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## **A study on the Braconidae (Hymenoptera: Ichneumonoidea) from Guilan province, Iran**

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### **Abstract**

In this paper, the fauna of the family Braconidae (Hymenoptera) is studied in Guilan province, northern Iran (south of Caspian Sea). Totally 55 species from 16 genera and subgenera and 7 subfamilies (Agathidinae, Blacinae, Brachistinae, Braconinae, Cheloninae, Microgastrinae, Opiinae) were collected. Also, the hosts of some braconids were determined through the rearing of the parasitoids. Among the collected braconids, two species including, *Blacus (Blacus) filicornis* (HAESSELBARTH) and *Blacus (Ganychorus) armatulus* (RUTHE) are new records for the fauna of Iran.

Key words: Hymenoptera, Ichneumonoidea, Braconidae, Fauna, Parasitoid, Guilan, Iran

### **Zusammenfassung**

Eine Studie über die Braconidenwespen (Hymenoptera: Ichneumonoidea) der Provinz Guilan, Iran. Die Fauna der Braconiden (Hymenoptera) der Provinz Guilan (nördlicher

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Iran am Kaspischen Meer) wurde untersucht. Es wurden 55 Arten von 16 Gattungen aus den 7 Unterfamilien Agathidinae, Blacinae, Brachistinae, Braconinae, Cheloninae, Microgastrinae und Opiinae gesammelt und identifiziert. Diese werden hier mitgeteilt. Von diesen sind *Blacus* (*Blacus*) *flicornis* (HAESELBARTH) und *Blacus* (*Ganychorus*) *armatulus* (RUTHE) neu für die Fauna des Iran.

## Introduction

The family Braconidae is the second largest family (after the Ichneumonidae) in the order Hymenoptera, containing more than 15000 valid species (QUICKE & ACHTERBERG 1990), from an estimated total world fauna of at least 40.000 (ACHTERBERG 1984). Although, ACHTERBERG (1984) recognized 35 subfamilies, later this number raised 39 (SHAW & HUDDLESTON 1991), and most recently to 44 (ACHTERBERG 1993). Regarding to the high importance of braconids in biological control of various pests, faunistic surveys on these powerful natural enemies is essential in different regions of the world (WHARTON 1993). On the other hand, determination of natural enemies is the first and most important step for conservation of them in biological control and IPM programs in order to successful control of the pests (FLINT & VAN DEN BOSCH 1981; DEBACH & ROSEN 1991; GODFRAY 1994).

Guilan province lies along the Caspian Sea, just west of the province of Mazandaran, east of the province of Ardabil, north of the provinces of Zanjan and Qazvin. At the center of the province is the main city of Rasht. This province has a humid temperate climate with plenty of annual rainfall. The Alborz range provides further diversity to the land in addition to the Caspian coasts. The amount of humidity is truly high in the warm seasons of the year in Guilan, however the coastlines are much cooler and pleasant at the same time. Despite of the abundant humidity, Guilan is known for its moderate, mild and Mediterranean-like climate. Large parts of the province are mountainous, green and forested. The coastal plain along the Caspian Sea is mainly used for rice paddies.

The aim of this paper is studying on the fauna of Braconidae in Guilan province as one of the Iranian provinces included diverse agricultural and forest ecosystems. The Iranian Braconidae were studied rather well in recent years (see GHAHARI et al. 2009a, b, c, d, 2010), but Iran is a large country with various geographical regions and climates, and therefore conducting the faunal surveys in different provinces is necessary for establishing the full species composition of the family.

## Materials and Methods

The materials were collected from different regions of Guilan province (northern Iran) by Malaise traps and sweeping net, and also rearing of hosts in optimum condition ( $25\pm 2$  °C,  $65\pm 5\%$  RH, 14: 10 L: D) in incubator. The specimens were put in alcohol 75% or mounted on triangular labels and were examined with a stereoscopic binocular microscope. Additionally some materials of various insect collections preserved in different universities (especially different branches of Islamic Azad University) and some museums of the world were used too. In this paper, the information concerning specific name, describer and description date, locality, altitude (in brackets), date of

collection, and number of species are given. Classification, nomenclature and distributional data of Braconidae suggested by YU et al. (2006) have been followed.

## Results

In a total 55 species from 16 genera and subgenera and 7 subfamilies of Braconidae were collected from different areas of Guilan province. The list of species is given below.

### Subfamily *Agathidinae* HALIDAY 1833

#### *Agathis nigra* NEES von ESENBECK 1814

Material examined: Talesh (77 m), 3 ♀♀, September 2007.

#### *Agathis assimilis* KOKUJEV 1895

Material examined: Masal (70 m), 1 ♂, July 2007.

#### *Agathis fulmeki* FISCHER 1957

Material examined: Rezvanshahr (5 m), 2 ♀♀, 2 ♂♂, September 2005. Rasht (39 m), 4 ♀♀, 3 ♂, August 2008.

