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A faunistic study on some families of Chalcidoidea (Hymenoptera) from Iran.

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Abstract: This paper deals with the fauna of Chalcidoidea (Hymenoptera) from some regions of Iran. In total 19 species belonging to 8 families: Chalcididae (1 genus, 2 species), Encyrtidae (2 genera, 2 species), Eulophidae (2 genera, 2 species), Eurytomidae (2 genera, 6 species), Mymaridae (1 genus, 1 species), Ormyridae (1 genus, 2 species), Perilampidae (1 genus, 2 species), and Torymidae (2 genera, 2 species) were collected and identified.

Key words: Hymenoptera, Chalcidoidea, fauna, new records, Iran.

Resumen: Estudio faunístico sobre algunas familias de Chalcidoidea (Hymenoptera) de Irán. Este trabajo trata sobre la fauna de Chalcidoidea (Hymenoptera) de algunas regiones de Irán. En total, fueron capturadas e identificadas 19 especies pertenecientes a 8 familias Chalcididae (1 género, 2 especies), Encyrtidae (2 géneros, 2 especies), Eulophidae (2 géneros, 2 especies), Eurytomidae (2 géneros, 6 especies), Mymaridae (1 género, 1 especie), Ormyridae (1 género, 2 especies), Perilampidae (1 género, 2 especies), and Torymidae (2 géneros, 2 especies).

Palabras clave: Hymenoptera, Chalcidoidea, fauna, nuevas citas, Irán.

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Introduction

The superfamily Chalcidoidea (Hymenoptera) is one of the largest groups of parasitoid wasps with about 22,000 valid species in about 2,100 genera world-wide, but these numbers represent only a fraction of the true chalcid diversity and estimates of 60,000 to 100,000 species world-wide do not seem unreasonable (Noyes 2003). Although some kinds of chalcidoids are plant feeders, most of the species are parasitoids of other insects especially Diptera, Coleoptera, Hemiptera, and other Hymenoptera, as well as two orders of Arachnida, and even one family of nematodes (Bendel-Janssen 1977; Gibson *et al.* 1999; Heraty *et al.* 2013). These beneficial insects attack all life stages from eggs to adults and, as internal parasitoids, often multiple life stages (Noyes & Valentine 1989). They can be primary, secondary, or even tertiary parasitoids, with some taxa required to parasitize their own species to complete development (heteronomous autoparasitism) (Hunter & Woolley 2001).

Because of its members' host associations and life-history traits, they are one of the most important groups for biological control of other insects in both natural and agricultural ecosystems (Greathead 1986; Hanson & LaSalle 1995; Heraty 2009). Additionally some Chalcidoidea, especially *Trichogramma* Westwood, 1833 (Trichogrammatidae) and *Nasonia* Ashmead, 1904 (Pteromalidae) are also model organisms for numerous studies of sex determination, the influence of bacterial endosymbionts and the genetics of speciation (Heraty *et al.* 2013).

In this paper, the fauna of several families of Iranian Chalcidoidea including Chalcididae, Encyrtidae, Eulophidae, Eurytomidae, Mymaridae, Ormyridae, Perilampidae, and Torymidae is studied in some regions of Iran.

Material and methods

The specimens were collected by sweeping nets and Malaise traps. Also some parasitoids were obtained through the rearing of their hosts in optimum conditions ($27\pm 1^\circ\text{C}$, $70\pm 5\%$ RH, 16:8 L:D) in an incubator for emergence of parasitoids. In this paper, classification, nomenclature and distribution data were taken from Noyes (2003).

Results

19 species of Chalcidoidea were collected and identified from some regions of Iran. Four species, *Blastothrix erythrosetha* (Walker, 1847) (Encyrtidae), *Elasmus platyedrae* Ferrière, 1935 (Eulophidae), *Eurytoma verticillata* Fabricius, 1798 (Eurytomidae), and *Microdontomerus annulatus* (Spinola, 1808) (Torymidae) are new records for the fauna of Iran.

Family Chalcididae Latreille, 1817

Genus *Brachymeria* Westwood, 1829

Brachymeria minuta (Linnaeus, 1767)

Material examined: Province of Mazandaran: Sari, $36^\circ 30' \text{N}$ $53^\circ 30' \text{E}$, 1♂, 2♀♀, April 2013.

Distribution outside Iran: Australia, Bosnia-Herzegovina, Bulgaria, Caucasus, Central Asia, China, Croatia, Cyprus, Czech Republic, Egypt, France, Germany, Hungary, India, Israel, Italy, Japan, Kazakhstan, Malaysia, Moldova, Montenegro, Netherlands, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Syria, Thailand, Turkey, UK, Ukraine, Uzbekistan.

