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# Study of the subfamilies Cryptinae and Ichneumoninae (Hymenoptera: Ichneumonidae) from Mazandaran province, with record of five species new to Iran

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## Abstract

The fauna the subfamilies Ichneumoninae and Cryptinae (Hymenoptera: Ichneumonidae) was studied in Mazandaran province, north of Iran during 2016. Sampling was done using 8 Malaise traps which were installed in three altitude layers. Totally, 126 and 64 specimens were collected from the subfamilies Cryptinae and Ichneumoninae, respectively representing 25 species into 20 genera. Of them four genera and five species are recorded for the first time from Iran as following: *Acrolyta* Förster, 1869, *Ceratophygadeuon* Viereck, 1924, *Eudelus* Förster, 1869 and *Mevesia* Holmgren, 1890, *Ceratophygadeuon varicornis* (Thomson, 1884), *Chirotica maculipennis* (Gravenhorst, 1829), *Eudelus gumperdensis* (Schmiedeknecht, 1893), *Mevesia arguta* (Wesmael, 1845) and *Virgichneumon albilineatus* (Gravenhorst, 1829). Also a checklist of subfamilies Ichneumoninae and Cryptinae in Iran is provided. With new data of current research, the number of identified species of the subfamily Cryptinae of Iran and of the Hyrcanian forests biome increased to 128 and 39 species and for Ichneumoninae increased to 191 and 115, respectively.

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## Introduction

Cryptinae and Ichneumoninae are the two most specious subfamilies of hymenopterous parasitic wasps of the family Ichneumonidae. Cryptinae is the largest subfamily of Ichneumonidae comprising more than 395 identified genera and more than 4500 species (Quick, 2015). Cryptines show a variety of biological strategies in their parasitic life. Most species of Cryptinae are idiobiont ectoparasitoids on pupae or prepupae of holometabolous insects including Diptera, Lepidoptera, Coleoptera, Neuroptera, Trichoptera and Hymenoptera but some genera are koinobiont or endoparasitoid and a few prey egg sacs of spiders (Townes, 1970).

The subfamily Ichneumoninae is the second largest subfamily of Ichneumonidae with 394 valid genera and almost 4300 known species. Ichneumoninae members are special endoparasitoids of larvae, prepupae or pupae of Lepidoptera but always emerge from their pupa (Heinrich, G.H. 1961).

Study of the fauna of the subfamilies Cryptinae and Ichneumoninae have been received more attention in recent decade. Up to now, there have been reported 125 and 174 species of the subfamilies Cryptinae and Ichneumoninae from Iran, respectively (Barahoei *et al*. 2012; 2015; Ghahari and Jussila, 2016a,b; Mahyabadi *et al*., 2016; Mohebban *et al*., 2016; Mohammadi- Shirzadegan *et al*., 2017; 2018; Khoramabadi *et al*., 2018; Kolarov and Ghahari, 2008; Ghahari and Jussila, 2010; Firuzi Jahantighi *et al*., 2011; Ghahari and Jussila, 2011; Barahoei *et al.*, 2012; Hooshyar *et al*., 2012; Ghahari and Jussila, 2014; Barahoei *et al.*, 2015; Ghahari and Gadallah, 2015; Mohebban *et al*., 2016; Ghahari and Jussila, 2016a; 2016b; Ghahari, 2016; Shirzadegan *et al*., 2017; 2018; Mohammadi-Khoramabadi *et al*., 2018; Mohebban *et al.*, 2018).

The Hyrcanian forests extended along the southern shores of the Caspian Sea from the Talish region in Ardebil province to Guilan, Mazandaran and Golestan provinces, Iran (Fig. 1) (Akhani *et al.,* 2010). This ecosystem in this region are amongst the most important and incomparable temperate deciduous broadleaved forests in the world (Haghdoost *et al*., 2011). This forest zone is limited to the Caspian Sea shores northwards and to the Alborz Mountain southwards. An ongoing project on the species diversity of the parasitoid wasps of the family Ichneumonidae has been started from 2011 in the Hyrcanian forests. In this study we present new data on the two subfamilies Ichneumoninae and Cryptinae in Mazandaran province, northern Iran.

### Material and Methods

Study area: The study was carried out in Amol county (N 52º 21' 23" E 36º 29' 36" to N 52º 21' 16" E 36º 26' 13") Mazandaran province, north of Iran (Fig. 1) from May to November 2016. Sampling was done using eight Malaise traps. These traps were set in four localities including Noabad, Kelerd, Shahandasht and Niak. Geographical characteristics of the studied localities and their vegetation type are shown in Table 1.

The captured specimens in each trap were extracted and separated by an interval of two weeks. They were then dried, pinned or card mounted. Identification was done by Dr. R. Jussila, University of Turku, Finland.

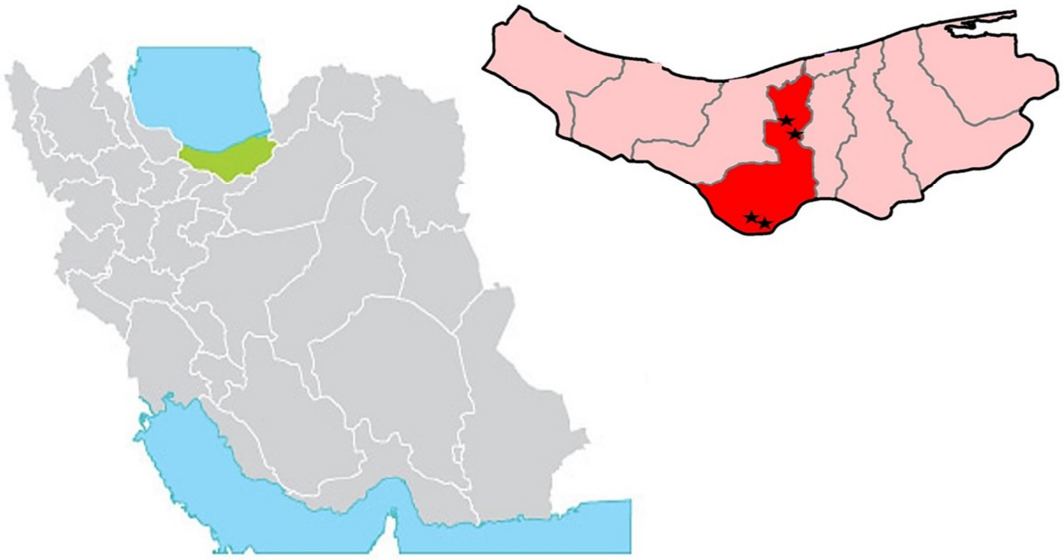

Fig. 1- Position of Amol county in Mazandaran province, Northern Iran, sampling localities are shown by star.

**Table 1- Geographical characteristics of the studied localities in Mazandaran province, Iran, 2016**

| Malaise traps | Altitude | Latitude (m) | vegetation |
|---|---|---|---|
| Noabad | N 40º 30' 96"<br>E 62º 70' 74" | 119 | Citrus garden |
| Kelerd 1 | N 40º 14' 67"<br>E 62º 28' 96" | 408 | Forest |
| Kelerd 2 | N 40º 14' 67"<br>E 62º 28' 36" | 438 | Forest |
| Shahandasht 1 | N 39º 75' 00"<br>E 61º 35' 46" | 1530 | Fruit garden |
| Shahandasht 3 | N 39º 75' 04"<br>E 61º 35' 81" | 1545 | Fruit garden |
| Shahandasht 2 | N 39º 75' 02"<br>E 61º 35' 79" | 1537 | Fruit garden |
| Niak 1 | N 39º 71' 27"<br>E 60º 72' 11" | 1710 | Lawn |
| Niak 2 | N 39º 71' 26"<br>E 60º 72' 32" | 1715 | Lawn |

## Results

A total of 188 specimens of Cryptinae and Ichneumoninae were collected which of them 58 specimens have been yet identified representing 25 species into 20 genera. As a result four new genera and five new species are recorded for the first time from Iran which are marked with an asterisk (*). Also eight new genera and seven new species are new for Mazandaran province.

## Ichneumoninae
## Tribe Ichneumonini

*Barichneumon plagiarius* (Weamael, 1848)

Material examined: Mazandaran province, Amol, Niak (N 39º 71' 27" E 60º 72' 11"), 1♂ 22.VII.2016; leg. H. Hooshyar.

Distribution within Iran: Qazvin (Ghahari and Schwarz, 2012), The genus is new for Mazandaran province.

General distribution: Holarctic, Belarus, Belgium, Bulgaria, Finland, France, Germany, Hungary, Poland, Portugal, Romania, Serbia, Montenegro, Spain, Turkey, United Kingdom (Yu et al., 2012).

*Barichneumon* sp. 1

Material examined: Mazandaran province, Amol, Niak (N 39º 71' 26" E 60º 72' 32"), 1♂ 24.VI.2016, leg. H. Hooshyar.

*Barichneumon* sp. 2

Material examined: Mazandaran province, Amol, Kelerd (N 40º 14' 67" E 62º 28' 36"), 1♂ 10.VI.2016, leg. H. Hooshyar.

