

APHIDS (HEMIPTERA: APHIDIDAE) ASSOCIATED WITH GRASSLANDS OF CENTRAL ALBORZ, IRAN

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Abstract

The aphid fauna associated with various host plants in grassland areas of central Alborz in Iran were studied. The samples were collected from 2002-2010 from different locations in the southern foothills of the Alborz Mountains which are a major highland on the plateau of Iran. Eighty aphid species from 32 genera in association with 168 host plants were collected and identified. In all, 284 aphid-host plant associations were recorded, 112 of which are new to Iran. Our results showed that grassland areas of central Alborz could be considered as major refugia for aphids from where they migrate to the neighboring cultivated fields.

KEY WORDS: Aphid fauna, Aphididae, diversity, host plant association, central Alborz, Iran

Introduction

The Alborz Mountains connect the northwest and northeast part of Iran and extend through six provinces. From the west, they stretch to Armenia, Azerbaijan and Turkey, while the eastern part ranges to neighboring mountains in Afghanistan and Turkmenistan. This mountain range reaches altitudes higher than 4500 m a.s.l. and represents a natural bio-geographical barrier. It separates two markedly different climatic and vegetation

zones at the northern extensions: a high rainfall zone with diversified vegetation in the north and a desert area in the south. On the other hand, both foothills are habitats for different types of shrubs and herbaceous plants which have an important role in soil conservation and ecological diversity. Additionally this mountain range is of economic importance in animal husbandry. Many plant species that belong to different botanical families are categorized as grasses, and form a large scale of grasslands in central Alborz.

Aphids are among the most diverse and widely dispersed insects associated with various host plants (BLACKMAN & EASTOP, 2006). Many aphid species which are considered serious pests on different cultivated plants aestivate in neighboring grassland areas (VAN EMDEN & HARRINGTON, 2007). Determination of the natural distribution and host association of the aphids is rather important in order to detect ecological refugia and to establish the conservation programs (TSCHARNTKE *et al.*, 2005). Few attempts to determine the diversity of aphids association with different host plants have been made, including the grasses, at central Alborz (REZWANI, 2001, HODJAT, 1993). Some aphid species are strictly isolated in this region (REMAUDIÈRE, 1964, REMAUDIÈRE & DAVATCHI, 1954, 1961). In addition, this area has recently been explored as part of faunistic survey on aphid parasitoids (RAKSHANI *et al.* 2005, 2006, 2007, 2008a, b; STARY *et al.*, 2000; TOMANOVIĆ *et al.*, 2007). The aphid species associated with grasslands of central Alborz are surveyed in the present study.

Material and Methods

The studied materials were selected from aphid specimens which were collected during spring and summer of 2002-2010. Samples were taken from different locations in six provinces, consisting Alborz, Guilan, Mazandaran, Qazvin, Tehran and Zanjan, which cover the area of central Alborz (Fig. 1). This area, where submountains prevail, is covered with wild grasses belonging to different botanical families.

In order to detect the presence of aphid colonies, all the parts of the host plants, including the leaves, stems, collar region, flowers, and, where possible, roots, were inspected. After aphids were detected, they were collected and carefully placed in semi-transparent rearing plastic boxes. Between 5 and 10 individuals of apterous aphids were collected and preserved in 90% ethanol and 75% lactic acid in a ratio of 2:1 (EASTOP & VAN EMDEN 1972). Aphid specimens were mounted on slides according to the method of BLACKMAN & EASTOP (2000). The host plants were labeled and herbarized for identification at a later date. The nomenclature of aphids and their host plant followed REMAUDIÈRE & REMAUDIÈRE (1997) and Holman (2009). Abbreviations of province names are as follows: AL – ALBORZ, GN – GUILAN, MA – MAZANDARAN, QA – QAZVIN, TH – TEHRAN, ZA – ZANJAN.

Results

During this study a total of 80 aphid species and 3 subspecies belonging to 4 subfamilies and 32 genera within the family Aphididae were recorded and found in association with 168 host plants. Additionally, 284 aphid-host plant associations were found, of which 112 combinations are new records to Iran.

Results of our findings during the collection period are presented in the following list of identified aphid species, their host plants and sampling data. Combinations of aphid-host plants new for Iran are indicated with an asterisk (*).

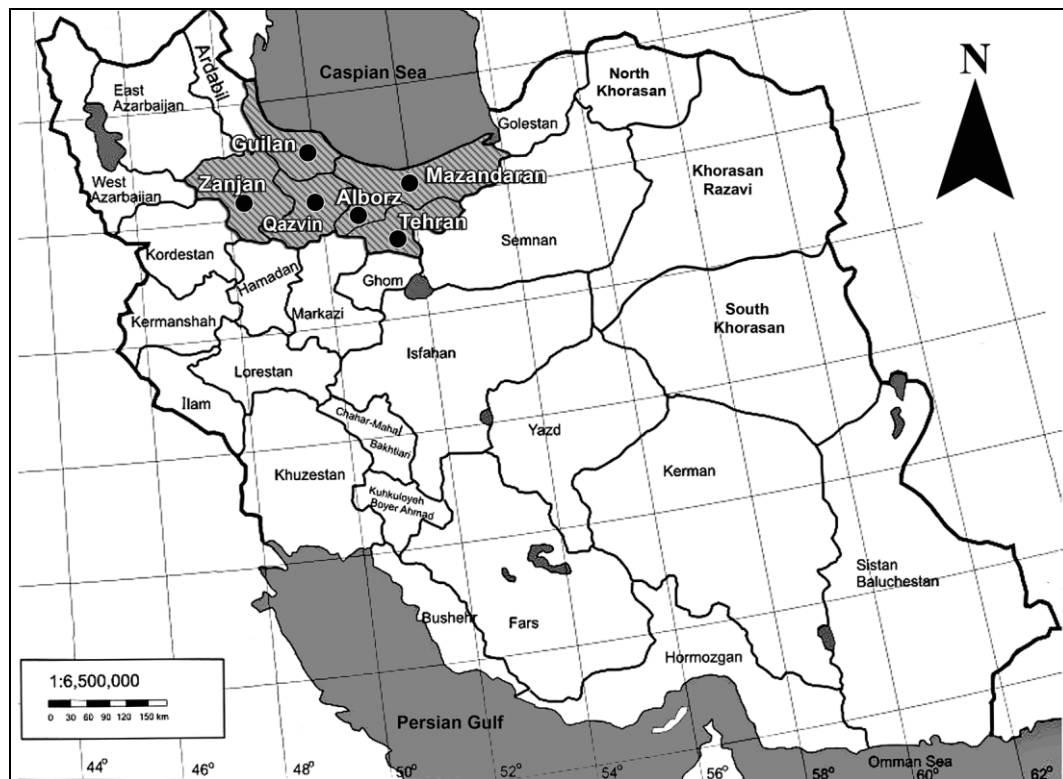


Figure 1. The map of sampling localities at central Alborz, including six provinces.

Acyrtosiphon (Acyrtosiphon) lactucae (Passerini, 1860)

Lactuca serriola (L.) Tom. (Asteraceae), 18.V 2003; AL- Shahrestanak, 16.IV 2005, AL-Karadj, 12.IV 2007; TH-Shahriar, 14.V 2009.

Acyrtosiphon (Acyrtosiphon) pisum (Harris, 1776)

Achillea millefolium L. (Asteraceae), TH-Damavand, 28.IV 2008; AL-Taleghan, 15.X 2009; *Medicago sativa* L. (Fabaceae) AL-Karadj, 12.VII 2006; *Sophora alopecuroides* L. (Fabaceae), TH-Shahriar, 02.V 2002; ZA-Aliabad, 04.X 2004; *Spartium junceum* L. (Fabaceae), QA-Abhar, 20.IV 2003; *Trifolium alexandrinum* L. (Fabaceae), AL-Eslamshahr, 25.IV 2002; *Trigonella foenum-graecum* L. (Fabaceae), AL-Karadj, 27.IV 2002; QA-Zereshk, 18.IV 2002; *Vicia pannonica* Crantz, TH-Peykanschahr, 12.VII 2004; *Vicia villosa* Roth (Fabaceae), AL-Taleghan, 14.V 2005; TH-Rodehen, 14.V 2008.

