

Hover flies of Khaf city in South-east of Razavi Khorasan Province, Iran

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(Received: 10 February 2015; Accepted: 4 July 2016)

In this article the fauna of the hoverflies in South-east of Razavi Khorasan Province has been identified during 2010-2011. The species were collected by sweeping net on various flowering plants. Among of 231 collected specimens, 17 species belonging to 10 genera and two subfamilies were verified. That all of them were newly recorded for the khaf region. *Eumerus ornatus* (Meigen, 1822) was a new record for the fauna of Razavi Khorasan Province.

Key words: Khaf city; Razavi Khorasan Province; Syrphidae, Iran.

INTRODUCTION

Syrphids are an attractive group of day flying insects and include many distinctive and familiar species. They are the friendly colorful sort of insects that many people enjoy seeing in the countryside and garden. Among their many interesting attributes is their famous precision at hovering. The American name is flower fly (Stubbs and Falk, 2002). This family has more than 6000 described species in the world and has been divided three subfamilies: Syrphinae, Microdontinae and Eristalinae (Thompson and Rotheray, 1998).

Almost all the adult syrphids feed on pollen or nectar, but syrphid larvae show a great variation in their feeding habits as phytophages, mycophages, saprophages and zoophages. Among them, the larvae of subfamily Syrphinae are considered the specialized aphidophagous predators play an important role in the reduction of aphid populations in agroecosystems (Sommaggio, 1999).

The Iranian fauna studied by: Farahbakhsh, 1961; Kuznetzov, 1985; Peck, 1988; Modarres Awal, 1994; Melkeshi et al, 1998; Gol Mohammad Zadeh Khiaban, 2000; Gharali et al, 2000; Dousti, 2000; Poor Rabi, 2000; Musavian, 2001; Azarkhsh, 2001; Poor Ghasem, 2001; Keyvanfar, 2002; Goldasteh, 2002; Sadeghi, 2003 (Sadeghi, Kayvanfar & Jajvandan, 2006); Amiri Moghadam, 2004; Gilasian, 2005; Kayvanfar and Bagherian, 2006; Dousti and Hayat, 2006; Ashrafi and Pashaei Rad, 2010; Khaghaninia, 2010; Ehteshamnia et al, 2010; Ahmadian and Pashaei Rad, 2012; Kazerani et al, 2012; Kazerani et al, 2014.

MATERIAL AND METHODS

The materials for this study were collected from agricultural areas of Khaf (34°34'35"N 60°08'27"E), a city located in South-east of Razavi Khorasan Province (Fig. 1).

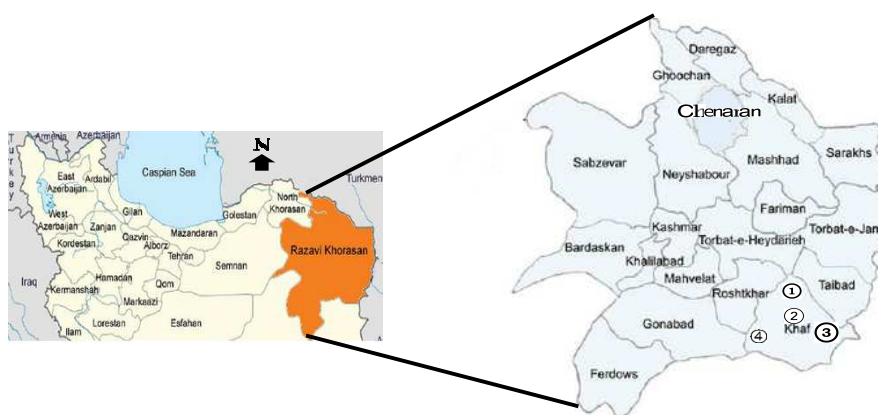


FIGURE 1. The geographic map of the sampling locality (1.Sede, 2. Khaf, 3. Sangan, 4. Ghasem Abad). Please insert a detailed map of the studied area

Four stations are recognized according to topography status and area vegetation. Sampling is done in sporadic way in four periods (5-16 May 2010, 11-22 July 2010, 4-16 September 2010, 5-16 May 2011) from 7-10 morning to 5-7 afternoon (Table 3). Temperature and moisture is measured by thermometer and psychrometer (Table 2).