*Ichneumon sarcitorius* Linnaeus, 1758

Material examined: Mazandaran province, Amol, Noabad (N 40º 30' 96" E 62º 70' 74"), 1♂ 31.VII.2016, leg. H. Hooshyar.

Distribution in Iran: Golestan (Mojeni and Sedivy, 2001), Azerbaijan-e-Sharghi (Masnadi and Jussila, 2008), Semnan, Guilan, Mazandaran, Golestan (Kolarov and Ghahari, 2005, 2008), Kerman (Mohebban *et al.*, 2018).

General distribution: This species is present in most of Europe, in the Near East, in the Oriental ecozone and in North Africa (Selfa, 1996; Yu et al., 2012).

*Ichneumon* sp.

Material examined: Mazandaran province, Amol, Shahandasht (N 39º 75' 02" E 61º 35' 79"), 1 ♂ 08.VII.2016, leg. H. Hooshyar.

*Stenobarichneumon citator* (Thunberg, 1824)

Material examined: Mazandaran province, Amol, Kelerd (N 40º 14' 67" E 62º 28' 96"), 1♀ 28.VI.2016, leg. Hengameh Hooshyar.

Distribution in Iran: Mazandaran, Golestan, Yazd, Khuzestan (Kolarov and Ghahari, 2008).

General distribution: Bulgaria, Czechoslovakia, Finland, France, Germany, Lithuania, Netherlands, Norway, Norway-main, Poland, Romania, Spain, Sweden, United Kingdom (Yu et al., 2012).

*Virgichneumon albilineatus* (Gravenhorst, 1829)

Material examined: Mazandaran province, Amol, Kelerd (N 40º 14' 67" E 62º 28' 36"), 1♂ 02.VI.2016, 1♂ 04.VI.2016, Noabad (N 40º 30' 96" E 62º 70' 74"), 1♂ 24.VI.2016, 1♂ 06.VI.2016, Niak (N 39º 71' 26" E 60º 72' 32"), 1♂ 24.VI.2016, leg. H. Hooshyar.

Distribution in Iran: The species is recorded for the first from Iran.

General distribution: Austria, Belarus, Belgium, Bulgaria, China, Croatia, Czechoslovakia, Finland, France, Germany, Hungary, Italy, Japan, Korea, Latvia, Netherlands, Norway, Poland, Romania, Russia, Spain, Sweden, Turkey, United Kingdom (Yu et al., 2012).

**Tribe Phaeogenini**

*Herpestomus arridens* (Gravenhorst, 1829)

Material examined: Mazandaran province, Amol, Shahandasht (N 39º 75' 02" E 61º 35' 79"), 1♂ 10.VI.2016, leg. Hengameh Hooshyar.

Distribution in Iran: West Azerbaijan (Kolarov and Ghahari, 2008) and Mazandaran province (current study).

General distribution: Algeria, Austria, Azerbaijan, Belgium, Bulgaria, Czechoslovakia, Denmark, Finland, France, Georgia, Germany, Greece, Greece-main, Hungary, Ireland, Israel, Italy, Latvia, Netherlands, Norway, Poland, Portugal, Romania, Russia, Spain, Sweden, Switzerland, Ukraine, United Kingdom (Yu et al., 2012).

*Herpestomus* sp.

Material examined: Mazandaran province, Amol, Shahandasht (N 39º 75' 02" E 61º 35' 79"), 1♂ 10.VI.2016, leg. H. Hooshyar.

*Mevesia arguta* (Wesmael, 1845)*

Material examined: Mazandaran province, Amol, Kelerd (N 40º 14' 67" E 62º 28' 96"), 1♀ 10.VI.2016, Kelerd (N 40º 14' 67" E 62º 28' 36"), 1♀ 02.VI.2016, leg. Hengameh Hooshyar.

Distribution in Iran: Mazandaran province (Current study). The genus and species are new for Iran.

General distribution: Europe, Western Palaearctic (Yu et al., 2012).

**Tribe Platylabini**

*Apaeleticus inimicus* (Gravenhorst, 1820)

Material examined: Mazandaran province, Amol, Shahandasht (N 39º 75' 00" E 61º 35' 46"), 1♀ 10.VI.2016, 1♀ 28.VI.2016, Shahandasht (N 39º 75' 02" E 61º 35' 79"), 1♀ 10.VI.2016, leg. Hengameh Hooshyar.

Distribution in Iran: Alborz, Guilan (Shirzadegan *et al.*, 2017) and Mazandaran province (current study).

General distribution: Algeria, Austria, Azerbaijan, Belgium, Bulgaria, Czechoslovakia, Denmark, Finland, France, Georgia, Germany, Greece, Hungary, Ireland, Israel, Italy, Latvia, Netherlands, Norway, Poland, Portugal, Romania, Russia, Spain, Sweden, Switzerland, Ukraine, United Kingdom (Yu et al,. 2012).

**Cryptinae**

**Tribe Cryptini**

*Mesostenus grammicus* Gravenhorst, 1829

Material examined: Mazandaran province, Amol, Niak (N 39º 71' 26" E 60º 72' 32"), 1♀ 08.IX.2016, leg. Hengameh Hooshyar.

Distribution in Iran: Fars (Barahoei *et al*. 2012), Kerman (Mahyabadi *et al*. 2016a,b) and Mazandaran province (current study).

General distribution: Eastern Palaearctic, Europe, Nearctic, Neotropical, Oceanic, Oriental, Western Palaearctic (Yu et al., 2012).

*Cryptus armator* Fabricius, 1804

Material examined: Mazandaran province, Amol, Kelerd (N 40º 14' 67" E 62º 28' 36"), 2♀♀ 02.VI.2016, leg. Hengameh Hooshyar.

Distribution in Iran: Kerman (Mahyabadi *et al*. 2016b), and Mazandaran province (current study).
General distribution: Finland.

*Trychosis atripes* (Gravenhorst, 1829)
Material examined: Mazandaran province, Amol, Niak (N 39º 71' 27" E 60º 72' 11"), 1♀ 22.VII.2016, leg. Hengameh Hooshyar.
Distribution in Iran: West Azerbaijan (Barahoei *et al*. 2012), and Mazandaran province (current study).
General distribution: Austria, France, Germany, Hungary, Romania, Spain (Yu et al., 2012).

*Trychosis tristator* (Thomson, 1873)
Material examined: Mazandaran province, Amol, Niak (N 39º 71' 27" E 60º 72' 11"), 1♀ 12.IX.2016, 1♀ 26.V.2016, Niak (N 39º 71' 26" E 60º 72' 32"), 1♀ 05.VIII.2016, Kelerd (N 40º 14' 67" E 62º 28' 96"), 1♀ 10.VI.2016, leg. Hengameh Hooshyar.
Distribution in Iran: West Azerbaijan (Barahoei *et al*. 2012), and Mazandaran province (current study).
General distribution: Austria, Azerbaijan, Belarus, Belgium, Bulgaria, Croatia, Czechoslovakia, Denmark, Finland, France, Germany, Greece, Hungary, Lithuania, Moldova, Netherlands, Norway, Poland, Romania, Spain, Sweden, Switzerland, Turkey, United Kingdom (Yu et al., 2012).

*Agrothereutes* sp.
Material examined: Mazandaran province, Amol, Kelerd (N 40º 14' 67" E 62º 28' 36"), 2♂♂ 02.VI.2016, Niak (N 39º 71' 26" E 60º 72' 32"); 1♂ 08.VII.2016, Shahandasht (N 39º 75' 00" E 61º 35' 46"), 1♂ 10.VI.2016, Noabad (N 40º 30' 96" E 62º 70' 74"), 1♂ 16.V.2016, leg. Hengameh Hooshyar.
Distribution in Iran: Semnan, West Azerbaijan, East Azerbaijan (Barahoei *et al*. 2012). The genus is new for Mazandaran province.

**Tribe Phygadeuontini**
*Endasys* sp.
Material examined: Mazandaran province, Amol, Shahandasht (N 39º 75' 04" E 61º 35' 81"), 1♂ 10.VI.2016, leg. Hengameh Hooshyar.
Distribution in Iran: Hamadan (Barahoei *et al*. 2012). The genus is new for Mazandaran province.

*Dichrogaster aestivalis* (Gravenhorst, 1829)
Material examined: Mazandaran, Amol, Shahandasht (N 39º 75' 00" E 61º 35' 46"), 1♂ + 2♀♀ 28.X.2016, leg. Hengameh Hooshyar.
Distribution in Iran: Khorasan-e Razavi, East Azerbaijan (Barahoei *et al*. 2012; Ghahari and Jussila, 2010), and Mazandaran province (current study).
General distribution: Austria, Azerbaijan, Belgium, Bulgaria, Czech Republic, Czechoslovakia, Egypt, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Moldova, Netherlands, Norway, Poland, Romania, Russia, Spain, Sweden, Turkey, Ukraine, United Kingdom (Yu et al., 2012).

*Gelis* sp.
Material examined: Mazandaran provinice, Amol, Niak (N 39º 71' 27" E 60º 72' 11"), 6 ♂♂ 10.VI.2016, 08.VII.2016, 19.VIII.2016, 08.IX.2016; Shahandasht (N 39º 75' 00" E 61º 35' 46"), 1♂, 28.X.2016; Kelerd (N 40º 14' 67" E 62º 28' 36"), 2♂♂ 10.X.2016, leg. Hengameh Hooshyar.

