

## ARTIGO / ARTÍCULO / ARTICLE

A faunistic study on some subfamilies of Braconidae  
(Hymenoptera: Ichneumonoidea) from Iran.Najmeh Samin<sup>1</sup>, Cees van Achterberg<sup>2</sup> & Özlem Çetin Erdoğan<sup>3</sup>

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**Abstract:** This paper deals with the species of Braconidae (Hymenoptera: Ichneumonoidea) recently collected in 13 provinces of Iran. In total, 33 species belonging to 16 subfamilies: Charmontinae, Cheloninae, Doryctinae, Euphorinae, Exothecinae, Histeromerinae, Homolobinae, Ichneutinae, Macrocentrinae, Microtypinae, Miracinae, Orgilinae, Rhyssalinae, Rogadinae, and Sigalphinae were collected and identified.

**Key words:** Hymenoptera, Ichneumonoidea, Braconidae, faunistics, Iran.

**Resumen:** Estudio faunístico sobre algunas familias de Braconidae (Hymenoptera: Ichneumonoidea) de Irán. Este trabajo trata sobre las especies de Braconidae (Hymenoptera: Ichneumonoidea) recientemente capturadas en 13 provincias de Irán. En total se capturaron e identificaron 33 especies pertenecientes a 16 subfamilias: Charmontinae, Cheloninae, Doryctinae, Euphorinae, Exothecinae, Histeromerinae, Homolobinae, Ichneutinae, Macrocentrinae, Microtypinae, Miracinae, Orgilinae, Rhyssalinae, Rogadinae y Sigalphinae.

**Palabras clave:** Hymenoptera, Ichneumonoidea, Braconidae, faunistic, Irán.

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## Introduction

Braconidae (Hymenoptera, Ichneumonoidea) is a family of parasitoid wasps and one of the largest families of insects with more than 19,400 described species worldwide; the species are grouped into about 46 subfamilies, 98 tribes and 1057 genera (Yu et al. 2012; Beyarslan & Aydoğdu 2014). In this paper, the species of Braconidae recently collected in 13 provinces (Chaharmahal & Bakhtiari, East Azarbaijan, Fars, Golestan, Guilan, Hamadan, Kerman, Khuzestan, Kordestan, Kuhgiluyeh & Boyerahmad, Mazandaran, Razavi Khorasan, and West Azarbaijan) are listed to get a better understanding of their distribution in Iran.

In total, 33 species of Braconidae belonging to the subfamilies Charmontinae, Cheloninae, Doryctinae, Euphorinae, Exothecinae, Histeromerinae, Homolobinae, Ichneutinae, Macrocentrinae, Microtypinae, Miracinae, Orgilinae, Rhyssalinae, Rogadinae, and Sigalphinae were collected from 13 regions of Iran. The results of this investigation (as well as the published catalogues by Gadallah & Ghahari (2013a, b, 2015), Khajeh et al. (2014) and Gadallah et al. (2015a, b, 2016a, b) indicate that the fauna of Iranian Braconidae is diverse and still poorly studied.

## Material and methods

Adult braconid wasps from Iran were collected during 2009-2013 especially in grass-dominated habitats and forest ecosystems. Sweeping and light trapping were used to obtain the samples. Additionally many specimens were obtained from some insect collections. The specimens were prepared, pinned and labeled according to taxonomic methods. Morphological terminology followed Tobias (1986), van Achterberg (1993), Belokobylskij (1988, 1998) and Chen *et al.* (2004). Classification, nomenclature, distribution and host data of Braconidae are derived from Yu *et al.* (2012), but the subfamily Adeliinae is included in the subfamily Cheloninae. An extended data set of 16S and 28S rDNA combined with 28S rDNA sequences and life history traits (Belshaw & Quicke 2002; Dowton *et al.* 2002) indicate that Adeliinae are likely a derived group within the Cheloninae. In the most recent overview of the higher classification of Braconidae (Sharanowski *et al.* 2011), the Adeliinae were included in the subfamily Cheloninae as a tribe what is in agreement with their morphology, biology and examined DNA-markers. An extensive study of the phylogeny of Cheloninae (Kittel 2014) shows that the Adeliinae are nested within the tribe Phanerotomini of Cheloninae and are at most a subtribe according to a RASP analysis based on the concatenated genes COI, EF1a and 28S.

