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## **Additional notes about the soldier flies (Diptera, Stratiomyidae) of Varzqan region-Iran**

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### **Abstract**

Based on collected specimens of the soldier flies from Varzqan region (located in north western of Iran) during 2010-2013, fourteen species from 7 genera are recognized of which *Chloromyia formosa* (SCOPOLI, 1763) is recorded for the first time from Iran. Besides this is a first record of the genus *Chloromyia* DUNCAN, 1837 from Iran. A list of the species along with notes on diagnostic characters, geographical distribution and supplementary figures of the new record are provided.

Key words: Stratiomyidae, New records, Varzqan region, Iran.

### **Zusammenfassung**

Basierend auf eine in den Jahren 2010-2013 getätigte Aufsammlung von Waffenfliegen (Diptera, Stratiomyidae) in der iranischen Region Varzqan (NW-Iran), gelang der Nachweis von 14 Arten aus 7 Gattungen, wobei *Chloromyia formosa* (SCOPOLI, 1763) und *Sargus rufipes* WAHLBERG, 1854 Neunachweise für den Iran darstellen. Zudem ist der Fund von jener der Gattung *Chloromyia* DUNCAN, 1837 der erste für Iran. Angaben zu diagnostischen Merkmalen, Verbreitung sowie bildliche Illustrationen ergänzen die Arbeit.

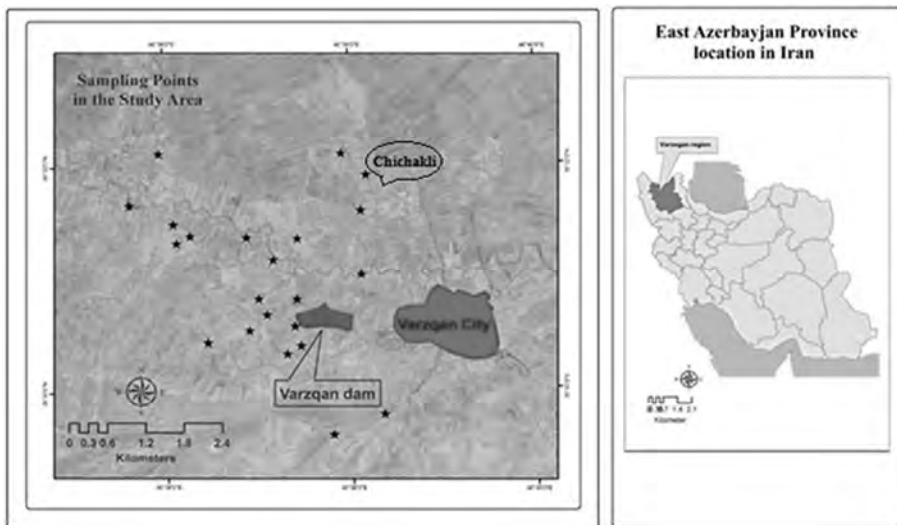
## Introduction

The Stratiomyidae (soldier flies) are members of the infraorder Stratiomyomorpha and are the sister-group to the Xylomyidae (JAMES 1981). They have a worldwide distribution and comprise 2.651 valid species (WOODLEY 2011). The adults brightly colored or metallic species sometimes resemble wasps or bees. The important character of this family is wing venation as anterior veins are strong, the discal cell is small and usually situated in the anterior half of the wing. The other characters like antennae have large structural variation and are used for the identification of genera and scutellum that often adorned with spines and may be the reason for the common name soldier flies (KOVAC & ROZKOŠNÝ 2004).

Adults of soldier flies are often found on leaves in sunny patches among the forest habitats. The Stratiomyidae have minor economic or sanitary importance role. The larvae of *Hermetia illucens* (Hermetiinae) may cause Myiasis in man (LECLERCQ 1969). The aquatic larvae of Stratiomyidae are found in large numbers in ponds and may be of importance as food for fish.

Some important studies have been done in the world about this family like: ROZKOŠNÝ (1983; 2004) studied the European Stratiomyidae. ROZKOŠNÝ & NARTSHUK (1988) provided catalogue of the soldier flies. ROZKOŠNÝ (1998) revised this family in the Palearctic region. WOODLEY (2001, 2011) provided the world catalogue of soldier flies. MASON (2013) revised the Italian soldier flies species.

The stratiomyids' fauna has been poorly studied in Iran, only in the recent years some studies have been conducted in Iran (KAZERANI & KHAGHANINIA, 2013, KAZERANI et al. 2013). The objective of this study is to investigate the soldier flies fauna in Varzqan region.



