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NEW DATA ON THE DIGGER WASPS (HYMENOPTERA, APOIDEA: CRABRONIDAE) IN SOUTHERN IRAN

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The data on digger wasp (Hymenoptera: Crabronidae) collected using Malaise traps from Fars province in southern Iran are given. A total of 45 species and sub-species of 23 genera belonging to 5 subfamilies: Astatinae (three species in one genus), Bembicinae (five species in four genera), Crabroninae (26 species in 11 genera), Pemphredoninae (six species in five genera) and Philanthinae (five species in two genera) are herein listed. Of these, five species and one subspecies are newly recorded from Iran. In addition, seven species are new records for Fars province. The greatest percentage of specimens is that of the subfamily Crabroninae, with 63.6% captured material.

KEY WORDS: Hymenoptera, wasps, Malaise trap, fauna, new records, Iran.

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Приведены сведения о роющих осах (Hymenoptera: Crabronidae), собранных в провинции Фарс на юге Ирана. Список включает 45 видов и подвигов из 5 подсемейств: Astatinae (3 вида из 1 рода), Bembicinae (5 видов из 4 родов), Crabroninae (26 видов из 11 родов), Pemphredoninae (6 видов из 5 родов) и

Philanthinae (5 видов из 2 родов). Из них 5 видов и 1 подвид впервые указываются из Ирана. Кроме того, 7 видов впервые приводятся для провинции Фарс. Наибольшее число собранных экземпляров (63.6%) относятся к подсемейству Crabroninae.

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INTRODUCTION

Crabronidae is a huge and diverse family of solitary digger wasps within Apoidea (Hymenoptera) includes 8 subfamilies, 242 genera and about 8773 species distributed worldwide (Aguiar *et al.*, 2013; Pulawski, 2015). They have a large number of feeding habitats and majority of species preying on multiple orders of insects and other arthropods. So they play an important role in natural control of pests (Bohart & Menke, 1976; Pulawski, 2015). Although some species have been described from Iran (Gussakovskij, 1933; de Beaumont, 1970; Schmid-Egger, 2004, 2014) or several species have been recorded from country (Pulawski, 1971, 1984, 1992, 1995, 2007; Dollfuss, 2006, 2008; Ebrahimi, 2000a, 2000b, 2005, 2008, 2014; Fallahzadeh *et al.*, 2006, 2009), but the Iranian fauna of the Crabronidae is still unknown and has not been thoroughly studied. Recently, Atbaei *et al.* (2015) provided a contribution to the fauna of Crabronidae in South-Western Iran and added several new records for Iran, but we believe the insect fauna in southern Iran has not been explored yet. There is no revise research or review study about this family from Iran and thus study of this fauna is not easy. Iran is located cross-road between Caucasus, Central Asian, Afrotropical and Oriental regions. Therefore, a rich and diverse entomofauna can be expected there. Fars province located in southern Iran between 27°01' and 31°51'N and between 50°27' and 55°45'E, covering an area of 125,000 km². The Fars province has a wide range of climate conditions so there is very rich flora and interesting fauna.

Here, we provide hereby further data on crabronid wasps which have been collected from Fars province in South-West Iran and add five species and one subspecies to the published records.

MATERIALS AND METHODS

The specimens were collected by first author (Sh. Rezaei) using Malaise traps in different locations (i.e. Shiraz, Dalin, Dasht e Arzhan and Kaftarak) from Fars province, Iran. The voucher specimens are deposited in Department of Entomology, Jahrom Branch, Islamic Azad University, Jahrom, Iran. The taxonomy and distributional data were adapted from Alexander (1992), Melo (1999), Nemkov & Ohl (2011), Nemkov & Lelej (2013) and Pulawski (2015). General distribution was compiled from Nemkov (2009), Schmid-Egger (2004, 2014) and Pulawski (2015). The subfamilies, tribes, subtribes, genera and species are listed in alphabetic order.

LIST OF THE SPECIES

Family Crabronidae Latreille, 1802
Subfamily Astatinae Lepeletier de Saint-Fargeau, 1845
Tribe Astatini Lepeletier de Saint-Fargeau, 1845
Genus *Astata* Latreille, 1796

***Astata apostata* Mercet, 1910**

MATERIAL EXAMINED. **Iran:** Fars: Kaftarak (29°34'N; 52°41'E), 5-7.VII 2014, 1♀.

DISTRIBUTION. Iran: Kordestan (Sakenin *et al.*, 2010), Fars province (new record). – Europe, Morocco, Ukraine, Russia, Kazakhstan, Turkey.

***Astata boops boops* (Schrank, 1781)**

MATERIAL EXAMINED. **Iran:** Fars: Kaftarak (29°34'N; 52°41'E), 8-10.VI 2014, 1♂, 1♀; the same locality, 4-6. IX 2014, 1♀.

DISTRIBUTION. Iran: Alborz, Ardabil, Fars, Tehran (Fallahzadeh *et al.*, 2009; Ebrahimi, 2005, 2014; Atbaei *et al.*, 2015). – North Africa, Europe, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, Great Britain, Turkey, Syria, Arabian Peninsula, North China.

***Astata costae costae* A. Costa, 1867**

MATERIAL EXAMINED. **Iran:** Fars: Kaftarak (29°34'N; 52°41'E), 9-19.IX 2014, 1♀; Fars: Dasht e Arzhan (29°38'N; 51°58'E), 28.VI-4.VII 2014, 1♀.

