

**A STUDY ON THE FAUNA OF SCELIONID WASPS  
(HYMENOPTERA: PLATYGASTROIDEA: SCELIONIDAE) IN THE ISFAHAN PROVINCE, IRAN**

NAJMEH SAMIN<sup>1</sup> and SHAHRIAR ASGARI<sup>2</sup>

<sup>1</sup> *Young Researchers Club, Science and Research Branch, Islamic Azad University, Tehran, Iran*

<sup>2</sup> *Agriculture and Natural Resources Research Center of Tehran, Varamin, Iran*

*Abstract* - Scelionid wasps (Hymenoptera: Scelionidae) are powerful egg parasitoids which have an efficient role in the biological control of agricultural pests, especially pentatomids (Hemiptera: Pentatomidae). The species diversity of these beneficial insects from Isfahan province is studied in this paper. Twenty species from 2 subfamilies, Scelioninae and Telenominae, were collected and identified. In this paper, the hosts of reared parasitoids are introduced together with the synonyms of scelionid wasps.

*Key words:* Hymenoptera, Scelionidae, parasitoid, fauna, Isfahan, Iran

## INTRODUCTION

The Scelionidae is a large family of parasitic Hymenoptera whose members specialize in egg parasitism of insects and arachnids (Masner, 1993, 1995). There are 3308 valid species of Scelionidae (Johnson, 2010). Scelionids have been used quite successfully in classic biological control programs directed principally against agricultural pests. They are virtually all solitary idiobiont primary parasitoids, and reports that diverge from this biology are rare and often unsubstantiated (Eberhard, 1975; Galloway and Austin, 1984; Dangerfield et al., 2001). Female scelionids have a hypodermic-like ovipositor that they use to pierce the chorion of a host egg (Austin, 1983) and lay their own single egg or sometimes several eggs. The wasp larva that hatches consumes the contents of the host egg and pupates within it. A wide range of taxa serve as hosts: in addition to spiders, insect hosts include the Odonata, Orthoptera, Mantodea, Embiidina, Hemiptera, Neuroptera, Coleoptera, Diptera, and Lepidoptera (Masner, 1976; Austin and

Field, 1997; Austin et al., 2005). Several biological studies have been undertaken on scelionids that are used as or have potential as biological control agents, for example, *Trissolcus*, *Telenomus*, and *Scelio*. Consequently, information is strongly biased toward the Telenominae, and care should be taken in extrapolating from these taxa to other members of the Scelionidae that are associated with different hosts (Austin et al., 2005). The aim of this research is a faunal study of the family Scelionidae in Isfahan province where the fauna of these beneficial insects has been poorly studied (Mehravari et al., 2000).

## MATERIALS AND METHODS

The materials for this research were collected from different regions of Isfahan province located in central Iran. The main sampling method was rearing the eggs of Pentatomidae (Hemiptera) for the emergence of parasitoids inside the host. Egg masses of pentatomids were placed in plastic bags and in optimum condition (26±2°C, 65±5% RH, 14: 10 L: D) in an

incubator. Additionally, a sweeping net and the many specimens preserved in the personal collection of third author were used for obtaining the scelionids of Isfahan. Classification, nomenclature and synonyms of Scelionidae suggested by Kozlov (1978), Masner (1980), Kozlov and Kononova (1983), Kononova (1992), Johnson (1992, 2010), Kononova and Kozlov (2008) have been followed.

## RESULTS

Twenty species of two subfamilies, Scelioninae and Telenominae, were collected from Isfahan province as given in the list below:

Family Scelionidae (Haliday 1840)

Subfamily Scelioninae Förster 1856

Genus *Gryon* Haliday 1833

### *Gryon monspeliense* (Picard 1924)

Synonyms: *Hadronotus monspeliensis* Picard 1924, *Hadronotus afanasievi* Meier 1949, *Hadronotus telenagai* Ryakhovskii 1959, *Gryon afanasievi* Kozlov 1963, *Hadronotellus monspeliensis* Szabo 1966.

Material examined: Chadegan (2111m), 2♀, 1♂, ex *Dolycoris baccarum* L. (Hemiptera: Pentatomidae), May 2001.

### *Gryon pedestre* (Nees 1834)

Synonyms: *Teleas pedestris* Nees 1834, *Prosocantha pedestris* Thomson 1859, *Hoplogryon subtilis* Kieffer 1908, *Hoplogryon bacilliger* Kieffer 1908, *Hadronotellus pedestre* Kieffer 1917, *Hadronotus pedestre* Kieffer 1926, *Trimorus bacilliger* Masner 1965, *Trimorus pedestris* Szabo 1966, *Trimorus subtilis* Sundholm 1967, *Gryon pedestre* Mineo 1979.

