

A faunistic study on Pompilidae and Vespidae (Hymenoptera: Vespoidea) from the west and northwest of Iran, with addition of new records

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This paper deals with the faunistic survey on the families Pompilidae and Vespidae (Hymenoptera: Vespoidea) from some regions of west and northwestern Iran. In total 12 species of Pompilidae from the subfamilies Ceropalinae, Pepsinae and Pompilinae, and 4 species of Vespidae were collected and identified. Eight species and one genus (*Caliadurgus* Pate) of Pompilidae are new records for the fauna of Iran.

Keywords: Hymenoptera, Vespoidea, Pompilidae, Vespidae, new records, faunistic list, Iran.

Cette enquête faunistique traite des Pompilidae et Vespidae (Hymenoptera Vespoidea) de l'ouest et nord-ouest de l'Iran avec au total 4 espèces de Vespides et 12 de Pompilides pour lesquels le genre *Caliadurgus* est cité pour la première fois et 8 espèces sont nouvelles pour la faune du pays.

Mots-clés : Hymenoptera, Vespoidea, Pompilidae, Vespidae, liste faunistique, Iran.

1 INTRODUCTION

Pompilidae is a rather big and cosmopolitan family of aculeata wasps which are known as spider-hunting wasps. There are 4000-4500 species of pompilids worldwide and 103 species and subspecies from 31 genera from Iran (Ghahari *et al.*, 2014). A large portion of them are burrowing and predatory wasps, but the family includes also some parasitoid species. The hunter carries the paralyzed spider in the nest and then lays an egg on the prey body. The eggs hatch and the larvae feed on alive, paralyzed spiders until it is time to pupate. Most of Pompilidae species are solitary and very few of them have semi-social life. Usually each larva develops on a single paralyzed spider (Araneae), very rarely another order of Arachnida, in a cell constructed and provisioned by the female, although a preexisting cavity may sometimes be used; the larva is rarely an ectoparasitoid of an active spider or a cleptoparasite in a cell provisioned by another pompilid.

The Vespidae is a cosmopolitan but predominantly tropical family, containing about 5000 described species in six subfamilies; Stenogastrinae, Eumeninae, Eupragiinae, Masarinae, Polistinae, and Vespinae. For Iranian fauna a total of 182 species from 51 genera were listed by Ebrahimi & Carpenter (2008), and then two checklists were prepared by Bagriacik & Samin (2011) and Dvorak *et al.* (2012) on the subfamily Vespinae. Some species have become invasive pests as they have been recorded from new regions. Yellow jackets (Vespinae) scavenge dead insects, earthworms and other carrion, including garbage. The aim of this study is to survey two hymenopteran families, Pompilidae and Vespidae distributed in some regions of the west and northwestern Iran.

2 MATERIAL AND METHODS

Specimens have been collected by sweeping of vegetation, Malaise traps and pitfall traps from some regions of the west and northwest of Iran.

(Ardabil, East Azarbaijan, Kordestan and West Azarbaijan provinces). Classification, nomenclature and distribution data of Pompilidae were taken from Wahis (2011) and Yildirim & Wahis (2011a, 2011b), and of Vespidae suggested by Ebrahimi & Carpenter (2008) and Dvorak *et al.* (2012) have been followed. The list of species is given below with distribution data. Within each subfamily, all taxa have been listed in alphabetical order.

3 RESULTS

As a result, a total of 12 species of Pompilidae of which 8 asterisked are recorded for the first time for the Iranian fauna. Also four species of Vespidae (subfamily Vespinae) were collected and identified from the west and northwestern parts of Iran.

Family POMPILIDAE

Subfamily Ceropalinae

Genus *Ceropales* Latreille 1796

**Ceropales (Hemiceropales) cribrata* Costa 1881

Material examined: West Azarbaijan province, Mahabad, 36°46'N 45°44'E, 1♀, 22-29 June 2012. General distribution: Austria (Kohl, 1888), Albania, Corsica, Cyprus, France, Greece, Italy, Slovakia, Spain, Switzerland, Ukraine (Wahis, 2011), Turkey (Priesner, 1967; Moczar, 1986; Özbek *et al.*, 1999; Yildirim & Wahis, 2009, 2010, 2011b).

