

A study to the Iranian Cryptinae (Hymenoptera: Ichneumonidae)

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Abstract

This paper provides faunistic data for 27 species of Cryptinae in Iran, of which 12 species and three genera, *Buathra* Cameron, *Myrmeleonostenus* Uchida and *Glyphicnemis* Foerster, are newly recorded from Iran. Previously recorded species with related references are also included. Distributional map is given for all species of Cryptinae. This study increases the number of known species of Iranian Cryptinae to 55.

Key words: Ichneumonidae, Cryptinae, fauna, new record, Iran

چکیده

در این مقاله اطلاعات فونستیک مربوط به ۲۷ گونه از زنبورهای پارازیتوئید متعلق به زیرخانواده‌ی Cryptinae آورده شده است، که از این تعداد ۱۲ گونه و سه جنس *Buathra* Cameron، *Myrmeleonostenus* Uchida و *Glyphicnemis* Foerster اولین گزارش از ایران می‌باشند. همچنین نام تمام گونه‌هایی که تاکنون از این زیرخانواده، از ایران گزارش شده‌اند به همراه نقشه‌ی پراکنش و منابع گزارش به تفکیک و به صورت جدول ارائه شده است. با این تحقیق، تعداد گونه‌های شناخته شده از زیرخانواده‌ی Cryptinae از ایران به ۵۵ عدد می‌رسد.
واژگان کلیدی: Ichneumonidae، Cryptinae، فون، رکورد جدید، ایران

Introduction

The family Ichneumonidae with 39 subfamilies and more than 8700 described and several unknown species in the Palaearctic region, is one of the largest families of insects throughout the world (Yu *et al.*, 2005). This family is easily distinguished from the other parasitic wasps, such as Braconidae, with the presence of vein 2_{m-cu} in the front wing; although species of few genera like *Hybrizon* Fallen or *Neorhacodes* Hedicke have a weaker venation. The subfamily Cryptinae (Gelinae of Townes (1969)) is the largest subfamily with some similarity to Ichneumoninae, Brachycyrtine and Labeninae with which it may be confused. The clypeus is always narrow and obviously convex, the mesopleuron with a sternaulus, and also with an epicnemial carina at, or close to the anterior margin of the mesopleuron. Most Cryptinae species are idiobiont pupal or prepupal ectoparasitoids of holometabolous insects (Goulet & Huber, 1993). The subfamily has more than 4505 described species throughout the world, of which 1775 species are described from the Palaearctic region (Yu *et al.*, 2005).

Iran is located in the Western Palaearctic region with some influences from the Oriental region in the south east and has a rich fauna of insects. In spite of a supposed high

biodiversity of Iranian ichneumonid wasps, the distribution and biology of the majority of Cryptinae is not well known, and only 35 species have previously been recorded by foreign authors (Heinrich, 1937; Townes *et al.*, 1965; Rossem, 1969; Schwarz, 1999; Kolarov & Ghahari, 2005, 2007) and eight species by Iranian authors (Davachi & Shojaei, 1968; Masnadi-Yazdinejad, 2006). The aim of this paper is to improve our understanding and to provide more information about the fauna and distribution of ichneumonid wasps from the subfamily Cryptinae in Iran.

Materials and methods

Most of the examined materials, especially those collected between 1963 and 2005, belong to the Hayk Mirzayans Insect Museum (HMIM). The rests were collected by the first author using sweep nets and Malasie traps in different provinces of Iran from 1999 to 2006. The materials was preserved in Ditrux solution and pinned for identification soon after collection. The identification was made using the following references: Townes, 1969; Rossem, 1969; Kasparyan, 1974; Schwarz, 1999. Some specimens were identified and confirmed by Dr. M. Schwarz (Linz / Austria) and the second author.

Results

In this study, the faunistic data for 27 species belonging to 13 genera and 3 tribes from Cryptinae are presented, of which 12 species and three genera, *Buathra* Cameron, *Myrmeleonostenus* Uchida and *Glyphicnemis* Foerster, are new records for Iran. The newly reported species and genera are marked with one and two asterisks, respectively. For each species, the geographical distribution and locality data are provided. A complete list of subfamily Cryptinae known from Iran is given in table 1, which is based both on the material examined by the authors and on records scattered in the literature. The distributional map is given for all species (fig. 1). The specimens were deposited at HMIM, Insect Taxonomy Research Department, Iranian Research Institute of Plant Protection.

