

A preliminary study of the spider wasp fauna (Hymenoptera, Pompilidae) from Southern Iran

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A list of spider wasps (Hymenoptera, Pompilidae) collected from southern Iran is given. It includes 24 species and subspecies belonging to 13 genera representing three subfamilies: Ceropalinae, Pepsinae and Pompilinae. Two genera namely *Icazus* Priesner 1966 and *Microphadnus* Cameron 1904, and 11 species are new records for Iranian insect fauna. Available data on geographical distribution of each species are included.

Key Words: Hymenoptera, Spider wasps, Malaise trap, Iran, Palaearctic Region.

Une liste des Pompilides (Hymenoptera Pompilidae) recueillis dans le sud de l'Iran comporte 24 espèces et sous-espèces appartenant à 13 genres. Deux d'entre eux *Icazus* Priesner 1966 et *Microphadnus* Cameron 1904 ainsi que 11 espèces sont signalés pour la première fois d'Iran. Des données relatives à la distribution générale de ces espèces sont également présentées.

Mots-clés: Hymenoptera, Pompilides, piège Malaise, Iran, région Paléarctique.

1 INTRODUCTION

The spider wasps (Hymenoptera, Pompilidae) are one of the largest and most divers families of aculeate wasps with over 4855 species in more than 125 genera known throughout the world (Aguiar *et al.*, 2013). Waichert *et al.* (2015) proposed five subfamilies (Ctenocerinae, Notocyphinae, Ceropalinae, Pepsinae, and Pompilinae) for Pompilidae. Two subfamilies, Ctenocerinae, Notocyphinae, are not present in Iran. All species are solitary, and most of them capture and paralyze spider as prey, however some species are cleptoparasites of other pompilids, laying their egg on a previously paralyzed and concealed spider (Shimizu, 2000). The faunistic works on Iranian pompilid species can be roughly divided into two groups: (1) the old and scattered papers that are related to a few decades ago (e.g. Haupt, 1930; Gussakovskij, 1932; Wolf, 1970; Esmaili & Rastegar, 1974) and (2) articles that have been published in recent years (e.g. Ebrahimi *et al.*, 2008; Amiresmaili *et al.*, 2010a, 2010b, 2011). Furthermore, Ghahari *et al.* (2014) provided a preliminary list of Iranian Pompilidae including 103 species and subspecies

from 31 genera; however the fauna of spider wasps from Iran is still unknown.

Hereby, we present some further data on the distribution of spider wasp fauna from southern Iran; add two genera and 11 species to the previously published records.

2 MATERIAL AND METHODS

This research was carried out during year 2012 aiming to make an inventory of the spider wasp fauna (Hymenoptera, Pompilidae) in Fars Province, Iran. Specimens were collected using Malaise traps in different locations in Fars province southern, Iran. The collected specimens were dropped directly into ethanol 75%, then dried, pinned, labeled, and put into collection boxes, subsequently. The voucher specimens are deposited in Department of Entomology, Jahrom Branch, Islamic Azad University, Jahrom, Iran and the collections of Gembloux Agro-Bio Tech (GxABT, Belgium). The taxonomy arrangements were adapted from Wahis (2015). The identification of the specimens is indebted to the third author.

3 RESULTS

A total of 24 species and subspecies belonging to 13 genera from three subfamilies were collected and identified. The subfamilies, genera and species are listed in alphabetic order.

Family POMPILIDAE

Subfamily Ceropalinae

Genus *Ceropales* Latreille 1796

Ceropales (Ceropales) helvetica Tournier 1889

Material examined: 1♂, 2♀: Iran, Fars, Larestan (27°38'N; 54°16'E), 9.iv.2012, leg. A. Falahatpishe.

Distribution in Iran: Alborz, Fars (Wolf *et al.*, 2009).

General distribution: Europe, Central Asia (Wahis, 2015; Tobias, 1978; Baghirov, 2014), Tunisia (Wolf, 2005b); Syria (Wolf, 2003, 2005b); Kazakhstan (Wolf, 2003); Kyrgyzstan (Wolf, 2004a, 2004b, 2006), Turkey (Özbek *et al.*, 1999; Yildirim & Wahis, 2011a, 2011b).