231 specimens were collected on various flowers. The syrphid species were captured by a hand net. The collected specimens were transferred to killing jar for few minutes. They were brought to the laboratory and identified after pinning them by using available keys and descriptions: Vockeroth and Thompson (1981), Bei- Bienko (1989), Stubbs and Falk (2002), Sorokina (2009), Speight (2010). Identifications were confirmed by Dr. Barkalov from Institute of Animal Systematic and Ecology (Siberia).

RESULTS

17 species belonged to 10 genera and two subfamilies were obtained by present study. All of the verified species are as new records for the studied area which are listed as following:

Subfamily Syrphinae

Episyrphus balteatus De Geer, 1776

Material examined: 15 specimens (3♂♂, 12♀♀).

The collector's name: Elahe Shojaei

Region: Sede, Khaf, Sangan (Table 2, 3).

Date of collecting: 5-16 May 2010, 4-16 September 2010, 5-16 May 2011 (table 3).

Distribution: Fennoscandia to the Mediterranean; Canary Islands, Azores and N Africa; Ireland through Eurasia to the Pacific coast; south through the Oriental region to Sri Lanka; Australia (Ehteshamnia, Khaghaninia & Farshbaf Pourabad, 2010).

Distribution in Iran: East Azerbaijan, West Azerbaijan, Ardebil, Qazvin, Khuzestan, Kerman, Golestan, Gilan, Lorestan, Mazandaran, Hamedan, Isfahan, Sistan, Fars, Razavi Khorasan (Mashhad & Neyshabor) (Gilasian, 2007; Sadeghi, Kayvanfar & Jajvandan, 2006).

TABLE 1. The Syrphid fauna of Razavi Khorasan province.