DISTRIBUTION. Iran: Mazandaran (de Beaumont, 1957), Fars (Atbaei *et al.*, 2015). – South Europe, Turkmenistan, Tajikistan, Kazakhstan, Turkey, North Africa.

Subfamily Bembicinae Latreille, 1802
Tribe Bembicini Latreille, 1802
Subtribe Bembicina Latreille, 1802
Genus *Bembix* Fabricius, 1775

***Bembix pallida* Radoszkowski, 1877**

MATERIAL EXAMINED. **Iran:** Fars: Dasht e Arzhan (29°38'N; 51°58'E), 3-8.VIII 2014, 1♀.

DISTRIBUTION. Iran (new record). – Europe, Kyrgyzstan, Tajikistan, Turkey, Kazakhstan, Russia.

Subtribe Gorytina Lepeletier de Saint-Fargeau, 1845
Genus *Harpactus* Shuckard, 1837

***Harpactus laevis* (Latreille, 1792)**

MATERIAL EXAMINED. **Iran:** Fars: Kaftarak (29°34'N; 52°41'E), 22-24.V 2014, 1♀.

DISTRIBUTION. Iran: Alborz, East Azerbaijan, Sistan & Baluchestan, Tehran, Fars (Ebrahimi, 2000b, 2005, 2014; Ghazi-Soltani *et al.*, 2010a, 2010b, 2010c; Atbaei *et al.*, 2015). – Europe, Turkey, Kazakhstan, Russia (southern Siberia), North China, Mongolia, Arabian Peninsula, North Africa.

Subtribe Spheciina Nemkov et Ohl 2011

Genus *Ammatomus* A. Costa, 1859

***Ammatomus coarctatus* (Spinola, 1808)**

MATERIAL EXAMINED. **Iran:** Fars: Kaftarak (29°34'N; 52°41'E), 9-19.IX 2014, 1♀.

DISTRIBUTION. Iran: Khorasan Razavi, Qazvin, Semnan, Fars (de Beaumont, 1957; Puławski, 1973; Atbaei *et al.*, 2015). – South Europe, Turkey, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, North Africa.

Subtribe Stizina A. Costa, 1859

Genus *Bembecinus* A. Costa, 1859

***Bembecinus iranicus* Schmid-Egger, 2004**

MATERIAL EXAMINED. **Iran:** Fars: Dasht e Arzhan (29°38'N; 51°58'E), 23-31.VIII 2014, 1♂.

DISTRIBUTION. Iran: Fars, Sistan & Baluchestan, Khorasan Razavi, Khuzestan (Schmid-Egger, 2004; Lehr *et al.*, 2007). – Turkey, Iraq, Afghanistan, Pakistan, Saudi Arabia, Turkmenistan, UAE.

***Bembecinus tridens tridens* (Fabricius, 1781)**

MATERIAL EXAMINED. **Iran:** Fars: Dasht e Arzhan (29°38'N; 51°58'E), 5-11.VII 2014, 3♂♂; the same locality, 28.VI-4.VII 2014, 4♂♂, 1♀; the same locality, 25-30.V 2014, 1♂; the same locality, 23-31.VIII 2014, 1♀; the same locality, 26.VII-2.VIII 2014, 1♀; the same locality, 20-25.VII 2014, 1♀; Fars: Dalin (30°03'N; 52°07'E), 16-22.VI 2014, 1♀.

DISTRIBUTION. Iran: Gilan, Kerman, Alborz, Fars, N. Iran, East Azerbaijan (Morice, 1921; de Beaumont, 1957; Gussakovskij, 1933; Schmid-Egger, 2004; Fallahzadeh *et al.*, 2009; Saghaei *et al.*, 2010). – Widespread in the Palaearctic region (from Europe to Russia).

Subfamily Crabroninae Latreille, 1802

Tribe Crabronini

Subtribe Crabronina Latreille, 1802

Genus *Crossocerus* Lepeletier de Saint Fargeau & Brullé, 1835

***Crossocerus megacephalus* (Rossi, 1790)**

MATERIAL EXAMINED. **Iran:** Fars: Shiraz (29°36'N; 52°28'E), 3-7.VI 2014, 1♂.

DISTRIBUTION. Iran: Isfahan (Kohl, 1915; Leclercq, 1993), Fars province (new record). – Europe, Great Britain, Russia, Kazakhstan, Tajikistan, Ukraine, Turkey, North Africa.

***Crossocerus tarsatus tarsatus* (Shuckard, 1837)**

MATERIAL EXAMINED. **Iran:** Fars: Dasht e Arzhan (29°38'N; 51°58'E), 28.VI-4.VII 2014, 1♀.

DISTRIBUTION. Iran: East Azerbaijan, Isfahan (Dollfuss, 2006; Ghazi-Soltani *et al.*, 2009, 2010c); Fars (Atbaei *et al.*, 2015). – Europe, Great Britain, Turkey, Kazakhstan, North Africa, Korea.

Genus *Ectemnius* Dahlbom, 1845

***Ectemnius continuus continuus* (Fabricius, 1804)**

MATERIAL EXAMINED. **Iran:** Fars: Shiraz (29°36'N; 52°28'E), 18-21.VI 2014, 1♂; the same locality, 8-11.VI 2014, 1♂; the same locality, 26-30.VI 2014, 1♂; the same locality, 20-25.V 2014, 1♀.

