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## **A faunistic study on Scelionidae (Hymenoptera: Platygastroidea) from some regions of Iran**

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**Abstract:** The Scelionidae is a large family of parasitic Hymenoptera whose members specialize in egg parasitism of insects and arachnids. This paper deals with the faunistic data of scelionid wasps (Hymenoptera: Scelionidae) from some regions of Iran. In total 11 species from 4 genera, *Gryon* HALIDAY, *Scelio* LATREILLE, *Telenomus* HALIDAY, *Trissolcus* ASHMEAD and 2 subfamilies Scelioninae and Telenominae were collected and identified.

**Key words:** Hymenoptera, Scelionidae, fauna, Iran.

### **Introduction**

The Scelionidae are exclusively egg parasitoids, with a wide host array, with host-dependent morphological specialization. They show high specificity in host partitioning at tribal level (GALLOWAY & AUSTIN 1983). There are 3.308 valid species of Scelionidae (JOHNSON 2010). Scelionids have been used quite successfully in classic biological control programs directed principally against agricultural pest. Scelionids are virtually all solitary idiobiont primary parasitoids, and reports that diverge from this biology are rare and often unsubstantiated (EBERHARD 1975; GALLOWAY & AUSTIN 1984; DANGERFIELD et al. 2001). Many of the characteristics considered most desirable in a natural enemy can be found within scelionid wasps. They have high searching abilities and reproductive rates, synchrony with host populations, positive host-density responsiveness, simple adult diets, can be reared easily, and lack of hyperparasitoids (DANGERFIELD et al. 2001; SAMIN et al. 2011b).

Of the three scelionid subfamilies, the Telenominae, the Scelioninae and the Teleasinae, the first two are highly abundant, diverse and quite significant to agroecosystems. While the Lepidoptera and the Heteroptera are principal host groups for telenomines, the Orthoptera, the Heteroptera, the Coleoptera, the Odonata, the Mantodea and the araneomorph spiders form the major host assemblage of the Scelioninae (AUSTIN et al. 2005).

The fauna of Iranian Scelionidae was studied well by different researchers (RADJABI & AMIR NAZARI 1989; RADJABI 1994; NOORBAKHSH & RAZAVI 1995; IRANIPOUR et al. 1998; TAGHADDOSI & RAJABI 1998; NOORI & ASGARI 2000; MANSOUR GHAZI & RADJABI 2000; HASHEMI RAD et al. 2000, 2002; RADJABI 2001; HAGHSHENAS 2004;

HASHEMI RAD 2008; RAKHSHANI et al. 2008; SAMIN 2010; IRANIPOUR & JOHNSON 2010; FATHI et al. 2011; GHAHARI et al. 2009; HEJAZI et al. 2011; SHAFAEI et al. 2011; RAHNEMAYE-SHASAVARI et al. 2011; SAMIN et al. 2010a, b, c; 2011 a, b, c; 2012; SAMIN & ASGARI 2012a, b). Additionally some checklists were prepared on Iranian Scelionidae e.g. MODARRES AWAL 1997, SCELIONIDAE; SAMIN et al. 2010d, *Telenomus*; GHAHARI et al. 2011, *Trissolcus*). Recently, GHAHARI et al. (2015) catalogued all the data about Iranian Scelionidae which totally fifty four species have been recorded from Iran so far.

## Materials and Methods

The materials of this research were collected from some regions of Iran by rearing of some eggs of Pentatomidae and Scutelleridae (Hemiptera), *Locusta migratoria* (LINNAEUS) (Orthoptera: Acrididae), and *Sesamia cretica* LEDERER (Lepidoptera: Noctuidae) for emergence of parasitoids inside the host. Egg masses were placed in plastic bags and in optimum condition ( $26\pm 2$  °C,  $65\pm 5$  %RH, 14: 10 L: D) in incubator. Classification, nomenclature and distributional data of Scelionidae suggested by KOZLOV (1978), KOZLOV & KONONOVA (1983), KONONOVA (1992, 1995), JOHNSON (1992, 2010), KONONOVA & KOZLOV (2008) have been followed.

## Results

Totally eleven scelionid species from four genera, *Gryon* HALIDAY, *Scelio* LATREILLE, *Telenomus* HALIDAY, *Trissolcus* ASHMEAD and two subfamilies, Scelioninae and Telenominae are given in this paper. The list of species is given below alphabetically with distribution data.

### Family Scelionidae (HALIDAY, 1840)

#### Subfamily Scelioninae FÖRSTER, 1856

#### Genus *Gryon* HALIDAY, 1833

#### *Gryon monspeliense* (PICARD, 1924)

*Hadronotus monspeliensis* PICARD, 1924; *Hadronotus afanasievi* MEIER, 1949; *Hadronotus telengai* RJACHOVSKY, 1959; *Gryon afanasievi* KOZLOV, 1963; *Hadronotellus monspeliensis* SZABO, 1966.

