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Orijinal araştırma (Original article)

Hover flies (Diptera: Syrphidae) of Mekidi Valley in East Azerbayjan Province, Iran

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Summary

Syrphid fauna of Mekidi valley in Iran was studied during 2008- 2009. The specimens were collected using malaise trap as well as common entomological net in eighteen. Among of 274 collected specimens, 38 species belonging to 20 genera and two subfamilies were verified that all of them are as new records for studied region and a species, *Chrysogaster virescens* Loew, 1854, is a new record for the Iranian insect fauna.

Key words: Fauna, Syrphidae, Mekidi Valley, Iran

Anahtar sözcükler: Fauna, Syrphidae, Mekidi Vadisi, İran

Introduction

Mekidi valley is located in central part of Qaradag forests, a registered biosphere in world heritages by UNESCO since 1976 in East Azarbaijan province, Iran. This biosphere situated in the west southern Keleyber city with a distance of 20.32 km and UTM (Universal Transfer Mercator) coordinate system, X from 663937.60 to 667066.66 E; Y from 4299517.99 to 4303332.34 N and varying latitude from 1426 m to 1760 m. Mekidi River follows through this area which including various species of Umbelliferea, Astraceae and Juncaceae, rangelands, forests particularly with oak and hazelnut.

Syrphidae is one of the largest and most diverse families of the order Diptera with more than 6000 described species over the world. Among many interesting attributes is their famous precision at hovering. They have the ability to keep the body motionless in the air for quite a period of time during flight. This is the most significant character of these flies, coupled usually with their yellow banded abdomen which resembling bees or wasps. This group consists of small to medium flies 6- 18 mm long which can be distinguished by the special venation of the wing (spurious vein) (Kevan & Baker, 1983). Many species are important pollinators of flowering plants (Faegri & van der Pijl, 1979; Sarıbıyık, 2003).

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In addition, the immatures of numerous species are predators of destructive aphids and other pests (Gilbert, 1981). The Iran Syrphids have been studied in various localities by some taxonomists (Modarres Awal, 1997; Khiaban et al., 1998; Dousti, 1999; Gharali et al., 2000; Alichi et al., 2002; Gharali et al., 2002; Goldasteh et al., 2002; Sadeghi et al., 2002; Golmohammadi & Khiaban, 2004; Gilasian, 2005; Khaghaninia, 2010; Ehteshamnia et al., 2010; Khaghaninia et al., 2010 a, b). Checklists of Iranian hover flies were listed by Peck (1988) and Dousti & Hayat (2006). So far the Syrphid fauna of Arasbaran forests particularly this area remained poorly studied.

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 two malaise traps which are situated through all the working area (Fig. 1).

