

FAUNISTIC STUDY ON FLOWER FLIES OF ZUNUZ REGION IN EAST AZERBAIJAN PROVINCE-IRAN (DIPTERA; SYRPHIDAE)

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ABSTRACT: Syrphid fauna of Zunuz region in Iran was studied during 2008- 2009. The specimens were collected using malaise trap and hand net in eighteen localities. Among of 365 collected specimens, 33 species belonged to 19 genera and two subfamilies were verified that all of them are as new records for studied area and a species, *Lejogaster metallina* (Fabricius), 1776, is as new record for Iran fauna.

KEY WORDS: Fauna, Zunuz region, hover flies, flower flies, pollinator, Syrphidae.

Zunuz, in northeastern of East Azarabayjan province- Iran, is located in 38°07' to 38°56'N; 45°15' to 45°50'E with varying latitude from 1650 m to 2300 m. This mountainous area, located in western mountainside of Sultan Senjer mountain with height of 3168 m, has very expansive and rich grasslands as well as native variety planted apple orchards. Zunuz is one of the most important centers for producing apple and animal husbandry in East Azarabayjan province.

Syrphidae is one of the largest families of the order Diptera with more than 6000 described species over the world. Considering the ability to keep the body motionless in the air for quite a period of time during flight as well as visiting the flowers, they comprises the popularly called hover flies or flower flies (Kevan & Baker, 1983). This large family consists of small to medium flies 6- 18 mm long, most of which have yellow and black striped bodies resembling bees or wasps. Adults, hovering near flowers, feed on nectar and pollen (Faegri & van der Pijl, 1979; Sarıbiyık, 2003). These floral resources enhance the longevity and fecundity of adult flies (Topham & Beardsley, 1975). These flies are common pollinators almost wherever flowers are found. Larvae are pale green to yellow maggots resembling slugs which prey on aphids, scales and other insects. Recently, the fauna of syrphid has been studied by the related taxonomists as well in Iran (Modarres Awal, 1997; Khiaban et al. 1998; Dousti, 1999; Gharali et al., 2000; Alichı et al., 2002; Gharali et al., 2002; Goldasteh et al., 2002; Sadeghi et al., 2002; Golmohammadi & Khiaban, 2004; Gilasian, 2005; Khaghaninia et al., 2010). Checklists of Iranian hover flies were listed by Peck (1988) and Dousti & Hayat (2006). Unfortunately, so far the syrphid fauna of this area has been poorly studied so it subjected for present study.

MATERIAL AND METHODS

Studied specimens were collected twice a month, during 2008- 2009. Flies were caught using sweeping entomological net in eighteen localities as well as four malaise traps which are situated through all the working area (Fig. 1).

The collected specimens were placed in ordinary paper envelopes after killing them in cyanid bottle in order to bring them in laboratory. The collection thus brought was placed in a desiccator (having water at its bottom) for about 24 h in

order to soak and soften them. Thereafter, they were pinned using 000, 00, 0, 1 and 2 mounted pins and their wings and legs set on appropriate setting boards to facilitate morphological studies and the others were put into tubes filled with 70% alcohol. For identification, the materials were examined under a Nikon (SMZ 1000) binocular microscope manufactured by Japan. The identification was done upto the specific level with the help of relevant literature such as Vockeroth & Tompson (1987), Bei- Bienko (1988), Stubbs & Falk (2002), Lyneborg & Barkemeyer (2005) and Speight (2006).

RESULTS

Thirty three species belonged to 19 genera and two subfamilies were revealed through this study. All of the verified species are as new records for studied area and a species which marked by an asterisk newly introduced to Iran fauna that totally listed as follows:

Subfamily Syrphinae

***Episyrphus balteatus* (De Geer, 1776)**

Mém. Ins., 6: 116 (*Musca*). Type locality: not given (Sweden).

Material examined: 24 specimens (9♂♂, 15♀♀).

