

Research Article

## Checklist of Aphidiinae parasitoids (Hymenoptera: Braconidae) and their host aphid associations in Iran

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**Abstract:** Fauna of the Aphidiinae (Hymenoptera: Braconidae) of Iran is reviewed and the data on their host aphid associations are summarized. Seventy-eight species belonging to 17 genera of Aphidiinae are listed in the associations with 193 aphid species. A total of 491 parasitoid-aphid associations are presented. The distribution of the Aphidiinae species in different parts of Iran and other countries is also discussed.

**Keywords:** Fauna, aphid parasitoids, host association, central Asia

### Introduction

Aphidiinae is a subfamily of Braconidae (Hymenoptera: Ichneumonoidea) with about 60 genera and over 400 species worldwide (Starý, 1988). They are exclusively solitary endoparasitoid of the aphids (Starý, 1970), having an important role in control of aphid population in different crop plants (Hughes, 1989; Hagvar and Hofsvang, 1991). Furthermore, several attempts have been made to introduce these parasitoids worldwide (Heimpel *et al.*, 2004; Starý, 2006) either in the fields (Levie *et al.*, 2005) or in the glasshouses (Van Steenis, 1995; Starý, 1993) for biological control of aphid pests.

Based on their economic importance in biological control of pest aphids (Starý, 1970, 1988), extensive studies have been performed on their systematics and trophic associations (Tomanović *et al.*, 2003a, b, 2006, 2012, Kavallieratos *et al.*, 2004, 2005, 2008, 2010, 2013; Starý, 2006; Žikić *et al.*, 2009, 2012; Petrović *et al.*, 2010, 2011; Kos *et al.*, 2011, 2012; Mifsud and Starý, 2011; Laamari *et al.*, 2012), as well as their phylogeny (Belshaw and Quicke, 1997; Kambhampati *et al.*, 2000; Sanchis *et al.*, 2000, 2001; Shi and Chen, 2005; Mitrović *et al.*, 2013).

The early evidences on fauna of Aphidiinae in Iran have been summarized in Starý *et al.* (2000) which includes 49 species belonging to 13 genera. Since then, many other attempts have been made on biosystematics of the aphidiine parasitoids, including tritrophic associations in different parts of Iran (Starý *et*

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*al.*, 2000, 2005; Rakhshani *et al.*, 2005a, b, 2006a, b, 2007a, b, 2008a, b, c, d, 2012a, b, 2013; Nazari *et al.*, 2012; Tomanović *et al.*, 2007; Kazemzadeh *et al.*, 2009; Talebi *et al.*, 2009; Bagheri-Matin *et al.*, 2010; Barahoei *et al.*, 2010, 2011, 2012, 2013; Mossadegh *et al.*, 2011; Rakhshani, 2012; Alikhani *et al.*, 2013). In addition, many studies have also directly contributed to ecology and biology of the important aphid parasitoid species in Iran (Rakhshani *et al.*, 2004; Fathipour *et al.*, 2006; Zamani *et al.*, 2006, 2007, 2012; Tahriiri *et al.*, 2007, 2010; Farhad *et al.*, 2011, 2012; Tazerouni *et al.*, 2011, 2012a, b, c, 2013).

Iran, as a crossroad between Eastern and Western Palaearctic, represents a large territory with various climatic conditions and different bio-geographical elements. This leads to the establishment of many different habitats which favor the colonization of aphids and their parasitoids. The faunistic research on Aphidiinae, jointed with the data on their trophic associations, is an important background for the subsequent ecological and biological studies. The knowledge about the fauna of aphid parasitoids and their trophic associations provides the crucial ecological information on their biocontrol potential (Starý, 2006).

It is clear that the faunistic and taxonomic studies are greatly depending on the results of recent evidences, which should be summarized and clarified. Here we present the checklist of all Aphidiinae species that have been recorded from Iran since 1957 up to 2013, as well as their host aphid associations and distribution. New data about distribution and host association of some species are also included.

## Materials and Methods

The major part of the data has been extracted from literature which refer to taxonomy, faunal diversity and biology of Aphidiinae parasitoids in various provinces of Iran. Additional unpublished data of the newly collected specimens are also included. A series of specimens were collected during 2002-2012 from various locations of Iran. Collection of

aphids and their parasitoids followed the methods in Rakhshani *et al.* (2012b) and Barahoei *et al.* (2013). These specimens were deposited in the collection of ER (Department of Plant Protection, University of Zabol).

Aphid nomenclature follows Remaudière and Remaudière (1997). For each parasitoid species, the data on the recorded host aphids in Iran, the distribution in different provinces and the general distribution in the world are presented. In addition, short remarks concerning their identity and the host association is also provided. The species names are presented alphabetically, both for parasitoids and their host aphids.

## Results

A total of 78 species belonging to 17 genera of Aphidiinae are listed here in the associations with 193 aphid species from Iran. Reviewed are 491 host aphid-parasitoid associations. The number of Aphidiinae species distributed in each province is listed in Table 1. Review of the species and their host associations is presented as follows:

### 1. *Adialytus ambiguus* (Haliday, 1834)

**Host records:** *Sipha elegans* del Guercio (Taheri and Rakhshani, 2013; Rakhshani *et al.*, 2008b, 2012a; Barahoei *et al.*, 2013); *Sipha flava* (Forbes) (Nazari *et al.*, 2012; Rakhshani *et al.*, 2012a); *Sipha maydis* Passerini (Starý *et al.*, 2000; Nazari *et al.*, 2012; Rakhshani *et al.*, 2012a, b; Barahoei *et al.*, 2013), *Sipha sp.* (Starý, 1979).

**Distribution in Iran:** East Azarbaijan (Starý, 1979; Starý *et al.*, 2000), Fars (Rakhshani *et al.*, 2008b, 2012a; Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013), Isfahan, Kerman (Rakhshani *et al.*, 2012a; Barahoei *et al.*, 2013), Kermanshah (Rakhshani *et al.*, 2012a; Nazari *et al.*, 2012), Kordestan (Nazari *et al.*, 2012), North Khorasan (Rakhshani *et al.*, 2012a, b), Khorasan-e-Razavi (Rakhshani *et al.*, 2012a).

**General distribution:** Holarctic (Yu *et al.*, 2012).

**Remarks:** This species has been subdivided into three phenotypes in Iran including *Adialytus*

*ambiguus* (Haliday, 1834), *Adialytus* cf. *ambiguus* (Haliday, 1834) and *Adialytus arvicola* (Starý, 1961) based on the morphological characters (Rakhshani et al., 2012a).

## 2. *Adialytus salicaphis* (Fitch, 1855)

**Host records:** *Chaitophorus euphraticus* Hodjat (Starý et al., 2000; Rakhshani et al., 2007b, 2012a; Talebi et al., 2009); *Chaitophorus leucomelas* Koch (Rakhshani et al., 2007b, 2012a; Taheri and Rakhshani, 2013; Barahoei et al., 2013); *Chaitophorus populeti* (Panzer) (Rakhshani et al., 2007b, 2012a); *Chaitophorus populiabae* (Boyer de Fonscolombe) (Yaghubi, 1997; Starý et al., 2000; Rakhshani et al., 2007b, 2012a; Barahoei et al., 2013); *Chaitophorus remaudierei* Pintera (Starý et al., 2000; Rakhshani et al., 2007b, 2012a; Talebi et al., 2009; Nazari et al., 2012); *Chaitophorus salijaponicus* Essig and Kuwana (Starý et al., 2000; Rakhshani et al., 2007b, 2012a, b; Taheri and Rakhshani, 2013; Nazari et al., 2012; Barahoei et al., 2013); *Chaitophorus truncatus* (Hausmann) (Rakhshani et al., 2007b; Talebi et al., 2009); *Chaitophorus vitellinae* (Schrank) (Rakhshani et al., 2007b, 2012a; Talebi et al., 2009; Barahoei et al., 2013); *Chaitophorus* spp. (Starý, 1979; Starý et al., 2000; Rakhshani et al., 2012a, b; Barahoei et al., 2012, 2013).

**Distribution in Iran:** Alborz (Starý, 1979; Starý et al., 2000; Rakhshani et al., 2007b, 2012a), Fars (Rakhshani et al., 2007b, 2012a; Taheri and Rakhshani, 2013), Guilan (Yaghubi, 1997; Starý, 1979; Rakhshani et al., 2007b; Talebi et al., 2009), Markazi (Rakhshani et al., 2007b, 2012a), Isfahan, Mazandaran, Zanzan (Rakhshani et al., 2007b), Kerman (Barahoei et al., 2012; Rakhshani et al., 2012a), Kermanshah (Nazari et al., 2012), North Khorasan (Starý, 1979; Starý et al., 2000; Rakhshani et al., 2012a, b), Kordestan (Rakhshani et al., 2007b, 2012a; Nazari et al., 2012), Qazvin (Rakhshani et al., 2007b; Talebi et al., 2009), Sistan and Baluchestan, Tehran (Rakhshani et al., 2007b, 2012a; Talebi et al., 2009).

**General distribution:** Holarctic (Yu et al., 2012).

## 3. *Adialytus thelaxis* (Starý, 1961)

**Host records:** *Thelaxes suberi* (del Guercio) (Starý, 1979; Babae et al., 2000; Starý et al., 2000; Nazari et al., 2012; Rakhshani et al., 2012a).

**Distribution in Iran:** Kermanshah (Starý, 1979; Starý et al., 2000; Nazari et al., 2012), Golestan (Starý, 1979; Starý et al., 2000; Rakhshani et al., 2012a), Guilan (Rakhshani et al., 2012a), Mazandaran (Starý, 1979; Babae et al., 2000; Starý et al., 2000).

**General distribution:** Western Palaearctic (Yu et al., 2012).

## 4. *Adialytus veronicaecola* (Starý, 1968)

**Host records:** *Aphis craccivora* Koch, *Aphis gossypii* Glover, *Aphis* sp. (Rakhshani et al., 2012a).

**Distribution in Iran:** Isfahan (Rakhshani et al., 2012a).

**General distribution:** This species has only been known from Kazakhstan, outside of Iran (Yu et al., 2012).

## 5. *Aphidius absinthii* Marshall, 1896

**Host records:** *Macrosiphoniella abrotani* (Walker) (Starý et al., 2000; Rakhshani et al., 2008a, 2011; Talebi et al., 2009); *Macrosiphoniella artemisiae* (Boyer de Fonscolombe) (Rakhshani et al., 2008a, 2011; Talebi et al., 2009); *Macrosiphoniella helichrysi* Remaudiere (Starý et al., 2000; Rakhshani et al., 2011); *Macrosiphoniella* nr. *macrura* Hille Ris Lambers (Rakhshani et al., 2011); *Macrosiphoniella oblonga* (Mordvilko) (Yaghubi, 1997; Starý et al., 2000; Rakhshani et al., 2008a, 2011; Talebi et al., 2009); *Macrosiphoniella pulvera* (Walker) (Starý, 1979; Starý et al., 2000; Rakhshani et al., 2011); *Macrosiphoniella riedeli* Szelegiewics (Rakhshani et al., 2011); *Macrosiphoniella tuberculata* (Nevsky) (Starý, 1979; Starý et al., 2000; Rakhshani et al., 2011); *Macrosiphoniella* sp. (Starý et al., 2000; Rakhshani et al., 2011).

**Distribution in Iran:** Guilan (Yaghubi, 1997; Starý et al., 2000; Rakhshani et al., 2008a; Talebi et al., 2009), North Khorasan,

Kohgiluyeh and Boyerahmad (Starý, 1979; Starý *et al.*, 2000), Mazandaran (Starý, 1979; Starý *et al.*, 2000), Tehran (Starý *et al.*, 2000).

**General distribution:** Holarctic (Yu *et al.*, 2012).

#### 6. *Aphidius arvensis* (Starý, 1960)

**Host records:** *Coloradoa achilleae* Hille Ris Lambers (Starý, 1979; Starý *et al.*, 2000; Talebi *et al.*, 2009; Nazari *et al.*, 2012; Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013).

**Distribution in Iran:** Fars (Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013), Hamadan (Talebi *et al.*, 2009; Nazari *et al.*, 2012), Kordestan (Nazari *et al.*, 2012), Tehran (Starý, 1979; Starý *et al.*, 2000)

**General distribution:** Western Palaearctic (Yu *et al.*, 2012).

#### 7. *Aphidius asteris* Haliday 1834

**Host records:** *Macrosiphoniella* spp., until recently, it has been known as *Aphidius absinthii* Marshall, 1896 and all host records had been referred to the later species.

**Distribution in Iran:** Same as *Aphidius absinthii*.

**General distribution:** Same as *Aphidius absinthii*.

**Remarks:** Records of *Aphidius asteris* are most probably referring to *Aphidius absinthii* or to mixtures of both species. *Aphidius asteris* has been synonymized with *Aphidius absinthii* (van Achterberg, 2011: fauna Europea), but later considered as a separate species Rakhshani *et al.* (2011). Recent evidences from Southeastern Europe have also confirmed the validity of both species (Kavallieratos *et al.*, 2013).

#### 8. *Aphidius avenae* Haliday, 1834

**Host records:** *Rhopalosiphum maidis* (Fitch) (Taheri and Rakhshani, 2013).

**Distribution in Iran:** Fars (Taheri and Rakhshani, 2013).

**General distribution:** Holarctic (Yu *et al.*, 2012).

#### 9. *Aphidius colemani* Viereck, 1912

**Host records:** *Amegosiphon platycaudum* (Narzikulov) (Nazari *et al.*, 2012); *Aphis*

*craccivora* Koch (Rakhshani *et al.*, 2005a, 2006a, 2008a; Talebi *et al.*, 2009; Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013); *Aphis fabae* Scopoli (Rakhshani *et al.*, 2008a, 2012b; Talebi *et al.*, 2009; Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013); *Aphis gossypii* Glover (Rakhshani *et al.*, 2008a; Talebi *et al.*, 2009; Nazari *et al.*, 2012); *Aphis intybi* Koch and *Aphis nerii* Boyer de Fonscolombe (Rakhshani *et al.*, 2008a; Talebi *et al.*, 2009; Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013); *Aphis punicae* Passerini (Rakhshani *et al.*, 2008a, 2012b; Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013); *Aphis rumicis* L. (Rakhshani *et al.*, 2012b); *Aphis umbrella* Börner (Rakhshani *et al.*, 2008a; Talebi *et al.*, 2009; Nazari *et al.*, 2012); *Brachycaudus amygdalinus* (Schouteden) (Rakhshani, 2012; Barahoei *et al.*, 2013); *Brachycaudus cardui* (L.) (Rakhshani *et al.*, 2008a; Talebi *et al.*, 2009; Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013); *Brachycaudus helichrysi* (Kaltenbach) (Rakhshani *et al.*, 2008a; Talebi *et al.*, 2009); *Capitophorus elaeagni* (Del Guercio) (Rakhshani *et al.*, 2008a; Talebi *et al.*, 2009); *Diuraphis noxia* (Kurdjumov) (Bandani, 1992; Starý *et al.*, 2000); *Hayhurstia atriplicis* (L.) (Rakhshani *et al.*, 2012b); *Hyalopterus amygdali* (Blanchard) (Taheri and Rakhshani, 2013); *Macrosiphum euphorbiae* (Thomas) (Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013); *Macrosiphum rosae* (L.) (Taheri and Rakhshani, 2013); *Myzus persicae* (Sulzer) (Rakhshani *et al.*, 2008a; Talebi *et al.*, 2009; Mossadegh *et al.*, 2011; Rakhshani, 2012; Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013); *Phorodon humuli* (Schrank) (Rakhshani *et al.*, 2008a; Rakhshani, 2012); *Rhopalosiphum padi* (L.) (Rakhshani *et al.*, 2008a, b; Nazari *et al.*, 2012; Barahoei *et al.*, 2013); *Schizaphis graminum* (Rondani) (Bandani, 1992; Starý *et al.*, 2000; Rakhshani *et al.*, 2008a, b; Barahoei *et al.*, 2013); *Sitobion avenae* (F.) (Bandani, 1992; Starý *et al.*, 2000; Rakhshani *et al.*, 2008a, b; Barahoei *et al.*, 2013).