Subfamily Cryptinae

I- Tribe Cryptini

Acroricnus elegans persicus Heinrich

Material examined – 1 ♀, Tehran, Karaj, 17.vii.1971; 1 ♀, Ghom, 3.ii.1969, leg. Sharifi.

Distribution – Eastern Palaearctic, Western Palaearctic (Yu *et al.*, 2005).

***Acroricnus seductor* (Scopoli)**

Material examined – 1 ♀, Golestan, Sulgerd, 23.viii.1984, 110 m, leg. H. Mirzayans & H. Brumand.

Distribution – Eastern Palaearctic, Western Palaearctic (Yu *et al.*, 2005).

Remarks – The host species of *A. seductor* are *Sceliphron destillatorium* (Illiger), *S. spirifex* (L.), *Alsophila aescularia* (Denis & Schiffermüller) (Lep.: Geometridae) and *Loxostege sticticalis* (L.) (Lep.: Pyralidae) (Yu *et al.*, 2005).

Buathra laborator* (Thunberg)*

Material examined – 6 ♀, Ardabil, Sabalan, Ghotur, 2300 m., 28.vi.1985, leg. H. Mirzayans & A. Pazuki.

Distribution – Eastern Palaearctic, Nearctic, Western Palaearctic, Iran (Yu *et al.*, 2005).

Remarks – The host species of *B. laborator* is *Malacosoma neustria* (L.) (Lep.: Lasiocampidae) (Yu *et al.*, 2005).

Buathra tarsoleucos* (Schränk)

Material examined – 1 ♂, Tehan, Firuzkuh, Markazi district, 12 km N Firuzkuh, Vash village, 2200 m, 4.vi.2005, leg. Berg.

Distribution – Eastern Palaearctic, Europe, Western Palaearctic (Yu *et al.*, 2005).

***Cryptus inculcator* (Linnaeus)**

Material examined – 2 ♂, Tehran, Karaj, Malard, Khoshnam, 25.xi.1991. leg. E. Ebrahimi.

Distribution – Eastern Palaearctic, Europe, Western Palaearctic (Yu *et al.*, 2005).

***Cryptus medius* Szepligeti**

Material examined – 1 ♀, Fars, Shiraz, 28.v.1999, leg. A. Masnadi-Yazdinejad.

Distribution – Eastern Palaearctic (Yu *et al.*, 2005).

***Cryptus spinosus* Gravenhorst**

Material examined – 1 ♀, 1 ♂, Fars, Shiraz, 22.vii.1999, leg. A. Masnadi-Yazdinejad.

Distribution – Western Palaearctic (Yu *et al.*, 2005).

***Cryptus tuberculatus* Gravenhorst**

Material examined – 1 ♀, 1 ♂, Fars: Shiraz, 3.viii.1999, leg. A. Masnadi-Yazdinejad; 1 ♀, Bajgah, 3.viii.1999, leg. A. Masnadi-Yazdinejad.

Distribution – Eastern Palaearctic, Europe, Western Palaearctic (Yu *et al.*, 2005).

Cryptus viduatorius* Fabricius

Material examined – 1 ♂, Azarbaijan-e Gharbi, Maku, Siah Cheshmeh Tazehkand, 1700 m, 21.viii.1994, leg. E. Ebrahimi & A. Sarafrazi; 2 ♂, Gilan, Asalem, 2100 m, 29.vi.1985, leg. H. Mirzayans & A. Pazuki.

Distribution – Eastern Palaearctic, Europe, Western Palaearctic (Yu *et al.*, 2005).

Gambrus incubitor* (Linnaeus)

Material examined – 1 ♀, Golestan, Park-e Melli Golestan, Almehr, 1700 m, 25.vii.2001, leg. E. Gilasian & R. Ghayorfar.

Distribution – Eastern Palaearctic, Ethiopian, Europe, Western Palaearctic (Yu *et al.*, 2005).

Remarks – The host species of *G. incubator* are *Lobesia botrana* (Denis & Schiffermüller) (Lep.: Tortricidae) and *M. neustria* (Yu *et al.*, 2005).

***Hoplocryptus bellosus* (Curtis)**

Material examined – 1 ♀, Fars: Shiraz, 22.vii. 1999, leg. A. Masnadi-Yazdinejad; 2 ♂, Bajgah, 3.viii.1999, leg. A. Masnadi-Yazdinejad.