Distribution: Fennoscandia to the Mediterranean; Canary Isles, Azores and N Africa; Ireland through Eurasia to the Pacific coast; south through the Oriental region to Sri Lanka; Australia. This is an extremely migratory species with records from offshore islands of northern Europe. Iran.

***Scaeva albomaculata* (Macquart, 1842)**

Mém. Soc. Sci. Agric. Lille, 1841(1): 146 and Dipt. exot., 2(2): 86 (*Syrphus*). Type localities: "Mont-sinai" (Egypt). "Alger" (Algeria).

Material examined: 5 specimens (1♂♂, 4♀♀).

Distribution: Iberian peninsula and round the Mediterranean basin to Morocco; Canary Islands; eastward through southern Russia, the Caucasus and southern Siberia to the far east and northern China; Afghanistan, Mongolia; highly migratory and occasionally reaches as far north as Britain. Iran.

***Scaeva pyrastris* (Linnaeus, 1758)**

Syst. Nat., Ed. 10, 1: 594 (*Musca*). Type locality: Svecia (Sweden).

Material examined: 7 specimens (4♂♂, 3♀♀).

Distribution: Fennoscandia south to Iberia, the Mediterranean, Canary Isles and North Africa; from Ireland east through much of Europe and Asia Minor into European Russia; through Siberia from the Urals to the Pacific coast (Kuril Isles); India; China; North America from Alaska to California and New Mexico. Iran.

***Eupeodes corollae* (Fabricius, 1794)**

Entom. Syst., 4: 306 (*Syrphus*). Type locality: Kilia [=Kiel] [Germany].

Material examined: 5 specimens (3♂♂, 2♀♀).

Distribution: From Iceland, Fennoscandia and the Faroes south to Iberia, the Mediterranean, Madeira, the Canary Isles 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; Formosa. Iran.

***Eupeodes nuba* (Wiedemann, 1830)**

Aussereurop. Zweifl. Insekt., 2: 136 (*Syrphus*). Type locality: "Nubien" (Sudan).

Material examined: 5 specimens (3♂♂, 2♀♀).

Distribution: Canary Isles, 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 South Africa (inclusive), Iran.

***Ischidon aegyptius* (Wiedemann, 1830)**

Aussereurop. Zweifl. Insekt., 2: 133 (*Syrphus*). Type localities: "Egypten und Nubin" (Egypt and Sudan).

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

Distribution: Throughout the Afrotropical region and into N Africa to the coast of the Mediterranean and Yemen; southern Spain, southern Italy, the Balearic Islands and the Canaries, Iran.

***Sphaerophoria rueppelli* (Wiedemann, 1830)**

Aussereurop. zweifl. Insekt., 2: 141 (*Syrphus*). Type locality: Nubien; Abyssinia (lectotype des. Vockeroth, 1971:1633).

Material examined: 29 specimens (17♂♂, 12♀♀).

Distribution: From southern Norway and Sweden south to North Africa and the Canary Isles; 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, Iran.

***Sphaerophoria scripta* (Linnaeus, 1758)**

Syst. Nat., Ed. 10, 1: 594 (*Musca*). Type locality: "Svecia" (Sweden); "Uppsala, Sweden" (lectotype des. Vockeroth, 1971:1633).

Material examined: 31 specimens (19♂♂, 12♀♀).

Distribution: A highly migratory species; southwest Greenland, Iceland and Fennoscandia south to the Mediterranean, the Canary Isles and N Africa; from Ireland eastwards through much of the Palaearctic to the Pacific coast of Asia; Kashmir and Nepal, Iran.

***Sphaerophoria turkmenica* Bankowska, 1964**

Annl. zool., Warsz., 22(15): 345 (*Sphaerophoria*). Type locality: "Turkmenische SSR, West Kopet Dag, Berg Siunt".

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

Distribution: Romania, USSR-South European territory, Transcaucasus, Soviet Middle Asia, Afghanistan (Peck, 1988) and Turkey (Hayat & Alaoglu, 1990), Iran.

