



A survey on Megachilidae (Hymenoptera, Apoidea) species available in Iranian Pollinator Insects Museum of Yasouj University

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ABSTRACT. In this study, the distribution of 88 species of the family Megachilidae, out of 3678 specimens in the Iranian Pollinator Insects Museum of Yasouj University (IPIM), which were collected in spring and summer 2009–2017 from different regions of Iran including Ardabil, Chaharmahal-o Bakhtiari, Fars, Golestan, Isfahan, Kerman, Khuzestan, Kohgiluyeh-va Boyer-Ahmad, Sistan-o Baluchestan, Alborz, are presented. Data on the number of specimens, locations, coordinates and distribution maps for Iran and global distribution of all species (where available) are also provided. *Megachile (Megachile) octosignata* Nylander 1852 is first recorded from Iran. Nineteen species are reported for the first time from Chaharmahal-o Bakhtiari and Kohgiluyeh-va Boyer-Ahmad Provinces.

Key words: Iran, Megachilidae, Bees, Parasitic bees

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Introduction

Members of family Megachilidae are important pollinators of pasture, crop and fruit plants in various regions of Iran like many other parts of the world. Most Megachilidae considered as cosmopolitan bees (Michener, 2007), being found across a wide diversity of habitats on all continents except Antarctica, ranging from lowland tropical rainforests to deserts to alpine environments (Gonzalez et al., 2012). Iran possesses an extensive and rich bee fauna (Warncke, 1979, 1980, 1981, 1985), but in spite of the investigations of several entomologists over the last six decades (Popov, 1967; Esmaili & Rastegar, 1974; Warncke, 1979, 1980, 1981, 1985; Talebi et al., 1995; Izadi et al., 2004; Tavakoli, 2004; Engel, 2004, 2006; Monfared et al., 2009; Tavakoli et al., 2010; Khaghaninia et al., 2010; Khodaparast & Monfared, 2012; Nadimi

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et al., 2013a, 2013b, 2014; Khodaparast & Monfared, 2013a, 2013b; Keshtkar et al., 2015; Kiani Bakiani et al., 2016; Falamarzi et al., 2017; Goodarzi & Monfared, 2018; Nazari et al., 2019; Khodarahmi Ghahnavayeh & Monfared, 2019) the faunistic data on wild bees in Iran is still not complete. Therefore, there is necessary to plan a comprehensive project to sample many localities and provide a distribution map of Iranian bee pollinator species. We emphasize that there are not comprehensive data on all species of bees in our country. After a period of 10 years (From 2010) collecting bees from various areas and gathering more than 50,000 specimens, which are preserved in the "Iranian Pollinator Insects Museum of Yasouj University", many regions nonetheless remain not sampled and many specimens are not yet identified to species level in different Apoidea families like Megachilidae. In this research, we give information about 88 species of Megachilid bees which their species confirmed by world experts.

In this paper, we introduce the new species records and the larger areas of Iran that are habitat for these bees, and more importantly, we provided a collection of confirmed specimens of Iranian Megachilid for researchers for future studies (Figures 1, 2, 3, 4 and 5). It is important for researchers within Iran to have specimens identified and approved by the world's leading experts in one place so that these specimens could easily use for further studies. This might facile study on other aspects like bees' genetics. Data are compiled on the geographical diversity of large Iranian fauna here, also, could be used by bees' world taxonomists. Also, we hope to provide a large comprehensive and an almost complete checklist of Megachilidae of Iran in the near future based on our available large number of specimens collected in our museum. List of Iranian Megachilidae species which previously recorded, (based on our available litreature) indicates that further sampling and identification is needed yet. Now we have many specimens which are not identified and study on them needs several years of work.

Material and methods

Sampling for Megachilid bees mostly carried out by the second author (AM), his students, or by the first author, MZ, from different provinces between early June 2009 and early August 2017 on crops and pasture plants. In total, 3678 specimens were collected, of which 835 specimens have thus far been identified. Samples were collected by Sweep netting and killed in the field by placing in a sealed container with ethyl acetate, then transferred to lab. Specimens were georeferenced including latitude, longitude and elevation using GPS eTriX HC (Garmin Ltd, Olathe, KN, USA). Specimens were pinned and labelled which indicate the location information, date of collection, collector name and set in collection boxes. All data were recorded in a database of excel file. All specimens were examined and classified based on family, subfamily, tribe and genus using Michener (2007). To identify of bees to species level, examples of specimens were sent to taxonomic specialists abroad, with identification carried out by the following: Megachilidae: Megachilini by Christophe Praz (Switzerland); Osmiini, Anthidini and Pararhophitini by Andreas Müller (Switzerland) and some Anthidini by Christophe Praz. Identified species are preserved in the Iranian Pollinator Insects Museum of Yasouj University (IPIM). Locality coordinates of collecting bees and an updated list based on our available literature of the family Megachilidae are provided (Table 1). Distributions of tribes of Megachilidae are shown in Figures 1-5. Thus, Dioxyini (Fig. 1), Anthidiini (Fig. 2), Osmiini (Fig. 3), Magachilini (Fig. 4) and Lithurgini with Pararhophitini (Fig. 5) are tribes which distributed in Iran.

