

# Preliminary checklist of Iranian mymarids (Hymenoptera: Chalcidoidea, Mymaridae)

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## Abstract

Twenty-seven species of Mymaridae (Hymenoptera: Chalcidoidea) belonging to eight genera are recorded from Iran: *Anagrus* Haliday (4 species), *Anaphes* Haliday (2 species), *Camoptoptera* Foerster (1 species), *Erythmelus* Enock (4 species), *Gonatocerus* Nees (10 species), *Mymar* Curtis (1 species), *Polynema* Haliday (3 species), and *Stephanodes* Enock (2 species). Brief information on their known biology and hosts is provided. Two genera, *Gonatocerus* and *Anagrus*, include about 80% of specimen composition.

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## Introduction

The family Mymaridae includes some of the smallest known insects: the combined lengths of three or even four adult individuals may not even equal 1 mm (Annecke & Doutt, 1961). More than 1400 species

and 100 genera are known (Noyes, 2013). This family is one of the most distinctive of the superfamily Chalcidoidea, in having the antennal toruli quite far apart (3-5 times their own diameter), usually a reduced wing venation, and distinctive fringed wings (Nikol'skaya, 1978). Its members are abundant and easily collected using a variety of trapping methods. The hosts of Mymaridae include eggs of Hemiptera, Psocoptera, Coleoptera, Orthoptera and some other insect orders (Huber, 1986). But only about one quarter of the genera have hosts reported for them. As in the Trichogrammatidae, several mymarids attack eggs of the aquatic insects. Huber (1986) published a comprehensive review of the known hosts of the mymarids known to that date. A few species of mymarids have been responsible for biological control successes (Lin *et al.*, 2007).

Unfortunately, the fauna of this family has not been studied comprehensively in Iran, so that only 11 species, namely *Anagrus atomus* (L.), *A. nigriceps* (Smits van Burgst), *Erythmelus flavovarius* (Walker), *E. israeliensis* Viggiani & Jesu, *E. panis* (Enock), *E. rex* (Girault), *Gonatocerus litoralis* (Haliday), *G. oxygygus* Foerster (as *G. ovicentatus* Leonard & Crosby), *Mymar taprobanicum* Ward, *Stephanodes reduvioli* (Perkins) and *S. similis* (Foerster) were previously reported from Iran (Fallahzadeh & Huber, 2011). Fallahzadeh & Huber (2011) listed 10 species from Iran. Later, Triapitsyn (2013), Haghayeghi-Nosrati *et al.* (2013), Bayegan *et al.* (2014) and Haghayeghi-Nosrati *et al.* (2014) added some new records and increased the number of known species from country. So, prior to present study, the total numbers of mymarid species recorded from Iran were 20.

The present contribution to their knowledge in Iran is based mainly on new data and material accumulated in recent years by the author. Also some biological and ecological studies were made by Hesami *et al.* (2004, 2009), Latifian & Soleyman-Nejadian (2009), and Akbarzadeh-Shoukat (1998).

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## Materials and methods

The specimens were collected with a Malaise trap during 2011-2013. Samples were collected and labelled every 7-10 days, replacing alcohol in the collecting vessel.

Captures were made in different areas of Iran including East-Azərbayjan Province: Khosroshahr (N 37° 58' 28" and E 46° 02' 55", elevation 1346 m). Then specimens were sorted into vials with 70-80% ethyl alcohol. Because of their small size, slide preparations of the entire or dissected specimens are needed, preferably using a permanent mounting medium as Canada balsam, to see some of the distinguishing features. Representatives from each morphospecies, both females and males, were slide-mounted into Canada balsam using the technique described by Noyes (1982) and modified for the Mymaridae by Dr. J. T. Huber (pers. communication). Approximately 350 slide-

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Key words: Hymenoptera; Mymaridae; Chalcidoidea; fauna; distribution; Iran.

Acknowledgements: I would like to thank Dr. Triapitsyn and Dr. Huber for confirmation of identifications and sharing their experiences on preparation of slide. I am grateful to Dr. Triapitsyn for critical comments on the manuscript.

Received for publication: 9 January 2015.

Revision received: 14 June 2015.

Accepted for publication: 18 June 2015.

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Journal of Entomological and Acarological Research 2015; 47:4838

doi:10.4081/jear.2015.4838

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mounted and pinned specimens were examined during this study. Identifications of genera were made from card-mounted specimens after drying from ethanol using HMDS. Identifications were made using the following references: Huber (1986, 1988); Huber & Fidalgo (1997); Baquero & Jordana (2003); Beardsley & Huber (2000); Matthews (1986); Noyes & Valentine (1989); Peck *et al.* (1964); Pricop (2010); Soyka (1955, 1961); Schauff (1984); Triapitsyn (1978, 2002, 2006) and Viggiani & Jesu (1988).