DISTRIBUTION. Iran: Alborz, Ardabil, East Azerbaijan, West Azerbaijan, Bushehr, Chahar Mahaal & Bakhtiari, Fars, Gilan, Golestan, Hamadan, Ilam, Isfahan, Kermanshah, North Khorasan, Khorasan Razavi, South Khorasan, Khuzestan, Kohgiluyeh & Boyer-Ahmad, Kurdistan, Lorestan, Markazi, Mazandaran, Qazvin, Qom, Semnan, Tehran, Yazd, Zanjan (Radoszkovsky, 1871; Leclercq, 1954; de Beaumont, 1957; Leclercq, 1999; Ghahari *et al.*, 2007; Fallahzadeh *et al.*, 2009; Sakenin *et al.*, 2011; Ebrahimi, 2014; Atbaei *et al.*, 2015). – Europe, Great Britain, Turkey, Syria, Jordan, Azerbaijan, Tajikistan, Kyrgyzstan, Kazakhstan, Russia (southern Siberia, Far East), North Africa, North China, Mongolia, Korea, Japan, North America, Cuba.

***Ectemnius crassicornis* (Spinola, 1808)**

MATERIAL EXAMINED. **Iran:** Fars: Dasht e Arzhan (29°38'N; 51°58'E), 3-8.VIII 2014, 1♀.

DISTRIBUTION. Iran: Fars (Leclercq, 1999; Dollfuss, 2004b; Jacobs, 2006). – Europe, Turkey, Ukraine, Russia, Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan, Iraq, Israel, Jordan, Syria.

Genus *Lestica* Billberg, 1820

***Lestica clypeata clypeata* (Schreber, 1759)**

MATERIAL EXAMINED. **Iran:** Fars: Dasht e Arzhan (29°38'N; 51°58'E), 28.VI-4.VII 2014, 1♂.

DISTRIBUTION. Iran: Alborz, East Azerbaijan, Fars, Ilam, Markazi, Mazandaran, Sistan & Baluchestan (Gussakovskij, 1933; de Beaumont, 1957; Leclercq, 1993; Ghazi-Soltani *et al.*, 2006, 2009, 2010b, 2010c; Fallahzadeh *et al.*, 2009; Ebrahimi, 2014; Atbaei *et al.*, 2015). – Europe, Turkey, Syria, Lebanon, Israel, Iraq, Turkmenistan, Uzbekistan, Kyrgyzstan, Kazakhstan, Russia (southern Siberia), North Africa.

Genus *Lindenius* Lepeletier de Saint Fargeau et Brullé, 1835

***Lindenius panzeri* (Vander Linden, 1829)**

MATERIAL EXAMINED. **Iran:** Fars: Dasht e Arzhan (29°38'N; 51°58'E), 28.VI-4.VII 2014, 1♀; Fars: Kaftarak (29°34'N; 52°41'E), 20-26.IX 2014, 1♀; Fars: Shiraz (29°36'N; 52°28'E), 1-6.VII 2014, 1♀.

DISTRIBUTION. Iran: Fars (Atbaei *et al.*, 2015). Europe, Great Britain, Turkey, Turkmenistan, Uzbekistan, Tajikistan, Kyrgyzstan, Kazakhstan, Russia (southern Siberia), North-East China, Mongolia, North Africa, India.

Tribe Oxybelini

Genus *Oxybelus* Latreille, 1796

***Oxybelus dissectus elegans* Mocsáry, 1879**

MATERIAL EXAMINED. **Iran:** Fars: Dalin (30°03'N; 52°07'E), 26.VII-2.VIII 2014, 1♀; the same locality, 15-21.VIII 2014, 1♀; Fars: Kaftarak (29°34'N; 52°41'E), 9-19.IX 2014, 1♀.

DISTRIBUTION. Iran (new record). – Europe, Israel, Turkey, Russia, Tunisia.

***Oxybelus latro* Olivier, 1812**

MATERIAL EXAMINED. **Iran:** Fars: Dasht e Arzhan (29°38'N; 51°58'E), 26.VII-2.VIII 2014, 1♂; the same locality, 10-15.VI 2014, 1♀; the same locality, 28.VI -4.VII 2014, 3♀♀; the same locality, 5-11.VII 2014, 1♀; the same locality, 12-19.VII 2014, 1♀; the same locality, 16-21.VI 2014, 2♀♀; Fars: Kaftarak (29°34'N; 52°41'E), 9-19.IX 2014, 1♀; the same locality, 11-13.VI 2014, 1♀; Fars: Dalin (30°03'N; 52°07'E), 26.VII-2.VIII 2014, 1♀.

DISTRIBUTION. Iran: Ardabil, East Azerbaijan, Khorasan Razavi, Mazandaran, Qazvin, Tehran, Fars (de Beaumont, 1957; Ghazi-Soltani *et al.*, 2009, 2010c; Ebrahimi, 2005; 2014; Atbaei *et al.*, 2015). – Europe, Turkey, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, North China, Afghanistan.

