

FLOWER FLIES OF ISPEREKHAN VALLEY WITH THE FIRST RECORD OF *CHALCOSYRPHUS* CURRAN, 1925 FROM IRAN (DIPTERA: SYRPHIDAE)

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ABSTRACT: Syrphid fauna of Isperekhan valley in Iran was studied during 2008- 2010. The specimens were collected using common entomological net in nineteen localities. In total 315 collected specimens, 37 species belonged to 19 genera and two subfamilies were verified that all of them are as new records for studied region and a species, *Chalcosyrphus nemorum* (Fabricius), 1805, is as new record for the Iran insect fauna.

KEY WORDS: Fauna, Syrphidae, Isperekhan Valley, Iran.

Isperekhan valley is located in northern west of Sahand chain Mountains, the highest as well as biggest chain mountains in Azerbaijan, in East Azerbaijan province-Iran. This area is expanded in about 4.82 km long and UTM (Universal Transfer Mercator) coordinate system, X from 623648.34 to 625550.33 E; Y from 4178983.37 to 4181710.75 N and varying latitude from 2170 m to 2768 m. Ligvan River follows through this region which including various species of Umbelliferae, Astraceae and scattered fields of grain and alfalfa.

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; Sarıbyyk, 2003). 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; Alichy 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; Gharali & Reemer, 2010; Khaghaninia et al., 2010a,b,c). Checklists of Iranian hover flies were listed by Peck (1988) and Dousti & Hayat (2006). The Syrphid fauna of Sahand's mountainsides particularly this area have not yet been studied.

MATERIAL AND METHODS

Studied specimens were collected monthly, during 2008- 2010. Flies were caught using sweeping entomological net in nineteen localities which are situated through all the working area (Fig. 1).

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 upto the specific level with the help of valid keys such as Vockeroth and Thompson (1987), Bei-Bienko (1988), Stubbs & Falk (2002), Lyneborg & Barkemeyer (2005) and Speight (2010). The distribution of the species was mostly given using Speight (2010).

RESULTS

Thirty seven species belonged to 19 genera and two subfamilies were yielded 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

Chalcosyrphus Curran, 1925

Diagnostic characters: Metasternum hairy, male hind femur not arched. Tergites strongly transverse. Hind femur distinctly broader one third from tip than one third from base.

**Chalcosyrphus nemorum* (Fabricius, 1805)

Syst. antl.: 192 (*Milesia*). Type-locality: "Austria".

Material examined: 1 specimen (1♂): Isperekhan valley; 37°46' N 46°24' E, 2504 m, 8 Aug. 2009 (Collected by S. Khaghaninia, Deposited at Insect Museum of Tabriz University).

Diagnostic characters: having two pairs of pale spots on the abdomen, both sexes are very short-bodied, the abdomen being little longer than the thorax, the tergites are strongly transverse. In the males, the orange spots are square, separated by a thick black cross whose limbs are of equal length. The female markings are generally less sharp and normally grayish-orange or grey (Hipps, 1978; Chandler, 1998) (Fig. 2).

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, Turkey (Saribiyik & Ozgur, 2000). New record for the Iran insect fauna.

Flowers visited: white umbellifers; *Anemone nemorosa*, *Caltha*, *Euphorbia amygdaloides*, *Potentilla erecta*, *Ranunculus*, *Rubus idaeus*, *Sorbus aucuparia*, *Taraxacum* (Speight, 2010).

Chrysotoxum elegans Loew, 1841

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

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

Iranian Records: Oromieh (Khiaban et al., 1998; Khiaban & Parchami, 2001), Iran (Amirimoghdam & Sirjani, 2004).

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: 3 specimens (1♂, 2♀♀).

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.

***Chrysotoxum vernale* Loew, 1841**

Stettin. ent. Ztg, 2: 138 (*Chrysotoxum*). Type-locality: not given ("hier gefangen") [= environs of Poznan] (Poland).

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

Distribution: Fennoscandia south to the Pyrenees; from Britain (southern England) eastwards through most of Europe into Asia almost to the Pacific; Iran.

***Chrysotoxum verralli* (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: 1 specimen (1♀).

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.

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

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

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

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 (Jensen, 2001) are assumed to be due to annual immigration, rather than indicative of the occurrence of resident populations, Iran.

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

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

Material examined: 3 specimens (3♀♀).

Distribution: from Iceland, Fennoscandia and the Faroes (Jensen, 2001) 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 latifasciatus* (Macquart, 1829)**

Mém. Soc. Sci, Agric. Lille, 1827-1828: 242 and Ins. Dipt., 4: 94 (*Syrphus*). Type locality: "Arras" (France).

Material examined: 1 specimen (1♂).

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, Iran.

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

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

Material examined: 2 specimens (1♂, 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; 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), Iran.

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

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

Material examined: 39 specimens (15♂♂, 24♀♀).

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.

***Melanostoma scalare* (Fabricius, 1794)**

Entom. Syst., 4: 308 (*Syrphus*). Type-locality: "Kiliae" [= Kiel] [D].

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

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; in Siberia from the Urals to the Pacific coast (Kuril Isles); in eastern parts of the Afrotropical region south to Zimbabwe; throughout the Oriental region to New Guinea, Iran.