Acyrtosiphon (Acyrtosiphon) gossypii Mordvilko, 1914

Glycyrrhiza glabra L. (Fabaceae), QA-Ziaran, 20.IV 2002; AL-Karadj, 27.IV 2002, TH-Peykanschahr, 22.V 2009; 16.IV 2005; *Gossypium herbaceum* L. (Malvaceae), QA-Ardak, 19.IV 2002, ZA-Aliabad, 04.X 2004; *Malva sylvestris* L. (Malvaceae), AL- Karadj, 12.IV 2007; *Sinapis arvensis* L. (Brassicaceae), AL-Karadj,

10.IV 2004; *Sophora alopecuroides* L. (Fabaceae), TH-Shahriar, 05.V 2002; 12.IV 2006; ZA-Aliabad, 04.X 2004; *Tragopogon graminifolius* DC* (Asteraceae), AL-Shahrestanak, 16.IV 2008; *Trigonella foenum-graecum* L* (Fabaceae), QA-Zereshk, 08.X 2004, AL-Kordan, 05.XII 2004, 15.X 2006.

Amphorophora (Amphorophora) rubi (Kaltenbach, 1843)

Rubus sp. (Rosaceae), AL-Taleghan, 29.X 2004, TH-Damavand, 20.V 2009.

Anoecia (Anoecia) corni (Fabricius, 1775)

**Alopecurus pratensis* L. (Poaceae), AL-Karadj, 21.VII 2003; **Avena fatua* L. (Poaceae), AL-Kordan, 05.XII 2004; **Calamagrostis canescens* (Weber) Roth (Poaceae), ZA-Zarinabad, 16.V 2005; **Cynodon dactylon* L. (Poaceae), AL-Karadj, 21.VII 2008; **Echinochloa crus-galli* (L.) BEAUV. (Poaceae), ZA-Gilvan, 05.X 2004; AL-Shahrestanak, 24.V 2007.

Anuraphis subterranea (Walker, 1852)

Echinophora platyloba L. (Apiaceae) TH-Rodehen, 25.V 2010; *Pastinaca sativa* L. (Apiaceae), GN-Rostamabad, 03.V 2004.

Aphis (Aphis) acetosae Linnaeus, 1761

Rumex acetosa L. (Polygonaceae), AL-Karadj, 21.VII 2003; TH-Varamin, 24.IV 2006; AL-Kordan, 27.IV 2002; TH-Rodehen, 10.VII 2004; *Rumex acetosella* L. (Polygonaceae), AL-Taleghan, 29.X 2004; AL-Karadj, 25.V 2009; QA-Ziaran, 20.IV 2002; ZA-Tarom, 15.V 2005. TH-Shahriar, 27.IV 2008.

Aphis (Aphis) affinis Del Guercio, 1911

**Marrubium alternidens* Rech. F. (Lamiaceae), AL-Eslamshahr, 25.IV 2002; *Mentha longifolia* (L.) Hudson (Lamiaceae), Karadj-Mohamadshahr, 16.V 2002; AL-Karadj, Fardis Road, 18.V 2005; ZA-Zarinabad, 16.V 2005; QA-Abyek, 23.V 2002, AL-Kordan, 15.IV 2008, TH-Shahriar, 14.V 2009.

Aphis (Protaphis) anuraphoides (Nevesky, 1928)

**Onopordon acanthium* L. (Asteraceae), AL-Taleghan, 15.VII 2010.

Aphis (Aphis) craccivora Koch, 1854

Alhagi maurorum Medik. (Fabaceae), TH-Rodehen, 10.VII 2004; AL-Karadj, 13.V 2003; 10.IV 2004, 19.V 2007; *Amaranthus blitoides* Wats (Amaranthaceae), ZA-Tarom, 15.V 2005; *Amaranthus retroflexus* L. (Amaranthaceae), TH-Peykanshahr, 30.X 2004; MA-Marzanabad, 22.IV 2008; *Anagallis arvensis* L. (Primulaceae), QA-Razmian, 20.IV 2002; *Astragalus arbusculinus* Bomm. & Gauba (Fabaceae), ZA-Zarinabad, 16.V 2005; *Astragalus spinosus* (Forsk.) Muschl. (Fabaceae), TH-Damavand, 28.IV 2003, *Calamintha* sp. (Lamiaceae) AL-Shahrestanak, 24.V 2007; *Capsella bursa-pastoris* (L.) Med. (Brassicaceae), AL-Aghasht, 09.V 2002, AL-Karadj, 14.VII 2008, *Cardaria draba* (L.) Desv. (Brassicaceae), AL-Karadj, 15.V 2007; **Chamomilla recutita* (L.) Rauschert (Asteraceae), QA-Abyek, 23.V 2002; **Chanomeles japonica* (Thub) (Rosaceae), TH-Shahriar, 22.V 2010; *Chenopodium album* L. (Chenopodiaceae), AL-Karadj, 13.V 2008; **Cichorium intybus* L. (Asteraceae), ZA-Tarom, 15.V 2005; *Convolvulus arvensis* L. (Convolvulaceae), QA-Garmarud, 21.IV 2002; **Descurainia sophia* (L.) Webb Ex Prantl (Brassicaceae), AL-Eslamshahr, 25.IV 2002; AL-Kordan, 05.XII 2004; **Galium tricorutum* Dandy (Rubiaceae); AL-Aghasht, 09.V 2002; AL-Shahrestanak,

24.V 2007, *Glycyrrhiza aspera* Pall. (Fabaceae), TH-Shahriar, 02.V 2002; 12.V 2009; *Glycyrrhiza glabra* L. (Fabaceae), TH-Shahriar, 02.V 2002; **Lathyrus sativus* L. (Fabaceae), AL-Ovrazan, 25.IV 2002, AL-Taleghan, 29.X 2004; *Lotus corniculatus* L. (Fabaceae), ZA-Abhar, 08.IX 2004; **Marrubium alternidens* Rech. F. (Lamiaceae), AL-Eslamshahr, 25.IV 2002; *Medicago sativa* L. (Fabaceae), TH-Tehran, 18.V 2003; TH-Shahriar, 02.V 2002; TH-Varamin, 19.V 2003; *Melilotus officinalis* (L.) Pallas (Fabaceae), TH-Shahriar, 02.V 2002; AL-Kalvan, 25.IV 2002; QA-Razmian, 20.IV 2002; **Onobrychis viciifolia* Scop. (Fabaceae), ZA-Zarinabad, 16.V 2005; *Ononis spinosa* L. (Fabaceae), AL-Shahrestanak, 16.IV 2005; **Pittosporum undulatum* Vent. (Pittosporaceae), GN-Rudbar 7.VII 2005; *Portulaca oleracea* L. (Portulacaceae), TH-Peykanshahr, 28.V 2003; **Rumex crispus* L. (Polygonaceae); *Salsola kali* L. (Chenopodiaceae), ZA-Tashvir, 05.X 2004; **Sambucus nigra* L. (Caprifoliaceae), GN-Rostamabad 03.V 2004; **Silene vulgaris* (Moench) Garcke (Caryophyllaceae), GN-Rostamabad 4.V 2004; *Sisymbrium altissimum* L. (Brassicaceae), AL-Karadj, 10.IV 2004; *Spartium junceum* L. (Fabaceae), MA-Marzanabad, 20.III 2003; *Taraxacum officinale* Weber (Asteraceae), AL-Aghasht, 09.V 2002; *Thlaspi arvense* L. (Brassicaceae), AL-Shahrestanak, 20.III 2003; **Torilis arvensis* (Hudson) Link (Apiaceae), AL-Shahrestanak, 13.V 2003; 24.VI 2007; *Tribulus terrestris* L. (Zygophyllaceae), ZA-Aliabad, 04.X 2004; **Trifolium alexandrinum* L. (Fabaceae), AL-Eslamshahr, 25.IV 2002; *Trigonella foenum-graecum* L. (Fabaceae), QA-Zereshk, 18.IV 2002; TH-Rodehen, 22.VI 2007.

Aphis (*Aphis*) *crepidis* (Börner, 1940)

Crepis sancta (L.) Babcock (Asteraceae), ZA-Tarom, 15.V 2005.

Aphis (*Bursaphis*) *epilobii* Kaltenbach, 1843

Epilobium hirsutum L. (Onagraceae), GN-Rudbar, 04.III 2005; GN-Manjil, 12.III 2003.

Aphis (*Aphis*) *euphorbiae* Kaltenbach, 1843

Euphorbia esula L.* (Euphorbiaceae), ZA-Aliabad, 15.V 2003.