**Distribution in Iran:** Alborz (Rakhshani *et al.*, 2006a, 2008a; Talebi *et al.*, 2009), Fars (Starý *et al.*, 2000; Rakhshani *et al.*, 2008a;

Rakhshani, 2012; Taheri and Rakhshani, 2013; Barahoei et al., 2013), Golestan (Rakhshani et al., 2008b), Isfahan (Rakhshani et al., 2008a, b; Talebi et al., 2009; Rakhshani, 2012; Barahoei et al., 2013), Kermanshah (Rakhshani et al., 2008b; Nazari et al., 2012), North Khorasan (Rakhshani et al., 2008b, 2012b), Khorasan-e-Razavi (Rakhshani et al., 2008a), Khuzestan (Talebi et al., 2009; Mossadegh et al., 2011; Nazari et al., 2012), Kohgiluyeh and Boyer-Ahmad (Barahoei et al., 2013), Kordestan (Rakhshani et al., 2008a, b; Nazari et al., 2012), Qazvin (Starý, 1979), Qom (Rakhshani et al., 2008b), Sistan and Baluchestan (Bandani, 1992; Starý et al., 2000; Rakhshani et al., 2005a, 2006a, 2008a, b; Talebi et al., 2009), Tehran (Rakhshani et al., 2005a, 2008a, b; Talebi et al., 2009; Rakhshani, 2012).

**General distribution:** Cosmopolitan (Yu et al., 2012).

#### 10. *Aphidius cf. colemani* Viereck, 1912

**Host records:** *Aphis acetosae* L., *Aphis affinis* del Guercio (Barahoei et al., 2013); *Aphis craccivora* Koch, *Aphis fabae* Scopoli, *Aphis gossypii* Glover (Barahoei et al., 2012, 2013); *Aphis nerii* Boyer de Fonscolombe, *Aphis plantaginis* Goeze (Barahoei et al., 2013); *Aphis solanella* Theobald, *Aphis* sp., *Brachycaudus helichrysi* (Kaltenbach), *Brachycaudus tragopogonis* (Kaltenbach) (Barahoei et al., 2012, 2013); *Dysaphis pulverina* ssp. *iranica* Stroyan, *Dysaphis radicola* (Mordvilko), *Metopolophium dirhodum* (Walker) (Barahoei et al., 2013); *Myzus persicae* (Sulzer), *Rhopalosiphum maidis* (Fitch) (Barahoei et al., 2012, 2013).

**Distribution in Iran:** Kerman (Barahoei et al., 2012, 2013).

**General distribution:** endemic to central part of Iran (Barahoei et al., 2013).

**Remarks:** This species seems to be morphologically separated from common *Aphidius colemani* Viereck on the basis of number of flagellar segments, labial and maxillary palpomers and number of prominent carinae on antero-lateral area of petiole. The

association of this parasitoid with *Uroleucon sonchi* (L.) (Barahoei et al., 2012) needs further confirmations.

#### 11. *Aphidius eadyi* Starý, Gonzalez and Hall, 1980

**Host records:** *Acyrtosiphon pisum* (Harris) (Gonzalez et al., 1978; Starý, 1979; Starý et al., 1980, 2000; Rakhshani et al., 2006a, 2008a; Nazari et al., 2012; Barahoei et al., 2013).

**Distribution in Iran:** Alborz (Gonzalez et al., 1978; Starý, 1979; Starý et al., 2000; Rakhshani et al., 2006a, 2008a), Ardabil (Gonzalez et al., 1978; Starý, 1979; Starý et al., 2000), Hamadan (Rakhshani et al., 2006a, 2008a; Nazari et al., 2012), Isfahan (Rakhshani et al., 2006a, 2008a; Barahoei et al., 2013), Kermanshah (Rakhshani et al., 2006a; Nazari et al., 2012), Kordestan, Qazvin, Sistan and Baluchestan, Zanzan (Rakhshani et al., 2006a), Markazi (Rakhshani et al., 2006a, 2008a), Tehran (Rakhshani et al., 2008a).

**General distribution:** Western Palaearctic, New Zealand (imported), USA (imported) (Yu et al., 2012).

#### 12. *Aphidius ervi* Haliday, 1834

**Host records:** *Acyrtosiphon gossypii* Mordvilko (Barahoei et al., 2013); *Acyrtosiphon kondoi* Shinji (Gonzalez et al., 1978; Starý et al., 2000; Rakhshani et al., 2006a, 2008a, b; Nazari et al., 2012; Barahoei et al., 2013); *Acyrtosiphon pisum* (Harris) (Starý and Gonzalez, 1978; Gonzalez et al., 1978; Monajemi and Esmaili, 1981; Rasulian, 1985, 1989; Starý et al., 2000; Rakhshani et al., 2006a, 2008a, 2012b; Talebi et al., 2009; Taheri and Rakhshani, 2013; Nazari et al., 2012; Barahoei et al., 2013); *Macrosiphum euphorbiae* (Thomas) (Rakhshani et al., 2008a); *Microlophium carnosum* (Buckton) (Rakhshani et al., 2008a; Talebi et al., 2009); *Myzus persicae* (Sulzer) (Rakhshani et al., 2008a; Barahoei et al., 2013); *Rhopalosiphum padi* (L.) (Taheri and Rakhshani, 2013); *Sitobion avenae* (F.) (Darvish-Mojeni and Bayat-Asadi, 1995; Rakhshani et al., 2008a;

Barahoei *et al.*, 2013); *Wahlgreniella nervata* (Gillette) (Barahoei *et al.*, 2013).

**Distribution in Iran:** Alborz (Gonzalez *et al.*, 1978; Starý, 1979; Starý *et al.*, 2000; Rakhshani *et al.*, 2006a, 2008a), Fars (Rakhshani *et al.*, 2008a, b; Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013), Golestan (Darvish-Mojeni and Bayat-Asadi, 1995; Starý *et al.*, 2000; Rakhshani *et al.*, 2008a, b), Guilan (Rakhshani *et al.*, 2008a; Talebi *et al.*, 2009), Hamadan (Rakhshani *et al.*, 2006a, 2008a; Nazari *et al.*, 2012), Isfahan (Rakhshani *et al.*, 2006a, 2008a; Barahoei *et al.*, 2013), Kermanshah (Nazari *et al.*, 2012), Kerman (Gonzalez *et al.*, 1978; Starý *et al.*, 2000; Barahoei *et al.*, 2013), North Khorasan (Rakhshani *et al.*, 2012b), Kordestan (Rakhshani *et al.*, 2008a; Nazari *et al.*, 2012), Markazi (Rakhshani *et al.*, 2008b), Tehran (Monajemi and Esmaili, 1981; Rasulian, 1985, 1989; Starý *et al.*, 2000; Rakhshani *et al.*, 2008a; Talebi *et al.*, 2009).

**General distribution:** Cosmopolitan (Yu *et al.*, 2012).

### 13. *Aphidius funebris* Mackauer, 1961

**Host records:** *Uroleucon acroptilidis* Kadyrbekov, Renxin and Shao (Barahoei *et al.*, 2013); *Uroleucon chondrillae* (Nevsky) (Starý, 1979; Starý *et al.*, 2000; Rakhshani *et al.*, 2008a); *Uroleucon cichorii* (Koch) (Rakhshani *et al.*, 2008a); *Uroleucon compositae* (Theobald) (Rakhshani *et al.*, 2008a; Talebi *et al.*, 2009; Nazari *et al.*, 2012; Barahoei *et al.*, 2013); *Uroleucon erigeronense* (Thomas) (Rakhshani *et al.*, 2008a; Talebi *et al.*, 2009); *Uroleucon jaceae* (L.) (Rakhshani *et al.*, 2008a; Talebi *et al.*, 2009; Taheri and Rakhshani, 2013; Nazari *et al.*, 2012; Barahoei *et al.*, 2013); *Uroleucon sonchi* (L.) (Rakhshani *et al.*, 2008a; Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013); *Uroleucon sp.* (Barahoei *et al.*, 2012, 2013).

**Distribution in Iran:** Fars (Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013), Guilan (Rakhshani *et al.*, 2008a; Talebi *et al.*, 2009), Isfahan (Rakhshani *et al.*, 2008a; Talebi *et al.*, 2009; Barahoei *et al.*, 2013), Kerman (Barahoei

*et al.*, 2012, 2013), Kermanshah (Nazari *et al.*, 2012), Qazvin (Rakhshani *et al.*, 2008a), Tehran (Starý, 1979; Starý *et al.*, 2000; Rakhshani *et al.*, 2008a).

**General distribution:** Western Palaearctic, Oriental (Yu *et al.*, 2012).

### 14. *Aphidius hieraciorum* Starý, 1962

**Host records:** *Nasonovia ribisnigri* (Mosley) (Nazari *et al.*, 2012); *Nasonovia sp.* (Mossadegh *et al.*, 2011).

**Distribution in Iran:** Khuzestan (Mossadegh *et al.*, 2011; Nazari *et al.*, 2012).

**General distribution:** Europe (Yu *et al.*, 2012).

### 15. *Aphidius iranicus* Rakhshani and Starý, 2007

**Host records:** *Titanosiphon bellicosum* Nevesky (Tomanović *et al.*, 2007; Talebi *et al.*, 2009).

**Distribution in Iran:** Guilan (Tomanović *et al.*, 2007; Talebi *et al.*, 2009).

**General distribution:** This species has not been recorded outside Iran (Tomanović *et al.*, 2007; Talebi *et al.*, 2009).

**Remarks:** *Titanosiphon bellicosum* Nevsky is now a synonym of *Titanosiphon neoartemisiae* (Takahashi, 1921).

### 16. *Aphidius matricariae* Haliday, 1834

**Host records:** *Amegosiphon platicaudum* (Narzikulov) (Nazari *et al.*, 2012); *Aphis affinis* del Guercio (Rakhshani *et al.*, 2012b; Nazari *et al.*, 2012; Barahoei *et al.*, 2013); *Aphis craccivora* Koch (Rakhshani *et al.*, 2008a; Talebi *et al.*, 2009; Mossadegh *et al.*, 2011; Taheri and Rakhshani, 2013; Nazari *et al.*, 2012; Barahoei *et al.*, 2013); *Aphis crepidis* (Börner) (Starý *et al.*, 2000); *Aphis dlabolai* Holman (Barahoei *et al.*, 2013); *Aphis euphorbiae* Kaltenbach (Rakhshani *et al.*, 2008a; Talebi *et al.*, 2009; Mossadegh *et al.*, 2011; Barahoei *et al.*, 2013); *Aphis fabae* Scopoli (Rakhshani *et al.*, 2008a; Talebi *et al.*, 2009; Mossadegh *et al.*, 2011; Taheri and Rakhshani, 2013; Nazari *et al.*, 2012; Barahoei *et al.*, 2013); *Aphis gossypii* Glover (Starý,

1979; Starý *et al.*, 2000; Rakhshani *et al.*, 2008a; Talebi *et al.*, 2009; Mossadegh *et al.*, 2011; Nazari *et al.*, 2012; Barahoei *et al.*, 2013); *Aphis intybi* Koch (Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013); *Aphis nasturtii* Kaltentbach (Nazari *et al.*, 2012); *Aphis plantaginis* Goeze (Barahoei *et al.*, 2013); *Aphis pomi* DeGeer (Rakhshani *et al.*, 2008a; Rakhshani, 2012; Barahoei *et al.*, 2013); *Aphis punicae* Passerini (Nazari *et al.*, 2012; Barahoei *et al.*, 2013); *Aphis solanella* Theobald (Barahoei *et al.*, 2013); *Aphis spiraecola* Patch (Rakhshani, 2012); *Aphis umbrella* Börner (Schlinger and Mackauer, 1963; Starý *et al.*, 2000; Rakhshani *et al.*, 2008a; Talebi *et al.*, 2009; Nazari *et al.*, 2012); *Brachycaudus amygdalinus* (Schouteden) (Rakhshani, 2012; Nazari *et al.*, 2012); *Brachycaudus cardui* (L.) (Rakhshani *et al.*, 2008a; Rakhshani, 2012); *Brachycaudus divaricatae* Shaposhnikov (Jafari-Ahmadabadi *et al.*, 2011; Jafari-Ahmadabadi and Modarres, 2012); *Brachycaudus helichrysi* (Kaltentbach) (Mokhtari *et al.*, 2000; Starý *et al.*, 2000; Rakhshani *et al.*, 2008a, 2012b; Talebi *et al.*, 2009; Mossadegh *et al.*, 2011; Rakhshani, 2012; Jafari-Ahmadabadi *et al.*, 2011; Jafari-Ahmadabadi and Modarres, 2012; Nazari *et al.*, 2012; Barahoei *et al.*, 2013); *Brachycaudus persicae* (Passerini) (Rakhshani, 2012); *Brachycaudus tragopogonis* (Kaltentbach) (Barahoei *et al.*, 2013); *Capitophorus similis* van der Goot (Rakhshani *et al.*, 2008a; Talebi *et al.*, 2009); *Diuraphis noxia* (Kurdjumov) (Bandani, 1992; Gonzalez *et al.*, 1992; Zareh *et al.*, 1995; Starý *et al.*, 2000); *Dysaphis devectora* (Walker) (Starý *et al.*, 2000); *Dysaphis plantaginea* (Passerini) (Radjabi, 1989; Starý *et al.*, 2000; Mossadegh *et al.*, 2011; Rakhshani, 2012); *Dysaphis pyri* (Boyer de Fonscolombe) (Radjabi, 1989; Starý *et al.*, 2000); *Eucarazzia elegans* (Ferrari) (Rakhshani *et al.*, 2008a; Talebi *et al.*, 2009; Barahoei *et al.*, 2013); *Hyalopterus amygdali* (Blanchard) (Jafari-Ahmadabadi *et al.*, 2011; Jafari-Ahmadabadi and Modarres, 2012; Nazari *et al.*, 2012); *Hyalopterus pruni* (Geoffroy) (Mokhtari *et al.*, 2000; Starý *et al.*, 2000); *Hyperomyzus*