Ceropales (Ceropales) maculata (Fabricius 1775)

Material examined: 1♀: Iran, Fars, Larestan (27°13'N; 54°25'E), 8.vii.2012, leg. A. Falahatpishe.

Distribution in Iran: Tehran (Ebrahimi, 2006; Ebrahimi *et al.*, 2008), Alborz: Chalus (Wolf *et al.*, 2009).

General distribution: Europe, East Palaearctic, Near East, North Africa (Wahis, 2015), China, Korea, Mongolia (Yasumatsu, 1946), Japan (Yasumatsu & Ishikawa, 1955), Turkmenistan (Wolf, 1995), Kazakhstan (Wolf, 2004b), Kyrgyzstan (Zonstein, 1996; Wahis, 1996; Wolf, 2004b), Tadzhikistan (Wolf, 2004b), Mongolia (Wolf, 2005a); Turkey (Özbek *et al.*, 1999; Yildirim & Wahis, 2011a, 2011b).

Ceropales (Hemiceropales) cribrata Costa 1881

Material examined: 1♂: Iran, Fars, Larestan (28°13'N; 54°25'E), 11.xi.2012, leg. A. Falahatpishe.

General distribution: Europe and East Palaearctic (Wahis, 2015), Turkey (Özbek *et al.*, 1999; Yildirim & Wahis, 2011a, 2011b). New for the Iranian fauna.

Subfamily Pepsinae

Genus *Auplopus* Spinola 1841

Auplopus carbonarius (Scopoli 1763)

Material examined: 1♀: Iran, Fars, Larestan (27°38'N; 54°16'E), 14.vii.2012, leg. A. Falahatpishe; 1♂: Larestan (27°32'N; 54°59'E), 12.x.2012, A. Falahatpishe.

Distribution in Iran: Alborz (Ebrahimi *et al.*, 2008), East Azarbaijan (Ebrahimi, 2006; Ebrahimi *et al.*, 2008), Mazandaran (Amiresmaili *et al.*, 2010a, 2010b, 2011; Amiresmaili & Barari, 2012), Alborz: Chalus (Wolf *et al.*, 2009).

General distribution: Europe (Wahis, 2015), Kazakhstan, Kyrgyzstan (Wolf, 1998b), Jordan (Wolf, 1998c), Syria (Wolf, 2005b); Algeria, Britain, Israel, Japan, Lebanon, Mongolia, Morocco, Sweden (Wolf, 1971), Croatia (Wahis, 1963), France (Wahis, 1979), Greece (Priesner, 1965), Turkey (Özbek *et al.*, 1999; Yildirim & Wahis, 2011a, 2011b); Kazakhstan (Wolf, 2003, 2005a); Tadzhikistan (Wolf, 2004b), Russia, Western Europe, Ukraine, Kazakhstan, Near East, Korea, Japan, North Africa (Lelej & Loktionov, 2012; Baghirov, 2014).

Auplopus nigroaurantiacus (Magretti 1884)

Material examined: 1♂: Iran, Fars, Neyriz (29°16'N; 54°19'E), 24.ix.2012, leg. M. Khosroabadi.

General distribution: Natal, Zimbabwe, Senegal, Gambia, Saudi Arabia (Gadallah & El-Barty, 2011). New for the Iranian fauna.

Genus *Dipogon* Fox 1897

Dipogon (Deuteragenia) subintermedius (Magretti 1886)

Material examined: 1♂, 1♀: Iran, Fars, Larestan (27°38'N; 54°16'E), 5.viii.2012, leg. A. Falahatpishe; 1♀: Larestan (27°13'N; 54°25'E), 29.x.2012, leg. A. Falahatpishe.

General distribution: Europe (Austria, Britain I., Corsica, Czech Republic, Danish mainland, Finland, Germany, Greek mainland, Italian mainland, Luxembourg, Poland, Russia Central, Slovakia, Switzerland) (Wahis, 2015). New for the Iranian fauna.

