , <i>Velasquez</i> , <i>White Meidiland</i> , <i>Rosa canina</i> (Rosaceae)
18	<i>Metcalfa pruinosa</i>	<i>Acer negundo</i> (Aceraceae); <i>Albizia julibrissin</i> , <i>Robinia pseudoacacia</i> (Fabaceae); <i>Aesculus hippocastanum</i> (Sapindaceae); <i>Amaranthus</i> sp. (Amaranthaceae); <i>Atriplex hortensis</i> , <i>Chenopodium ficifolium</i> , <i>Spinacia oleracea</i> (Chenopodiaceae); <i>Prunus armeniaca</i> , <i>P. domestica</i> , <i>P. persica</i> , <i>Pyrus communis</i> , <i>Malus punila</i> var. <i>domestica</i> , <i>Rosa</i> sp., <i>Rubus</i> sp. (Rosaceae); <i>Buxus sempervirens</i> (Buxaceae); <i>Campsis radicans</i> (Bignoniaceae); <i>Cirsium arvense</i> (Asteraceae); <i>Bellis perenis</i> (Compositae); <i>Cucumis sativus</i> , <i>Cucurbita pepo</i> (Cucurbitaceae); <i>Ficus carica</i> , <i>Morus alba</i> (Moraceae); <i>Ligustrum vulgare</i> , <i>Fraxinus</i> sp. (Oleaceae); <i>Lonicera japonica</i> (Caprifoliaceae); <i>Melissa officinalis</i> (Lamiaceae); <i>Mirabilis jalapa</i> (Nyctaginaceae); <i>Parthenocissus quinquefolia</i> , <i>P. tricuspidata</i> , <i>Vitis vinifera</i> (Vitaceae); <i>Philadelphus coronaries</i> (Hydrangaceae); <i>Ribes grossularia</i> (Grossulariaceae); <i>Sambucus nigra</i> (Adoxaceae); <i>Spathiphyllum floribundum</i> (Araceae); <i>Ulmus</i> (Ulmaceae)
19	<i>Myzus persicae</i>	- Indoor: <i>Capsicum annuum</i> , <i>Lycopersicon lycopersicum</i> , <i>Solanum melongena</i> (Solanaceae) - Outdoor: <i>Prunus persica</i> , <i>Armeniaca vulgaris</i> (Rosaceae)
20	<i>Panaphis juglandis</i>	<i>Juglans regia</i> (Juglandaceae)
21	<i>Parthenolecanium corni</i>	<i>Albizia julibrissin</i> (Fabaceae); <i>Buxus</i> (Buxaceae); <i>Morus</i> (Moraceae); <i>Prunus</i> , <i>Ribes nigrum</i> (Grossulariaceae); <i>Robinia pseudoacacia</i> (Fabaceae); <i>Rosa canina</i> (Rosaceae); <i>Sambucus nigra</i> (Adoxaceae); <i>Vitis vinifera</i> (Vitaceae)
22	<i>Physochermes piceae</i>	<i>Picea abies</i> (Pinaceae)

Table 4 (continued)