***Oxybelus quatuordecimnotatus* Jurine, 1807**

MATERIAL EXAMINED. **Iran:** Fars: Kaftarak (29°34'N; 52°41'E), 16-18.VI 2014, 4♂♂; the same locality, 14-16.VII 2014, 2♂♂; the same locality, 11-13.VIII 2014, 6♂♂; the same locality, 10-13.VII 2014, 1♂; the same locality, 28-30.VI 2014, 1♂; the same locality, 20-26.IX 2014, 1♂; the same locality, 25-27.VII 2014, 1♂; the same locality, 1-3.IX 2014, 1♂; the same locality, 9-19.IX 2014, 1♂; the same locality, 4-6.IX 2014, 3♂♂; 17-20.VIII 2014, 3♂♂; the same locality, 25-27.VII 2014, 3♂♂; the same locality, 29-31.VIII 2014, 1♂; the same locality, 23-27.VI 2014, 1♂; the same locality, 4-7.VIII 2014, 1♂; ; the same locality, 1-3.IX 2014, 2♀♀; the same locality, 21-24.VIII 2014, 2♀♀; the same locality, 28-30.VI 2014, 1♀; the same locality, 6-18.VI 2014, 2♀♀; the same locality, 17-20.VIII 2014, 1♀; Fars: Dasht e Arzhan (29°38'N; 51°58'E), 28.VI-4.VII 2014, 1♀; the same locality, 20-26.IX 2014, 1♀; Fars: Kaftarak (29°34'N; 52°41'E), 9-19.IX 2014, 4♀♀; the same locality, 4-6.VII 2014, 5♀♀; the same locality, 11-13.VIII 2014, 1♀; the same locality, 25-27.VII 2014, 3♀♀; the same locality, 29-31.VIII 2014, 2♀♀; the same locality, 4-7.VIII 2014, 2♀♀.

DISTRIBUTION. Iran: Fars, Isfahan, Kerman, Khorasan, Razavi, Mazandaran, Qazvin, Tehran (Morice, 1921; de Beaumont, 1957, 1970; Dollfuss, 2008; Ebrahimi, 2014; Atbaei *et al.*, 2015). – Europe, Turkey, Syria, Israel, Jordan, Turkmenistan, Uzbekistan, Tajikistan, Kyrgyzstan, Kazakhstan, Russia (western Siberia), North China, Mongolia, Arabian Peninsula, Afghanistan, North Africa.

***Oxybelus variegatus* Wesmael, 1852**

MATERIAL EXAMINED. **Iran:** Fars: Dasht e Arzhan (29°38'N; 51°58'E), 3-8.VIII 2014, 1♂; Fars: Dalin (30°03'N; 52°07'E), 8-14.VIII 2014, 1♀; Fars: Dasht e Arzhan (29°38'N; 51°58'E), 12-19.VII 2014, 1♀; Fars: Dalin (30°03'N; 52°07'E), 14-20.VI 2014, 1♀.

DISTRIBUTION. Iran: Isfahan, Mazandaran, Qazvin, Tehran, Fars (de Beaumont, 1957; Dollfuss, 2008; Atbaei *et al.*, 2015). – Europe, Turkey, Syria, Turkmenistan, Uzbekistan, Tajikistan, Kyrgyzstan, Kazakhstan.

Tribe Larrini Latreille, 1810
Subtribe Larrina Latreille, 1810
Genus *Liris* Fabricius, 1804

***Liris niger niger* (Fabricius, 1775)**

MATERIAL EXAMINED. **Iran:** Fars: Kaftarak (29°34'N; 52°41'E), 29-31.VIII 2014, 1♀; Fars: Dalin (30°03'N; 52°07'E), 8-14.VIII 2014, 1♀.

DISTRIBUTION. Iran: Alborz, Ardabil, East Azerbaijan, Bushehr, Golestan, Mazandaran, Sistan & Baluchestan, Tehran, Fars (Gussakovskij, 1933; de Beaumont, 1970; Ghahari *et al.*, 2009; Ghazi-Soltani *et al.*, 2010b, 2010c; Ebrahimi, 2005, 2014; Samin *et al.*, 2015; Atbaei *et al.*, 2015). – Europe, Turkey, Israel, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, Mongolia, Arabian Peninsula, Afghanistan, North Africa, India, Burma, Malaysia.

***Liris nigricans nigricans* (Walker, 1871)**

MATERIAL EXAMINED. **Iran:** Fars: Kaftarak (29°34'N; 52°41'E), 17-20.VIII 2014, 1♀.

DISTRIBUTION. Iran: Gilan (Morice, 1921). – Widespread in Africa, Central Asia, Oman UAE.

Subtribe Gastrosericina André, 1886

Genus *Gastrosericus* Spinola, 1839

***Gastrosericus funereus* Gussakovskij, 1931**

MATERIAL EXAMINED. **Iran:** Fars: Kaftarak (29°34'N; 52°41'E), 7-9.VII 2014, 1♀.

DISTRIBUTION. Iran: Fars (Pulawski, 1995; Atbaei *et al.*, 2015). – Turkey, Turkmenistan, Tajikistan, Kazakhstan, Arabian Peninsula, Pakistan, North Africa, North India.

Genus *Larropsis* Patton, 1892

***Larropsis europaea* (Mercet, 1910)**

MATERIAL EXAMINED. **Iran:** Fars: Dasht e Arzhan (29°38'N; 51°58'E), 5-11.VII 2014, 1♂.

DISTRIBUTION. Iran (new record). – Spain, Algeria, Portugal.