Distribution – Europe, Western Palaearctic (Yu *et al.*, 2005).

Remarks – *H. bellosus* is known as an ectoparasitoid of larvae (Yu *et al.*, 2005).

***Listrognathus mactator* ssp. *persicator* Aubert**

Material examined – 1 ♀, Tehran, Karaj, 12.v.1982, leg. A. Hashemi.

Distribution – Eastern Palaearctic, Europe, Western Palaearctic (Yu *et al.*, 2005).

***Meringopus calescens* (Gravenhorst)**

Material examined – 1 ♀, Semnan: Shahrud, Shahkuh-e Paiin, 2702 m, 18.vii.2003, leg. H. Alipanah; 1 ♀, Shahkuh, Gandab, 2500 m, 1.vi.1982, leg. A. Hashemi.

Distribution – Eastern Palaearctic, Nearctic, Oriental, Europe, Western Palaearctic (Yu *et al.*, 2005).

Remarks – The host species of *M. calescens* is *Saturnia pyri* (Denis & Schiffermüller) (Lep.: Saturniidae) (Yu *et al.*, 2005).

Meringopus cyanator* (Gravenhorst)

Material examined – 1 ♀, Azarbayjan-e Sharghi, Sahand, 27.6.1970, leg. A. Pazuki.

Distribution – Eastern Palaearctic, Europe, Western Palaearctic (Yu *et al.*, 2005).

Remarks – The important host species of *M. cyanator* are *Lymantria dispar* (L.) (Lep.: Lymantriidae) and *M. neustria* (Yu *et al.*, 2005).

Meringopus palmipes* (Kokujev)

Material examined – 1 ♀, Azarbayjan-e Sharghi, Lighvan, 2440 m, 3.viii.1992, leg. M. Parchami-Araghi & H. Badii.

Distribution – Eastern Palaearctic (Yu *et al.*, 2005).

***Meringopus titillator* (Linnaeus)**

Material examined – 1 ♂, Tehran, Firuzkuh, Markazi district, 12 km N Firuzkuh, Vash village, 2200 m, 4.vi. 2005, leg. Berg; 1 ♂, Firuzkuh, Markazi district, 28 km, E Firuzkuh, Peynap valley, 2450 m, 3.vi.2005, leg. Berg.

Distribution – Eastern Palaearctic, Europe, Western Palaearctic (Yu *et al.*, 2005).

***Meringopus turanus* (Habermehl)**

Material examined – 2 ♀, Gilan, Asalem, 2100 m, 29.6.1985, leg. H. Mirzayans & A. Pazuki; 1 ♀, Azarbayjan-e Sharghi, Mianeh, Bozhjush, 2250 m, 29.vii.1992. leg. M. Parchami-Araghi; 1 ♀, Ardabil: Daryacheh-e Neur, 2350 m, 30.vii.1997, leg. V. Nazari; 1 ♀, Nour Lake, 2450 m, 21.vi.1973, leg. Gh. Rajabi.

Distribution – Eastern Palaearctic, Oriental, Europe, Western Palaearctic (Yu *et al.*, 2005).

***Mesostenus grammicus* Gravenhorst**

Material examined – 1 ♂, Fars: Shiraz, 22.vii.1999, leg. A. Masnadi-Yazdinejad; 2 ♂, Hajiabad, 23.v.2000, leg. A. Masnadi-Yazdinejad; 1 ♂, Kohmarr-e Sorkhi, 25.vii.2000, leg. A. Masnadi-Yazdinejad.

Distribution – Eastern Palaearctic, Europe, Western Palaearctic (Yu *et al.*, 2005).

Remarks – *M. grammicus* is one of the parasitoids of *Cydia pomonella* (L.) (Lep.: Tortricidae) and *Ephesia kuehniella* Zeller (Lep.: Gelechiidae) (Yu *et al.*, 2005).

Myrmeleonostenus italicus* (Gravenhorst)*

Material examined – 1 ♂, Fars, Shiraz, 26.vi.1999, leg. A. Masnadi-Yazdinejad.

Distribution – Eastern Palaearctic, Europe, Western Palaearctic (Yu *et al.*, 2005).

Remarks – *Myrmeleon formicarius* L. (Neu.: Myrmeleontidae) is the host species of *M. italicus* (Yu *et al.*, 2005).

***Sphexophaga vesparum* Curtis**

Material examined – 1 ♀, Fars, Shiraz, 22.v.1999, leg. A. Masnadi-Yazdinejad.