*lactucae* (L.) (Mossadegh *et al.*, 2011); *Lipaphis erysmi* (Kaltentbach) (Mossadegh *et al.*, 2011); *Lipaphis lepidii* Nevsky (Starý, 1979; Starý *et al.*, 2000; Mossadegh *et al.*, 2011); *Lipaphis pseudobrassicae* (Davis) (Barahoei *et al.*, 2013); *Metopolophium dirhodum* (Walker) (Bandani, 1992; Starý *et al.*, 2000; Rakhshani *et al.*, 2008a, b; Taheri and Rakhshani, 2013; Nazari *et al.*, 2012; Barahoei *et al.*, 2013); *Myzus ascalonicus* Doncaster (Barahoei *et al.*, 2013); *Myzus beybienkoi* (Narzykulov) (Starý *et al.*, 2000); *Myzus cerasi* (F.) (Mokhtari *et al.*, 2000; Starý *et al.*, 2000; Rakhshani *et al.*, 2008a; Rakhshani, 2012); *Myzus certus* (Walker) (Barahoei *et al.*, 2013); *Myzus ornatus* Laing (Starý *et al.*, 2000); *Myzus persicae* (Sulzer) (Schlinger and Mackauer, 1963; Starý, 1979; Radjabi, 1989; Starý *et al.*, 2000; Rakhshani *et al.*, 2008a; Talebi *et al.*, 2009; Mossadegh *et al.*, 2011; Jafari-Ahmadabadi *et al.*, 2011; Jafari-Ahmadabadi and Modarres, 2012; Rakhshani, 2012; Nazari *et al.*, 2012; Taheri and Rakhshani, 2013; Barahoei *et al.*, 2012, 2013); *Ovatus insitus* (Walker) (Rakhshani *et al.*, 2008a; Rakhshani, 2012); *Phorodon humuli* (Schränk) (Schlinger and Mackauer, 1963; Bandani, 1992; Starý *et al.*, 2000); *Rhopalomyzus* sp. (Starý, 1979); *Rhopalosiphum maidis* (Fitch) (Bandani, 1992; Starý *et al.*, 2000; Nazari *et al.*, 2012; Barahoei *et al.*, 2012, 2013); *Rhopalosiphum nymphaeae* (L.) (Mokhtari *et al.*, 2000; Starý *et al.*, 2000); *Rhopalosiphum padi* (L.) (Bandani, 1992; Starý *et al.*, 2000; Rakhshani *et al.*, 2008a, b; Mossadegh *et al.*, 2011; Rakhshani, 2012; Taheri and Rakhshani, 2013; Nazari *et al.*, 2012; Barahoei *et al.*, 2013); *Schizaphis graminum* (Rondani) (Bandani, 1992; Starý *et al.*, 2000; Rakhshani *et al.*, 2008a, b; Nazari *et al.*, 2012; Barahoei *et al.*, 2013); *Sitobion avenae* (F.) (Bandani, 1992; Starý *et al.*, 2000; Rakhshani *et al.*, 2008a, b; Mossadegh *et al.*, 2011; Barahoei *et al.*, 2013); *Sitobion fragariae* (Walker) (Barahoei *et al.*, 2013); *Wahlgreniella nervata* (Gillette) (Barahoei *et al.*, 2013).  
**Distribution in Iran:** Alborz (Starý, 1979; Starý *et al.*, 2000; Rakhshani *et al.*, 2008a; Talebi *et al.*,

2009), East Azarbaijan (Starý, 1979; Starý *et al.*, 2000; Rakhshani *et al.*, 2008a), Fars (Gonzalez *et al.*, 1992; Starý *et al.*, 2000; Rakhshani *et al.*, 2008a; Rakhshani, 2012; Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013), Golestan, Kordestan (Rakhshani, 2012), Guilan (Mokhtari *et al.*, 2000; Starý *et al.*, 2000; Talebi *et al.*, 2009), Hamadan (Rakhshani *et al.*, 2008a, b; Nazari *et al.*, 2012), Isfahan (Rakhshani *et al.*, 2008a; Barahoei *et al.*, 2013), Kohgiluyeh and Boyer-Ahmad (Barahoei *et al.*, 2013), Markazi (Rakhshani *et al.*, 2008b; Barahoei *et al.*, 2013), Qom (Rakhshani *et al.*, 2008a, b; Barahoei *et al.*, 2013), Kerman (Barahoei *et al.*, 2012, 2013), Kermanshah (Rakhshani *et al.*, 2008b; Nazari *et al.*, 2012; Rakhshani, 2012), North Khorasan (Rakhshani *et al.*, 2012b), Khorasan-e-Razavi (Jafari-Ahmadabadi *et al.*, 2011; Jafari-Ahmadabadi and Modarres, 2012; Rakhshani, 2012), Khuzestan (Rakhshani *et al.*, 2008a, b; Mossadegh *et al.*, 2011; Talebi *et al.*, 2009), Mazandaran (Starý *et al.*, 2000), Sistan and Baluchestan (Bandani, 1992; Starý *et al.*, 2000; Rakhshani *et al.*, 2008a, b; Talebi *et al.*, 2009), Tehran (Starý, 1979; Starý *et al.*, 2000; Rakhshani *et al.*, 2008a, b; Talebi *et al.*, 2009; Rakhshani, 2012).

**General distribution:** Cosmopolitan (Yu *et al.*, 2012).

**Remarks:** Records of *A. matricariae* as parasitoid of *Acyrtosiphon gossypii* Mordvilko (Taheri and Rakhshani, 2013) most probably corresponds to the other aphid species within the mixed aphid colonies.

#### 17. *Aphidius persicus* Rakhshani and Starý, 2006

**Host records:** *Macrosiphoniella* sp., *Uroleucon bielawskii* (Szelegiewicz), *Uroleucon carthami* Hille Ris Lambers (Barahoei *et al.*, 2013); *Uroleucon chondrillae* (Nevsky) (Rakhshani *et al.*, 2008a; Taheri and Rakhshani, 2013; Nazari *et al.*, 2012; Barahoei *et al.*, 2013); *Uroleucon compositae* (Theobald) *Uroleucon ochropus* (Hille Ris Lambers), (Barahoei *et al.*, 2013); *Uroleucon sonchi* (L.) (Rakhshani *et al.*, 2008a; Mossadegh *et al.*, 2011; Barahoei *et al.*, 2012, 2013); *Uroleucon* spp. (Rakhshani *et al.*, 2012b; Barahoei *et al.*, 2012, 2013).

**Distribution in Iran:** Alborz (Rakhshani *et al.*, 2008a), Fars (Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013), Hamadan (Rakhshani *et al.*, 2006b, 2008a; Nazari *et al.*, 2012), Isfahan (Barahoei *et al.*, 2013), Kerman (Barahoei *et al.*, 2012, 2013), North Khorasan (Rakhshani *et al.*, 2012b), Khuzestan (Mossadegh *et al.*, 2011), Tehran, Zanjan (Rakhshani *et al.*, 2006b, 2008a).

**General distribution:** It may be widely distributed in central Asia (Rakhshani *et al.*, 2011).

#### 18. *Aphidius popovi* Starý, 1978

**Host records:** *Amphorophora catharinae* (Nevsky) (Rakhshani *et al.*, 2008a, 2012b; Talebi *et al.*, 2009; Nazari *et al.*, 2012; Barahoei *et al.*, 2013); *Metopolophium dirhodum* (Walker) (Barahoei *et al.*, 2012, 2013).

**Distribution in Iran:** Alborz, Tehran (Rakhshani *et al.*, 2008a; Talebi *et al.*, 2009), Kerman (Barahoei *et al.*, 2012, 2013), Kermanshah (Nazari *et al.*, 2012), North Khorasan (Rakhshani *et al.*, 2012b).

**General distribution:** Central Asia (Yu *et al.*, 2012).

#### 19. *Aphidius rhopalosiphii* De Stefani-Perez, 1902

**Host records:** *Diuraphis noxia* (Kurdjumov) (Starý *et al.*, 2000); *Metopolophium dirhodum* (Walker) (Rakhshani *et al.*, 2008a, b; Nazari *et al.*, 2012; Barahoei *et al.*, 2013); *Rhopalosiphum maidis* (Fitch) (Nazari *et al.*, 2012); *Rhopalosiphum padi* (L.) (Starý *et al.*, 2000; Rakhshani *et al.*, 2008a, b; Nazari *et al.*, 2012; Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013); *Schizaphis graminum* (Rondani) (Rakhshani *et al.*, 2008a, b; Nazari *et al.*, 2012; Barahoei *et al.*, 2013); *Sitobion avenae* (F.) (Darvish-Mojeni, 1994; Starý *et al.*, 2000; Rakhshani *et al.*, 2008a, b; Mossadegh *et al.*, 2011; Nazari *et al.*, 2012; Barahoei *et al.*, 2013).

**Distribution in Iran:** Fars (Starý *et al.*, 2000; Rakhshani *et al.*, 2008a, b; Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013), Hamadan, Kermanshah (Rakhshani *et al.*,



2008a, b; Nazari *et al.*, 2012), Isfahan, Markazi, Qom (Rakhshani *et al.*, 2008a, b; Barahoei *et al.*, 2013), Golestan (Rakhshani *et al.*, 2008b; Starý *et al.*, 2000), Khorasan-e-Razavi, Kordestan (Rakhshani *et al.*, 2008a), Khuzestan (Rakhshani *et al.*, 2008a, b; Mossadegh *et al.*, 2011), Sistan and Baluchestan (Rakhshani *et al.*, 2008a), Tehran (Rakhshani *et al.*, 2008a, b).

**General distribution:** Holarctic, Neotropical (Yu *et al.*, 2012).

#### 20. *Aphidius rosae* Haliday, 1833

**Host records:** *Macrosiphum rosae* (L.) (Mehrparvar *et al.*, 2005; Rakhshani *et al.*, 2008a; Talebi *et al.*, 2009; Mossadegh *et al.*, 2011; Nazari *et al.*, 2012; Barahoei *et al.*, 2013).

**Distribution in Iran:** Alborz (Rakhshani *et al.*, 2008a), Hamadan (Talebi *et al.*, 2009; Nazari *et al.*, 2012), Isfahan (Mehrparvar *et al.*, 2005; Rakhshani *et al.*, 2008a; Barahoei *et al.*, 2013), Kerman (Barahoei *et al.*, 2013), Khuzestan (Mossadegh *et al.*, 2011), Tehran (Rakhshani *et al.*, 2008a; Talebi *et al.*, 2009).

**General distribution:** Holarctic, Neotropical (Yu *et al.*, 2012).

#### 21. *Aphidius salicis* Haliday, 1834

**Host records:** *Cavariella aegopodii* (Scopoli) (Starý, 1979; Starý *et al.*, 2000; Rakhshani *et al.*, 2007b, 2008a; Talebi *et al.*, 2009; Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013); *Cavariella aquatica* (Gillette and Bragg) (Starý, 1979; Starý *et al.*, 2000); *Cavariella aspidaphoides* Hille Ris Lambers (Starý, 1979; Starý *et al.*, 2000); *Cavariella theobaldi* (Gillette and Bragg) (Starý, 1979; Starý *et al.*, 2000); *Hyadaphis foeniculi* (Passerini) (Talebi *et al.*, 2009).

**Distribution in Iran:** Alborz (Starý, 1979; Starý *et al.*, 2000), Fars (Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013), Kohgiluyeh and Boyer-Ahmad (Barahoei *et al.*, 2013), Tehran (Starý, 1979; Starý *et al.*, 2000; Rakhshani *et al.*, 2007b, 2008a; Talebi *et al.*, 2009).

**General distribution:** Holarctic, Neotropical, Australian (Yu *et al.*, 2012).

#### 22. *Aphidius cf. salicis* Haliday, 1834

**Host records:** *Capitophorus elaeagni* (del Guercio) (Nazari *et al.*, 2012).

**Distribution in Iran:** Kermanshah (Nazari *et al.*, 2012).

**General distribution:** This species has not been recorded outside Iran (Nazari *et al.*, 2012).

#### 23. *Aphidius smithi* Sharma and Subba Rao, 1959

**Host records:** *Acyrtosiphon kondoi* Shinji (Gonzalez *et al.*, 1978; Starý *et al.*, 2000; Rakhshani *et al.*, 2006a); *Acyrtosiphon pisum* (Harris) (Gonzalez *et al.*, 1978; Starý, 1979; Yaghubi, 1997; Starý *et al.*, 2000; Rakhshani *et al.*, 2006a, 2008a, 2012b; Nazari *et al.*, 2012; Barahoei *et al.*, 2013); *Nearctaphis bakeri* (Cowen) (Barahoei *et al.*, 2013); *Sitobion avenae* (F.) (Rakhshani *et al.*, 2008).

**Distribution in Iran:** Alborz (Gonzalez *et al.*, 1978; Starý, 1979; Starý *et al.*, 2000; Rakhshani *et al.*, 2006a, 2008a), Fars (Rakhshani *et al.*, 2008a), Guilan (Yaghubi, 1997; Starý *et al.*, 2000; Rakhshani *et al.*, 2008a), Hamadan, Kermanshah, Kordestan (Rakhshani *et al.*, 2006a, 2008a; Nazari *et al.*, 2012), Isfahan (Rakhshani *et al.*, 2006a, 2008a; Barahoei *et al.*, 2013), Kerman (Barahoei *et al.*, 2012), North Khorasan (Rakhshani *et al.*, 2012b), Sistan and Baluchestan (Rakhshani *et al.*, 2006a, 2008a).

**General distribution:** Holarctic (Yu *et al.*, 2012).

**Remarks:** *Aphidius smithi* has been considered as specific parasitoid of *Acyrtosiphon pisum* (Gonzalez *et al.*, 1978; Rakhshani *et al.*, 2006a), avoiding even parasitism of *Acyrtosiphon kondoi* Shinji (Bueno *et al.*, 1993). Records of *Aphidius smithi* as parasitoid of *Aphis fabae* Scopoli in Iran (Barahoei *et al.*, 2013) and *Nearctaphis bakeri* in USA (Pike *et al.*, 2000) need further confirmation.

#### 24. *Aphidius stigmaticus* Rakhshani and Tomanović, 2011

**Host records:** *Macrosiphoniella tanacetaria* Kaltentbach (Rakhshani *et al.*, 2011).

**Distribution in Iran:** Hamadan (Rakhshani *et al.*, 2011).

**General distribution:** This species has not been reported outside Iran (Rakhshani *et al.*, 2011).

#### 25. *Aphidius tanacetarius* Mackauer, 1962

**Host records:** *Metopeurum fuscoviride* Stroyan (Rajabi-Mazhar *et al.*, 2008).

**Distribution in Iran:** Hamadan (Rajabi-Mazhar *et al.*, 2008).

**General distribution:** Europe (Yu *et al.*, 2012).

#### 26. *Aphidius transcaspicus* Telenga, 1958

**Host records:** *Hyalopterus amygdali* (Blanchard) (Rakhshani *et al.*, 2008a; Mossadegh *et al.*, 2011; Rakhshani, 2012; Jafari-Ahmadabadi *et al.*, 2011; Jafari-Ahmadabadi and Modarres, 2012; Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013); *Hyalopterus pruni* (Geoffroy) (Mokhtari *et al.*, 2000; Starý *et al.*, 2000; Rakhshani *et al.*, 2008a, 2012b; Jafari-Ahmadabadi *et al.*, 2011; Jafari-Ahmadabadi and Modarres, 2012; Rakhshani, 2012; Nazari *et al.*, 2012; Tomanović *et al.*, 2012; Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013); *Melanaphis donacis* (Passerini) (Tomanović *et al.*, 2012); on *Arundo donax*, Iran, Zabol, 09-VI-2010, leg. H. Barahoei.

**Distribution in Iran:** East Azarbaijan (Mosavi *et al.*, 2012), Fars (Starý *et al.*, 2000; Rakhshani, 2012; Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013), Guilan (Mokhtari *et al.*, 2000; Starý *et al.*, 2000), Hamadan (Rakhshani, 2012), Ilam (Rakhshani, 2012; Nazari *et al.*, 2012), Isfahan (Rakhshani *et al.*, 2008a; Rakhshani, 2012; Barahoei *et al.*, 2013), Kerman (Barahoei *et al.*, 2013), Kermanshah (Nazari *et al.*, 2012), Khorasan-e-Razavi (Jafari-Ahmadabadi *et al.*, 2011; Jafari-Ahmadabadi and Modarres, 2012), North Khorasan (Rakhshani, 2012; Rakhshani *et al.*, 2012b), Khuzestan (Mossadegh *et al.*, 2011), Qazvin (Starý *et al.*, 2000), Sistan and Baluchestan (New record), Tehran (Rakhshani *et al.*, 2008a; Rakhshani, 2012).

**General distribution:** Holarctic (Yu *et al.*, 2012).

**Remarks:** Other host records on *Phorodon humuli* (Schrank) (Mokhtari *et al.*, 2000; Starý *et al.*, 2000), *Rhopalosiphum nymphaeae* (L.)

(Mokhtari *et al.*, 2000; Starý *et al.*, 2000) may correspond to *Aphidius colemani* Viereck.

#### 27. *Aphidius urticae* Haliday, 1834

**Host records:** *Acyrtosiphon pisum* (Harris) (Rakhshani *et al.*, 2008a); *Acyrtosiphon gossypii* Mordvilko (Barahoei *et al.*, 2013); *Acyrtosiphon* sp. (Starý and Gonzalez, 1978); *Microlophium carnosum* (Buckton) (Starý *et al.*, 2000; Talebi *et al.*, 2009; Rakhshani *et al.*, 2008a).