***Syrphus ribesii* (Linnaeus, 1758)**

Syst. Nat., Ed. 10, 1: 593 (*Musca*). Type locality: Svecia. (Sweden).

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

Distribution: From Iceland and Fennoscandia south to Iberia and the Mediterranean; Canary Isles; from Ireland eastwards through most of Europe into Turkey, European parts of Russia and Afghanistan; from the Urals to the Pacific coast (Kuril Isles); Japan; North America from Alaska south to central parts of the USA, Iran.

***Chrysotoxum elegans* Loew, 1841**

Stettin. ent. Ztg. 2: 140 (*Chrysotoxum*). Type locality: "Wien" (Austria).

Material examined: 13 specimens (4♂♂, 9♀♀).

Distribution: Fennoscandia south to Iberia and the Mediterranean; through central and southern Europe into European parts of Russia as far as the Caucasus Mountains and into Turkey, Iran.

***Chrysotoxum festivum* (Linnaeus, 1758)**

Syst. Nat., Ed. 10, 1: 593 (*Musca*). Type locality: "Europa".

Material examined: 9 specimens (5♂♂, 4♀♀).

Distribution: Ireland, Great Britain, Norway, Sweden, Finland, Spain, Italy, Yugoslavia, Bulgaria, USSR from Kola to Transcaucasus, Kazakh SSR, Siberia, Far East, Asia: Mongolia, Japan, Oriental region.

***Chrysotoxum veralli* Collin, 1940**

Entomologist's mon. Mag., 76: 155 (*Chrysotoxum*, for *Chrysotoxum octomaculatum*: Verrall, 1901: British flies, 8: 647, not Curtis, 1837; misidentification). Type localities "at Harpenden (Herts.), from Timworth (Suffolk), Chippenham Fen and Fleam Dyke (Cambs.), and Fowl Mere near Wretham (Norfolk)" (Great Britain).

Material examined: 13 specimens (6♂♂, 7♀♀).

Distribution: Denmark south to central France; Britain (Wales and central/southern England) eastwards through central Europe into European parts of Russia to the Caucasus and on into eastern Siberia, Iran.

***Melanostoma mellinum* (Linnaeus, 1758)**

Syst. Nat., Ed. 10, 1: 593 (*Musca*). Type-locality: Svecia (Sweden).

Material examined: 31 specimens (21♂♂, 10♀♀).

Distribution: From Iceland and Fennoscandia south to Iberia, the Mediterranean and North Africa; from Ireland eastwards through most of Europe into European parts of Russia; Siberia from the Urals to the Pacific coast; North America from Alaska to Quebec and south to Washington, Iran.

***Paragus bicolor* (Fabricius, 1794)**

Entom. Syst., 4: 297 (*Syrphus*). Type locality: "Barbariae" [= NW Africa].

Material examined: 11 specimens (4♂♂, 7♀♀).

Distribution: From Belgium (extinct) south to the Mediterranean and North Africa; from France eastwards through central and southern Europe to Mongolia; Iran and Afghanistan; North America, Iran.

***Paragus compeditus* Wiedemann, 1830**

Aussereurop. Zweifl. Insekt., 2:89 (*Paragus*). Type locality: "Egypten" (Egypt).

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

Distribution: USSR-South European territory, Transcaucasus, Kazakhstan, Soviet Middle Asia, Iran, Afghanistan, North China, Egypt (Peck, 1988) and Turkey (Hayat & Clausen, 1997), Iran.

***Paragus haemorrhous* (Meigen, 1822)**

Syst. Besch., 3: 182 (*Paragus*). Type locality: Osterreich (Austria); sudliches Frankreich (France).

Material examined: 6 specimens (2♂♂, 4♀♀).