Material examined: Lorestan province, Azna,  $33^{\circ}28'N$   $49^{\circ}25'E$ , 2 ♀♀, ex *Dolycoris baccarum* LINNAEUS, 14.v.2012.

General distribution: France (PICARD 1924), Turkey (LODOS 1982), Russia, Ukraine, Azerbaijan, Belgium, Bulgaria, Italy, Romania (KONONOVA & KOZLOV 2008).

**Genus *Scelio* LATREILLE, 1805*****Scelio flavibarbis* (MARSHALL, 1874)**

*Aleria flavibarbis* MARSHAL, 1874.

**M a t e r i a l e x a m i n e d :** Hamadan province, Malayer, 34°20'N 48°45'E, 3 ♀ ♀, ex *Locusta migratoria* (LINNAEUS) (Orthoptera: Acrididae), 11.vi.2011.

**G e n e r a l d i s t r i b u t i o n :** Corsica (MARSHAL 1874), Bulgaria, Kazakhstan, Russia Ukraine, (KONONOVA & KOZLOV 2008).

**Subfamily T e l e n o m i n a e THOMSON, 1860****Genus *Telenomus* HALIDAY, 1833*****Telenomus busseolae* GAHAN, 1922**

*Platytenomus hylas* NIXON, 1935; *Platytenomus busseolae* MASNER, 1965.

**M a t e r i a l e x a m i n e d :** Golestan province, Gorgan, 36°50'N 54°30'E, 2 ♀ ♀, 1 ♂, ex *Sesamia cretica* LEDERER (Lepidoptera: Noctuidae), 21.vii.2013.

**G e n e r a l d i s t r i b u t i o n :** Israel (KOZLOV & KONONOVA 1983), Bangladesh, Cameroon, Egypt, Ghana, Greece, Iran, Iraq, Kenya, Mauritius, Nigeria, Reunion, Senegal, South Africa, Sudan, Uganda (POLASZEK & KIMANI 1990).

***Telenomus chloropus* (THOMSON, 1861)**

*Phanurus chloropus* THOMSON, 1861; *Telenomus sokolowi* MAYR, 1897; *Telenomus mayri* SOKOLOV, 1904; *Prophanurus Sokolowi* KIEFFER, 1912; *Telenomus tischleri* NIXON, 1939; *Telenomus sokolovi* MEIER, 1940.

**M a t e r i a l e x a m i n e d :** Tehran province, Taleqan, 35.48°N 50.58°E, 3 ♀ ♀, ex *Eurygaster integriceps* PUTON, 9.viii.2012.

**G e n e r a l d i s t r i b u t i o n :** Ukraine (KIEFFER 1926), Turkey (LODOS 1961), England (JAVAHERY 1968), Armenia, Azerbaijan, Georgia, Kazakhstan, Moldova, Russia (European part, Altai, Far East) (KOZLOV & KONONOVA 1983; KONONOVA 1995), Ireland (O'CONNOR & MINEO 2009), France, Hungary, Spain, Sweden, Japan, USA (Mississippi) (JOHNSON 1984).

**Genus *Trissolcus* ASHMEAD, 1893*****Trissolcus basalis* (WOLLASTON, 1858)**

*Telenomus basalis* WOLLASTON, 1858; *Telenomus maderensis* WOLLASTON, 1858; *Telenomus megacephalus* ASHMEAD, 1895; *Telenomus megalcephalus* SCHULZ, 1906; *Telenomus piceipes* DODD, 1920; *Liophanurus megacephalus* KIEFFER, 1926; *Microphanurus basalis* NIXON, 1935; *Asolcus basalis* DELUCCHI, 1961; *Trissolcus basalis* MASNER, 1965; *Trissolcus maderensis* MASNER, 1965; *Trissolcus piceipes* MASNER, 1965; *Asolcus lodosi* SZABO, 1981.

**M a t e r i a l e x a m i n e d :** Qazvin province, Abyek, 36°03'N 50°20'E, 3 ♀ ♀, 1 ♂, ex *Eurygaster maura* (LINNAEUS), 14.vii.2011. West Azarbaijan province, Salmas, 38°11'N 44°44'E, 2 ♀ ♀, 2 ♂ ♂, ex *Eurygaster integriceps* PUTON, 24.ix.2012. Kordestan province, Qorveh, 35°15'N 47°40'E, 4 ♀ ♀, 3 ♂ ♂, ex *Aelia acuminata* (LINNAEUS), 27.vi.2013.