**Distribution in Iran:** Guilan (Rakhshani *et al.*, 2008a; Talebi *et al.*, 2009), Kerman (Barahoei *et al.*, 2013), Mazandaran (Starý *et al.*, 2000).

**General distribution:** Holarctic (Yu *et al.*, 2012).

#### 28. *Aphidius uzbekistanicus* Luzhetzki, 1960

**Host records:** *Diuraphis noxia* (Kurdjumov) (Bandani, 1992; Zareh *et al.*, 1995; Starý *et al.*, 2000); *Metopolophium dirhodum* (Walker) (Rakhshani *et al.*, 2008a, b; Barahoei *et al.*, 2013); *Rhopalosiphum maidis* (Fitch) (Bandani, 1992; Starý *et al.*, 2000); *Rhopalosiphum padi* (L.) (Starý, 1979; Bandani, 1992; Starý *et al.*, 2000; Rakhshani *et al.*, 2008a, b; Nazari *et al.*, 2012); *Schizaphis graminum* (Rondani) (Bandani, 1992; Starý *et al.*, 2000; Rakhshani *et al.*, 2008a, b; Barahoei *et al.*, 2013); *Sitobion avenae* (F.) (Starý, 1979; Bandani, 1992; Darvish-Mojeni and Bayat-Asadi, 1995; Starý *et al.*, 2000; Rakhshani *et al.*, 2008a, b, 2012b; Barahoei *et al.*, 2013).

**Distribution in Iran:** Alborz (Starý, 1979; Starý *et al.*, 2000), Fars (Starý *et al.*, 2000; Rakhshani *et al.*, 2008a, b; Barahoei *et al.*, 2013), Golestan (Darvish-Mojeni and Bayat-Asadi, 1995; Starý *et al.*, 2000; Rakhshani *et al.*, 2008b), Hamadan, Khuzestan, Qom (Rakhshani *et al.*, 2008b), Isfahan (Rakhshani *et al.*, 2008a, b; Barahoei *et al.*, 2013), Kermanshah (Nazari *et al.*, 2012), North Khorasan (Rakhshani *et al.*, 2008b, 2012b), Khorasan-e-Razavi (Starý *et al.*, 2000; Rakhshani *et al.*, 2008b), Kordestan, Markazi (Rakhshani *et al.*, 2008a, b), Mazandaran (Starý *et al.*, 2000), Sistan and Baluchestan (Bandani, 1992; Starý *et al.*, 2000; Rakhshani *et al.*,

2008a, b), Tehran (Starý *et al.*, 2000; Rakhshani *et al.*, 2008a, b).

**General distribution:** Holarctic, Neotropical (Yu *et al.*, 2012).

**Remarks:** Records of *Sipha maydis* Passerini (Bandani, 1992; Starý *et al.*, 2000) as host aphids for *Aphidius uzbekistanicus* need confirmation.

### 29. *Areopraon lepellei* (Waterson, 1926)

**Host records:** *Eriosoma lanuginosum* (Hartig) (Kazemzadeh *et al.*, 2009; Rakhshani *et al.*, 2012b).

**Distribution in Iran:** North Khorasan (Kazemzadeh *et al.*, 2009; Rakhshani *et al.*, 2012b).

**General distribution:** Western Palaearctic, Oriental (India) (Yu *et al.*, 2012).

### 30. *Betuloxys hortorum* (Starý, 1960)

**Host records:** *Tinocallis saltans* (Nevsky) (Mackauer and Starý, 1967; Starý, 1979; Starý *et al.*, 2000).

**Distribution in Iran:** Not exactly defined (Mackauer and Starý, 1967; Starý, 1979; Starý *et al.*, 2000).

**General distribution:** Eastern and central Europe, India (Yu *et al.*, 2012).

### 31. *Binodoxys acalephae* (Marshall, 1896)

**Host records:** *Aphis affinis* del Guercio (Talebi *et al.*, 2009; Barahoei *et al.*, 2013); *Aphis craccivora* Koch (Starý, 1979; Starý *et al.*, 2000; Rakhshani *et al.*, 2005a, 2012b; Talebi *et al.*, 2009; Nazari *et al.*, 2012; Barahoei *et al.*, 2013); *Aphis euphorbiae* Kaltentbach (Talebi *et al.*, 2009; Nazari *et al.*, 2012); *Aphis fabae* Scopoli (Talebi *et al.*, 2009; Rakhshani *et al.*, 2012b; Nazari *et al.*, 2012; Barahoei *et al.*, 2013); *Aphis gossypii* Glover (Barahoei *et al.*, 2013); *Aphis idaei* van der Goot on *Rubus idaeus*, Iran, Tehran, 21-I-2002, Leg. E. Rakhshani; *Aphis nerii* Boyer de Fonscolombe (Talebi *et al.*, 2009); *Aphis pomi* de Geer (Rakhshani, 2012); *Aphis spiraeicola* Patch (Rakhshani, 2012); *Aphis umbrellae* (Börner) (Mackauer and Starý, 1967; Starý *et al.*, 2000; Talebi *et al.*, 2009; Nazari *et al.*, 2012); *Aphis urticata* F. (Talebi *et*

*al.*, 2009); *Aphis sp.* (Starý, 1979; Mossadegh *et al.*, 2011); *Protaphis sp.* (Barahoei *et al.*, 2012, 2013).

**Distribution in Iran:** Alborz, Sistan and Baluchestan (Rakhshani *et al.*, 2005a), West Azarbaijan (Starý, 1979; Starý *et al.*, 2000), Golestan (Rakhshani, 2012), Guilan, Qazvin (Talebi *et al.*, 2009), Hamadan (Talebi *et al.*, 2009; Rakhshani, 2012; Nazari *et al.*, 2012), Isfahan (Barahoei *et al.*, 2013), Kerman (Barahoei *et al.*, 2012, 2013), Kermanshah (Starý, 1979; Starý *et al.*, 2000, Talebi *et al.*, 2009), North Khorasan (Rakhshani *et al.*, 2012b), Khorasan-e-Razavi (Jafari-Ahmadabadi *et al.*, 2011; Jafari-Ahmadabadi and Modarres, 2012), Khuzestan (Mossadegh *et al.*, 2011; Nazari *et al.*, 2012), Kordestan (Nazari *et al.*, 2012), Tehran (Starý, 1979; Starý *et al.*, 2000; Rakhshani *et al.*, 2005a; Talebi *et al.*, 2009).

**General distribution:** Transpalaearctic (Yu *et al.*, 2012).

**Remarks:** Records of *Binodoxys acalephae* as parasitoid of *Brachycaudus helichrysi* (Kaltenbach) (Jafari-Ahmadabadi *et al.*, 2011; Jafari-Ahmadabadi and Modarres, 2012) need confirmation.

### 32. *Binodoxys angelicae* (Haliday, 1833)

**Host records:** *Aphis acetosae* L. (Barahoei *et al.*, 2013); *Aphis affinis* del Guercio (Mossadegh *et al.*, 2011; Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013); *Aphis craccivora* Koch (Rakhshani *et al.*, 2005a; Mossadegh *et al.*, 2011; Nazari *et al.*, 2012; Barahoei *et al.*, 2013); *Aphis epilobiaria* Theobald (Nazari *et al.*, 2012); *Aphis fabae* Scopoli (Talebi *et al.*, 2009; Mossadegh *et al.*, 2011; Nazari *et al.*, 2012; Barahoei *et al.*, 2012, 2013; Taheri and Rakhshani, 2013); *Aphis farinosa* Gmelin (Yaghubi, 1997; Starý *et al.*, 2000); *Aphis gossypii* Glover (Yaghubi, 1997; Starý *et al.*, 2000; Mossadegh *et al.*, 2011; Nazari *et al.*, 2012; Barahoei *et al.*, 2013); *Aphis hederae* Kaltentbach (Yaghubi, 1997; Starý *et al.*, 2000); *Aphis idaei* van der Goot (Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013); *Aphis nerii* Boyer de Fonscolombe (Talebi *et al.*, 2009); *Aphis pomi* de Geer (Radjab, 1989;

Starý *et al.*, 2000; Rakhshani, 2012), *Aphis polygonata* Rusanova (Mossadegh *et al.*, 2011); *Aphis rumicis* L. (Talebi *et al.*, 2009; *Aphis solanella* Theobald (Barahoei *et al.*, 2012, 2013); *Aphis spiraecola* Patch (Rakhshani, 2012); *Aphis umbrella* (Börner) (Mackauer and Starý, 1967; Starý *et al.*, 2000; Talebi *et al.*, 2009; Mossadegh *et al.*, 2011; Nazari *et al.*, 2012); *Aphis sp.* (Mossadegh *et al.*, 2011).

**Distribution in Iran:** Alborz (Talebi *et al.*, 2009; Rakhshani, 2012), Fars (Talebi *et al.*, 2009; Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013), Isfahan (Barahoei *et al.*, 2013), Golestan (Rakhshani, 2012), Guilan (Yaghubi, 1997; Starý *et al.*, 2000), Kerman (Barahoei *et al.*, 2012, 2013), Kermanshah (Nazari *et al.*, 2012), Khorasan-e-Razavi (Jafari-Ahmadabadi *et al.*, 2011; Jafari-Ahmadabadi and Modarres, 2012), Khuzestan (Talebi *et al.*, 2009; Mossadegh *et al.*, 2011; Nazari *et al.*, 2012), Markazi (Radjabi, 1989; Starý *et al.*, 2000), Tehran (Rakhshani *et al.*, 2005a; Talebi *et al.*, 2009).

**General distribution:** Transpalaeartic (Yu *et al.*, 2012).

**Remarks:** Records of aphids other than species of the genus *Aphis* as host of *Binodoxys angelicae* including *Brachycaudus helichrysi* (Kaltenbach) (Mossadegh *et al.*, 2011; Jafari-Ahmadabadi *et al.*, 2011; Jafari-Ahmadabadi and Modarres, 2012); *Lipaphis lepidii* Nevsky (Talebi *et al.*, 2009) and *Myzus persicae* (Sulzer) (Mossadegh *et al.*, 2011) need confirmation.

### 33. *Binodoxys brevicornis* (Haliday, 1833)

**Host records:** *Cavariella aegopodii* (Scopoli) (Rakhshani *et al.*, 2007b; Talebi *et al.*, 2009; Barahoei *et al.*, 2013); *Hyadaphis sp.* (Yaghubi, 1997; Starý *et al.*, 2000).

**Distribution in Iran:** Guilan (Yaghubi, 1997; Starý *et al.*, 2000), Markazi (Rakhshani *et al.*, 2007b; Talebi *et al.*, 2009; Barahoei *et al.*, 2013).

**General distribution:** Western Palaearctic, Neotropical, India (Yu *et al.*, 2012).

### 34. *Binodoxys heraclei* (Haliday, 1833)

**Host records:** *Cavariella aspidaphoides* Hille Ris Lambers (Rakhshani *et al.*, 2007b; Talebi *et al.*, 2009; Nazari *et al.*, 2012).

**Distribution in Iran:** Kermanshah (Nazari *et al.*, 2012), Khorasan-e-Razavi (Rakhshani *et al.*, 2007b; Talebi *et al.*, 2009).

**General distribution:** Transpalaeartic (Yu *et al.*, 2012).

### 35. *Diaeretiella rapae* (M'Intosh, 1855)

**Host records:** *Amegosiphon platicaudum* (Narzikulov) (Nazari *et al.*, 2012); *Aphis craccivora* Koch (Rakhshani *et al.*, 2006a; Taheri and Rakhshani, 2013; Nazari *et al.*, 2012; Barahoei *et al.*, 2013); *Aphis fabae* Scopoli (Barahoei *et al.*, 2013); *Aphis gossypii* Glover (Mossadegh *et al.*, 2011; Barahoei *et al.*, 2013); *Aphis punicae* Passerini (Nazari *et al.*, 2012); *Aphis solanella* Theobald, *Aphis umbrella* (Börner) (Barahoei *et al.*, 2013); *Brachycaudus amygdalinus* (Schouteden) (Starý, 1979; Starý *et al.*, 2000); *Brachycaudus cardui* (L.) (Starý, 1979; Starý *et al.*, 2000); *Brevicoryne brassicae* (L.) (Davatchi and Shojai, 1968; Starý, 1979; Starý *et al.*, 2000; Talebi *et al.*, 2009; Mossadegh *et al.*, 2011; Rakhshani *et al.*, 2012b; Nazari *et al.*, 2012; Barahoei *et al.*, 2012, 2013; Taheri and Rakhshani, 2013); *Diuraphis noxia* (Kurdjumov) (Bandani, 1992; Gonzalez *et al.*, 1992; Ahmadi and Sarafrazi, 1993; Zareh *et al.*, 1995; Ahmadi 2000; Starý *et al.*, 2000; Rakhshani *et al.*, 2008b, 2012b; Nazari *et al.*, 2012; Barahoei *et al.*, 2013); *Hayhurstia atriplicis* (L.) (Starý, 1979; Starý *et al.*, 2000; Nazari *et al.*, 2012; Rakhshani *et al.*, 2012b), on *Chenopodium album*, Iran, Tehran, 09-VII-2004, leg. E. Rakhshani; *Lipaphis erysimi* (Kaltenbach) (Starý, 1979; Starý *et al.*, 2000; Mossadegh *et al.*, 2011); *Lipaphis lepidii* Nevsky (Starý *et al.*, 2000; Talebi *et al.*, 2009; Mossadegh *et al.*, 2011; Nazari *et al.*, 2012); *Lipaphis pseudobrassicae* (Davis) (Barahoei *et al.*, 2013); *Mariaella lambersi* Szelegiewicz (Starý, 1979; Starý *et al.*, 2000); *Metopolophium dirhodum* (Walker) (Rakhshani *et al.*, 2008b); *Myzus beybienkoi* (Narzikulov) (Starý, 1979; Starý *et al.*, 2000); *Myzus persicae* (Sulzer) (Starý, 1979; Hodjat and Moradeshaghi, 1988; Starý *et al.*, 2000; Rakhshani, 2012; Mossadegh *et al.*, 2011;

Jafari-Ahmadabadi *et al.*, 2011; Jafari-Ahmadabadi and Modarres, 2012; Taheri and Rakhshani, 2013; Nazari *et al.*, 2012; Barahoei *et al.*, 2013); *Rhopalosiphum maidis* (Fitch) (Starý, 1979; Bandani, 1992; Starý *et al.*, 2000; Barahoei *et al.*, 2013); *Rhopalosiphum padi* (L.) (Bandani, 1992; Starý *et al.*, 2000; Rakhshani *et al.*, 2008b; Mossadegh *et al.*, 2011; Barahoei *et al.*, 2013); *Saltusaphis scirpus* Theobald (Starý *et al.*, 2000); *Schizaphis graminum* (Rondani) (Starý, 1979; Bandani, 1992; Starý *et al.*, 2000; Rakhshani *et al.*, 2008b; Barahoei *et al.*, 2013); *Sitobion avenae* (F.) (Bandani, 1992; Starý *et al.*, 2000; Rakhshani *et al.*, 2008b; Mossadegh *et al.*, 2011; Rakhshani *et al.*, 2012b; Barahoei *et al.*, 2013).

