Article

Checklist of the subfamilies Mirinae and Orthotylinae (Hemiptera: Heteroptera: Miridae) in western parts of Kerman Province, Iran

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Abstract

A faunal study was carried out on the subfamilies Mirinae and Orthotylinae (Heteroptera: Miridae) from different parts of western Kerman Province on various host plants. In total 16 species belonging to 14 genera were collected and identified from different host plants and localities.

Keywords Fauna; Miridae; plant bugs; Kerman Province; Iran.

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1 Introduction

The Plant bugs (Hemiptera: Miridae) are the most populated family of Hemiptera order, with approximately 11,020 described species (Cassis and Schuh, 2012). Size variation in Mirid bugs is from 1 to 15 mm. In term of food behavior, Plant bugs are Phytophagous, Carnivorous, and Omnivorous. This family comprising eight subfamilies which among them subfamilies Mirinae and Orthotylinae are the most diverse. The Mirinae is the largest subfamily of Miridae with 6 tribe and more than 4000 described species (Cassis & Schuh, 2012). This subfamily is defined by pretarsal and genitalic characters (Schwartz, 2008). Orthotylinae is another subfamily that is comprised with six recognized tribes and more than 2000 described species (Schuh, 2002-2013). The outstanding features of this subfamily that can be noted, are the greatly enlarged male parameres and exaggerated endosomal spicules (Asquith, 1994).The existing species of these two subfamily have a wide range of hosts including those which are plant feeder or predacious (Slater & Baranowski, 1978). Many of plant feeder in Mirinae subfamily like *Lygus* Hahn and *Adelphocoris* Reuter directly damage the organs of plants by feeding from plants sap and also indirectly damages them by potentially transferring plant pathogens. Also species in *Phytocoris* Fallen genus are predaceous that nymphs and adults prey on mites, mite eggs, aphids, and other small arthropods. In Orthotylinae subfamily species *Ceratocapsus* Reuter genus are predaceous that nymphs and adults prey on mites and aphids (Braimah et al., 1982).

Recently much attention has been focused on Iranian Plant bugs fauna. There are numbers of publications have been published on Iranian mirid bugs in different regions (Hosseini, 1997; Hosseini and Linnavuori, 2000; Hosseini et al., 2000, 2002a, b; Hosseini, 2013a, b, c; Hosseini, 2014; Linnavuori and Hosseini, 1998, 1999, 2000; Lashkari and Hosseini, 2012; Yarmand et al., 2004; Linnavuori, 2006, 2007, 2009; Mirab-Baloo, 2008; Arkani; 2009, Ebrahimi et al, 2012). As a part of an extensive research on Plant bugs in Kerman, the aim of this study was to collect and identify the species of the subfamilies Mirinae and Orthotylinae in Kerman Province.

The Kerman Province, geographically is located on the south of Iran, neighbors with Khorasan and Yazd Province in the north, Hormozgan Province in the South, Sistan-Baluchistan Province in the East and Fars province in the West. Kerman is one of the Iran's largest provinces and occupied about 11% of this country. The precipitation rate in this province is about 120 mm per year. Kerman province has a great variety of climates. Extreme differences in elevation, latitude, and located in the vicinity of the world's driest deserts are the reasons for this diversity (Society and Department of Geography Kerman Province, 2012).