Aphis (*Aphis*) *fabae cirsiacanthoidis* Scopoli, 1763

Carduus acanthoides L. (Asteraceae), TH-Rodehen, 10.VII 2004; TH-Peykanshahr, 18.V 2003; *Cirsium arvense* (L.) Scop. (Asteraceae), TH-Shahriar; AL-Shahriar, 02.V 2002; *Cirsium vulgare* (Savi) Airy-Shaw. (Asteraceae), AL-Karadj, 10.IV 2004; AL-Taleghan, 29.X 2004; AL-Shahrestanak, 16.IV 2005; QA-Ziaran, 20.IV 2002; ZA-Aliabad, 15.V 2003; *Onopordum acanthium* L. (Asteraceae), ZA-Zarinabad, 16.V 2005; AL-Karadj, 10.IV 2004; AL-Karadj, 10.IV 2004; *Senecio vulgaris* L. (Asteraceae); GN-Manjil, 12.V 2003; MA-Veresk, 12.III 2004; AL-Taleghan, 29.X 2004; AL-Shahrestanak, 16.IV 2005.

Aphis (*Aphis*) *fabae evonymi* Fabricius, 1775

Arctium lappa L. (Asteraceae), AL-Shahrestanak, 26.X 2004.

Aphis (*Aphis*) *fabae fabae* Scopoli, 1763

Amaranthus sp. (Amaranthaceae), AL-Karadj, 22.III 2007; *Chenopodium album* L. (Chenopodiaceae), AL-Karadj, 27.IX 2004, 14.V 2007; *Papaver rhoeas* L. (Papaveraceae), QA-Zereshk, 18.IV 2002; **Plantago lanceolata* L. (Plantaginaceae), TH-Peykanshahr, 18.V 2003; *Rumex acetosa* L. (Polygonaceae), AL-Karadj, 14.V 2003; 20.IV 2006, 22.X 2008; *Rumex crispus* L.* (Polygonaceae), TH-Peykanshahr, 04.V 2002.

Aphis (Aphis) fabae solanella Theobald, 1914

**Solanum dulcamara* L. (Solanaceae), AL-Aghasht, 09.V 2002, 05.XI 2004; *Solanum nigrum* L. (Solanaceae), AL-Karadj, 5.XII 2004; 13.VI 2009. AL-Kordan, 27.IV 2002; TH-Rodehen, 10.VII 2004, 20.V 2010.

Aphis (Aphis) gerardiana Mordvilko, 1929

Euphorbia seguierana Necker (Euphorbiaceae), AL-Karadj, 13.V 2004.

Aphis (Aphis) gossypii Glover, 1877

**Abutilon theophrastii* Medic. (Malvaceae), QA-Kooshk, 22.IV 2002; *Achillea millefolium* L. (Asteraceae), ZA-Alvand, 07.V 2004, AL-Shahrestanak, 12.IV 2008; **Althaea officinalis* L. (Malvaceae), QA-Ardak, 19.IV 2002; *Anagallis arvensis* L. (Primulaceae), QA-Razmian, 20.IV 2002; *Arctium lappa* L. (Asteraceae), AL-Shahrestanak, 13.V 2003; **Cannabis sativa* L. (Cannabaceae), AL-Kordan, 05.XII 2004; **Cardaria draba* (L.) Desv. (Brassicaceae), AL-Karadj, 16.IV 2005, 20.V 2007; **Chenopodium album* L. (Chenopodiaceae), AL-Karadj, 14.V 2007, 27.IV 2009; *Datura stramonium* L. (Solanaceae), AL-Aghasht, 09.V 2002; **Dianthus barbatus* L. (Caryophyllaceae), MA-Savadkuh, 20.III 2003; **Echinops* sp. (Asteraceae), MA-Lashkan, 21.III 2003; *Galium verum* L. (Rubiaceae), MA-Parvar, 04.VII 2004; *Gossypium hirsutum* L. (Malvaceae), GN-Jouben 07.VII 2005; *Malva neglecta* Wallr. (Malvaceae), AL-Karadj, 12.VI 2008; **Peganum harmala* L. (Zygophyllaceae), ZA-Aliabad, 15.V 2003; *Rumex acetosa* L. (Polygonaceae), AL-Taleghan, 15.VII 2010.

Aphis (Aphis) idaei Van Der Goot, 1912

Rubus idaeus L. (Rosaceae), TH-Peykanschahr, 18.V 2003, 21.IV 2001; AL-Karadj, 11.XI 2004; 22.V 2007.

Aphis (Aphis) intybi Koch, 1855

Cichorium intybus L. (Asteraceae), ZA-Tarom, 15.V 2005; AL-Kordan, 27.IV 2002; AL-Taleghan, 15.VII 2010.

Aphis (Aphis) nasturtii Kaltenbach, 1843

**Anagallis arvensis* L. (Primulaceae), QA-Razmian, 20.IV 2002; **Plantago lanceolata* L. (Plantaginaceae), TH-Peykanschahr, 18.V 2003, 15.IV 2008; TH-Shahriar, 30.V 2009; AL-Aghasht, 09.V 2002; QA-Zereshk, 18.IV 2002; *Raphanus raphanistrum* L. (Brassicaceae), MA-Savadkuh, 20.III 2003; *Rumex acetosa* L. (Polygonaceae), TH-Rodehen, 15.V 2009.

Aphis (Aphis) plantaginis Goeze, 1778

Plantago lanceolata L. (Plantaginaceae), AL-Karadj, 16.IV 2005, 25.V 2007; AL-Shahrestanak, 16.IV 2005; AL-Aghasht, 09.V 2002.

Aphis (Aphis) polygonata (Nevsky, 1929)

Polygonum aviculare L. (Polygonaceae), AL-Eslamshahr, 25.IV 2002; QA-Ziaran, 20.IV 2002.

Aphis (Aphis) ruborum (Börner & Schilder, 1931)

Rubus persicus Boiss. (Rosaceae), GN-Jouben, 07.VII 2005; AL-Shahrestanak, 24.VI 2007.

Aphis (Aphis) rumicis Linnaeus, 1758

**Rheum palmatum* L. (Polygonaceae), ZA-Golchin, 16.V 2005; *Rumex acetosella* L. (Polygonaceae), QA-Ziaran, 20.IV 2002; **Rumex crispus* L. (Polygonaceae), TH-Tehran, 23.X 2004; TH-Peykanshahr, 04.V 2002, 15.V 2006.

Aphis (Aphis) sambuci Linnaeus, 1758

Sambuchus ebulus L. (Caprifoliaceae), AL-Karadj, 27.IV 2009; AL-Shahrestanak, 24.VI 2007.

Aphis (Aphis) spiraecola Patch, 1914

**Angelica archangelica* L. (Apiaceae), MA-Veresk, 12.III 2004; **Bidens bipinnata* L. (Asteraceae), MA-Karvard, 04.VII 2004; **Thalictrum minus* L. (Ranunculaceae), GN-Rudbar, 07.VII 2005.

Aphis (Aphis) umbrella (Börner, 1950)

**Althaea* sp. (Malvaceae), AL-Shahrestanak, 16.IV 2005, 24.VI 2007, AL-Hashtgerd, 23.V 2002; *Malva neglecta* Wallr. (Malvaceae), TH-Peykanshahr, 18.V 2003; **Malva sylvestris* L. (Malvaceae), TH-Shahriar, 02.V 2002; AL-Karadj, 14.V 2003, 05.V 2008.

Aphis (Aphis) verbasci Schrank, 1801

Verbascum songaricum Schrenk (Scrophulariaceae), AL-Shahrestanak, 20.III 2003; AL-Shahrestanak, 24.VI 2007; *Verbascum thapsus* L. (Scrophulariaceae), AL-Taleghan, 12.V 2004; TH-Peykanshahr, 18.V 2003.

Aulacorthum solani (Kaltenbach, 1843)

**Astragalus* sp. (Fabaceae), AL-Eslamshahr, 25.IV 2002; TH-Varamin, 22.IV 2008; *Geranium robertianum* L. (Geraniaceae); GN-Lozan, 7.V 2005; *Solanum nigrum* L. (Solanaceae); TH-Peykanshahr, 18.V 2003; QA-Zereshk, 08.X 2004; TH-Shahriar, 12.V 2010.