#### *Agathis anglica* MARSHALL 1885

Material examined: Astaneh Ashrafyeh (-34 m), 5 ♀♀, 3 ♂♂, June 2005. Masooleh (968 m), 4 ♀♀, 2 ♂♂, July 2007.

#### *Agathis nigra* NEES 1812

Material examined: Langrood (16 m), 2 ♀♀, Unknown date.

#### *Bassus pumilus* (RATZEBURG 1844)

Material examined: Deylaman (1450 m), 2 ♀♀, August 2005.

### Subfamily *Blacinae* FORSTER 1862

#### *Blacus (Blacus) filicornis* (HAESSELBARTH 1973)

Material examined: Rasht (127 m), 1 ♂, August 2008. New record for Iran.

#### *Blacus (Blacus) interstitialis* (RUTHE 1861)

Material examined: Lahijan (12 m), 2 ♀♀, September 2005. Some'e Sara (25 m), 2 ♀♀, 2 ♂♂, September 2006.

#### *Blacus (Ganychorus) armatulus* (RUTHE 1861)

Material examined: Lahijan (12 m), 1 ♀, July 2007. New record for Iran.

**Subfamily Braconinae FOERSTER 1862**

***Schizoprymnus obscurus* (NEES 1816)**

Material examined: Roodsar (2 m), 1 ♀, June 2007.

***Triaspis flavipes* (IVANOV 1899)**

Material examined: Fooman (34 m), 1 ♀, 1 ♂, August 2008.

**Subfamily Braconinae NEES von ESENBECK 1811**

***Pseudovipio inceptor* (NEES von ESENBECK 1834)**

Material examined: Lahijan (12 m), 2 ♀♀, 1 ♂, September 2005, parasitoid of *Ostrinia nubilalis* Hb. (Lepidoptera: Pyraustidae).

***Bracon (Bracon) leptus* MARSHALL 1897**

Material examined: Rasht (39 m), 3 ♀♀, 1 ♂, August 2008.

***Bracon (Bracon) mariae* DALLA TORRE 1898**

Material examined: Bandar-Anzali (-15 m), 1 ♂, July 2007.

***Bracon (CyanopteroBracon) illyricus* (MARSHALL 1888)**

Material examined: Roodsar (2 m), 1 ♂, July 2007, parasitoid of *Larinus turbinatus* GYLL. (Coleoptera: Curculionidae).

***Bracon (GlabroBracon) atrator* (NEES VON ESENBECK 1834)**

Material examined: Astaneh Ashrafyeh (-34 m), 6 ♀♀, 3 ♂♂, June 2005.

***Bracon (GlabroBracon) planinotus* TOBIAS 1957**

Material examined: Rasht (127 m), 2 ♀♀, August 2008.

***Bracon (GlabroBracon) praetermissus* MARSHALL 1885**

Material examined: Lahijan (12 m), 2 ♀♀, 2 ♂♂, September 2005, parasitoid of *Biorhiza pallida* OL. (Hymenoptera: Cynipidae)

***Bracon (HabroBracon) radialis* TELENGA 1936**

Material examined: Roodbar (213 m), 1 ♀, July 2007.

***Bracon (Lucobracon) humidus* TOBIAS 1976**

Material examined: Langrood (16 m), 1 ♀, Unknown date.

***Bracon (Lucobracon) meyeri* (TELENGA 1936)**

Material examined: Siyahkal (25 m), 2 ♀♀, August 2007.

***Bracon (Lucobracon) suchorukovi* (TELENGA 1936)**

Material examined: Masal (70 m), 1 ♀, July 2007.

***Pigeria piger* (WESMAEL 1838)**

Material examined: Chaboksar (2 m), 2♀♀, 2♂♂, July 2005. Astara (-8 m), 1♀, September 2007.

***Vipio nominator* (FABRICIUS 1787)**

Material examined: Deylaman (1450 m), 2♀♀, 1♂, August 2005. Masal (70 m), 1♂, July 2007.

**Subfamily Cheloniinae FOERSTER 1862**

***Chelonus annulatus* (NEES 1816)**

Material examined: Rasht (39 m), 3♀♀, August 2008.

***Microchelonus cisapicalis* TOBIAS 1989**

Material examined: Roodbar (213 m), 1♀, July 2007.

***Microchelonus incisus* TOBIAS 1986**

Material examined: Roodsar (9 m), 1♂, July 2007.

***Microchelonus mongolicus* (TELENGA 1941)**

Material examined: Astaneh Ashrafyeh (-34 m), 2♀♀, June 2005.

**Subfamily Microgastriinae FOERSTER 1862**

***Apanteles metacarpalis* THOMSON 1895**

Material examined: Bandar-Anzali (-15 m), 2♂♂, June 2007.