N	Species	Region	Author
1	<i>Chrysotoxum binctum</i>	Kashmar	Amiri Moghadam (2004)
2	<i>Chrysotoxum intermedium</i>	Mashhad, Kashmar, Neyshabur	Sadeghi <i>et al.</i> (2006)
3	<i>Dasyrphus albostratus</i>	Mashhad	Sadeghi <i>et al.</i> (2006)
4	<i>Episyrphus balteatus</i>	Mashhad, Neyshabur	Sadeghi <i>et al.</i> (2006), Hosseini & Sadeghi (2008)
5	<i>Eupeodes corollae</i>	Mashhad, Kashmar, Neyshabur	Sadeghi <i>et al.</i> (2006) Amiri Moghadam (2004), Hosseini & Sadeghi (2008)
6	<i>Eupeodes nuba</i>	Mashhad, Kashmar, Neyshabur	Sadeghi <i>et al.</i> (2006), Amiri Moghadam (2004), Hosseini & Sadeghi (2008)
7	<i>Ischiodon aegypticus</i>	Mashhad	Sadeghi <i>et al.</i> (2006)
8	<i>Paragus bicolor</i>	Mashhad, Kashmar, Neyshabur	Sadeghi <i>et al.</i> (2006), Amiri Moghadam (2004), Hosseini & Sadeghi (2008)
9	<i>Paragus haemorrhous</i>	Mashhad, Neyshabur	Sadeghi <i>et al.</i> (2006), Hosseini & Sadeghi (2008)
10	<i>Paragus majoranae</i>	Mashhad	Sadeghi <i>et al.</i> (2006)
11	<i>Paragus quadrifasciatus</i>	Mashhad, Neyshabur	Sadeghi <i>et al.</i> (2006), Hosseini & Sadeghi (2008)
12	<i>Paragus tibialis</i>	Neyshabur	Hosseini & Sadeghi (2008)
13	<i>Scaeva albomaculata</i>	Mashhad	Sadeghi <i>et al.</i> (2006)
14	<i>Scaeva latimaculata</i>	Kashmar	Amiri Moghadam (2004)
15	<i>Scaeva pyrastris</i>	Mashhad, Neyshabur	Sadeghi <i>et al.</i> (2006), Hosseini & Sadeghi (2008)
16	<i>Scaeva selenitica</i>	Mashhad	Sadeghi <i>et al.</i> (2006)
17	<i>Sphaerophoria rueppelli</i>	Mashhad, Kashmar	Sadeghi <i>et al.</i> (2006), Amiri Moghadam (2004)
18	<i>Sphaerophoria scripta</i>	Mashhad, Kashmar, Neyshabur	Sadeghi <i>et al.</i> (2006), Amiri Moghadam (2004), Hosseini & Sadeghi (2008)
19	<i>Syrphus ribesii</i>	Mashhad, Kashmar	Sadeghi <i>et al.</i> (2006), Amiri Moghadam (2004)
20	<i>Syrphus vitripennis</i>	Mashhad, Kashmar, Neyshabur	Sadeghi <i>et al.</i> (2006), Amiri Moghadam (2004), Hosseini & Sadeghi (2008)
21	<i>Melanostoma mellinum</i>	Neyshabur	Hosseini & Sadeghi (2008)
22	<i>Eristalis arbustorum</i>	Mashhad, Neyshabur	Sadeghi <i>et al.</i> (2006), Hosseini & Sadeghi (2008)
23	<i>Eristalis taeniopsis</i>	Mashhad	Sadeghi <i>et al.</i> (2006)
24	<i>Eristalis tenax</i>	Mashhad, Neyshabur	Sadeghi <i>et al.</i> (2006), Hosseini & Sadeghi (2008)
25	<i>Eristalinus aeneus</i>	Mashhad, Kashmar, Neyshabur	Sadeghi <i>et al.</i> (2006), Amiri Moghadam (2004), Hosseini & Sadeghi (2008)
26	<i>Eristalinus taeniops</i>	Neyshabur	Hosseini & Sadeghi (2008)
27	<i>Eumerus jacobsoni</i>	Neyshabur	Hosseini & Sadeghi (2008)
28	<i>Eumerus strigatus</i>	Neyshabur	Hosseini & Sadeghi (2008)
29	<i>Eumerus tricolor</i>	Neyshabur	Hosseini & Sadeghi (2008)
30	<i>Helophilus trivittatus</i>	Neyshabur	Hosseini & Sadeghi (2008)
31	<i>Myathropa florea</i>	Mashhad, Kashmar, Neyshabur	Sadeghi <i>et al.</i> (2006), Amiri Moghadam (2004), Hosseini & Sadeghi (2008)
32	<i>Syritta pipiens</i>	Mashhad, Neyshabur	Sadeghi <i>et al.</i> (2006), Hosseini & Sadeghi (2008)
33	<i>Vollucella zonaria</i>	Mashhad	Sadeghi <i>et al.</i> (2006)

***Eupeodes corolla* Fabricius, 1794**

Material examined: 40 specimens (15♂♂, 25♀♀).

The collector's name: Elahe Shojaei

Region: Sede, Khaf, Ghasem Abad, Sangan (Table 2, 3).

Date of collecting: 5-16 May 2010, 11-22 July 2010, 4-16 September 2010, 5-16 May 2011 (table 3).

Distribution: From Iceland, Fennoscandia and the Faroes, south to Iberia, the Mediterranean, Madeira, the Canary Islands and N Africa; coastal States of Africa down to and including S Africa; Mauritius; from Ireland eastwards through most of Europe into European parts of Russia; through Siberia from the Urals to the Pacific coast; Japan; China (Ehteshamnia, Khaghaninia & Farshbaf Pourabad, 2010).