Distribution in Iran: Golestan (Ghahari and Jussila, 2010), Qazvin (Barahoei *et al*. 2012; Ghahari and Schwarz, 2012), East Azerbaijan, Sistan-o Baluchistan, Kerman, Ardabil, Golestan (Barahoei *et al*. 2012), Kerman (Barahoei *et al*. 2012; Mahyabadi *et al*. 2016a,b), Khorasan-e Razavi (Ghahari *et al*., 2014), Isfahan (Barahoei *et al*. 2015), Lorestan (Ghahari and Gadallah, 2015). The genus is new for Mazandaran province.

*Chirotica maculipennis* (Gravenhorst, 1829)*

Material examined: Mazandaran province, Amol, Kelerd (N 40º 14' 67" E 62º 28' 96"), 1♂ 24.VI.2016, leg. Hengameh Hooshyar.

Distribution in Iran: Mazandaran province (current study).

General distribution: Austria, Bulgaria, Czech Republic, Czechoslovakia, Finland, France, Germany, Hungary, Italy, Latvia, Libya, Moldova, Norway, Poland, Portugal, Russia, Spain, Sweden, Switzerland, United Kingdom (Yu et al., 2012),.

*Acrolyta* sp.*

Material examined: Mazandaran province, Amol, Niak (N 39º 71' 26" E 60º 72' 32"), 1♀ 10.VI.2016, leg. H. Hooshyar.

Distribution in Iran: The genus is new for Iran.

*Lysibia nana* (Gravenhorst, 1829)

Material examined: Mazandaran province, Amol, Niak (N 39º 71' 27" E 60º 72' 11"), 1♀ 22.VII.2016, leg. H. Hooshyar.

Distribution in Iran: Mazandaran (Barahoei *et al*. 2012), Isfahan (Barahoei *et al*. 2015), Kerman (Mohebban *et al*. 2015, 2016; Mahyabadi *et al*. 2016a,b), Golestan, Qazvin (Ghahari and Jussila, 2015; Ghahari and Schwarz, 2012).

General distribution: Afghanistan, Austria, Azerbaijan, Belarus, Belgium, Bulgaria, Canary Islands, China, Czech Republic, Denmark, Finland, France, Georgia, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Moldova, Morocco, Netherlands, New Zealand, Norway, Pakistan, Poland, Romania, Portugal, Russia, Slovenia, Spain, Sweden, Switzerland, Turkey, U.S.A., Ukraine, United Kingdom, Yugoslavia.

*Eudelus gumperdensis* (Schmiedeknecht, 1893)*

Material examined: Mazandaran province, Amol, Shahandasht (N 39º 75' 04" E 61º 35' 81"), 1♂ 10.VI.2016, leg. Hengameh Hooshyar.

Distribution in Iran: The genus and species are new for Iran.

General distribution: Bulgaria; Germany (Yu et al., 2012)

*Ceratophygadeuon varicornis* (Thomson, 1884)*

Material examined: Mazandaran province, Amol, Kelerd (N 40º 14' 67" E 62º 28' 96"), 1♂ 22.VII.2016, leg. Hengameh Hooshyar.

Distribution in Iran: Mazandaran province (current study).

General distribution: Austria, Bulgaria, France, Germany, Italy, Poland, Romania, Russia, Ukraine, United Kingdom (Yu et al., 2012).

*Phygadeuon* sp.

Material examined: Mazandaran province, Amol, Shahandasht (N 39º 75' 00" E 61º 35' 46"), 1♀ 22.VII.2016, 1♀ 27.V.2016, Kelerd (N 40º 14' 67" E 62º 28' 36"), 1♀ + 2♂♂ 10.X.2016, Shahandasht (N 39º 75' 00" E 61º 35' 46"), 1♂ 08.VII.2016, Niak (N 39º 71' 26" E 60º 72' 32"), 1♂ 10.VI.2016, Shahandasht (N 39º 75' 04" E 61º 35' 81"), 1♀ 24.VI.2016, 1♀ 28.X.2016, leg. Hengameh Hooshyar.

Distribution in Iran: East Azerbaijan, Tehran, Fars (Barahoei *et al*. 2012), Kerman (Mahyabadi *et al*. 2016b).

## Discussion:

Four genera and five species were found newly for the Iranian fauna of Ichneumonidae. The number of identified species of the subfamily Cryptinae of Iran and of the Hyrcanian forests biome increased to 128 and 39 species and for Ichneumoninae increased to 191 and 115, respectively (Table 1). Eight genera and seven species are added to the ichneumon fauna of Mazandaran province. Previous to this study, 14 species and 10 genera of Cryptinae were recorded from Mazandaran province (Table 1). By adding the new taxa of present study, these numbers increase to 24 species and 18 genera. In Mazandaran province, 36 species and 17 genera of Ichneumoninae have been reported up to now (Table 1). With the new contributions given in the present study, these numbers increase to 45 species and 22 genera (Table 1). More sampling will reveal a more complete picture of the species richness of the family Ichneumonidae in the Hyrcanian forests.

Among the studied localities, the minimum number of captured specimens was occurred in the Malaise trap installed in Noabad as only 4 specimens were obtained from Noabad locality. This few number could be a result of pesticide spraying in Citrus orchard that has a lethal effect on natural enemies including Ichneumonidae family.

The altitudinal distribution of identified specimens was significant. We can divide sampling sites into two faction according to altitude: 1- regions in high altitude (more than 1500 m) and 2- regions in low altitude (less than 500). Species of Ichneumoninae which were found in high altitudes include *Barichneumon plagiarius*, *Barichneumon* sp. 1, *Ichneumon* sp., *Herpestomus arridens*, *Herpestomus* sp. and *Apaeleticus inimicus*. In low altitudes *Ichneumon sarcitorius*, *Barichneumon* sp. 2, *Stenobarichneumon citator* and *Mevesia arguta* were collected. Also *Virgichneumon albilineatus* occurred in both high and low altitudes. Çoruh *et al*. (2014) had a survey on Ichneumonidae fauna of Turkey and provided some information on their altitudinal distribution. They made this arrangement for altitude: low altitude (0-1250 m) and high altitude (1250-2500 m). Two species *B. plagiarius* and *A. inimicus* were found in high altitude, as we did it. They collected *I. sarcitorius* in both high and low altitudes, but we found it just in low altitude. Also they collected *V. albilineatus* in high altitude, but we found it in both high and low altitudes. Amongst Cryptinae species *Mesostenus grammicus*, *Trychosis atripes*, *Acrolyta* sp., *Lysibia nana*, *Endasys* sp., *Dichrogaster aestivalis* and *Eudelus gumperdensis* were collected in high altitudes and *Cryptus armatus*, *Chirotica maculipennis* and *Ceratophygadeuon varicornis* were found in low altitudes. Some species like *Trychosis tristator*, *Agrothereutes* sp., *Gelis* sp. and *Phygadeuon* sp. were collected in low and high altitudes. The species *L. nana* occurs in high altitude in Turkey as well as in our investigation region. We collected *T. tristator* and *Agrothereutes* sp. in both high and low altitude, but in Turkey, *T. tristator* was found in low altitude and *Agrothereutes* spp. were found in high altitude (Çoruh *et al*., 2014).

Vegetation of low altitude regions include citrus garden and Hyrcanian forests. *Virgichneumon albilineatus* (Ichneumoninae), *Ichneumon sarcitorius* (Ichneumoninae) and *Agrothereutes* sp. (Cryptinae) were collected from citrus garden. According to Sullivan *et al*. (2010) *V. albilineatus* is a parasitoid of overwintering *Hyphantria cunea* (Drury) (Lepidoptera: Arctiidae) pupae in hazelnut plantations of the central Black Sea region of Turkey. In current survey it is found in Citrus garden.

So it might be a parasitoid of some of Citrus pest. *Agrothereutes* spp. were reported as parasitoids of Lepidoptera and Hymenoptera species (Quicke and Sahw, 2004). We found this genus from forest regions, Citrus garden, fruit garden and lawns. It shows that this genus occurs in various habitats. *Barichneumon* sp. 2, *Virgichneumon albilineatus*, *Stenobarichneumon citator, Mevesia arguta* (Icheumoninae), *Cryptus armatus*, *Trychosis tristator*, *Agrothereutes* sp., *Gelis* sp., *Chirotica maculipennis* and *Ceratophygadeuon varicornis* and *Phygadeuon* sp. (Cryptinae) were found in forests. Vegetation of high altitude regions includes grass, walnut, plum, cherry, pear, apple and, grape trees.

