

A contribution to the study of Eulophidae (Hymenoptera: Chalcidoidea) from Iran

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GHAHARI, H.: *A contribution to the study of Eulophidae (Hymenoptera: Chalcidoidea) from Iran.*

Abstract: The fauna of the family Eulophidae (Hymenoptera: Chalcidoidea) from various regions of Iran is studied. In total 25 species of 18 genera and three subfamilies namely Entedoninae, Eulophinae, and Tetrastichinae were collected and identified. *Chrysocharis pentheus* (Walker, 1839), *Chrysocharis pubicornis* (Zetterstedt, 1838), *Chrysocharis viridis* (Nees, 1834) and *Sympiesis flavopicta* Bouček, 1958 are new records for the fauna of Iran.

Keywords: Hymenoptera, Chalcidoidea, Eulophidae, Fauna, New record, Iran.

Introduction

Eulophidae (Hymenoptera: Chalcidoidea) is one of the most diverse family of parasitoids wasps, containing over 4472 species placed in four subfamilies (Entedoninae, Eutiinae, Eulophinae, Tetrastichinae) and 297 genera (NOYES 2012). Most of the taxa can be easily identified as having 4-segmented tarsi, four (or fewer) antennal funicular segments and a straight fore tibial spur (BOUČEK 1988). Many species of Eulophidae are used in biological control, and parasitoid forms can be endoparasitoids or ectoparasitoids: idiobionts or koinobionts; solitary or gregarious; primary parasitoids, hyperparasitoids or facultative hyperparasitoids; or specialists or generalists. Eulophid species can attack eggs, larvae, pupae or even adults in a few cases (YANG & XIE 1998). Eulophids are parasitoids of many insect families namely: Chrysomelidae, Curculionidae (Coleoptera), Agromyzidae, Cecidomyiidae, Drosophilidae, Tephritidae (Diptera), Aleyrodidae, Aphididae (Hemiptera), Cimbicidae, Diprionidae, Pamphilidae, Tenthredinidae (Hymenoptera), Bucculatricidae, Coleophoridae, Gelechiidae, Gracillaridae, Heliozelidae, Lasiocampidae, Nepticulidae, Pyralidae and Yponomotidae (Lepidoptera) (NOYES 2012).

Soon after publishing the first report on *Tetrastichus epilachnae* (GIARD 1896) by KIRYUKHIN (1948) the study of Iranian eulophids is accelerated and the following papers were published: DAVATCHI & CHODJAI (1969), HERTING (1973), DOGANLAR (1992), MALEKZADEH et al. (1998), JAFARI (2000), MALEKZADEH (2002), ALAVI et al. (2002), ZAHIRI et al. (2003), MAHANI et al. (2003), REZAEI et al. (2003), RAKHSHANI et al. (2003), FARROKHI et al. (2004), TALEBI et al. (2005), HESAMI et al. (2005, 2006a,b, 2007, 2009, 2010), ASADI et al. (2006), GHAHARI et al. (2006), FALLAHZADEH et al. (2006), FATHIPOUR et al. (2006), HAGHANI et al. (2007), NAZEMI-RAFIE et al. (2007), YEFREMOVA et al.

(2007), DOUSTI (2007, 2008), DOUSTI et al. (2008), LOTFALIZADEH et al. (2008), AMIRI et al. (2009), EBRAHIMI et al. (2009), HESAMI (2009), SAEEDIFAR et al. (2010), FALLAHZADEH et al. (2011), FATHI (2011), MAHMOUDI et al. (2011), RAJABI et al. (2011), YEGORENKOVA et al. (2012), GHAHARI (2012), LOTFALIZADEH et al. (2012), BIPARVA et al. (2013) and SAMIN & YEGORENKOVA (2014). TALEBI et al. (2011) completed the catalogue on the Iranian Eulophidae with 106 species belonging to 37 genera. Later the Iranian species number increased up to 122 by HESAMI et al. (2011). After that one genus *Neochrysocharis* Kurdjumov and 6 species, *Aprostocetus* (*Aprostocetus*) *pausiris* (Walker, 1839), *Cirrospilus diallus* Walker, 1838, *Hemiptarsenus ornatus* (Nees, 1834), *Neochrysocharis formosa* (Westwood, 1833), *Oomyzuz sempronius* (Erdős, 1954), and *Pediobius nigritarsis* (Thomson, 1878) were recorded by Ghahari & Yefremova (2013), and then 7 species, *Chrysocharis pubens* Delucchi, 1954, *Pediobius eubius* (Walker, 1839), *Di cladocerus westwoodi* Westwood, 1832, *Miotropis unipuncta* (Nees, 1834), *Sympiesis viridula* (Thomson, 1878), *Aprostocetus pygmaeus* (Zetterstedt, 1838) and *Neotrichoporoides viridimaculatus* (Fullaway, 1955) were recorded by Samin & Yegorenkova (2014) for the fauna of Iran.