Distribution in Iran: East Azerbaijan, West Azerbaijan, Ardebil, North Khorasan, Qazvin, Khuzestan, Tehran, Semnan, Zanjan, Golestan, Mazandaran, Hamedan, Isfahan, Sistan, Fars, Razavi Khorasan (Mashhad, Kashmar & Neyshabor) (Gilasian, 2007; Sadeghi, Kayvanfar & Jajvandan, 2006).

***Eupeodes nuba* Wiedemann, 1830**

Material examined: 14 specimens (4♂♂, 10♀♀).

The collector's name: Elahe Shojaei

Region: Sede, Khaf, Ghasem Abad (Table 2, 3).

Date of collecting: 5-16 May 2010, 11-22 July 2010, 4-16 September 2010, 5-16 May 2011 (table 3).

Distribution: Canary Islands, Mediterranean basin, from southern France to Italy (Sicily) and parts of the former Yugoslavia, Crete, Cyprus, Lebanon, Israel, Egypt and Morocco; Switzerland in central Europe, Roumania; Transcaucasus and south-western parts of Asia (Uzbekistan, Kirghizistan, Tajikistan) to Afghanistan and Mongolia. In eastern parts of the Afrotropical region from Ethiopia south to S Africa (inclusive) (Ehteshamnia, Khaghaninia & Farshbaf Pourabad, 2010).

Distribution in Iran: Ardebil, Gilan, Khuzestan, Tehran, Semnan, Golestan, Fars, Razavi Khorasan (Mashhad, Kashmar & Neyshabor) (Gilasian, 2007; Sadeghi, Kayvanfar & Jajvandan, 2006).

***Eupeodes latifasciatus* Macquart, 1829**

Material examined: 8 specimens (3♂♂, 5♀♀).

The collector's name: Elahe Shojaei

Region: Sede, Khaf, Sangan (Table 2, 3).

Date of collecting: 5-16 May 2010, 4-16 September 2010, 5-16 May 2011 (table 3).

Distribution: From Iceland and Fennoscandia south to Iberia, the Mediterranean (including Cyprus), N Africa and Turkey; from Ireland eastwards through most of Europe into European parts of Russia; through Siberia from the Urals to the Pacific coast (Sakhalin and Kuril Isles); India; in N America from Alaska south to California and Texas (Ehteshamnia, Khaghaninia & Farshbaf Pourabad, 2010).

Distribution in Iran: Gilan, Tehran, Semnan, Isfahan (Gilasian, 2007; Sadeghi, Kayvanfar & Jajvandan, 2006).

***Ischiodon (Simosyrphus) scutellaris* Fabricius, 1805**

Material examined: 10 specimens (3♂♂, 7♀♀).

The collector's name: Elahe Shojaei

Region: Sede, Khaf, Ghasem Abad (Table 2, 3).

Date of collecting: 5-16 May 2010, 11-22 July 2010, 4-16 September 2010, 5-16 May 2011 (table 3).

Distribution: Turkey; southern, Asiatic parts of the Palaearctic from Iran to Japan; Oriental Region; Oceania; Australasian Region (Ehteshamnia, Khaghaninia & Farshbaf Pourabad, 2010).

TABLE 2. Sampling station properties

N	Station	Geography peculiarity	Height	Temperature average in sampling	Humidity average in sampling	Conquering covering herbal	Number of specimens
1	Sede	34°50' N 59° 53' E	880 m	27/5°c	50	1. <i>Oryza sp.</i> 2. <i>Convolvulus sp.</i> 3. <i>Prosopis farcta</i> 4. <i>Trifolium pratense</i> 5. <i>Taraxacum officinale</i>	96
2	Khaf	34°54' N 60° 16' E	995 m	28°c	48	1. <i>Astragalus cancellatus</i> 2. <i>Gundelia tournefortii</i> 3. <i>Descurainia Sophia</i> 4. <i>Convolvulus sp.</i> 5. <i>Acanthopphyllum sp.</i>	53
3	Sangan	34°23' N 60° 15' E	855 m	27°c	49	1. <i>Albagi sp.</i> 3. <i>Carthamus sp.</i> 2. <i>Gundelia tournefortii</i>	36
4	Ghasem Abad	34°21' N 59° 52' E	770 m	31°c	46/5	1. <i>Albagi sp.</i> 2. <i>Centaurea sp.</i> 3. <i>Acanthopphyllum sp.</i> 4. <i>Carthamus sp.</i>	46