**Fig. 1.** Location of sampling points on satellite image (SPOT) of Varzqan region.

## Materials and methods

Studied materials were collected from twenty two localities which are situated through the Varzqan region using sweeping entomological net 2010-2013. Varzqan is situated in the west extrem of Qaradag Forests, a registered biosphere in East Azerbaijan province, Iran (Fig. 1). Chichakli region is one of the most divers forestry area in view point of flora as well as fauna in the northern east of Varzqan region.

The terminology primarily follows BEI-BIENKO (1988) and ROZKOŠNÝ (1998). The general distribution for each species was followed by (PAPE & THOMPSON 2011, WOODLEY 2011).

## Results

### Cilliteraninae

#### Genus *Adoxomyia* KERTÉSZ, 1907

##### *Adoxomyia sarudnyi* (PLESKE, 1903)

Material examined: 1♀: Varzqan region: N38°39.199' E46°15.783', 1272m, 14.vi.2010; leg. Khaghaninia.

Distribution: Palaearctic: Afghanistan, Iran.

#### Genus *Lasiopa* BRULLÉ, 1832

##### *Lasiopa pseudovillosa* ROZKOSNY, 1983

Material examined: 2♀, 1♂: Varzqan region: N38°35.284' E46°14.375', 1219m, 20.vii.2011; leg. Khaghaninia.

Distribution: Iran, Italy.

##### *Lasiopa caucasica* (PLESKE, 1901)

Material examined: 2♀: Chichekli: N38°30.342' E46°37.235', 1689 m.a.s.l, 07.vi.2012; leg. Khaghaninia.

Distribution: Armenia, Azerbaijan, Georgia, Russia, Turkey, Iran.

#### Genus *Nemotelus* GEOFFROY, 1762

##### *Nemotelus argentifer* LOEW, 1846

Synonyms: *Nemotelus limbatus* EGGER, 1859

Material examined: 1♀: Varzqanregion: N38° 50.864' E46° 54.901', 1426 m.a.s.l, 13.vii.2013; leg. Khaghaninia.

Distribution: Armenia, Bulgaria, Cyprus, Greece, Iran, Israel, Italy, Kazakhstan, Russia, Spain, Turkey, Ukraine, former Yugoslavia.

## Genus *Oxycera* MEIGEN, 1803

### *Oxycera meigenii* STAEGER, 1844

Material examined: 1♀: Varzqan region: N38° 39.546' E46° 16.790', 1255m, 19.vi.2011; leg. S. Khaghaninia.

Distribution: Afganistan, Austria, Azerbaijan, Belgium, China, Czech Republic, Denmark, France, Georgia, Germany, Greece, Hungary, Iran, Italy, Kazakhstan, Mongolia, Poland, Romania, Russia, Slovakia, Sweden, Switzerland, Tajikistan, Turkey, Turkmenistan, Ukraine, Usbekistan.

## Stratiomyinae

### Genus *Odontomyia* MEIGEN, 1803

Type species: *Musca hydroleon* LINNAEUS, 1758

### *Odontomyia angulate* PANZER, 1798

Synonyms: *Odontomyia hdgropota* SCHINER, 1855; *Odontomyia latifasciata* KERTESZ, 1908; *Stratiomys brevicornis* LOEW, 1840; *Stratiomys hydropota* MEIGEN, 1822.

Material examined: 1♀: Varzqan region: N38° 37.169' E46° 26.536', 1534 m.a.s.l, 10.vii.2011; leg. S. Khaghaninia.

Distribution: Afghanistan, Albania, Algeria, Austria, Belgium, Bulgaria, China, Czech Republic, Denmark, Egypt, England, Estonia, Finland, France, Germany, Greece, Hungary, Iran, Israel, Italy, Kazakhstan, Morocco, Netherlands, Poland, Romania, Russia, Slovakia, Spain.

### *Odontomyia cephalonica* STROBL, 1898

Synonyms: *Eulalia persica* PLESKE, 1922; *Odontomyia byzantine* STROBL, 1902.

Material examined: 1♂: Chichekli: N 38°37.104', E46°26.322', 1534m.a.s.l, 15.vii.2012; leg. S. Khaghaninia.

Distribution: Azerbaijan, Bulgaria, Greece, Iran, Israel, Italy, Russia, Turkey, Ukraine.

### Genus *Oplodontha* RÓNDANI, 1863

### *Oplodontha viridula* (FABRICIUS, 1775)

Synonyms: *Musca jejuna* SCHRANK, 1837; *Odontomyia atrata* VERRALL, 1909; *Odontomyia dentate* MEIGEN, 1804; *Stratiomys bimaculata* MEIGEN, 1835; *Stratiomys jejuna* SCHRANK, 1803.