Genus *Tachysphex* Kohl, 1883

***Tachysphex argentatus* Gussakovskij, 1952**

MATERIAL EXAMINED. **Iran:** Fars: Dasht e Arzhan (29°38'N; 51°58'E), 4-9.VI 2014, 1♂; Fars: Shiraz (29°36'N; 52°28'E), 7-11.VII 2014, 1♀; the same locality, 10-13.V 2014, 1♀.

DISTRIBUTION. Iran (new record). – Egypt, Israel, Syria, Kazakhstan, Tajikistan, Turkey, Sudan.

***Tachysphex consocius* Kohl, 1892**

MATERIAL EXAMINED. **Iran:** Fars: Kaftarak (29°34'N; 52°41'E), 11-13.VIII 2014, 1♀.

DISTRIBUTION. Iran: East Azerbaijan, Mazandaran, Fars (Pulawski, 2007; Samin et al., 2015; Atbaei et al., 2015). – Europe, Turkey, Syria, Lebanon, Israel, Armenia, Azerbaijan, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, Arabian Peninsula, Afghanistan, India, Sri Lanka, Africa.

***Tachysphex incertus* (Radoszkowski, 1877)**

MATERIAL EXAMINED. **Iran:** Fars: Kaftarak (29°34'N; 52°41'E), 19-20.VII 2014, 1♂; Fars: Dalin (30°03'N; 52°07'E), 1-7.VIII 2014, 1♀.

DISTRIBUTION. Iran: Ardabil, Golestan, Mazandaran, Sistan & Baluchestan, Fars (de Beaumont, 1957; Ebrahimi, 2014; Atbaei et al., 2015). – Europe, Turkey, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, Arabian Peninsula, Afghanistan, Pakistan, North Africa.

***Tachysphex julliani* Kohl, 1883**

MATERIAL EXAMINED. **Iran:** Fars: Dasht e Arzhan (29°38'N; 51°58'E), 5-11.VII 2014, 1♂; Fars: Dasht e Arzhan (29°38'N; 51°58'E), 4-9.VI 2014, 1♀.

DISTRIBUTION. Iran: Kerman, Mazandaran, Sistan & Baluchestan, Tehran, Fars (Gussakovskij, 1933; Pulawski, 2007; Atbaei et al., 2015). – South Europe, Turkey, Lebanon, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, Arabian Peninsula, Pakistan, North Africa.

***Tachysphex nitidior* de Beaumont, 1940**

MATERIAL EXAMINED. **Iran:** Fars: Dasht e Arzhan (29°38'N; 51°58'E), 25-30.v.2014, 1♂.

DISTRIBUTION. Iran: Kerman, Mazandaran, Semnan, Sistan & Baluchestan, Tehran, Fars (Pulawski, 2007; Atbaei et al., 2015). – Europe, Turkey, Israel, Lebanon, Georgia, Azerbaijan, Turkmenistan, Uzbekistan, Tajikistan, Kyrgyzstan, Kazakhstan, Mongolia, Arabian Peninsula, North Africa, India, Kenya.

***Tachysphex panzeri* (Vander Linden, 1829)**

MATERIAL EXAMINED. **Iran:** Fars: Dasht e Arzhan (29°38'N; 51°58'E), 10-15.VI 2014, 1♀; the same locality, 31.VIII 2014, 1♀; Fars: Dalin (30°03'N; 52°07'E), 10-18.IX 2014, 1♀; the same locality, 22-28.VIII 2014, 1♀; the same locality, 27.VII-3.VIII 2014, 1♀; the same locality, 19-25.IX 2014, 1♀; Fars: Dasht e Arzhan (29°38'N; 51°58'E), 28.V-4.VI 2014, 2♀♀; the same locality, 4-9.VI 2014, 1♀; Fars: Dalin (30°03'N; 52°07'E), 27.VI-3.VII 2014, 2♀♀; the same locality, 19-25.IX 2014, 1♀; the same locality, 1-7.VIII 2014, 1♀; the same locality, 22-28.VIII 2014, 1♀.

DISTRIBUTION. Iran: Kerman, Tehran (Gussakovskij, 1933; de Beaumont, 1957; Pulawski, 1971), Fars province (new record). – Europe, Algeria, Israel, Jordan, Kazakhstan, Libya, Morocco, Russia, Saudi Arabia, Slovakia, Spain, Tajikistan, Tunisia, Turkmenistan, Ukraine, Uzbekistan, Bahrain, Djibouti, Eritrea, Ethiopia, Oman, UAE, Yemen, India, Sri Lanka.

***Tachysphex psammobius* (Kohl, 1880)**

MATERIAL EXAMINED. **Iran:** Fars: Dasht e Arzhan (29°38'N; 51°58'E), 9-15.VIII 2014, 1♀.

DISTRIBUTION. Iran (new record). – Europe, North Africa, Central Asia.

***Tachysphex sericeus* (F. Smith, 1856)**

MATERIAL EXAMINED. **Iran:** Fars: Dasht e Arzhan (29°38'N; 51°58'E), 16.-22.VIII 2014, 1♂; Fars: Kaftarak (29°34'N; 52°41'E), 8.-10.VI 2014, 1♀.

DISTRIBUTION. Iran (new record). – Turkey, West Africa, Israel, South Africa.

Tribe Miscophini W. Fox, 1895

Genus *Miscophus* Jurine, 1807

***Miscophus bicolor bicolor* Jurine, 1807**

MATERIAL EXAMINED. **Iran:** Fars: Shiraz (29°36'N; 52°28'E), 4-19.IX 2014, 1♀.