## Results

### List of species

#### I-Genus *Anagrus* Haliday, 1833

*Anagrus* species parasitize mainly Cicadellidae and Delphacidae (Huber *et al.*, 2009). Four species occur in Iran while two species in the UAE (Huber *et al.*, 2009), and seven species are recorded for Yemen (Huber *et al.*, 2009).

##### *Anagrus atomus* (Linnaeus, 1767)

MATERIAL EXAMINED: 4♂♂, East-Azərbayjan, Khosroshahr, 6.v.2012, H. Lotfalizadeh.

Hesami *et al.* (2001) studied the morphology of *A. atomus* that was reared from the grape leafhopper, *Arboridia kermanshah* Dlabola (Cicadellidae), in Isfahan. This species has been also reported from eggs of other insects (Chiappini, 1987; Noyes, 2013).

It is cosmopolitan and has been recorded from Europe, North Africa, Middle East, Central Asia, North and South America (Triapitsyn, 1978; Triapitsyn & Berezovskiy, 2004). *Anagrus atomus* was reported from Iran by Hesami *et al.* (2001) and Triapitsyn & Berezovskiy (2004).

##### *Anagrus nigriceps* (Smits van Burgst, 1914)

MATERIAL EXAMINED: 4♀♀ and 1♂, East-Azərbayjan, Khosroshahr, 15.iii.2012, H. Lotfalizadeh.

This species was reported from Europe, Middle East, Central Asia, China and Iran (Triapitsyn & Berezovskiy, 2004).

##### *Anagrus avalae* Soyka, 1956

MATERIAL EXAMINED: 20♀♀ and 17♂♂, East-Azərbayjan, Khosroshahr, 20.v.2012, H. Lotfalizadeh.

It is widely distributed in Europe, North America, Australia, New Zealand and Iran (Triapitsyn & Berezovskiy, 2004). Triapitsyn & Berezovskiy (2004) gave a list of known leafhopper hosts of this species.

##### *Anagrus* sp.

Material Examined: 2♀♀ and 1♂, East-Azərbayjan, Khosroshahr, vii.2012, H. Lotfalizadeh.

#### II-Genus *Anaphes* Haliday, 1833

In the neighbouring countries to Iran, one specimen of an unidentified species was collected in Oman and one in the UAE (Huber *et al.*, 2009), and also one species from Syria and Turkey (Aeschlimann, 1986).

This genus includes parasitoids of Curculionidae or Chrysomelidae and Miridae (Huber *et al.*, 2009). Some species are used as biological control agents (Huber, 1992). Species identification in *Anaphes* is very difficult, and no good keys are available.

##### *Anaphes* sp. 1

MATERIAL EXAMINED: 6♀♀ and 1♂♂, East-Azərbayjan, Khosroshahr, 1.ix.2012, H. Lotfalizadeh.

##### *Anaphes* sp. 2

MATERIAL EXAMINED: 1♂, East-Azərbayjan, Khosroshahr, 17.ix.2013, H. Lotfalizadeh.

#### III-Genus *Camptoptera* Foerster, 1856

Only two specimens of one species were collected in Iran; Huber *et al.* (2009) reported a few specimens from Yemen and Oman. The genus was reviewed by Huber (1999).

##### *Camptoptera* sp.

MATERIAL EXAMINED: 1♀, East-Azərbayjan, Khosroshahr, 1.xi.2010, H. Lotfalizadeh. 1♀, same data, 12.x.2011.

#### IV-Genus *Erythmelus* Enoch, 1909

This genus includes four species from two subgenera (*Erythmelus* s. str. and *Parallelaptera* Enoch) in Iran while three species in the UAE (Huber *et al.*, 2009), one species in Iraq (Triapitsyn, 2003), and two species in Yemen (Huber *et al.*, 2009).

*Erythmelus* species parasitize Miridae and Tingidae.

##### *Erythmelus flavovarius* (Walker, 1846)

MATERIAL EXAMINED: 1♀ and 5♂♂, East-Azərbayjan, Khosroshahr, 15.v.2013, H. Lotfalizadeh.

##### *Erythmelus israeliensis* Viggiani & Jesu, 1985

This species was reported from Karaj, Alborz Province, Iran by Triapitsyn (2003).

