

**Annotated catalogue of the Iranian broad-headed bugs
(Hemiptera: Heteroptera: Alydidae)**

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Abstract. The fauna of Iranian broad-headed bugs (Coreoidea: Alydidae) is studied in this paper. A total of twenty-one species of eleven genera (*Alydus* Fabricius, 1803, *Camptopus* Amyot & Serville, 1843, *Euthetus* Dallas, 1852, *Heegeria* Reuter, 1881, *Megalotomus* Fieber, 1860, *Mirperus* Stål, 1860, *Nariscus* Stål, 1865, *Nemausus* Stål, 1866, *Riptortus* Stål, 1859, *Tenosius* Stål, 1860, *Leptocoris*a Latreille, 1829) belonging to two subfamilies (Alydinae, Leptocorisinae) are listed for Iranian fauna. Out of them, three species, *Megalotomus junceus* (Scopoli, 1763), *M. ornaticeps* (Stål, 1858) and *Leptocoris*a *oratoria* (Fabricius, 1794), are new records for Iran.

Keywords: Heteroptera, Coreoidea, Alydidae, fauna, catalogue, Iran

Introduction

The broad-headed bugs (Alydidae) are a cosmopolitan family of coreoid bugs. About 50 genera and over 200 species are known worldwide (DOLLING 2006), with most species occurring in the subtropical and tropical regions of the world; for example, Europe has a mere 10 species, and only four of them occur outside the Mediterranean region (SLATER 1982, SCHUH & SLATER 1995, DOLLING 2006).



Fig. 1. Map of Iran with boundaries of provinces.

Most species of the Alydidae are characterized by their elongate and slender form and often elongate appendages. They are often dull grey-brown in color. Some species mimic ants (particularly the larvae) or wasps. The head width is greater than half the width of the posterior margin of the pronotum. The bucculae never exceed the antenniferous tubercles. The antennae are inserted dorsal to the midline of the eye. The metathoracic scent glands have a single small sac, and their external scent efferent system has a distinct peritreme. The membrane of the hemelytra has numerous veins. The abdominal trichobothria are lateral and sublateral on sterna V-VII and submedial on sterna III and IV. The male and female genitalia are diagnostic (AHMAD & SOUTHWOOD 1964, SCHAEFER 1975, McIVER & STONEDAHL 1993, SCHUH & SLATER 1995).

The alydids were first recognized as a family by AMYOT & SERVILLE (1843), a ranking that has been followed by most subsequent authors (e.g., SCHAEFER 1965, SLATER 1982, SCHUH & SLATER 1995). STÅL (1867) regarded them as a subfamily of the Coreidae; however, despite their close relationship, this classification has had little modern usage. SCHAEFER (1965) identified two subfamilies, the Alydinae and Micrelytrinae, with the latter divided into two tribes (Micrelytrini and Leptocorisini). AHMAD (1965) raised the Leptocorisini to a subfami-

ly, thereby recognizing three alydid subfamilies. Until recently, this arrangement had been followed by most authors (SCHAEFER 1980, 1996; FROESCHNER 1988). LI & ZHENG (1993) provided a cladistic classification of the alydids supporting SCHAEFER's (1965) division into two subfamilies. SCHAEFER (1999) reviewed the morphology and classification of the alydids and established the following classification: Alydinae (Alydini and Daclerini) and Micrelytrinae (Micrelytrini and Leptocorisini: Leptocorisina and Noliphina).

LETHIERRY & SEVERIN (1894) is the most recent bibliographic treatment of the world fauna of the family. A number of regional catalogues of Heteroptera exist: for Palaearctic Region (OSHANIN 1906, 1912; DOLLING 2006), Nearctic Region (FROESCHNER 1988), Ecuador (FROESCHNER 1981), Panama (FROESCHNER 2000) and Australia (CASSIS & GROSS 2002). The Alydidae have received little modern monographic treatment. The most important revisionary works are: STÅL (1859, 1867, 1873 – world), FRACKER (1918 – Nearctic Region), GROSS (1963 – Micronesia), SCHAFFNER (1964 – world), AHMAD (1965 – world Leptocorisini), BRAILOVSKY & ZURBIA FLORES (1979 – Mexico), HSIAO (1977 – China), LINNAVUORI (1987 – West and Central Africa), BRAILOVSKY (1991 – Neotropical Region), MOULET (1995 – West Palaearctics) and GÖLLNER-SCHIEDING (2000 – Afrotropical Region).