Distribution: From northern Norway south to Iberia and the Mediterranean (including Sicily and Malta); North Africa, Israel and Turkey; also in the Afrotropical region; from Ireland eastwards through central and southern Europe (Italy, the former Yugoslavia) into European parts of Russia; in North America from the Yukon south to Costa Rica, Iran.

***Paragus tibialis* (Fallén, 1817)**

Syrphici Sveciae: 60 (*Pipiza*). Type locality: in Vestrogothia; in arvis montosis Scaniae [=prov. Vastergotland and prov. Skane] (Sweden).

Material examined: 2 specimens (2♂♂).

Distribution: Uncertain at present, due to confusion with other species until recently; apparently occurs from southern Norway, Sweden and Denmark south to the Mediterranean coast of Europe, North Africa and the Canary Isles; from Britain (southern England) eastwards through central and southern Europe to the former Yugoslavia, Turkey, Israel, Nearctic and Oriental Regions, Iran.

Subfamily Milesiinae

***Pipizella caucasica* Skufjin, 1976**

Ent. Obozr., 55(4): 932 (*Pipizella*). Type locality: plateau Lagonaki, North Caucasus.

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

Distribution: USSR-South European territory (North Caucasus), Turkey and Iran.

***Cheilisia proxima* (Zetterstedt, 1843)**

Dipt. Scand., 2:792 (*Eristalis*). Type- locality: "in Ostrogothia ...; ad Haradshammar" (Sweden).

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

Distribution: Europe: from Scandinavia to Italy, Yugoslavia, Bulgaria; USSR: from Leningrad region to Transcaucasus, West Siberia, East Siberia, Iran.

***Cheilisia scutellata* (Fallén, 1817)**

Syrphici Sveciae: 55 (*Eristalis*). Type localities: "Esperod Scaniae, Aras Wermlandiae" (Sweden).

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

Distribution: Fennoscandia south to Iberia and round the Mediterranean to Greece, Turkey and North Africa; from Ireland eastwards through Eurasia to the Pacific coast, Iran.

***Volucella inanis* (Linnaeus, 1758)**

Syst. Nat., Ed. 10, 1: 595 (*Musca*). Type locality: "Europa".

Material examined: 9 specimens (4♂♂, 5♀♀).

Distribution: From southern Fennoscandia south to Spain and the Mediterranean (including islands, e.g. Crete), north Africa and Asia Minor (Syria); from Britain (southern

England) eastwards through central and southern Europe into Turkey and European parts of Russia and on through Siberia to the Pacific; Afghanistan, Mongolia, China, Iran.

***Volucella zonaria* (Poda, 1761)**

Insect. Mus. Graecensis: 118 (*Conops*). Type locality: not given ("ad Graecium") [= environs of Graz] (Austria).

Material examined: 6 specimens (2♂♂, 4♀♀).

Distribution: From Poland south to the Mediterranean (including islands, e.g. Crete) and North Africa; from Britain (southern England) eastwards through central and southern Europe (Italy, the former Yugoslavia, Greece) into Turkey and European parts of Russia and on through Siberia to the Pacific; Mongolia, Iran.

***Chrysogaster viduata* (Linnaeus, 1758)**

Syst. Nat., Ed. 10, 1: 598 (*Musca*). Type-locality: "Europa".

Material examined: 11 specimens (5♂♂, 6♀♀).

Distribution: Norway, Sweden, Finland, Denmark, The Netherlands, Belgium, Luxembourg, Germany, Poland, Czech Republic and Slovakia, France, Austria, Hungary, Spain, Italy, the former Yugoslavia, Bulgaria, USSR-Central and South European territories, Transcaucasus, Iran.

****Lejogaster metallina* (Fabricius), 1776**

Species insect, 2: 431 (*Syrphus*). Type locality: "Germaniae".

***New record for the fauna of Iran.**

Material examined: 16 specimens (6♂♂, 10♀♀). The specimens sampled in June 2009, on weeds around Mahar spring, located in X; 38° 87' E, Y; 55° 36' N with 2300 m.