Table 1. Name of Localities in Iran, where the Megachilid bees were collected.

Province	Location	Altitude (m a.s.l)	Longitude	Latitude
Ardebil	Meshkinshahr, Moeil	2500	47°43'53.00" E	38°16'28.51" N
Sistan-o Baluchestan	Zahedan	1390	60°50'56.00" E	29°27'22.58" N
	Zabol	4800	61°30'04.00" E	31°01'43.00" N
Esfahan	Mobarakeh, Ghahnavieh	1668	51°31.54'00" E	32°19.94'00" N
	Mobarakeh	1645	51°30.97'00" E	32°20.84'00" N
	Baharan	1608	51°46'08.94" E	32°28.409.0" N
	IUT (Isfahan Univ. Technol.)	1676	51°31.69'00" E	32°43.24'00" N
	Dorcheh Piaz	1608	51°31.75'00" E	32°35.10'00" N
	NajafAbad, Ghale Sefid	1653	51°26.41'00" E	32°35.735.0" N
	Karvan, Jafar Abad	2035	51°00.51'00" E	32°52.780.0" N
	Mobarakeh, Sera Rud	1646	51°31'1.320" E	32°21'47.16" N
	Tiran, Khamiran	2018	51°01.17'00" E	32°47.79'00" N
	Flavarjan, Habib Abad	1650	51°32'00.00" E	32°31'00.00" N
	Kooshk	1552	51°29'60.00" E	32°38'20.40" N
	Zodan	1606	51°34'45.00" E	32°26'26.00" N
	Zazeran	1608	51°29'49.00" E	32°36'10.00" N
	Chadegan, Zayandehrud	2070	50°38'00.00" E	32°46'00.00" N
	Fereydan, Bazmeh	2442	52°33'25.95" E	32°24'9.800" N
	Baharestan	1608	51°46'8.940" E	32°28'24.56" N
	Meymeh	2059	51°09.83'00" E	33°29.20'00" N
	Semirom (Qare Qaj)	2627	51°37'23.24" E	31°27'23.61" N
	Aran & Bidgol	0947	51°29'04.00" E	34°03'34.00" N
	Zarin Shahr (Sarcheshme)	1696	50°19'4.020" E	33°12.52'00" N
	Sadegh Abad, Berenjgan	1784	51°06.78'00" E	32°25.37'00" N
	Mehdi Abad	1993	51°49'15.66" E	32°29'56.94" N
	Khansar	2425	50°21'25.90" E	33°12'4.380" N
	Dehaghan, Astaneh	2399	51°38'52.00" E	31°56'24.00" N
	Karvan	2035	50°51.42'00" E	32°52.78'00" N
	Marq	1556	51°42.24'00" E	32°31.39'00" N
	Flavarjan, Qahdarijan	1600	51°37'10.80" E	32°34'26.60" N
	Golpaygan	1861	50°17'19.36" E	33°27'23.38" N
	Si-o-se pol	1538	51°40'30.78" E	32°37'42.84" N
	Kashan	1077	51°22'14.82" E	33°56'37.86" N
	Ostandari st.	1570	51°40'18.54" E	32°39'10.74" N
Fars	Kazeroun, Bidzard	0721	51°52'20.34" E	29°19'51.96" N
	Kazeroun, Davan	1150	51°40'50.16" E	29°40'15.90" N
	Kazeroun	0860	051°39.15'0" E	29°37.10'00" N
	Kazeroun, Ghaleseied	0987	51°33'33.12" E	29°38'50.46" N
	Kazeroun, Siakh Darengun	1840	52°18.563'0" E	29°31.84'00" N
	Jahrom	1404	52°57'44.67" E	29°01'51.35" N
	Eqlid	2266	52°40'33.00" E	30°53'00.78" N
	Sepidan	2250	51°00'10.20" E	30°14'16.68" N
	Sepidan, Bahraghan	2161	52°00.89'00" E	30°13.39'00" N
	Evaz, Mansour Abad	0917	54°03'8.394" E	28°15'50.55" N
	Ghirokarzin, Rikan	0750	52°58'31.41" E	28°35'18.96" N
	Darab	1105	54°28'48.82" E	28°44'51.24" N
	Abadeh	1800	52°39'02.00" E	31°09'39.00" N

Table 1. Countinued.