Alydids are phytophagous on either vegetative material or ripe and unripe seeds mainly belonging to Fabaceae. These bugs often inhabit semiarid and sandy habitats like seashores, heathland, steppe and savannas. Their main food is seeds that they pierce with their rostrum to suck the nutritious fluids contained within. Some are economically significant pests, for example *Leptocoris oratoria* (Fabricius, 1794) on rice (reviewed by PANIZZI et al. (2000)). Cannibalism is known at least in some Alydinae; some of them are occasionally coprophagous or necrophagous (MOULET 1995, CONSTANT 2007). SCHAEFER (1980), SCHAEFER & MITCHELL (1983) and SCHUH & SLATER (1995) summarized their feeding habits and host plant relationships.

Although Iran is a large country with diverse climate and flora, the biodiversity of Iranian Heteroptera is underestimated and especially family Alydidae was studied very poorly before this project. The only comprehensive paper on the Iranian Alydidae is the review by HOBBERLANDT (1985). MODARRES AWAL (1997b) listed three species among agricultural pests in Iran, i.e. *Camptopus lateralis* (Germar, 1817), *C. tragacanthae* (Kolenati, 1845) and *Riptortus linearis* (Fabricius, 1775).

The objective of this research is to describe the fauna of the Iranian Alydidae, and this paper is a continuation of the series of annotated catalogues of Heteroptera of Iran (see GHAHARI et al. 2009a,b, 2010).

Materials and methods

The specimens were collected by sweeping of vegetation and by light traps method from various cultivated plants and weeds in different locations of Iran. Also, many specimens from different insect collections of Iranian universities (especially different branches of Islamic Azad University) were checked, and their data have also been included in this paper. In addition to the specimens, all published records on Iranian Alydidae were revised by the authors.

Results

In a total, 2 subfamilies, 11 genera and 21 species of Alydidae are listed as the fauna of Iran. Among them, 3 species are new records for Iran. The list of the Iranian alydid species is given below. For full synonymy see DOLLING (2006).

Family ALYDIDAE Amyot & Serville, 1843

Subfamily Alydinae Amyot & Serville, 1843

The Alydinae are the most diverse alydid subfamily and are found in all major zoogeographic regions (Schaefer 1964).

Genus *Alydus* Fabricius, 1803

Alydus calcaratus (Linnaeus, 1758)

Distribution in Iran. Northern Iran (JAKOVLEV 1877; OSHANIN 1906, 1912), Tehran (HOBERLANDT 1985).

General distribution. Widespread in Europe, Morocco, North and Central Asia; also present in Nearctic Region (DOLLING 2006).

Genus *Camptopus* Amyot & Serville, 1843

Camptopus bifasciatus Fieber, 1864

Distribution in Iran. Fars (WAGNER 1961, HOBERLANDT 1985, LINNAVUORI 2007), Guilan (LINNAVUORI 2007), Kerman (HOBERLANDT 1985), Semnan (KIRITSHENKO 1938), Tehran (LINDBERG 1938).

General distribution. Armenia, Azerbaijan, Iran, Turkey (DOLLING 2006).

Camptopus illustris Horváth, 1899

Distribution in Iran. Fars (HOBERLANDT 1955, 1985), West Azarbaijan (HOBERLANDT 1985).

General distribution. Armenia, Azerbaijan, Iran, Iraq, Turkey (DOLLING 2006).

Camptopus lateralis (Germar, 1817)

Distribution in Iran. Ardabil (MODARRES AWAL 1996a,b), East Azarbaijan (SADAGHIAN et al. 2002, KHALILZADEH et al. 2006, KHALILZADEH 2008, HASSANZADEH et al. 2009, GHARAAT et al. 2009, KHAGHANINIA et al. 2010a,b), Fars (WAGNER 1968, HOBERLANDT 1985), Golestan (HOBERLANDT 1985, HEISS 2002, LINNAVUORI 2007), Guilan (HOBERLANDT 1985, LINNAVUORI 2007), Kerman (HOBERLANDT 1955), Khorasan (HOBERLANDT 1985, HAVASKARY et al. 2010), Khuzestan (HOBERLANDT 1955), Mazandaran (WAGNER 1968, HOBERLANDT 1985, LINNAVUORI 2007), Semnan (LINNAVUORI 2007), Tehran (LINDBERG 1938; HOBERLANDT 1955, 1985; BROWN 1966; LINNAVUORI 2007), West Azarbaijan (HOBERLANDT 1985).

General distribution. Holo-Mediterranean, extending to south of Central Europe and Central Asia in the north, and Pakistan and India in the east (DOLLING 2006).

Comment. YARMAND et al. (2002) reported *C. lateralis* from the forests of Iran, but without exact locality.