Genus *Priocnemis* Schioedte 1837***Priocnemis (Umbripennis) sulci* Balthasar 1943**

Material examined: 1♂: Iran Fars, Larestan (27°13'N; 54°25'E), 11.xi.2012; 1♂, 1♀: same data, 17.iv.201.

Distribution in Iran: Gorgan (Wolf *et al.*, 2009); Mazandaran (Amiresmaili *et al.*, 2010a, 2010b, 2011; Amiresmaili & Barari, 2012).

General distribution: Austria, Britain, Czech Republic, Dodecanese Islands, Italy, Romania, Slovakia (Wahis, 2015), Kazakhstan, Tadjikistan, Uzbekistan (Wolf, 1998b), Turkey (Özbek *et al.*, 1999; Yildirim & Wahis, 2011a, 2011b).

Subfamily Pompilinae**Genus *Agenioideus* Ashmead 1902*****Agenioideus arenicola* (Priesner 1955)**

Material examined: 1♂: Iran, Fars, Larestan (27°38'N; 54°16'E), 30.x.2012, leg. A. Falahatpishe.

Distribution in Iran: Sistan and Baluchestan (Wolf *et al.*, 2009).

General distribution: Morocco, Tunisia, Egypt, Sudan, Israel (Wolf, 1990).

***Agenioideus ciliatus* (Lepelletier 1845)**

Material examined: 1♂: Iran, Fars, Larestan (27°38'N; 54°16'E), 14.vii.2012, leg. A. Falahatpishe; 1♂: same data, 30.x.2012; 1♂: Larestan (27°32'N; 54°59'E), 5.x.2012, leg. A. Falahatpishe; 1♀: Larestan (27°13'N; 54°25'E), 18.x.2012, leg. A. Falahatpishe.

General distribution: Europe, Near East (Wahis, 2015), Kazakhstan (Wolf, 2003); Uzbekistan (Wolf, 2005a); Syria (Wolf, 2004a, 2005b), Turkey (Özbek *et al.*, 2000; Yildirim & Wahis, 2011a, 2011b). New for the Iranian fauna.

***Agenioideus nudatus* (Smith 1855)**

Material examined: 1♂: Iran, Fars, Larestan (27°38'N; 54°16'E), 6.vii.2012, leg. A. Falahatpishe; 4♂, 2♀: Larestan (27°13'N; 54°25'E), 24.iv.2012, leg. A. Falahatpishe.

General distribution: Turkey, Sudan, Algeria, India, Pakistan, Mauritania, Senegal, Guinea, Niger, Gabon, Congo, Kenya, Zambia, Mozambique, Namibia, Zimbabwe and South African (Wahis, 2000b). New for the Iranian fauna

***Agenioideus waltlii* (Spinola 1838)**

Material examined: 1♂: Iran, Fars, Larestan (27°38'N; 54°16'E), 13.xi.2012, leg. A. Falahatpishe; 31♂: Larestan (27°13'N; 54°25'E), 18.x.2012, leg. A. Falahatpishe.

General distribution: Egypt, Israel, North Africa, Saudi Arabia (Gadallah & El-Barty, 2011). New for the Iranian fauna.

Genus *Anoplius* Dufour 1834***Anoplius concinnus* (Dahlbom 1843)**

Material examined: 1♀: Iran Fars, Larestan (27°32'N; 54°59'E), 12.x.2012.

Distribution in Iran: Sistan & Baluchestan (Wolf, 1970), Alborz: Chalus (Wolf *et al.*, 2009), Golestan (Ebrahimi, 2006; Ebrahimi *et al.*, 2008).

General distribution: Europe (Wahis & Terzo, 1996; Wahis, 2015), Israel (Wolf, 1998a), Kyrgyzstan, Turkmenistan, Uzbekistan, Kazakhstan, Uzbekistan (Wolf, 1998b, 2005a); Kyrgyzstan (Wahis, 1996), Turkey (Özbek *et al.*, 2000; Yildirim & Wahis, 2011a, 2011b), Yemen (Wahis, 2000a), Russia; Kazakhstan, Central Asia, Iran, Mongolia (Tobias, 1978; Shlyahenok *et al.*, 2012).