Distribution – Eastern Palaearctic, Nearctic, Oceanic, Europe, Western Palaearctic (Yu *et al.*, 2005).

Synechocryptus bovei* (Brullé)

Material examined – 1 ♀, Khozestan: Behbahan, 1.v.1969, leg. Ayatollahi & Zairi; 1 ♀, Andimeshk, 7.v.1972, leg. Zairi; 1 ♀, Hormozgan, Bandarabbass, 29.iii.1963, leg. M. Safavi; 1 ♂, Fars, Thion, 29.vii.1999, leg. A. Masnadi-Yazdinejad.

Distribution – Ethiopian, Western Palaearctic (Yu *et al.*, 2005).

***Trychosis legator* (Thunberg)**

Material examined – 1 ♀, Fars: Sadra, 26.iv.2000, leg. A. Masnadi-Yazdinejad; 1 ♀, Ghasr-e Ghomshe, 26.iv.2000, leg. A. Masnadi-Yazdinejad.

Distribution – Eastern Palaearctic, Europe, Western Palaearctic (Yu *et al.*, 2005).

Remarks – *T. legator* is known as the parasitoid of egg sacs of spiders (Yu *et al.*, 2005).

II- Tribe Hemigasterini

Pleolophus larvatus* (Gravenhorst)

Material examined – 4 ♂, Ardabil, Sabalan, 2300 m, 28.vi.1985, leg. H. Mirzayans & A. Pazuki.

Distribution – Western Palaearctic (Yu *et al.*, 2005).

Remarks – *P. larvatus* emerges from host cocoons (Yu *et al.*, 2005).

III- Tribe Phygadeuontini

Endasys talitzkii (Telenga)*

Material examined – 1 ♀, Hamedan, Lalejin, Soleymanabad, 1730 m, 14.vii.2001, leg. E. Ebrahimi.

Distribution – Western Palaearctic (Yu *et al.*, 2005).

Glyphicnemis vagabunda (Gravenhorst)**

Material examined – 14 ♂, Ardabil, Sabalan, Ghotur, 2300 m, 28.vi.1985, leg. H. Mirzayans & A. Pazuki.

Distribution – Eastern Palaearctic, Europe, Western Palaearctic (Yu *et al.*, 2005).

Phygadeuton fumator Gravenhorst*

Material examined – 1 ♂, Tehran, Varamin, Mohsenabad, 800 m, 4.v.1991, leg. E. Ebrahimi & H. Badii; 1 ♂, Azarbaijan-e Sharghi, Maku, Siah Cheshmeh, Tazehkand, 1700 m, 21.viii.1994, leg. E. Ebrahimi & A. Sarafrazi.

Distribution – Eastern Palaearctic, Nearctic, Europe, Western Palaearctic (Yu *et al.*, 2005).

Remarks – *P. fumator* is the parasitoid of *Musca domestica* L. (Dip.: Muscidae) and *Stomoxys calcitrans* (L.) (Dip.: Muscidae), and emerges from the pupal stage (Yu *et al.*, 2005).

Phygadeuton trichops Thomson

Material examined – 1 ♀, Fars, Shiraz, 26.vi.1999, leg. A. Masnadi-Yazdinejad.

Distribution – Eastern Palaearctic, Europe, Western Palaearctic (Yu *et al.*, 2005).

Remarks – *P. trichops* is the pupal parasitoid of *Delia antique* (Meigen) (Dip.: Anthomyiidae), *M. domestica* and *Pegomya betae* (Curtis) (Dip.: Anthomyiidae), and emerges from pupae (Yu *et al.*, 2005).

Table 1. List of Ichneumonid species known from Iran belonging to the subfamily Cryptinae.