Camptopus tragacanthae (Kolenati, 1845)

Distribution in Iran. Ardabil (LINNAVUORI 2007), East Azarbaijan (MODARRES AWAL 1996b, 1997a; SADAGHIAN et al. 2002), Golestan (HEISS 2002), Guilan (LINNAVUORI 2007), Kerman (BROWN 1966), Khorasan (MODARRES AWAL 1997b, 2008), Sistan & Baluchestan (KIRITSHENKO 1966, SEIDENSTÜCKER 1957), Tehran (LINDBERG 1938, HOBERLANDT 1955, BROWN 1966, LINNAVUORI 2007).

General distribution. Distributed from Asian part of Turkey and Transcaucasia towards southwestern Russia, and through the Central Asia to Afghanistan and northwestern China (DOLLING 2006).

Genus *Euthetus* Dallas, 1852

Euthetus humilis Horváth, 1907

Distribution in Iran. Hormozgan (HOBERLANDT 1985).

General distribution. Canary Islands, Libya, Tunisia, Israel, Iran and tropical Africa (DOLLING 2006).

Euthetus pallescens Distant, 1902

Distribution in Iran. Hormozgan (HOBERLANDT 1985).

General distribution. Iran and tropical Africa (DOLLING 2006).

Euthetus pulchellus Dallas, 1852

Distribution in Iran. Hormozgan (WAGNER 1968, LINNAVUORI 2004), Sistan & Baluchestan (SEIDENSTÜCKER 1957, HOBERLANDT 1985).

General distribution. Iran and Oriental Region (DOLLING 2006).

Genus *Heegeria* Reuter, 1881

Heegeria tangirica (Saunders, 1877)

Distribution in Iran. Hormozgan (HOBERLANDT 1985, as *Tenosius tangiricus*; LINNAVUORI 2004), Kerman (SEIDENSTÜCKER 1958, as *Tenosius tangiricus*), Sistan & Baluchestan (HOBERLANDT 1985, as *Tenosius tangiricus*).

General distribution. Greece (Crete), Italy, Spain, Egypt, Morocco, Israel, Oman, Yemen, Iran, Pakistan and tropical Africa (DOLLING 2006).

Genus *Megalotomus* Fieber, 1860***Megalotomus junceus* (Scopoli, 1763)**

Material examined. MAZANDARAN: Ramsar (48 m), Summer 2002, 1 ♂, H. Ghahari leg., D. L. Carpintero det. New record for Iran.

General distribution. Central, southeastern and eastern Europe, Asian part of Russia Kazakhstan, Mongolia, northern China, and Korea (DOLLING 2006).

***Megalotomus obtusus* Ghauri, 1972**

Distribution in Iran. Sistan & Baluchestan (HOBERLANDT 1985).

General distribution. Iran and Pakistan (DOLLING 2006).

***Megalotomus ornaticeps* (Stål, 1858)**

Material examined. EAST AZERBAIJAN: Arasbaran (837 m), September 2004, 1 ♂ 3 ♀♀, M. Havaskary leg., D. L. Carpintero and R. E. Linnavuori det. New record for Iran.

General distribution. Steppe zone of eastern Europe and Asia from Ukraine to Transcaucasia, northern China and West Siberia (DOLLING 2006).

Genus *Mirperus* Stål, 1860***Mirperus demetrii* (Kiritshenko, 1966)**

Distribution in Iran. Hormozgan (KIRITSHENKO 1966, as *Dolichocamptopus demeterii*; HOBERLANDT 1985), Sistan & Baluchestan (KIRITSHENKO 1966, as *Dolichocamptopus demeterii*).

General distribution. Iran and tropical Africa (Kenya, Sudan) (DOLLING 2006).

***Mirperus torridus* (Westwood, 1842)**

Distribution in Iran. Hormozgan (HOBERLANDT 1985, as *M. jaculus*; LINNAVUORI 2004).

General distribution. Tropical Africa, Sinai, Yemen, Saudi Arabia, Iran and Pakistan (DOLLING 2006).

Comment. HOBERLANDT (1985) considered *Mirperus torridus* to be a junior synonym of *M. jaculus* (Thunberg, 1783). However, this synonymy was not accepted by subsequent authors (e.g., LINNAVUORI 1987, GÖLLNER-SCHIEDING 2000) (see DOLLING 2006).

Genus *Nariscus* Stål, 1865***Nariscus conspurcatus* Mancini, 1946**

Distribution in Iran. Hormozgan (LINNAVUORI 2004).

General distribution. Tropical Africa, Yemen, Oman, Saudi Arabia, Iran, and Afghanistan (DOLLING 2006).