***Cotesia jucunda* (MARSHALL 1885)**

Material examined: Rasht (76 m), 2♀♀, Unknown date.

***Cotesia scabricula* (REINHARD 1880)**

Material examined: Roodsar (9 m), 1♂, June 2007.

***Cotesia vestalis* (HALIDAY 1834)**

Material examined: Rasht (76 m), 1♀, August 2008.

***Microgaster parvistriga* THOMSON 1895**

Material examined: Roodbar (213 m), 1♂, July 2007.

**Subfamily Opiinae BLANCHARD 1845**

***Biosteres (Chilotrichia) brevipalpis* (THOMSON 1895)**

Material examined: Rezvanshahr (5 m), 1♀, 2♂♂, September 2005.

***Biosteres (Chilotrichia) haemorrhoeus* (HALIDAY 1836)**

Material examined: Masooleh (968 m), 2♂♂, July 2007.

***Opius (Agnopius) tirolensis* FISCHER 1958**

Material examined: Chaboksar (2 m), 2♀♀, July 2005.

***Opius (Allophlebus) singularis* WESMAEL 1835**

Material examined: Roodsar (9 m), 1♀, June 2007.

***Opius (Apodesmia) aethiops* HALIDAY 1837**

Material examined: Siyahkal (25 m), 1♂, August 2007.

***Opius (Cryptonastes) tersus* (FOERSTER 1862)**

Material examined: Astaneh Ashrafyeh (-34 m), 1♀, 3♂♂, June 2005.

***Opius (Gastrosema) caucasi* TOBIAS 1986**

Material examined: Masal (70 m), 1♀, July 2007. Rasht (39 m), 2♀♀, 1♂, August 2008.

***Opius (Hypocynodus) crassipes* WESMAEL 1835**

Material examined: Lahijan (12 m), 1♀, 2♂♂, September 2005.

***Opius (Ilicopius) pulchriceps* (SZÉPLIGETI 1898)**

Material examined: Masal (70 m), 1♀, July 2007.

***Opius (Nosopoea) circulator* (NEES 1834)**

Material examined: Roodbar (213 m), 1♂, Unknown date.

***Opius (Nosopoea) maculipes* WESMAEL 1835**

Material examined: Chaboksar (2 m), 1♀, July 2005. Rezvanshahr (5 m), 1♀, 2♂♂, September 2005.

***Opius (Odontopoea) connivens* THOMSON 1895**

Material examined: Some'e Sara (25 m), 1♀, September 2006.

***Opius (Opiothorax) filicornis* THOMSON 1895**

Material examined: Masooleh (968 m), 2♀♀, 1♂, July 2007.

***Opius (Opiothorax) longicornis* THOMSON 1895**

Material examined: Talesh (77 m), 1♀, September 2007.

***Opius (Opiothorax) nigricoloratus* FISCHER 1958**

Material examined: Rasht (39 m), 1♂, August 2008.

***Opius (Opius) pallipes* WESMAEL 1835**

Material examined: Siyahkal (25 m), 1♀, 2♂♂, August 2007.

***Opius (Phaedrotoma) diversa* (SZÉPLIGETI 1898)**

Material examined: Astara (-19 m), 1 ♀, 1 ♂, September 2007.

***Opius (Phaedrotoma) pulchriventris* (FISCHER 1958)**

Material examined: Lahijan (12 m), 1 ♂, September 2005. Rasht (39 m), 2 ♀ ♀, 1 ♂, August 2008.

***Opius (Utetes) coracinus* (THOMSON 1895)**

Material examined: Fooman (34 m), 3 ♀ ♀, August 2008.

***Opius (Utetes) magnus* (FISCHER 1958)**

Material examined: Roodbar (213 m), 1 ♀, Unknown date.

***Opius (Utetes) testaceus* (WESMAEL 1838)**

Material examined: Astara (-19 m), 2 ♀ ♀, September 2007.

***Opius (Xynobius) decoratus* (STELFOX 1949)**

Material examined: Fooman (34 m), 1 ♂, August 2008.

### Discussion

Upon this research, 55 braconid species from 16 genera and subgenera and 7 subfamilies (including, Agathidinae, Blacinae, Brachistinae, Braconinae, Cheloninae, Microgastrinae and Opiinae) were collected from Guilan province, northern Iran. Guilan is one of the most important regions for various agricultural crops and incorporates vast forests with diverse trees and shrubs; therefore we expect that the fauna of braconid wasps is very diverse in this area and a large number of species remain to be discovered. Among the 16 studied genera in this research, two genera including, *Opius* and *Bracon* with 13 and 10 collected species respectively, are the most diverse genera in Guilan province. With attention to the various agricultural and forest pests in the mentioned province, surely the fauna of Braconidae of Guilan is more diverse than the results of the present work and we suggest to the researchers to continue the faunistic works on this taxon.

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