23	<i>Pineus pini</i>	<i>Pinus</i> (Pinaceae)
24	<i>Pineus strobi</i>	<i>Pinus strobus</i> (Pinaceae)
25	<i>Pseudalacaspis pentagona</i>	<i>Syringa vulgaris</i> variety <i>Charles Joly</i> (Oleaceae)
26	<i>Quadraspidiotus gigas</i>	<i>Populus</i> (Salicaceae)
27	<i>Saissetia oleae</i>	<i>Asparagus acutifolius</i> (Asparagaceae); <i>Nerium oleander</i> (Apocynaceae)
28	<i>Stictocephala bisonia</i>	<i>Malus</i> , <i>Pyrus</i> , <i>Prunus</i> , <i>Persica</i> , <i>Cerasus</i> (Rosaceae); <i>Vitis vinifera</i> (Vitaceae); <i>Salix</i> , <i>Populus</i> (Salicaceae); <i>Tilia</i> (Malvaceae)
29	<i>Tetraneura ulmi</i>	<i>Ulmus minor</i> (Ulmaceae)
30	<i>Thecabius affinis</i>	<i>Populus pyramidalis</i> (Salicaceae)
31	<i>Trialeurodes vaporariorum</i>	- Indoor: <i>Hibiscus rosa-sinensis</i> , <i>botanika</i> and <i>brilliant</i> varieties (Malvaceae); <i>Pelargonium domesticum</i> , <i>P. peltatum</i> (Geraniaceae); <i>Saintpaulia ionantha</i> , <i>Desdemona</i> and <i>Snow Bunny</i> varieties (Gesneriaceae). - Outdoor: <i>Brassica oleracea</i> (Brassicaceae); <i>Capsicum annum</i> , <i>Lycopersicon lycopersicum</i> , <i>Solanum melongena</i> (Solanaceae); <i>Cleome hassleriana</i> (Cleomaceae); <i>Cucumis sativus</i> , <i>Cucurbita maxima</i> , <i>C. pepo</i> (Cucurbitaceae); <i>Lactuca sativa</i> (Asteraceae); <i>Lonicera japonica</i> (Caprifoliaceae); <i>Mirabilis jalapa</i> (Nyctaginaceae); <i>Pelargonium domesticum</i> , <i>P. peltatum</i> (Geraniaceae); <i>Phaseolus vulgaris</i> , <i>Ph. coccineus</i> (Fabaceae); <i>Rumex patientia</i> (Polygonaceae); <i>Spinacia oleracea</i> (Chenopodiaceae)
32	<i>Unaspis euonymi</i>	<i>Syringa vulgaris</i> (Oleaceae)
33	<i>Viteus vitifolii</i>	<i>Vitis vinifera</i> (Vitaceae)

CONCLUSIONS

A series of non-native Homoptera species, recorded in Romania since the 19th century, to 2018 is presented in the present paper, indicating their presumably origin zone, biogeographic region, their first report in Romania, and in some cases, other subsequent bibliographical references. Through the compilation of bibliographic sources (295 papers) with 47 personal papers (one author or co-author, published between 1969 and 2010) and some not yet published data, a total of 219 Homoptera species belonging to 27 families, were identified in greenhouses (on vegetables and ornamental plants), in houses or different other controlled temperature conditions buildings, on ornamental plants, on open field vegetables, and other field crops, in orchards, gardens, parks, forests, as well as on imported tropical or subtropical fruits.

Certainly, this list is not complete, and can be supplemented with new or unknown records, but the present paper can complete the gaps in knowledge about the alien Homoptera species in Romania and offer new information in existing data base referring to these insects.

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NEW ICHNEUMONID PARASITIDS (HYMENOPTERA:
ICHNEUMONIDAE) OF THE EAST ASIAN INVASIVE SPECIES
OF SAWFLY, *APROCEROS LEUCOPODA* (HYMENOPTERA:
ARGIDAE), DEFOLIATOR OF THE FIELD ELM, *ULMUS MINOR*
IN SOME DECIDUOUS FORESTS IN MOLDOVA (ROMANIA)

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In this paper we present some aspects about attack and biology of *Aproceros leucopoda* and two parasitoid species for this defoliator pest, native in the East Asia (Japan, China and the Eastern part of Russia). In Romania this defoliator pest was observed for the first time in 2005 on *Ulmus minor* Mill., but its presence was published later, in 2010 (Blank *et al.*). We obtain by rearings two new ichneumonid parasitoids species: *Itopectis maculator* (Fabricius) and *Pimpla turionellae* (L.), (Hymenoptera: Ichneumonidae: Pimplinae) for *Aproceros leucopoda*. Both ichneumonid species *Itopectis maculator* (F.) and *Pimpla turionellae* (L.) are larval parasitoids of *Aproceros leucopoda*, but its adults emerged from the pupae of the host.

Keywords: *Aproceros leucopoda*, *Ulmus*, new larval parasitoid species, new host.

INTRODUCTION

Aproceros leucopoda Takeuchi, 1939 (Hymenoptera: Argidae) is an invasive defoliator pest of the *Ulmus* genus, introduced passively in Europe. It is native from Eastern Asia: Japan (Takeuchi, 1939), Russian Far East (Zhelochovtsev, Zinoviev, 1995), China (Wen & Wei, 1998). *Aproceros leucopoda* is a monophagous or oligophagous species of the *Ulmus* genus. In Europe, this defoliator was collected for the first time in Hungary and Poland (2003), then from Romania (Dulcești, Neamț county, 2005) and Ukraine (Luhansk, 2005).