***Nariscus spinosus* (Burmeister, 1835)**

Distribution in Iran. Hormozgan (HOBERLANDT 1955, 1985), Kerman (SEIDENSTÜCKER 1958), Sistan & Baluchestan (HOBERLANDT 1955, misidentified as *N. cinciventrus*; HOBERLANDT 1985).

General distribution. Tropical Africa, Algeria, Egypt, Cyprus, Saudi Arabia, Yemen, Oman, and Iran (DOLLING 2006).

Genus *Nemausus* Stål, 1866***Nemausus sordidatus* (Stål, 1858)**

= *Nemausus simplex* Horvath, 1911

Distribution in Iran. Hormozgan (HOBERLANDT 1985, as *N. simplex*; LINNAVUORI 2004).

General distribution. Spain, Canary Islands, northern and tropical Africa, Yemen, Oman, Saudi Arabia, Israel, Jordan and Iran (DOLLING 2006). The record from Poland (as 'PL!') by DOLLING (2006) is undoubtedly an error (cf. LIS et al. 2008) and most likely concerns Portugal (P. Moulet).

Comment. *Nemausus simplex* Horváth, 1911 was synonymized with *N. sordidatus* by LINNAVUORI (2004).

Genus *Riptortus* Stål, 1859***Riptortus aegyptiacus* Lindberg, 1939**

Distribution in Iran. Sistan & Baluchestan (HOBERLANDT 1985).

General distribution. Egypt, Saudi Arabia and Iran (DOLLING 2006).

***Riptortus linearis* (Fabricius, 1775)**

Distribution in Iran. Hormozgan (HOBERLANDT 1985, LINNAVUORI 2004), Kerman (HOBERLANDT 1985), Khorasan (MODARRES AWAL 1996b), Sistan & Baluchestan (SEIDENSTÜCKER 1957).

General distribution. Iraq, Iran, China, Taiwan, Japan, Oriental and Australasian Regions (DOLLING 2006).

Genus *Tenosius* Stål, 1860***Tenosius proletarius* (Schaum, 1853)**

Distribution in Iran. Fars (HOBERLANDT 1985), Hormozgan (HOBERLANDT 1985, LINNAVUORI 2004), Kerman (HOBERLANDT 1985), Sistan & Baluchestan (HOBERLANDT 1985).

General distribution. Canary Islands, Libya, Israel, Yemen, Oman, Saudi Arabia, Iran, tropical Africa and Oriental Region (DOLLING 2006).

Subfamily Leptocorisinae Stål, 1872

Genus *Leptocorisa* Latreille, 1829

Leptocorisa oratoria (Fabricius, 1794)

Material examined. ISFAHAN: Isfahan (1588 m), July 1999, 1 ♂, H. Masjedian leg., D. L. Carpintero det. New record for Iran.

General distribution. China, Japan, Oriental and Australasian Regions (DOLLING 2006).

Comment. Both the adults and nymphs feed on grains at the milking stage (especially wheat and barley). Feeding causes empty or small grains during the milking stage. At the soft or hard dough stage, feeding causes deformed or spotty grains. The grains become dark as a result of spilling of endosperm. The spillage becomes a medium for fungal infection. Since the eggs of *Leptocorisa* spp. are parasitized by *Gryon* spp. (Scelionidae) and *Ooencyrtus* spp. (Encyrtidae) (CORBETT 1930, AKBAR 1958, AHMAD 1965, REISSIG et al. 1986), and some specimens of *Gryon* sp. (near to *G. nixonii* Masner, 1965) and *Ooencyrtus* sp. were collected from Isfahan, they can probably be efficient parasitoids of *L. oratoria* in this region.

Discussion

The results of the present paper indicate that 21 species of 11 genera were identified from Iran so far. Iran is a large country incorporating various geographical regions and climates (Fig. 1), and we suppose that a large number of species remain to be discovered. To find new species and distributional records, more studies should be conducted on the Alydidae in all regions of Iran.

Also, the host associations of Iranian alydids are poorly known. The majority of the alydine species in Iran are found on legumes. *Riptortus linearis* is a pest of legumes but it is also known from several unrelated host plants. The host associations of the Leptocorisinae are better known. SANDS (1977) provided a detailed account of the biology of the *Leptocorisa* species in Papua New Guinea outlining their life histories, host associations and crop damage. The works conducted on host plants of the world Alydidae are rather limited (SCHAEFER 1980). Determining of host plants and natural enemies (especially parasitoids) of alydids in Iran and also other regions of the world can be the important and invaluable research work.

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