Brachycaudus (Acaudus) cardui (Linnaeus, 1758)

Arctium lappa L. (Asteraceae), AL-Gachsar, 13.VI 2009; **Borago officinalis* L. (Boraginaceae), AL-Karadj, 13.V 2004; *Carduus acanthoides* L. (Asteraceae); TH-Rodehen, 10.VII 2004; **Centaurea solstitialis* L. (Asteraceae), AL-Karadj, 24.V 2007; *Cirsium arvense* (L.) Scop. (Asteraceae), TH-Peykanshahr, 28.IV 2002; AL-Karadj, 15.V 2008; AL-Gachsar, 13.VI 2009; **Cirsium vulgare* (Savi) Airy-Shaw (Asteraceae), AL-Shahrestanak, 13.V 2003; AL-Kordan, 27.IV 2002; **Echium vulgare* L. (Boraginaceae), ZA-Tashvir, 05.X 2004; **Onopordum acanthium* L. (Asteraceae), ZA-Gilvan, 05.X 2004; ZA-Tarom, 15.V 2005; *Senecio vulgaris* L. (Asteraceae), TH-Firuzkuh, 10.III 2005; AL-Karadj, 14.V 2003, QA-Abyek, 23.V 2002, QA-Zereshk, 18.IV 2002; *Silybum marianum* (L.) GAERTN. (Asteraceae), ZA-Alvand, 05.X 2004.

Brachycaudus (Appelia) tragopogonis (Kaltenbach, 843)

**Scorzonera parviflora* L. (Asteraceae), AL-Karadj, 13.V 2004; *Tragopogon graminifolius* DC. (Asteraceae), TH-Shahriar, 02.V 2002; AL-Karadj, 27.IV 2002, 15.V 2006; AL-Taleghan, 29.X 2004; AL-Shahrestanak, 16.IV 2005, 24.VI 2007; *Tragopogon pratensis* L. (Asteraceae), AL-Aghasht, 09.V 2002; QA-Ziaran, 20.IV 2002.

Brachycaudus (Acaudus) persicae (Passerini, 1860)

**Ageratum* sp. (Asteraceae), QA-Zereshk, 08.X 2004.

Brachycaudus (Brachycaudus) helichrysi (Kaltenbach, 1843)

**Matricaria perforata* Mérat (Asteraceae), MA-Marzanabad, 20.III 2003; MA-Veresk, 12.III 2004; *Eupatorium cannabinum* L. (Asteraceae), GN-Rudbar 07.VII 2005; MA-Siahbisheh (Chalous Road), 22.IX 2004; *Helichrysum amenium* DC. (Asteraceae), ZA-Golchin, 16.V 2005; **Leucanthemum vulgare* L. (Asteraceae), QA-Kooshk, 22.IV 2002; *Solidago virgaurea* L. (Asteraceae), GN-Kakroud, 02.X 2004.

Brachyunguis (Brachyunguis) harmalae Das, 1918

Fagonia bruguieri DC*. (Zygophyllaceae), TH-Damavand, 10.VII 2004; *Peganum harmala* L. (Zygophyllaceae), AL-Karadj, 16.IV 2005; AL-Gachsar, 15.VII 2007; TH-Shahriar, 02.V 2002, TH-Varamin, 10.V 2008.

Brevicoryne brassicae (Linnaeus, 1758)

Alyssum alyssoides (L.) (Brassicaceae), AL-Aghasht, 09.V 2002; AL-Shahrestanak, 16.IV 2005; *Brassica nigra* (L.) Koch (Brassicaceae), ZA-Abhar, 08.IX 2004; **Capsella bursa-pastoris* (L.) MED. (Brassicaceae), MA-Veresk, 12.III 2004; GN-Lozan, 7.V 2005; ZA-Gilvan, 05.X 2004; AL-Ovrazan, 25.IV 2002; AL-Karadj, 27.IV 2009, *Descurainia sophia* (L.) Webb Ex Prantl (Brassicaceae), AL-Karadj, 13.IV 2002; TH-Rodehen, 27.III 2002; **Eruca vesicaria* (Miller) Thell. (Brassicaceae), AL-Kalvan, 25.IV 2002; ZA-Aliabad, 04.X 2004; *Raphanus raphanistrum* L. (Brassicaceae), MA-Savadkuh, 20.III 2003; **Rapistrum rugosum* (L.) ALL. (Brassicaceae), GN-Rudbar, 04.III 2005; *Sinapis arvensis* L. (Brassicaceae), AL-Karadj, 21.VII 2003; AL-Kordan, 05.XII 2004; *Sisymbrium irio* L. (Brassicaceae), AL-Shahrestanak, 12.XI 2004; 16.IV 2005, 24.VI 2007.

Cavariella (Cavariella) aegopodii (Scopoli, 1763)

**Ammi majus* L. (Apiaceae), TH-Peykanshahr, 18.V 2003; AL-Aghasht, 09.V 2002; **Angelica archangelica* L. (Apiaceae), AL-Aghasht, 09.V 2002; **Levisticum officinale* Koch (Apiaceae), AL-Shahrestanak, 13.V 2003; MA-Lashkan, 21.III 2003.

Cavariella (Cavariella) theobaldi (Gillette & Bragg, 1918)

Heracleum persicum Desf. ex Fischer (Apiaceae), MA-Veresk, 12.III 2004.

Coloradoa achilleae Hille Ris Lambers, 1939

Achillea melliefolium L., ZA-Alvand, 22.III 2004, 07.IX 2007.

Diuraphis (Diuraphis) noxia (Kurdjumov, 1913)

**Agropyron repens* (L.) Benuv. (Poaceae), QA-Garmarud, 21.IV 2002; QA-Ziaran, 20.IV 2002; AL-Karadj, 18.IX 2004; *Avena fatua* L. (Poaceae), AL-Karadj, 12.VII 2009; *Bromus tectorum* L. (Poaceae), TH-Shahriar, 12.VI 2010; *Cynodon dactylon* L. (Poaceae), AL-Gachsar, 20.III 2008; *Digitaria sanguinalis* (L.) Scop. (Poaceae), AL-Vamkuh, 25.IV 2002; *Echinochloa crus-galli* (L.) Beauv. (Poaceae), ZA-Gilvan, 05.X 2004, AL-Shahrestanak, 16.IV 2005; **Hordeum murinum* L. (Poaceae), AL-Hashtgerd, 23.V 2002; *Secale cereale* L. (Poaceae), AL-Eslamshahr, 25.IV 2002; AL-Taleghan, 29.X 2004.

Dysaphis (Dysaphis) apiifolia (Börner, 1950)

**Angelica archangelica* L. (Apiaceae), MA-Veresk, 12.III 2004.

Dysaphis (Cotoneasteria) microsiphon (Nevsky, 1929)

Mentha sylvestris L. (Malvaceae), AL-Shahrestanak, 13.V 2008.

Dysaphis (Pomaphis) plantaginea (Passerini, 1860)

Plantago lanceolata L. (Plantaginaceae), MA-Savadkuh, 20.III 2003.

Dysaphis (Pomaphis) pyri (Boyer de Fonscolombe, 1841)

**Asperula glomerata* (Bieb.) Griseb (Rubiaceae), QA-Razmian, 20.IV 2002; **Galium verum* L. (Rubiaceae), MA-Parvar, 4.VII 2004.

Dysaphis (Dysaphis) radicola (Mordvilko, 1879)

**Rumex crispus* L. (Polygonaceae), AL-Shahrestanak, 24.VI 2007.

Dysaphis (Dysaphis) tulipae (Boyer de Fonscolombe, 1841)

Iris sp. (Iridaceae), AL-Karadj, 22.VI 2008.

Eucarazzia elegans (Ferrari, 1872)

**Lavandula angustifolia* Miller (Lamiaceae), ZA-Abhar, 14.V 2003; GN-Rostamabad 03.V 2004; *Salvia officinalis* L. (Lamiaceae), AL-Shahrestanak, 24.VI 2007.

Hayhurstia atriplicis (Linnaeus, 1761)

Atriplex hortense L. (Chenopodiaceae), AL-Shahrestanak, 24.VI 2007; *Chenopodium album* L. (Chenopodiaceae), TH-Rodehen, 10.VII 2004; TH-Damavand, 14.VII 2007; TH-Shahriar, 02.V 2002, AL-Karadj, 14.V 2003, 30.VI 2008.

Hyadaphis foeniculi (Passerini, 1860)

Ammi majus L. (Apiaceae), TH-Peykanschahr, 09.III 2005; **Angelica archangelica* L. (Apiaceae), MA-Veresk, 12.III 2004; AL-Karadj, 16.IV 2005; *Torilis arvensis* (Huds) link (Apiaceae), AL-Taleghan, 15.VII 2010.