**Table 1. Checklist of the subfamilies Cryptinae and Ichneumoninae in Iran, the Hyrcanian forests and Mazandaran province**

| Species name | Iran | The Hyrcanian forests | Mazandaran province | Reference |
|---|---|---|---|---|
| **Subfamily Cryptinae** | | | | |
| *Acroricnus (seductor) elegans* (Mocsáry, 1883) | Golestan, Guilan, Mazandaran, West Azerbaijan | * | * | Barahoei *et al*. (2012) |
| *Acroricnus stylator* (Thunberg, 1822) | Lorestan, Mazandaran | * | * | Ghahari and Gadallah (2015); Barahoei *et al*. (2012) |
| *Acrolyta* sp. | Mazandaran | * | * | Current study |
| *Agrothereutes abbreviatus* (Fabricius, 1794) | Semnan | | | Barahoei *et al*. (2012) |
| *Agrothereutes adustus* (Gravenhorst, 1829) | West Azerbaijan | | | Barahoei *et al*. (2012) |
| *Agrothereutes fumipennis* (Gravenhorst, 1829) | East Azerbaijan | | | Barahoei *et al*. (2012) |
| *Agrothereutes hospes* (Tschek, 1871) | Semnan | | | Barahoei *et al*. (2012) |
| *Agrothereutes parvulus* (Habermehl, 1926) | West Azerbaijan | | | Barahoei *et al*. (2012) |
| *Aritranis claviventris* (Kriechbaumer, 1894) | West Azerbaijan | | | Barahoei *et al*. (2012) |
| *Aritranis director* (Thunberg, 1824) | West Azerbaijan | | | Barahoei *et al*. (2012) |
| *Aritranis nigrifemur* (Szepligeti, 1916) | West Azerbaijan | | | Barahoei *et al*. (2012) |
| *Aritranis occisor* (Gravenhorst, 1829) | West Azerbaijan | | | Barahoei *et al*. (2012) |
| *Buathra laborator* (Thunberg, 1824) | Ardabil, Mazandaran, Tehran | * | * | Barahoei *et al*. (2012); Ghahari (2016) |
| *Buathra tarsoleucos* (Schrank, 1781) | Lorestan, Tehran | | | Ghahari and Gadallah (2015); Barahoei *et al*. (2012) |
| *Cryptus armator* Fabricius, 1804 | Kerman, Mazandaran | * | * | Mohebban *et al*. (2016)<br>Current study |
| *Cryptus dianae* Gravenhorst, 1829 | West Azerbaijan | | | Barahoei *et al*. (2012) |
| *Cryptus inculcator* (Linnaeus, 1758) | Kerman, Alborz, Sistan-o Baluchistan, Yazd, Fars, Isfahan, Khorasan-e Razavi | | | Mohebban *et al*. (2015, 2016); Mahyabadai *et al*. (2016a,b); Barahoei *et al*. (2012, 2013, 2014, 2015); Sarafi *et al*. (2015); |
| *Cryptus inquisitor* Tschek, 1871 | West Azerbaijan | | | Barahoei *et al*. (2012) |
| *Cryptus macellus* Tschek, 1871 | Semnan | | | Barahoei *et al*. (2012) |
| *Cryptus medius* Szépligeti, 1916 | Fars | | | Barahoei *et al*. (2012) |
| *Cryptus nigropictus* Cameron, 1905 | Mazandaran | * | * | Barahoei *et al*. (2012) |
| *Cryptus spinosus* Gravenhorst, 1829 | Fars, Yazd, Khorasan-e Razavi | | | Barahoei *et al*. (2012); Ghahari *et al*. (2014) |

| | | | | |
|---|---|---|---|---|
| *Cryptus spiralis* (Geoffroy, 1785) | Semnan | | | Barahoei *et al*. (2012) |
| *Cryptus subspinosus* Smits van Burgst, 1913 | West Azerbaijan | | | Barahoei *et al*. (2012) |
| *Cryptus triguttatus* Gravenhorst, 1829 | East Azerbaijan, West Azerbaijan | | | Barahoei *et al*. (2012) |
| *Cryptus tuberculatus* Gravenhorst, 1829 | Fars | | | Barahoei *et al*. (2012) |
| *Cryptus viduatorius* Fabricious, 1804 | Guilan, West Azerbaijan, Yazd, Khorasan-e-Razavi, Lorestan | | | Barahoei *et al*. (2012, 2014); Ghahari and Gadallah (2015) |
| *Gambrus carnifex* (Gravenhorst, 1829) | Golestan | * | | Barahoei *et al*. (2012) |
| *Gambrus incubitor* (Linnaeus, 1758) | Golestan, Lorestan Tehran | * | | Barahoei *et al*. (2012); Ghahari and Gadallah (2015) Ghahari (2016) |
| *Gambrus ornatus* (Gravenhorst, 1829) | Lorestan | | | Ghahari and Gadallah (2015) |
| *Goryphus* sp. | Kerman | | | Mahyabadai *et al*. (2016a) |
| *Hidryta sordida* (Tschek, 1871) | West Azerbaijan | | | Barahoei *et al*. (2012) |
| *Hoplocryptus bellosus* (Curtis, 1837) | Fars | | | Barahoei *et al*. (2012) |
| *Hoplocryptus bohemani* (Holmgren, 1856) | Lorestan | | | Ghahari and Gadallah (2015) |
| *Hoplocryptus confector* (Gravenhorst, 1829 | West Azerbaijan | | | Barahoei *et al*. (2012) |
| *Hoplocryptus coxator* (Tschek, 1871) | Not exactly defined | | | Barahoei *et al*. (2012) |
| *Hoplocryptus femoralis* (Gravenhorst, 1829) | Not exactly defined | | | Barahoei *et al*. (2012) |
| *Hoplocryptus heliophilus* (Tschek, 1871) | Kerman, Sistan-o-Baluchistan | | | Mahyabadai *et al*. (2016a,b), Barahoei *et al*. (2012, 2013) |
| *Hoplocryptus murarius* (Borner, 1782) | West Azerbaijan | | | Barahoei *et al*. (2012) |
| *Idiolispa analis* (Gravenhorst, 1807) | West Azerbaijan Golestan | * | | Barahoei *et al*. (2012) Ghahari and Jussila (2016) |
| *Ischnus agitator* (Olivier, 1792) | East Azerbaijan, Mazandaran | * | * | Barahoei *et al*. (2012) |
| *Ischnus alternator* (Gravenhorst, 1829) | Mazandaran | * | * | Barahoei *et al*. (2012) |
| *Ischnus inquisitorius* (Muller, 1776) | North Khorasan | | | Ghahari *et al*. (2014) |
| *Listrognathus furax* (Tschek, 1871) | Alborz | | | Barahoei *et al*. (2012) |
| *Listrognathus mactator* (Thunberg, 1822) | Alborz, Golestan | * | | Barahoei *et al*. (2012) |
| *Listrognathus orientalis* Horstmann, 1989 | Not exactly defined | | | Barahoei *et al*. (2012) |
| *Meringopus calescens* (Gravenhorst, 1829) | Fars, Mazandaran, Semnan, Tehran, Yazd, Lorestan | * | * | Barahoei *et al*. (2012); Ghahari and Gadallah (2015) |
| *Meringopus cyanator* (Gravenhorst, 1829) | East Azerbaijan | | | Barahoei *et al*. (2012) |
| *Meringopus naitor* Aubert, 1986 | Fars, Yazd | | | Barahoei *et al*. (2012) |
| *Meringopus palmipes* (Kokujev, 1905) | East Azerbaijan, Tehran | | | Barahoei *et al*. (2012) |
| *Meringopus pseudonymus* (Tschek, 1872) | West Azerbaijan, Lorestan | | | Barahoei *et al*. (2012); Ghahari and Gadallah (2015) |