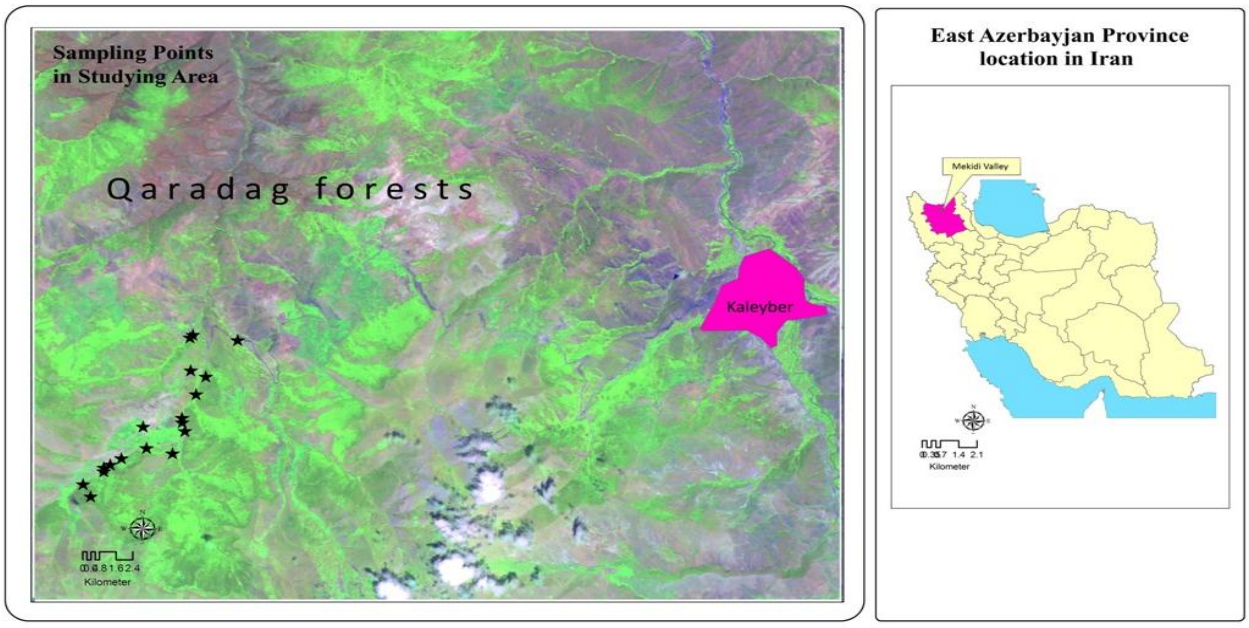

Figure 1. Location of sampling points on satellite image (SPOT) of Mekidi Region.

After killing the collected specimens in cyanid bottle, they were placed in a desiccator (having water at its bottom) for about 24 h in order to soak and soften then 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. The identification was done up to the specific level with the help of valid keys such as Vockeroth & Thompson (1987), Bei- Bienko (1988), Stubbs & Falk (2002), Lyneborg & Barkemeyer (2005) and Speight (2010). The distributions of the species were mostly given using Speight (2010).

Results

Thirty eight species belonged to 20 genera and two subfamilies were obtained by present study. All of the verified species are as new records for the studied area and a species which marked by an asterisk newly introduced to Iran fauna and totally listed as follows:

Subfamily Syrphinae

1. *Chrysotoxum bicinctum* (Linnaeus, 1758)

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

Distribution: Fennoscandia south to Iberia and the Mediterranean, including N Africa; through central and southern Europe (Italy, the former Yugoslavia, Bulgaria) into Turkey and European parts of Russia; in Asiatic parts of Russia as far as central Siberia, Iran.

2. *Chrysotoxum festivum* (Linnaeus, 1758)

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

Distribution: Fennoscandia south to Iberia and the Mediterranean, including N Africa; from Ireland eastwards through much of Europe, Great Britain, Norway, Sweden, Finland, Spain, Italy, Yugoslavia, Bulgaria, into Turkey and European parts of Russia; through Siberia to the Pacific coast; Japan; northern India, Iran.

3. *Chrysotoxum verralli* (Collin, 1940)

Material examined: 9 specimens (2♂♂, 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.

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

Material examined: 16 specimens (5♂♂, 11♀♀).

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 and records from offshore islands of northern Europe, such as the Faroes are assumed to be due to annual immigration, rather than indicative of the occurrence of resident populations, Iran.

5. *Eupeodes corollae* (Fabricius, 1794)

Material examined: 2 specimens (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.

6. *Eupeodes nuba* (Wiedemann, 1830)

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

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; Transcausasus 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), Iran.

7. *Melanostoma mellinum* (Linnaeus, 1758)

Material examined: 28 specimens (11♂♂, 17♀♀).

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.

8. *Meliscaeva auricollis* (Meigen, 1822)

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

Distribution: Fennoscandia and the Faroes south to Iberia, the Mediterranean (including Cyprus, Malta and Crete), Canary Isles, North Africa, Turkey and Israel; Ireland eastwards through most of Europe into European parts of Russia, Iran.

9. *Paragus bicolor* (Fabricius, 1794)

Material examined: 5 specimens (2♂♂, 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, Iran.

10. *Paragus compeditus* Wiedemann, 1830

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

Distribution: Italy, USSR-South European territory, Transcaucasus, Kazakhstan, Soviet Middle Asia, Afghanistan, North China, Egypt (Peck, 1988) and Turkey (Hayat and Claussen, 1997) to North Africa and the Afrotropical region, Iran.

11. *Paragus haemorrhous* (Meigen, 1822)

Material examined: 4 specimens (1♂, 3♀♀).

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.

12. *Paragus tibialis* (Fallén, 1817)

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

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.

13. *Platycheirus albimanus* (Fabricius, 1781)

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

Distribution: Greenland, Iceland, the Faroes and Fennoscandia south to Iberia and the Mediterranean; from Ireland eastwards through most of Europe into Turkey and European parts of Russia; in Siberia from the Urals to the Pacific coast (Kuril Isles); Philippines; in N America from Alaska south into Canada and western parts of the USA, Iran (Kaghaninia et al., 2010a).