Distribution: Norway, Sweden, Finland, Spain, Italy, Yugoslavia, Rumania, North European territory to Transcaucasia, Kazakh, Soviet Middle Asia, West Siberia, East Siberia; Asia: Afghanistan.

Description: Tergites entirely metallic colored, with green reflections. Male eyes separated as females. Third antennal segment in males is black and wider than long but in females is either black or with some orange coloration beneath and about as board as long, rounded. The female abdomen is very board whilst, the male has a somewhat slender oval abdomen.

Note: Larvae have been reported from decaying vegetation of a floating mat of bulrush and other plants in an old pond. It is mainly associated with wet meadows, marshes, fens, mildly acid boggy flushes and similar situations.

***Eumerus basalis* Loew, 1848**

Stettin. Ent. Ztg, 9: 126 (*Eumerus*). Type locality: Rhodus [=Rhodos] (Greece).

Material examined: 7 specimens (2♂♂, 5♀♀).

Distribution: Mediterranean parts of Europe, from southern France (plus Corsica) to Greece (including Crete and Rhodes), Croatia, Montenegro and Serbia, plus Bulgaria, Roumania and the Ukraine; Turkey and Iran.

***Merodon armipes* Rondani, 1843**

Revue zool., 6: 43 and Mag. Zool., Paris 1845:154 (*Merodon*). Type locality: "Parmenis prope torrentem" [=region of Parma] (Italy).

Material examined: 1 specimen (1♂).

Distribution: From north-east France (Rhine valley in Alsace) and adjacent parts of Germany. Through central Europe (Switzerland) and mountainous parts of northern Italy into the former Yugoslavia and on to Bulgaria, Roumania and the Crimea; Greece, Iran, Israel, North Africa.

***Eristalinus aeneus* (Scopoli, 1763)**

Ent. Carniolic: 356 sex?; (*Conops*). Type locality: Idria (Yugoslavia).

Material examined: 19 specimens (10♂♂, 9♀♀).

Distribution: Cosmopolitan; southern Sweden south to N Africa and the Canary Isles; on into the Afrotropical 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; Bermuda, Iran.

***Eristalinus sepulchralis* (Linnaeus, 1785)**

Syst. Nat., Ed.10, 1: 596 (*Musca*). Type locality: "Europa".

Material examined: 5 specimens (2♂♂, 3♀♀).

Distribution: Fennoscandia south to Iberia and the Mediterranean, including North Africa; from Ireland through most of Europe into Turkey and European parts of Russia; through Siberia to the Pacific coast; Japan; China; India, Iran.

***Eristalis arbustorum* (Linnaeus, 1758)**

Syst. Nat., Ed. 10, 1: 591 (*Musca*). Type locality: Europa.

Material examined: 9 specimens (4♂♂, 5♀♀).

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, Iran.

***Eristalis tenax* (Linnaeus, 1758)**

Syst. Nat., Ed. 10, 1: 591 (*Musca*). Type locality: Svecia (Sweden).

Material examined: 7 specimens (4♂♂, 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, Iran.

***Syritta flaviventris* Macquart, 1842**

Mém. Soc.Sci. Agric. Lille, 1841 (1): 135 and Dipt. Exot., 2 (2): 75 (*Syritta*). Type locality: Senegal (W Africa).

Material examined: 6 specimens (2♂♂, 4♀♀).

Distribution: Portugal, Spain and round the Mediterranean from the southern coast of France to Turkey and on to north Africa; in eastern parts of the Afrotropical region to the southern tip of Africa and in Madagascar. Known from various Mediterranean islands: Corsica, Sardinia, Sicily, Crete, plus Cape Verde. Also cited from Argentina, Brazil and Chile in the Neotropical region and Easter Island in Oceania (to which it has supposedly been introduced), Iran.