Material and methods

Specimens were collected by sweeping net, Malaise trap which were completed by rearing from various hosts in incubator, in optimum condition (26±2 °C, 65±5 %RH, 14:10 L: D). The host species and their parasitoids were collected from cultivated and non-cultivated plants in different areas. Additionally, materials of various insect collections were also studied. The specimens were identified by Dr. Z. Yefremova (State Pedagogical University, Russia) and T.C. Narendran (University of Calicut, India). Classification and nomenclature we follow was established by NOYES (2012). Distributional data from outside Iran can be found in UCD (Universal Chalcidoidea Database, NOYES 2012), it is not discussed here in details.

Results

In this study, 25 species of 18 genera and three subfamilies are listed. Four species *Chrysocharis pentheus* (Walker, 1839), *Chrysocharis pubicornis* (Zetterstedt, 1838), *Chrysocharis viridis* (Nees, 1834) and *Sympiesis flavopicta* Bouček, 1958 are new records for the fauna of Iran. The list of species is given below with distribution data.

Subfamily Entedoninae

Genus *Chrysocharis* Förster, 1856

Chrysocharis laomedon (Walker, 1839)

Material examined: Kerman province, Jiroft, 702 m, 1♀, IX. 2009.

Chrysocharis pentheus (Walker, 1839)

Material examined: West Azarbaijan province, Piranshahr, 1447 m, 3♀, VI. 2011. New record for Iran.

Chrysocharis pubicornis (Zetterstedt, 1838)

Material examined: Kerman province, Jiroft, 702 m, 2♀, 2♂, IX. 2009. New record for Iran.

Chrysocharis viridis (Nees, 1834)

Material examined: East Azarbaijan province, Ahar, 1364 m, 1♀, X. 2012. New record for Iran.

Genus *Neochrysocharis* Kurdjumov, 1912

Neochrysocharis formosus (Westwood, 1833)

Material examined: Khorasan province, Bojnord, 1084 m, 3♀, 1♂, VIII. 2010.

Genus *Entedon* Dalman, 1820

Entedon ergias Walker, 1839

Material examined: Guilan province, Masal, 67 m, 2♀, IX. 2011.

Genus *Euderomphale* Girault, 1916

Euderomphale bemisiae Viggiani, 1977

Material examined: Mazandaran province, Ramsar, 9 m, 1♀, VIII. 2010.

Genus *Pediobius* Walker, 1846

Pediobius pyrgo (Walker, 1839)

Material examined: Ilam province, Ilam, 1413 m, 2♀, XI. 2012.

Subfamily **Eulophinae**

Genus *Cirrospilus* Westwood, 1832

Cirrospilus vittatus Walker, 1838

Material examined: Ilam province, Ilam, 1413 m, 1♀, X. 2012.

Genus *Diglyphus* Walker, 1844

Diglyphus isaea (Walker, 1838)

Material examined: Isfahan province, Golpayegan, 1802 m, 2♀, 1♂, III. 2008. Golestan province, Gorgan, 107 m, 6♀, 3♂, IX. 2008. Mazandaran province, Savadkooh, 573 m, 4♀, 2♂, VI. 2009. Kerman province, Jiroft, 702 m, 2♀, 2♂, X. 2009. Guilan province, Roodsar, 3 m, 2♀, 2♂, V. 2010. Khorasan province, Bojnord, 1084 m, 4♀, 3♂, VIII. 2010. Tehran province, Shahreyar, 601 m, 3♀, 1♂, V. 2012. Semnan province, Shahrood, 1304 m, 2♂, VI. 2012.