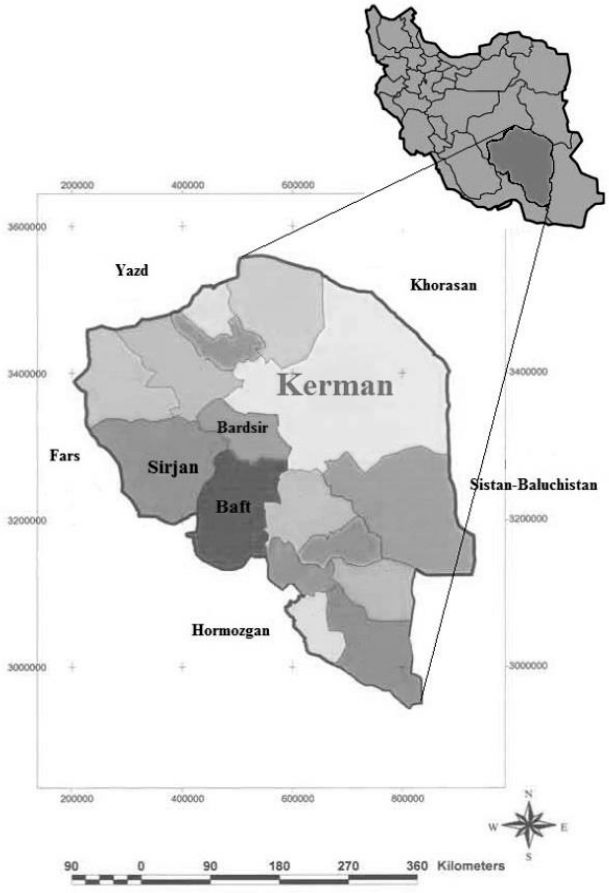

Fig. 1 Map of Kerman province, its adjacent provinces and position in Iran. where shows the position of three cities of Baft, Sirjan and Bardsir among other cities of Kerman.

2 Materials and Methods

The research was conducted in the west of Kerman Province from different locations by collecting adult mirids during summer 2012. Sampling was conducted in three cities in the western regions of the province including; Baft (2283m, 29˚13'59"N, 56˚36'08"E) that is located on the southern east of province, neighbors with Jiroft in

the east, Sirjan in the west, Bardsir in the north and Hormozgan Province in the south). Sirjan (1746m, 29˚27'07"N, 55˚40'52"E) that is neighbor with Baft from the east, Shahrebabak from the north, Fars province from the west and Hormozgan Province from the south) and Bardsir (2046m, 29˚55'39"N, 56˚34'19"E) that is adjacent to Baft from the south, Kerman from the east and north, and Sirjan from the west (Fig. 1). Specimens were collected by sweep net and light trap. The sweeping method was used to collect living bugs on flowering plants, shrubs, and foliage of trees. A sweep net (45cm diameter and 75cm length) was used for sweeping in vegetation, and bushnet was used for tree foliages. The collected specimens were killed promptly in a small tube containing Ethyl acetate, then they were transferred to the laboratory and were prepared for identification under stereomicroscope (Olympus SZX 12). The genitalia was separated from males and mounted on slide by using glycerin. Identification was done by relevant taxonomic keys (Wagner and Weber, 1964; Wagner, 1971; 1973) and compared with type species available in the Natural History Museum of University of Guilan. All the specimens were deposited in the department of Plant Protection, Faculty of Agriculture, University of Guilan, Rasht, Iran.

3 Results

In this study, a total of 60 specimens belonging to16 species and 14 genera were collected. The collected species are as follow:

Subfamily: Mirinae

***Stenodema turanica* Reuter, 1904**

Material examined

Iran, Kerman, Baft: Torang, August 2012, (2145m, 28˚45'21"N, 56˚48'52"E), *Medicago sativa* (Fabaceae), (M. Shamsi), Gogher, July 2012, (2625m, 29˚28'42"N, 56˚24'37"E), (Weed), (M. Shamsi), Bardsir: Bardsir, September 2012, (2046m, 29˚55'39"N, 56˚34'19"E), (Weeds), (M. Shamsi), Negar, August 2012, (2094m, 29˚51'34"N, 56˚47'57"E), *Glycyrrhiza* sp. (Fabaceae), (M. Shamsi).

Comments

Europe, Asia (Aukema & Rieger, 1999), Irano-Turanian (Linnavuori, 2009).