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| *Meringopus sogdianus* (Maljavin, 1968) | Kerman | | | Barahoei *et al*. (2012) |
| *Meringopus titillator* (Linnaeus, 1758) | Fars, Alborz, Mazandaran, Tehran | * | * | Barahoei *et al*. (2012) |
| *Meringopus turanus* (Habermehl, 1918) | Ardabil, Guilan, East Azerbaijan | * | | Barahoei *et al*. (2012) |
| *Mesostenus albinotatus* Gravenhorst, 1829 | Kerman, Mazandaran | * | * | Mohebban *et al*. (2015, 2016) Mahyabadai *et al*. (2016a,b) Current study |
| *Mesostenus grammicus* Gravenhorst, 182 | Fars, Kerman Golestan, Mazandaran | * | * | Mahyabadai *et al*. (2016a,b) Barahoei *et al*. (2012) Ghahar and Jussila (2016) |
| *Mesostenus transfuga* Gravenhorst, 1829 | Fars, Guilan, Mazandaran, Isfahan, Kerman, Khorasan-e Razavi, Lorestan, Qazvin | * | * | Mahyabadai *et al*. (2016a,b), Barahoei *et al*. (2012, 2014, 2015); Ghahari and Gadallah (2015); Ghahari and Schwarz (2012) |
| *Myrmeleonostenus italicus* (Gravenhorst, 1829) | Fars | | | Barahoei *et al*. (2012) |
| *Pycnocryptodes reticulator* Aubert, 1971 | West Azerbaijan | | | Barahoei *et al*. (2012) |
| *Schreineria cingulipes* (Förster, 1888) | Khorasan-e Razavi | | | Barahoei *et al*. (2012) |
| *Schreineria populnea* (Giraud, 1872) | Hamadan | | | Barahoei *et al*. (2012) |
| *Sphecophaga vesparum* (Curtis, 1828) | Fars | | | Barahoei *et al*. (2012) |
| *Stenarella domator* (Poda, 1761) | Hamadan | | | Barahoei *et al*. (2012) |
| *Synechocryptus levaillantii* (Lucas, 1849) | Golestan, Yazd | * | | Barahoei *et al*. (2012) |
| *Synechocryptus persicator* Aubert, 1986 | Fars, Mazandaran | * | * | Barahoei *et al*. (2012) |
| *Synechocryptus sanguinolentus* (Gravenhorst, 1829) | Fars, Isfahan, Hormozgan, Khuzestan, Semnan | | | Barahoei *et al*. (2012) |
| *Trychosis atripes* (Gravenhorst, 1829) | West Azerbaijan, Mazandaran | * | * | Barahoei *et al*. (2012) Current study |
| *Trychosis ingrata* (Tschek, 1871) | Lorestan | | | Ghahari and Gadallah (2015) |
| *Trychosis neglecta* (Tschek, 1871) | Lorestan | | | Ghahari and Gadallah (2015) |
| *Trychosis legator* (Thunberg, 1824) | Fars, Kerman, Sistan-o Baluchistan, West Azerbaijan, Khorasan-e Razavi, Qazvin | | | Mahyabadai *et al*. (2016a) Barahoei *et al*. (2012, 2014); Ghahari and Schwarz (2012) |
| *Trychosis paupe* (Tschek, 1871) | Sistan-o Baluchistan, West Azerbaijan | | | Barahoei *et al*. (2012) |
| *Trychosis priesneri* Rossem, 1971 | Khorasan-e-Razavi | | | Barahoei *et al*. (2015) |
| *Trychosis tristator* (Tschek, 1871) | West Azerbaijan, Mazandaran | * | * | Barahoei *et al*. (2012) Current study |

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|---|---|---|---|---|
| *Xylophrurus nigricornis* (Thomson, 1885) | West Azerbaijan | | | Barahoei *et al*. (2012) |
| *Aclastus micator* (Gravenhorst, 1807) | North Khorasan | | | Barahoei *et al*. (2012) |
| *Aclastus solutus* (Thomson, 1884) | Golestan, Lorestan | * | | Barahoei *et al*. (2012); Ghahari and Gadallah (2015) |
| *Atractodes* sp. | Sistan-o Baluchistan | | | Barahoei *et al*. (2012, 2013) |
| *Bathythrix maculata* (Hellén, 1957) | Kerman | | | Barahoei *et al*. (2012) |
| *Bathythrix pellucidator* (Gravenhorst, 1829) | Not exactly defined | | | Mahyabadai *et al*. (2016) |
| *Bathythrix thomasi* (Kerrich, 1942) | Lorestan | | | Ghahari and Gadallah (2015) |
| *Blapsidotes vicinus* (Gravenhorst, 1829) | West Azerbaijan, Qazvin Tehran | | | Barahoei *et al*. (2012); Ghahari and Schwarz (2012) Ghahari (2016) |
| *Ceratophygadeuon varicornis* (Thomson, 1884) | Mazandaran | * | * | Current study |
| *Chirotica decorator* (Villers, 1789) | Qazvin | | | Ghahari and Schwarz (2012) |
| *Chirotica maculipennis* (Gravenhorst, 1829) | Mazandaran | * | * | Current study |
| *Chirotica ruficeps* Horstmann, 1983 | Fars | | | Barahoei *et al*. (2012) |
| *Chirotica terebrator* Horstmann, 1983 | Fars | | | Barahoei *et al*. (2012) |
| *Dichrogaster aestivalis* (Gravenhorst, 1829 | Khorasan-e Razavi, East Azerbaijan, Mazandaran | | | Barahoei *et al*. (2012); Ghahari and Jussila (2010) Current study |
| *Dichrogaster liostylus* (Thomson, 1885) | North Khorasan | | | Ghahari *et al*. (2014) |
| *Dichrogaster longicaudata* (Thomson, 1884) | Fars, Mazandaran, Sistan-o Baluchistan, Kerman, Khorasan-e Razavi, East Azerbaijan, Lorestan Tehran | * | * | Mahyabadai *et al*. (2016a,b); Barahoei *et al*. (2012, 2014); Mohebban *et al*. (2015, 2016); Ghahari and Jussila (2015), Ghahari and Gadallah (2015) Ghahari (2016) |
| *Dichrogaster saharator* (Aubert, 1964) | Ardabil, Fars, Khuzestan, Mazandaran, Sistan-o Baluchistan, Tehran, Zanjan, Fars, Isfahan, Kerman, Khorasan-e Razavi, Hamadan | * | | Mahyabadai *et al*. (2016a,b); Barahoei *et al*. (2012, 2013, 2014, 2015); Sarafi *et al*. (2015) Mohebban *et al*. (2015, 2016); Ghahari and Jussila (2015) |
| *Eudelus gumperdensis* (Schmiedeknecht, 1893) | Mazandaran | * | * | Current study |
| *Endasys talitzkii* (Telenga, 1961) | Hamadan | | | Barahoei *et al*. (2012) |
| *Gelis agilis* (Fabricius, 1775) | Qazvin | | | Ghahari and Schwarz (2012) |
| *Gelis areator* (Panzer, 1804) | Not exactly defined | | | (Barahoei *et al*., 2015) |
| *Gelis bicolor* (Villers, 1789) | Kerman | | | Mahyabadai *et al*. (2016a,b) |

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|---|---|---|---|---|
| *Gelis caudator* Horstmann, 1986 | Qazvin | | | Barahoei *et al*. (2012) |
| *Gelis cinctus* (Linnaeus, 1758) | Khorasan-e Razavi | | | Ghahari *et al*. (2014) |
| *Gelis declivis* (Förster, 1850) | Guilan, Alborz, Fars | | | Mohammadi-Khoramabadi *et al.,* (2018) |
| *Gelis exareolatus* (Förster, 1850) | Kerman | | | Barahoei *et al*. (2012) |
| *Gelis fallax* (Forster, 1850) | Qazvin | | | Ghahari and Schwarz (2012) |
| *Gelis ferruginosus* (Strickland, 1912) | East Azerbaijan | | | Barahoei *et al*. (2012) |
| *Gelis fidens* Schwarz, 2009 | Sistan-o Baluchistan | | | Barahoei *et al*. (2012, 2013) |
| *Gelis formicarius* (Linnaeus, 1758) | Qazvin | | | Ghahari and Schwarz (2012) |
| *Gelis kermaniae* Schwarz, 2009 | Kerman | | | Barahoei *et al*. (2012) |
| *Gelis melanocephalus* (Schrank, 1781) | Lorestan | | | Ghahari and Gadallah (2015) |
| *Gelis mutillatus* (Gmelin, 1790) | Lorestan | | | Ghahari and Gadallah (2015) |
| *Gelis liparae* (Giraud, 1863) | Kerman | | | Barahoei *et al*. (2012) |
| *Gelis proximus* (Förster, 1850) | Ardabil, Golestan, Qazvin Mazandaran | * | * | Barahoei *et al*. (2012); Ghahari and Schwarz (2012); Ghahari and Jusilla (2016) |
| *Gelis terebrator* (Ratzeburg, 1848) | Khorasan-e Razavi | | | Ghahari *et al*. (2014) |
| *Gelis trux* (Förster, 1850) | Lorestan | | | Ghahari and Gadallah (2015) |
| *Glyphicnemis profligator* (Fabricius, 1775) | Khorasan-e Razavi | | | Ghahari *et al*. (2014) |
| *Gelis rufipes* (Bridgman, 1883) | Golestan | * | | Ghahari and Jussila (2010) |
| *Glyphicnemis vagabunda* (Gravenhorst, 1829) | Ardabil, Qazvin | * | | Barahoei *et al*. (2012); Ghahari and Schwarz (2012) |
| *Grasseiteles ciliator* Aubert, 1965 | Alborz | | | Barahoei *et al*. (2012) |
| *Lysibia nana* (Gravenhorst, 1829) | Isfahan, Kerman, Mazandaran, Golestan, Qazvin | * | * | Mahyabadai *et al*. (2016a,b), Barahoei *et al*. (2012, 2015), Mohebban *et al*. (2015, 2016); Ghahari and Jussila (2015); Ghahari and Schwarz (2012) Current study |
| *Mesoleptus incessor* (Haliday, 1838) | Golestan, Mazandaran, Semnan, West Azerbaijan | * | * | Barahoei *et al*. (2012) |
| *Mesoleptus laevigatus* (Gravenhorst, 1820) | Isfahan | | | Barahoei *et al*. (2015) |
| *Phygadeuon* sp. | Kerman | | | Mahyabadai *et al*. (2016b) |
| *Phygadeuon fumator* Gravenhorst, 1829 | East Azerbaijan, Tehran | | | Barahoei *et al*. (2012) |