##### *Erythmelus rex* (Girault, 1911)

MATERIAL EXAMINED: 1♀ and 3♂♂, East-Azərbayjan, Khosroshahr, 3.vi.2013, H. Lotfalizadeh.

##### *Erythmelus panis* (Enock, 1909)

MATERIAL EXAMINED: 1♀ and 4♂♂, East-Azərbayjan, Khosroshahr, 6.vi.2013, H. Lotfalizadeh.

This species belongs to the subgenus *Parallelaptera* and is distributed in Australia, Europe, China, India (Noyes, 2013) and Iran: Alborz (Triapitsyn, 2003), West-Azərbayjan (Akbarzadeh-Shoukat, 1998) and East-Azərbayjan Provinces.

#### V-Genus *Gonatocerus* Nees, 1834

*Gonatocerus*, with seven known species in Iran, is one of the most common genera in the country (Haghighy-Nosrati *et al.*, 2013).

This genus is divided into three subgenera: *Cosmocomoidea* Howard, *Lymaenon* Walker and *Gonatocerus* Nees ab Esenbeck (Triapitsyn *et al.*, 2010; Triapitsyn, 2013). Among the collected species from Iran two belong to *Cosmocomoidea* (*ater*, *oxypygus*), one to *Gonatocerus* (*pictus*) and four to *Lymaenon* (*aureus*, *litoralis*, *novickyi*, *thyrides*).

##### *Gonatocerus* (*Cosmocomoidea*) *ater* Förster, 1841

MATERIAL EXAMINED: 1♀, East-Azərbayjan, Khosroshahr, 19.iv.2013, H. Lotfalizadeh.

It was previously reported from Iran: East-Azərbayjan Province by Haghighy-Nosrati *et al.* (2013).

*Gonatocerus (Lymaenon) aureus* Girault, 1911

MATERIAL EXAMINED: 5♀♀, East-Azərbayjan, Khosroshahr, 2.vii.2012, H. Lotfalizadeh.

This species widely distributed in the Palaearctic, Neotropical and Nearctic regions (Noyes, 2013) and Iran: East-Azərbayjan Province (Haghighyeghi-Nosrati *et al.*, 2013).

*Gonatocerus (Lymaenon) litoralis* (Haliday, 1833)

MATERIAL EXAMINED: 100♀♀ and 81♂♂, East-Azərbayjan, Khosroshahr, 8.vii.2012, H. Lotfalizadeh.

This species is widely distributed in the Palaearctic, Neotropical and Nearctic regions (Noyes, 2013) and in Iran: East-Azərbayjan and Khorasan-Razavi Provinces (Haghighyeghi-Nosrati *et al.*, 2013; Triapitsyn, 2013).

*Gonatocerus (Lymaenon) novickyi* Soyka, 1946

MATERIAL EXAMINED: 2♀♀, East-Azərbayjan, Khosroshahr, 1.vi.2013, H. Lotfalizadeh.

This species was recorded from Iran: East-Azərbayjan Province (Haghighyeghi-Nosrati *et al.*, 2013).

*Gonatocerus (Lymaenon) thyrides* (Debauche, 1948)

MATERIAL EXAMINED: 7♀♀, East-Azərbayjan, Khosroshahr, 23.xi.2013, leg. H. Lotfalizadeh.

This species is widely distributed in the Palaearctic region (Noyes, 2013) and in Iran: East-Azərbayjan Province (Haghighyeghi-Nosrati *et al.*, 2013).

*Gonatocerus (Gonatocerus) longicornis* Nees ab Esenbeck, 1834

MATERIAL EXAMINED: 3♀♀, East-Azərbayjan, Khosroshahr, 2.ix.2011, H. Lotfalizadeh. 4♀♀, Gilan Province, Roudabr, 13.xi.2012, H. Lotfalizadeh.

This species was reared from *Zyginidia sohrab* Zachvatkin, 1947 (Hem.: Cicadellidae) on *Triticum aestivum* L. in Iran (Fallahzadeh & Huber, 2011). It is distributed in the Palaearctic and Oriental regions (Noyes, 2013) and in Iran: East-Azərbayjan Province (Fallahzadeh & Huber, 2011; Haghighyeghi-Nosrati *et al.*, 2013).

*Gonatocerus (Cosmocomoidea) oxypygus* Foerster, 1856

MATERIAL EXAMINED: 15♀♀, East-Azərbayjan, Khosroshahr, 12.vii.2013, H. Lotfalizadeh.