Hyalopterus pruni (Geoffroy, 1762)

Aruno donax L. (Poaceae), AL-Asara (Chalous road), 26.VI 2008, TH-Shahriar, 02.V 2007.

Hyperomyzus (Hyperomyzus) lactucae (Linnaeus, 1758)

**Cirsium arvense* (L.) Scop. (Asteraceae), TH-Shahriar, 02.V 2002, 14.V 2006; AL-Karadj, 13.V 2004; *Lactuca serriola* (L.) Tom. (Asteraceae), TH-Pekanschahr, 14.III 2003; **Launaea arborescens* (Batt.) Murb. (Asteraceae); QA-Abyek, 23.V 2002; QA-Garmarud, 21.IV 2002; *Sonchus asper* (L.) Hill (Asteraceae), QA-Zereshk, 18.IV 2002; MA-Shoorakchal, 12.III 2004. AL-Kordan, 25.XI 2007.

Lipaphis (Lipaphidiella) lepidii (Nevsky, 1929)

Cardaria draba (L.) Desv. (Brassicaceae), AL-Karadj (Mardabad), 03.V 2003; AL-Gachsar, 24.VI 2007; GN-Rudbar, 7.VII 2005; AL-Aghasht, 09.V 2002; *Lepidium latifolium* L. (Brassicaceae), TH-Tehran, 10.V 2009; *Sisymbrium officinale* (L.) Scop. (Brassicaceae), AL-Karadj, 16.IV 2005, 15.V 2008; **Thlaspi arvense* L. (Brassicaceae), AL-Aghasht, 09.V 2002.

Lipaphis (Lipaphis) erysimi (Kaltenbach, 1843)

Brassica nigra (L.) Koch (Brassicaceae), ZA-Abhar, 08.IX 2004; *Capsella bursa-pastoris* (L.) MED. (Brassicaceae), TH-Shahriar, 02.V 2002; AL-Karadj, 21.VII 2003, 15.V 2008; *Descurainia sophia* (L.) Webb ex Prantl (Brassicaceae), AL-Kordan, 05.XII 2004.

Lipaphis (Lipaphis) fritzmulleri Börner, 1950

Sisymbrium irio L. (Brassicaceae), TH-Tehran, 27.V 2004.

Macrosiphoniella (Macrosiphoniella) abrotani (Walker, 1852)

**Achillea millefolium* L. (Asteraceae), AL-Shahrestanak, 24.VI 2007; *Artemisia annua* L. (Asteraceae), GN-Rostamabad, 09.V 2005.

Macrosiphoniella (Macrosiphoniella) artemisiae (Boyer de Fonscolombe, 1841)

Artemisia absinthium L. (Asteraceae), GN-Rostamabad, 09.V 2005; *Artemisia vulgaris* L. (Asteraceae), GN-Rostamabad 03.V 2004.

Macrosiphoniella (Macrosiphoniella) helichrysi Remaudière, 1952

**Artemisia vulgaris* L. (Asteraceae), GN-Jouben 07.VII 2005; **Helichrysum oligocephalum* DC. (Asteraceae), GN-Lozan, 07.V 2005.

Macrosiphoniella (Papillomyzus) tuberculata (Nevsky, 1928)

Picnomon acarna (L.) Cass. (Asteraceae), GN-Rostamabad 03.V 2004.

Macrosiphoniella (Macrosiphoniella) tanacetaria (Kaltenbach, 1843)

Tanacetum polycephalum Schultz-Bip. (Acetereace), ZA-Alvand, 16.V 2005.

Macrosiphum euphorbiae (Thomas, 1878)

**Achillea millefolium* L. (Asteraceae), ZA-Alvand, 07.V 2004; *Aconitum* sp. (Ranunculaceae), GN-Manjil, 06.VII 2005; **Amaranthus blitoides* Wats (Amaranthaceae), ZA-Tarom, 15.V 2005; **Anagallis arvensis* L. (Primulaceae), QA-Razmian, 20.IV 2002; **Atriplex* sp. (Chenopodiaceae), MA-Savadkuh, 20.III 2003; *Malva sylvestris* L. (Malvaceae), AL-Karadj, 14.V 2007.

Melanaphis donacis (Passerini, 1862)

Arundo donax L. (Poaceae), AL-Shahrestanak, 13.V 2003, 24.VI 2007; **Phragmites australis* (Cav.) Trin. ex Steudel (Poaceae), QA-Abyek, 23.V 2002.

Melanaphis sacchari (Zehntner, 1897)

Echinochloa crus-galli (L.) Beauv. (Poaceae), ZA-Gilvan, 05.X 2004, ZA-Aliabad, 15.V 2003.

Metopolophium dirhodum (Walker, 1849)

Avena fatua L. (Poaceae), AL-Nazarabad, 30.VI 2010; **Aegilops crassa* Boiss. (Poaceae), QA-Kooshk, 08.X 2004; **Agropyron repens* (L.) P. Beauv. (Poaceae), QA-Ziaran, 20.IV 2002; *Alopecurus pratensis* L. (Poaceae), ZA-Alvand, 05.X 2004; *Bromus tectorum* L. (Poaceae), AL-Karadj, 27.IV 2002, 19.V 2007; TH-Peykanschahr, 18.V 2003; QA-Abyek, 23.V 2002; **Festuca ovina* L. (Poaceae), ZA-Zarinabad, 16.V 2005; **Zinnia elegans* Jacq. (Asteraceae), AL-Karadj, 15.V 2008.

Microlophium carnosum (Bockton, 1876)

Urtica dioica L. (Urticaceae), TH-Firuzkooh, 24.IX.2009; TH-Rodehen, 22.IV 2008.

Myzus (Sciamyzus) ascalonicus Doncaster, 1946

**Conyza canadensis* (L.) Cronq. (Asteraceae), TH-Firuzkooh, 17.IX 2009; **Epilobium hirsutum* L. (Onagraceae), GN-Rudbar, 04.III 2005.

Myzus (Nectarosiphon) certus (Walker, 1849)

**Anagallis arvensis* L. (Primulaceae), AL-Shahrestanak, 13.V 2003; *Cardaria draba* (L.) Desv. (Brassicaceae), AL-Karadj, 15.IV 2010.

Myzus (Nectarosiphon) persicae (Sulzer, 1776)

Abutilon theophrastii Medic. (Malvaceae), QA-Kooshk, 22.IV 2002; **Achillea millefolium* L. (Asteraceae), AL-Shahrestanak, 20.III 2003, 15.VI 2007, *Amaranthus retroflexus* L. (Amaranthaceae), TH-Peykanschahr, 22.V 2003, AL-Karadj, 22.III 2009; **Ammi majus* L. (Apiaceae), AL-Aghasht, 09.V 2002; **Cannabis sativa* L. (Cannabaceae), AL-Ovrazan, 25.IV 2002; *Caryophila* sp., TH-Tehran, 02.V 2007; TH-Peykanschahr, 18.V 2003; *Chenopodium album* L. (Chenopodiaceae), AL-Kordan, 05.XII 2004; AL-Nazarabad, 17.VI 2008; *Convolvulus arvensis* L. (Convolvulaceae), QA-Gamarud, 21.IV 2002; *Datura stramonium* L. (Solanaceae), AL-Karadj, 16.IV 2005; *Dianthus caryophyllus* L. (Caryophyllaceae), ZA-Golchin, 16.V 2005; *Malva neglecta* Wallr. (Malvaceae), TH-Peykanschahr, 26.IV 2002; *Spergula arvensis* L. (Caryophyllaceae), Tehran-Peykanschahr, 18.V 2003; *Taraxacum officinale* Weber (Asteraceae), AL-Aghasht, 09.V 2002; *Thalictrum minus* L. (Ranunculaceae), GN-Rudbar 7.VII 2005; **Veronica persica* Poirlet (Scrophulariaceae), ZA-Abhar, 14.V 2003; **Withania somnifera* (L.) Dunal (Solanaceae), MA-Dinarkuh (Haraz Road), 19.III 2003.

Ovatus crataegarius (Walker, 1850)

**Mentha Longifolia* (L.) Hudson (Lamiaceae), TH-Firuzkooh, 17.IX 2009; AL-Taleghan, 15.VII 2010.

Rhopalosiphum maidis (Fitch, 1856)

Avena sativa L. (Poaceae), ZA-Aliabad, 15.V 2003; *Echinochloa crus-galli* (L.) Beauv. (Poaceae), ZA-Gilvan, 05.X 2004; *Sorghum* sp. (Poaceae), ZA-Tarom, 15.V 2005. AL-Taleghan, 15.VII 2010.