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|---|---|---|---|---|
| *Phygadeuon trichops* Thomson, 1884 | Fars | | | Barahoei *et al*. (2012) |
| *Polytribax perspicillator* (Gravenhorst, 1807) | Qazvin | | | Ghahari and Schwarz (2012) |
| *Stilpnus gagates* (Gravenhorst, 1807) | Isfahan, Sistan-o Baluchistan | | | Barahoei *et al*. (2012, 2015) |
| *Thaumatogelis* sp. | Kerman | | | Mahyabadai *et al*. (2016a) |
| *Xenolytus bitinctus* (Gmelin, 1790) | Guilan | * | | Barahoei *et al*. (2012) |
| *Zoophthorus graculus* (Gravenhorst, 1829) | Lorestan | | | Ghahari and Gadallah (2015) |
| *Zoophthorus plumbeus* (Thomson, 1884) | Isfahan | | | Barahoei *et al*. (2015) |
| *Pleolophus brachypterus* (Gravenhorst, 1815) | Lorestan | | | Ghahari and Gadallah (2015) |
| *Pleolophus larvatus* (Gravenhorst, 1829) | Ardabil | * | | Barahoei *et al*. (2012) |
| *Thrybius praedator* (Rossi, 1792) | Lorestan | | | Ghahari and Gadallah (2015) |
| *Aptesis terminata* (Gravenhorst, 1829) | Guilan | * | | Ghahari and Jussila (2016) |
| *Endasys rubricator* (Thunberg, 1822) | Guilan | * | | Ghahari and Jussila (2016) |
| *Gelis zonatus* (Foerster, 1850) | Guilan | * | | Ghahari and Jussila (2016) |
| *Latibulus argiolus* (Rossi, 1790) | Mazandaran | * | * | Ghahari and Jussila (2016) |
| **Subfamily Ichneumoninae** | | | | |
| *Amblyjoppa fuscipennis* Wesmael, 1893 | East Azerbaijan | | | Barahoei *et al*. (2012) |
| *Callajoppa* caspica (Heinrich, 1929) | Fars | | | Barahoei *et al*. (2012) |
| *Coelichneumon afghanicus* Heinrich, 1957 | Mazandaran | * | * | Barahoei *et al*. (2012) |
| *Coelichneumon biannulatus* (Gravenhorst, 1820) | Ardabil, Mazandaran | * | * | Barahoei *et al*. (2012) |
| *Coelichneumon biguttulatus* (Kriechbaumer, 1875) | Guilan, Mazandaran | * | * | Barahoei *et al*. (2012) |
| *Coelichneumon comitator* (Linnaeus, 1758) | Golestan, Tehran | * | | Barahoei *et al*. (2012) |
| *Coelichneumon desinatorius* (Thunberg, 1824) | Guilan, Qazvin, Golestan | * | | Barahoei *et al*. (2012) |
| *Coelichneumon dorsosignatus* (Berthoumieu and Eversmann, 1894) | Mazandaran | * | * | Barahoei *et al*. (2012) |
| *Coelichneumon erythromerus* (Rudow, 1888) | Ardabil | * | | Barahoei *et al*. (2012) |
| *Coelichneumon falsificus* (Wesmael, 1845) | Khuzestan | | | Barahoei *et al*. (2012) |
| *Coelichneumon leucocerus* (Gravenhorst, 1820) | Hamedan, West and East Azerbaijan | | | Barahoei *et al*. (2012) |
| *Coelichneumon nigerrimus* (Stephens, 1835) | West Azerbaijan | | | Barahoei *et al*. (2012) |
| *Coelichneumon nigratus* (Berthoumieu, 1894) | Guilan | * | | Barahoei *et al*. (2012) |
| *Coelichneumon nudicoxator* Aubert, 1966 | Semnan | | | Barahoei *et al*. (2012) |
| *Coelichneumon orbitator* (Thunberg, 1824) | Isfahan, Chaharmahal-o-Bakhtiari, Markazi, Fars, Mazandaran | * | * | Barahoei *et al*. (2012) |

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|---|---|---|---|---|
| *Coelichneumon singularis* (Berthoumieu, 1892) | Sistan-o-Baluchistan, Fars, East Azerbaijan | | | Barahoei *et al*. (2012) |
| *Coelichneumon deliratorius* (Linnaeus, 1758) | Guilan, Golestan, Qazvin | * | | Masnadi and Jussila (2008) |
| *Coelichneumon orbitator* (Thunberg, 1824) | Fars, Mazandaran, Markazi, Isfahan, Chaharmahal-o-Bakhtiari | * | * | Barahoei *et al*. (2012) |
| *Coelichneumon problematicus* Riedel, Coruh & Özbek, 2010 | Tehran | | | Barahoei *et al*. (2012) |
| *Coelichneumon singularis* (Berthoumieu, 1892) | Sistan-o-Baluchistan, Fars, East Azerbaijan | | | Barahoei *et al*. (2012) |
| *Coelichneumon validus* (Berthoumieu, 1894) | Tehran | | | Barahoei *et al*. (2012) |
| *Lymantrichneumon disparis* (Poda, 1761) | Mazandaran | * | * | Barahoei *et al*. (2012) |
| *Syspasis rufina* (Gravenhorst, 1820) | Guilan, East Azerbaijan | * | | Barahoei *et al*. (2012) |
| *Syspasis scutellator* (Gravenhorst, 1829) | Tehran, Mazandaran, West Azerbaijan | * | * | Barahoei *et al*. (2012) |
| *Amblyteles armatorius* Förster, 1771 | East Azerbaijan, Isfahan, Yazd, Guilan | * | | Barahoei *et al*. (2012) |
| *Barichneumon albicaudatus* (Fonscolombe, 1847) | West Azerbaijan | | | Barahoei *et al*. (2012) |
| *Barichneumon bilunulatus* (Gravenhorst, 1829) | North Khorasan | | | Barahoei *et al*. (2012) |
| *Barichneumon incubitor* Zetterstedt var. *caucasica*, 1893 | Guilan | * | | Ghahari and Jussila (2012) |
| *Barichneumon derogator (Wesmeal, 1845)* | Kerman | | | Mohebban *et al*. (2016) |
| *Barichneumon gaullei* Berthoumieu, 1903 | Kerman | | | Mohebban *et al*. (2016) |
| *Barichneumon peregrinator* (Linnaeus, 1758) | Kermanshah, Ilam, | | | Barahoei *et al*. (2012) |
| *Barichneumon plagiarius* (Weamael, 1848) | Qazvin, Mazandaran | * | * | (Ghahari and Schwarz, 2012) Current study |
| *Barichneumon quadriguttatus* (Gravenhorst, 1829) | Kordestan, Golestan, Ardabil, East Azerbaijan | * | | Barahoei *et al*. (2012) |
| *Chasmias masanderanicus* (Heinrich, 1929) | Mazandaran | * | * | Barahoei *et al*. (2012) |
| *Crytea sanguinator* (Rossi, 1794) | Semnan, West Azerbaijan | | | Barahoei *et al*. (2012) |
| *Ctenichneumon castigator* (Fabricius, 1793) | Golestan, Guilan, Mazandaran | * | * | Barahoei *et al*. (2012) |
| *Cratichneumon coruscator* (Linnaeus, 1758) | Mazandaran | * | * | Barahoei *et al*. (2012) |
| *Cratichneumon culex* (Mulier, 1776) | Golestan, West Azerbaijan, Guilan, Semnan, North Khorasan, Isfahan, Mazandaran | * | * | Barahoei *et al*. (2012) |