DISTRIBUTION. Iran: Tehran (de Andrade, 1960), Fars province (new record). – Europe throughout Russia, Turkey.

***Miscophus graciosus* de Andrade, 1960**

MATERIAL EXAMINED. **Iran:** Fars: Kaftarak (29°34'N; 52°41'E), 10-13.VII 2014, 2♂♂; the same locality, 8-10.VIII 2014, 3♂♂; the same locality, 25-27.VII 2014, 1♂; the same locality, 31.VII -3.VIII 2014, 1♂; the same locality, 16-18.VI 2014, 2♂♂; Fars: Shiraz (29°36'N; 52°28'E), 1-6.VII 2014, 1♂; Fars: Kaftarak (29°34'N; 52°41'E), 4-6.VII 2014, 1♂; the same locality, 23-27.VI 2014, 2♂♂; the same locality, 1-3.VII 2014, 2♀♀; the same locality, 10-13.VII 2014, 12♀♀; the same locality, 14-16.VII 2014, 4♀♀; the same locality, 29-31.VIII 2014, 3♀♀; the same locality, 28-30.VI 2014, 6♀♀; the same locality, 16-18.VI 2014, 9♀♀; the same locality, 20-26.IX 2014, 2♀♀; the same locality, 25-28.VII 2014, 5♀♀; the same locality, 8-10.VIII 2014, 3♀♀; the same locality, 4-6.IX 2014, 5♀♀; the same locality, 1-3.VII 2014, 2♀♀; the same locality, 28-30.VII 2014, 2♀♀; the same locality, 19-22.VI 2014, 1♀; the same locality, 9-19.IX 2014, 2♀♀; the same locality, 19-20.VII 2014, 2♀♀; the same locality, 17-20.VIII 2014, 1♀; the same locality, 10-13.VII 2014, 2♀♀; the same locality, 14-16.VIII 2014, 1♀; the same locality, 5-7.VI 2014, 2♀♀; Dasht e Arzhan (29°38'N; 51°58'E), 12-19.VII 2014, 1♀.

DISTRIBUTION. Iran: Fars (Atbaei *et al.*, 2015). – Syria, Greece.

Tribe Trypoxylini Lepeletier de Saint Fargeau, 1845

Genus *Trypoxylon* Latreille, 1796

***Trypoxylon albipes* F. Smith, 1856**

MATERIAL EXAMINED. **Iran:** Fars: Kaftarak (29°34'N; 52°41'E), 31.VII - 3.VIII 2014, 1♂; the same locality, 7-8.IX 2014, 1♂; the same locality, 21-24.VII 2014, 2♂♂; the same locality, 19-20.VII 2014, 2♂♂; the same locality, 5-7.VI 2014, 1♂; the same locality, 19-22.VI 2014, 1♂; the same locality, 23-27.VI 2014, 1♂; the same locality, 31.VII - 3.VIII 2014, 1♀; the same locality, 22-24.V 2014, 1♀; the same locality, 1-3.VII 2014, 1♀.

DISTRIBUTION. **Iran:** Markazi, Fars (Ebrahimi, 2014; Atbaei *et al.*, 2015). – South Europe, Turkey, Syria, Israel, Armenia, Azerbaijan, Turkmenistan, Uzbekistan, Tajikistan, Pakistan, North Africa.

***Trypoxylon scutatatum scutatatum* Chevrier, 1867**

MATERIAL EXAMINED. **Iran:** Fars: Kaftarak (29°34'N; 52°41'E), 14-16.VI 2014, 5♂♂, 1♀; the same locality, 21-24.VII 2014, 1♀; the same locality, 19-22.VI 2014, 1♂, 1♀; the same locality, 1-3.VII 2014, 1♂; the same locality, 23-27.VI 2014, 2♂♂, 1♀; the same locality, 5-7.VI 2014, 22♂♂, 3♀♀; the same locality, 17-20.VIII 2014, 3♀♀; the same locality, 19-20.VII 2014, 1♀; the same locality, 7-9.VII 2014, 1♀; the same locality, 16-18.VI 2014, 1♀; the same locality, 31.VII-3.VIII 2014, 1♀; Fars: Dalin (30°03'N; 52°07'E), 26.VII - 2.VIII 2014, 1♂; Fars: Dasht e Arzhan (29°38'N; 51°58'E), 29-31.VIII 2014, 1♂, 1♀; the same locality, 9-15.VIII 2014, 1♂, 1♀; the same locality, 16-22.VIII 2014, 1♀; Fars: Shiraz (29°36'N; 52°28'E), 20-25.V 2014, 1♀; the same locality, 4-19.IX 2014, 1♀.

DISTRIBUTION. **Iran:** Alborz, Ardabil, East Azerbaijan, Mazandaran, Fars (de Beaumont, 1957; Ghazi-Soltani *et al.*, 2010b, 2010c; Ebrahimi, 2005, 2014; Atbaei *et al.*, 2015). – Europe, Turkey, Syria, Israel, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, North Africa, Ethiopia.

Subfamily Pemphredoninae Dahlbom, 1835

Tribe Pemphredonini Dahlbom, 1835

Subtribe Pemphredonina Dahlbom, 1835

Genus *Diodontus* Curtis, 1834

***Diodontus minutus minutus* (Fabricius, 1793)**

MATERIAL EXAMINED. **Iran:** Fars: Kaftarak (29°34'N; 52°41'E), 1-3.VII 2014, 1♂; the same locality, 17-20.VIII 2014, 1♂; the same locality, 9-15.VIII 2014, 1♀; the same locality, 20-25.V 2014, 1♀; the same locality, 28-30.VII 2014, 1♀; the same locality, 25-26.V 2014, 1♀.