14. *Scaeva pyrastri* (Linnaeus, 1758)

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

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.

15. *Sphaerophoria rueppelli* (Wiedemann, 1830)

Material examined: 32 specimens (19♂♂, 13♀♀).

Distribution: from southern Norway and Sweden south to N 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.

16. *Sphaerophoria turkmenica* Bankowska, 1964

Material examined: 15 specimens (7♂♂, 8♀♀).

Distribution: parts of European Russia; the Caucasus (Armenia, Azerbaijan); Arabian peninsula (Oman),Turkmenistan; Kazakhstan; Turkey (Hayat & Alaoğlu, 1990); Iran.

17. *Syrphus ribesii* (Linnaeus, 1758)

Material examined: 5 specimens (1♂, 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.

18. *Xanthogramma maculipenne* Mik, 1887

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

Distribution: Yugoslavia, Transcaucasus and Iran.

19. Xanthogramma pedissequum (Harris, 1776)

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

Distribution: Uncertain, due to confusion with related species, but from from Britain and Atlantic seabord countries south to the Paris basin and into central Europe to the Alps (France, Switzerland); Iran.

Subfamily Milesiinae

20*. Chrysogaster basalis* Loew, 1857

Material examined: 4 specimens (1♂, 3♀♀).

Distribution: Europe: from northern France and southern Germany south to Spain and Portugal and in N Africa; Switzerland; Roumania and much of the Balkan Peninsula (Bosnia-Herzegovina, Croatia, Greece, Macedonia, Serbia). Assuming *musatovi* is the same species as *basalis*, then *C.basalis* also occurs in the Ukraine, the Caucasus and on into Kazakhstan and Tajikistan; Iran (Khaghaninia et al., 2010a).

21*. *Chrysogaster virescens* Loew, 1854

Material examined: 4 specimens (4♀♀): Makidi village (on bogs); 38°50' N 46°54' E, 1656 m , 19 Aug. 2008, (Collected by S. Khaghaninia, Deposited at Insect Museum of Tabriz University).

Diagnosis characters: Antennae with third segment partly or entirely reddish, rarely dark. Hairs on sternite 2 shorter than those on thoracic dorsum. The males are rather more slender than the females, the latter usually having an exceptionally broad oval abdomen. The abdomen is normally dull on top but rather shining in some specimens, especially females. The thorax and scutellum have greenish reflection which is strongly developed in some females but less obvious in many specimens. The face profile in the male is strongly developed. Wing length 5.75-6.75 mm (Fig. 2).

Note: *Chrysogaster virescens* is to be found on bogs and in wet acid pastures, although adults sometimes congregate at flowers some distance away.

Distribution: southern Finland, Ireland, Britain and the Atlantic seaboard of Europe from Denmark to the Pyrenees and northern Spain. Also in Switzerland, in central Europe. New record for the Iranian insect fauna.

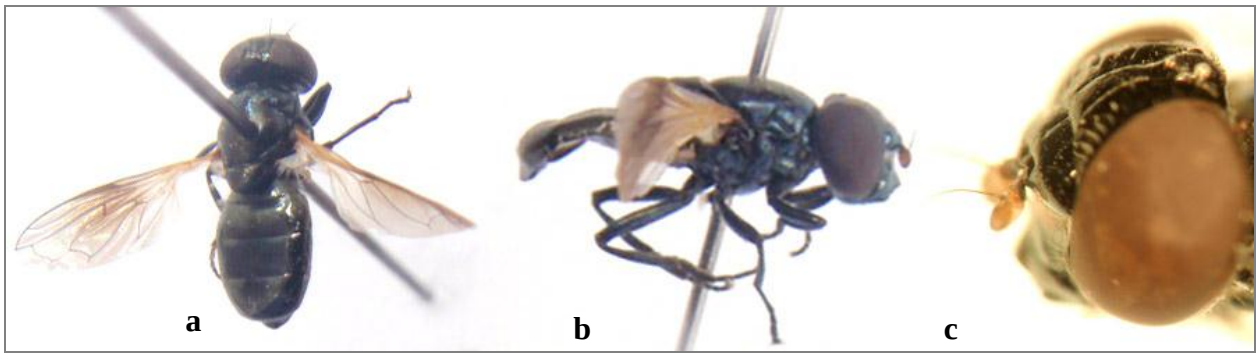

Figure 2. *Chrysogaster virescens*, female, a: dorsal view, b: lateral view, c: the head, lateral view.