***Anoplius infuscatus* (Vander Linden 1827)**

Material examined: 1♂: Iran, Fars, Larestan (27°38'N; 54°16'E), 14.vii.2012, leg. A. Falahatpishe; 1♂: Larestan (27°13'N; 54°25'E), 17.iv.2012, leg. A. Falahatpishe; 1♂: same data, 11.xi.2012.

Distribution in Iran: Tehran, Khorasan Razavi (Wolf *et al.*, 2009); Alborz (Ebrahimi, 2006), Guilan (Ebrahimi *et al.*, 2008), Tehran (Ebrahimi, 2006; Ebrahimi *et al.*, 2008).

General distribution: Albania, Austria, Belarus, Belgium, Bosnia and Herzegovina, Britain, Bulgaria, Canary Islands, China (Yasumatu, 1946), Algeria (Priesner, 1962), Corsica, Cyprus, Czech Republic, Denmark, Egypt (Priesner, 1960), Europe (Wahis, 2015), Jordan (Wolf, 1998c), Kyrgyzstan, Turkmenistan, Uzbekistan, Kazakhstan (Wolf, 1998b, 2005a) Turkey (Yildirim & Wahis, 2011a, 2011b); Russia; Japan, South Korea, Mongolia, Central Asia, Ukraine, North Africa (Shlyahenok *et al.*, 2012).

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

Material examined: 1♀: Iran, Fars, Larestan (27°13'N; 54°25'E), 17.iv.2012, leg. A. Falahatpishe; 1♀: same data, 11.xi.2012.

Distribution in Iran: Alborz, East Azarbaijan (Ebrahimi, 2006; Ebrahimi *et al.*, 2008), Mazandaran (Amiresmaili *et al.*, 2010a, 2010b, 2011; Amiresmaili & Barari, 2012), Tehran (Ebrahimi, 2006), Gilan (Wolf *et al.*, 2009).

General distribution: Crete (Priesner, 1965), Egypt (Priesner, 1960), Kyrgyzstan, Kazakhstan, Uzbekistan (Wolf, 1998b, 2005), Turkmenistan (Wolf, 2005a), Jordan (Wolf, 1998c), Syria (Wolf, 2005b); Turkey (Wahis, 1998; Yildirim & Wahis, 2011a, 2011b), Europe, Russia, Georgia, Kazakhstan, Turkmenistan, Mongolia, Japan, South Korea, North Africa (Shlyahtenok *et al.*, 2012; Baghirov, 2014).

Genus *Arachnospila* Kincaid 1900

***Arachnospila (Acanthopompilus) conjungens* (Kohl 1898)**

Material examined: 2♀: Iran, Fars, Larestan (27°13'N; 54°25'E), 17.iv.2012, leg. A. Falahaatpishe.

General distribution: Europe (Austria, Belarus, Bosnia and Herzegovina, Corsica, French mainland, Greek mainland, Romania), Turkey (Özbek *et al.*, 2000; Yildirim & Wahis, 2011a, 2011b). New for the Iranian fauna.

***Arachnospila (Ammosphex) anceps* (Wesmael 1851)**

Material examined: 1♂: Iran, Fars, Larestan (27°13'N; 54°25'E), 17.iv.2012, leg. A. Falahaatpishe; 1♂: same data, 11.xi.2012.

Distribution in Iran: Khorasan Razavi, Alborz (Wolf *et al.*, 2009); Mazandaran (Amiresmaili *et al.*, 2011; Amiresmaili & Barari, 2012), Iran (no locality cited) (Móczár, 1968 in Loktionov & Lelej, 2011).

General distribution: Corsica, Hungary, Morocco (Wolf, 1971), Finland (Wolf, 1967a), Kazakhstan, Kyrgyzstan (Wolf, 1998b), Sicilia (Wahis & Terzo, 1996), Tunisia (Wolf, 2005b); Turkey (Özbek *et al.*, 2000; Yildirim & Wahis, 2011a, 2011b); Russia, Great Britain, Norway, Denmark, the Netherlands, Belgium, Luxembourg, France, Spain, Portugal, Germany, Poland, Belarus, Czech Republic, Slovakia, Austria, Switzerland, Italy, Bosnia and Herzegovina, Romania, Bulgaria, Albania, Greece, Cyprus, Turkey, Syria, Iran, Kyrgyzstan, Mongolia (Loktionov & Lelej, 2011, 2015; Bagirov, 2014).