Diglyphus minoëus (Walker, 1838)

Material examined: Sistan & Baluchestan province, Zahedan, 1359 m, 1♀, IV. 2009.

Genus *Elachertus* Spinola, 1811

Elachertus fenestratus Nees, 1834

Material examined: Golestan province, Golestan National Park, Dasht-e-Mirzabaylu, 1575 m, 1♂, VIII. 2007.

Genus *Euplectrus* Westwood, 1832

Euplectrus bicolor (Swederus, 1795)

Material examined: Khorasan province, Mashhad, 1027 m, 1♀, 1♂, IV. 2009.

Genus *Hemiptarsenus* Westwood, 1833

Hemiptarsenus varicornis (Girault, 1913)

Material examined: Kohgiluyeh & Boyer-Ahmad province, Yasooj, 1837 m, 1♀, 1♂, IX. 2009.

Genus *Hyssopus* Girault, 1916

Hyssopus geniculatus (Hartig, 1838)

Material examined: Golestan province, Golestan National Park, Yaghtiklan, 1920 m, 2♀, VIII. 2007.

Genus *Pnigalio* Schrank, 1802

Pnigalio pectinicornis (Haeselbarth, 1989)

Material examined: West Azarbaijan province, Piranshahr, 1447 m, 2♀, 1♂, VI. 2011.

Genus *Sympiesis* Förster, 1856

Sympiesis flavopicta Boucek, 1958

Material examined: Khorasan province, Bojnord, 1084 m, 2♀, VIII. 2010. New record for Iran.

Sympiesis sericeicornis (Nees, 1834)

Material examined: Kermanshah province, Javanrood, 1328 m, 2♀, 2♂, VIII. 2009.

Subfamily **Tetrastichinae**

Genus *Aprostocetus* Westwood, 1833

Aprostocetus zosimus (Walker, 1839)

Material examined: Golestan province, Gorgan, 107 m, 2♂, IX. 2008.

Genus *Baryscapus* Förster, 1856

Baryscapus endemus (Walker, 1839)

Material examined: East Azarbaijan province, Maragheh, 1481 m, 1♀, 1♂, XII. 2010.

Baryscapus evonymellae (Bouché, 1834)

Material examined: West Azarbaijan province, Ourmieh, 1382 m, 2♀, 1♂, 21.IX. 2011.

Genus *Minotetrastichus* Kostjukov, 1977

Minotetrastichus frontalis (Nees, 1834)

Material examined: Guilan province, Roodsar, 3 m, 1♀, IV. 2010.

Genus *Oomyzus* Rondani, 1870

Oomyzus incertus (Ratzeburg, 1844)

Material examined: Mazandaran province, Savadkooh, 573 m, 2♀, 1♂, IV. 2009.

Oomyzus sokolowskii (Kurdjumov, 1912)

Material examined: Isfahan province, Golpayegan, 1802 m, 2♀, 1♂, V. 2008.

Genus *Sigmophora* Rondani, 1867

Sigmophora brevicornis (Panzer, 1804)

Material examined: Kohgiluyeh & Boyerahmad province, Dehdasht, 804 m, 2♀, IX. 2009.

Discussion

Previously, the total number of Iranian Eulophidae species was 135 of 40 genera (TALEBI et al. 2011, HESAMI et al. 2011, GHAHARI & YEFREMOVA 2013, SAMIN & YEGORENKOVA 2014). Now with the four new records, it increased to 139 species. *Diglyphus isaea* (Walker, 1838) proved to be the dominant species. The frequency of the other species (i.e. rare or sporadic or frequent) shall be established in the future combined with their nature conservation status (i.e. vulnerable, endangered, critically endangered or least concern) according to the IUCN categories.

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