TABLE 3. Species frequent in various time intervals and sampling stations

N	Species	5-16 May 2010	11-22 July 2010	4-16 September 2010	5-16 May 2011	Sede	Khaf	Sangan	Ghasem Abad	Total
1	<i>Episyrphus balteatus</i>	5	0	2	8	7	3	5	0	15
2	<i>Eupeodes corollae</i>	12	6	7	15	15	8	7	10	40
3	<i>Eupeodes nuba</i>	4	2	3	5	7	3	0	4	14
4	<i>Eupeodes atifasciatus</i>	5	0	2	1	4	2	2	0	8
5	<i>Ischiodon scutellaris</i>	3	2	1	4	4	3	0	3	10
6	<i>Paragus albifrons</i>	7	1	3	4	5	3	2	5	15
7	<i>Paragus bicolor</i>	2	3	4	3	7	3	2	0	12
8	<i>Paragus quadrifasciatus</i>	2	0	0	0	2	0	0	0	2
9	<i>Sphaerophoria rueppellii</i>	2	0	3	5	6	4	0	0	10
10	<i>Sphaerophoria scripta</i>	15	8	7	6	13	7	6	10	36
11	<i>Sphaerophoria turkmenica</i>	2	0	4	6	5	3	0	4	12
12	<i>Syrphus vitripennis</i>	0	0	0	2	0	2	0	0	2
13	<i>Eristalinus aeneus</i>	1	0	0	2	2	0	1	0	3
14	<i>Eristalis arbustorum</i>	3	0	2	3	3	2	3	0	8
15	<i>Eristalis tenax</i>	4	1	2	3	2	2	3	3	10
16	<i>Eumerus ornatus</i>	0	2	0	0	2	0	0	0	2
17	<i>Syrilla pipiens</i>	11	2	9	10	12	8	5	7	32
Total		78	27	49	77	96	53	36	46	231

Distribution in Iran: Khuzestan, Fars, Kerman, Hormozgan (Gilasian, 2007; Sadeghi, Kayvanfar & Jajvandan, 2006).

***Paragus albifrons* Fallen, 1817**

Material examined: 15 specimens (4♂♂, 11♀♀).

The collector's name: Elahe Shojaei

Region: Sede, Khaf, Ghasem Abad, Sangan (Table 2, 3).

Date of collecting: 5-16 May 2010, 11-22 July 2010, 4-16 September 2010, 5-16 May 2011 (table 3).

Distribution: From southern Sweden and Denmark south to the Mediterranean: From Britain (south England) eastwards through central and southern Europe (Italy, the former Yugoslavia, Bulgaria) into European parts of Russia and the Caucasus and on to the Pacific; Afghanistan and Mongolia (Ehteshamnia, Khaghaninia & Farshbaf Pourabad, 2010).

Distribution in Iran: Tehran (Ahmadian & Pashaei Rad, 2012).

***Paragus bicolor* Fabricius, 1794**

Material examined: 12 specimens (4♂♂, 8♀♀).

The collector's name: Elahe Shojaei

Region: Sede, Khaf, Sangan (Table 2, 3).

Date of collecting: 5-16 May 2010, 11-22 July 2010, 4-16 September 2010, 5-16 May 2011 (table 3).

Distribution: From southern Sweden and Denmark (extinct in Belgium) south to the Mediterranean and North Africa; from France eastwards through central and southern Europe to Mongolia; Iran and Afghanistan; North America (Ehteshamnia, Khaghaninia & Farshbaf Pourabad, 2010).

Distribution in Iran: West Azerbaijan, North Khorasan, Ardebil, Gilan, Khuzestan, Semnan, Golestan, Razavi Khorasan (Mashhad, Kashmar & Neyshabor) (Gilasian, 2007; Sadeghi, Kayvanfar & Jajvandan, 2006).

