New records for fauna of the subfamily Dexiinae (Diptera: Tachinidae) in Iran

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ABSTRACT. This study was carried out to identify the Tachinidae fauna in northern Iran during 2010-2011 and ten species belonging to nine genera and two tribes of the subfamily Dexiinae were found. The species *Estheria petiolata*, *Periscepsia spathulata*, *Stomina caliendrata* and *Thelaira nigripes* are new records for the Iranian tachinid fauna.

KEY WORDS: Diptera, Tachinidae, Dexiinae, Parasitoid, Iran, new records.

INTRODUCTION

Tachinidae is one of the most diverse dipteran families, with more than 8500 species worldwide (O'HARA 2013). Nearly all the members of this family are entomophagous parasitoids and have an important role as biocontrol agents of pests in agricultural and forest ecosystems. Many tachinids have been successfully used in biological control programmes (GRENIER 1988, STIREMAN et al. 2006). The Tachinidae are divided into four subfamilies: Phasiinae, Dexiinae, Exoristinae and Tachininae. The Dexiinae are the only subfamily widely regarded as monophyletic, a belief based on shared derived features of

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the male terminalia. In particular, male dexiines possess a hinged connection between the basiphallus and distiphallus that is not found in other tachinids (TSCHORSNIG 1985, WOOD 1987). This subfamily has about 54 genera and 236 species in the Palearctic region (HERTING & DELY-DRASKOVITS 1993, O'HARA 2013) and the species of this subfamily commonly parasitize larval Coleoptera (mostly Scarabaeidae) and Lepidoptera.

The history of studies on Tachinidae fauna in Iran is not very long and only a few short notes have been published about Iranian Dexiinae. In the first study, SAMET et al. (1977) reported the species *Billaea biserialis* (PORTSHINSKY, 1881), *Billaea zimini* KOLOMIETS, 1966 and *Periscepsia carbonaria* (PANZER, 1798) in the "Preliminary list of Diptera of Iran". Later, HERTING (1984) added *Estheria pallicornis* (LOEW, 1873) and PARCHAMI ARAGHI (1995) reported the species *Voria ruralis* (FALLÉN, 1810) as a parasitoid of larval *Autographa gamma* (LINNAEUS, 1758). GHEIBI et al. (2008, 2009) reported four species – *Athrycia impressa* (VAN DER WULP, 1869), *Cyrtophloebe ruricola* (MEIGEN, 1824), *Periscepsia carbonaria* (PANZER, 1798) and *Thelaira solivaga* (HARRIS, 1780) – from Fars province. ZIEGLER et al. (2016) described the subspecies of *Dinera fuscata occidentalis* ZIEGLER, 2013 from Mazandaran and East Azerbaijan provinces. Prior to this study, we reported 17 tachinid species belonging to 14 genera of the subfamily Dexiinae from north-western Iran, of which 14 species and ten genera were new records for the Tachinidae fauna of Iran (SEYYEDI SAHEBARI et al. 2014).

This study aims to extend the checklist of Iranian tachinid species and to add further data on their distributions in Iran.

MATERIALS AND METHODS

Twelve Malaise traps were deployed in grasslands and forests of Gilan and Mazandaran provinces, situated in northern Iran. The forests are named after the ancient region of Hyrcania. This region includes the coast along the Caspian Sea and the northern slopes of the Alborz Mountains (Fig. 1). The climate in this region is humid subtropical maritime in middle altitude locations, while in the mountains it is humid continental with most precipitation occurring in autumn, winter and spring. The specimens were collected from April to October in 2010 and 2011. They were deposited at the Faculty of Agriculture, Tarbiat Modares University, Tehran, Iran, and in the collection of Professor Hasan MALEKI MILANI, Tabriz University, Iran (ICHMM). The specimens were identified on the basis of the keys by MESNIL (1944-1975, 1980), TSCHORSNIG & HERTING (1994) and TSCHORSNIG & RICHTER (1998). The photographs were taken using a Nikon SMZ 1000 stereomicroscope equipped with a Nikon D5200 digital camera.

Fig. 1. Gilan and Mazandaran provinces, where the material for this study was collected.

List of localities

Gilan province:

Roodsar, Eshman Kamachal, 37°22'3.66"N, 49°57'57.84"E, 1 m, 37°21'10.50"N, 49°57'56.16"E, 2 m; vegetation: rice field, area near the sea.

Roodsar, Ghazichak, 36°45'5.54"N, 50°19'35.22"E, 1803 m, 36°45'52.62"N, 50°20'1.08"E, 1787 m; vegetation: grassland, barberry bush.

Roodsar, Ziaz, 36°25'27.18"N, 50°13'24.78"E, 490 m, 36°25'34.44"N, 50°13'17.22"E, 537 m; vegetation: hazelnut garden.