**Ceropales (Ceropalinae) helvetica* Tournier 1889

Material examined: West Azarbaijan province, Oshnavieh, 37°03'N 45°05'E, 1♀, 14 May 2013. General distribution: Bulgaria, Corsica, Croatia, Cyprus, France, Germany, Greece, Hungary, Italy, Macedonia, Poland, Portugal, Romania, Russia, Slovakia, Spain, Switzerland (Wahis, 2011), Malta (Wahis, 1998a), Kazakhstan (Wolf, 2003), Kyrgyzstan (Wolf, 1998), Turkey (Priesner, 1967; Moczar, 1989; Özbek *et al.*, 1999; Japoshvili *et al.*, 2011; Yildirim & Wahis, 2011a, 2011b), Russia, Europe, Central Asia (Tobias, 1978a; Wahis, 2013), Siberia (Baghirov, 2014).

Subfamily Pepsinae

Genus *Caliadurgus* Pate 1946

**Caliadurgus fasciatellus* (Spinola 1808)

Material examined: Ardabil province, Germei, 39°00'N 47°57'E, 1♀, 26 August 2013.

General distribution: Austria (Wolf, 1993; Wahis, 2011), Belarus, Belgium, Bosnia-Herzegovina, England, Corsica, Cyprus, Czech Republic, Denmark (Wahis, 2011; Yildirim & Wahis, 2011a, 2011b), Turkey (Özbek *et al.*, 1999; Wahis, 2011; Yildirim & Wahis, 2011a, 2011b), Finland, France, Germany, Italy, Luxemburg, Montenegro, Netherlands, Poland, Romania, Russia, Serbia, Slovakia, Spain (Wahis, 2011), Russia, western Europe, Ukraine, Belarus (Lelej & Loktionov, 2012b), Siberia (Baghirov, 2014).

Note: The genus *Caliadurgus* is recorded for the first time from Iran. It's not a surprise, because the genus was largely distributed in Europa.

Genus *Cryptocheilus* Panzer 1806

**Cryptocheilus (Adonta) freydessneri* (Kohl 1883)

Material examined: West Azarbaijan province, Khoy, 38°33'N 44°57'E, 1♀, 15-17 May 2012. General distribution: Czech Republic, Romania, Russia, Slovakia (Tobias, 1978a; Wahis, 2011, 2013), Turkey (Yildirim & Wahis, 2011a, 2011b), Italy (Tobias, 1978a; Wahis, 2013), Siberia (Baghirov, 2014).

Genus *Dipogon* Fox 1897

Dipogon (Deuteragenia) bifasciatus (Geoffroy 1785)

Material examined: West Azarbaijan province, Oshnavieh, 37°03'N 45°05'E, 1♀, 1♂, 14 May 2013. General distribution: Austria (Wolf, 1993; Wahis, 2011), Belarus, Belgium, Bosnia-Herzegovina, England, Corsica, Czech Republic, Finland, France, Germany, Italy, Poland, Romania, Slovakia, Netherlands (Wahis, 2011), Georgia, Japan, Ukraine (Lelej & Loktionov, 2012a), Russia (Wahis, 2011; Lelej & Loktionov, 2012; Loktionov & Lelej, 2014).

Genus *Priocnemis* Schiödte 1837

**Priocnemis (Priocnemis) agilis* (Shuckard 1837)

Material examined: East Azarbaijan province, Tabriz, 38°05'N 46°17'E, 1♀, August 2010. General distribution: Albania, Belgium, England, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Italy, Malta, Romania, Slovakia, Switzerland (Wahis, 2011), Austria (Wolf, 1993; Wahis, 2011), Turkey (Özbek *et al.*,

1999; Yildirim & Wahis, 2011a, 2011b), Russia, Western Europe, Central Asia (Tobias, 1978a; Wahis, 2013), Siberia (Baghirov, 2014).

Subfamily Pompilinae

Genus *Anoplius* Dufour 1834

Anoplius (*Arachnophroctonus*) *viaticus* (Linnaeus 1758)

Material examined: Ardabil province, Germe, 39°00'N 47°57'E, 1♂, 26 August 2013. West Azarbaijan province, Ourmieh, 37°33'N 45°00'E, 3♂, 3-5 August 2013.