***Paragus quadrifasciatus* Meigen, 1822**

Material examined: 2 specimens (2♀♀).

The collector's name: Elahe Shojaei

Region: Sede (Table 2, 3).

Date of collecting: 5-16 May 2010 (table 3).

Distribution: From northern France (Brittany) south to the Mediterranean and N.Africa; from Portugal eastwards through southern and central Europe to Roumania, Greece (including Crete and Rhodes), Turkey, Iran and the Caucasus; European parts of Russia eastwards through Kazakhstan, Tajikistan etc. to the far east; northern China, Korea, Japan (Ehteshamnia, Khaghaninia & Farshbaf Pourabad, 2010).

Distribution in Iran: East Azerbaijan, Semnan, Razavi Khorasan (Mashhad & Neyshabor) (Gilasian, 2007; Sadeghi, Kayvanfar & Jajvandan, 2006).

***Sphaerophoria rueppelli* Wiedemann, 1830**

Material examined: 10 specimens (3♂♂, 7♀♀).

The collector's name: Elahe Shojaei

Region: Sede, Khaf (Table 2, 3).

Date of collecting: 5-16 May 2010, 4-16 September 2010, 5-16 May 2011 (table 3).

Distribution: From southern Norway and Sweden south to N Africa and the Canary Islands; from Ireland east through central and southern Europe, including Greece, Turkey and Mediterranean islands into Asia Minor, Russia and Afghanistan and on to the Pacific coast, China and Korea; in

eastern parts of the Afrotropical region south to Kenya (Ehteshamnia, Khaghaninia & Farshbaf Pourabad, 2010).

Distribution in Iran: West Azerbaijan, Ardebil, Khuzestan, Golestan, Mazandaran, Fars, Semnan, Sistan, Razavi Khorasan (Mashhad & Kashmar) (Gilasian, 2007; Sadeghi, Kayvanfar & Jajvandan, 2006).

***Sphaerophoria scripta* Linnaeus, 1758**

Material examined: 36 specimens (15♂♂, 21♀♀).

The collector's name: Elahe Shojaei

Region: Sede, Khaf, Ghasem Abad, Sangan (Table 2, 3).

Date of collecting: 5-16 May 2010, 11-22 July 2010, 4-16 September 2010, 5-16 May 2011 (table 3).

Distribution: A highly migratory species; southwest Greenland, Iceland and Fennoscandia south to the Mediterranean, the Canary Islands and N Africa; from Ireland eastwards through much of the Palaearctic to the Pacific coast of Asia; Kashmir and Nepal (Ehteshamnia, Khaghaninia & Farshbaf Pourabad, 2010).

Distribution in Iran: East Azerbaijan, West Azerbaijan, North Khorasan, Ardebil, Qazvin, Khuzestan, Golestan, Gilan, Mazandaran, Hamedan, Isfahan, Sistan, Fars, Razavi Khorasan (Mashhad, Kashmar & Neyshabor) (Gilasian, 2007; Sadeghi, Kayvanfar & Jajvandan, 2006).

***Sphaerophoria turkmenica* Bańkowska, 1964**

Material examined: 12 specimens (5♂♂, 7♀♀).

The collector's name: Elahe Shojaei

Region: Sede, Khaf, Ghasem Abad (Table 2, 3).

Date of collecting: 5-16 May 2010, 4-16 September 2010, 5-16 May 2011 (table 3).

Distribution: Parts of European Russia; the Caucasus (Armenia, Azerbaijan); Arabian peninsula (Oman), Turkmenistan; Kazakhstan; Turkey (Ehteshamnia, Khaghaninia & Farshbaf Pourabad, 2010).

Distribution in Iran: East Azerbaijan, West Azerbaijan, North Khorasan, Ardebil, Mazandaran, Fars, Khuzestan, Golestan, Isfahan (Gilasian, 2007; Sadeghi, Kayvanfar & Jajvandan, 2006).