**Distribution in Iran:** Alborz (Starý, 1979; Starý *et al.*, 2000; Talebi *et al.*, 2009), Fars (Gonzalez *et al.*, 1992; Ahmadi and Sarafrazi, 1993; Starý *et al.*, 2000; Rakhshani *et al.*, 2008b; Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013), Golestan, Kordestan (Rakhshani *et al.*, 2008b), Hamadan (Starý *et al.*, 2000; Rakhshani *et al.*, 2008b), Guilan, Semnan, Mazandaran (Starý *et al.*, 2000), Isfahan (Rakhshani *et al.*, 2008b; Talebi *et al.*, 2009; Barahoei *et al.*, 2013), Kerman (Barahoei *et al.*, 2012, 2013), Kermanshah (Rakhshani *et al.*, 2008b; Nazari *et al.*, 2012), North Khorasan (Starý *et al.*, 2000; Rakhshani *et al.*, 2012b), Khorasan-e-Razavi (Rakhshani *et al.*, 2008b; Jafari-Ahmadabadi *et al.*, 2011; Jafari-Ahmadabadi and Modarres, 2012; Rakhshani, 2012), Khuzestan (Mossadegh *et al.*, 2011), Markazi, Qom (Rakhshani *et al.*, 2008b; Barahoei *et al.*, 2013), Qazvin (Davatchi and Shojai, 1968; Starý *et al.*, 2000), Sistan and Baluchestan (Bandani, 1992; Starý *et al.*, 2000; Rakhshani *et al.*, 2006a, 2008b; Talebi *et al.*, 2009), Tehran (Hodjat and Moradeshaghi, 1988; Starý *et al.*, 2000; Rakhshani *et al.*, 2008b; Talebi *et al.*, 2009).

**General distribution:** Cosmopolitan (Yu *et al.*, 2012).

**Remarks:** While, *Diaeretiella rapae* has a wide range of host aphid species, records from *Hyalopterus pruni* (Geoffroy) (Jafari-

Ahmadabadi *et al.*, 2011; Jafari-Ahmadabadi and Modarres, 2012) and *Uroleucon sonchi* (L.) (Starý, 1979) need confirmation.

### 36. *Ephedrus cerasicola* Starý, 1962

**Host records:** *Dysaphis plantaginea* (Passerini) (Rakhshani, 2012; Barahoei *et al.*, 2013); *Myzus cerasi* (F.) (Rakhshani, 2012); *Myzus persicae* (Sulzer) (Rakhshani, 2012); *Phorodon humuli* (Schrank) (Mokhtari *et al.*, 2000; Starý *et al.*, 2000); *Rhopalosiphum nymphaeae* (L.) (Mokhtari *et al.*, 2000; Starý *et al.*, 2000).

**Distribution in Iran:** Guilan (Mokhtari *et al.*, 2000; Starý *et al.*, 2000; Rakhshani, 2012), Isfahan (Rakhshani, 2012; Barahoei *et al.*, 2013), Kordestan, Khorasan-e-Razavi (Rakhshani, 2012).

**General distribution:** Western Palaearctic, USA (Yu *et al.*, 2012).

### 37. *Ephedrus chaitophori* Gardenfors, 1986

**Host records:** *Chaitophorus populeti* (Panzer) (Rakhshani *et al.*, 2007b).

**Distribution in Iran:** Tehran (Rakhshani *et al.*, 2007b).

**General distribution:** Western Palaearctic, USA (Yu *et al.*, 2012).

### 38. *Ephedrus helleni* Mackauer, 1968

**Host records:** *Cavariella aquatica* (Gillette and Bragg) (Starý, 1979; Starý *et al.*, 2000; Rakhshani *et al.*, 2007b; Talebi *et al.*, 2009); *Hayhurstia atriplicis* (L.) on *Atriplex* sp., Iran, Tehran-Peykanshahr, 08 XI 2004; on *Chenopodium album* L., Iran, Tehran - Shahriar, 07-XI-2003, Leg. E. Rakhshani.

**Distribution in Iran:** Tehran (Starý, 1979; Starý *et al.*, 2000; Rakhshani *et al.*, 2007b; Talebi *et al.*, 2009).

**General distribution:** Transpalaearctic (Yu *et al.*, 2012).

**Remarks:** This species has originally been recorded as *Ephedrus salicicola* Takada, 1968 from Iran (Starý, 1979).

### 39. *Ephedrus niger* Gautier, Bonnamour and Gaumont, 1929

**Host records:** *Macrosiphoniella abrotani* (Walker) (Mackauer and Starý, 1967; Starý *et*

*al.*, 2000; Rakhshani *et al.*, 2011); ***Macrosiphoniella sanborni*** (Gillette) (Rakhshani *et al.*, 2011; Nazari *et al.*, 2012); ***Macrosiphoniella* sp.** (Starý, 1979; Yaghubi, 1997; Starý *et al.*, 2000; Rakhshani *et al.*, 2011; Barahoei *et al.*, 2013); ***Uroleucon cichorii*** (Koch) (Yaghubi, 1997; Starý *et al.*, 2000; Barahoei *et al.*, 2012, 2013); ***Uroleucon acroptilidis*** Kadyrbekov, Renxin and Shao, ***Uroleucon bielawskii*** (Szelegiewicz), ***Uroleucon cichorii*** (Koch) (Barahoei *et al.*, 2013); ***Uroleucon compositae*** (Theobald) (Nazari *et al.*, 2012; Barahoei *et al.*, 2013); ***Uroleucon erigeronense*** (Thomas) (Starý *et al.*, 2000; Talebi *et al.*, 2009; Nazari *et al.*, 2012); ***Uroleucon jaceae*** (L.) (Starý *et al.*, 2000; Talebi *et al.*, 2009; Rakhshani *et al.*, 2012b; Nazari *et al.*, 2012; Barahoei *et al.*, 2012, 2013); ***Uroleucon sonchi*** (L.) (Talebi *et al.*, 2009; Taheri and Rakhshani, 2013; Rakhshani *et al.*, 2012b; Nazari *et al.*, 2012; Barahoei *et al.*, 2012, 2013); ***Uroleucon* sp.** (Starý, 1979; Starý *et al.*, 2000; Barahoei *et al.*, 2012, 2013). **Distribution in Iran:** Fars (Taheri and Rakhshani, 2013), Guilan (Yaghubi, 1997; Starý *et al.*, 2000; Talebi *et al.*, 2009), Isfahan (Talebi *et al.*, 2009; Barahoei *et al.*, 2013), Kerman (Barahoei *et al.*, 2012, 2013), Kermanshah (Nazari *et al.*, 2012), North Khorasan (Starý, 1979; Starý *et al.*, 2000; Rakhshani *et al.*, 2012b), Mazandaran (Starý, 1979; Starý *et al.*, 2000), Tehran (Starý, 1979; Starý *et al.*, 2000; Talebi *et al.*, 2009). **General distribution:** Transpalearctic (Yu *et al.*, 2012).

#### 40. *Ephedrus persicae* Froggatt, 1904

**Host records:** ***Aphis affinis*** del Guercio (Talebi *et al.*, 2009; Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013); ***Aphis craccivora*** Koch (Mackauer, 1963; Starý *et al.*, 2000; Rakhshani *et al.*, 2005a, 2006a; Žikić *et al.*, 2009; Nazari *et al.*, 2012; Barahoei *et al.*, 2012, 2013); ***Aphis fabae*** Scopoli (Starý, 1979; Žikić *et al.*, 2009; Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013); ***Aphis gossypii*** Glover (Barahoei *et al.*, 2013); ***Aphis nerii*** Boyer de Fonscolombe (Talebi *et al.*, 2009), on *Nerium*

*oleander*, Iran, Zabol, 05-I-2003; Iran, Tehran, 24-XI-2003, leg. E. Rakhshani; ***Aphis plantaginis*** Goeze (Barahoei *et al.*, 2013); ***Aphis pomi*** DeGeer (Malkeshi, 1997; Starý *et al.*, 2000); ***Aphis punicae*** Passerini (Mackauer, 1963; Starý *et al.*, 2000); ***Brachycaudus amygdalinus*** (Schouteden) (Talebi *et al.*, 2009; Žikić *et al.*, 2009; Jafari-Ahmadabadi *et al.*, 2011; Jafari-Ahmadabadi and Modarres, 2012; Rakhshani, 2012; Nazari *et al.*, 2012; Rakhshani *et al.*, 2012b); ***Brachycaudus cardui*** (L.) (Žikić *et al.*, 2009); ***Brachycaudus helichrysi*** (Kaltenbach) (Starý, 1979; Starý *et al.*, 2000; Žikić *et al.*, 2009; Rakhshani, 2012; Nazari *et al.*, 2012; Barahoei *et al.*, 2013); ***Brachyunguis tamaricis*** (Lichtenstein) (Starý, 1979; Starý *et al.*, 2000); ***Diuraphis noxia*** (Kurdjumov) (Bandani, 1992; Starý *et al.*, 2000); ***Dysaphis crataegi*** (Kaltenbach) (Starý *et al.*, 2000); ***Dysaphis devectora*** (Walker) (Žikić *et al.*, 2009); ***Dysaphis foeniculus*** Theobald (Talebi *et al.*, 2009); ***Dysaphis plantaginea*** (Passerini) (Malkeshi, 1997; Starý *et al.*, 2000; Rakhshani, 2012; Nazari *et al.*, 2012; Barahoei *et al.*, 2013); ***Dysaphis pyri*** (Boyer de Fonscolombe) (Mackauer, 1963; Malkeshi, 1997; Starý *et al.*, 2000; Žikić *et al.*, 2009; Rakhshani, 2012); ***Dysaphis reaumurii*** (Mordvilko) (Rakhshani, 2012; Barahoei *et al.*, 2013); ***Hayhurstia atriplicis*** (L.) (Barahoei *et al.*, 2013); ***Hyadaphis coriandri*** Das (Talebi *et al.*, 2009); ***Hyalopterus amygdali*** (Blanchard) (Rakhshani, 2012; Jafari-Ahmadabadi *et al.*, 2011; Jafari-Ahmadabadi and Modarres, 2012; Barahoei *et al.*, 2013); ***Hyadaphis coriandri*** Das on *Coriandrum* sp., Iran, Zabol, 04-I-2003, leg. E. Rakhshani; ***Metopolophium dirhodum*** (Walker) (Bandani, 1992; Starý *et al.*, 2000; Rakhshani *et al.*, 2008b); ***Myzus cerasi*** (F.) (Žikić *et al.*, 2009; Rakhshani, 2012); ***Myzus persicae*** (Sulzer) (Talebi *et al.*, 2009; Žikić *et al.*, 2009; Rakhshani, 2012; Nazari *et al.*, 2012; Barahoei *et al.*, 2013); ***Phorodon humuli*** (Schränk) (Rakhshani, 2012; Barahoei *et al.*, 2013); ***Rhopalosiphum maidis*** (Fitch) (Starý, 1979; Gärdenfors 1986; Bandani, 1992; Starý *et al.*, 2000; Mossadegh *et al.*, 2011; Barahoei *et al.*, 2012, 2013); ***Rhopalosiphum padi*** (L.)

(Starý, 1979; Gärdenfors 1986; Bandani, 1992; Starý et al., 2000; Rakhshani et al., 2008b); *Schizaphis graminum* (Rondani) (Bandani, 1992; Starý et al., 2000; Žikić et al., 2009; Rakhshani et al., 2008b, 2012b); *Sipha maydis* Passerini (Bandani, 1992; Starý et al., 2000); *Sitobion avenae* (F.) (Bandani, 1992; Starý et al., 2000; Barahoei et al., 2013); *Toxoptera aurantii* Boyer de Fonscolombe (Mackauer, 1963).

**Distribution in Iran:** Alborz (Starý, 1979; Starý et al., 2000; Rakhshani, 2012), Fars (Starý, 1979; Starý et al., 2000; Rakhshani, 2012; Taheri and Rakhshani, 2013; Barahoei et al., 2013), Guilan (Starý et al., 2000), Isfahan (Rakhshani, 2012; Barahoei et al., 2013), Kerman (Barahoei et al., 2012, 2013), Kermanshah (Rakhshani et al., 2008b; Rakhshani, 2012; Nazari et al., 2012), North Khorasan (Malkeshi, 1997; Starý et al., 2000; Rakhshani, 2012; Rakhshani et al., 2012b), Khorasan-e-Razavi (Jafari-Ahmadabadi et al., 2011; Rakhshani, 2012; Jafari-Ahmadabadi and Modarres, 2012), Kordestan, Qazvin (Rakhshani, 2012), Khuzestan (Mossadegh et al., 2011), Markazi, Qom (Rakhshani et al., 2008b), Sistan and Baluchestan (Bandani, 1992; Starý et al., 2000; Rakhshani et al., 2005a, 2006a, 2008b; Talebi et al., 2009), Tehran (Mackauer, 1963; Starý, 1979; Starý et al., 2000; Rakhshani et al., 2005a; Talebi et al., 2009; Rakhshani, 2012).

**General distribution:** Cosmopolitan (Yu et al., 2012).

#### 41. *Ephedrus plagiator* (Nees, 1811)

**Host records:** *Brachycaudus cardui* (L.) (Yaghubi, 1997; Starý et al., 2000); *Brachycaudus helichrysi* (Kaltenbach) (Rakhshani, 2012); *Dysaphis crataegi* (Kaltenbach) (Starý et al., 2000); *Dysaphis pyri* (Boyer de Fonscolombe) (Rakhshani, 2012); *Dysaphis* sp. (Starý, 1979); *Myzus cerasi* (F.) (Mokhtari et al., 2000; Starý et al., 2000); *Rhopalosiphum padi* (L.) (Rakhshani et al., 2008b; Barahoei et al., 2013); *Schizaphis graminum* (Rondani) on *Triticum aestivum* L., Iran, Zabol, 24-II-2003, leg. E. Rakhshani;

*Schizaphis graminum* (Rondani) (Rakhshani et al., 2008b); *Sitobion avenae* (F.) (Darvish-Mojeni and Bayat-Asadi, 1995; Starý et al., 2000; Rakhshani et al., 2008b; Nazari et al., 2012).

**Distribution in Iran:** Alborz, Khorasan-e-Razavi (Rakhshani, 2012), East Azarbaijan (Starý, 1979; Starý et al., 2000), Golestan (Darvish-Mojeni and Bayat-Asadi, 1995; Starý et al., 2000), Guilan (Yaghubi, 1997; Mokhtari et al., 2000; Starý et al., 2000), Isfahan (Rakhshani et al., 2008b; Barahoei et al., 2013), Khuzestan (Rakhshani et al., 2008b; Nazari et al., 2012), Sistan and Baluchestan (New record), Tehran (Rakhshani et al., 2008b).

**General distribution:** Transpalaeartic, Australian (Yu et al., 2012).

#### 42. *Euaphidius cingulatus* Ruthe, 1859

**Host records:** *Pterocomma pilosum* Buckton (Starý, 1979; Starý et al., 2000; Rakhshani et al., 2007b, 2008a, 2012b; Talebi et al., 2009); *Pterocomma populeum* (Kaltenbach) (Starý, 1979; Rakhshani et al., 2007b, 2008a, 2012b); *Pterocomma* sp. (Starý et al., 2000).

**Distribution in Iran:** Alborz (Starý, 1979; Starý et al., 2000; Rakhshani et al., 2007b, 2008a), Guilan (Rakhshani et al., 2007b, 2008a; Talebi et al., 2009), Khorasan-e-Razavi (Starý, 1979; Starý et al., 2000; Rakhshani et al., 2007b), North Khorasan (Rakhshani et al., 2012b).

**General distribution:** Holarctic (Yu et al., 2012).

#### 43. *Euaphidius setiger* Mackauer, 1961

**Host records:** *Periphyllus testudinaceus* (Frenie) (Rakhshani et al., 2008a); *Periphyllus* sp. (Starý, 1979; Starý et al., 2000; Nazari et al., 2012).

**Distribution in Iran:** Lorestan (Starý, 1979; Starý et al., 2000; Rakhshani et al., 2008a; Nazari et al., 2012).

**General distribution:** Holarctic (Yu et al., 2012).

#### 44. *Lipolexis gracilis* Forster, 1862

**Host records:** *Aphis fabae* Scolopli (Rakhshani et al., 2008d); *Aphis salviae* Walker (Barahoei et al., 2013; Alikhani et al., 2013); *Brachycaudus amygdalinus* (Schouteden) (Rakhshani et al., 2012b).