Rhopalosiphum nymphaeae (Linnaeus, 1761)

**Plantago lanceolata* L. (Plantaginaceae), TH-Damavand, 10.VII 2009; TH-Varamin, 22.IV 2008.

Rhopalosiphum padi (Linnaeus, 1758)

**Aeluropus littoralis* (Gouan) Parl. (Poaceae), QA-Kooshk, 22.IV 2002; **Alopecurus pratensis* L. (Poaceae), QA-Zereshk, 18.IV 2002; *Avena fatua* L. (Poaceae), AL-Kordan, 5.XII 2004; AL-Shahrestanak, 16.IV 2005, 24.V 2008; *Bromus tectorum* L. (Poaceae), AL-Karadj, 27.IV 2002, 15.V 2007; QA-Abyek, 23.V 2002; *Dactylis glomerata* L. (Poaceae), QA-Garmarud, 21.IV 2002; **Festuca ovina* L. (Poaceae), ZA-Zarinabad, 16.V 2005; QA-Zereshk, 18.IV 2002; **Hordeum murinum* L. (Poaceae), AL-Hashtgerd, 23.V 2002; *Zea mays* L. (Poaceae), AL-Karadj, 24.V 2007.

Schizaphis (*Schizaphis*) *graminum* (Rondan, 1847)

Bromus tectorum L. (Poaceae), TH-Peykanschahr, 12.VII 2004; AL-Karadj, 27.IV 2002; **Digitaria sanguinalis* (L.) Scop. (Poaceae), AL-Vamkuh, 25.IV 2002; *Setaria viridis* (L.) Beauv. (Poaceae), AL-Nazarabad, 21.III 2009; *Sorghum halepense* (L.) Pers. (Poaceae), AL-Taleghan, 15.VII 2010.

Sipha (*Rungisia*) *elegans* del Guercio, 1905

Avena sativa L. AL-Karadj, 12.IV 2007; *Bromus sterilis* L. (Poaceae), AL-Eslamshahr, 25.IV 2002.

Sipha (*Rungisia*) *maydis* Passerini, 1860

**Aeluropus littoralis* (Gouan) Parl. (Poaceae), TH-Damavand, 10.VII 2004; QA-Kooshk, 22.IV 2002; **Agrostis stolonifera* L. (Poaceae), AL-Taleghan, 29.X 2004; *Cynodon dactylon* L. (Poaceae), AL-Taleghan, 29.X 2004, 30.VI 2009.

Sitobion (*Sitobion*) *avenae* (Fabricius, 1775)

Dactylis glomerata L. (Poaceae), MA-Marzanabad, 22.IV 2008; **Paspalum dilatatum* Poir. (Poaceae), AL-Shahrestanak, 13.V 2003; **Setaria pumila* (Poiret) Roem. & Schult. (Poaceae), QA-Kooshk, 22.IV 2002.

Sitobion (*Sitobion*) *fragariae* (Walker, 1848)

**Avena fatua* L. (Poaceae), MA-Parvar, 04.VII 2004; **Bromus tectorum* L. (Poaceae), AL-Shahrestanak, 24.VI 2007.

Therioaphis (*Rhizoberlesia*) *riehmi* (Börner, 1949)

**Medicago orbicularis* (L.) Barta (Fabaceae), GN-Lozan, 07.V 2005.

Uroleucon (*Uroleucon*) *chondrillae* (Nevsky, 1929)

Chondrilla juncea L. (Asteraceae), TH-Tehran, 04.X 2002, ZA-Zarinabad, 16.IV 2005; TH-Taleghan, 22.VII 2007.

Uroleucon (*Uroleucon*) *cichorii* (Koch, 1855)

Cichorium intybus L. (Asteraceae), TH-Rodehen, 22.IV 2004, QA-Abyek, 23.V 2006; *Tragopogon graminifolius* DC (Asteraceae), AL-Karadj, 27.IV 2002, TH-Damavand, 18.V 2009.

Uroleucon (*Lambertius*) *erigeronense* (Thomas, 1878)

Conyza canadensis (L.) Cronq. (Asteraceae), TH-Firuzkooh, 17.IX 2005; TH-Rodehen, 15.VI 2008.

Uroleucon (Uromelan) jaceae (Linnaeus, 1758)

Acroptilon repens (L.) DC. (Asteraceae), ZA-Abhar, 10.IX 2004; *Carduus acanthoides* L. (Asteraceae), TH-Rodehen, 10.VII 2004; *Centaurea depressa* M. Bieb. (Asteraceae), AL-Karadj, 16.IV 2005, 25.V 2007; **Centaurea solstitialis* L. (Asteraceae), MA-Savadkuh, 20.III 2003; **Tragopogon pratensis* L. (Asteraceae), AL-Aghasht, 09.V 2002; TH-Peykanschahr, 09.III 2004; AL-Taleghan, 29.X 2010.

Uroleucon (Uroleucon) sonchi (Linnaeus, 1767)

**Crepis sancta* L. (Asteraceae), ZA-Tarom, 15.V 2005; AL-Karadj, 14.V 2008; *Lactuca serriola* (L.) TORN. (Asteraceae), TH-Peykanschahr, 14.III 2003; **Launaea arborescens* (Batt.) Murb. (Asteraceae), AL-Ovrazan, 25.IV 2002; **Senecio vulgaris* L. (Asteraceae), ZA-Tarom, 15.V 2005; MA-Karvard, 04.VII 2004; *Sonchus arvensis* L. (Asteraceae), AL-Karadj, 25.IV 2002; TH-Damavand, 15.V 2007, *Sonchus asper* (L.) Hill (Asteraceae), TH-Shahriar, 02.V 2002, 19.V 2006.

Discussion

As a result of this study we documented 80 aphid species comprising 4 subfamilies and 32 genera (Tab. I). The largest subfamily Aphidinae is composed of 76 species and 29 genera. Within the subfamilies Anoecinae, Chaitophorinae and Myzocallidinae only one genus was present. The most common genus was *Aphis* represented by 21 species, followed by *Dysaphis* (6), *Macrosiphoniella* (5) and *Uroleucon* (5). It was also recorded that the most common hosts for aphids in grasslands are represented by family Asteraceae (46 species), followed by Poaceae (25) and Fabaceae (19). Among host plants, the highest number of species was recorded on *Achillea millefolium* and *Anagallis arvensis* (6), followed by *Chenopodium album*, *Plantago lanceolata*, *Avena fatua*, and *Bromus tectorum* (5).

In general, a diverse complex of aphids detected in association with grasslands of central Alborz, among which many species are of economic importance: *A. pisum*, *A. craccivora*, *A. fabae*, *A. gossypii*, *A. idaei*, *A. ruborum*, *A. nasturti*, *A. spiraecola*, *A. solani*, *B. cardui*, *B. helichrysi*, *B. brassicae*, *D. pyri*, *H. pruni*, *M. euphorbiae*, *M. persicae*, *R. padi*, *S. graminum* and *S. avenae*. It was also found that three aphid species (*Aphis craccivora*, *Aphis gossypii* and *Myzus persicae*) showed a wide host range pattern.

The majority of aphids in all four subfamilies were detected to be specific to certain host plants. Patterns of host specificity for aphids are known as one of the most important biological characters used to identify species (BLACKMAN & EASTOP, 2000, 2006, DIXON, 1998). A considerable number of plants were in association with more than one single aphid species, which include both specific and generalist species. In this respect, higher diversity of the host plants can directly contribute to diversity of associated aphids. The host plants which belong to the family Poaceae, as one of the major components of grassland vegetations, were associated with various aphid species. Some of the detected species (*D. noxia*, *M. dirhodum*, *R. padi*, *S. avenae* and *S. graminum*) are considered as serious pests on cultivated cereals (RAKHSHANI *et al.*, 2008).

Many species of the genus *Dysaphis* Börner were found in association with different host plants. Some of them, like *Dysaphis plantaginea* and *Dysaphis pyri*, are considered as serious pests of some fruit orchards (RADJABI, 1989; RAKHSHANI, 2012) and inhabit grasses as the secondary host plants. In the same way the population of certain aphid species (*B. cardui*, *B. helichrysi*, *H. pruni* and *M. persicae*) relocate from grassland areas into the neighboring fruit orchards.