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

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

Material examined: 4 specimens (1♂, 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.

***Paragus compeditus* Wiedemann, 1830**

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

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

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.

***Paragus tibialis* (Fallén, 1817)**

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

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

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.

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

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

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

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.

***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: 4 specimens (1♂, 3♀♀).

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.

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

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

Material examined: 34 specimens (16♂♂, 18♀♀).

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.

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

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

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

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**

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

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

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

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

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

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

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.

***Xanthogramma pedissequum* (Harris, 1776)**

Expos. Eng. Ins.: 61, tab. XV, fig. 19 (*Musca*). Type locality: not given (England).

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

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

***Chrysogaster basalis* Loew, 1857**

Wien. Ent. Mschr., 1: 5 (*Chrysogaster*). Type-locality: "Deutschland" (Germany).

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

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).

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

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

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

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.

***Cheilosia aerea* Dufour, 1848**

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

***Cheilosia proxima* (Zetterstedt, 1843)**

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

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

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.

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

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

Material examined: 19 specimens (8♂♂, 11♀♀).

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.

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

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

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

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: 4 specimens (1♂, 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; Iran.

***Eumerus sogdianus* Stackelberg, 1952**

Trudy zoll Inst., 12: 390 (*Eumerus*). Type-locality: Tajikistan: Stalinabad [=Dushanbe] calley of the r. Kafernighan.

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

Distribution: Denmark south to southern Spain; from Belgium eastwards through central and southern Europe into European parts of Russia and on into central Asia (Kazakhstan, Tajikistan, Uzbekistan, Mongolia); China. The presence of this species in Western Europe has only been recognised recently, Iran.

***Eumerus strigatus* (Fallén, 1817)**

Syrphici Sveciae: 61 (*Pipiza*). Type locality: Vestrogothia; et in Scania [=prov. Vastergotland and prov. Skane] (Sweden).

Material examined: 1 specimen (1♂).

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.

***Merodon aberrans* Egger, 1860**

Verh. Zool. – bot. Ges. Wien, 10: 664 (*Merodon*). Type locality: "Austria".

Material examined: 2 specimens (1♂, 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).

***Merodon warnckei* Hurkmans, 1993**

Tijdschrift voor Entomologie, 136: 147-234. Type locality: "Hakkari and Van" (Turkey).

Material examined: 1 specimen (1♀).

Distribution: Turkey, Iran.

***Pipizella caucasica* Skufjin, 1976**

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

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

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

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

Mitt. Schweiz. Ent. Ges., 47 (3- 4): 238 (Heringia). Type locality: "Roschenz (Jura BE)" (Switzerland).

Material examined: 18 specimens (5♂♂, 13♀♀).

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).

***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: 9 specimens (7♂♂, 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.

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

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

Material examined: 20 specimens (8♂♂, 12♀♀).

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.

***Spazigaster ambulans* (Fabricius, 1798)**

Suppl. Entom. Syst.: 562 (*Syrphus*). Type-locality: "Italia".

Material examined: 18 specimens (11♂♂, 7♀♀).

Distribution: Schwarzwald (Germany), Alps, Apennines, Hungary, northern parts of the former Yugoslavia, the Carpathians, the Caucasus, Turkey, Iran (Gharali and Reemer, 2010 and Khaghaninia et al., 2010d).

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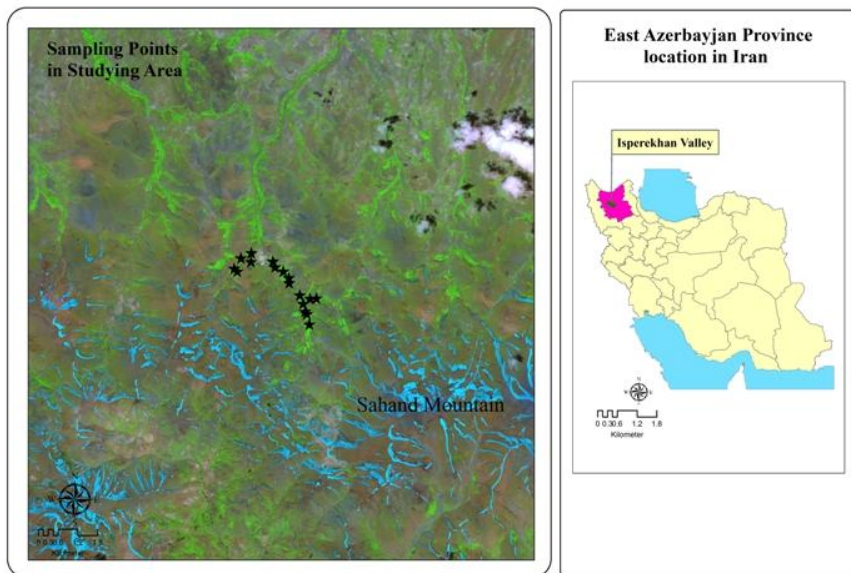


Figure 1. Location of sampling points on satellite image (SPOT) of Isperekhan valley.



(a)



(b)

Figure 2. *Chalcosyrphus nemorum*, male, a: dorsal view, b: lateral view.