

## A FAUNISTIC STUDY ON BRACONID WASPS (HYMENOPTERA: ICHNEUMONOIDEA: BRACONIDAE) OF IRAN

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*A faunistic study on braconid wasps (Hymenoptera: Ichneumonoidea: Braconidae) of Iran. – N. Samin, J. Papp, J.M. Coronado-Blanco. – In total, 20 species within eight genera of Braconidae (Hymenoptera) were collected and identified which 17 species are new records for Iran. Alysiinae: one species, Braconinae: four species in one genus, Euphorinae: four species in three genera, Microgastrinae: three species in one genus, Opiinae: three species in one genus, Orgilinae: five species in one genus.*

**Key words:** *Ichneumonoidea, Braconidae, fauna, new records, parasitoid, Iran*

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**Фауністичне дослідження ос-браконід (Hymenoptera: Ichneumonoidea: Braconidae) Ірану. – Н. Самін, Дж. Пapp, Х.М. Коронадо-Бланко. – Станом на сьогодні для Ірану відомо 873 види ос-браконід. Однак, ми припускаємо наявність у фауні Ірану 1500 видів з цієї родини, які поширені в різних доволі різноманітних кліматичних зонах та екологічних умовах. За результатами досліджень, які наведені в даній роботі, загалом в 10 провінціях було зібрано 20 видів з восьми родів родини Braconidae (Hymenoptera). З них 17 видів ідентифіковані як нові знахідки для фауни Ірану: Alysiinae – один вид, Braconinae – чотири види з одного роду, Euphorinae – чотири види з трьох родів, Microgastrinae – три види з одного роду, Opiinae – три види з одного роду, Orgilinae – п'ять видів з одного роду. Така значна кількість нових видів для фауни країни свідчить про те, що іранська фауна ос-браконід багата, і з іншого боку – досить мало вивчена, хоча до цього часу було опубліковано лише кілька робіт по цій групі перетинчастокрилих для Ірану. Продовження досліджень в різних регіонах, особливо в районах, де досі матеріал ретельно не збирався (наприклад, південний захід і північний схід Ірану), призведе до нових знахідок і отримання оновлених результатів. Більшість фауністичних даних по іранських Braconidae були отримані в результаті вибірки матеріалу з ловчих пасток і методом ентомологічного косіння. Однак, в цих випадках види-хазяї для даних браконід залишаються невідомими. Отримання даних щодо відносин «паразит-хазяїн» є необхідним для успішного впровадження програм з біологічного контролю задля метою збереження природних ворогів комах-шкідників та боротьби з цими сільськогосподарськими шкідниками.**

**Ключові слова:** *Ichneumonoidea, Braconidae, фауна, нові знахідки, паразитоїди, Іран.*

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### Introduction

The family Braconidae is the second largest family of Hymenoptera (after Ichneumonidae) (Shaw, Huddleston 1991; Sharkey 1993). The Braconidae includes 21,221 described species worldwide classified into 45 subfamilies (Yu et al. 2016) which are parasitoids of other insects (Wharton 1993). The fauna of Iranian Braconidae has been

studied rather well and most of species have been catalogued earlier (e.g., Gadallah, Ghahari 2013a, 2013b, 2015, 2016, 2017; Farahani et al. 2014, 2016; Gadallah et al. 2015a, 2015b, 2016a, 2016b; Ghahari, 2016; Beyarslan et al. 2017; Samin et al. 2018; Sakenin et al. 2018). Below new data on the Braconidae of the fauna of Iran is given.

## Materials and methods

The specimens were collected by Malaise traps and sweeping net from different regions of Iran. Some material was reared from the hosts under laboratory conditions (24±1 °C, 55 ± 5 % RH, 12:12 L: D). The specimens were put in ethanol 75 %, pinned or mounted on card labels and were determined by the second author and are preserved in The Hungarian Natural History Museum. Classification, nomenclature and world distribution are based on Yu et al. (2016).

## Results

A total of 20 species from six subfamilies (Alysiinae Leach, 1815, Braconinae Nees, 1811, Euphorinae Foerster, 1863, Microgastrinae Förster, 1862, Opiinae Blanchard, 1845, and Orgilinae Ashmead, 1900) were collected and identified. Seventeen species are new records for Iran, and for other three species new localities are given.

### Subfamily Alysiinae Leach, 1815

#### Genus *Chorebus* Haliday, 1833

##### *Chorebus (Chorebus) gnaphalii* Griffiths, 1967

Material examined: 2♀♀, East Azarbaijan province, Shabestar, 38°12'N 45°44'E, July 2011

World distribution: Czech Republic, Germany, Greece, Hungary, former Yugoslavia, \*Iran (new record).

Region: Palaearctic.