Tribe	Species	Reference/s	
Cryptini	<i>Acroricnus elegans</i> Heinrich	Heinrich, 1937; Townes <i>et al.</i> , 1965; Yu & Horstmann, 1997; Kolarov & Ghahari, 2005	
	<i>Acroricnus seductor</i> (Scopoli)	Townes <i>et al.</i> , 1965; Kolarov & Ghahari, 2005	
	<i>Buathra laborator</i> (Thunberg)	New record	
	<i>Buathra tarsoleucos</i> (Schrank)	New record	
	<i>Cryptus australis</i> Cameron	Kolarov & Ghahari, 2007	
	<i>Cryptus inculcator</i> (Linnaeus)	Davachi & Shojaei, 1968	
	<i>Cryptus medius</i> Szepliget	Masnadi-Yazdinejad, 2006	
	<i>Cryptus spinosus</i> Gravenhorst	Masnadi-Yazdinejad, 2006	
	<i>Cryptus triguttatus</i> Gravenhorst	Kolarov & Ghahari, 2007	
	<i>Cryptus tuberculatus</i> Gravenhorst	Masnadi-Yazdinejad, 2006	
	<i>Cryptus viduatorius</i> Fabricius	New record	
	<i>Gambrus incubitor</i> (Linnaeus)	New record	
	<i>Hoplocryptus bellosus</i> (Curtis)	Masnadi-Yazdinejad, 2006	
	<i>Ischnus alternator</i> (Gravenhorst)	Kolarov & Ghahari, 2007	
	<i>Listrognathus furax</i> (Tschek)	Schwarz, 1999; Kolarov & Ghahari, 2005	
	<i>Listrognathus mactator</i> Aubert	Schwarz, 1999	
	<i>Listrognathus orientalis</i> Horstmann	Horstmann, 1990; Kolarov & Ghahari, 2005	
	<i>Meringopus calescens</i> (Gravenhorst)	Townes <i>et al.</i> , 1965; Rossem, 1969; Yu & Horstmann, 1997; Kolarov & Ghahari, 2005	
	<i>Meringopus cyanator</i> (Gravenhorst)	New record	
	<i>Meringopus nator</i> Aubert,	Yu & Horstmann, 1997; Kolarov & Ghahari, 2005	
	<i>Meringopus palmipes</i> (Kokujev)	New record	
	<i>Meringopus sogdianus</i> (Maljavin)	Aubert, 1990; Kolarov & Ghahari, 2005	
	<i>Meringopus titillator</i> (Linnaeus)	Rossem, 1969; Kolarov & Ghahari, 2005	
	<i>Meringopus turanus</i> (Habermehl)	Aubert, 1990; Yu & Horstmann, 1997; Kolarov & Ghahari, 2005	
	<i>Mesostenus grammicus</i> Gravenhorst	Masnadi-Yazdinejad, 2006	
	<i>Mesostenus transfuga</i> Gravenhorst	Kolarov & Ghahari, 2007	
	<i>Myrmeleonostenus italicus</i> (Gravenhorst)	New record	
	<i>Schreineria cingulipes</i> (Forster)	Kolarov & Ghahari, 2007	
	<i>Schreineria populnea</i> (Giraud)	Kolarov & Ghahari, 2007	
	<i>Sphecofaga vesparum</i> Curtis	Masnadi-Yazdinejad, 2006	
	<i>Stenarella domator</i> (Poda)	Kolarov & Ghahari, 2007	
	<i>Synechocryptus bovei</i> (Brullé)	New record	
	<i>Synechocryptus levaillantii</i> (Lucas)	Yu & Horstmann, 1997; Kolarov & Ghahari, 2005	
	<i>Synechocryptus persicator</i> Aubert	Kolarov & Ghahari, 2007	
	<i>Synechocryptus sanguinolentus</i> (Brulle)	Kolarov & Ghahari, 2007	
	<i>Trychosis legator</i> (Thunberg)	Masnadi-Yazdinejad, 2006	
	<i>Trychosis pauper</i> (Tschek)	Kolarov & Ghahari, 2007	
	<i>Xylophrurus nigricornis</i> (Thomson)	Kolarov & Ghahari, 2007	
	Phygadeuontini	<i>Aclastus micator</i> (Gravenhorst)	Kolarov & Ghahari, 2007
		<i>Bathythrix maculate</i> (Hellen)	Kolarov & Ghahari, 2007
		<i>Bathythrix pellucidator</i> (Gravenhorst)	Sawoniewicz, 1980; Kolarov & Ghahari, 2005
		<i>Chirotica ruficeps</i> Horstmann	Kolarov, 1995; Yu & Horstmann, 1997; Kolarov & Ghahari, 2005
		<i>Chirotica terebrator</i> Horstmann	Kolarov & Ghahari, 2005
		<i>Dichrogaster longicaudata</i> (Thomson)	Kolarov & Ghahari, 2007
		<i>Dichrogaster saharator</i> (Aubert)	Kolarov & Ghahari, 2007
		<i>Endasys talitzkii</i> (Telenga)	New record
		<i>Gelis exareolatus</i> (Foerster)	Schwarz, 1998; Kolarov & Ghahari, 2005
<i>Glyphicnemis vagabunda</i> (Gravenhorst)		New record	
<i>Grasseiteles ciliator</i> Aubert		Kolarov & Ghahari, 2007	
<i>Lysibia nana</i> (Gravenhorst)		Kolarov & Ghahari, 2007	
<i>Mesoleptus scrutator</i> (Haliday)		Kolarov & Ghahari, 2007	
<i>Phygadeuton fumator</i> Gravenhorst		New record	
<i>Phygadeuton trichops</i> Thomson		Masnadi-Yazdinejad, 2006	
<i>Xenolytus bitinctus</i> (Gmelin)		Kolarov & Ghahari, 2007	
Hemigasterini		<i>Pleolophus larvatus</i> (Gravenhorst)	New record