***Syrphus vitripennis* Meigen, 1822**

Material examined: 2 specimens (2♀♀).

The collector's name: Elahe Shojaei

Region: Khaf (Table 2, 3).

Date of collecting: 5-16 May 2011 (table 3).

Distribution: Through most of the Palaearctic region, including North Africa; in N. America from Alaska to California; Formosa (Ehteshamnia, Khaghaninia & Farshbaf Pourabad, 2010).

Distribution in Iran: East Azerbaijan, West Azerbaijan, North Khorasan, Ardebil, Mazandaran, Golestan, Tehran, Razavi Khorasan (Mashhad, Kashmar & Neyshabor) (Gilasian, 2007; Sadeghi, Kayvanfar & Jajvandan, 2006).

Subfamily Eristalinae

***Eristalinus aeneus* Scopoli, 1763**

Material examined: 3 specimens (1♂, 2♀♀).

The collector's name: Elahe Shojaei

Region: Sede, Sangan (Table 2, 3).

Date of collecting: 5-16 May 2010, 5-16 May 2011 (table 3).

Distribution: Cosmopolitan; southern Sweden south to N Africa and the Canary Islands; on into the Afro tropical region south to Kenya and Tanzania; from Ireland eastwards through central and southern Europe and on through Russia and China to the Pacific and south into the Oriental region; Mauritius; in North America from Minnesota and Ontario south to California and Texas; Hawaii, Australia and the Gilbert and Ellis islands in Australasia (Ehteshamnia, Khaghaninia & Farshbaf Pourabad, 2010).

Distribution in Iran: East Azerbaijan, West Azerbaijan, North Khorasan, Golestan, Gilan, Hamedan, Khuzestan, Semnan, Razavi Khorasan (Mashhad, Kashmar & Neyshabor)(Sadeghi, Kayvanfar & Jajvandan, 2006).

***Eristalis arbustorum* Linnaeus, 1758**

Material examined: 8 specimens (2♂♂, 6♀♀).

The collector's name: Elahe Shojaei

Region: Sede, Khaf, Sangan (Table 2, 3).

Date of collecting: 5-16 May 2010, 4-16 September 2010, 5-16 May 2011(table 3).

Distribution: Throughout the Palaearctic region, including North Africa; North America from Wisconsin to Labrador and south to Kansas and South Carolina; reaches the Oriental region in northern India (Ehteshamnia, Khaghaninia & Farshbaf Pourabad, 2010).

Distribution in Iran: East Azerbaijan, West Azerbaijan, Golestan, Gilan, Hamedan, Khuzestan, Semnan, Ardebil, Isfahan, Sistan, Mazandaran, Razavi Khorasan (Mashhad & Neyshabor)(Sadeghi, Kayvanfar & Jajvandan, 2006).

***Eristalis tenax* Linnaeus, 1758**

Material examined: 10 specimens (1♂, 9♀♀).

The collector's name: Elahe Shojaei

Region: Sede, Khaf, Ghasem Abad, Sangan (Table 2, 3).

Date of collecting: 5-16 May 2010, 11-22 July 2010, 4-16 September 2010, 5-16 May 2011(table 3).

Distribution: Highly migratory; cosmopolitan; the most widely distributed syrphid species in the world, known from all regions except the Antarctic; found throughout Europe except in the far north. It occasionally reaches offshore islands of northern Europe, such as the Faroes (Ehteshamnia, Khaghaninia & Farshbaf Pourabad, 2010).

Distribution in Iran: East Azerbaijan, West Azerbaijan, Golestan, Gilan, Hamedan, Khuzestan, Semnan, Ardebil, Mazandaran, Razavi Khorasan (Mashhad & Neyshabor)(Sadeghi, Kayvanfar & Jajvandan, 2006).

***Eumerus ornatus* Meigen, 1822**

Material examined: 2 specimens (2♀♀).

The collector's name: Elahe Shojaei

Region: Sede (Table 2, 3).