The spreading of *Aproceros leucopoda* extended in its new areal, Europe, which had enlarged. Thus, *Aproceros leucopoda* was recorded from the Republic of Moldova (Timuș *et al.*, 2008, misidentified as *Arge* sp.), Austria (Altenhofer, 2009, in Blank *et al.*, 2010), Slovakia (Blank *et al.*, 2010), Serbia (Hirka, 2010), Italy (Zandigiacomo *et al.*, 2012), Germany (Kraus *et al.*, 2012), Croatia (Matošević, 2012), European Russia (Lengesova, 2012), Slovenia (de Groot *et al.*, 2012), Czech Republic (Roques *et al.*, 2013), Serbia (Glavendekić *et al.*, 2013), Belgium (Boevé, 2014), Netherlands (Mol & Vonk, 2015), Letonia (Mihailova, 2015), Bulgaria (Doychev, 2015), Switzerland (Roques *et al.*, 2016).

The first studies on the biology and control of *Aproceros leucopoda* were made in the Eastern Asia, in China, by Wu & Xin (2006). In Europe, the new area of this invasive sawfly, the studies on the biology and ecology were made by Lengsova & Mishchenko (2013) in the Middle Volga region, Russia.

However, *Aproceros leucopoda* was recorded for the first time in Europe and in all Western Palaearctic subregions by Stephan Blank, Raoul Constantineanu, Csóka György and Hideho Hara, published in a part of the project: “Identification of the wasp pest species of plants” (2004–2010) of the German Institute of Entomology, Leibniz Center for the Agricultural Research.

Anyway, Blank *et al.* (2010) have published the first paper on the recording of the *Aproceros leucopoda* in Europe. *Aproceros leucopoda* is a parthenogenetic and a multivoltine species, with four generations in Eastern Asia. In Romania it has at least two generations per year. In Eastern Asia, the only known natural enemy of *Aproceros leucopoda* is the parasitoid *Blondelia nigripes* (Fallén, 1810) (Diptera: Tachinidae) (Blank *et al.*, 2010). Although, this parasitoid is a widespread Palaearctic species, not being recorded as a parasitoid of *Aproceros leucopoda* in Europe until now. In Romania it was recorded for the first time only the egg parasitoid, *Asecodes erxias* (Walker, 1848) (Hymenoptera: Eulophidae: Entedoninae) (Pricop *et al.*, 2012). Milka Glavendekić (2013) had recorded in Serbia the larvae of the predatory Harlequin ladybeetle, *Harmonia axyridis* (Pallas, 1773) (Coleoptera: Coccinellidae) feeding with larvae of *Aproceros leucopoda*, being the only predator known for this elm defoliator pest. Thus, in a nursery in the western part of Serbia (Šabac) she had observed a larva of *Harmonia axyridis* feeding on larvae of *A. leucopoda*.

MATERIAL AND METHODS

The field observations on the attack of *Aproceros leucopoda* and the collectings of its larvae, were made in the forests: Trușești, Botoșani county (Fig. 1), Roșcani and Gorban, Iași county. In the laboratory, the larvae of *Aproceros leucopoda* (Fig. 2) were fed with elm leaves, then they weaved a cocoon (Fig. 3), until they became pupae (Fig. 4) and adults (Fig. 5).



Fig. 1. A strong attack of *Aproceros leucopoda* with losing a substantial volume of leaves of *Ulmus minor* (Trușești forest, Botoșani county, June 2009).



Fig. 2. Larva of *Aproceros leucopoda*.

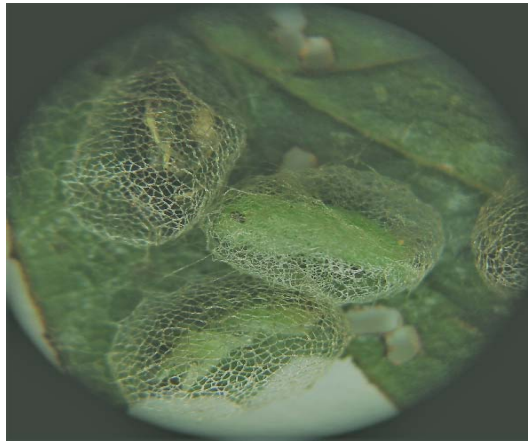


Fig. 3. Cocoons of *Aproceros leucopoda*.