## Results and discussion

### Subfamily Charmontinae van Achterberg, 1979

#### Tribe Charmontini van Achterberg, 1979

#### Genus *Charmon* Haliday, 1833

#### *Charmon extensor* (Linnaeus, 1758)

**Material examined:** Province of Fars: Sepidan, 2178 m, 1♀, unknown data.

**Distribution outside Iran:** Austria, Azerbaijan, Belgium, Bulgaria, Canada, China, Croatia, Cyprus, Czech Republic, Democratic Republic of Congo, Finland, France, Germany, Hungary, India, Ireland, Italy, Japan, Korea, Latvia, Lithuania, Mexico, Moldova, Mongolia, Netherlands, Norway, Poland, Portugal, Romania, Russia, Slovakia, Spain, Sweden, Switzerland, UK, USA.

#### *Charmon cruentatus* Haliday, 1833

**Material examined:** Province of Kordestan: Saqez, 1342 m, 1♂, 1♀, July 2010.

**Distribution outside Iran:** Austria, Belgium, Bulgaria, Canada, China, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Korea, Mexico, Mongolia, Netherlands, Norway, Poland, Russia, Slovakia, South Africa, Sweden, Switzerland, UK, USA.

### Subfamily Cheloninae Foerster, 1863

#### Tribe Adeliini Vierek, 1918

#### Genus *Adelius* Haliday, 1833

#### *Adelius erythronotus* (Foerster, 1851)

**Material examined:** Province of Razavi Khorasan: Qouchan, 1273 m, 1♂, April 2006.

**Distribution outside Iran:** Azerbaijan, Bosnia-Herzegovina, Bulgaria, Czech Republic, France, Georgia, Germany, Hungary, Ireland, Korea, Moldova, Poland, Romania, Russia, Slovakia, Switzerland, Turkmenistan, UK, Ukraine, Uzbekistan.

***Adelius subfasciatus* Haliday, 1833**

**Material examined:** Province of Hamadan: Toyserkan, 1850 m, 1♀, unknown date.

**Distribution outside Iran:** Belgium, Bulgaria, Croatia, Czech Republic, Finland, France, Georgia, Germany, Hungary, Italy, Kazakhstan, Latvia, Lithuania, Moldova, Netherlands, Poland, Romania, Russia, Serbia, Slovakia, Spain, Sweden, Switzerland, Turkey, UK, Ukraine.

**Subfamily Doryctinae Foerster, 1863**

**Tribe Doryctini Förster, 1863**

**Genus *Dendrosoter* Wesmael, 1838**

***Dendrosoter protuberans* (Nees, 1834)**

**Material examined:** Province of Kordestan: Deh Golan, 1837 m, 1♀, July 2010.

**Distribution outside Iran:** Armenia, Austria, Azerbaijan, Croatia, Czech Republic, Egypt, Finland, France, Georgia, Germany, Hungary, Israel, Italy, Latvia, Lithuania, Moldova, Montenegro, Netherlands, Poland, Russia, Serbia, Slovakia, Spain, Sweden, Switzerland, Tunisia, Turkey, Turkmenistan, UK, Ukraine, USA.

**Genus *Doryctes* Haliday, 1836**

***Doryctes undulatus* (Ratzeburg, 1852)**

**Material examined:** Province of Khuzestan: Izeh, 897 m, 1♂, 1♀, April 2009.

**Distribution outside Iran:** Bulgaria, Czech Republic, Germany, Hungary, Italy, Japan, Kazakhstan, Korea, Lithuania, Moldova, Mongolia, Poland, Russia, Slovakia, Sweden, Switzerland, UK.

**Genus *Doryctodes* Hellén, 1927**

***Doryctodes imperator* (Haliday, 1836)**

**Material examined:** Province of Kordestan: Deh Golan, 1837 m, 1♂, July 2010.

**Distribution outside Iran:** Azerbaijan, Belgium, Bulgaria, Canada, China, Croatia, Czech Republic, Finland, France, Georgia, Germany, Hungary, Ireland, Israel, Italy, Japan, Kazakhstan, Korea, Latvia, Lithuania, Netherlands, Poland, Russia, Serbia, Slovakia, Sweden, Switzerland, Taiwan, UK, Ukraine, USA.

**Tribe Heterospilini Fischer, 1981**

**Genus *Heterospilus* Haliday, 1836**

***Heterospilus cephi* Rohwer, 1925**

**Material examined:** Province of Guilan: Fooman, 34 m, 1♀, September 2010.

**Distribution outside Iran:** Armenia, Austria, Bulgaria, Czech Republic, France, Germany, Greece, Hungary, Israel, Italy, Japan, Kazakhstan, Korea, Moldova, Mongolia, Russia, Serbia, Spain, Tunisia, Turkmenistan, USA.

