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A recent contribution to the black scavenger flies (Diptera: Sepsidae) in Iran

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Abstract. In order to study the family Sepsidae in Iran, a survey was conducted in East Azerbaijan province during 2009-2012. Two genera and six species of the family are recognized. Three species, *Nemopoda nitidula* (Fallén, 1820), *Sepsis biflexuosa* Strobl, 1893, *S. punctum* (Fabricius 1794) are recorded for the first time from Iran. An identification key to the Iranian sepsids is prepared as well the localities and photos of identified species in this study are given.

Key words: Sepsidae, East Azerbaijan province, Iran, new records.

Introduction

The Sepsidae (commonly called black scavenger flies) with more than 300 declared species belonging to two subfamilies Orygmatinae (including a single species *Orygma luctuosum* Meigen, 1830) and Sepsinae (other species of 36 genera), are a moderately large family of superfamily Sciomyzoidea and relatively small compared with some other families of acalyptratae flies (Ozerov 2005). The external morphology for most of the Sepsidae is rather remarkable that allows easily distinguishing them in a sweeping net from other flies by relatively small, slender, shiny, ant like body and sometimes with round spot near apex of vein R_{2+3} (Pont & Meier 2002). Morphologically it differs from the other closest families of flies by the following combination of characters: small to medium size (2-12 mm); head rounded and subspherical, postvertical setae divergent or absent, palpi usually vestigial; posterior thoracic spiracle with one or more fine bristles (Duda 1926a, Duda 1926b, Ozerov 2005, Ang & Meier 2010). Sepsids breed in a variety of decaying organic matter (Pont & Meier 2002). Some important taxonomic studies and catalogue on the world fauna include: Ozerov (1992, 2000, 2005) a world catalogue of Sepsidae including taxonomy of family, Afrotropical and Nearctic Sepsidae; Silva (1990, 1992) a revision of the family Sepsidae of the Neotropical Region; Ozerov 1993, Iwasa & Thinh 2008, Ang & Meier 2010 Vietnamese Sepsidae.

Before this study, Ozerov (2005) listed 8 species (*Nemopoda speiseri* (Duda, 1926), *Saltella sphondylii* (Schrank, 1803), *Sepsis barbata* Becker, 1907, *S. fissa* Becker, 1903, *S. thoracica* (Robineau-Desvoidy, 1830), *S. fulgens* Hoffmannsegg, 1826, *S. violacea* Meigen, 1826, *S. flavimana* Meigen, 1826) belonging to 3 genera of the family Sepsidae from Iran. This study adds three species of this family for fauna of Iran.

Material and methods

Adult specimens were collected by standard sweep-netting in various habitats (forest, grassland, semi-aquatic and some area with decaying organic microhabitats) in East Azerbaijan province of Iran during 2009- 2012. The samples were killed in a killing jar containing potassium cyanide and the voucher specimens were deposited at Insect Museum of Tabriz University. The species were identified based on Stackelberg (1988), Pont & Meier (2002) and Ang et al. (2013). Hypopygium was cleared in 10% KOH. Images were obtained using a stereo microscope (Nikon SMZ 1000) connected to an image analyzing system.

Results

Six species of the family Sepsidae were identified. Three of them marked with an asterisk are being newly reported for the Iran insect fauna (**Nemopoda nitidula* (Fallén, 1820), **Sepsis biflexuosa* Strobl, 1893, *S. fulgens* Meigen, 1826, **S. punctum* (Fabricius 1794), *S. thoracica* (Robineau-Desvoidy 1830) and *S. violacea* Meigen 1826).

Identification key to the Iranian sepsids (male)

(Adapted from Stackelberg, 1988)

1. Cells br and bm fused, wings smoky gray ..... ***Saltella sphondylii* (Schrank)**
— Cells br and bm of wings separate **2**
2. Fore femur on lower side with comb of spinules **3**
— Fore femur on lower side without comb of spinules **4**
3. Orbital and outer vertical setae present, posterior trochanters in male with two strong spines ..... ***Nemopoda nitidula* Fallén**
— Orbital and outer vertical setae absent ..... ***N. speiseri* Duda**
4. Fore femur in male on lower side between median group of spines and basal area of femur with thin and long hairs ..... ***Sepsis barbata* Becker**
— Fore femur in male on lower side between median group of spines and basal area of femur without long hairs **5**
5. Fore femur in male on lower side with tubercles **6**
— Fore femur in male on lower side without tubercles ..... ***Sepsis fissa* Becker**
6. Sternopleuron partially lustrous ..... ***Sepsis thoracica* R.-D.**
— Sternopleuron with white coating throughout its length **7**
7. Fore femur in male on lower side between median group of spines and apex of femur with spines **8**