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| *Eutanyacra glaucatoria* (Fabricius, 1793) | Golestan, Khorasan-e-Razavi | * | | Barahoei *et al*. (2012) |
| *Eutanyacra picta* (Schrank, 1776) | Golestan, Isfahan, Fars, Kerman, Guilan | * | | Barahoei *et al*. (2012) |
| *Exephanes occupator* (Gravenhorst, 1829) | East Azerbaijan, Guilan | * | | Barahoei *et al*. (2012) |
| *Fileanta flavolaeta* (Berthoumieu, 1892) | Ghom | | | Barahoei *et al*. (2012) |
| *Hoplismenus bidentatus* (Gmelin, 1790) | Not exactly defined | | | Barahoei *et al*. (2012) |
| *Hoplismenus bispinatorius* (Thunberg, 1824) | Mazandaran, Guilan, Zanjan | * | * | Barahoei *et al*. (2012) |
| *Hoplismenus lamprolabus* Wesmael, 1857 | Tehran, Lorestan | | | Barahoei *et al*. (2012) |
| *Ichneumon balteatus* Wesmael, 1845 | Fars, Bushehr | | | Barahoei *et al*. (2012) |
| *Ichneumon bucculentus* Wesmael, 1845 | Golestan, Mazandaran, Semnan, Tehran | * | * | Barahoei *et al*. (2012) |
| *Ichneumon caloscelis* Wesmael, 1845 | Yazd, Tehran, Guilan | * | | Barahoei *et al*. (2012) |
| *Ichneumon caedator* Gravenhorst, 1829 | North Khorasan | | | Barahoei *et al*. (2012) |
| *Ichneumon caloscelis* Wesmael, 1845 | Guilan, Yazd, Tehran | * | | Barahoei *et al*. (2012) |
| *Ichneumon caucasicus* Meyer 1926 | Guilan | * | | Barahoei *et al*. (2012) |
| *Ichneumon cerinthius* Gravenhorst, 1820 | Guilan | * | | Barahoei *et al*. (2012) |
| *Ichneumon cessator* Muller, 1776 | Mazandaran, Golestan, Guilan, East Azerbaijan | * | * | Barahoei *et al*. (2012) |
| *Ichneumon curtulus* Kriechbaumer, 1882 | Not exactly defined | | | Barahoei *et al*. (2012) |
| *Ichneumon eumerus* Wesmael, 1857 | Guilan | * | | Barahoei *et al*. (2012) |
| *Ichneumon fulvicornis* Gravenhorst, 1829 | Semnan | | | Barahoei *et al*. (2012) |
| *Ichneumon exilicornis* Wesmael, 1857 | West Azerbaijan | | | Ghahari and Jusila (2016b) |
| *Ichneumon gracilicornis* Gravenhorst, 1829 | Hamadan | | | Ghahari and Jusila (2016b) |
| *Ichneumon gracilentus* Wesmael, 1845 | Kordesatn | | | Barahoei *et al*. (2012) |
| *Ichneumon haemorrhoicus crassigena* Kriechbaumer 1887, | Guilan | * | | Barahoei *et al*. (2012) |
| *Ichneumon ignobilis* Wesmael, 1855 | Semnan | | | Barahoei *et al*. (2012) |
| *Ichneumon insidiosus* Wesmael, 1845 | Kermanshah, Khuzestan | | | Barahoei *et al*. (2012) |
| *Ichneumon igatorius* Thunberg, 1824 | Khorasan-e-Razavi | | | Barahoei *et al*. (2012) |
| *Ichneumon iranicus* (Heinrich, 1929) | Golestan | * | | Barahoei *et al*. (2012) |
| *Ichneumon languidus* Wesmael, 1845 | Guilan | * | | Barahoei *et al*. (2012) |
| *Ichneumon ligatorius* Thunberg, 1824 | Khorasan-e-Razavi | | | Barahoei *et al*. (2012) |
| *Ichneumon melanosomus* Wesmael, 1855 | West Azerbaijan | | | Barahoei *et al*. (2012) |
| *Ichneumon minutorius* Desvignes, 1856 | Khorasan-e-Razavi | | | Barahoei *et al*. (2012) |
| *Ichneumon molitorius* Linnaeus, 1761 | Hamedan, Ilam, Guilan | * | | Barahoei *et al*. (2012) |

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|---|---|---|---|---|
| *Ichneumon novemalbatus* Kriechbaumer, 1875 | Not exactly defined | | | Barahoei *et al*. (2012) |
| Ichneumon persicus Heinrich, 1929 | Guilan | * | | Barahoei *et al*. (2012) |
| *Ichneumon quaesitorius* Linnaeus, 1761 | Guilan | * | | Ghahari and Jusila (2016b) |
| *Ichneumon proletarius* Wesmael, 1848 | Tehran, Sistan-o-Baluchistan | | | Barahoei *et al*. (2012) |
| *Ichneumon ruficinctus* (Townes, Momoi and Townes, 1965) | Guilan | * | | Barahoei *et al*. (2012) |
| *Ichneumon sarcitorius* Linnaeus, 1758 | Golestan, East Azerbaijan, Semnan, Kerman Mazandaran | * | * | Barahoei *et al*. (2012); Mohebban *et al*. (2016) Current study |
| *Ichneumon sexcinctus* Gravenhorst, 1829 | Guilan | * | | Barahoei *et al*. (2012) |
| *Ichneumon tuberculipes* Wesmael, 1848 | Isfahan, Fars, Chaharmahal-o-Bakhtiari, Khuzestan | | | Barahoei *et al*. (2012) |
| *Ichneumon vafer meridionalis* Heinrich, 1929 | Mazandaran, Golestan, Guilan, Tehran, East and West Azerbaijan | * | * | Barahoei *et al*. (2012) |
| *Ichneumon xanthorius* Forster, 1771 | Mazandaran, Ilam | * | * | Barahoei *et al*. (2012) |
| *Melanichneumon glaucatoriops* Heinrich, 1972 | Noth Khorasan, West Azerbaijn | | | Barahoei *et al*. (2012) |
| *Obtusodonta equitatoria* (Panzer, 1786) | Ardabil, Isfahan | * | | Barahoei *et al*. (2012) |
| *Obtusodonta erythrocephalus* (Meyer, 1927) | Fars | | | Barahoei *et al*. (2012) |
| *Obtusodonta carnifex* (Kriechbaumer, 1882) | Guilan | * | | Barahoei *et al*. (2012) |
| *Platylabops cornicula* (Wesmael, 1855) | Semnan | | | Barahoei *et al*. (2012) |
| *Probolus concinnus* Wesmael, 1853 | East Azerbaijan | | | Barahoei *et al*. (2012) |
| *Probolus culpatorius* (Linnaeus, 1758) | Golestan | * | | Barahoei *et al*. (2012) |
| *Pseudoamblyteles homocerus* | Semnan | | | Barahoei *et al*. (2012) |
| *Rictichneumon lombardi* (Berthoumieu, 1897) | Chaharmahal-o-Bakhtiari | | | Ghahari and Jusila (2016b) |
| *Spilothyrateles nuptatorius* (Fabricius, 1793) | Golestan, Isfahan | * | | Barahoei *et al*. (2012, 2015) |
| *Spilichneumon occisorius* (Fabricius, 1793) | South Khorasan | | | Barahoei *et al*. (2015) |
| *Spilothyrateles illuminatorius* (Gravenhorst, 1820) | Mazandaran, Guilan, Semnan, Kerman | * | * | Barahoei *et al*. (2015); Mohebban *et al.* (2016) |
| *Spilothyrateles punctus* (Gravenhorst, 1829) | Golestan, Guilan | * | | Barahoei *et al*. (2012, 2015) |
| *Spilichneumon tennecabunensis* (Heinrich, 1929) | Guilan, Golestan | * | | Barahoei *et al*. (2012) |
| *Stenichneumon culpator* (Schrank, 1802) | Sistan-o-Baluchistan, Golestan | * | | Barahoei *et al*. (2012) |
| *Stenobarichneumon basiglyptus* (Kriechbaumer, 1890) | Mazandaran, Golestan, Yazd, Khuzestan | * | * | Barahoei *et al*. (2012) |
| *Stenobarichneumon citator* (Thunberg, 1822) | Ardabil, Mazandaran | * | * | Barahoei *et al*. (2012) Current study |
| *Thyrateles camelinus* (Wesmael, 1845) | Guilan | * | | Barahoei *et al*. (2012) |
| *Triptognathus atripes* (Gravenhorst, 1820) | Guilan | * | | Barahoei *et al*. (2012) |

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| *Triptognathus bolivari* (Berthoumieu, 1894) | Ardabil, Guilan | * | | Barahoei *et al*. (2012) |
| *Triptognathus fumigator* (Gravenhorst, 1820) | Not exactly defined | | | Barahoei *et al*. (2012) |
| *Triptognathus rubrocinctus* (Lucas, 1849) | Guilan | * | | Barahoei *et al*. (2012) |
| *Triptognathus unifasciatus* (Spinola, 1843) | Tehran, Qazvin, Guilan | * | | Barahoei *et al*. (2012) |
| *Virgichneumon albilineatus* (Gravenhorst, 1829) | Mazandaran | * | * | Current study |
| *Virgichneumon albosignatus* (Gravenhoerst, 1893) | West Azerbaijan, Khorasan-e-Razavi, Mazandaran, Golestan | * | * | Barahoei *et al*. (2012) Ghahari and Jussila (2016a) |
| *Virgichneumon callicerus* (Gravenhorst, 1820) | Ardabil, East Azerbaijan | * | | Barahoei *et al*. (2012) |
| *Virgichneumon digrammus* (Gravenhorst, 1820) | Khorasan-e-Razavi, Golestan | * | | Barahoei *et al*. (2012) |
| *Virgichneumon monostagon* Gravenhorst, 1893 | Mazandaran | * | * | Barahoei *et al*. (2012) |
| *Virgichneumon maculicauda* (Perkins, 1953) | Mazandaran, Tehran, Semnan | * | * | Barahoei *et al*. (2012) |
| *Vulgichneumon bimaculatus* (Schrank, 1776) | Guilan, Golestan, Mazandaran | * | * | Barahoei *et al*. (2012) |
| *Vulgichneumon deceptor* (Scopoli, 1763) | Kuhgiloyeh-o-Boyerahmad | | | Ghahari and Jussila (2016b) |
| *Vulgichneumon bimaculatus* (Schrank, 1776) | Golestan, Mazandaran, Guilan | * | * | Barahoei *et al*. (2012) |
| *Vulgichneumon saturatorius* (Linnaeus, 1758) | Guilan | * | | Barahoei *et al*. (2012) |
| *Vulgichneumon suavis* (Gravenhorst, 1820) | Ardabil, Guilan | * | | Barahoei *et al*. (2012) |
| *Anisobas cingulatellus* Horstmann, 1997 | Tehran, Semnan, Isfahan | | | Barahoei *et al*. (2012, 2015) |
| *Anisobas rebellis* Wesmael, 1845 | Sistsn-o-Baluchistan | | | Barahoei *et al*. (2012) |
| *Neotypus nobilitator* (Gravenhorst, 1807) | Semnan | | | Barahoei *et al*. (2012) |
| *Aethecerus persicator* Aubert, 1970 | Tehran | | | Barahoei *et al*. (2012) |
| *Centeterus confector* (Gravenhorst, 1829) | Ardabil, Guilan | * | | Barahoei *et al*. (2012); Shirzadegan *et al*. (2018) |
| *Centeterus major Wesmael, 1845* | West Azerbaijan | | | Barahoei *et al*. (2012) |
| *Centeterus rubiginosus* (Gmelin, 1790) | East Azerbaijan | | | Barahoei *et al*. (2012) |
| *Colpognathus grandiculus* Diller and Riedel, 2015 | Kerman, Alborz, Tehran, Guilan | * | | Mohebban *et al*. (2016); Shirzadegan *et al*. (2018) |
| *Colpognathus celerator* (Gravenhorst, 1807) | Guilan | * | | Barahoei *et al*. (2012); Shirzadegan *et al*. (2018) |
| *Colpognathus divisus* Thomson, 1891 | Fars | | | Barahoei *et al*. (2012) |
| *Diadromus collaris* (Gravenhorst, 1829) | Sistsn-o-Baluchistan, Golestan, Isfahan, Kerman | * | | Barahoei *et al*. (2012, 2013, 2015); Mohebban *et al*. (2016) |
| *Dicaelotus inflexus* Thomson, 1891 | West Azerbaijan | | | Barahoei *et al*. (2012) |