Material examined: 8♀, 5♂: Chichekli: 38° 30.263' N, 46° 36.269' E, 1724 m.a.s.l, 1.vi.2011; leg. S. Khaghaninia.

Distribution: Albania, Algeria, Austria, Belgium, Bulgaria, China, Czech Republic, Denmark, England, France, Finland, Germany, Greece, Hungary, Iraq, Ireland, Israel, Italy, Kazakhstan, Kyrgyzstan, Mongolia, Netherlands, Norway, Poland, Roumania, Russia, Slovakia, Spain.

### Genus *Stratiomys* GEOFFROY, 1762

### *Stratiomys cenisia* MEIGEN, 1822

Synonyms: *Stratiomyia ahngeri* PLESKE, 1901; *Stratiomyia kervillei* VILLENEUVE, 1912; *Stratiomys flaviventris* LOEW, 1846.

**Material examined:** 2♀, 1♂: Chichekli: 38° 30.263' N, 46° 36.269' E, 1724 m.a.s.l, 1.vi.2011; leg. S. Khaghaninia.

**Distribution:** Algeria, Armenia, Austria, Bulgaria, Cyprus, Czech Republic, Egypt, France, Germany, Hungary, Iran, Israel, Italy, Kazakhstan, Morocco, Poland, Romania, Russia, Slovakia, Spain, Syria, Turkey, Tunisia, Ukraine, former Yugoslavia.

### ***Stratiomys ruficornis* (MACQUART, 1838)**

Synonyms: *Stratiomys erythrocerus* EGGER, 1859; *Stratiomys moravica* HRBACEK, 1945; *Stratiomys pyrrhocera* LOEW, 1869; *Stratiomys sublunata* LOEW, 1869.

**Material examined:** 2♀, 1♂: Chichekli: 38° 40.587' N, 46° 31.537' E, 2243m.a.s.l, 4.v.2010; 1♀: N38° 40.520' N, 46° 31.560', 2239m, 20.vi.2011; leg. S. Khaghaninia.

**Distribution:** Albania, Armenia, Austria, Azerbaijan, Bulgaria, Croatia, Czech Republic, France, Greece, Hungary, Iraq, Iran, Lebanon, Poland, Romania, Russia, Slovakia, Syria, Turkey, former Yugoslavia.

### ***Stratiomys singularior* (HARRIS, 1778)**

Synonyms: *Musca singularius* HARRIS, 1778; *Stratiomys furcate* FABRICIUS, 1794; *Stratiomys panthaleon* FALLEN, 1817; *Stratiomys riparia* MEIGEN, 1822.

**Material examined:** 3♀, 2♂♂: Chichekli: 38° 40.558' N, 46° 31.533' E, 2168 m.a.s.l, 14.vi.2013; leg. S. Khaghaninia.

**Distribution:** Armenia, Austria, Belgium, Bulgaria, China, Czech Republic, Denmark, England, Estonia, Finland, France, Germany, Hungary, Iran, Ireland, Italy, Kazakhstan, Lithuania, Mongolia, Netherlands, Norway, Poland, Romania, Russia, Slovakia, Spain, Sweden, Switze.