Material examined: Kashan (938 m), ex *Dolycoris penicillatus* Horv. (Hemiptera: Pentatomidae), 14 October 2007.

Genus *Scelio* Latreille 1805

### *Scelio flavibarbis* (Marshall 1874)

Synonym: *Aleria flavibarbis* Marshall 1874.

Material examined: Koohpayeh (1732 m), 1♀, 2♂, ex *Locusta migratoria* (L.) (Orthoptera, Acrididae), 12 April 2008.

### *Scelio remaudierei* Ferrière 1952

Material examined: Ardestan (1242 m), 3♀ ex *Locusta migratoria* (L.) (Orthoptera, Acrididae), 24 July 2008.

Subfamily Telenominae Thomson 1860

Genus *Psix* Kozlov and Le 1976

### *Psix lacunatus* Johnson and Masner 1985

Material examined: Koohpayeh (1755 m), 1♂, 12 April 2008.

Genus *Telenomus* Haliday, 1833

### *Telenomus acrobates* Giard, 1895

Synonym: *Phanurus acrobates* Kieffer, 1926.

Material examined: Golpayegan (1814 m), 2♀, ex *Chrysoperla carnea* (Steph.) (Neuroptera: Chrysopidae), 10 April 2009.

### *Telenomus busseolae* Gahan, 1922

Synonyms: *Platytenomus hylas* Nixon, 1935; *Platytenomus busseolae* Masner, 1965.

Material examined: Najaf-Abad (1744 m), 3♀, 2♂, ex *Sesamia nonagrioides* Lefebvre (Lepidoptera, Noctuidae), 16 May 2009.

### *Telenomus chloropus* (Thomson, 1861)

Synonyms: *Phanurus chloropus* Thomson, 1861; *Telenomus sokolowi* Mayr, 1897; *Telenomus mayri* Sokolov, 1904; *Prophanurus sokolowi* Kieffer, 1912; *Telenomus tischleri* Nixon, 1939; *Telenomus sokolovi* Meier, 1940.

Material examined: Isfahan (1585 m), 2♀, ex *Eurygaster integriceps* Put. (Hemiptera: Pentatomidae), August 1998.

***Telenomus heydeni* Mayr, 1879**

Material examined: Kashan (1024 m), 1♀, 2♂, ex *Lixus incanescens* Boh. (Coleoptera: Curculionidae), 25 July 2005

***Telenomus politus* (Thomson, 1861)**

Synonym: *Phanurus politus* Thomson, 1861.

Material examined: Khomeynishahr (1489m), 1♀, ex *Eurygaster integriceps* Put. (Hemiptera: Pentatomidae), 7 August 2001.

Genus *Trissolcus* Ashmead 1893

***Trissolcus basalis* (Wollaston 1858)**

Synonyms: *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.

Material examined: Natanz (1656 m), 5♀, 3♂, ex *Apodiphus amygdali* Germ., May 2000. Chadegan (2111 m), 2♀, 4♂, ex *Carpocoris fuscipinus* Boh., May 2001. Isfahan (1587 m), 2♀, 2♂, ex *Aelia acuminata* (L.) (Hemiptera: Pentatomidae), summer 2001.

***Trissolcus djadetshko* (Ryakhovskii 1959)**

Synonyms: *Microphanurus djadetshko* Ryakhovskii 1959, *Asolcus djadetshko* Viktorov 1964.

Material examined: Isfahan (1563 m), 1♀, 3♂, ex *Eurydema ornatum* (L.) (Hemiptera: Pentatomidae), September 2006.

***Trissolcus dryope* (Kozlov et Le 1976)**

Synonym: *Aporophlebus dryope* Kozlov and Le 1976.

Material examined: Koohpayeh (1755 m), 2♀, ex *Acrosternum* sp. (Hemiptera: Pentatomidae), 12 April 2008.

***Trissolcus esmailii* Radjabi 2001**

Material examined: Najaf-Abad (1708 m), 1♀, ex *Dolycoris baccarum* L. (Hemiptera: Pentatomidae), 16 May 2009.

***Trissolcus festiva* (Viktorov 1964)**

Synonym: *Asolcus festiva* Viktorov 1964.

Material examined: Kashan (927 m), 2♀, 1♂, ex *Eurydema ornatum* L. (Hemiptera: Pentatomidae), 11 May 2006.