Roodsar, Orkom, 36°45'44.34"N, 50°18'11.88"E, 1201 m; vegetation: mixed deciduous forest, hazelnut garden.

Mazandaran province:

Ghaznasara, 36°16'56.82"N, 52°10'58.50"E, 2032 m, 36°16'58.08"N, 52°10'55.62"E, 2013 m; vegetation: grassland, shrub.

Tanghevaz, 36°21'55.02"N, 52°10'74"E, 692 m, 36°18'51.42"N, 52°7'48"E, 703 m, 36°21'55.68"N, 52°6'10.32"E, 702 m; vegetation: deciduous and coniferous forest.

RESULTS

In the course of the study, 52 individuals of the subfamily Dexiinae were collected and identified; they belong to ten species, nine genera and two tribes. Four species are new records (marked with an asterisk) for the Iranian Tachinidae fauna. The diagnostic characters of the first recorded species are documented with photographs. All altitudes are given in metres above mean sea level (m).

Tribe: Dexiini

Genus: *Dexia* MEIGEN, 1826

Dexia rustica (FABRICIUS, 1775)

Material examined: (1♂), 20.V.2010 & (1♂), 18.VI.2010, Gilan province, Roodsar (Ghazichak) (36°45'5.54"N, 50°19'35.22"E, 1803 m); (1♂), 20.VI.2010 & (1♂), 1.VII.2010, Gilan province, Roodsar (Ziaz) (36°25'27.18"N, 50°13'24.78"E, 490 m); (1♂), 20.VI.2010 & (2♂♂, 1♀), 11.VII.2010, Gilan province, Roodsar (Ziaz) (36°25'34.44"N, 50°13'17.22"E, 537 m), leg. M. KHEIRANDISH; (1♀), Mazandaran province, Ghaznasara (36°16'56.82"N, 52°10'58.50"E, 2032 m), 4.VII.2011; (1♂), Mazandaran province, Tanghevaz (36°21'55.02"N, 52°10'74"E, 692 m), 27.VII.2011; (1♂), Mazandaran province, Tanghevaz (36°18'51.42"N, 52°7'48"E, 703 m), 4.VIII.2011, leg. A. NADIMI.

Distribution: All Europe (TSCHORSNIG et al. 2017). **Asia:** Transcaucasia, southern and western Siberia (HERTING 1984). **Iran** (SEYYEDI SAHEBARI et al. 2014).

Host range: *Melolontha* sp.; *Amphimallon solstitialis* (LINNAEUS, 1758); *Phyllopertha horticola* (LINNAEUS, 1758); *Rhizotrogus aequinoctialis* (HERBST, 1790); *R. marginipes* MULSANT, 1842 (Coleoptera: Scarabaeidae) (TSCHORSNIG & HERTING 1994).

Genus *Estheria* ROBINEAU-DESVOIDY, 1830

***Estheria petiolata* (BONSDORFF, 1866) * (Fig. 2)**

Material examined: (1♂), Mazandaran province, Ghaznasara (36°16'56.82"N, 52°10'58.50"E, 2032 m), 27.VII.2011; (1♂), Mazandaran province, Tanghevaz (36°21'55.68"N, 52°6'10.32"E, 702 m), 4. VIII. 2011, leg. A. NADIMI.

Remarks: European and Mediterranean species of male *Estheria* have a darker scutellum near the anterior margin and partly yellow mid-tibiae (CERLETTI & TSCHORSNIG 2012). The scutellum and legs of our male specimens are entirely black. We take these to be intraspecific variations.

Distribution: Europe: Finland, Spain, France, Belarus, Ukraine (TSCHORSNIG et al. 2017). **Asia:** Transcaucasia, Kazakhstan and Central Asia (Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan) (HERTING & DELY-DRASKOVITS 1993). **New record for Iran.**

Host range: *Amphimallon solstitialis* (Coleoptera: Scarabaeidae) (TSCHORSNIG & HERTING 1994).

Fig. 2. *Estheria petiolata* (BONSDORFF, 1866), male.

Tribe: Voriini**Genus *Athrycia* ROBINEAU-DESVOIDY, 1830*****Athrycia trepida* (MEIGEN, 1824)**

Material examined: (1♂), 1.V.2010 & (1♂, 1♀), 27.VI.2010, Gilan province, Roodsar (Orkom) (36°45'44.34"N, 50°18'11.88"E, 1201 m), leg. M. KHEIRANDISH.

Distribution: **Europe:** Sweden, Finland, Italy, Greece, Bulgaria, Spain, France, Belarus, Ukraine (TSCHORSNIG et al. 2017) **Asia:** Transcaucasia, Central Asia, Middle East, Mongolia, Russia (HERTING & DELY-DRASKOVITS 1993). **Iran** (SEYYEDI SAHEBARI et al. 2014).