General distribution: Algeria, Cyprus, Italy, Morocco, Portugal, Spain, Switzerland, Tunisia (Junco y Reyes, 1959), Austria (Junco y Reyes, 1959; Priesner, 1966, 1968; Wolf, 1993), Belarus, Belgium, Bosnia-Herzegovina, Britain, Bulgaria (Junco y Reyes, 1959; Wahis, 2002), Egypt (Walker, 1871; Junco y Reyes, 1959; Priesner, 1960), Iran (Ebrahimi, 2006; Ebrahimi *et al.*, 2008; Amiresmaili *et al.*, 2010a, 2010b; Amiresmaili & Barari, 2012), Italy-Sicilia (Wahis & Terzo, 1996), Jordan (Wolf, 1998a), Kazakhstan (Wolf, 1998b, 2004, 2005; Shlyahtenok *et al.*, 2012), Kyrgyzstan (Wolf, 1998b, 2004, 2005; Zonstein, 2002), Libya (Wolf, 1983), Malta (Junco y Reyes, 1959; Wahis, 1997, 2011), Mongolia, Japan, Korea, Georgia, North Africa, Russia (Shlyahtenok *et al.*, 2012), Saudi Arabia (Gadallah & El-Barty, 2011), Siberia (Baghirov, 2014), Spain-Belears (Wahis, 1974), Sweden (Day, 1979), Tajikistan (Wolf, 2004), Tunisia (Wolf, 2004), Turkey (Priesner, 1967; Wahis, 1998a, 2000; Özbek *et al.*, 2000; Yildirim & Wahis, 2011a), Turkmenistan (Wolf, 1995, 1998b, 2005; Shlyahtenok *et al.*, 2012), Uzbekistan (Wolf, 1998b, 2005).

Genus *Arachnospila* Kincaid 1900

**Arachnospila* (*Arachnospila*) *clericalis* (F. Morawitz 1889)

Material examined: Kordestan province, Qorveh, 35°15'N 47°40'E, 1♀, 2♂, 11 April 2012.

General distribution: China, Kazakhstan, Mongolia, Russia (Lelej & Loktionov, 2011), Siberia (Baghirov, 2014), Turkey (Özbek *et al.*, 2000; Yildirim & Wahis, 2011a, 2011b; Lelej & Loktionov, 2011).

Arachnospila (*Arachnospila*) *fumipennis* (Zetterstedt 1838)

Material examined: West Azarbaijan province, Ourmieh, 37°33'N 45°00'E, 1♂, 3-5 August 2013. General distribution: Albania, Belgium, Bosnia-Herzegovina, Czech Republic, Finland, France, Germany, Greece, Italy, Norway, Romania, Slovakia, Netherlands (Wahis, 2011), Austria (Wolf, 1993; Wahis, 2011), Egypt, Israel (Wolf, 1998c), Turkey (Özbek *et al.*, 2000; Yildirim & Wahis, 2011a, 2011b), Russia, Western Europe, Ukraine, Kazakhstan, Kyrgyzstan, Tajikistan, Mongolia, Near East, China, Japan, North America (Lelej & Loktionov, 2011), Siberia (Baghirov, 2014).

**Arachnospila* (*Arachnospila*) *rufa* (Haupt 1927)

Material examined: East Azarbaijan province, Tabriz, 38°05'N 46°17'E, 1♂, August 2010.

General distribution: Albania, Belgium, Bosnia & Herzegovina, Bulgaria, England, Czech Republic, Denmark, Finland, France, Germany, Italy, Luxembourg, Norway, Poland, Spain, Sweden, Netherlands (Wahis, 2011), Austria (Wolf, 1993; Wahis, 2011), Turkey (Özbek *et al.*, 2000; Wahis, 1998b; Yildirim & Wahis, 2011a, 2011b; Lelej & Loktionov, 2011), Russia (Lelej & Loktionov, 2011; Wahis, 2011), Western Europe, Belarus, Kazakhstan, Kyrgyzstan, Mongolia, Near East (Lelej & Loktionov, 2011), Siberia (Baghirov, 2014).

Genus *Batozonellus* Arnold 1937

Batozonellus lacerticida (Pallas 1771)

Material examined: Kordestan province, Qorveh, 35°15'N 47°40'E, 1♀, 11 April 2012.

General distribution: Austria (Wolf, 1993; Zettel & Wiesbauer, 2004), Spain (Junco y Reyes, 1963), Turkey (Wolf, 1966; Priesner, 1967; Özbek *et al.*, 2000; Anlaş *et al.*, 2005; Yildirim & Wahis, 2011a, 2011b), Japan (Endo & Endo, 1994).

Genus *Evagetes* Lapeletier 1845

**Evagetes crassicornis* (Shuckard 1837)

Material examined: West Azarbaijan Province, Miandoab, 36°57'N 46°00'E, 1♂, 14-16 April 2013.