DISTRIBUTION. **Iran:** Alborz, Khorasan, Razavi, Tehran, Fars (Gussakovskij, 1933; Ebrahimi *et al.*, 1995; Ebrahimi, 2014; Atbaei *et al.*, 2015). – Europe, Great Britain, Turkey, Iraq, Turkmenistan, Tajikistan, Kazakhstan, Afghanistan, Russia (southern Siberia), North America.

Genus *Passaloecus* Shuckard, 1837

***Passaloecus pictus* Ribaut, 1952**

MATERIAL EXAMINED. **Iran:** Fars: Kaftarak (29°34'N; 52°41'E), 10-13.VII 2014, 1♀.

DISTRIBUTION. Iran: Fars (Atbaei *et al.*, 2015). – Europe, Turkey, Syria, North Africa, Brazil (introduced in Sao Paulo).

Genus *Pemphredon* Latreille, 1796

***Pemphredon lethifer* (Shuckard, 1837)**

MATERIAL EXAMINED. **Iran:** Fars: Shiraz (29°36'N; 52°28'E), 7-11.VII 2014, 3♀♀; Fars: Kaftarak (29°34'N; 52°41'E), 10-13.VII 2014, 1♀.

DISTRIBUTION. Iran: Alborz, Isfahan, Qazvin, Tehran, Fars (Dollfuss, 1995; Ebrahimi, 1993, 2014; Atbaei *et al.*, 2015). – Europe, Great Britain, Turkey, Israel, Uzbekistan, Kyrgyzstan, Kazakhstan, Russia (southern Siberia), Afghanistan, North China, Korea, Japan, North Africa.

Tribe Psenini A. Costa, 1858

Genus *Mimesa* Shuckard, 1837

***Mimesa caucasica* Maidl, 1914**

MATERIAL EXAMINED. **Iran:** Fars: Dasht e Arzhan (29°38'N; 51°58'E), 10-15. VI 2014, 1♀.

DISTRIBUTION. Iran: Fars (Atbaei *et al.*, 2015). – Southern Europe, Georgia, Azerbaijan, Turkmenistan, Tajikistan, Kyrgyzstan, Kazakhstan, North China, Mongolia.

***Mimesa grandii* Maidl, 1933**

MATERIAL EXAMINED. **Iran:** Fars: Dasht e Arzhan (29°38'N; 51°58'E), 20-26.IX 2014, 1♂; the same locality, 5-11.VII 2014, 1♀; the same locality, 22-27.VI 2014, 1♀; the same locality, 9-15.VIII 2014, 1♀.

DISTRIBUTION. Iran: Tehran, Alborz (Gussakovskij, 1937; Ebrahimi, 2000b, 2005), Fars province (new record). – Europe, Turkey, Morocco, Algeria.

Genus *Psenulus* Kohl, 1896

***Psenulus pan* de Beaumont, 1967**

MATERIAL EXAMINED. **Iran:** Fars: Kaftarak (29°34'N; 52°41'E), 10-13.VII 2014, 3♂♂, 3♀♀; the same locality, 25-27.VII 2014, 3♂♂, 3♀♀; the same locality,

7-9.VII 2014, 5♂♂, 1♀; the same locality, 19-22.VII 2014, 2♂♂, 3♀♀; the same locality, 5-7.VII 2014, 1♂, 4♀♀; the same locality, 31.VII -3.VIII 2014, 1♂; the same locality, 9-19.IX 2014, 1♂; the same locality, 16-18.VI 2014, 4♀♀; the same locality, 23-27.VI 2014; 1♀, the same locality, 31.VII -3.VIII 2014; 4♀♀, the same locality, 11-13.VI 2014; 1♀, the same locality, 4-6.VII 2014, 4♀♀; the same locality, 5-7.VI 2014, 1♀; the same locality, 25-26.V 2014, 4♀♀; Fars: Dasht e Arzhan (29°38'N; 51°58'E), 23-31.VIII 2014, 1♂, 1♀; the same locality, 22-27.VII 2014, 1♂; Fars: Shiraz (29°36'N; 52°28'E), 29.V-2.VI 2014, 2♂♂, 4♀♀; the same locality, 29.IV-9.V 2014, 1♂; the same locality, 12-19.VII 2014, 2♂♂; the same locality, 20-25.V 2014, 3♀♀; the same locality, 8-11.VI 2014, 3♀♀; the same locality, 7-11.VII 2014, 1♀; the same locality, 3-7.VI 2014, 1♀; the same locality, 22-25.VI 2014, 2♀♀.

DISTRIBUTION. Iran: Fars (Dollfuss, 2004a). – Turkey, Kazakhstan, Georgia, Azerbaijan, Syria, Lebanon.

Subfamily Philanthinae Latreille, 1802
Tribe Cercerini Lepeletier de Saint-Fargeau, 1845
Genus *Cerceris* Latreille, 1802

***Cerceris bupresticida* Dufour, 1841**

MATERIAL EXAMINED. **Iran:** Fars: Dalin (30°03'N; 52°07'E), 10-18.IX 2014, 1♀.