***Trissolcus grandis* (Thomson 1861)**

Synonyms: *Telenomus grandis* Thomson 1861, *Telenomus nigripes* Thomson 1861, *Telenomus frontalis* Thomson 1861, *Telenomus Nigrita* Thomson 1861, *Telenomus nigritus* 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 nigritus* 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 nix-*

*omartini* Fergusson 1984, *Telenomus silwoodensis* Fergusson 1984.

Material examined: Isfahan (1585 m), 2♀, 1♂, ex *Aelia acuminata* (L.), August 1998. Natanz (1656 m), 6♀, 4♂, ex *Eurygaster integriceps* Put., May 2000. Khomeynishahr (1471 m), 3♀, 2♂, ex *Graphosoma lineatum* (L.), 7 August 2001. Najaf-Abad (1744 m), 1♀, 2♂, ex *Apodiphus amygdali* Germ. (Hemiptera: Pentatomidae), 16 May 2009.

#### ***Trissolcus rufiventris* (Mayr 1908)**

Synonyms: *Telenomus rufiventris* Mayr 1907, *Prophanurus Rufiventris* Kieffer 1912, *Dissolcus rufiventris* Kieffer 1926, *Microphanurus anitus* Nixon 1939, *Asolcus rufiventris* Masner 1959, *Telenomus rubriventris* Szabo 1959.

Material examined: Kashan (906 m), 2♀, ex *Aelia furcula* Fieb., 12 May 2006. Golpayegan (1814 m), 2♀, 4♂, ex *Dolycoris penicillatus* Horv. (Hemiptera: Pentatomidae), 10 April 2009.

#### ***Trissolcus semistriatus* (Nees 1834)**

Synonyms: *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 (1612 m), 9♀, 6♂, ex *Eurygaster integriceps* Put., April 1998. Isfahan (1579 m), 6♀, 7♂, ex *Dolycoris baccarum* L., June 2000. Natanz (1656 m), 3♀, 3♂, ex *Holcostethus sphacelatus* (F.), May 2000. Koohpayeh (1732 m), 3♀, ex *Aelia acuminata* (L.), 12 April 2008. Ardestan (1242 m), 1♀, 2♂, ex *Carpocoris pudicus* (Pd.), 24 July 2008. Khomeynishahr (1471 m), 2♂, ex *Apodiphus amygdali* (Gm.), 7 August 2009, (Hemiptera: Pentatomidae).

#### ***Trissolcus simoni* (Mayr 1879)**

Synonyms: *Telenomus Simoni* Mayr 1897, *Asolcus scutellaris* Masner 1958, *Microphanurus vassilievi* Viktorov 1960, *Asolcus simoni reticulatus* Delucchi 1961, *Asolcus reticulatus* Delucchi 1963, *Asolcus simoni* Delucchi 1961, *Asolcus reticulatus reticulatus* Viktorov 1964, *Trissolcus reticulatus reticulatus* Viktorov 1967.

Material examined: Chadegan (2111 m), 1♀, ex *Aelia acuminata* (L.), May 2001. Isfahan (1587 m), 2♀, 2♂, ex *Dolycoris baccarum* L. Summer 2001. Najaf-Abad (1708 m), 3♀, 1♂, ex *Eurydema ornatum* L. (Hemiptera: Pentatomidae), 16 May 2002.

#### ***Trissolcus vassilievi* (Mayr 1903)**

Synonyms: *Telenomus Vassilliewi* Mayr 1903, *Microphanurus vassilliewi* Kieffer 1926, *Microphanurus vassilievi* Meier 1940, *Trissolcus (Microphanurus) vassilievi* Ryakhovskii 1959, *Asolcus vassilievi* Delucchi 1961.

Material examined: Koohpayeh (1756 m), 2♀, ex *Carpocoris mediterraneus* Tam., 13 April 2008. Isfahan (1597 m), 3♀, 2♂, ex *Eurygaster maura* (L.), July 2008. Golpayegan (1781 m), 3♀, ex *Graphosoma semipunctatum* (F.) (Hemiptera: Pentatomidae), 10 April 2009.

### CONCLUDING REMARKS

As can be seen from the presented findings, the fauna of scelionid wasps is rather diverse in Isfahan province. Iran is a large country with a diverse insect fauna, and these faunistic researches will help in determining Iranian Scelionidae. Some valuable systematic studies have been conducted on Iranian Scelionidae in recent years (Asgari, 1995, 2001; Samin, 2010; Samin et al., 2010a, b; Ghahari et al., 2011) and must be continued in different regions of Iran. In light of the contribution of these beneficial insects to the biological control of pentatomid pests, their conservation is an important topic for successful and safe pest management.

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