***Lygus gemellatus* (Herrich-Schaeffer, 1835)**

Material examined

Iran, Kerman, Baft: Torang, Agust 2012, (2145m, 28˚45'21"N, 56˚48'52"E), *Teriticum sativum* (Poaceae), (M. Shamsi), Bezenjan, August 2012, (2358m, 29˚14'48"N, 56˚41'50"E), (M. Shamsi), Kiskan, August 2012, (2611m, 29˚22'46"N, 56˚38'14"E), *Medicago sativa* (Fabaceae), (M. Shamsi), Rabor, August 2012, (2330m, 29˚17'29"N, 56˚54'45"E), (Weed), (M. Shamsi), Gogher, August 2012, (2625m, 29˚28'42"N, 56˚24'37"E), *Teriticum sativum* (Poaceae), (M. Shamsi), Baft, August 2012, (2283m, 29˚13'59"N, 56˚36'08"E), *M. sativa* (Fabaceae), (M. Shamsi), khabr, August 2012, (2140m 28˚48'59"N, 56˚20'49"E), *T. sativum* (Poaceae), (M. Shamsi), Sirjan: Zeydabad, July 2012, (1726m, 29˚36'55"N, 55˚32'12"E), *Trifolium* sp. (Leguminosae), (M. Shamsi), Bardsir: Bardsir, August 2012, (2046m, 29˚55'39"N, 56˚34'19"E), *M. sativa* (Fabaceae), (M. Shamsi), Negar, September 2012, (2094m, 29˚51'34"N, 56˚47'57"E), *T. sativum* (Poaceae), (M. Shamsi).

Comments

Holopalaearctic (Linnavuori 2007), Europe, Asia , North Africa, North India, Nepal, Pakistan (Aukema & Rieger, 1999).

***Lygus pratensis* (Linnaeus, 1758)**

Material examined

Iran, Kerman, Baft:Torang, August 2012, (2145m, 28˚45'21"N, 56˚48'52"E), *Medicago sativa* (Fabaceae), (M. Shamsi), Dashtab, July 2012, (2026m, 29˚59'45"N, 56˚38'12"E), *M. sativa* (Fabaceae), (M. Shamsi), Bezenjan, September 2012, (2358m, 29˚14'48"N, 56˚41'50"E), *M. sativa* (Fabaceae), (M. Shamsi), Kiskan, August 2012, (2611m, 29˚22'46"N, 56˚38'14"E), *Trifolium resupinatum* (Fabaceae), (M. Shamsi), Rabor, July 2012, (2330m, 29˚17'29"N, 56˚54'45"E), *T. resupinatum* (Fabaceae), (M. Shamsi), Orzooiieh, July 2012, (1169m, 28˚22'42"N, 56˚29'10"E), *M. sativa* (Fabaceae), (M. Shamsi), Sirjan: Sirjan, August 2012, (1746m, 29˚27'07"N, 55˚40'52"E), *T. resupinatum* (Fabaceae), (M. Shamsi), Bardsir: Negar, July 2012, (2094m, 29˚51'34"N, 56˚47'57"E), (M. Shamsi), *T. resupinatum* (Fabaceae), Lalezar, July 2012, (2844m, 29˚31'11"N, 56˚49'09"E), *M. sativa* (Fabaceae), (M. Shamsi), Ghaleaskar, September 2012, (2659m, 29˚30'44"N, 56˚41'07"E), *M. sativa* (Fabaceae), (M. Shamsi).

Comments

Holopalaearctic (Linnavuori 2007).

***Eurystylus bellevoyei* (Reuter, 1879)**

Material examined

Iran, Kerman, Baft: Baft, July 2012, (2283m, 29˚13'59"N, 56˚36'08"E), *Pirus malus* (Rosaceae), (M. Shamsi), Dashtab, September 2012, (2026m, 29˚59'45"N, 56˚38'12"E), (Weed), (M. Shamsi), Kiskan, September 2012, (2611m, 29˚22'46"N, 56˚38'14"E), *Medicago sativa* (Fabaceae), (M. Shamsi), Rabor, September 2012, (2330m, 29˚17'29"N, 56˚54'45"E), *Onobrychis sativa* (Leguminosae), (M. Shamsi), Orzooiieh, July 2012, (1169m, 28˚22'42"N, 56˚29'10"E), *Solanum tuberosum* (Solanaceae), (M. Shamsi), August 2012, (2844m, 29˚31'11"N, 56˚49'09"E), *M. sativa* (Fabaceae), (M. Shamsi), Gogher, August 2012, (2625m, 29˚28'42"N, 56˚24'37"E), *M. sativa* (Fabaceae), (M. Shamsi), Sirjan: Sirjan, August 2012, (1746m, 29˚27'07"N, 55˚40'52"E), *M. sativa* (Fabaceae), (M. Shamsi), Zeydabad, July 2012, (1726m, 29˚36'55"N, 55˚32'12"E), (Weeds), (M. Shamsi), Nosratabad, September 2012, (1724m, 29˚30'31"N, 55˚35'46"E), (Weed), (M. Shamsi), Bardsir: Bardsir, August 2012, (2046m, 29˚55'39"N, 56˚34'19"E), *S. tuberosum* (Solanaceae), (M. Shamsi), Lalezar, July 2012, (2844m, 29˚31'11"N, 56˚49'09"E), (Weed), (M. Shamsi), Ghaleaskar, August 2012, (2659m, 29˚30'44"N, 56˚41'07"E), *Pirus malus* (Rosaceae),(M. Shamsi), Negar, September 2012, (2094m, 29˚51'34"N, 56˚47'57"E), (M. Shamsi),