Brachymeria tibialis (Walker, 1834)

Material examined: Province of Ardabil: Germi, $39^\circ 00' \text{N}$ $47^\circ 57' \text{E}$, 2♀♀, September 2010. Province of Kermanshah: Ravansar, $34^\circ 45' \text{N}$ $46^\circ 41' \text{E}$, 1♀, June 2011. Province of Semnan: Shahrud, $35^\circ 30' \text{N}$ $55^\circ 30' \text{E}$, 1♂, 1♀, October 2011.

Distribution outside Iran: Albania, Algeria, Armenia, Austria, Azerbaijan, Bosnia-Herzegovina, Bulgaria, Canada, Caucasus, Central Asia, Croatia, Cyprus, Czech Republic, France, Germany, Greece, Hungary, India, Iraq, Israel, Italy, Kazakhstan, Lebanon, Macedonia, Moldova, Morocco, Netherlands, North Africa, Pakistan, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Syria, Tunisia, Turkey, UK, Ukraine, USA, Uzbekistan.

Family Encyrtidae Walker, 1837

Genus *Blastothrix* Mayr, 1876

Blastothrix erythrosetha (Walker, 1847)

Material examined: Province of Kurdistan: Kamyaran, $34^\circ 55' \text{N}$ $46^\circ 55' \text{E}$, 2♀♀, July 2007. New record for Iran.

Distribution outside Iran: Armenia, Austria, Bulgaria, Egypt, France, Georgia, Germany, Hungary, Israel, Italy, Moldova, Poland, Romania, Russia, Spain, Transcaucasus, Turkey, UK, Ukraine.

Genus *Monstranusia* Trjapitzin, 1964

***Monstranusia antennata* (Narayanan, 1960)**

Material examined: Province of Razavi Khorasan: Sabzevar, 36°12'N 57°35'E, 1♀, May 2011.
Distribution outside Iran: Afghanistan, Egypt, India, Kenya, Nigeria, Pakistan, South Africa.

Family Eulophidae Westwood, 1829

Genus *Elachertus* Spinola, 1811

***Elachertus inunctus* Nees, 1834**

Material examined: Province of Northern Khorasan: Bojnord, 37°35'N 57°20'E, 1♀, May 2011.
Distribution outside Iran: Austria, Bosnia Hercegovina, Bulgaria, China, Czech Republic, Germany, Hungary, Italy, Japan, South Korea, Lithuania, Moldova, Montenegro, Netherlands, Norway, Poland, Russia, Slovakia, Slovenia, Sweden, Switzerland, Taiwan, Turkmenistan, UK, Ukraine.

Genus *Elasmus* Westwood, 1833

***Elasmus platyedrae* Ferrière, 1935**

Material examined: Province of Kurdistan: Kamyaran, 34°55'N 46°55'E, 1♀, July 2007. New record for Iran.
Distribution outside Iran: Armenia, Austria, Bulgaria, Croatia, Cyprus, Czech Republic, Egypt, France, Georgia, Greece, Hungary, India, Italy, Macedonia, North Africa, Portugal, Slovakia, Spain, Sweden, Turkey, UAE, USA, Yemen.

Family Eurytomidae Walker, 1832

Genus *Eurytoma* Illiger, 1807

***Eurytoma appendigaster* Swederus, 1795**

Material examined: Province of Guilan: Rudsar, 36°42'N 50°18'E, 2♀♀, June 2007.
Distribution outside Iran: Bulgaria, Canada, China, Czech Republic, France, Germany, Hungary, Italy, Moldova, Netherlands, North Africa, Poland, Romania, Slovakia, Sweden, Turkey, UK, USA, former Yugoslavia.

***Eurytoma laserpitii* Mayr, 1878**

Material examined: Province of Golestan: Gorgan, 36°50'N 54°30'E, 1♀, August 2012.
Distribution outside Iran: Austria, Bulgaria, Hungary, Romania, Transcaucasus, Turkey, UK, former USSR.

***Eurytoma serratulae* Fabricius, 1798**

Material examined: Province of Ardabil: Germe, 39°00'N 47°57'E, 2♀♀, September 2010.
Distribution outside Iran: Austria, Bulgaria, Czech Republic, France, Germany, Hungary, Italy, Moldova, Morocco, Netherlands, Sweden, Turkey, UK, former USSR.

***Eurytoma verticillata* Fabricius, 1798**

Material examined: Province of West Azarbaijan: Khoy, 38°33'N 44°57'E, 2♀♀, May 2012. New record for Iran.

Distribution outside Iran: Austria, Bulgaria, Canada, China, Croatia, Czech Republic, Denmark, France, Germany, Hungary, Italy, Japan, South Korea, Macedonia, Moldova, Netherlands, Poland, Romania, Russia, Serbia, Slovakia, Sweden, Switzerland, Turkey, UK, Ukraine, USA.