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| *Dicaelotus montanus* (di Stefani) | Kerman, Guilan | * | | Kazemi *et al*. (2014); Shirzadegan *et al*. (2018) |
| *Dicaelotus erythrostoma* Wesmael, 1845 | Alborz | | | Shirzadegan *et al*. (2018) |
| *Dicaelotus pudibundus* (Wesmael, 1845) | Guilan | * | | Shirzadegan *et al*. (2018) |
| *Hemichneumon subdolus* Wesmael, 1857 | Semnan, West Azerbaijan | | | Barahoei *et al*. (2012) |
| *Diadromus subtilicornis* (Gravenhorst, 1829) | Kermanshah | | | Barahoei *et al*. (2012) |
| *Diadromus ustalatus* Holmgren, 1890 | East Azerbaijan | | | Barahoei *et al*. (2012) |
| *Diadromus varicolor* Wesmael, 1845 | West Azerbaijan | | | Barahoei *et al*. (2012) |
| *Dirophanes invisor* (Thunberg, 1824) | Guilan, West Azerbaijan | * | | Barahoei *et al*. (2012) |
| *Hemiehneumon subdolus* Wesmael, 1857 | Semnan, West Azerbaijan | | | Barahoei *et al*. (2012) |
| *Herpestomus arridens* (Gravenhorst, 1829) | West Azerbaijan, Mazandaran | * | * | Barahoei *et al*. (2012) Current study |
| *Herpestomus brunnicornis* (Gravenhorst, 1829) | Tehran, East Azerbaijan | | | Barahoei *et al*. (2012) |
| *Heterischnus filiformis* (Gravenhorst, 1829) | Isfahan, Kerman | | | Barahoei *et al*. (2015); Mohebban *et al*. (2016) |
| *Heterischnus nigricollis* (Wesmael, 1845) | Kermanshah, Golestan | * | | Barahoei *et al*. (2012) |
| *Heterischnus truncator* (Fabricius, 1798) | Mazandaran, Golestan, Semnan, Ardabil, West Azerbaijan, Tehran, Guilan | * | * | Barahoei *et al*. (2012); Shirzadegan *et al*. (2018) |
| *Mevesia arguta* (Wesmael, 1845) | Mazandaran | * | * | Current study |
| *Oronotus binotatus* (Gravenhorst, 1829) | Guilan | * | | Shirzadegan *et al*. (2018) |
| *Phaeogenes heterogonus* Holmgren, 1860 | Chaharmahal-o-Bakhtiari, Isfahan, Markazi | | | Barahoei *et al*. (2012) |
| *Phaeogenes melanogonos* (Gmelin, 1790) | Ardabil | * | | Barahoei *et al*. (2012) |
| *Phaeogenes ophthalmicus* Wesmael, 1844 | Guilan | * | | Ghahari and Jussila (2012) |
| *Protichneumon fusorius* (Linnaeus, 1761) | Mazandaran | * | * | Barahoei *et al*. (2012) |
| *Protichneumon persicus* Morley, 1915 | Golestan | * | | Barahoei *et al*. (2012) |
| *Protichneumon pisorius* Linnaeus, 1903 | Mazandaran, Khorasan-e-Razavi | * | * | Barahoei *et al*. (2012) |
| *Protichneumon similatorius* (Fabricius, 1798) | Not exactly defined | | | Barahoei *et al*. (2012) |
| *Thyraeella collaris* (Gravenhorst, 1829) | Sistan-o-Baluchisan, Guilan | * | | Firuzi Jahantighi *et al.* (2013); Ghahari and Jussila (2012) |
| *Tycherus ophtalmicus* (Wesmael, 1845) | Mazandaran, East Azerbaijan | * | * | Barahoei *et al*. (2012) |
| *Apaeleticus bellicosus* Wesmael, 1845 | Kerman, Alborz | | | Mohebban *et al*. (2016); Shirzadegan *et al*. (2017) |

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| *Apaeleticus inimicus (Gravenhorst, 1820)* | Alborz, Mazandaran | * | * | Shirzadegan *et al*. (2017)<br>Current study |
| *Cyclolabus nigricollis* Wesmael, 1844 | Guilan, Ardabil | * | | Barahoei *et al*. (2012) |
| *Cyclolabus pactor* (Wesmael, 1845) | Mazandaran | * | * | Barahoei *et al*. (2012); Ghahari and Jussila (2016a) |
| *Ectopius rubellus* (Gmelin, 1790) | Mazandaran, West Azerbaijan | * | | Barahoei *et al*. (2012) |
| *Linycus exhortator* (Fabricius, 1787) | Alborz | | | Shirzadegan *et al*. (2017) |
| *Hypomecus quadriannulatus* (Gravenhorst, 1829) | Khuzestan | | | Barahoei *et al*. (2012) |
| *Platylabus heteromallus* Berthoumieu, 1910 | East Azerbaijan | | | Barahoei *et al*. (2012) |
| *Platylabus iridipennis* Gravenhorst, 1829 | Kerman, Alborz | | | Mohebban *et al*. (2016); Shirzadegan *et al*. (2017) |
| *Platylabus rufus* Wesmael, 1845 | Mazandaran | * | * | Barahoei *et al*. (2012) |
| *Platylabus tricingulatus* (Gravenhorst, 1820) | Golestan | * | | Barahoei *et al*. (2012) |
| *Eurylabus torvus* Wesmael, 1845 | East Azerbaijan | | | Barahoei *et al*. (2012) |
| *Eurylabus tristis* (Gravenhorst, 1829) | East Azerbaijan | | | Barahoei *et al*. (2012) |

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# مطالعه زیرخانواده‌های Cryptinae و Ichneumoninae ( Hymenoptera: Ichneumonidae) در استان مازندران و گزارش پنج گونه جدید برای ایران

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## چکیده

فون زیرخانواده‌های Ichneumoninae و Cryptinae (Hymenoptera: Ichneumonidae) در استان مازندران در شمال ایران، طی سال‌های ۱۳۹٥-۱۳۹٤ مطالعه شد. نمونه‌برداری با استفاده از هشت تله مالیز که در سه ارتفاع متفاوت نصب شدند، انجام شد. در مجموع از هر یک از زیرخانوده‌های Ichneumoninae و Cryptinae به‌ترتیب ٦٤ و ۱۲٦ نمونه جمع‌آوری شد که شامل ۲٥ گونه متعلق به ۲۰ جنس بود. از بین آن‌ها چهار جنس و پنج گونه برای اولین‌بار از ایران گزارش می‌شود که به شرح زیر است: *Acrolyta* Förster, 1869، *Ceratophygadeuon* Viereck, 1924، *Eudelus* Förster, 1869، *Mevesia* Holmgren, 1890، *Chirotica maculipennis* (Gravenhorst, 1829)، *Ceratophygadeuon varicornis* (Thomson, 1884)، *Eudelus gumperdensis* (Schmiedeknecht, 1893)، *Mevesia arguta* (Wesmael, 1845) و *Virgichneumon albilineatus* (Gravenhorst, 1829). همچنین فهرستی از گونه‌های این دو زیرخانواده در ایران ارائه شده است. با گزارشات جدید حاصل از این پژوهش، تعداد گونه‌های زیرخانواده Cryptinae در ایران و جنگل‌های هیرکانی به‌ترتیب به ۱۲۸ و ۳۹ گونه و برای زیرخانواده Ichneumoninae به ۱۹۱ و ۱۱٥ گونه افزایش یافت.

**واژه‌های کلیدی:** گزارش جدید، جنگل‌های هیرکانی، Ichneumonidae

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