**Distribution in Iran:** North Khorasan (Rakhshani *et al.*, 2012b), Markazi (Barahoei *et al.*, 2013; Alikhani *et al.*, 2013).

**General distribution:** Transpalearctic (Yu *et al.*, 2012).

#### 45. *Lysiphlebus cardui* (Marshall, 1896)

**Host records:** *Aphis fabae* Scopoli (Alikhani *et al.*, 2013).

**Distribution in Iran:** Markazi (Alikhani *et al.*, 2013).

**General distribution:** Western Palearctic (Yu *et al.*, 2012).

#### 46. *Lysiphlebus confusus* Tremblay and Eady 1978

**Host records:** *Acyrtosiphon* sp. (Starý *et al.*, 2000); *Aphis affinis* del Guercio (Taheri and Rakhshani, 2013); *Aphis craccivora* Koch (Starý, 1979; Starý *et al.*, 2000; Rakhshani *et al.*, 2005a, 2006a; Talebi *et al.*, 2009; Taheri and Rakhshani, 2013; Nazari *et al.*, 2012; Barahoei *et al.*, 2013); *Aphis fabae* Scopoli (Talebi *et al.*, 2009; Nazari *et al.*, 2012); *Aphis farinosa* Gmelin (Yaghubi, 1997; Starý *et al.*, 2000; Rakhshani *et al.*, 2007b; Talebi *et al.*, 2009; Nazari *et al.*, 2012); *Aphis gossypii* Glover (Nazari *et al.*, 2012); *Aphis idaei* van der Goot (Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013); *Aphis intybi* Koch (Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013); *Aphis verbasci* Schrank (Yaghubi, 1997; Starý *et al.*, 2000; Talebi *et al.*, 2009; Rakhshani *et al.*, 2012b; Barahoei *et al.*, 2013); *Aulacorthum* sp. (Starý, 1979); *Brachycaudus cardui* (L.) (Yaghubi, 1997; Starý *et al.*, 2000); *Brachycaudus helichrysi* (Kaltenbach) (Nazari *et al.*, 2012); *Brachyunguis skafi* Remaudiere and Talhouk (Starý *et al.*, 2000); *Ephedraphis ephedrae* (Nevsky) (Starý, 1979; Starý *et al.*, 2000); *Hyperomyzus lactucae* (L.) (Barahoei *et al.*, 2013); *Macrosiphoniella tapuskae* Hottes and Frison (Starý, 1979; Starý *et al.*, 2000; Rakhshani *et al.*, 2011); *Protaphis* sp. (Starý, 1979); *Toxoptera aurantii* (Boyer de Fonscolombe) (Aghajanzadeh *et al.*, 1995; Starý *et al.*, 2000); *Uroleucon* sp. (Barahoei *et al.*, 2012, 2013).

**Distribution in Iran:** Ardabil (Talebi *et al.*, 2009), Fars (Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013), Guilan (Yaghubi, 1997; Starý *et al.*, 2000; Talebi *et al.*, 2009), Hamadan (Rakhshani *et al.*, 2007b; Talebi *et al.*, 2009; Nazari *et al.*, 2012), Kerman (Barahoei *et al.*, 2012, 2013), Kermanshah (Nazari *et al.*, 2012), North Khorasan (Starý, 1979; Starý *et al.*, 2000; Rakhshani *et al.*, 2012b), Khorasan-e-Razavi (Starý, 1979; Starý *et al.*, 2000), Mazandaran (Aghajanzadeh *et al.*, 1995; Starý *et al.*, 2000), Sistan and Baluchestan (Rakhshani *et al.*, 2005a), Tehran (Starý, 1979; Starý *et al.*, 2000; Rakhshani *et al.*, 2005a; Talebi *et al.*, 2009).

**General distribution:** Transpalearctic (Yu *et al.*, 2012).

**Remarks:** The host records and the distribution data for *Lysiphlebus ambiguus* have been transferred to *Lysiphlebus confusus*.

#### 47. *Lysiphlebus desertorum* Starý, 1965

**Host records:** *Aphis craccivora* Koch (Barahoei *et al.*, 2013); *Aphis* sp. (Rakhshani *et al.*, 2012b); *Protaphis terricola* Walker (Barahoei *et al.*, 2013); *Protaphis* sp. (Talebi *et al.*, 2009; Nazari *et al.*, 2012); *Xerobion cinae* (Nevsky) (Starý, 1979; Starý *et al.*, 2000; Barahoei *et al.*, 2013).

**Distribution in Iran:** Kerman (Barahoei *et al.*, 2013), Kermanshah (Talebi *et al.*, 2009), North Khorasan (Starý, 1979; Starý *et al.*, 2000; Rakhshani *et al.*, 2012b), Kordestan (Nazari *et al.*, 2012), Tehran (Starý, 1979).

**General distribution:** Eastern Palearctic, Central Asia (Yu *et al.*, 2012).

#### 48. *Lysiphlebus fabarum* (Marshall, 1896)

**Host records:** *Acyrtosiphon ilka* Eastop (Starý, 1979; Starý *et al.*, 2000); *Acyrtosiphon gossypii* Mordvilko (Barahoei *et al.*, 2013); *Acyrtosiphon lactucae* (Passerini) (Starý *et al.*, 2000); *Aphis acetosae* L. (Yaghubi, 1997; Starý *et al.*, 2000; Barahoei *et al.*, 2013); *Aphis affinis* del Guercio (Yaghubi, 1997; Starý *et al.*, 2000; Talebi *et al.*, 2009; Rakhshani *et al.*, 2012b; Taheri and Rakhshani, 2013; Nazari *et al.*, 2012; Tomanović *et al.*, 2012; Barahoei *et*



- al., 2013); *Aphis alexandrae* (Nevsky) (Rakhshani et al., 2012b); *Aphis althaeae* (Nevsky) (Starý, 1979; Starý et al., 2000; Rakhshani et al., 2012b); *Aphis anthemidis* Börner (Talebi et al., 2009; Nazari et al., 2012); *Aphis craccivora* Koch (Starý, 1979; Monajemi and Esmaili, 1981; Yaghubi, 1997; Starý et al., 2000; Rakhshani et al., 2005a, 2006a, 2012b; Talebi et al., 2009; Mossadegh et al., 2011; Barahoei et al., 2011, 2012, 2013; Nazari et al., 2012; Taheri and Rakhshani, 2013); *Aphis epilobii* Kaltenbach (Nazari et al., 2012); *Aphis eunymii* F. (Talebi et al., 2009); *Aphis euphorbicola* Rezwani and Lampel (Rakhshani et al., 2012b; Barahoei et al., 2013); *Aphis fabae* Scopoli (Davatchi and Shojai, 1968; Yaghubi, 1997; Starý et al., 2000; Talebi et al., 2009; Rakhshani et al., 2012b; Nazari et al., 2012; Taheri and Rakhshani, 2013; Barahoei et al., 2011, 2012, 2013); *Aphis gerardianae* Mordvilko (Rakhshani et al., 2012b); *Aphis gossypii* Glover (Starý, 1979; Yaghubi, 1997; Starý et al., 2000; Talebi et al., 2009; Mossadegh et al., 2011; Taheri and Rakhshani, 2013; Rakhshani et al., 2012b; Barahoei et al., 2011, 2012, 2013; Nazari et al., 2012); *Aphis idaei* van der Goot (Talebi et al., 2009; Taheri and Rakhshani, 2013; Barahoei et al., 2013); *Aphis intybi* Koch (Yaghubi, 1997; Starý et al., 2000; Talebi et al., 2009; Taheri and Rakhshani, 2013; Rakhshani et al., 2012b); *Aphis nasturtii* Kaltenbach (Starý, 1979; Starý et al., 2000; Nazari et al., 2012; Barahoei et al., 2013); *Aphis nerii* Boyer de Fonscolombe (Yaghubi, 1997; Starý et al., 2000; Talebi et al., 2009; Barahoei et al., 2013); *Aphis origani* Passerini, *Aphis plantaginis* Goeze (Barahoei et al., 2013); *Aphis pomi* DeGeer (Radjabi, 1989; Malkeshi, 1997; Starý et al., 2000; Rakhshani, 2012); *Aphis punicae* (Passerini) (Talebi et al., 2009; Taheri and Rakhshani, 2013; Nazari et al., 2012; Barahoei et al., 2013); *Aphis ruborum* Blackman (Starý, 1979; Yaghubi, 1997; Starý et al., 2000); *Aphis rumicis* L. (Yaghubi, 1997; Starý et al., 2000; Talebi et al., 2009; Nazari et al., 2012); *Aphis salviae* Walker (Starý, 1979; Starý et al., 2000); *Aphis solanella* Theobald (Nazari et al., 2012; Barahoei et al., 2013); *Aphis spiraecola* Patch (Yaghubi, 1997; Starý et al., 2000; Rakhshani, 2012); *Aphis taraxacicola* (Börner) (Starý, 1979; Starý et al., 2000); *Aphis umbrella* (Börner) (Starý et al., 2000; Talebi et al., 2009; Nazari et al., 2012; Barahoei et al., 2013); *Aphis urticata* Gmelin (Yaghubi, 1997; Starý et al., 2000); *Aphis* sp. (Starý, 1979; Yaghubi, 1997; Starý et al., 2000; Nazari et al., 2012; Barahoei et al., 2013); *Brachycaudus amygdalinus* (Schouteden) (Nazari et al., 2012; Rakhshani, 2012); *Brachycaudus cardui* (L.) (Yaghubi, 1997; Starý et al., 2000; Talebi et al., 2009; Rakhshani et al., 2012b; Taheri and Rakhshani, 2013; Nazari et al., 2012; Barahoei et al., 2013); *Brachycaudus helichrysi* (Kaltenbach) (Yaghubi, 1997; Starý et al., 2000; Rakhshani, 2012; Jafari-Ahmadabadi et al., 2011; Jafari-Ahmadabadi and Modarres, 2012; Taheri and Rakhshani, 2013; Nazari et al., 2012; Barahoei et al., 2013); *Brachycaudus persicae* (Passerini) (Rakhshani, 2012); *Brachycaudus tragopogonis setosus* Hille Ris Lambers (Starý et al., 2000; Barahoei et al., 2012, 2013; Rakhshani et al., 2012b); *Brachyunguis harmalae* Das (Talebi et al., 2009; Rakhshani et al., 2012b); *Brachyunguis zygophylli* (Nevsky) (Barahoei et al., 2011, 2012, 2013); *Coloradoa* sp. (Starý, 1979; Starý et al., 2000); *Dysaphis lappae* Koach (Starý, 1979); *Dysaphis plantaginea* (Passerini) (Starý et al., 2000; Rakhshani, 2012; Barahoei et al., 2013); *Dysaphis radicola* (Mordvilko); *Hyadaphis coriandri* (Passerini); *Lipaphis erysimi* (Kaltenbach); *Lipaphis fritzmulleri* Börner; *Myzus beybienkoi* (Narzikulov); *Protaphis elongata* (Nevsky) (Talebi et al., 2009); *Hayhurstia atriplicis* (L.) (Nazari et al., 2012); *Hyalopterus amygdali* (Blanchard) (Rakhshani, 2012); *Hyalopterus pruni* (Geoffroy) (Jafari-Ahmadabadi et al., 2011; Jafari-Ahmadabadi and Modarres, 2012); *Lipaphis lepidii* Nevsky (Starý, 1979; Starý et al., 2000; Talebi et al., 2009); *Macrosiphoniella papilata* Holman (Barahoei et al., 2013); *Macrosiphoniella sanborni* (Gillette) (Yaghubi, 1997; Starý et al., 2000); *Macrosiphum rosae* (L.) (Taheri and

Rakhshani, 2013); *Melanaphis* sp. (Barahoei *et al.*, 2012, 2013); *Melanaphis sacchari* (Zehntner) (Barahoei *et al.*, 2011); *Metopolophium dirhodum* (Walker) (Barahoei *et al.*, 2013); *Myzus persicae* (Sulzer) (Talebi *et al.*, 2009; Barahoei *et al.*, 2013); *Phorodon humuli* (Schrank) (Mokhtari *et al.*, 2000; Starý *et al.*, 2000); *Protaphis terricola* Walker (Barahoei *et al.*, 2013); *Protaphis* sp. (Starý, 1979; Barahoei *et al.*, 2013); *Rhopalosiphum nymphaeae* (L.) (Mokhtari *et al.*, 2000; Starý *et al.*, 2000); *Rhopalosiphum padi* (L.) (Rakhshani *et al.*, 2008b; Nazari *et al.*, 2012; Taheri and Rakhshani, 2013); *Saltusaphis scirpus* Theobald (Starý *et al.*, 2000; Tomanović *et al.*, 2012); *Saltusaphis* sp. (Starý, 1979); *Toxoptera aurantii* (Boyer de Fonscolombe) (Aghajanzadeh *et al.*, 1995; Starý *et al.*, 2000).

**Distribution in Iran:** Alborz (Starý, 1979; Starý *et al.*, 2000; Rakhshani *et al.*, 2005a, 2006a; Talebi *et al.*, 2009), East Azarbaijan, West Azarbaijan (Starý, 1979; Starý *et al.*, 2000), Fars (Davatchi and Shojai, 1968; Starý, 1979; Starý *et al.*, 2000; Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013), Golestan (Starý, 1979; Starý *et al.*, 2000; Rakhshani, 2012), Guilan (Yaghubi, 1997; Mokhtari *et al.*, 2000; Starý *et al.*, 2000; Talebi *et al.*, 2009), Hamadan (Rakhshani *et al.*, 2006a; Talebi *et al.*, 2009; Nazari *et al.*, 2012), Isfahan (Starý *et al.*, 2000; Rakhshani *et al.*, 2006a, 2008b; Talebi *et al.*, 2009; Rakhshani, 2012; Barahoei *et al.*, 2013), Kerman (Barahoei *et al.*, 2011, 2012, 2013), Kermanshah (Talebi *et al.*, 2009; Nazari *et al.*, 2012; Rakhshani *et al.*, 2006a; Rakhshani, 2012), North Khorasan (Rakhshani *et al.*, 2012b), Khorasan-e-Razavi (Starý, 1979; Starý *et al.*, 2000; Jafari-Ahmadabadi *et al.*, 2011; Jafari-Ahmadabadi and Modarres, 2012; Rakhshani, 2012), Khuzestan (Mossadegh *et al.*, 2011; Nazari *et al.*, 2012), Kordestan (Rakhshani *et al.*, 2006a; Nazari *et al.*, 2012), Markazi (Talebi *et al.*, 2009; Barahoei *et al.*, 2013), Mazandaran (Aghajanzadeh *et al.*, 1995; Starý *et al.*, 2000), Qazvin (Rakhshani *et al.*, 2006a; Talebi *et al.*, 2009), Qom (Barahoei *et al.*, 2013), Sistan and Baluchestan (Rakhshani

*et al.*, 2005a, 2006a, 2008b; Talebi *et al.*, 2009), Tehran (Starý, 1979; Monajemi and Esmaili, 1981; Radjabi, 1989; Starý *et al.*, 2000; Rakhshani *et al.*, 2005a, 2006a; Talebi *et al.*, 2009; Rakhshani, 2012), Zanjan (Rakhshani *et al.*, 2006a).

**General distribution:** Transpalaeartic, Australian (Yu *et al.*, 2012).

**Remarks:** The specimens reared from *Brachycaudus* aphids have been considered as a separate undescribed species, which is biologically different from *Lysiphlebus fabarum*. Nevertheless, we did not separate these records here.