22. *Cheilosia aerea* Dufour, 1848

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

Distribution: Poland south to the Mediterranean; from the Netherlands eastwards through much of central and southern Europe into European parts of Russia as far as the Transcaucasus; Iran (Khaghaninia et al., 2010a).

23. *Cheilosia cumanica* (Szilady, 1938)

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

Distribution: Balkans (Bosnia-Herzegovina, Macedonia, Montenegro, Serbia) and Carpathians (Roumania, Serbia); Iran (Khaghaninia et al., 2010a).

24. *Cheilosia proxima* (Zetterstedt, 1843)

Material examined: 16 specimens (11♂♂, 5♀♀).

Distribution: Fennoscandia south to Pyrenees and mountainous parts of Spain; Britain eastwards through much of Europe into Turkey and European parts of Russia; in Siberia from the Urals to Kamchatka; Iran.

25. *Eristalinus aeneus* (Scopoli, 1763)

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

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.

26. *Eristalinus sepulchralis* (Linnaeus, 1785)

Material examined: 4 specimens (1♂, 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.

27. *Eristalis arbustorum* (Linnaeus, 1758)

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

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.

28. *Eristalis nemorum* (Linnaeus, 1758)

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

Distribution: northern Fennoscandia south to Iberia; from Ireland eastwards through central Europe into Turkey and Russia and on into Asia over most of Siberia; Italy; the former Yugoslavia; Japan; in N America from Quebec south to Colorado; Iran.

29. *Eristalis tenax* (Linnaeus, 1758)

Material examined: 11 specimens (3♂♂, 8♀♀).

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; Iran.

30. *Eumerus lucidus* Loew, 1848

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

Distribution: Southwest France, Greece; southwestern Asia (Turkmenistan, Uzbekistan, Tajikistan); Iran (Khaghaninia et al., 2010a).

31. *Eumerus strigatus* (Fallén, 1817)

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

Distribution: Fennoscandia south to Iberia and the Mediterranean; much of Europe through into Turkey and Russia; from the Urals to the Pacific coast (Sakhalin); Japan; introduced to North America and recorded from both Canada and the USA; introduced to both Australia and New Zealand; Iran.

32. *Merodon aberrans* Egger, 1860

Material examined: 1 specimen (1♂).

Distribution: Through central Europe from Germany, the Czech Republic and the Alps (France, Switzerland, Austria) to Hungary and Roumania and on to the Ukraine and southern Russia; in southern Europe from mountainous parts of Portugal and Spain eastwards to Italy, Albania, the former Yugoslavia and Greece and on to Turkey and round the Mediterranean (Lebanon) into N Africa (Morocco), including Mediterranean islands e.g. Crete.; Iran (Khaghaninia et al., 2010a).

33. *Merodon armipes* Rondani, 1843

Material examined: 2 specimens (1♂, 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.

34. *Pipizella caucasica* Skufjin, 1976

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

Distribution: Caucasus (Georgia) and north-east Turkey; Iran.

35. *Pipizella divicoi* (Goeldlin de Tiefenau, 1974)

Material examined: 4 specimens (3♂♂, 1♀).

Distribution: From the Netherlands south to the Mediterranean coast of Spain; from Belgium and northern France (Rhine valley) eastwards through central and southern Europe (Italy, the former Yugoslavia) to Turkey and European parts of Russia and on through Siberia to the Pacific coast; Mongolia. This species disappears with introduction of irrigation to its dry grassland habitat; Iran (Khaghaninia et al., 2010a).

36. *Syritta flaviventris* Macquart, 1842

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

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, Mexico and Texas (USA) in the Nearctic and Easter Island in Oceania (to which it has supposedly been introduced); Iran.

37. *Syritta pipiens* (Linnaeus, 1758)

Material examined: 14 specimens (6♂♂, 8♀♀).

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.

38. *Volucella inanis* (Linnaeus, 1758)

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

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.

Özet

İran'ın Doğu Azerbaycan İli Mekidi Vadisi syrphid türleri (Diptera: Syrphidae)

İran'da Mekidi Vadisi'nin syrphid faunası 2008-2009 yıllarında incelendi. Örnekler, malaise tuzağı ve atrap (18 türde) kullanılarak toplandı. Toplanan 274 örnekten, 20 cins ve iki altfamilyaya bağlı 38 tür belirlendi. Türlerin tamamı araştırma alanı, *Chrysogaster virescens* Loew, 1854 türü ise İran böcek faunası için yeni kayıttır.

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