**General distribution:** Afrotropical, Australasian, Nearctic, Neotropical, Oriental, and Palearctic Regions (JOHNSON 1992).

***Trissolcus djadetshko* (RJACHOVSKY, 1959)**

*Microphanurus djadetshko* RJACHOVSKY, 1959; *Asolcus djadetshko* VIKTOROV, 1964.

**Material examined:** Kordestan province, Bijar, 35°52'N 47°36'E, 1 ♀, ex *Eurygaster integriceps* PUTON, 29.vi.2013.

**General distribution:** Armenia, Azerbaijan, Kazakhstan, Moldova, Russia (European part, Altai, Primorskii krai), Ukraine, Uzbekistan, Mongolia (KOZLOV & LE 1988; KONONOVA 1995), Denmark (BUHL 1999), Turkey (KOÇAK & KILINÇER 2000, 2003), Romania (POPOVICI 2004).

***Trissolcus festivae* (VIKTOROV, 1964)**

*Asolcus festivae* VIKTOROV, 1964.

**Material examined:** Zanjan province, Zanjan, 36°35'N 48°15'E, 2 ♀ ♀, ex *Eurygaster integriceps* PUTON, 16.viii.2012. Chaharmahal & Bakhtiari province, Borojien, 31°54'N 51°12'E, 1 ♀, 1 ♂, ex *Eurydema ornatum* LINNAEUS, 7.ix.2013.

**General distribution:** Armenia, Azerbaijan, Kazakhstan, Moldova, Mongolia, Russia (North Caucasus, European part, Altai), Turkmenistan, Ukraine, Uzbekistan (KOZLOV & LE 1988; KOZLOV & KONONOVA 1983), Romania (FABRITIUS 1974), Turkey (TARLA 1997).

***Trissolcus grandis* (THOMSON, 1861)**

*Telenomus grandis* THOMSON, 1861; *Telenomus nigripes* THOMSON, 1861; *Telenomus frontalis* THOMSON, 1861; *Telenomus nigrita* THOMSON, 1861; *Telenomus nigrinus* DALLA TORE, 1898; *Aphanurus nigripes* KIEFFER, 1912; *Aphanurus grandis* KIEFFER, 1912; *Aphanurus nigrita* KIEFFER, 1912; *Aphanurus frontalis* KIEFFER, 1912; *Microphanurus nigripes* KIEFFER, 1926; *Microphanurus grandis* KIEFFER, 1926; *Microphanurus nigrinus* KIEFFER, 1926; *Microphanurus frontalis* KIEFFER, 1926; *Asolcus grandis* DELUCCHI, 1961; *Asolcus nixomartini* JAVAHERY, 1968; *Asolcus silwoodensis* JAVAHERY, 1968; *Trissolcus nigripes* FERGUSSON, 1978; *Trissolcus nixomartini* FERGUSSON, 1978; *Trissolcus silwoodensis* FERGUSSON, 1978; *Telenomus nigripes* FERGUSSON, 1984; *Telenomus nixomartini* FERGUSSON, 1984; *Telenomus silwoodensis* FERGUSSON, 1984.

**Material examined:** Yazd province, Yazd, 31°53'N 54°27'E, 3 ♀ ♀, 1 ♂, ex *Eurygaster maura* (LINNAEUS), 20.iv.2012. Chaharmahal & Bakhtiari province, Koohrang, 32°25'N 50°00'E, 2 ♀ ♀, 3 ♂ ♂, ex *Dolycoris baccarum* (LINNAEUS), 6.ix.2013. Markazi province, Khomeyn, 33°40'N 50°00'E, 2 ♀ ♀, 4 ♂ ♂, ex *Graphosoma lineatum* (LINNAEUS), 15.v.2014.

**General distribution:** Denmark (THOMSON 1861), Armenia, Kazakhstan, Middle Asia, Moldova, Russia (South of Far East), Ukraine (KOZLOV & KONONOVA 1983; KONONOVA 1995), Belgium (DEBAUCHE 1947), Syria (REMAUDIÈRE & SKAF 1963), Morocco (VOEGLÉ 1964), England (JAVAHERY 1968), Romania (FABRITIUS 1974), Italy (VIGGIANI & MINEO 1974), Turkey (KOÇAK 2007), Iraq (ALI 2011).

***Trissolcus rufiventris* (MAYR, 1908)**

*Telenomus rufiventris* MAYR, 1907; *Prophanurus rufiventris* KIEFFER, 1912; *Dissolcus rufiventris* KIEFFER, 1926; *Microphanurus anitus* NIXON, 1939; *Asolcus rufiventris* MASNER, 1959.