Comments

Eremian with a wide distributional range in the Holomediterranean and sudanes subregions (Linnavuori, 2009), Europe, Asia, Afrotropical regions and Orietal (Aukema & Rieger, 1999).

***Adelphocoris lineolatus* (Goeze, 1778)**

Material examined

Iran, Kerman, Baft: Baft, July 2012, (2283m, 29˚13'59"N, 56˚36'08"E), *Medicago sativa* (Fabaceae), (M. Shamsi), Dashtab, July 2012, (2026m, 29˚59'45"N, 56˚38'12"E), *M. sativa* (Fabaceae), (M. Shamsi), Gogher, August 2012, (2625m, 29˚28'42"N, 56˚24'37"E), *Glycyrrhiza* sp. (Fabaceae), (M. Shamsi), Kiskan, August 2012, (2611m, 29˚22'46"N, 56˚38'14"E), *M. sativa* (Fabaceae), (M. Shamsi), Sirjan: Nosratabad, September 2012, (1724m, 29˚30'31"N, 55˚35'46"E), *Glycyrrhiza* sp. (Fabaceae), (M. Shamsi), Mahmoodabad, September 2012, (1733m, 29˚31'40"N, 55˚36'23"E), *M. sativa* (Fabaceae), (M. Shamsi), Sirjan, September 2012, (1746m, 29˚27'07"N, 55˚40'52"E), *Onobrychis sativa* (Leguminosae), (M. Shamsi), Bardsir: Ghaleaskar, September 2012, (2659m, 29˚30'44"N, 56˚41'07"E), *M. sativa* (Fabaceae), (M. Shamsi), Negar, August 2012, (2094m, 29˚51'34"N, 56˚47'57"E), *M. sativa* (Fabaceae), (M. Shamsi).

Comments

Holopalaearctic (Linnavuori, 2007), Europe, Asia, North Africa, North India, Nepal, Pakistan, Kashmir and North America (Aukema & Rieger, 1999).

***Agnocoris reclairei* (Wagner, 1949)**

Material examined

Iran, Kerman, Baft: khabr, August 2012, (2140m, 28˚48'59"N, 56˚20'49"E), *Salix* sp. (Salicaceae), (M. Shamsi), Bongan, September 2012, (2615m, 29˚18'31"N, 56˚43'30"E), *S. pendula* (Salicaceae), (M. Shamsi), Orzooiieh, July 2012, (1169m, 28˚22'42"N, 56˚29'10"E), *S. Purpurea* sp. (Salicaceae), (M. Shamsi), Torang, August 2012, (2145m, 28˚45'21"N, 56˚48'52"E), *Salix* sp. (Salicaceae), (M. Shamsi), Dashtab, september 2012, (2026m, 29˚59'45"N, 56˚38'12"E), *Salix* sp. (Salicaceae), (M. Shamsi), Sirjan: Sirjan, August 2012, (1746m, 29˚27'07"N, 55˚40'52"E), *S.* sp. (Salicaceae), (M. shamsi), Balvard, July 2012, (1949m, 29˚24'26"N, 56˚00'41"E), *S.* sp. (Salicaceae), (M. Shamsi), Mahmoodabad, September 2012, (1733m, 29˚31'40"N, 55˚36'23"E), *S.* sp. (Salicaceae), (M. Shamsi), Bardsir: Ghaleaskar, August 2012, (2659m, 29˚30'44"N, 56˚41'07"E), *S.* sp. (Salicaceae), (M. Shamsi).