### Subfamily Braconinae Nees, 1811

#### Genus *Bracon* Fabricius, 1804

##### *Bracon (Habrobracon) crassicornis* Thomson, 1892

Material examined: 1♀, Kordestan province, Bijar, 35°52'N 47°36'E, May 2011.

World distribution: Armenia, Bulgaria, Cyprus, Denmark, France, Georgia, Greece, Hungary, Iran (Ilam: Ghahari et al., 2011; Kordestan: new locality record), Israel, Italy, Jordan, Macedonia, Romania, Spain, Sweden, Tunisia, Turkey, Turkmenistan, United Kingdom, former Yugoslavia.

Region: Palaearctic.

##### *Bracon (Glabrobracon) jaroslavensis* Telenga, 1936

Material examined: 2♀♀, 1♂, Ardebil province, Lahrud, 38°51'N 47°83'E, July 2010.

World distribution: Azerbaijan, Greece, Hungary, Russia, Switzerland, Turkey, \*Iran (new record).

Region: Palaearctic.

##### *Bracon (Lucobracon) hungaricus* (Szépligeti, 1896)

Material examined: 3♀♀, Luristan province, Nur-Abad, 34°07'N 47°97'E, June 2013.

World distribution: Azerbaijan, Bulgaria, Croatia, Czech Republic, Czechoslovakia, France, Georgia, Hungary, Kazakhstan, Moldova, Mongolia, Romania, Russia, Serbia & Montenegro, Slovakia, Turkey, Ukraine, former Yugoslavia, \*Iran (new record).

Region: Palaearctic.

##### *Bracon (Lucobracon) santaecrucis* Schmiedeknecht, 1897

Material examined: 2♀♀, Mazandaran province, Nur, 36°19'N 52°00'E, August 2010.

World distribution: Algeria, Bosnia Hercegovina, Croatia, Greece, Spain, Tunisia, \*Iran (new record).

Region: Palaearctic.

### Subfamily Euphorinae Foerster, 1863

#### Genus *Meteorus* Haliday, 1835

##### *Meteorus politutele* Shenefelt, 1969

Material examined: 1♀, Golestan province, Gorgan, 36°50'N 54°30'E, September 2014.

World distribution: Turkey, Uzbekistan, \*Iran (new record).

Region: Palaearctic.

##### *Meteorus salicorniae* Schmiedeknecht, 1897

Material examined: 4♀♀, Khorasan-e Shomali province, Shirvan, 37°32'N 57°54'E, April 2011.

World distribution: Austria, Bulgaria, Croatia, Czechoslovakia, France, Germany, Greece, Hungary, Italy, Japan, Korea, Romania, Russia, Switzerland, Turkey, former Yugoslavia, \*Iran (new record).

Region: Palaearctic.

#### Genus *Peristenus* Foerster, 1862

##### *Peristenus digoneutis* Loan, 1973

Material examined: 2♀♀, East Azarbaijan province, Heris, 38°14'N 46°50'E, September 2010, ex *Lygus rugulipennis* Poppus (Hemiptera: Miridae).

World distribution: Canada, Germany, Hungary, Italy, Moldova, Poland, Turkey, USA, Ukraine, \*Iran (new record).

Region: Nearctic, Palaearctic.

#### Genus *Pygostolus* Haliday, 1833

##### *Pygostolus multiarticulatus* (Ratzeburg, 1852)

Material examined: 1♀, Khorasan-e Shomali province, Shirvan, 37°32'N 57°54'E, April 2011; 2♀♀, Semnan province, Shahrud, 35°30'N 55°30'E, 23.vii.2012.

World distribution: Japan, Russia, \*Iran (new record).  
Region: Palaearctic.

**Subfamily Microgastrinae Förster, 1862**

**Genus *Apanteles* Foerster, 1863**

***Apanteles (Dolichogenidea) appellator* Telenga, 1949**

Material examined: 2♀♀, 2♂♂, Ardebil province, Sarein, 38°15'N 48°07'E, September 2013.

World distribution: Afghanistan, Armenia, Azerbaijan, Belarus, Bulgaria, Cape Verde Islands, China, Croatia, Cyprus, Egypt, Germany, Ghana, Greece, Hungary, Iran (Isfahan: Kazemzadeh et al. 2014; Ardebil, new locality record), Israel, Italy, Jordan, Kazakhstan, Malta, Moldova, Mongolia, Romania, Russia, Selvagens Islands, Spain, Switzerland, Tajikistan, Turkey, Turkmenistan, Ukraine, United Kingdom, Uzbekistan, former Yugoslavia.

Region: Afrotropical, Oceanic, Palaearctic.

***Apanteles (Dolichogenidea) subemarginatus* Abdinbekova, 1969**

Material examined: Mazandaran province, Babol, 36°30'N 52°35'E, 2♀, June 2011.

World distribution: Armenia, Azerbaijan, Hungary, Turkey, \*Iran (new record).