#### 49. *Lysiphlebus testaceipes* (Cresson, 1880)

**Host records:** *Aphis craccivora* Koch (Rakhshani *et al.*, 2005a).

**Distribution in Iran:** Tehran (Rakhshani *et al.*, 2005a).

**General distribution:** Cosmopolitan (Yu *et al.*, 2012).

#### 50. *Monoctonia vesicarii* Tremblay, 1991

**Host records:** *Pemphigus spirothecae* Passerini (Ghafouri Moghaddam *et al.*, 2012).

**Distribution in Iran:** Ardabil (Ghafouri Moghaddam *et al.*, 2012).

**General distribution:** Eastern Palaeartic, Western Palaeartic (Yu *et al.*, 2012).

#### 51. *Monoctonus mali* van Achterberg, 1989

**Host records:** Without host data (Mosavi *et al.*, 2012).

**Distribution in Iran:** West Azarbaijan (Mosavi *et al.*, 2012).

**General distribution:** Western Palaeartic (Yu *et al.*, 2012).

#### 52. *Pauesia antennata* (Mukerji, 1950)

**Host records:** *Pterochloroides persicae* (Cholodkovsky) (Mackauer and Starý, 1967; Starý *et al.*, 2000; Rakhshani *et al.*, 2005b, 2012b; Talebi *et al.*, 2009; Rakhshani, 2012; Nazari *et al.*, 2012; Barahoei *et al.*, 2013).

**Distribution in Iran:** Ardabil, Tehran (Rakhshani *et al.*, 2005b; Rakhshani, 2012), Hamadan (Rakhshani *et al.*, 2005b), Kerman

(Rakhshani, 2012; Barahoei *et al.*, 2013), Kermanshah (Rakhshani, 2012; Nazari *et al.*, 2012), North Khorasan (Rakhshani, 2012; Rakhshani *et al.*, 2012b), Sistan and Baluchestan (Rakhshani *et al.*, 2005b; Talebi *et al.*, 2009; Rakhshani, 2012).

**General distribution:** Central Asia, India (Yu *et al.*, 2012).

### 53. *Pauesia hazratbalensis* Bhagat, 1981

**Host records:** *Cinara (Cupressobium) tujafilina* (del Guercio) (Starý *et al.*, 2005; Rakhshani *et al.*, 2012b).

**Distribution in Iran:** North Khorasan (Rakhshani *et al.*, 2012b), Tehran (Starý *et al.*, 2005).

**General distribution:** Central Asia, India (Yu *et al.*, 2012).

### 54. *Praon abjectum* (Haliday, 1833)

**Host records:** *Brachycaudus cardui* (L.) (Rakhshani *et al.*, 2007a; Rakhshani, 2012).

**Distribution in Iran:** Tehran (Rakhshani *et al.*, 2007a; Rakhshani, 2012).

**General distribution:** Transpalearctic (Yu *et al.*, 2012).

### 55. *Praon absinthii* Bignell 1894

**Host records:** *Macrosiphoniella absinthii* (L.) (Starý, 1979; Starý *et al.*, 2000; Rakhshani *et al.*, 2011); *Macrosiphoniella oblonga* (Mordvilko) (Rakhshani *et al.*, 2007a, 2011; Talebi *et al.*, 2009); *Macrosiphoniella sanborni* (Gillette) (Rakhshani *et al.*, 2007a, 2011).

**Distribution in Iran:** Guilan (Starý, 1979; Starý *et al.*, 2000), Tehran (Rakhshani *et al.*, 2007a), Zanzan (Rakhshani *et al.*, 2007a; Talebi *et al.*, 2009).

**General distribution:** Transpalearctic (Yu *et al.*, 2012).

### 56. *Praon barbatum* Mackauer, 1967

**Host records:** *Acyrtosiphon pisum* (Harris) (Gonzalez, 1978; Starý and Gonzalez, 1978; Starý, 1979; Starý *et al.*, 2000; Rakhshani *et al.*, 2007a; Nazari *et al.*, 2012; Taheri and Rakhshani, 2013; Barahoei *et al.*, 2013); *Nearctaphis bakeri* (Cowen) (Barahoei *et al.*, 2013).

**Distribution in Iran:** Alborz (Starý, 1979; Starý *et al.*, 2000), Ardabil (Gonzalez, 1978; Starý and Gonzalez, 1978; Starý, 1979; Starý *et al.*, 2000), Fars (Taheri and Rakhshani, 2013), Isfahan (Barahoei *et al.*, 2013), Kermanshah (Nazari *et al.*, 2012), Tehran (Rakhshani *et al.*, 2007a).

**General distribution:** Western Palearctic, introduced to USA (Yu *et al.*, 2012).

### 57. *Praon dorsale* (Haliday, 1833)

**Host records:** *Uroleucon jaceae* (L.) (Starý *et al.*, 2000).

**Distribution in Iran:** Guilan (Starý *et al.*, 2000).

**General distribution:** Transpalearctic (Yu *et al.*, 2012).

**Remarks:** Evidences about distribution and host records for this species are mixed with *Praon yomenae* Takada, a parasitoid of *Uroleucon* aphids. *Praon dorsale* is a rare species which is restricted to parasitizing *Corylobium avellanae* (Schrank) (Tremblay and Pennacchio, 1985; Tremblay *et al.*, 1986).

### 58. *Praon exsoletum* (Nees, 1811)

**Host records:** *Therioaphis riehmii* (Börner) (Van den Bosch, 1957; Starý *et al.*, 2000); *Therioaphis trifolii* (Monell) (Farahbakhsh, 1961; Starý, 1979; Monajemi and Esmaili, 1981; Rasulian, 1985, 1989; Starý *et al.*, 2000; Rakhshani *et al.*, 2006a, 2007a, 2012b; Nazari *et al.*, 2012; Barahoei *et al.*, 2013).

**Distribution in Iran:** Alborz, Sistan and Baluchestan, Zanzan (Rakhshani *et al.*, 2006a, 2007a), Isfahan (Barahoei *et al.*, 2013), Hamadan, Kordestan (Rakhshani *et al.*, 2006a, 2007a; Nazari *et al.*, 2012), Kermanshah (Rakhshani *et al.*, 2006a; Nazari *et al.*, 2012), North Khorasan (Rakhshani *et al.*, 2012b), Qazvin, Semnan (Rakhshani *et al.*, 2006a), Tehran (Monajemi and Esmaili, 1981; Rasulian, 1985, 1989; Starý *et al.*, 2000; Rakhshani *et al.*, 2006a, 2007a).

**General distribution:** Western Palearctic, Nearctic (Yu *et al.*, 2012).

**Remarks:** Recorded on *Acyrtosiphon pisum* (Harris) (Monajemi and Esmaili, 1981; Starý *et al.*, 2000), as a host of *Praon exoletum* seem doubtful.

#### 59. *Praon flavinode* (Haliday, 1833)

**Host records:** *Tinocallis nevskyi* Remaudiere, Quednau and Heie (Barahoei *et al.*, 2010, 2012, 2013).

**Distribution in Iran:** Kerman (Barahoei *et al.*, 2010, 2012, 2013).

**General distribution:** Transpalaeartic, Oriental (Yu *et al.*, 2012).

#### 60. *Praon gallicum* Starý, 1971

**Host records:** *Rhopalosiphum padi* (L.) (Bagheri-Matin *et al.*, 2010; Nazari *et al.*, 2012).

**Distribution in Iran:** Kermanshah (Bagheri-Matin *et al.*, 2010; Nazari *et al.*, 2012)

**General distribution:** Transpalaeartic, Nearctic, Neotropical (Yu *et al.*, 2012).

#### 61. *Praon necans* Mackauer, 1959

**Host records:** *Aphis craccivora* Koch (Nazari *et al.*, 2012); *Aphis gossypii* Glover, *Aphis nerii* Boyer de Fonscolombe (Mossadegh *et al.*, 2011); *Aphis punicae* Passerini, *Macrosiphoniella sanborni* (Gillette) (Nazari *et al.*, 2012); *Myzus persicae* (Sulzer) (Mossadegh *et al.*, 2011); *Rhopalosiphum nymphaeae* (L.) (Nazari *et al.*, 2012); *Rhopalosiphum padi* (L.) (Mossadegh *et al.*, 2011; Nazari *et al.*, 2012); *Sitobion avenae* (F.) (Mossadegh *et al.*, 2011).

**Distribution in Iran:** Kermanshah (Nazari *et al.*, 2012), Khuzestan (Mossadegh *et al.*, 2011).

**General distribution:** Transpalaeartic (Yu *et al.*, 2012).

**Remarks:** All host records from Iran (Mossadegh *et al.*, 2011; Nazari *et al.*, 2012) have been contributed to an endemic phenotype of *Praon* cf. *necans*, which has broader host range and some morphological differences with *Praon necans* Mackauer.

#### 62. *Praon orpheusi* Kavallieratos, Athanassiou and Tomanović, 2003

**Host records:** *Hyperomyzus lactucae* (L.) (Rakhshani *et al.*, 2007a; Talebi *et al.*, 2009).

**Distribution in Iran:** Tehran (Rakhshani *et al.*, 2007a, Talebi *et al.*, 2009).

**General distribution:** Western Palaeartic (Iran, Greece, Bulgaria) (Yu *et al.*, 2012).

#### 63. *Praon pubescens* Starý, 1961

**Host records:** *Nasonovia ribisnigri* (Mosley) (Nazari *et al.*, 2012).

**Distribution in Iran:** Khuzestan (Nazari *et al.*, 2012).

**General distribution:** Western Palaeartic, India (Yu *et al.*, 2012).

#### 64. *Praon rosaecola* Starý, 1961

**Host records:** *Macrosiphum rosae* (L.) (Rakhshani *et al.*, 2007a, 2012b; Talebi *et al.*, 2009; Barahoei *et al.*, 2010, 2012, 2013); *Wahlgreniella nervata* (Gillette) (Barahoei *et al.*, 2013).

**Distribution in Iran:** Guilan (Rakhshani *et al.*, 2007a), Isfahan (Barahoei *et al.*, 2013), Kerman (Barahoei *et al.*, 2010, 2012, 2013), North Khorasan (Rakhshani *et al.*, 2012b), Tehran (Rakhshani *et al.*, 2007a; Talebi *et al.*, 2009).

**General distribution:** Western Palaeartic (Yu *et al.*, 2012).

#### 65. *Praon unitum* Mescheloff and Rosen, 1988

**Host records:** *Macrosiphoniella sanborni* (Gillette) (Rakhshani *et al.*, 2011); *Uroleucon acrotilidis* Kadyrbekov, Renxin and Shao (Barahoei *et al.*, 2010, 2012, 2013); *Uroleucon jaceae* (L.), *Uroleucon sonchi* (L.) (Barahoei *et al.*, 2013).

**Distribution in Iran:** Kerman (Barahoei *et al.*, 2010, 2012, 2013).

**General distribution:** This species has not been reported outside Iran and Israel (Yu *et al.*, 2012).

#### 66. *Praon volucre* (Haliday, 1833)

**Host records:** *Acyrtosiphon lactucae* (Passerini) (Rakhshani *et al.*, 2007a); *Acyrtosiphon pisum* (Harris) (Rakhshani *et al.*, 2006a, 2007a); *Amphorophora catharinae* (Nevsky) (Rakhshani *et al.*, 2012b; Barahoei *et al.*, 2010, 2012, 2013); *Aphis affinis* del Guercio (Rakhshani *et al.*, 2012b); *Aphis*

*craccivora* Koch (Rakhshani et al., 2005a, 2006a, 2007a, 2012b; Barahoei et al., 2010, 2012, 2013); *Aphis dlabolai* Holman (Barahoei et al., 2013); *Aphis fabae* Scopoli (Starý, 1979; Starý et al., 2000; Rakhshani et al., 2007a; Barahoei et al., 2013; Taheri and Rakhshani, 2013; Nazari et al., 2012); *Aphis gossypii* Glover (Barahoei et al., 2013); *Aphis pomi* de Geer (Rakhshani, 2012); *Aphis solanella* Theobald (Rakhshani et al., 2007a; Talebi et al., 2009; Barahoei et al., 2010, 2012, 2013); *Aphis urticata* Gmelin (Rakhshani et al., 2012b); *Brachycaudus amygdalinus* (Schouteden) (Rakhshani et al., 2007a; Talebi et al., 2009; Rakhshani, 2012); *Brachycaudus cardui* (L.) (Rakhshani, 2012); *Brachycaudus helichrysi* (Kaltenbach) (Rakhshani et al., 2007a; Talebi et al., 2009; Jafari-Ahmadabadi et al., 2011; Jafari-Ahmadabadi and Modarres, 2012; Rakhshani, 2012; Barahoei et al., 2013); *Brachycaudus persicae* (Passerini) (Rakhshani, 2012); *Diuraphis noxia* (Kurdjumov) (Starý et al., 2000; Rakhshani et al., 2007a, 2008b; Barahoei et al., 2013); *Dysaphis pyri* (Boyer de Fonscolombe) (Rakhshani, 2012); *Hyalopterus amygdali* (Blanchard) (Rakhshani et al., 2007a; Taheri and Rakhshani, 2013; Rakhshani, 2012; Nazari et al., 2012); *Hyalopterus pruni* (Geoffrey) (Rakhshani et al., 2007a; Rakhshani, 2012; Jafari-Ahmadabadi et al., 2011; Jafari-Ahmadabadi and Modarres, 2012; Barahoei et al., 2013); *Hyperomyzus lactucae* (L.) (Rakhshani et al., 2007a; Talebi et al., 2009); *Macrosiphum rosae* (L.) (Rakhshani et al., 2007a; Talebi et al., 2009; Barahoei et al., 2010, 2012, 2013; Nazari et al., 2012); *Macrosiphum* sp. (Starý et al., 2000); *Macrosiphoniella* sp. (Rakhshani et al., 2011); *Metopolophium dirhodum* (Walker) (Rakhshani et al., 2008b; Taheri and Rakhshani, 2013; Barahoei et al., 2013); *Myzus beybienkoi* (Narzykulov) (Starý et al., 2000); *Myzus persicae* (Sulzer) (Starý, 1979; Starý et al., 2000; Rakhshani et al., 2007a; Rakhshani, 2012; Jafari-Ahmadabadi et al., 2011; Jafari-Ahmadabadi and Modarres, 2012; Nazari et al., 2012; Barahoei et al., 2013);

*Phorodon humuli* (Schrank) (Rakhshani et al., 2007a); *Rhopalosiphum maidis* Fitch (Rakhshani et al., 2007a, 2008b; Nazari et al., 2012; Barahoei et al., 2010, 2012, 2013); *Rhopalosiphum padi* (L.) (Rakhshani et al., 2007a, 2008b; Barahoei et al., 2013); *Schizaphis graminum* (Rondani) (Rakhshani et al., 2007a, 2008b; Nazari et al., 2012; Barahoei et al., 2013); *Sitobion avenae* (F.) (Rakhshani et al., 2007a, 2008b; Barahoei et al., 2013); *Uroleucon cichorii* (Koch) (Rakhshani et al., 2007a); *Uroleucon compositae* (Theobald) (Rakhshani et al., 2007a; Barahoei et al., 2013); *Uroleucon jaceae* (L.) (Rakhshani et al., 2007a); *Uroleucon sonchi* (L.) (Rakhshani et al., 2007a, 2012b; Talebi et al., 2009; Nazari et al., 2012; Barahoei et al., 2010, 2012, 2013).