This species widely distributed in the Palaearctic and Oriental regions (Noyes, 2013) and in Iran: Fars (Fallahzade & Huber, 2011) and Zanjan Provinces (Triapitsyn, 2013).

*Gonatocerus (Gonatocerus) pictus* (Haliday, 1833)

MATERIAL EXAMINED: 12♀♀, East-Azərbayjan, Khosroshahr, 12.vii.2013, H. Lotfalizadeh.

This species is distributed in Europe (Trjapitzin, 1978; Noyes, 2013) and Iran: East-Azərbayjan Province (Haghighyeghi-Nosrati *et al.*, 2013). *Gonatocerus pictus* is a rare species in Romania (Pricop, 2010).

*Gonatocerus (Lymaenon) sp. 1*

This undescribed species has been reported from Iran: Fars Province (Triapitsyn, 2013).

*Gonatocerus (Lymaenon) sp. 2*

This undescribed species has been reported from Iran: Khorasan-Razavi Province as an egg parasitoid of *N. tenellus* on *Artemisia* sp. and *Salsola* sp. leaves (Triapitsyn, 2013).

VI-Genus *Mymar* Curtis, 1829

Only one species of the genus *Mymar* have been reported from Iran (Bayegan *et al.*, 2014) and two species from Yemen (Huber *et al.*, 2009).

Annecke & Doult (1961) provided a key to females of the world species and Triapitsyn & Berezovskiy (2001) gave a key to females and males of the eight recognized species of *Mymar* in the world. Bayegan *et al.* (2014) collected this genus from a rice field. Huber *et al.* (2009) reported Cicadellidae and Delphacidae as hosts of this genus.

*Mymar taprobanicum* Ward, 1875

MATERIAL EXAMINED: 4♀♀ Gilan Province, 13.xi.2012, Z.-S. Bayegan. 1♀, East-Azərbayjan, Arasbaran, vii.2013.

This species is almost cosmopolitan and was reported from Iran: Gilan Province by Bayegan *et al.* (2014).

VII-Genus *Polynema* Haliday, 1833

Three undetermined species of this genus were found in the north-west of Iran. These species represent the three subgenera recognized by Triapitsyn & Fidalgo (2006): *Dorypolynema* Hayat & Anis, 1999, *Polynema* Haliday, 1833 and *Doriclytus* Forester, 1847. Four species of *Polynema* have been reported from the UAE and 10 species from Yemen (Huber *et al.*, 2009).

Members of this genus are reported as parasitoids of Hemiptera (Cicadellidae, Membracidae, Miridae, Nabidae, and Anthocoridae) and Odonata (Lestidae) (Huber *et al.*, 2009).

*Polynema (Dorypolynema) sp. 1*

MATERIAL EXAMINED: 2♀♀ and 10♂♂, East-Azərbayjan, Khosroshahr, 5.v.2012, H. Lotfalizadeh.

*Polynema (Polynema) sp. 2*

MATERIAL EXAMINED: 3♀♀ and 7♂♂, East-Azərbayjan, Khosroshahr, 20.xi.2012, H. Lotfalizadeh.

*Polynema (Doriclytus) sp. 3*

MATERIAL EXAMINED: 6♀♀ and 3♂♂, East-Azərbayjan, Khosroshahr, 26.xi.2012, H. Lotfalizadeh.

VIII-Genus *Stephanodes* Enock, 1909

Only one species was reported from Iran (Haghighyeghi-Nosrati *et al.*, 2014). *Stephanodes* species were reviewed by Huber & Fidalgo (1997).

*Stephanodes* species parasitize Nabidae and Cicadellidae (Huber *et al.*, 2009).

*Stephanodes reduvioli* (Perkins, 1905)

Triapitsyn & Berezovskiy (2002) illustrated the diagnostic characters of the two Palaearctic species. The male genitalia of *S. reduvioli* have a relatively longer phallobase and the aedeagus relatively narrower in the middle.

This species has been reported from Iran: Alborz Province, Karaj, and Shahdasht (Huber & Fidalgo, 1997).

*Stephanodes similis* (Foerster, 1847)

MATERIAL EXAMINED: 2♀♀ and 1♂, East-Azərbayjan, Khosroshahr, 5.v.2013, H. Lotfalizadeh.

*Stephanodes similis* is an egg parasitoid of Nabidae and Cicadellidae (Huber & Fidalgo, 1997).

This species is widely distributed in Europe (Pricop, 2009), North America and Argentina (Triapitsyn & Berezovskiy, 2002) and was recently reported from Iran: East-Azərbayjan Province (Haghighyeghi-Nosrati *et al.*, 2014).