Table I. Subfamilies, genera and number of the found species in central Alborz

Subfamily	Genus	Number of species
Anoeciinae	<i>Anoecia</i>	1
Aphidinae	<i>Acyrtosiphon</i>	3
	<i>Amphorophora</i>	1
	<i>Anuraphis</i>	1
	<i>Aphis</i>	21
	<i>Aulacorthum</i>	1
	<i>Brachycaudus</i>	4
	<i>Brachyunguis</i>	1
	<i>Brevicoryne</i>	1
	<i>Cavariella</i>	2
	<i>Coloradoa</i>	1
	<i>Diuraphis</i>	1
	<i>Dysaphis</i>	6
	<i>Eucarazzia</i>	1
	<i>Hayhurstia</i>	1
	<i>Hyadaphis</i>	1
	<i>Hyalopterus</i>	1
	<i>Hyperomyzus</i>	1
	<i>Lipaphis</i>	3
	<i>Macrosiphoniella</i>	5
	<i>Macrosiphum</i>	1
	<i>Melanaphis</i>	2
	<i>Metopolophium</i>	1
	<i>Microlophium</i>	1
	<i>Myzus</i>	3
	<i>Ovatus</i>	1
	<i>Rhopalosiphum</i>	3
	<i>Schizaphis</i>	1
<i>Sitobion</i>	2	
<i>Uroleucon</i>	5	
Chaitophorinae	<i>Sipha</i>	2
Myzocallidinae	<i>Therioaphis</i>	1
Σ	4 subfamilies 32 genera	80 species

Generally, besides their role as natural habitat (RAKSHANI *et al.* 2005, 2006, 2007, 2008a, b; STARÝ *et al.*, 2000; TOMANOVIĆ *et al.*, 2007), the grassland areas of central Alborz can be considered as the major refugia of both aphids and their parasitoid. According to STARÝ (1988), aphids migrate to the neighboring fields of the cultivated host plant and can also spread the internal parasitoids. This value of such an ecological

consequence had been discussed by several authors (STARÝ 1986a; KAVALLIERATOS *et al.*, 2002, HAVELKA *et al.* 2012).

List of host plants and associated aphids

Amaranthaceae

Amaranthus blitoides: *Aphis craccivora*, *Macrosiphum euphorbiae*

Amaranthus retroflexus: *Aphis craccivora*, *Myzus persicae*

Amaranthus sp.: *Aphis fabae fabae*

Apiaceae

Ammi majus: *Cavariella aegopodii*, *Hyadaphis foeniculi*, *Myzus persicae*

Angelica archangelica: *Cavariella aegopodii*, *Dysaphis apiifolia*, *Hyadaphis foeniculi*

Echinophora platyloba: *Anuraphis subterranea*

Heracleum persicum: *Cavariella theobaldi*

Levisticum officinale: *Cavariella aegopodii*

Pastinaca sativa: *Anuraphis subterranea*

Torilis arvensis: *Aphis craccivora*, *Hyadaphis foeniculi*

Asteraceae

Achillea millefolium: *Acyrtosiphon pisum*, *Aphis gossypii*, *Coloradoa achilleae*, *Macrosiphoniella abrotani*, *Macrosiphum euphorbiae*, *Myzus persicae*

Acroptilon repens: *Uroleucon jaceae*

Ageratum sp.: *Brachycaudus persicae*

Arctium lappa: *Aphis fabae evonymi*, *Aphis gossypii*, *Brachycaudus cardui*

Artemisia absinthium: *Macrosiphoniella artemisiae*

Artemisia annua: *Macrosiphoniella abrotani*

Artemisia vulgaris: *Macrosiphoniella artemisiae*, *Macrosiphoniella helichrysi*

Bidens bipinnata: *Aphis spiraecola*

Carduus acanthoides: *Aphis fabae cirsiiacanthoidis*, *Brachycaudus cardui*, *Uroleucon jaceae*

Centaurea depressa: *Uroleucon jaceae*

Centaurea solstitialis: *Uroleucon jaceae*

Chamomilla recutita: *Aphis craccivora*

Matricaria perforata: *Brachycaudus helichrysi*

Chondrilla juncea: *Uroleucon chondrillae*

Cichorium intybus: *Aphis craccivora*, *Aphis intybi*, *Uroleucon cichorii*

Cirsium arvense: *Aphis fabae cirsiiacanthoidis*, *Brachycaudus cardui*, *Hyperomyzus lactucae*

Cirsium vulgare: *Aphis fabae cirsiiacanthoidis*, *Brachycaudus cardui*

Conyza canadensis: *Myzus ascalonicus*, *Uroleucon erigeronense*

Crepis sancta: *Aphis crepidis*, *Uroleucon sonchi*

Echinops sp.: *Aphis gossypii*

Eupatorium cannabinum: *Brachycaudus helichrysi*

Helichrysum armenium: *Brachycaudus helichrysi*

Helichrysum oligocephalum: *Macrosiphoniella helichrysi*

Lactuca serriola: *Acyrtosiphon lactucae*, *Hyperomyzus lactucae*, *Uroleucon sonchi*
Launaea arborescens: *Hyperomyzus lactucae*, *Uroleucon sonchi*
Leucanthemum vulgare: *Brachycaudus helichrysi*
Onopordum acanthium: *Aphis anuraphoides*, *Aphis fabae cirsiacanthoidis*, *Brachycaudus cardui*
Picnomon acarna: *Macrosiphoniella tuberculata*
Scorzonera parviflora: *Brachycaudus tragopogonis*
Senecio vulgaris: *Aphis fabae cirsiacanthoidis*, *Brachycaudus cardui*, *Uroleucon sonchi*
Silybum marianum: *Brachycaudus cardui*
Solidago virgaurea: *Brachycaudus helichrysi*
Sonchus arvensis: *Uroleucon sonchi*
Sonchus asper: *Hyperomyzus lactucae*, *Uroleucon sonchi*
Tanacetum polycephalum: *Macrosiphoniella tanacetaria*
Taraxacum officinale: *Aphis craccivora*, *Myzus persicae*
Tragopogon graminifolius: *Acyrtosiphon gossypii*, *Brachycaudus tragopogonis*, *Uroleucon cichorii*
Tragopogon pratensis: *Brachycaudus tragopogonis*, *Uroleucon jaceae*
Zinnia elegans: *Metopolophium dirhodum*

Boraginaceae

Echium vulgare: *Brachycaudus cardui*
Borago officinalis: *Brachycaudus cardui*

Brassicaceae

Alyssum alyssoides: *Brevicoryne brassicae*
Brassica nigra: *Brevicoryne brassicae*, *Lipaphis erysimi*
Capsella bursa-pastoris: *Aphis craccivora*, *Brevicoryne brassicae*, *Lipaphis erysimi*
Cardaria draba: *Aphis craccivora*, *Aphis gossypii*, *Lipaphis lepidii*, *Myzus certus*
Descurainia sophia: *Aphis craccivora*, *Brevicoryne brassicae*, *Lipaphis erysimi*
Eruca vesicaria: *Brevicoryne brassicae*
Lepidium latifolium: *Lipaphis lepidii*
Raphanus raphanistrum: *Aphis nasturtii*, *Brevicoryne brassicae*
Rapistrum rugosum: *Brevicoryne brassicae*
Sinapis arvensis: *Acyrtosiphon gossypii*, *Brevicoryne brassicae*
Sisymbrium altissimum: *Aphis craccivora*
Sisymbrium irio: *Brevicoryne brassicae*, *Lipaphis fritzmulleri*
Sisymbrium officinale: *Lipaphis lepidii*
Thlaspi arvense: *Aphis craccivora*, *Lipaphis lepidii*

Cannabaceae

Cannabis sativa: *Aphis gossypii*, *Myzus persicae*

Caprifoliaceae

Sambachus ebulus: *Aphis sambuci*
Sambucus nigra: *Aphis craccivora*

Caryophyllaceae

Caryophila sp.: *Myzus persicae*

Dianthus barbatus: *Aphis gossypii*, *Myzus persicae*

Dianthus caryophyllus: *Myzus persicae*

Silene vulgaris: *Aphis craccivora*

Spergula arvensis: *Myzus persicae*

Chenopodiaceae

Atriplex hortense: *Hayhurstia atriplicis*

Atriplex sp.: *Macrosiphum euphorbiae*

Chenopodium album: *Aphis craccivora*, *Aphis fabae fabae*, *Aphis gossypii*, *Hayhurstia atriplicis*, *Myzus persicae*