***Syritta pipiens* (Linnaeus, 1758)**

Syst. Nat., Ed.10, 1: 594 (*Musca*). Type locality: Europa.

Material examined: 26 specimens (17♂♂, 9♀♀).

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, Iran.

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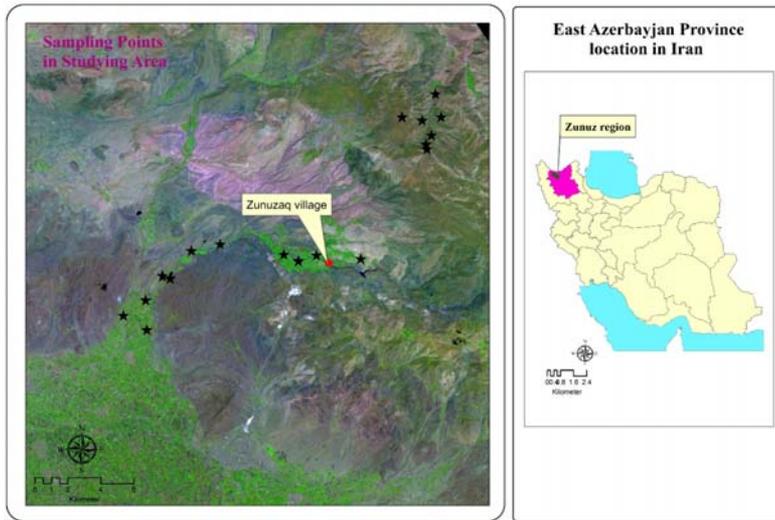


Figure 1. Location of sampling points on satellite image (SPOT) of Zunuz region.

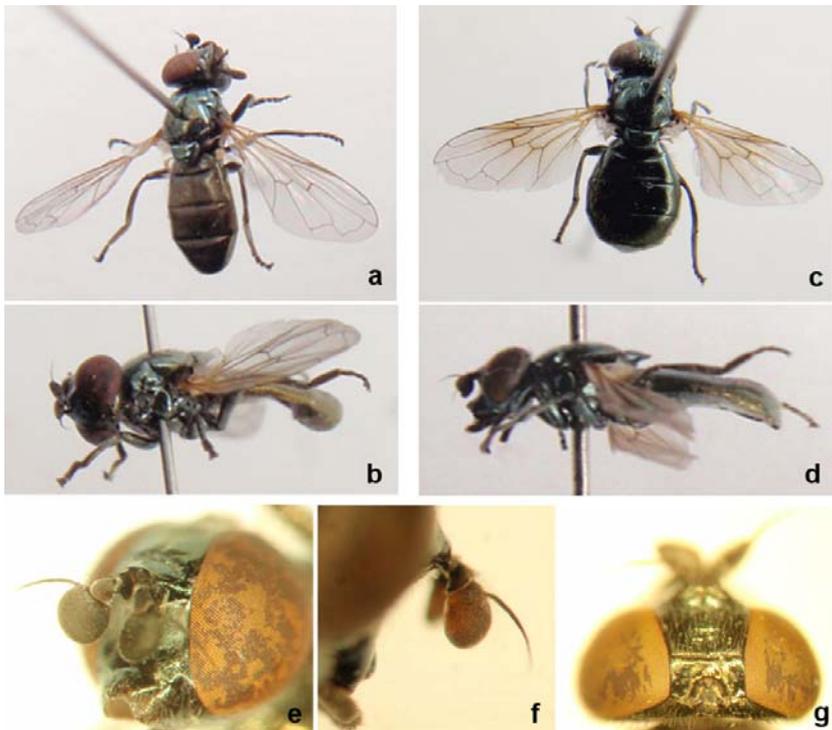


Figure 2. *Lejogaster metallina*, a: male; dorsal view, b: the same; lateral view, c: female; dorsal view, d: the same; lateral view, e: antenna (male); inner view, f: antenna (female); outer view, g: the head (male); dorsal view.