Genus *Dicyrtomellus* Gussakovskij 1935

***Dicyrtomellus tingitanus* (Wolf 1966)**

Material examined: 1♂: Iran, Fars, Larestan (27°32'N; 54°59'E), 12.x.2012, leg. A. Falahaatpishe.

Distribution in Iran: Golestan, Kermanshah (Ebrahimi *et al.*, 2008), West Azarbaijan (Sakenin *et al.*, 2010).

General distribution: Bulgaria, Greece, Italy, Uzbekistan, former Yugoslavia (Priesner, 1968; Wolf, 1971, 1995, 1999), Corsica (Wahis, 2007), Israel (Wolf, 1998a), Sicilia (Wahis & Terzo, 1996), Jordan, Syria (Wolf, 1998c), Kazakhstan (Wolf, 2005), Iran (Ebrahimi *et al.*, 2008), Kyrgyzstan (Zonstein, 2002b), Morocco (Wolf, 1966b as *Arachnospila (Arachnospila) fumipennis tingitana*), Turkey (Özbek *et al.*, 2000), Turkmenistan (Wolf, 2005).

Genus *Evagetes* Lepeletier 1845

***Evagetes crassicornis* (Shuckard 1837)**

Material examined: 1♂: Iran, Fars, Larestan (27°13'N; 54°25'E), 17.iv.2012, leg. A. Falahaatpishe.

General distribution: Europe (Wahis, 2015), Kyrgyzstan (Zonstein, 1996; Wolf, 2004b), Tadjikistan (Wolf, 2004b), Kazakhstan (Wolf, 2005a), Turkey (Yildirim & Wahis, 2011a, 2011b), Russia, Georgia, Mongolia, Morocco, South America (Lelej & Loktionov, 2012; Baghirov, 2014). New for the Iranian fauna.

***Evagetes pectinipes* (Linnaeus 1758)**

Material examined: 12♂: Iran, Fars, Larestan (27°13'N; 54°25'E), 17.iv.2012, leg. A. Falahaatpishe.

General distribution: Western Europe, Turkey, Russia, Belarus, Ukraine, Kazakhstan, Uzbekistan, Kyrgyzstan, Algeria (Loktionov & Lelej, 2009). New for the Iranian fauna.

***Evagetes proximus* (Dahlbom 1843)**

Material examined: 2♂: Iran, Fars, Larestan (27°13'N; 54°25'E), 11.xi.2012, leg. A. Falahaatpishe.

Distribution in Iran: Iran (no locality cited) Smissen (2003).

General distribution: Europe (Wahis, 2015); Kazakhstan (Wolf, 2003, 2005); Kyrgyzstan (Zonstein, 1996; Wolf, 2004b), Tadjikistan (Wolf, 2004b); Turkey (Özbek *et al.*, 2000; Yildirim & Wahis, 2011a, 2011b); Russia,

Western Europe, Ukraine, Belarus, Turkey, Iran, Mongolia, China (Hebei), Japan (Hokkaido) (Loktionov & Lelej, 2009; Baghirov, 2014).

Genus *Homonotus* Dahlbom 1843

Homonotus sanguinolentus (Fabricius 1793)

Material examined: 1♂: Iran, Fars, Larestan (27°31'N; 54°26'E), 5.viii.2012, leg. A. Falahatpishe; 1♀: Larestan (27°13'N; 54°25'E), 18.x.2012, leg. A. Falahatpishe.

Distribution in Iran: Khorasan (Ebrahimi *et al.*, 2008).

General distribution: Austria, Belgium, Corsica, Croatia (Wahis, 1963), Cyprus, Czech Republic, Germany, Greece, Italy (Wahis & Terzo, 1996), Kyrgyzstan (Zonstein, 2002), Kazakhstan (Wolf, 2003); Romania, Sicily, Slovakia, Spain, Switzerland (Wahis, 2015), Syria (Wolf, 1998c), Turkey (Özbek *et al.*, 2000).