## Discussion and conclusions

The list of Mymaridae in Iran includes 27 species belonging to 8 genera (Table 1), 37% of them are in the genus *Gonatocerus* with 10 species. The genera *Anagrus* and *Erythmelus* include 4 species, *Polynema* 3 species, *Anaphes* and *Stephanodes* 2 species, and *Camptoptera* and *Mymar* only 1 species. Based on the present study, the list of Iranian mymarids has increased from 10 reported species by Fallahzadeh & Huber (2011) to 27 species.

A list of the Mymaridae known from Iran is given in Table 1, which is based on the material examined and the previously recorded species. About 80% of the studied specimens belong to the genera *Gonatocerus* and *Anagrus* (Figure 1).

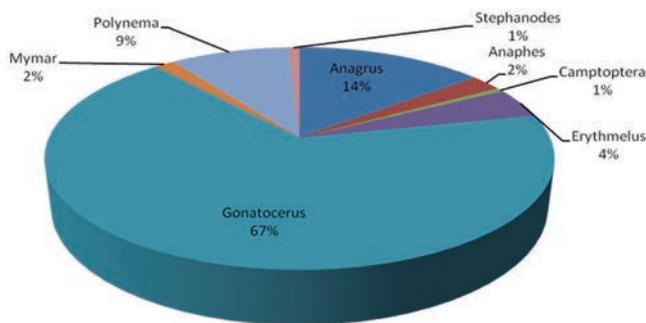


Figure 1. Composition of Mymaridae based on number of collected specimens in present study.

Table 1. List of Mymaridae known from Iran.

Genus	Species	Distribution in Iranian provinces	References
<i>Anagrus</i>	<i>A. atomus</i> (L.)	East-Azarbaijan	Present study
		Fars	Fallahzadeh & Huber (2011)
		Khorasan	Triapitsyn (1998)
		Alborz	Walker <i>et al.</i> (1997)
<i>A. nigriceps</i> (Smits van Burgst)	<i>A. nigriceps</i> (Smits van Burgst)	Isfahan	Hesami <i>et al.</i> (2001)
		East-Azarbaijan	Present study
		Alborz	Triapitsyn & Berezovskiy (2004)
		Alborz	Present study
<i>Anaphes</i>	<i>Anaphes</i> sp. 1 <i>Anaphes</i> sp. 2	East-Azarbaijan	Present study
		East-Azarbaijan	Present study
<i>Camptoptera</i>	<i>Camptoptera</i> sp.	East-Azarbaijan	Present study
<i>Erythmelus</i>	<i>E. flavovarius</i> (Walker)	Alborz	Fallahzadeh & Huber (2011)
		Alborz	Fallahzadeh & Huber (2011)
	<i>E. israeliensis</i> Viggiani & Jesu	Alborz	Triapitsyn (2003)
		East-Azarbaijan	Present study
	<i>E. rex</i> (Girault)	Alborz	Triapitsyn (2003)
<i>E. panis</i> (Enock)	East-Azarbaijan	Present study	
	Alborz	Triapitsyn (2003)	
<i>Gonatocerus</i>	<i>G. ater</i> Förster	East-Azarbaijan	Haghighyeghi-Nosrati <i>et al.</i> (2013)
		East-Azarbaijan	Haghighyeghi-Nosrati <i>et al.</i> (2013)
	<i>G. aureus</i> Girault	East-Azarbaijan	Haghighyeghi-Nosrati <i>et al.</i> (2013)
		East-Azarbaijan	Haghighyeghi-Nosrati <i>et al.</i> (2013)
	<i>G. litoralis</i> (Haliday)	Khorasan-Razavi	Triapitsyn (2013)
		East-Azarbaijan	Haghighyeghi-Nosrati <i>et al.</i> (2013)
	<i>G. novickyi</i> Soyka	East-Azarbaijan	Haghighyeghi-Nosrati <i>et al.</i> (2013)
	<i>G. thyrades</i> (Debauche)	East-Azarbaijan	Haghighyeghi-Nosrati <i>et al.</i> (2013)
	<i>G. longicornis</i> Nees ab Esenbeck	East-Azarbaijan	Haghighyeghi-Nosrati <i>et al.</i> (2013)
		Zanjan	Fallahzadeh & Huber (2011)
<i>G. oxypygus</i> Foerster	East-Azarbaijan	Haghighyeghi-Nosrati <i>et al.</i> (2013)	
	Gilan	Present study	
<i>G. pictus</i> (Haliday)	Zanjan	Triapitsyn (2013)	
	East-Azarbaijan	Haghighyeghi-Nosrati <i>et al.</i> (2013)	
<i>Gonatocerus</i> sp. 1	Fars	Triapitsyn (2013)	
	East-Azarbaijan	Haghighyeghi-Nosrati <i>et al.</i> (2013)	
<i>Gonatocerus</i> sp. 2	Khorasan Razavi	Triapitsyn (2013)	
	East-Azarbaijan	Present study	
<i>Mymar</i>	<i>M. taprobanicum</i> Ward	East-Azarbaijan	Present study
		Gilan	Bayegan <i>et al.</i> (2014)
<i>Polynema</i>	<i>Polynema</i> sp. 1 <i>Polynema</i> sp. 2 <i>Polynema</i> sp. 3	East-Azarbaijan	Present study
		East-Azarbaijan	Present study
		East-Azarbaijan	Present study
<i>Stephanodes</i>	<i>S. reduvioli</i> (Perkins) <i>S. similis</i> (Forester)	Alborz	Huber & Fidalgo (1997)
		East-Azarbaijan	Haghighyeghi-Nosrati <i>et al.</i> (2014)