**Material examined:** South Khorasan province, Sarbisheh, 32°24'N 60°05'E, 2♀, 1♂, ex *Aelia furcula* FIEBER, 19.iv.2013. Kermanshah province, Sonqor, 34°50'N 47°30'E, 2♀, ex *Eurygaster integriceps* PUTON, 11.viii.2014.

**General distribution:** Morocco (VOEGELÉ 1964), Romania (FABRITIUS 1974), Middle Asia, Moldova, Mongolia, West Kazakhstan, West Europe, Russia, Ukraine (North Caucasus, European part, Altai), Africa (KOZLOV & KONONOVA 1983; KONONOVA 1995), Turkey (TUATAY et al. 1972; KOÇAK 2007), Iraq (ALI 2011).

### ***Trissolcus semistriatus* (NEES, 1834)**

*Teleas semistriatus* NEES, 1834; *Telenomus ovulorum* THOMSON, 1861; *Telenomus semistriatus* MAYR, 1879; *Aphanurus semistriatus* KIEFFER, 1912; *Microphanurus semistriatus* KIEFFER, 1926; *Microphanurus alexeevi* MEIER, 1949; *Microphanurus schtepetelnikovae* MEIER, 1949; *Asolcus semistriatus* MASNER, 1959.

**Material examined:** Isfahan province, Kashan, 34°00'N 51°20'E, 2♀, 3♂, ex *Carpocoris fuscipinus* (BOHEMAN), 5.vi.2011. Semnan province, Garmsar, 35°00'N 52°20'E, 4♀, 2♂, ex *Dolycoris baccarum* LINNAEUS, 25.iv.2012. Golestan province, Azadshahr, 37°07'30"N 55°06'00"E, 2♀, 2♂, ex *Eurygaster maura* (LINNAEUS), 21.vii.2013.

**General distribution:** Armenia, Austria, Azerbaijan, Denmark, France, Germany, Moldova, Russia (European part, Altai, Primorskii krai), Ukraine (KOZLOV & KONONOVA 1983; KONONOVA 1995), England (JAVAHERY 1968), Portugal (GRAHAM 1984), Romania (FABRITIUS 1974), Turkey (LODOS 1961), Morocco (VOEGELÉ 1964), Iraq (ALI 2011).

### ***Trissolcus vassilievi* (MAYR, 1903)**

*Telenomus Vassilliewi* MAYR, 1903; *Microphanurus vassilliewi* KIEFFER, 1926; *Microphanurus vassilievi* MEIER, 1940; *Trissolcus (Microphanurus) vassilievi* RJACHOVSKY, 1959; *Asolcus vassilievi* DELUCCHI, 1961.

**Material examined:** East Azarbaijan province, Shabestar, 38°12'N 45°44'E, 4♀, 1♂, ex *Carpocoris mediterraneus* (TAMANINI), 17.vi.2013. North Khorasan province, Shirvan, 37°32'N 57°54'E, 3♀, ex *Graphosoma lineatum* (LINNAEUS), 28.viii.2014.

**General distribution:** Turkey (LODOS 1961; KOZLOV & KONONOVA 1983; KONONOVA 1995), Syria (REMAUDIÈRE & SKAF 1963), Morocco (VOEGELÉ 1964), Armenia, Moldova, Russia (European part, North Caucasus, European part), Central Asia, Mongolia, Ukraine (KOZLOV & KONONOVA 1983; KONONOVA 1995), Iraq (ALI 2011).

## **Discussion**

The several conducted researches on Iranian Scelionidae which were catalogued by GHAHARI et al. (2015) indicate that the fauna of these beneficial insects is very diverse in Iran. Scelionid wasps can have efficient role in biological control programs if the conservation methods are done effectively in agroecosystems. The main conservation of these efficient egg parasitoids can be done with management in pesticides application. Although fewer than 30 species have been used in classical biological control attempts, several of these have produced excellent results. In despite of rich faunistic works on Iranian Scelionidae but since Iran contains various geographical regions and especially diverse fauna of Pentatomoidea (GHAHARI et al. 2009, 2014) as the main hosts of

scelionid wasps, we expect that there are some other species which carrying on the faunistic surveys will result to finding new data.

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### Zusammenfassung

Vorliegende Arbeit behandelt die Faunistik der Scelionidae (Hymenoptera) aus verschiedenen Regionen Irans. Insgesamt gelang der Nachweise von 11 Arten aus den 4 Gattungen *Gryon* HALIDAY, *Scelio* LATREILLE, *Telenomus* HALIDAY und *Trissolcus* ASHMEAD, welche den Unterfamilien Scelioninae and Telenominae angehören.

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