***Heterospilus (Heterospilus) leptosoma* Fischer, 1960**

**Material examined:** Province of Mazandaran: Behshahr, 57 m, 2♀♀, April 2009.

**Distribution outside Iran:** Armenia, Austria, Bulgaria, Czech Republic, France, Germany, Greece, Hungary, Israel, Italy, Japan, Kazakhstan, Korea, Moldova, Mongolia, Russia, Serbia, Slovakia, Spain, Tunisia, Turkmenistan, USA.

**Tribe Hecabolini Foerster, 1863**

**Genus *Polystenus* Foerster, 1863**

***Polystenus rugosus* Foerster, 1863**

**Material examined:** Province of Kerman: Bam, 1094 m, 1♂, 2♀♀, April 2013.

**Distribution outside Iran:** Austria, China, Czech Republic, Germany, Hungary, Italy, Japan, Kazakhstan, Korea, Liechtenstein, Poland, Russia, Serbia, Slovakia, Switzerland, Tajikistan, Ukraine.

**Tribe Spathiini Marshall, 1872**

**Genus *Spathius* Nees, 1819**

***Spathius radzayanus* Ratzeburg, 1848**

**Material examined:** Province of Golestan: Minudasht, 31 m, 1♀, July 2009.

**Distribution outside Iran:** Bulgaria, China, Croatia, Czech Republic, Georgia, Germany, Hungary, Italy, Japan, Kazakhstan, Korea, Latvia, Mongolia, Poland, Russia, Switzerland, Ukraine.

**Subfamily Euphorinae Foerster, 1863**

**Tribe Neoneurini Bengtsson, 1918**

**Genus *Neoneurus* Haliday, 1838**

***Neoneurus clypeatus* (Foerster, 1863)**

**Material examined:** Province of Kuhgiluyeh & Boyer-Ahmad: Sisakht, 2100 m, 2♂♂, 2♀♀, August 2011.

**Distribution outside Iran:** Austria, Czech Republic, Denmark, Finland, Germany, Hungary, Italy, Kazakhstan, Korea, Lithuania, Moldova, Mongolia, Netherlands, Norway, Russia, Serbia, Sweden, Ukraine.

**Subfamily Exothecinae Foerster, 1863**

**Genus *Colastes* Haliday, 1833**

***Colastes braconius* Haliday, 1833**

**Material examined:** Province of Kuhgiluyeh & Boyer-Ahmad: Dehdasht, 807 m, 2♀♀, August 2011.

**Distribution outside Iran:** Armenia, Austria, Azerbaijan, Belarus, Belgium, Bulgaria, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Japan, Kazakhstan, Korea, Latvia, Lithuania, Moldova, Netherlands, Norway, Poland, Romania, Russia, Slovakia, Sweden, Switzerland, Tunisia, UK, Ukraine, former Yugoslavia.

**Genus *Shawiana* van Achterberg, 1983**

***Shawiana laevis* (Thomson, 1892)**

**Material examined:** Province of Razavi Khorasan: Sabzevar, 1024 m, 2♂♂, June 2011.

**Distribution outside Iran:** Belarus, China, Czech Republic, Finland, Germany, Korea, Lithuania, Mongolia, Netherlands, Norway, Russia, Sweden, Switzerland, UK, Ukraine.

**Subfamily Histeromerinae Fahringer, 1930**

**Genus *Histeromerus* Wesmael, 1838**

***Histeromerus mystacinus* Wesmael, 1838**

**Material examined:** Province of West Azarbaijan: Seroo, 1612 m, 1♀, July 2012.

**Distribution outside Iran:** Belgium, Czech Republic, Denmark, France, Georgia, Germany, Hungary, Ireland, Lithuania, Netherlands, Poland, Russia, Slovakia, Sweden, UK, Ukraine.

**Subfamily Homolobinae van Achterberg, 1979**

**Genus *Homolobus* Foerster, 1863**

***Homolobus (Phylacter) annulicornis* (Nees, 1834)**

**Material examined:** Province of Chaharmahal & Bakhtiari: Koohrang, 2288 m, 2♀, September 2010.

**Distribution outside Iran:** Austria, Azerbaijan, Belarus, Belgium, China, Croatia, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Japan, Korea, Latvia, Lithuania, Moldova, Netherlands, Poland, Romania, Russia, Serbia, Sweden, Switzerland, UK.