General distribution: Albania, Belarus, Belgium, Bulgaria, England, Czech Republic, Denmark, Finland, France, Germany, Greece, Italy,

Luxembourg, Norway, Poland, Portugal, Romania, Slovakia, Sweden, Switzerland, Netherlands (Wahis, 2011), Austria (Wolf, 1993; Wahis, 2011), Turkey (Yildirim & Wahis, 2011a, 2011b), Russia, Europe, Georgia, Morocco, Kazakhstan, Kyrgyzstan, Tajikistan, Mongolia, South America (Lelej & Loktionov, 2012b), Siberia (Baghirov, 2014).

Family VESPIDAE

Subfamily Vespinae

Genus *Vespa* Linnaeus 1758

Vespa crabro Linnaeus 1758

Material examined: West Azarbaijan Province, Ourmieh, 37°33'N 45°00'E, 1♀, 1♂, 3-5 August 2013. Ardabil province, Khalkhal, 37°37'N 48°32'E, 2♀, 1♂, September 2013. East Azarbaijan province, Mianeh, 37°25'N 47°42'E, 1♂, 15 September 2014.

General distribution: British Isles, Europe except extreme north and south; Asia east to Japan and south to Iran, China, and Taiwan; introduced into North America (Carpenter & Kojima, 1997), Europe, North Africa, Turkey, North America (Gusenleitner, 2013)

Vespa orientalis Linnaeus 1771

Material examined: East Azarbaijan province, Maragheh, 37°23'N 46°24'E, 1♀, 17 September 2011.

General distribution: Southeastern Europe; northern Africa; Arabian Peninsula; Asia east to India, Nepal, and China; introduced into Madagascar and Mexico (Carpenter & Kojima, 1997; Gusenleitner, 2013).

Genus *Vespula* Thomson 1869

Vespula germanica (Fabricius 1793)

Material examined: West Azarbaijan Province, Oshnavieh, 37°03'N 45°05'E, 2♀, 14 May 2013.

General distribution: Europe; northern Africa; Asia east to Korea and south to northern India; introduced into many regions of the world: Iceland, New Zealand, Australia, Ascension island, South Africa, Chile, Argentina, USA, Canada (Carpenter & Kojima, 1997), Canary Islands, Turkey, Israel, Iraq, North America (Gusenleitner, 2013).

Genus *Dolichovespula* Rohwer 1916

Dolichovespula sylvestris (Scopoli 1763)

Material examined: West Azarbaijan Province, Mahabad, 36°46'N 45°44'E, 1♂, 22-29 June 2012. East Azarbaijan province, Maragheh, 37°23'N 46°24'E, 1♂, 17 September 2011.

General distribution: Europe except extreme north; Morocco; through southern Siberia to Afghanistan, Pakistan, Kashmir, Mongolia, and China. North-West Africa, Western Europe, north to the Arctic Circle (Pekkarinen & Huldén, 1995), Asia Minor, Armenia, Iran, Afghanistan, Pakistan, India: Kashmir, Kyrgyzstan, Kazakhstan, Mongolia, China (Carpenter & Kojima, 1997). Russia: southern regions of the European part, N Caucasus, S Siberia to Transbaikalia (Tobias, 1978b; Kurzenko, 1995; Dubatolov, 1998), Europe, Palaearctic Asia, Turkey, Northwest Africa (Gusenleitner, 2013).

4 DISCUSSION

Upon the results of this paper, the total number of Iranian Pompilidae species reaches to 112 species and subspecies from 32 genera. The fauna of Iranian Vespidae is diverse with 182 species from 51 genera (Ebrahimi & Carpenter, 2008). After the mentioned checklist, three species of the subfamily Eumeninae were recorded from Iran by Salehi Fard *et al.* (2013) and Gusenleitner *et al.* (2013). So now the total number of Iranian Vespidae is 185 species. Among the adjacent countries of Iran, the fauna of these taxa was studied well in Turkey. Regarding to Pompilidae 205 species and subspecies from 35 genera (Yildirim & Wahis, 2011b) and of the Vespidae a total of 298 species and subspecies belonging to 53 genera have been recorded from Turkey (Yildirim, 2012). These very valuable difference (hardly simple to double) arises from lack of data consequently to one insufficient hunting task. Indubitably, additional investigations would rapidly allow a notable increase about the species inventory.

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