Salsola kali: *Aphis craccivora*

Convolvulaceae

Convolvulus arvensis: *Aphis craccivora*, *Myzus persicae*

Euphorbiaceae

Euphorbia esula: *Aphis euphorbiae*

Euphorbia seguierana: *Aphis gerardiana*

Fabaceae

Alhagi maurorum: *Aphis craccivora*

Astragalus arbusculus: *Aphis craccivora*

Astragalus sp.: *Aulacorthum solani*

Astragalus spinosus: *Aphis craccivora*

Glycyrrhiza aspera: *Aphis craccivora*

Glycyrrhiza glabra: *Acyrtosiphon gossypii*, *Aphis craccivora*

Lathyrus sativus: *Aphis craccivora*

Lotus corniculatus: *Aphis craccivora*

Medicago orbicularis: *Therioaphis riehmi*

Medicago sativa: *Aphis craccivora*

Melilotus officinalis: *Aphis craccivora*

Onobrychis viciifolia: *Aphis craccivora*

Ononis spinosa: *Aphis craccivora*

Sophora alopecuroides: *Acyrtosiphon pisum*, *Acyrtosiphon gossypii*

Spartium junceum: *Acyrtosiphon pisum*, *Aphis craccivora*

Trifolium alexandrinum: *Acyrtosiphon pisum*, *Aphis craccivora*

Trigonella foenum-graecum: *Acyrtosiphon pisum*, *Acyrtosiphon gossypii*, *Aphis craccivora*

Vicia pannonica: *Acyrtosiphon pisum*

Vicia villosa: *Acyrtosiphon pisum*

Geraniaceae

Geranium robertianum: *Aulacorthum solani*

Iridaceae

Iris sp.: *Dysaphis tulipae*

Lamiaceae

Calamintha sp.: *Aphis craccivora*

Lavandula angustifolia: *Eucarazzia elegans*

Marrubium alternidens: *Aphis affinis*, *Aphis craccivora*

Mentha longifolia: *Aphis affinis*, *Ovatus crataegarius*

Salvia officinalis: *Eucarazzia elegans*

Malvaceae

Althaea officinalis: *Aphis gossypii*

Althaea officinalis: *Aphis umbrella*

Abutilon theophrastii: *Aphis gossypii*, *Myzus persicae*

Gossypium herbaceum: *Acyrtosiphon gossypii*

Gossypium hirsutum: *Aphis gossypii*

Malva neglecta: *Aphis gossypii*, *Aphis umbrella*, *Myzus persicae*

Malva sylvestris: *Acyrtosiphon gossypii*, *Aphis umbrella*, *Dysaphis microsiphon*, *Macrosiphum euphorbiae*

Onagraceae

Epilobium hirsutum: *Aphis epilobii*, *Myzus ascalonicus*

Papaveraceae

Papaver rhoeas: *Aphis fabae fabae*

Pittosporaceae

Pittosporum undulatum: *Aphis craccivora*

Plantaginaceae

Plantago lanceolata: *Aphis fabae fabae*, *Aphis nasturtii*, *Aphis plantaginis*, *Dysaphis plantaginea*, *Rhopalosiphum nymphaeae*

Poaceae

Aegilops crassa: *Metopolophium dirhodum*

Aeluropus littoralis: *Rhopalosiphum padi*, *Sipha maydis*

Agropyron repens: *Diuraphis noxia*, *Metopolophium dirhodum*

Agrostis stolonifera: *Sipha maydis*

Alopecurus pratensis: *Anoecia corni*, *Metopolophium dirhodum*, *Rhopalosiphum padi*

Arundo donax: *Hyalopterus pruni*, *Melanaphis donacis*

Avena fatua: *Anoecia corni*, *Diuraphis noxia*, *Metopolophium dirhodum*, *Rhopalosiphum padi*, *Sitobion fragariae*

Avena sativa: *Rhopalosiphum maidis*, *Sipha elegans*

Bromus sterilis: *Sipha elegans*

Bromus tectorum: *Diuraphis noxia*, *Metopolophium dirhodum*, *Rhopalosiphum padi*, *Schizaphis graminum*, *Sitobion fragariae*

Calamagrostis canescens: *Anoecia corni*

Cynodon dactylon: *Anoecia corni*, *Diuraphis noxia*, *Sipha maydis*

Dactylis glomerata: *Rhopalosiphum padi*, *Sitobion avenae*

Digitaria sanguinalis: *Schizaphis graminum*

Echinochloa crus-galli: *Anoecia corni*, *Diuraphis noxia*, *Melanaphis sacchari*, *Rhopalosiphum maidis*

Festuca ovina: *Metopolophium dirhodum*, *Rhopalosiphum padi*

Hordeum murinum: *Diuraphis noxia*

Paspalum dilatatum: *Sitobion avenae*

Phragmites australis: *Melanaphis donacis*

Secale cereale: *Diuraphis noxia*

Setaria pumila: *Sitobion avenae*

Setaria viridis: *Schizaphis graminum*

Sorghum sp.: *Rhopalosiphum maidis*

Sorghum halepense: *Schizaphis graminum*

Zea mays: *Rhopalosiphum padi*

Polygonaceae

Polygonum aviculare: *Aphis polygonata*

Rheum palmatum: *Aphis rumicis*

Rumex acetosa: *Aphis acetosae*, *Aphis fabae fabae*, *Aphis gossypii*, *Aphis nasturtii*

Rumex acetosella: *Aphis acetosae*, *Aphis rumicis*

Rumex crispus: *Aphis craccivora*, *Aphis fabae fabae*, *Aphis rumicis*, *Dysaphis radicola*

Portulacaceae

Portulaca oleracea: *Aphis craccivora*

Primulaceae

Anagallis arvensis: *Aphis craccivora*, *Aphis gossypii*, *Aphis nasturtii*, *Aphis spiraeicola*, *Macrosiphum euphorbiae*, *Myzus certus*

Ranunculaceae

Aconitum sp.: *Macrosiphum euphorbiae*

Thalictrum minus: *Aphis spiraeicola*, *Myzus persicae*

Rosaceae

Chanomeles japonica: *Aphis craccivora*

Rubus idaeus: *Aphis idaei*

Rubus persicus: *Aphis ruborum*

Rubus sp.: *Amphorophora rubi*

Rubiaceae

Asperula glomerata: *Dysaphis pyri*

Galium tricorutum: *Aphis craccivora*
Galium verum: *Aphis gossypii*, *Dysaphis pyri*

Scrophulariaceae

Verbascum songaricum: *Aphis verbasci*
Verbascum thapsus: *Aphis verbasci*
Veronica persica: *Myzus persicae*

Solanaceae

Datura stramonium: *Aphis gossypii*, *Myzus persicae*
Solanum dulcamara: *Aphis fabae solanella*
Solanum nigrum: *Aphis fabae solanella*, *Aulacorthum solani*
Withania somnifera: *Myzus persicae*

Urticaceae

Urtica dioica: *Microlophium carnosum*

Zygophyllaceae

Fagonia bruguieri: *Brachyunguis harmalae*
Peganum harmala: *Aphis gossypii*, *Brachyunguis harmalae*
Tribulus terrestris: *Aphis craccivora*

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БИЉНЕ ВАШИ (HEMIPTERA: APHIDIDAE) ИЗ ТРАВНИХ ОБЛАСТИ ПРОВИНЦИЈЕ ЦЕНТРАЛНИ АЛБОРЗ, У ИРАНУ

АЗИЗОЛАХ МОКТАРИ, ЈАМАСЪ НОЗАРИ, АЛИ РЕЗВАНИ, ГОЛАМРЕЗА РАСОЛИАН,
ОЛИВЕРА ПЕТРОВИЋ-ОБРАДОВИЋ И ЕХСАН РАКШАНИ

Извод

У раду су представљени резултати студије фауне биљних ваши травних области провинције Централни Алборз у Ирану. Узорци су сакупљани у периоду од 2002. до 2010. године на различитим локалитетима у јужном подножју планина Алборз, највећој висоравни у Ирану. 80 врста које се сврставају у 32 рода биљних ваши и 168 врста биљака домаћина је идентификовано током студије. Забележене су 284 асоцијације биљних ваши и биљака домаћина од којих су 112 нове за Иран. Резултати истраживања показују да се травне области Централног Алборза могу сматрати главним рефугијумом, из којег биљне ваши мигрирају ка околним областима са засадама различитих биљних култура.

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