— Fore femur in male on lower side between median group of spines and apex of femur without spines **10**
8. Tergite$_{1+2}$ without long hairs on sides ..... ***Sepsis fulgens*** **Hoffmannsegg**
— Tergite$_{1+2}$ with long hairs on sides **9**
9. Fore femur in male on lower side between median group of spines and proximal spine with additional strong spine ..... ***Sepsis punctum*** **(Fabricius)**
— Fore femur in male on lower side between median group of spines and proximal spine without additional strong spine ..... ***Sepsis violacea*** **Meigen**
10. Fore tibia notably S-shaped ..... ***Sepsis biflexuosa*** **Strobl**
— Fore tibia slightly curved ..... ***Sepsis flavimana*** **Meigen**

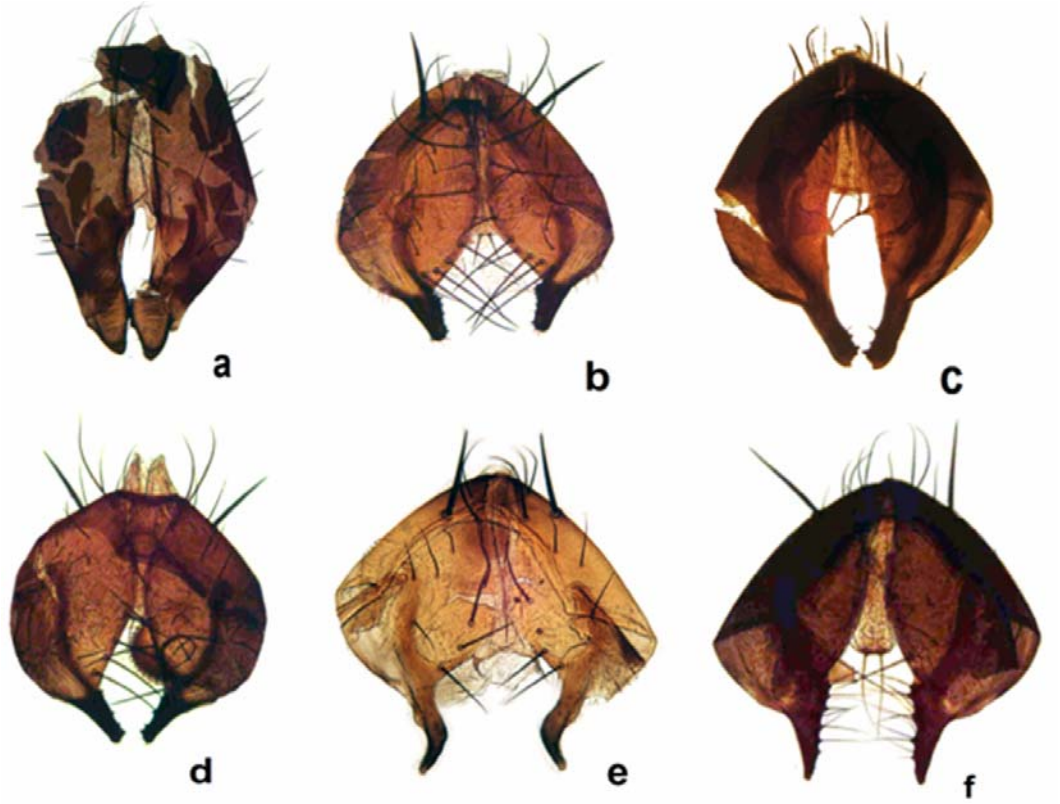

Figure 1. Hypopygium of male, dorsal view; a) *Nemopoda nitidula*; b) *Sepsis biflexuosa*; c) *S. fulgens*; d) *S. punctum*; e) *S. thoracica*; f) *S. violacea.*

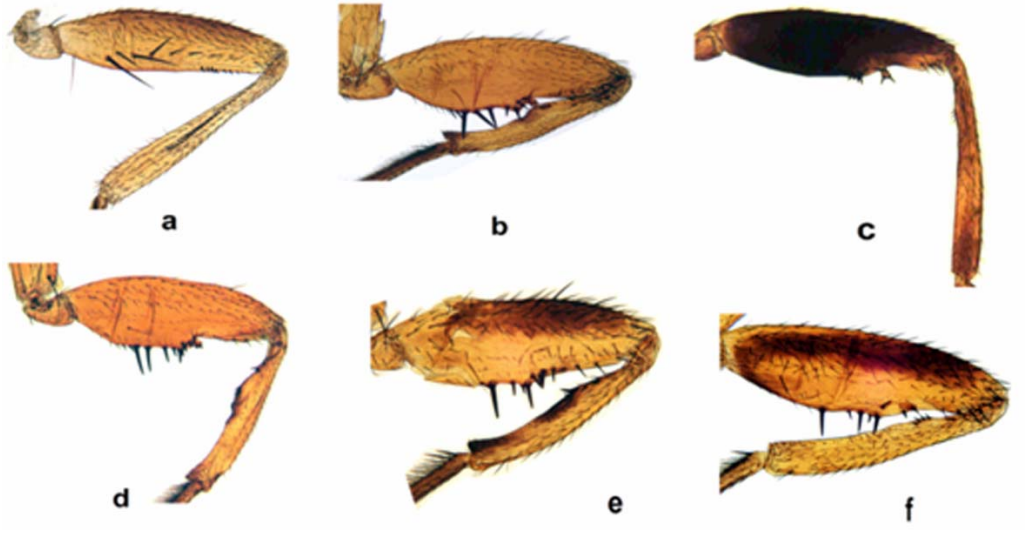

Figure 2. Fore femur and tibia of male, lateral view; a) *Nemopoda nitidula*; b) *Sepsis biflexuosa*; c) *S. fulgens*; d) *S. punctum*; e) *S. thoracica*; f) *S. violacea.*