**Distribution in Iran:** Alborz (Starý, 1979; Starý et al., 2000; Rakhshani et al., 2007a; Talebi et al., 2009; Rakhshani, 2012), West Azarbaijan (Starý et al., 2000), Fars (Rakhshani et al., 2007a, 2008b; Rakhshani, 2012; Taheri and Rakhshani, 2013; Barahoei et al., 2013), Golestan (Rakhshani et al., 2007a, 2008b), Hamadan (Rakhshani et al., 2007a, 2008b; Rakhshani, 2012; Nazari et al., 2012), Isfahan (Rakhshani et al., 2007a, 2008b; Talebi et al., 2009; Barahoei et al., 2013), Kerman (Barahoei et al., 2010, 2012, 2013), Kermanshah (Rakhshani et al., 2008b; Rakhshani, 2012; Nazari et al., 2012), Khorasan-e-Razavi (Rakhshani et al., 2008b; Jafari-Ahmadabadi et al., 2011; Rakhshani, 2012; Jafari-Ahmadabadi and Modarres, 2012), North Khorasan (Rakhshani, 2012; Rakhshani et al., 2012b), Khuzestan (Rakhshani et al., 2008b; Nazari et al., 2012), Kordestan (Rakhshani et al., 2007a, 2008b; Rakhshani, 2012), Markazi, Qom (Rakhshani et al., 2008b), Qazvin (Rakhshani et al., 2007a), Sistan and Baluchestan (Rakhshani et al., 2006a, 2007a, 2008b; Talebi et al., 2009; Rakhshani, 2012), Tehran (Starý, 1979; Starý et al., 2000; Rakhshani et al., 2005a, 2007a, 2008b; Rakhshani, 2012), Zanzan (Rakhshani et al., 2006a).

**General distribution:** Transpalearctic, Oriental, Neotropical (Yu et al., 2012).

**67. *Praon yomenae* Takada, 1968**

**Host records:** *Uroleucon acroptilidis* Kadyrbekov, Renxin and Shao (Barahoei *et al.*, 2010, 2012, 2013); *Uroleucon carthami* (Hille Ris Lambers) (Barahoei *et al.*, 2013); *Uroleucon cichorii* (Koch) (Barahoei *et al.*, 2010, 2012, 2013); *Uroleucon chondrillae* (Nevsky) (Rakhshani *et al.*, 2007a; Nazari *et al.*, 2012); *Uroleucon compositae* (Theobald) (Rakhshani *et al.*, 2007a); *Uroleucon jaceae* (L.) (Rakhshani *et al.*, 2007a; Barahoei *et al.*, 2010, 2012, 2013); *Uroleucon sonchi* (L.) (Rakhshani *et al.*, 2007a, 2012b; Talebi *et al.*, 2009; Barahoei *et al.*, 2010, 2012, 2013); *Uroleucon tortuosissimae* Rezwani and Lampel (Barahoei *et al.*, 2013).

**Distribution in Iran:** Alborz (Rakhshani *et al.*, 2007a; Talebi *et al.*, 2009), Hamadan (Nazari *et al.*, 2012), Isfahan (Rakhshani *et al.*, 2007a; Talebi *et al.*, 2009; Barahoei *et al.*, 2013), Kerman (Barahoei *et al.*, 2010, 2012, 2013), North Khorasan (Rakhshani *et al.*, 2012b), Tehran, Zanjan (Rakhshani *et al.*, 2007a).

**General distribution:** Transpalaeartic (Yu *et al.*, 2012).

**68. *Tanytrichophorus petiolaris* Mackauer, 1961**

**Host records:** *Brachycaudus persicae* (Passerini) (Mackauer, 1961; Starý, 1979; Starý *et al.*, 2000).

**Distribution in Iran:** Tehran (Starý *et al.*, 2000).

**General distribution:** This genus and species has not been reported outside Iran.

**69. *Toxares* sp.**

**Host records:** *Diuraphis noxia* (Kurdjumov) (Ahmadi and Sarafrazi, 1993; Starý *et al.*, 2000).

**Distribution in Iran:** Fars (Ahmadi and Sarafrazi, 1993; Starý *et al.*, 2000).

**Remarks:** It has been considered as doubtful record (Starý *et al.*, 2000), but there is no species other than *Toxares deltiger* in Western Palaeartic.

**70. *Trioxys asiaticus* Telenga, 1953**

**Host records:** *Acyrtosiphon gossypii* Mordvilko (Mackauer, 1960; Starý, 1979; Starý

*et al.*, 2000; Rakhshani *et al.*, 2008c; Talebi *et al.*, 2009; Barahoei *et al.*, 2013); *Acyrtosiphon pisum* (Harris) (Barahoei *et al.*, 2013).

**Distribution in Iran:** Alborz (Starý *et al.*, 2000), Kerman (Talebi *et al.*, 2009; Barahoei *et al.*, 2013), Tehran (Talebi *et al.*, 2009).

**General distribution:** Eastern Palaeartic, Central Asia (Yu *et al.*, 2012).

**71. *Trioxys cirsii* (Curtis, 1831)**

**Host records:** *Drepanosiphum platanoidis* (Schrank) (Babae *et al.*, 2000; Starý *et al.*, 2000; Rakhshani *et al.*, 2008c).

**Distribution in Iran:** Mazandaran (Babae *et al.*, 2000; Starý *et al.*, 2000).

**General distribution:** Western Palaeartic, Australian, Nearctic (Yu *et al.*, 2012).

**72. *Trioxys complanatus* Quilis, 1931**

**Host records:** *Therioaphis khayami* Remaudiere (Starý *et al.*, 2000); *Therioaphis riehi* (Börner) (Van den Bosch, 1957; Starý, 1979; Starý *et al.*, 2000); *Therioaphis trifolii* (Monell) (Van den Bosch, 1957; Farahbakhsh, 1961; Starý, 1979; Monajemi and Esmaili, 1981; Starý *et al.*, 2000; Rakhshani *et al.*, 2006a, 2008c, 2012b; Nazari *et al.*, 2012; Barahoei *et al.*, 2013); *Therioaphis* spp. (Starý, 1979).

**Distribution in Iran:** Alborz, Ardabil, Markazi, Qazvin, Semnan, Sistan and Baluchestan, Zanjan (Rakhshani *et al.*, 2006a), West Azarbaijan (Starý, 1979; Starý *et al.*, 2000), Isfahan (Rakhshani *et al.*, 2006a; Barahoei *et al.*, 2013), Kerman (Barahoei *et al.*, 2013), Hamadan, Kermanshah, Kordestan (Rakhshani *et al.*, 2006a; Nazari *et al.*, 2012), North Khorasan (Rakhshani *et al.*, 2012b), Tehran (Monajemi and Esmaili, 1981; Starý *et al.*, 2000; Rakhshani *et al.*, 2006a).

**General distribution:** Australian, Nearctic, Western Palaeartic, Oriental (India) (Yu *et al.*, 2012).

**73. *Trioxys curvicaudus* Mackauer, 1967**

**Host records:** *Eucalipterus tilliae* (L.) (Rakhshani *et al.*, 2008c).

**Distribution in Iran:** Tehran (Rakhshani *et al.*, 2008c).

**General distribution:** Western Palaearctic (Yu et al., 2012).

#### 74. *Trioxys metacarpalis* Rakhshani and Starý, 2012

**Host records:** *Chaitaphis tenuicauda* Nevsky (Rakhshani et al., 2012b).

**Distribution in Iran:** North Khorasan (Rakhshani et al., 2012b).

**General distribution:** This species has not been reported outside Iran.

**Remarks:** This species was originally recorded as *Trioxys parauctus* Starý, 1960 from Iran (Rakhshani et al., 2008c) but later was described as a new species (Rakhshani et al., 2012b).

#### 75. *Trioxys pallidus* (Haliday, 1833)

**Host records:** *Chromaphis juglandicola* (Kaltenbach) (Van den Bosch et al., 1970; Van den Bosch and Messenger, 1973; Starý, 1979; Mohammadbeigi, 2000; Starý et al., 2000; Rakhshani et al., 2004, 2008c, 2012b; Talebi et al., 2009; Taheri and Rakhshani, 2013; Nazari et al., 2012; Barahoei et al., 2012, 2013); *Hoplocallis pictus* (Ferrari) (Rakhshani et al., 2008c); *Pterocallis alni* (DeGeer) (Babaee et al., 2000; Starý et al., 2000).

**Distribution in Iran:** Alborz, Golestan (Talebi et al., 2009), Fars (Taheri and Rakhshani, 2013; Barahoei et al., 2013), Isfahan, Kohgiluyeh and Boyer-Ahmad (Talebi et al., 2009; Barahoei et al., 2013), Kerman (Barahoei et al., 2012, 2013), Kermanshah (Nazari et al., 2012), Mazandaran (Babaee et al., 2000; Starý et al., 2000), Qazvin (Mohammadbeigi, 2000; Starý et al., 2000), Tehran (Starý et al., 2000; Rakhshani et al., 2004; Talebi et al., 2009).

**General distribution:** Transpalearctic, introduced to USA and Chile (Yu et al., 2012).

#### 76. *Trioxys pannonicus* Starý, 1960

**Host records:** *Macrosiphoniella tuberculata* (Nevsky) (Starý, 1979; Starý et al., 2000; Rakhshani et al., 2011); *Macrosiphoniella* sp. (Rakhshani et al., 2008c; Talebi et al., 2009); *Titanosiphon neoartemisiae* (Takahashi) on *Artemisia* sp., Iran, Zabol, 17-IV-2012, Leg. H. Barahoei.

**Distribution in Iran:** Guilan (Talebi et al., 2009), Kermanshah (Starý, 1979; Starý et al., 2000), Sistan and Baluchistan (New record).

**General distribution:** Western Palaearctic, Central Asia (Yu et al., 2012).

#### 77. *Trioxys persicus* Davidian, 2005

**Host records:** Without host record (Davidian, 2005).

**Distribution in Iran:** Not exactly defined (Davidian, 2005).

**General distribution:** This species has not been reported outside Iran (Davidian, 2005).

#### 78. *Trioxys tanaceticola* Starý, 1971

**Host records:** *Coloradoa heinzei* Börner (Starý, 1979; Starý et al., 2000); *Coloradoa absinthii* (Lichtenstein) (Talebi et al., 2009); *Coloradoa* sp. on *Artemisia absinthium* L., Iran, Rasht, 06 VII 2005; on *Artemisia absinthium* L., Iran, Rostamabad, 02-VIII-2004, Leg. E. Rakhshani; *Titanosiphon neoartemisiae* Nevsky (Rakhshani et al., 2008c; Talebi et al., 2009).

**Distribution in Iran:** Guilan (Talebi et al., 2009), Mazandaran (Starý, 1979; Starý et al., 2000).

**General distribution:** Western Europe (France), central Asia (Yu et al., 2012).

### Discussion

Considering the number of recorded parasitoid taxa (17 genera and 78 species) and their associations with aphid hosts (61 genera and 193 species), it can be preliminarily presumed that many other parasitoid species in associations with other aphids could be detected. Although several studies on Aphidiinae of Iran have been published by following authors (Starý et al., 2000, 2005; Rakhshani et al., 2005a, b, c, 2006, 2007a, b, 2008a, b, c, 2012a, b, 2013; Tomanović et al., 2007; Kazemzadeh et al., 2009; Talebi et al., 2009; Bagheri-Matin et al., 2010; Barahoei et al., 2010, 2011, 2012, 2013; Mossadegh et al., 2011; Rakhshani, 2012; Nazari et al., 2012; Alikhani et al., 2013), many areas of the country still remain unexplored. An overall comparison of the Aphidiinae fauna of Iran, with those of central

Asian countries (Starý and Juchnevič, 1978; Starý *et al.*, 1998; Starý and Kaddou, 1971; Achvlediani, 1981; Uysal *et al.*, 2004; Tomanović *et al.*, 2008) indicates the necessity for further research. A great diversity of Aphidiinae has been found in some countries of south-eastern Europe, e.g. Serbia and Montenegro (122 species) (Žikić *et al.*, 2012), Bulgaria (63 species) (Atanasova, 1997; Todorov, 2008). While Iran covers a very large area in Central Asia with a highly diversified environment, only 430 aphid species have been registered (Rezwani, 2001). This could be the reason for the low diversity of aphid parasitoids in major parts of the country. According to the data reviewed, it can be proved that the greatest diversity of aphid parasitoids have been determined in the north and western parts of the country. At the same time, the north-western part of Iran with the great diversity of plant species, has not been adequately studied for aphid parasitoids (Mosavi *et al.*, 2012).

The fauna of Aphidiinae in Iran comprise the elements of the Central Asian (Starý, 1979), and partially the Mediterranean area (Starý, 1976) supplemented with the occasionally encountered species, i.e., *Aphidius tanacetarius*, *Lysiphlebus testaceipes*, *Lysiphlebus cardui* and *Trioxyx curvicaudus*. Some other species, like *Pauesia hazratbalensis* seems to be invasive (Starý *et al.*, 2005). *Areopraon lepellei* (Kazemzadeh *et al.*, 2009) and *Monoctonia vesicarii* (Ghafouri Moghaddam *et al.*, 2012) have been recently recorded in the north-eastern and north-western parts of the country, respectively. Few species, such as *Lysiphlebus fabarum* (Rakhshani *et al.*, 2013), *Aphidius colemani*, *Aphidius matricariae* and *Diaeretiella rapae* have a very wide distribution, which maybe owing to their wide host range and the adaptation in various regions of the country. Very few species, i.e., *Aphidius iranicus*, *Aphidius stigmaticus* and *Tanytrichophorus petiolaris* can be temporarily considered as precinctive species. Additional specimens from the first two species (*A. iranicus*, *A. stigmaticus*) are recently collected (unpublished data), but the only evidence for *T. petiolaris* is the male holotype despite the intensive efforts in Iran.

General comparison of the data shows large differences in the number of records among species relating to the intensity of the research in each region and the overall diversity of species (Table 1). It has been shown that the northern parts of Iran, with the greatest diversity of plants (Heshmati, 2007) can be home to many species of Aphidiinae compared to the desert areas of the central and south-eastern provinces.

**Table 1** Number of recorded Aphidiinae species and the number of publications per each Iranian province. The localities are sorted based on their area (km<sup>2</sup>).

Provinces	Area (km <sup>2</sup> )	Recorded species	Published papers
Alborz	5,122	25	11
Qom	11,526	7	3
Tehran	13,692	41	22
Guilan	14,042	26	10
Kohgiluyeh and Boyerahmad	15,504	5	4
Qazvin	15,567	13	10
Chaharmahal and Bakhtiari	16,328	0	0
East Azarbaijan	16,328	5	4
Ardabil	17,800	6	9
Hamadan	19,368	21	13
Ilam	20,133	1	2
Golestan	20,367	13	9
Zanjan	21,773	9	6
Bushehr	22,743	0	0
West Azarbaijan	22,743	5	3
Mazandaran	23,842	13	5
Kermanshah	25,009	32	10
Lorestan	28,294	1	4
North Khorasan	28,434	29	7
Markazi	29,127	15	10
Kordestan	29,137	19	7
Khuzestan	64,055	18	5
Hormozgan	70,697	0	0
South Khorasan	95,385	0	0
Semnan	97,491	2	2
Isfahan	107,018	29	11
Khorasan-e-Razavi	118,851	17	10
Fars	122,608	24	13
Yazd	129,285	0	0
Kerman	180,726	29	9
Sistan and Baluchestan	181,785	20	11



The knowledge of these tritrophic associations is believed to be of basic information in the research of aphid parasitoid diversity, their food chains and community structure. We expect to obtain better knowledge on the Aphidiinae fauna of Iran by performing further investigations, especially in high mountains of north-western and the temperate area of southern parts of the country.

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## چک لیست زنبورهای پارازیتوئید زیر خانواده (Aphidiinae (Hymenoptera: Braconidae) و روابط میزبانی آنها با شته‌ها در ایران

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**چکیده:** فون زنبورهای زیر خانواده (Aphidiinae (Hymenoptera: Braconidae) ایران مرور و اطلاعات مربوط به روابط میزبانی آنها با شته‌ها جمع‌بندی شد. به‌طور کلی ۷۸ گونه زنبور پارازیتوئید شته متعلق به ۱۸ جنس در ارتباط با ۱۹۳ گونه شته فهرست شدند. این فهرست شامل ۴۹۱ مورد روابط میزبانی بین زنبورهای پارازیتوئید و شته‌های میزبان است. پراکنش این گونه‌ها در نقاط مختلف ایران و سایر کشورها نیز مورد بحث قرار گرفت.

**واژگان کلیدی:** فون، پارازیتوئیدهای شته‌ها، روابط میزبانی، آسیای مرکزی