DISTRIBUTION. Iran: Qazvin, South Khorasan (de Beaumont, 1957, 1970), Fars province (new record). – Europe, Turkey, Caucasus, Ukraine, Armenia, Turkmenistan, Tajikistan, Kazakhstan, Kyrgyzstan, Russia, Palestine, Afghanistan, North Africa, China.

***Cerceris rubida rubida* (Jurine, 1807)**

MATERIAL EXAMINED. **Iran:** Fars: Dasht e Arzhan (29°38'N; 51°58'E), 9-15. VIII 2014, 1♂; the same locality, 28.VI-4.VII 2014, 1♂; the same locality, 26.VII-2.VIII 2014, 1♂.

DISTRIBUTION. Iran: Iran (Schmidt & Bitsch, 1997), Fars province (new record). – Europe to southern part of former USSR.

***Cerceris sabulosa sabulosa* (Panzer, 1799)**

MATERIAL EXAMINED. **Iran:** Fars: Dalin (30°03'N; 52°07'E), 10-18.IX 2014, 2♂♂; the same locality, 15-21.VIII 2014, 1♀; Fars: Dasht e Arzhan (29°38'N; 51°58'E), 5-9.VI 2014, 1♀.

DISTRIBUTION. Iran: Ardabil, West and East Azerbaijan, Khorasan Razavi, Gilan, Mazandaran, Qazvin, Tehran, Fars (Morice, 1921; de Beaumont, 1957, 1970; Sakenin *et al.*, 2010; Ebrahimi, 2005, 2014; Atbaei *et al.*, 2015). – Europe, Great

Britain, Turkey, Iraq, Georgia, Armenia, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, Russia (southern Siberia), North China, Arabian Peninsula, North Africa.

***Cerceris vagans* Radoszkowski, 1877**

MATERIAL EXAMINED. **Iran:** Fars: Kaftarak (29°34'N; 52°41'E), 8-10.VIII 2014, 1♂; the same locality, 4-7.VIII 2014, 1♀.

DISTRIBUTION. Iran: Kerman, South Khorasan, Qazvin, Sistan & Baluchestan, Tehran, Fars (de Beaumont, 1957, 1970; Atbaei *et al.*, 2015). – Turkey, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, Arabian Peninsula, Afghanistan, Pakistan.

Tribe Philanthini Latreille, 1802
Subtribe Philanthina Latreille, 1802
Genus *Phlanthus* Fabricius, 1790

***Phlanthus triangulum triangulum* (Fabricius, 1775)**

MATERIAL EXAMINED. **Iran:** Fars: Kaftarak (29°34'N; 52°41'E), 24-25.V 2014, 1♂; the same locality, 17-18.VII 2014, 3♂♂, 1♀; the same locality, 22-24.V 2014, 2♂♂; the same locality, 7-9.VII 2014, 2♀♀; the same locality, 1-3.VII 2014, 2♀♀; the same locality, 8-10.VI 2014, 2♀♀; the same locality, 23-27.VI 2014, 2♀♀; the same locality, 14-16.VII 2014, 2♀♀; the same locality, 5-7.VI 2014, 1♀; the same locality, 19-22.VI 2014, 1♀; the same locality, 28.VI-4.VII 2014, 1♀.

DISTRIBUTION. Iran: Alborz, Ardabil, East Azerbaijan, West Azerbaijan, Fars, Gilan, Golestan, Hormozgan, Ilam, Isfahan, Kermanshah, Khorasan, Razavi, South Khorasan, Markazi, Mazandaran, Qazvin, Semnan, Tehran (Morice, 1921; de Beaumont, 1957, 1970; Esmaili & Rastegar, 1974; Ghahari *et al.*, 2007; Fallahzadeh *et al.*, 2009; Ghazi-Soltani *et al.*, 2010a, 2010b, 2010c; Saghaei *et al.*, 2010; Sakenin *et al.*, 2011; Ebrahimi, 2005, 2014; Samin *et al.*, 2015; Atbaei *et al.*, 2015). – Europe, Great Britain, Canary Islands, Turkey, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, Russia (southern Siberia), North China, Arabian Peninsula, Afghanistan, North Africa.

DISCUSSION

In the present study, which was conducted in a few localities (Kaftarak, Shiraz, Dalin and Dasht e Arzhan) from Fars province in southern Iran, 45 species and subspecies belonging to 23 genera, 20 tribes and 5 subfamilies were collected and identified. Of these, five species (*Bembix pallida*, *Larropsis europaea*, *Tachysphex argentatus*, *T. psammobius*, *T. sericeus*) and one subspecies (*Oxybelus dissectus elegans*) are newly recorded from Iran. In addition, seven species are new records for studied area (Fars province). The 385 specimens have been collected (including

128 males and 257 females). The greatest percentage of specimens was that of the subfamily Crabroninae, with 26 species and 63.6% captured material. The proportions collected in other subfamilies were as followed: Pemphredoninae – 6 species (22.9%), Philanthinae – 5 species (7.5%), Bembicinae – 5 species (4.4%), and Astatinae – 3 species (1.6%). This result confirms the Iranian Crabronidae fauna is very rich and still not well studied.

The digger wasps have been reported as preying on several orders of insects and other arthropods (Ebrahimi, 2005). There is a little of behavioral, ecological and biological data concerning crabronid wasps in Iran, so more investigations and complementary sampling should be encouraged.

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