Host range: *Orthosia gothica* (LINNAEUS, 1758) (Lepidoptera: Noctuidae) (TSCHORSNIG & HERTING 1994).

Genus *Cyrtophleba* RONDANI, 1856***Cyrtophleba ruricola* (MEIGEN, 1824)**

Material examined: (1♂), Gilan province, Roodsar (Orkom) (36°45'44.34"N, 50°18'11.88"E, 1201 m), 27.VI. 2010, leg. M. KHEIRANDISH.

Distribution: **Europe:** Widespread in Europe (TSCHORSNIG et al. 2017). **Asia:** Transcaucasia, Central Asia, Mongolia, Israel, south-eastern Siberia (HERTING & DELY-DRASKOVITS 1993). **Iran** (GHEIBI et al. 2008).

Host range: *Apopestes spectrum* (ESPER, 1787) (Lepidoptera: Noctuidae); *Deilephila elpenor* (LINNAEUS, 1758) (Lepidoptera: Sphingidae); *Pachycnemia hippocastanaria* (HÜBNER, 1799) (Lepidoptera: Geometridae) (TSCHORSNIG & HERTING 1994).

Genus *Eriothrix* MEIGEN, 1803***Eriothrix rufomaculatus* (DE GEER, 1776)**

Material examined: (1♂), 1.V.2010 & (1♂), 1.X.2010, Gilan province, Roodsar (Orkom) (36°45'44.34"N, 50°18'11.88"E, 1201 m); (1♂), 20.V.2010 & (1♂), 11.IX.2010, Gilan province, Roodsar (Ghazichak) (36°45'52.62"N, 50°20'1.08"E, 1787 m), leg. M. KHEIRANDISH (1♂), 4.VI.2010 & (1♂), 27.IX.2010, Mazandaran province, Ghaznasara (36°16'56.82"N, 52°10'58.50"E, 2032 m); (1♂), Mazandaran province, Ghaznasara (36°16'58.08"N, 52°10'55.62"E, 2013 m), 27.IX.2011; (1♂), Mazandaran province, Tanghevaz (36°21'55.02"N, 52°10'74"E, 692 m), 4.VIII.2011, leg. A. NADIMI.

Distribution: **Europe:** Sweden, Finland, Norway, Italy, Greece, Bulgaria, Spain, France, Ukraine (TSCHORSNIG et al. 2017). **Asia:** Middle East, Transcaucasia, Kazakhstan, Uzbekistan, southern Siberia, Russian Far East (ZIEGLER & SHIMA 1996), **Iran** (SEYYEDI SAHEBARI et al. 2014).

Host range: *Chrysoteucha culmella* (LINNAEUS, 1758) (Lepidoptera: Crambidae) (TSCHORSNIG & HERTING 1994).

Genus *Periscepsia* GISTEL, 1848

***Periscepsia carbonaria* (PANZER, 1798)**

Material examined: (1♂), Gilan province, Roodsar (Ghazichak) (36°45'52.62"N, 50°20'1.08"E, 1787 m); 20.IX.2010, leg. M. KHEIRANDISH; (8♂♂, 1♀), Mazandaran province, Ghaznasara (36°16'58.08"N, 52°10'55.62"E, 2013 m), 27.IX.2011; (3♂♂), Mazandaran province, Ghaznasara (36°16'56.82"N, 52°10'58.50"E, 2032 m), 27.IX.2011, leg. A. NADIMI.

Distribution: **Europe:** Widespread in Europe (TSCHORSNIG et al. 2017). **Asia:** Transcaucasia, Israel (HERTING & DELY-DRASKOVITS 1993), **Iran** (SAMET et al. 1977).

Host range: *Agrotis* spp., *Euxoa obelisca* (DENIS et SCHIFFERMÜLLER, 1775) (Lepidoptera Noctuidae) (TSCHORSNIG & HERTING 1994).

Fig. 3. *Periscepsia spathulata* (FALLÉN, 1820), male.

***Periscepsia spathulata* (FALLÉN, 1820) * (Fig. 3)**

Material examined: (1♂), Gilan province, Roodsar (Ziaz) (36°25'34.44"N, 50°13'17.22"E, 537 m); 27.IV.2010; (1♂), Gilan province, Roodsar (Ziaz) (36°25'27.18"N, 50°13'24.78"E, 490 m), 20.V.2010, leg. M. KHEIRANDISH.

Distribution: Europe: Sweden, Finland, Norway, Italy, Greece, Bulgaria, Portugal, Spain, France, Russia, Ukraine, Greece, Bulgaria (TSCHORSNIG et al. 2017). **Asia:** Transcaucasia, China (HERTING & DELY-DRASKOVITS 1993). **New record for Iran.**

Host range: Various Noctuidae (Lepidoptera) (TSCHORSNIG & HERTING 1994).