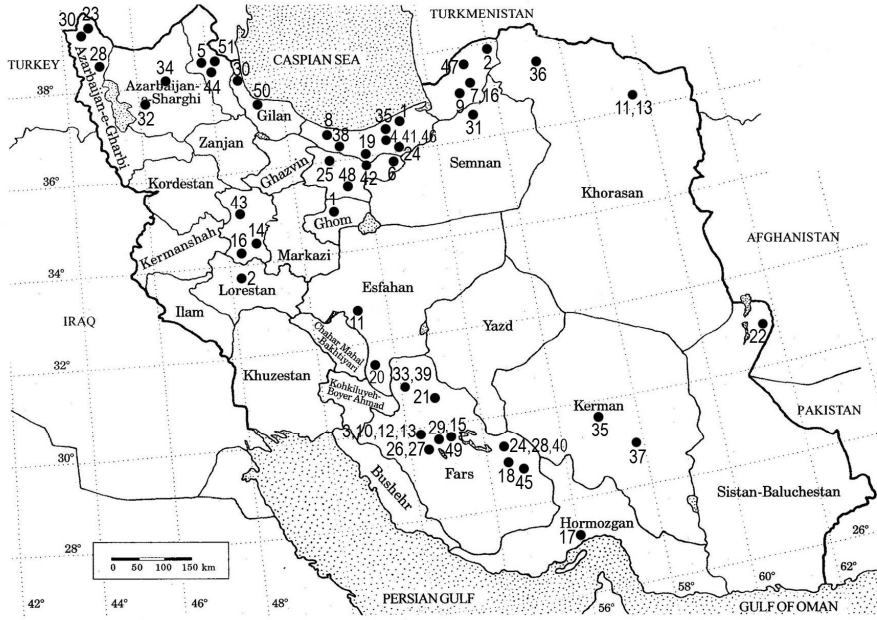


Figure 1. Collecting localities for the species of the subfamily Cryptinae from Iran. The tribe Cryptini: 1- *Acroricnus elegans*, 2- *A. seductor*, 3- *Hoplocryptus bellosus* 4- *Ischnus alternator*, 5- *Buathra laborator*, 6- *B. tarsoleucos*, 7- *Gambrus incubator*, 8- *Listrognathus furax*, 9- *L. mactator*, (*L. orientalis* has been recorded by Kolarov & Ghahari (2005) without locality), 10- *Mesostenus grammicus*, 11- *M. transfuga*, 12- *Myrmeleonostenus italicus*, 13- *Schrenieria cingulipes*, 14- *S. populnea*, 15- *Sphecofaga vesparum*, 16- *Stenarella domator*, 17- *Synechocryptus boevi*, 18- *S. levaillantii*, 19- *S. persicator*, 20- *S. sanguinolentus*, 21- *Trychosis legator*, 22- *T. paupes*, 23- *Xylophrurus nigricornis*, 24- *Cryptus australus*, 25- *C. inculator*, 26- *C. medius*, 27- *C. spinosus*, 28- *C. triguttatus*, 29- *C. tuberculatus*, 30- *C. viduatorius*, 31- *Meringopus calescens*, 32- *M. cyanator*, 33- *M. naitor*, 34- *M. palmipes*, 35- *M. sogdianus*, (*M. titillator* and *M. turanus* have been recorded by Kolarov & Ghahari (2005) without localities); the tribe Phygadeuontini: 36- *Aclastus micator*, 37- *Bathythrix maculate*, 38- *B. pellucidator*, 39- *Chirotica ruficeps*, 40- *C. terebrator*, 41- *Dichrogaster longicaudata*, 42- *D. saharator*, 43- *Endasyx talitzkii*, 44- *Glyphicnemis vagabunda*, 45- *Grasseiteles ciliator*, 46- *Lysibia nana*, 47- *Mesoleptus scrutator*, 48- *Phygadeuton fumator*, 49- *P. trichops*, 50- *Xenolytus bitinctus*, (*Gelis exareolatus* has been recorded by Kolarov & Ghahari (2005) without locality); the tribe Hemigasterini: 51- *Pleolophus larvatus*.