Comments

The species was collected by light trap in gardens and deciduous forests. Euro-Siberian (Linnavuori, 2007).

***Dichrooscytus persicus* Josifov, 1974**

Material examined

Iran, Kerman, Baft: Torang, August 2012, (2145m, 28˚45'21"N, 56˚48'52"E), *Cupressus sempervirens* (Cupressaceae), (M. Shamsi), khabr, july 2012, (2140m, 28˚48'59"N, 56˚20'49"E), *C. sempervirens* (Cupressaceae), (M. Shamsi), Rabor, September 2012, (2330m, 29˚17'29"N, 56˚54'45"E), *C. sempervirens* (Cupressaceae), (M. Shamsi).

Comments

Irano-Turanian (Linnavuori, 2007).

***Liocoris tripustulatus* (Fabricus, 1781)**

Material examined

Iran, Kerman**,** Bardsir: Lalezar, July 2012, (2844m, 29˚31'11"N, 56˚49'09"E), *Salix* sp. (Salicaceae), (M. Shamsi).

Comments

Holomediterranean, extending to Turkey, Azerbaijan, Iran, and Iraq (Linnavuori, 2007).

***Charagochilus gyllenhali* (Fabricus, 1807)**

Material examined

Iran, Kerman, Baft: Baft, July 2012, (2283m, 29˚13'59"N, 56˚36'08"E), *Galium* sp. (Rubiaceae), (M. Shamsi), Khabr, August 2012, (2140m, 28˚48'59"N, 56˚20'49"E), (Weed), (M. Shamsi), Gogher, August 2012, (2625m, 29˚28'42"N, 56˚24'37"E), *M. sativa* (Fabaceae), (M. Shamsi), Bongan, July 2012, (2615m, 29˚18'31"N, 56˚43'30"E), *Galium* sp. (Rubiaceae), (M. Shamsi), Bardsir: Lalezar, July 2012, (2844m, 29˚31'11"N, 56˚49'09"E), *Onobrychis* sp. (Leguminosae), (M. Shamsi), Ghaleaskar, September 2012, (2659m, 29˚30'44"N, 56˚41'07"E), (Weed), (M. Shamsi).

Comments

Holopalaearctic (Linnavuori, 2007).

***Megacoelum hormozganicum* Linnavuori, 2004**

Material examined

Iran, Kerman, Baft: Torang, July 2012, (2145m, 28˚45'21"N, 56˚48'52"E), *Glycyrrhiza* sp. (Fabaceae), (M. Shamsi), Khabr, July 2012, (2140m, 28˚48'59"N, 56˚20'49"E), (Weed), (M. Shamsi), Dashtab, September 2012, (2026m, 29˚59'45"N, 56˚38'12"E), *Glycyrrhiza* sp. (Fabaceae), (M. Shamsi).

Comments

Endemic to Iran (Linnavuori, 2009).

***Orthops frenatus* (Horvath, 1894)**

Material examined

Iran, Kerman, Baft: Khabr, August 2012, (2140m, 28˚48'59"N, 56˚20'49"E), *Medicago sativa* (Fabaceae), (M. Shamsi), Gogher, July 2012, (2625m, 29˚28'42"N, 56˚24'37"E), *M. sativa* (Fabaceae), (M. Shamsi), Dashtab, July 2012, (2026m, 29˚59'45"N, 56˚38'12"E), *Onobrychis* sp. (Leguminosae), (M. Shamsi), Torang, July 2012, (2145m, 28˚45'21"N, 56˚48'52"E), (M. Shamsi), Bardsir: Lalezar, July 2012, (2844m, 29˚31'11"N, 56˚49'09"E), *M. sativa* (Fabaceae), (M. Shamsi), Ghaleaskar, September 2012, (2659m, 29˚30'44"N, 56˚41'07"E), *M. sativa* (Fabaceae), (M. Shamsi).