## References

- AESCHLIMANN J.P., 1986 - Distribution and effectiveness of *Anaphes diana* [= *Patasson lameerei*] [Hym.: Mymaridae], a parasitoid of *Sitona* spp. eggs [Col.: Curculionidae] in the Mediterranean region. - *Entomophaga* 31: 163-172.
- AKBARZADEH-SHOUKAT G., 1998 - The first report on the occurrence of the egg parasitoid of pear lace bug in Iran. - *Appl. Entomol. Phytopath.* 66: 44-45.
- ANNECKE D.P., DOUTT R.L., 1961 - The genera of the Mymaridae. Hymenoptera: Chalcidoidea. - *Entomol. Mem. Dept. Agr. Un. S. Africa* 5: 1-71.
- BAQUERO E., JORDANA R., 2003 - The genus *Gonatocerus* Nees (Hymenoptera Chalcidoidea Mymaridae) in corn fields of Navarra, North Spain. - *Redia* 85:1-19.
- BAYEGAN Z.S., LOTFALIZADEH H., ZARGARAN M.R., POORAIIOUBY R., 2014 - New record of a genus and species of Mymaridae (Hymenoptera: Chalcidoidea) from Iran. - *Turk. J. Zool.* 38: 655-656.
- BEARDSLE, J.W., HUBER J.T., 2000 - Key to genera of Mymaridae in the Hawaiian Islands, with notes on some of the species (Hymenoptera: Chalcidoidea). - *Proc. Haw. Entomol. Soc.* 34: 1-22.
- CHIAPPINI E., 1987 - Ricerche sulla variabilità di *Anagrus atomus* (L.) (Hymenoptera: Mymaridae) e di una specie affine presente sul rovo. - *Bol. Zool. Bachicolt. Ser. II* 19: 71-97.
- ENOCK F., 1909 - New genera of British Mymaridae (Haliday). - *Trans. Entomol. Soc. Lond. Part 4*: 449-459.
- FALLAHZADEH M., HUBER J.T., 2011 - The occurrence of *Gonatocerus litoralis* (Haliday, 1833) (Chalcidoidea: Mymaridae) in Iran, with a new host record. - *Mun. Entomol. Zool.* 6: 297-300.
- GIRAULT A.A., 1911 - A new mymarid genus and species from North America allied with *Anthemus* Howard. - *Proc. Entomol. Soc. Wash.* 13: 185-187.
- HAGHAYEGHI-NOSRATI F., GHAJARYEH H., LOTFALIZADEH,H., TRIAPITSYN S.V., 2014 - New record of *Stephanodes similis* (Forester) (Hym.: Mymaridae) from Iran. - *J. Entomol. Soc. Iran* [In press].
- HAGHAYEGHI-NOSRATI F., LOTFALIZADEH H., GHAJARYEH H., 2013 - Species of the genus *Gonatocerus* (Hym.: Mymaridae) in East-Azerbaijan province. - *Appl. Entomol. Phytopath.* 81: 143-152. [In Persian].
- HESAMI S., SEYEDOLESLAMI H., EBADI R., 2001 - Morphological notes on *Anagrus atomus* (Hym.: Mymaridae), an egg parasitoid of Grape leafhopper, *Arboridia kermanshah* (Hom.: Cicadellidae) in Isfahan. - *J. Entomol. Soc. Iran* 21: 51-67.
- HESAMI S., SEYEDOLESLAMI H., EBADI R., 2004 - Biology of *Anagrus atomus* (Hym., Mymaridae), an egg parasitoid of the grape leafhopper *Arboridia kermanshah* (Hom., Cicadellidae). - *Entomol. Sci.* 7: 271-276.
- HESAMI S., SEYEDOLESLAMI H., HATAMI B., 2009 - Impact of overwintering refugia of *Anagrus atomus* on egg parasitism of grape leafhopper, *Arboridia kermanshah*. - *Plant Prot. J.* 1: 94-106.
- HUBER J.T., 1986 - Systematics, biology, and hosts of the Mymaridae and Mymaromatidae (Insecta: Hymenoptera): 1758-1984. - *Entomograp. Annu. Rev. Biosyst.* 4: 185-243.
- HUBER J.T., 1988 - The species groups of *Gonatocerus* Nees in North America with a revision of the *sulphuripes* and *ater* groups (Hymenoptera: Mymaridae). - *Can. Entomol.* 119: 1-108.
- HUBER J.T., 1992 - The subgenera, species groups and synonyms of *Anaphes* (Hymenoptera: Mymaridae) with a review of the described Nearctic species of the *fuscipennis* group of *Anaphes* s.s. and the described species of *Anaphes* (*rungaburra*). - *Proc. Entomol. Soc. Ont.* 123: 23-110.
- HUBER J.T., 1999 - World review of the *Camptoptera* group of genera (Hymenoptera: Mymaridae). - *Can. Entomol.* 130: 21-65.
- HUBER J.T., FIDALGO P., 1997 - Review of the genus *Stephanodes* (Hymenoptera: Mymaridae). - *Proc. Entomol. Soc. Ont.* 128: 27-63.