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References

- Aubert, J. F.** (1990) Adjonctions aux Cryptini et autres Ichneumonides pétiolées. *Bulletin de la Société Entomologique de Mulhouse* 5, 49-54.
- Davachi, A. & Shojaei, M.** (1968) Les Hymenopteres entomophages de l'Iran-etudes faunestiques. *The First Iranian Plant Protection Congress*. 89 pp.
- Goulet, H. & Huber, J.** (1993) *Hymenoptera of the world; an identification guide to families*. 667 pp. Research Branch, Agriculture Canada Publication, Monograph No. 1894/E.
- Heinrich, G. H.** (1937) Zur Systematik der Ichneumoninae Stenopneusticae VIII (Hym.). *Mitteilungen der Deutschen Entomologischen Gesellschaft* 8, 51-54.
- Horstmann, K.** (1990) Die westpalaarktischen Arten einiger Gattungen der Cryptini (Hymenoptera, Ichneumonidae). *Mitteilungen Munchener Entomologoschen Gesellschaft* 79, 65-89.
- Kasparyan, D. R.** (1974) On the fauna of ichneumonids of the Mongolian People's Republic; tribes Pimplini, Tryphonini and the genus *Lycorina*. *Insects of Mongolia* 2, 250-258. [In Russian].
- Kolarov, J.** (1995) A catalogue of the Turkish Ichneumonidae (Hymenoptera). *Entomofauna* 16(7), 137-188.
- Kolarov, J. & Ghahari, H.** (2005) A catalogue of Ichneumonidae (Hymenoptera) from Iran. *Linzer biologische Beiträge* 37, 503-532.
- Kolarov, J. & Ghahari, H.** (2007) A study of the Iranian Ichneumonidae (Hymenoptera): I. Pimplinae and Tryphoninae. *Zoology in the Middle East* 38, 63-68.
- Masnadi-Yazdinejad, A.** (2006) First report of ten wasp species (Hym.: Ichneumonidae: Cryptinae) from Iran. *Journal of Entomological Society of Iran* 25(2), 79-82.
- Rossem, G. Van.** (1969) A study of the genus *Meringopus* Förster in Europe and of some related species in Asia. *Tijdschrift voor Entomologie* 112, 165-196.
- Sawoniewicz, J.** (1980) Revision of European species of the genus *Bathythrix* Foerster (Hym., Ichneumonidae). *Annales Zoologici* 35, 319-365.

- Schwarz, M.** (1998) Revision der westpalaarktischen Arten der Gattungen *Gelis* Thunberg mit apteren Weibchen und *Thumatogelis* Schmiedeknecht (Hymenoptera, Ichneumonidae), Teil 2. *Linzer biologische Beiträge* 30(2), 629-704.
- Schwarz, M.** (1999). Anmerkungen zu einigen westpaläarktischen Arten der Gattung *Listrognathus* Tschek (Hymenoptera, Ichneumonidae). *Linzer biologische Beiträge* 31, 459-463.
- Townes, H.** (1969) The genera of Ichneumonidae, part 1. *Memoirs of the American Entomological Institute* 11, 1-300.
- Townes, H., Momoi, S. & Townes, M.** (1965) A catalogue and reclassification of the Eastern Palearctic Ichneumonidae. *Memoirs of the American Entomological Institute* 5, 1-661.
- Yu, D. & Horstmann, K.** (1997) A catalogue of world Ichneumonidae (Hymenoptera), *Memoirs of the American Entomological Institute* 58(1-2), 1-1558.
- Yu, D. S., Van Achterberg, K. & Horstmann, K.** (2005) *World Ichneumonoidea 2004, taxonomy, biology, morphology and Distribution*. CD/DVD, Taxapad, Vancouver, Canada.

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