Comments

The species were collected by light trap. Irano-Turanian, recorded from Armenia, Iran, Afghanistan, and Middle Asia (Linnavuori, 2007).

***Orthops pilosulus* (Jakovlev, 1877)**

Material examined

Iran, Kerman, Baft: Gogher, July 2012, (2625m, 29˚28'42"N, 56˚24'37"E), *Amaranthus* sp. (Amaranthaceae), (M. Shamsi), Torang, August 2012, (2145m, 28˚45'21"N, 56˚48'52"E), (Weed), (M. Shamsi), Kiskan, August 2012, (2611m, 29˚22'46"N, 56˚38'14"E), *Onobrychis* sp. (Leguminosae), (M. Shamsi), Rabor, september 2012, (2330m, 29˚17'29"N, 56˚54'45"E), (Weed), (M. Shamsi), Bardsir: Lalezar, september 2012, (2844m, 29˚31'11"N, 56˚49'09"E), *Onobrychis* sp. (Leguminosae), (M. Shamsi), Ghaleaskar, August 2012, (2659m, 29˚30'44"N, 56˚41'07"E), *Amaranthus* sp. (Amaranthaceae), (M. Shamsi), Torang, September 2012, (2145m, 28˚45'21"N, 56˚48'52"E), *Amaranthus* sp. (Amaranthaceae), (M. Shamsi).

Comments

Irano-Turanian (Linnavuori, 2007).

***Creontiades pallidus* (Rambur, 1839)**

Material examined

Iran, Kerman, Baft: Orzooiieh, July 2012, (1169m, 28˚22'42"N, 56˚29'10"E), *Gossypium arboreum* (Malvaceae), (M. Shamsi), Torang, August 2012, (2145m, 28˚45'21"N, 56˚48'52"E), *Onobrychis* sp. (Leguminosae), (M. Shamsi), Khabr, August 2012, (2140m, 28˚48'59"N, 56˚20'49"E), *Onobrychis* sp. (Leguminosae), (M. Shamsi).

Comments

Holomediterranean, widely distributed in the Middle East and the Ethiopian Region (Linnavuori, 2007).

***Taylorilygus apicalis* (Fieber, 1861)**

Material examined

Iran, Kerman, Baft:Torang, september 2012, (2145m, 28˚45'21"N, 56˚48'52"E), *Artemisia aucheri*

(Asteraceae), (M.Shamsi), Khabr, August 2012, (2140m, 28˚48'59"N, 56˚20'49"E), *A. aucheri* (Asteraceae), (M.Shamsi), Dashtab, July 2012, (2026m, 29˚59'45"N, 56˚38'12"E), (Weed), (M. Shamsi).

Comments

The species were collected by light trap. Cosmopolitan in tropical and subtropical regions (Linnavuori, 1999).

Subfamily: Orthotylinae

***Orthotylus flavosparsus* Sahlberg, 1841**

Material examined

Iran, Kerman, Baft: Bezenjan, July 2012, (2358m, 29˚14'48"N, 56˚41'50"E), (Weed), (M. Shamsi), Khabr, August 2012, (2140m, 28˚48'59"N, 56˚20'49"E), *Rosa damascene* (Rosaceae), (M. Shamsi), Gogher, July 2012, (2625m, 29˚28'42"N, 56˚24'37"E), (M. Shamsi), Sirjan: Balvard, August 2012, (1949m, 29˚24'26"N, 56˚00'41"E), (Weed), (M. Shams), Bardsir: Lalezar, september 2012, (2844m, 29˚31'11"N, 56˚49'09"E), (Weed), (M. Shamsi), Ghaleaskar, September 2012, (2659m, 29˚30'44"N, 56˚41'07"E), *R. damascene* (Rosaceae), (M. Shamsi),

Comments

Holarctic (Linnavuori, 2007).

***Globiceps fulvicollis* Jakovlev, 1877**

Material examined

Iran, Kerman, Bardsir: Lalezar, July 2012, (2844m, 29˚31'11"N, 56˚49'09"E), *Onobrychis* sp. (Leguminosae), (M. Shamsi).

Comments

West-Palaearctic (Linnavuori, 2007).

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