## **S a r g i n a e**

### **Genus *Chloromyia* DUNCAN, 1837**

#### ***Chloromyia formosa* (SCOPOLI, 1763)**

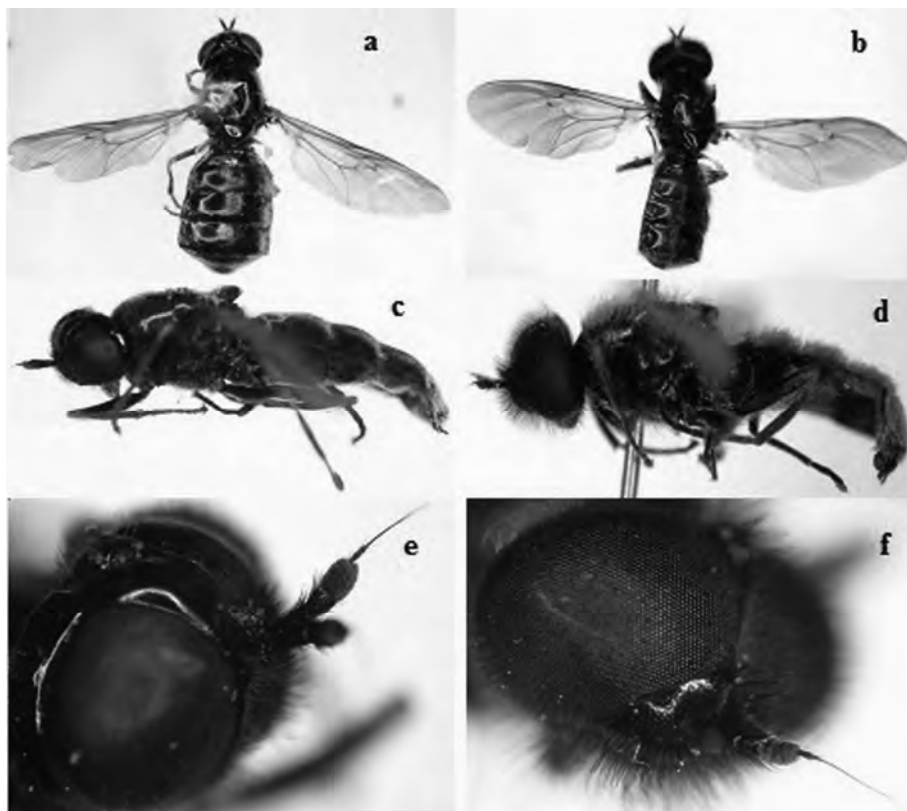
Synonyms: *Musca formosa* SCOPOLI, 1763; *Nemotelus flavogeniculatus* DE GEER, 1776; *Musca cicur* HARRIS, 1776; *Musca aurata* FABRICIUS, 1787; *Sargus xanthopfents* MEIGEN, 1804; *Sargus azureus* LOEW, 1840.

**Material examined:** 1♂, 1♀: Varzqan region: N38° 39.546' E46° 16.790', 1255m, 19.vi.2011; leg. S. Khaghaninia.

**Distribution:** Widespread Europe, **New to Iran.**

**Diagnostic characters:** Male: Eyes densely pilose, contiguous; frons and face shining black, slightly swollen, face partly yellowish dusted in lower part (Fig. 2f); antennae inserted at middle of head profile, relatively long and entirely black, scape about twice as long as wide, 3rd segment suboval, arista remarkably thickened and haired in basal (Fig. 2f); thorax shining black; mesonotum, scutellum and mediotergite metallic green (Fig. 2b); thoracic pile mainly erect, as long as longest hairs on head, golden yellow on dorsum and yellowish to dark brown on pleura (Fig. 2d); legs dark brown, only knees broadly yellow (Fig. 2d); wings yellowish-brown infuscated, veins hardly darker, wing microtrichia reduced on alula and at base on anal lobe (Fig. 2b); abdomen with metallic green and purple reflections dorsally, abdominal pile fairly long and yellow, almost golden dorsally (Fig. 2b,d).

Female: Eyes with dense but short (Fig. 2e); frons and face shining black; antenna black (Fig. 2e); thoracic pile very short, semi-erect and yellowish-white on mesonotum (Fig. 2c); legs and wings as in male; abdomen usually wider; metallic blue dorsally, and dark with slight metallic reflections ventrally; abdominal pile short, pale yellow to whitish, mainly adpressed (Fig. 2a,c).



**Fig. 2.** *Chloromyia Formosa* (SCOPOLI, 1763); (a) dorsal view of female, (b) dorsal view of male, (c) lateral view of female, (d) lateral view of male, (e) lateral view of female head, (f) frontal view of male head.

### Genus *Sargus* FABRICIUS, 1798

#### *Sargus cuprarius* (LINNAEUS, 1758)

Synonyms: *Musca capraria* LINNAEUS, 1758; *Musca violacea* SCOPOLI, 1763; *Nemotelus cuprarius* DEGEER, 1776; *Sargus coeruleicollis* LOEW, 1855; *Sargus cuprinus* CHAGNON, 1901; *Sargus nubeculosus* ZETTERSTEDT, 1842; *Sargus minimus* ZETTERSTEDT, 1849.

Material examined: 1♂, 1♀: Chicekli: 38° 40.558' N, 46° 31.533' E, 2168 m.a.s.l, 14.vi.2013; leg. S. Khaghaninia.

Distribution: Widespread Nearctic and Central and Western Palearctic.

### ***Sargus iridatus* (SCOPOLI, 1763)**

Synonyms: *Musca caeruleascens* VILLERS, 1789; *Sargus coeruleascens* BEZZI, 1903; *Sargus irradiatus* SCHINER, 1855; *Sargus minor* LOEW, 1855; *Sargus minutus* ZETTERSTEDT, 1849.

Material examined: 1♀: Varzqan region: N38°39.199' E46°15.783', 1272m, 14.vi.2010; leg. Khaghaninia.

Distribution: Widespread Palearctic, from Europe (Scotland, Britain, Ireland) to western Siberia and Mongolia.

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