**Subfamily Ichneutinae Foerster, 1863**

**Genus *Ichneutes* Nees, 1816**

***Ichneutes reunitor* Nees, 1816**

**Material examined:** Province of Chaharmahal & Bakhtiari: Shahrekod, 2050 m, 2♂♂, September 2010.

**Distribution outside Iran:** Azerbaijan, Belgium, Czech Republic, Finland, France, Georgia, Germany, Hungary, Ireland, Italy, Japan, Kazakhstan, Lithuania, Mongolia, Netherlands, Norway, Poland, Romania, Russia, Serbia, Slovakia, Sweden, Switzerland, UK, Ukraine, USA.

**Genus *Proterops* Wesmael, 1835**

***Proterops nigripennis* Wesmael, 1835**

**Material examined:** Province of Khuzestan: Gotvand, 214 m, 1♀, April 2009.

**Distribution outside Iran:** Austria, Azerbaijan, Belgium, China, Czech Republic, Denmark, Finland, France, Georgia, Germany, Hungary, Ireland, Italy, Japan, Kazakhstan, Korea, Mongolia, Netherlands, Norway, Poland, Russia, Sweden, Switzerland, UK.

**Subfamily Macrocentrinae Foerster, 1863**

**Genus *Macrocentrus* Curtis, 1833**

***Macrocentrus infirmus* (Nees, 1834)**

**Material examined:** Province of Kuhgiluyeh & Boyerahmad: Dogonbadan, 750 m, 2♂♂, 1♀, unknown date.

**Distribution outside Iran:** Austria, Belarus, Belgium, Bulgaria, China, Croatia, Czech Republic, Finland, France, Germany, Hungary, Ireland, Italy, Kazakhstan, Korea, Lithuania, Moldova, Mongolia, Netherlands, Norway, Poland, Romania, Russia, Sweden, Switzerland, UK.

***Macrocentrus resinellae* (Linnaeus, 1758)**

**Material examined:** Province of Chaharmahal & Bakhtiari: Shahrekod, 2050 m, 1♀, September 2010.

**Distribution outside Iran:** Andorra, Austria, Azerbaijan, Belarus, Belgium, Bulgaria, China, Czech Republic, Finland, France, Georgia, Germany, Greece, Hungary, Italy, Japan, Kazakhstan, Latvia, Lithuania, Moldova, Netherlands, Poland, Romania, Russia, Slovakia, Spain, Sweden, Switzerland, UK, former Yugoslavia.

***Macrocentrus thoracicus* (Nees, 1811)**

**Material examined:** Province of East Azarbaijan: Hashtroud, 1621 m, 2♀♀, unknown data. Province of Chaharmahal & Bakhtiari: Sarkhoon, 1576 m, 1♀, September 2012.

**Distribution outside Iran:** Albania, Armenia, Austria, Azerbaijan, Belarus, Belgium, Bulgaria, China, Croatia, Czech Republic, Finland, France, Georgia, Germany, Greece, Hungary, Italy, Japan, Kazakhstan, Korea, Lithuania, Moldova, Netherlands, Poland, Russia, Serbia, Slovakia, Spain, Sweden, Switzerland, Turkey, UK, Ukraine, USA.

**Subfamily Microtypinae Szépligeti, 1908**

**Tribe Microtypini Szépligeti, 1908**

**Genus *Microtypus* Ratzeburg, 1848**

***Microtypus algiricus* Szépligeti, 1908**

**Material examined:** Province of Khuzestan: Gotvand, 214 m, 3♀♀, April 2009.

**Distribution outside Iran:** Algeria, Armenia, China, Iraq, Jordan.

**Subfamily Miracinae Vierek, 1918**

**Genus *Mirax* Haliday, 1833**

***Mirax rufilabris* Haliday, 1833**

**Material examined:** Province of Chaharmahal & Bakhtiari: Koohrang, 2288 m, 1♀, September 2010.

**Distribution outside Iran:** Armenia, Azerbaijan, Bulgaria, Croatia, Czech Republic, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, Moldova, Poland, Romania, Russia, Slovakia, Spain, Sweden, Turkey, UK, Ukraine.

**Subfamily Orgilinae Ashmead, 1900**

**Tribe Orgilini Ashmead, 1900**

**Genus *Kerorgilus* van Achterberg, 1985**

***Kerorgilus zonator* (Szépligeti, 1896)**

**Material examined:** Province of West Azarbaijan: Hassanloo, 1288 m, 1♀, July 2012.

**Distribution outside Iran:** Azerbaijan, China, Germany, Greece, Hungary, Korea, Mongolia, Romania, Turkey.

**Genus *Orgilus* Haliday, 1833**

***Orgilus punctulator* (Nees, 1812)**

**Material examined:** Province of Kordestan: Dezaj, 1524 m, 1♂, July 2010.

**Distribution outside Iran:** Armenia, Azerbaijan, Bulgaria, Croatia, Czech Republic, France, Germany, Hungary, Italy, Kazakhstan, Lithuania, Moldova, Mongolia, Netherlands, Poland, Russia, Slovakia, Sweden, Switzerland, Turkey, UK.