- HUBER J.T., VIGGIANI G., JESU R., 2009 - Order Hymenoptera, family Mymaridae. In: VAN HARTEN A. (Ed.), *Arthropod Fauna of the UAE. Volume 2.* - Dar Al Ummah Printing, Adu Dhabi, UAE: 270-297.
- LATIFIAN M., SOLEYMAN-NEJADIAN E., 2009 - Study on the effects of spatial distribution and density of the parasitoid *Anagrus atomus* L. (Hym., Mymaridae) on its searching efficiency on grape leafhopper eggs *Arboridia kermanshah* Dealabola (Hem., Cicadellidae). - *J. Entomol. Res.* 1: 239-248.
- LIN N.Q., HUBER J.T., LA SALLE J., 2007 - The Australian genera of Mymaridae (Hymenoptera: Chalcidoidea). - *Zootaxa* 1596: 1-111.
- MATTHEWS M.J., 1986 - The British species of *Gonatocerus* Nees (Hymenoptera: Mymaridae), egg parasitoids of Homoptera. - *Syst. Entomol.* 11: 213-229.
- NIKOL'SKAYA M.N., 1978 - Fam. Serphitidae, pp. 646-647. In Medvedeva, G. S. [ed], *Handbook of the insects of the European part of the U.S.S.R. Vol. III, Second Part.* Zool. Instit., Academy of Science U.S.S.R., Leningard. 758 pp. [In Russian].
- NOYES J.S., 1982 - Collecting and preserving chalcid wasps (Hymenoptera: Chalcidoidea). - *J. Nat. Hist.* 16: 315-334.
- NOYES J.S., 2013 - Universal Chalcidoidea Database. - Available from: <http://www.nhm.ac.uk/entomology/chalcidoidea/index.html> Accessed: 28 May 2013.
- NOYES J.S., VALENTINE E.W., 1989 - Mymaridae (Insecta: Hymenoptera) - Introduction and review of genera. - *Fauna New Zeal.* 17: 1-95.
- PECK O., BOUCEK Z., HOFFER A., 1964 - Keys to the Chalcidoidea of Czechoslovakia (Insect: Hymenoptera). - *Mem. Entomol. Soc. Can.* 34: 1-170.
- PRICOP E., 2009 - Preliminary studies of the Mymaridae (Hym., Chalcidoidea) from Neam county, Romania, species distribution, vascular flora/vegetation, an ecological approach. - *AES BIOFLUX.* 13-29.
- PRICOP E., 2010 - First record of *Gonatocerus novickyi* Soyka (Hym.: Mymaridae) in Romania, with notes on other species of *Gonatocerus* (*litoralis* group). - *Anal. Stiin. Univ. "Al. I. Cuza" Iasi (Biol. Anim.)* 56: 77-82.
- SCHAUFF M.E., 1984 - The Holarctic genera of Mymaridae (Hymenoptera: Chalcidoidea). - *Mem. Entomol. Soc. Wash.* 12: 1-67.
- SOYKA W., 1955 - Neue Revision der Gattung *Mymar* Curtis. - *Mitt. Münch. Entomol. Gesell.* 44/45: 460-475.
- SOYKA W., 1961 - Neue monographische Revision der *Camptoptera*-gruppe mit den gattungen *Camptoptera* Förster, *Stichothrix* Förster, *Macrocamptoptera* Girault und *Weranekiella* n.g. (Mymaridae, Chalcidoidea, Hymenoptera). - *Pub. Nat. Gen. Limb.* 12: 72-89.
- TRJAPITZIN V.A., 1978 - Hymenoptera II. Chalcidoidea 18. Mymaridae. - *Opredeliteli Nasekomykh Evropeyskoy Chasti SSR* 3: 516-538.
- TRIAPITSYN S.V., 1998 - *Anagrus* (Hymenoptera: Mymaridae) egg parasitoids of *Erythroneura* spp. and other leafhoppers (Homoptera: Cicadellidae) in North American vineyards and orchards: A taxonomic review. - *Trans. Am. Entomol. Soc.* 124: 77-112.
- TRIAPITSYN S.V., 2002 - Descriptive notes on a new and other little known species of *Anagrus* Haliday, 1833 (Hymenoptera: Mymaridae), collected by A. A. Oglobin in Argentina. - *Russian Entomol.* 1: 213-222.
- TRIAPITSYN S.V., 2003 - Review of the Mymaridae (Hymenoptera, Chalcidoidea) of Primorskii Krai: Genus *Erythmelus* Enoch, with taxonomic notes on some extralimital species. - *Far East. Entomol.* 126: 1-44.
- TRIAPITSYN S.V., 2006 - A key to the Mymaridae (Hymenoptera) egg parasitoids of proconiine sharpshooters (Hemiptera: Cicadellidae) in the Nearctic region, with description of two new species of *Gonatocerus*. - *Zootaxa* 1203: 1-38.
- TRIAPITSYN S.V., 2013 - Review of *Gonatocerus* (Hymenoptera:

- Mymaridae) in the Palearctic region, with notes on extralimital distributions. - *Zootaxa* 3644 (1): 1-178.
- TRIAPITSYN S.V., BEREZOVSKIY V.V., 2001 - Review of the Mymaridae (Hymenoptera, Chalcidoidea) of Primorskii Krai: genus *Mymar* Curtis. - *Far East. Entomol.* 100: 1-20.
- TRIAPITSYN S.V., BEREZOVSKIY V.V., 2002 - Review of the Mymaridae (Hymenoptera, Chalcidoidea) of Primorskii Krai: Genera *Chaetomymar* Oglobin, *Himopolynma* Taguchi, and *Stephanodes* Enock. - *Far East. Entomol.* 110: 1-11.
- TRIAPITSYN S.V., BEREZOVSKIY V.V., 2004 - Review of the genus *Anagrus* Haliday, 1833 (Hymenoptera: Mymaridae) in Russia, with notes on some extralimital species. - *Far East. Entomol.* 139: 1-36.
- TRIAPITSYN S.V., FIDALGO P., 2006 - Definition of *Doriclytus*, stat. rev. as a subgenus of *Polynema* and redescription of its type species, *P. (Doriclytus) vitripenne* (Hymenoptera: Mymaridae). - *Zootaxa* 1362: 55-68.
- TRIAPITSYN S.V., HUBER J.T., LOGARZO G.A., BEREZOVSKIY V.V., AQUINO D.A., 2010 - Review of *Gonatocerus* (Hymenoptera: Mymaridae) in the Neotropical region, with description of eleven new species. - *Zootaxa* 2456: 1-243.
- VIGGIANI G., JESU R., 1988 - Considerazioni sui Mymaridi italiani ed i loro ospiti. - *Atti [XV] Con. Nazion. Ital. Entomol. [LAquila]* 15: 1019-1029.
- WALKER G.P., ZAREH N., BAYOUN I.M., TRIAPITSYN S.V., 1997 - Introduction of western Asian egg parasitoids into California for biological control of beet leafhopper, *Circulifer tenellus*. - *Pan-Pac. Entomol.* 73: 236-242.