Date of collecting: 11-22 July 2010 (table 3).

Distribution: Southern Sweden south to the Pyrenees and northern Spain; from Britain (southern England) eastwards through central and southern Europe, including Italy (and Sicily), the former Yugoslavia, Roumania and Turkey, into European parts Russia; N Africa (Ehteshamnia, Khaghaninia & Farshbaf Pourabad, 2010).

Distribution in Iran: Tehran (Ahmadian & Pashaei Rad, 2012).

***Syritta pipiens* Linnaeus, 1758**

Material examined: 32 specimens (12♂♂, 20♀♀).

The collector's name: Elahe Shojaei

Region: Sede, Khaf, Ghasem Abad, Sangan. (Table 2, 3)

Date of collecting: 5-16 May 2010, 11-22 July 2010, 4-16 September 2010, 5-16 May 2011 (table 3).

Distribution: Becoming cosmopolitan; known from most of the Palaearctic, including North Africa, most of North America, South America and the Oriental region. But records from the Afrotropical region are apparently erroneous (Ehteshamnia, Khaghaninia & Farshbaf Pourabad, 2010).

Distribution in Iran: Golestan, Gilan, Khuzestan, Semnan, Ardebil, Isfahan, Mazandaran, Razavi Khorasan (Mashhad & Neyshabor) (Sadeghi, Kayvanfar & Jajvandan, 2006).

DISCUSSION

The most frequently collected specimens belonged to *syrphinae* subfamily. *Eupeodes corolla* (%17/3), *sphaerophoria scripta* (%15/6) were the most abundant species.

Hosseini and sadeghi (2008) has reported this two species with *Episyrphus balteatus* as the most frequent species in Neyshaboor. *Eupeodes corolla* species is also known as the often species in natural habitat of farm margins across the western Europe and is considered as the most current aphid predator in potato farms in Portugal (Cruz De Boelpaepe, 1991).

Syrphus vitripennis (%0/8), *Paragus quadrifasciatus* (%0/8) were the least abundant. Since the larvae of the above mentioned specimens are aphidophagous, they play a crucial role in biological control of aphids.

Syrpitta pipiens (%13/8) species is reported as the most abundance one in Eristalinae subfamily in Neyshaboor (Hosseini & Sadeghi, 2008) and the least abundant genera were *Eristalinus aeneus* (%1/3) and *Eumerus ornatus* (%0/8).

The most frequent species of Syrphidea subfamily is registered in May, 2010 (33.7%) and May, 2011 (33.3%) and September, 2010 (21.2%) (Table 3). According to Padhakrishnan and Muraleedharan (1993) assessments in India, the highest population of predator is in the spring and fall onset. The results of this research confirm this subject.

Hosseini and sadeghi (2008) are registered the most variant of Syrphidae species in May in Neyshaboor. Jalilian, *et al* (2014) are reported that predator population species of canola farms are the most frequent in May. They express that increase of Syphidae population may be due of increase of aphids.

Eumerus ornatus species was reported by Ahmadiyan and Pashaei rad (2012) in Damavand city for the first time. Since then, it is reported from Tehran and Razavi Khorasan provinces (table1).

Between the sampling stations, Sede station (41.5%) has the most, and Sangan station (15.5%) has the least sample number (Table 2, 3). Sede station because of having dam, better weather, and watering farm grounds has more proper vegetation. So, it is provided more proper habitat for Syrphidae. Kevan and Baker's (1983) results showed that many factors such as eradicating of woods and ranches, drying rivers and wetlands, development of monocultural systems, agricultural pesticide usage as well as industrial made pollutants have fundamental roles in reduction of species diversity of natural ecosystems and consequently, syrphid population reduction.

As considered above, Sangan station has less species number probably because of warmer weather, less moisture, wind blowing with dust and lack of vegetation.

Acknowledgments

We are grateful to Dr. Anatoli Barkalov (Siberian Zoological Museum, Novosibirsk, Russia) for his help with the species identification and sending some papers about syrphid flies.

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