Genus *Icazus* Priesner 1966

Icazus arcanus (Priesner 1955)

Material examined: 1♂: Iran, Fars, Larestan (27°13'N; 54°25'E), 11.xi.2012, leg. A. Falahatpishe; 4♂: same data, 17.iv.2012.

General distribution: Egypt, Saudi Arabia (Gadallah & El-Barty, 2011). The genus and species are new for the Iranian fauna.

Comments: Easily recognised by the distinctive wing venulation (third submarginal cell narrow and elongated). Created by Priesner (1966) for his *Pompilus arcanus* with addition of *Pompilus khargensis*, both described from Egypt in 1955. Reported from Saudi Arabia (Gallahari & El-Barty, 2011) but also present in North Africa (Senegal), in the Middle-East (Iran, Israel) and India: Mysore (R. Wahis, personal communication).

Genus *Microphadnus* Cameron 1904

Microphadnus pumilus (Costa 1882)

Material examined: 1♀: Iran, Fars, Larestan (27°32'N; 54°59'E), 12.x.2012, leg. A. Falahatpishe.

General distribution: Mediterranean subregion, Saudi Arabia (Gadallah & El-Barty, 2011), Turkey (Özbek *et al.*, 2000; Yildirim & Wahis, 2011a, 2011b). The genus and species are new for the Iranian fauna.

Comments: With two submarginal cells, the basal vein strongly angulate and the elongate

propodeum longitudinally striated, the genus is very easy to identify. As yet, it's present in the Mediterranean area (Cyprus, France, Spain, Italy, Greece, Turkey, URSS: Uzbekistan), the Middle East (Bahrein, Egypt, Israel, Jordan, Oman, Socotra, Yemen, UAE), North Africa (Algeria), Ethiopian Region (Ghana, Ivory Coast, Madagascar, Mali, Nigeria, Rhodesia, Senegal, Somaliland, Soudan, South Africa, Togo, Zimbabwe), Oriental Region (India) and Australia (R. Wahis, personal communication).

Genus *Paracyphonyx* Ashmead 1902

Paracyphonyx ruficrus (Klug 1828)

Material examined: 19♂, 3♀: Iran, Fars, Larestan (27°13'N; 54°25'E), 9.ix.2012, leg. A. Falahatpishe; 2♂: Larestan (27°38'N; 54°16'E), 14.vii.2012, leg. A. Falahatpishe; 5♂: Larestan (27°31'N; 54°26'E), 5.viii.2012, leg. A. Falahatpishe; 2♂: Larestan (27°32'N; 54°59'E), 12.x.2012, leg. A. Falahatpishe.

Distribution in Iran: Sistan & Baluchestan (Wolf, 2003).

General distribution: Africa, Asia Minor, Saudi Arabia, Yemen (Wahis, 2002), Egypt, South Africa, Zimbabwe (Arnold, 1936), Israel (Haupt, 1962).

4 DISCUSSION

Altogether 24 species and subspecies are listed with two genera and 11 species of Pompilidae were reported for the first time from Iran. Twenty-three species are new records for Fars province. There is no revise or review study about this family from Iran and thus study of this fauna is not easy. Meanwhile, in Turkey, that is neighbor Iran with an area of less, about 200 species and subspecies were reported (Yildirim & Wahis, 2011a, 2011b). Due to the geographical location of southern Iran, that located cross-road between Oriental and Afrotropical, very rich and unique fauna can be expected there. Although in recent years, the known number of pompilid species from Iran has rapidly increased (Ebrahimi *et al.*, 2008; Amiresmaeili *et al.*, 2010a, 2010b, 2011), but this fauna is still poorly known. The large part of new records (45%) evidences that the fauna of Iranian spider wasp is diverse and rich but has not yet been completely studied. As well as all regions of the country have not been investigated well and we assume that a large number of species remain to be discovered. In addition to faunistic

surveys, further studies on the biology and behavior of spider wasps in Iran are needed.

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