Region: Palaearctic.

***Apanteles (Iconella) albinervis* Tobias, 1964**

Material examined: 1♀, 2♂♂, East Azarbayjan province, Soofiyan, 38°28'N 45°98'E, July 2011.

World distribution: Azerbaijan, Hungary, Kazakhstan, Moldova, Turkey, Ukraine, \*Iran (new record).

Region: Palaearctic.

**Subfamily Opiinae Blanchard, 1845**

**Genus *Opius* Wesmael, 1835**

***Opius (Misophthora) instabilis* Wesmael, 1835**

Material examined: 1♀, 2♂♂, Luristan province, Azna, 33°28'N 49°25'E, 3-7.viii.2010; 1♀, Chahar-Mahal and Bakhtiary province, Borujen, 31°54'N 51°12'E, 15-21.vii.2013.

World distribution: Algeria, Austria, Belgium, Czechoslovakia, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Kyrgyzstan, Lithuania, Poland, Spain, Sweden, Switzerland, Turkey, United Kingdom, former Yugoslavia, \*Iran (new record).

Region: Palaearctic.

***Opius (Merotrachys) laetatorius* Fischer, 1958**

Material examined: 2♀♀, Chahar-Mahal and Bakhtiary province, Borujen, 31°54'N 51°12'E, 15-21.vii.2013.

World distribution: Czechoslovakia, France, Germany, Hungary, Moldova, Russia, Spain, Turkey, \*Iran (new record).

Region: Palaearctic.

***Opius (Opius) mendus* Papp, 1982**

Material examined: 1♀, Semnan province, Shahrud, 35°30'N 55°30'E, April 2009.

World distribution: Afghanistan, Spain, Turkey, \*Iran (new record).

Region: Palaearctic.

**Subfamily Orgilinae Ashmead, 1900**

**Genus *Orgilus* Haliday, 1833**

***Orgilus (Orgilus) dovnari* Tobias, 1986**

Material examined: 2♀♀, 1♂, Kordestan province, Qorveh, 35°15'N 47°40'E, October 2013.

World distribution: Czechoslovakia, Germany, Hungary, Mongolia, Netherlands, Russia, Slovakia, Sweden, Turkey, Ukraine, \*Iran (new record).

Region: Palaearctic.

***Orgilus (Orgilus) ischnus* Marshall, 1898**

Material examined: 2♀♀, Ardebil province, Sarein, 38°15'N 48°07'E, September 2013.

World distribution: Austria, China, Czech Republic, Czechoslovakia, Germany, Hungary, Mongolia, Netherlands, Norway, Poland, Russia, Switzerland, United Kingdom, former Yugoslavia, Iran [Alborz, Tehran: Farahani et al. 2014; Ardebil (new locality record)].

Region: Palaearctic, Oriental.

***Orgilus (Orgilus) nitidus* Marshall, 1898**

Material examined: 1♀, East Azarbayjan province, Shabestar, 38°12'N 45°44'E, July 2011.

World distribution: Azerbaijan, Hungary, Mongolia, Russia, Spain, \*Iran (new record).

Region: Palaearctic.

***Orgilus (Orgilus) rudolphae* Tobias, 1976**

Material examined: 2♀♀, Chahar-Mahal and Bakhtiary province, Borujen, 31°54'N 51°12'E, 15-21.vii.2013.

World distribution: Czechoslovakia, Greece, Hungary, Kazakhstan, Russia, Turkey, former Yugoslavia, \*Iran (new record).

Region: Palaearctic.

***Orgilus (Orgilus) similis* Szépligeti, 1896**

Material examined: 4♀♀, West Azarbayjan province, Mahabad, 36°46'N 45°44'E, 9-11.viii.2014.

World distribution: Bulgaria, Croatia, Hungary, Italy, Moldova, Mongolia, Russia, Turkey, former Yugoslavia, \*Iran (new record).  
Region: Palaearctic.

### Discussion

Totally 20 braconid species have been collected from 10 provinces, which indicates that the fauna of Iranian Braconidae is rich and on the other hand rather unknown - although several contributions have been published so far. Regarding to various climates and ecosystems in Iran, we assume presence of 1,500 braconid species in Iran, while 873 species have been known from Iran so far (835 spp. in Samin et al. 2018; 21 spp. more in Sakenin et al., 2018; and 17 more in this research). Continuing of samplings in different regions especially in the areas where have not so far been sampled carefully (e.g. southwest and northeast of

Iran), will result to new findings. Additionally, most the conducted faunistic surveys on Iranian Braconidae were upon samplings by Malaise traps and sweeping, which in this case the hosts of these parasitoids are unknown. Finding the data on host-parasitoid relationships is necessary to establishment of biological control programs in order to conservation of natural enemies and control of agricultural pests, successfully.

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