Genus *Tetramesa* Walker, 1848

***Tetramesa brischkei* Schlechtendal, 1891**

Material examined: Province of Northern Khorasan: Bojnord, 37°35'N 57°20'E, 1♀, April 2009.

Distribution outside Iran: Bulgaria, Germany, Kazakhstan, Russia, Sweden, Turkey.

***Tetramesa linearis* Walker, 1832**

Material examined: Province of West Azarbaijan: Mahabad, 36°46'N 45°44'E, 1♂, 1♀, June 2012.

Distribution outside Iran: Bulgaria, Caucasus, Czech Republic, France, Germany, Hungary, Kazakhstan, Moldova, Mongolia, Netherlands, New Zealand, Romania, Russia, Serbia, Slovakia, Sweden, Turkey, UK, Ukraine, USA.

Family Mymaridae Haliday, 1833

Genus *Stephanodes* Enock, 1909

***Stephanodes similis* (Förster, 1847)**

Material examined: Province of Golestan: Gorgan, 36°50'N 54°30'E, 1♂, 2♀♀, August 2012.

Distribution outside Iran: Argentina, Austria, Belgium, Bulgaria, Canada, Croatia, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Kirgizia, Macedonia, Moldova, Norway, Paraguay, Poland, Romania, Russia, Slovenia, Spain, Sweden, Switzerland, Turkey, Turkmenistan, UK, Ukraine, USA, Zaire.

Family Ormyridae Förster, 1856

Genus *Ormyrus* Westwood, 1832

***Ormyrus gratiosus* (Förster, 1860)**

Material examined: Province of Golestan: Gorgan, 36°50'N 54°30'E, 1♂, 1♀, August 2012. Province of West Azarbaijan: Urmia, 37°33'N 45°00'E, 1♀, May 2012.

Distribution outside Iran: Armenia, Austria, Bulgaria, Caucasus, Czech Republic, Finland, France, Georgia, Germany, Hungary, Kazakhstan, Macedonia, Netherlands, Poland, Russia, Serbia, Slovakia, Spain, Sweden, Switzerland, Turkey, Turkmenistan, UK, Ukraine, Uzbekistan.

***Ormyrus orientalis* Walker, 1871**

Material examined: Province of Razavi Khorasan: Sabzevar, 36°12'N 57°35'E, 2♀♀, May 2011. Province of Mazandaran: Sari, 36°30'N 53°30'E, 1♂, 1♀, April 2013.

Distribution outside Iran: Afghanistan, Azerbaijan, Belarus, Bulgaria, Caucasus, Croatia, Czech Republic, France, Georgia, Germany, Greece, Hungary, India, Iraq, Italy, Macedonia, Moldova, Montenegro, Pakistan, Russia, Serbia, Slovakia, Spain, Sri Lanka, Tadjikistan, Turkey, Turkmenistan, Ukraine, Uzbekistan.

Family Perilampidae Förster, 1856

Genus *Chrysolampus* Spinola, 1811

***Chrysolampus splendidulus* (Spinola, 1808)**

Material examined: Province of Golestan: Gorgan, 36°50'N 54°30'E, 1♂, August 2012.

Distribution outside Iran: Algeria, Caucasus, Czech Republic, Germany, Hungary, Italy, Kazakhstan, Moldova, North Africa, Russia, Slovakia, Sweden, Transcaucasus, Tunisia.

***Chrysolampus thenae* (Walker, 1848)**

Material examined: Province of West Azarbaijan: Mahabad, 36°46'N 45°44'E, 2♀♀, June 2012.

Distribution outside Iran: Croatia, Czech Republic, Finland, France, Hungary, Kazakhstan, Macedonia, Moldova, Montenegro, Netherlands, Poland, Russia, Serbia, Slovakia, Spain, Sweden, Turkey, UK, Ukraine.

Family Torymidae Walker, 1833

Genus *Microdontomerus* Crawford, 1907

***Microdontomerus annulatus* (Spinola, 1808)**

Material examined: Province of Kerman: Jiroft, 28°50'N 57°35'E, 2♀♀, June 2009. New record for Iran.

Distribution outside Iran: Austria, Croatia, Czech Republic, Egypt, France, Germany, Hungary, Italy, Libya, Moldova, Montenegro, Pakistan, Romania, Serbia, Slovakia, Spain, Sweden, Transcaucasus, Turkey, UK, Ukraine.

Genus *Torymoides* Walker, 1871

***Torymoides kiesenwetteri* (Mayr, 1874)**

Material examined: Province of South Khorasan: Birjand, 32°32'N 58°50'E, 1♂, 2♀♀, October 2011.

Distribution outside Iran: Andorra, Bulgaria, China, Croatia, Czech Republic, Egypt, France, Germany, Greece, Hungary, India, Italy, Macedonia, Moldova, Nepal, Poland, Portugal, Romania, Serbia, Slovakia, Spain, Switzerland, Turkey.

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