List of identified species at the present study

Subfamily Sepsinae

***Nemopoda nitidula* (Fallén, 1820)** (Fig. 1a, 2a)
Material examined: 1 ♂, Kandovan, 37°45 N, 46°18' E, 2840 m a.s.l., 20 May 2010.

Distribution: Common species in Afrotropical, Nearctic and Palaearctic regions (Ozerov 2005). New to the Iranian fauna.

***Sepsis biflexuosa* Strobl, 1893** (Fig. 1b, 2b)
Material examined: 2 ♂, Qurigol, 37°54' N 46°42' E, 1920 m a.s.l., 8 June 2012.

Distribution: Hawaiian islands, Taiwan, Canary Is., Morocco, Tunisia. Common species in Nearctic and Palaearctic regions (Ozerov 2005). New to the Iranian fauna.

***Sepsis fulgens* Meigen, 1826** (Fig. 1c, 2c)
Material examined: 3 ♂, 1 ♀, Chichakli, 38°39' N, 46°31' E, 2140 m a.s.l., 5 August 2009; 1 ♂, 2 ♀, Maraghe, 37°25' N, 46°25' E, 1790 m a.s.l., 20 June 2011; 5 ♂, 8 ♀, Qurigol, 37°54' N, 46°41' E, 1943 m a.s.l., 9 July 2011; 3 ♂, Kandovan, 37°44' N, 46°19' E, 3000 m a.s.l., 6 June 2012; 1 ♂, 1 ♀, Qaradagh forests, 38°53' N, 46°48' E, 1860 m a.s.l., 20 June 2012.

Distribution: Algeria, Morocco, Tunisia. Very common species in Palaearctic regions (Ozerov 2005).

***Sepsis punctum* (Fabricius 1794)** (Fig. 1d, 2d)
Material examined: 5 ♂, 7 ♀, Qaradagh forests, 38°51' N, 46°52' E, 1770 m a.s.l., 14 June 2010; 2 ♂, 1 ♀, Ajabshir, 37°31' N, 46°07' E, 1660 m a.s.l., 10 April 2010; 1 ♂, Qurigol, 37°54'N, 46°41'E, 1950 m, 2011; 2♂, 1♀, Kandovan, 37°45'N, 46°18'E, 2840 m, 13 May 2012.

Distribution: Common species in Nearctic, Neotropical, Oriental, Palaearctic regions and some area in North Africa (Ozerov 2005). New to the Iranian fauna.

***Sepsis thoracica* (Robineau-Desvoidy 1830)** (Fig. 1e, 2e)
Material examined: 4 ♂, 5 ♀, Maraghe, 37°25' N, 46°25' E, 1790 m a.s.l., 20 June 2011; 3 ♂, 3 ♀, Qaradagh forests, 38°51' N, 46°52' E, 1770 m a.s.l., 14 June 2010.

Distribution: Hawaiian islands , common species in Afrotropical, Oriental, Palaearctic regions and some area in North Africa (Ozerov 2005).

***Sepsis violacea* Meigen 1826** (Fig. 1f, 2f)
Material examined: 2♂, 4♀, Ajabshir, 37°30' N, 46°01' E, 1437 m, 20 June 2009, 3♂, 2♀, 37°29' N, 45°52' E, 2037 m 15 July 2010; 2♂, Chichakli, 38°39' N, 46°31' E, 2140 m a.s.l., 5 August 2009, 1♀, 38°39 N, 46°31 E, 2140 m, 28 July 2010; 5 ♂, 6 ♀, Qaradagh forests, 38°51' N, 46°52' E, 1770 m a.s.l., 14 June 2010; 3♂, 4♀, Horand, 38°59´N, 47°22´E, 1370 m, 15 July 2010, (1♂), 38°56´N, 47°27´E, 1360 m, 5 July 2010; 3♀, Isperekhan, 37°46' N, 46°24' E, 2504 m, 10 August 2012.

Distribution: Morocco, Tunisia. Very common species in Palaearctic regions (Ozerov 2005).

Discussion

In total, eight sepsids have been recorded along previous studies (Ozerov 2005). The present study adds three new species which increases the national list of Iran to 11 species discovered mainly during this study. Iranian sepsids fauna is poorly known. For comparison, Ozerov (2005) listed more than 60 and 20 species from Russia and Turkey respectively and discussion on the zoogeography of Iranian sepsids fauna is premature.

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