Fig. 4. *Stomina caliendrata* (RONDANI, 1862), male.

Genus *Stomina* ROBINEAU-DESVOIDY, 1830

***Stomina caliendrata* (RONDANI, 1862) * (Fig. 4)**

Material examined: (2♂♂), Mazandaran province, Ghaznasara (36°16'56.82"N, 52°10'58.50"E, 2032 m), 13.V.2011, leg. A. NADIMI.

Distribution: Europe: Portugal, Spain, France, Croatia, Italy, Bulgaria, Ukraine (TSCHORSNIG et al. 2017). **Asia:** Transcaucasia, Israel (HERTING & DELY-DRASKOVITS 1993). **New record for Iran.**

Host range: Unknown.

Remarks: MESNIL (1944–1975: 1817) wrote that the scutellum of *S. caliendrata* is brown, more or less blackened in its anterior half. Specimens have a yellow scutellum, black on the anterior margin (Fig. 4). We take this to be an intraspecific variation.

Genus *Thelaira* ROBINEAU-DESVOIDY, 1830

***Thelaira nigripes* (FABRICIUS, 1794) * (Fig. 5)**

Material examined: (1♀), Gilan province, Roodsar (Orkom) (36°45'44.34"N, 50°18'11.88"E, 1201 m), 26.X.2010; (1♂, 1♀), 11.IX.2010 & (1♀), 20.X.2010, Gilan province, Roodsar (Eshman Kamachal) (37°22'3.66"N, 49°57'57.84"E, 1 m), leg. M. KHEIRANDISH.

Distribution: **Europe:** Widespread in Europe (TSCHORSNIG et al. 2017). **Asia:** Transcaucasia, eastern Siberia (HERTING & DELY-DRASKOVITS 1993). **New record for Iran.**

Host range: Mainly Arctiidae (Erebidae), but also a few Noctuidae (Lepidoptera) and other Macrolepidoptera (TSCHORSNIG & HERTING 1994).

Fig. 5. *Thelaira nigripes* (FABRICIUS, 1794), male.

Genus *Voria* ROBINEAU-DESVOIDY, 1830***Voria ruralis* (FALLÉN, 1810)**

Material examined: (1♂), 4.V.2010 & (1♀), 20.X.2010, Gilan province, Roodsar (Eshman Kamachal) (37°22'3.66"N, 49°57'57.84"E, 1 m); (1♂, 1♀), Gilan province, Roodsar (Ghazichak) (36°45'57.54"N, 50°19'35.22"E, 1803 m), 11.VI.2010; (1♀), Gilan province, Roodsar (Eshman Kamachal) (37°21'10.50"N, 49°57'56.16"E, 2 m), 30.X.2010, leg. M. KHEIRANDISH; (1♀), Mazandaran province, Ghaznasara (36°16'58.08"N, 52°10'55.62"E, 2013 m), 27.VII.2011, leg. L.A. NADIMI.

Distribution: **Europe:** Widespread in Europe (TSCHORSNIG et al. 2017). **Asia:** Transcaucasia, Central Asia, Middle East, Mongolia, Siberia, Russian Far East (HERTING & DELY-DRASKOVITS 1993, ZIEGLER & SHIMA 1996), Pakistan (O'HARA et al. 2009), **Iran** (PARCHAMI ARAGHI 1995).

Host range: *Autographa gamma* LINNAEUS; *Spodoptera exigua* (HÜBNER, 1808); *Diachrysia chrysitis* (LINNAEUS, 1758) (Lepidoptera: Noctuidae) (TSCHORSNIG & HERTING 1994).

DISCUSSION

In the present study, the tribe Voriini comprises 7 genera and 8 species, among them three species are new records for the Iranian tachinid fauna. *Periscepsia spathulata* has a wide Western Palearctic distribution; the occurrence of this species in Transcaucasia and China was reported previously (HERTING & DELY-DRASKOVITS 1993, TSCHORSNIG et al. 2017). *Stomina caliendrata* is widespread in the Western Palearctic and has an Asian distribution in Transcaucasia and Israel (HERTING & DELY-DRASKOVITS 1993, TSCHORSNIG et al. 2017).

Another tribe – Dexiini – has two genera and two species. *Estheria petiolata* is a new record for the Iranian tachinid fauna. This species is widely distributed in the Western Palearctic and has been reported from Transcaucasia, Kazakhstan and Central Asia (HERTING & DELY-DRASKOVITS 1993, TSCHORSNIG et al. 2017).

The present study increases the number of known Iranian Dexiinae species from 23 to 27. More intensive studies in northern Iran should be carried out: they would lead to a considerable increase in the number of known species from this area.

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