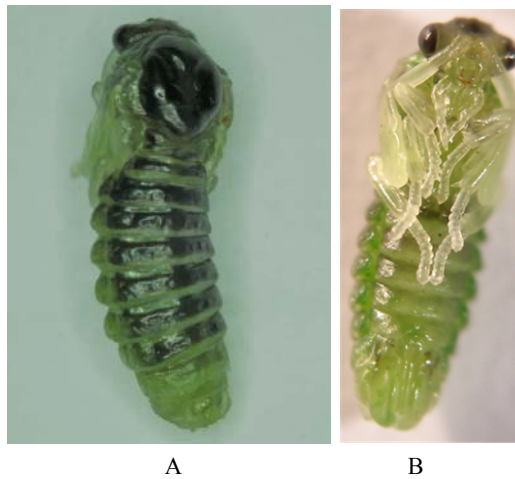


Fig. 4. The pupa of *Aproceros leucopoda*: A – dorsal view; B – ventral view.



Fig. 5. Adult of *Aproceros leucopoda*: A – on elm leaves; B – dorsal view.

RESULTS

On 8.05.2009, 200 larvae of *Aproceros leucopoda* were collected from Trușești forest, Botoșani county. On 26.05.2009 one male emerged of the ichneumonid species *Itopectis maculator* (F.), ♂ (Fig. 6).



Fig. 6. *Itopectis maculator*, ♂, emerged.

On 3.06.2008, 200 larvae of *Aproceros leucopoda* were collected from Roșcani, near Pașcani town, Iași county. In the laboratory they became pupae and from one pupa one male of the ichneumonid species *Itopectis maculator* (F.), ♂ emerged on 9.06.2008.

On 26.05.2009 200 larvae of *Aproceros leucopoda* were collected from Gorban forest, Iași county. In the laboratory they became pupae and from a pupa an ichneumonid species of *Itopectis maculator* (F.), ♂ emerged on 10.06.2009.

Itopectis maculator (F.) (Hymenoptera: Ichneumonidae: Pimplinae) (Fig. 6). The basic color of the body is black, with length of 8–10 mm. The female ovipositor is 2–5 mm length. It is a polyphagous species, its larvae parasitize over 75 species of pest insects of agriculture and forestry. It is a Holarctic species, in Romania being widespread, with large populations.

Aproceros leucopoda is a new host in science for *Itopectis maculator* (F.).

On 28.05.2008, 50 larvae of *Aproceros leucopoda* were collected from Roșcani forest, Iași county and reared in the laboratory. In the laboratory they became pupae and 1 ♀ and 1 ♂ of the ichneumonid species *Pimpla turionellae* (L.) (Fig. 7) emerged, each from a pupa of the host, on 8.06.2008.



Fig. 7. *Pimpla turionellae*, ♀ from a cocoon of *Aproceros leucopoda*.

Pimpla turionellae (L.) (Hymenoptera: Ichneumonidae: Pimplinae) (Fig. 7). The basic color of the body is black, with a length of 5–12 mm, the female with an ovipositor not outrun $\frac{1}{2}$ of the abdomen length. It is a polyphagous species, its larvae parasitize over 100 species of pest insects of agriculture and forestry. It is a Holarctic species, in Romania being widespread, with large populations. In the U.S.A., *Pimpla turionellae* (L.) was introduced in 1906 to control the gypsy moth, *Lymantria dispar* (L.). This ichneumonid parasitoid was established there. Also, *Pimpla turionellae* (L.) was introduced in 2009 and established in Central Asia to control gypsy moth, *Lymantria dispar* (L.) (Orozumbekov *et al.*, 2009).

Aproceros leucopoda is a new host in science for *Pimpla turionellae* (L.).

CONCLUSIONS

In the present paper we record two larval ichneumonid species, emerged from pupae of *Aproceros leucopoda*: *Itopectis maculator* (F.) and *Pimpla turionellae* (L.) (Hymenoptera: Ichneumonidae: Pimplinae).

Aproceros leucopoda Takeuchi is a new host in science for parasitoids *Itopectis maculator* (F.) and *Pimpla turionellae* (L.).

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