**Subfamily Rhysipolinae Belokobylskij, 1984**

**Genus *Rhysipolis* Foerster, 1863**

***Rhysipolis decorator* (Haliday, 1836)**

**Material examined:** Province of Khuzestan: Izeh, 897 m, 2♀♀, April 2009.

**Distribution outside Iran:** Austria, Azerbaijan, Belgium, Bulgaria, Canada, Croatia, Czech Republic, Finland, France, Georgia, Germany, Hungary, Italy, Kazakhstan, Lithuania, Mongolia, Poland, Russia, Serbia, Spain, Sweden, Switzerland, UK, USA, Uzbekistan.

***Rhysipolis hariolator* (Haliday, 1836)**

**Material examined:** Province of Chaharmahal & Bakhtiari: Shalamzar, 1956 m, 2♀♀, September 2010.

**Distribution outside Iran:** Armenia, Azerbaijan, Belgium, Bulgaria, Czech Republic, Finland, France, Germany, Hungary, Italy, Japan, Kazakhstan, Korea, Lithuania, Moldova, Mongolia, Netherlands, Poland, Russia, Slovakia, Sweden, Switzerland, UK, Ukraine.

***Rhysipolis meditator* (Haliday, 1836)**

**Material examined:** Province of Kuhgiluyeh & Boyerahmad: Dehdasht, 807 m, 1♀, August 2011.

**Distribution outside Iran:** Armenia, Azerbaijan, Belgium, Bulgaria, Czech Republic, Finland, France, Germany, Hungary, Italy, Japan, Kazakhstan, Korea, Lithuania, Moldova, Mongolia, Netherlands, Poland, Russia, Slovakia, Sweden, Switzerland, UK, Ukraine.

**Subfamily Rhyssalinae Foerster, 1863**

**Tribe Rhyssalini Foerster, 1863**

**Genus *Dolopsidea* Hincks, 1944**

***Dolopsidea indagator* (Haliday, 1836)**

**Material examined:** Province of Kordestan: Deh Golan, 1837 m, 2♂♂, July 2010.

**Distribution outside Iran:** Armenia, Austria, Azerbaijan, Belgium, Bulgaria, Czech Republic, Finland, France, Germany, Hungary, Ireland, Italy, Korea, Lithuania, Montenegro, Russia, Sweden, Switzerland, UK, Ukraine.

**Subfamily Rogadinae Foerster, 1863**

**Tribe Aleiodini Muesebeck, 1928**

**Genus *Aleiodes* Wesmael, 1838**

***Aleiodes varius* (Herrich-Schäffer, 1838)**

**Material examined:** Province of Chaharmahal & Bakhtiari: Shalamzar, 1956 m, 1♂, September 2010.

**Distribution outside Iran:** Belgium, Czech Republic, France, Germany, Hungary, Italy, Japan, Lithuania, Russia, Switzerland.

**Tribe Clinocentrini van Achterberg, 1991**

**Genus *Clinocentrus* Haliday, 1833**

***Clinocentrus cunctator* (Haliday, 1836)**

**Material examined:** Province of West Azarbaijan: Seyedtajedin, 1423 m, 1♀, unknown date.

**Distribution outside Iran:** Belgium, Bulgaria, Czech Republic, Finland, France, Georgia, Germany, Hungary, Ireland, Italy, Korea, Montenegro, Netherlands, Poland, Russia, Slovakia, Sweden, Switzerland, UK, former Yugoslavia.

***Clinocentrus vestigator* (Haliday, 1836)**

**Material examined:** Province of Kuhgiluyeh & Boyerahmad: Sisakht, 2100 m, 2♂♂, 1♀, August 2011.

**Distribution outside Iran:** Denmark, Finland, Germany, Ireland, Italy, Kazakhstan, Lithuania, Norway, Poland, Russia, Switzerland, UK, Ukraine.

**Subfamily Sigalphinae Haliday, 1833**

**Genus *Acampsis* Wesmael, 1835**

***Acampsis alternipes* (Nees, 1816)**

**Material examined:** Province of West Azarbaijan: Hassanloo, 1288 m, 1♂, July 2012.

**Distribution outside Iran:** Austria, Belgium, Bulgaria, Czech Republic, France, Germany, Hungary, Italy, Moldova, Netherlands, Poland, Russia, Slovakia, Switzerland, UK, former Yugoslavia.

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