Province	Location	Altitude (m a.s.l)	Longitude	Latitude
Fars	Kharestan	1992	51°55'00.60" E	30°38'23.16" N
	Shiraz, Kohmare	1846	52°06'00.00" E	29°27'00.00" N
	Shiraz, Bagh Anari	1500	52°31'37.82" E	29°38'6.900" N
	Shiraz, Delgosha	1552	52°34'29.39" E	29°37'09.83" N
	Shiraz, Jannat	1573	52°28'22.13" E	29°36'47.56" N
	Shiraz, Eram	1569	52°31'32.33" E	29°38'09.35" N
	Shiraz, Ghasre Ghomsheh	1750	52°25'12.00" E	29°46'48.00" N
	Shiraz, Shahrak Golestan	1700	52°24'42.02" E	29°45'11.56" N
	Shiraz, Sadra	1800	52°28'30.00" E	29°48'53.99" N
	Shiraz, Afif Abad	1573	52°29'55.27" E	29°37'24.01" N
	Shiraz, Azadi	1539	52°32'22.45" E	29°37'46.51" N
	Shiraz, Besat	1566	52°30'01.21" E	29°37'12.03" N
	Khonj, Mahmeleh	1200	51°42'35.81" E	30°13'48.55" N
	Noorabad	0920	51°31'18.00" E	30°06'51.00" N
	Noorabad, Zirdu, Tolekohneh	0980	51°25'43.02" E	30°14'20.21" N
	Noorabad, Javid	1400	51°37'38.31" E	30°10'51.32" N
	Noorabad, Bosharjan	1100	51°16'40.15" E	29°57'01.44" N
	Noorabad, Doshmanzeyare	1966	52°04.74'00" E	30°01.85'00" N
	Noorabad, Mehrenjan	1200	51°42'35.81" E	30°13'48.55" N
	Noorabad Gazargah	0920	51°030'12.6" E	30°06'56.02" N
	Noorabad, Aalivand	0980	51°30'42.20" E	30°04'47.14" N
	Noorabad, Dalan	1300	51°36'59.69" E	30°06'13.78" N
	Neyeiz	1587	54°14'35.47" E	29°20'29.78" N
	Estahban	1730	54°06'36.51" E	29°12'303.8" N
	Firoozabad, Jaidasht	1315	52°34'15.00" E	28°50'38.00" N
Zarghan	1620	52°42'39.60" E	29°46'41.16" N	
Kerman	Jiroft, Esfandadge	0720	57°44'26.00" E	28°40'41.00" N
	Jiroft, Sarbijan	0780	57°32'20.04" E	29°06'43.92" N
	Kahnuj	0505	57°42'00.00" E	27°57'00.00" N
Kohgiluyeh-va Boyer-Ahmad	Yasouj, Dashteroom	1200	51°31'52.15" E	30°33'14.23" N
	Kakan	2326	52°03'04.32" E	30°54'03.12" N
	Yasouj	1870	51°59'32.70" E	30°14'33.10" N
	Yasouj, Sarabid	1200	51°29'40.74" E	30°041'03.2" N
	Gachsaran	0726	50°47'53.00" E	30°21'31.00" N
	Yasouj University	1812	51°35.341'0" E	30°39.182'0" N
Yasouj, Tangetamoradi	1400	51°25'6.400" E	30°30'52.84" N	
Chaharmahal-o Bakhtiari	Soureshjan	2091	50°40'32.00" E	32°19.04'00" N
	Babahaydar	2243	50°28'15.17" E	32°19'47.70" N
	Hosein Abad	2200	51°5'29.840" E	31°52'19.86" N
	Chelgerd	2390	50°07'23.00" E	32°27'60.00" N
	Cheshmeh Shaykhalikhan	2755	49°59'18.39" E	32°33'04.87" N
	Faradonbeh	2169	51°12'57.86" E	32°0'51.120" N
	Mal-khalifeh	2600	51°15'32.84" E	31°17'27.30" N
	Shahrekord, Asad Abad	2227	50°38'20.84" E	32°24'49.63" N
	Dehkohne	2300	51°07'18.12" E	31°11'48.10" N
	Brujen	2197	52°29'55.27" E	29°37'24.01" N
Khuzestan	Shadegan	010.0	48°39'14.14" E	30°39'16.55" N
Alborz	Karaj, Shahrestanak	2190	51°21'2.510" E	35°58'9.240" N
Golestan	Gorgan	0128	54°26'21.60" E	36°50'44.31" N

Results

In this survey, we publish accounts of 88 species of Iranian Megachilids as follow:

Subfamily: Fideliinae Cockerell, 1932

Tribe: Pararhophitini Popov, 1949 (Fig. 5)

Pararhophites orobinus Morawitz, 1876

Material examined: Isfahan University of Technology (IUT) courtyard 1676m, 16.V.2012, 1♀; Mobarakeh, Ghahnavieh, 1668m, 27.V.2013; 3♀♀; Sistan-o Baluchestan, Zahedan, 1390m, 1.V.2010, 1♂. Swept, leg.: R. Khodarahmi.

General distribution: Iran (Grace, 2010), Turkmenistan, Kazakhstan, Pakistan, India (Ascher & Pickering, 2020; Schmid-Egger, 2017).

Subfamily: Megachilinae Latreille, 1802

Tribe: Dioxyini Cockerell, 1902 (Fig. 1)

Metadioxys formosa (Morawitz, 1875)

Material examined: Fars, Kazeroun, Bidzard, 721m, 20.V.2011, 2♂♂ and 2♀; Fars, Kazeroun, Bidzard, 721m, 4.VI.2010, 1♂; Isfahan, Mobarakeh, Ghahnavieh, 1668m, 27.V.2013, 1♂. Swept, leg.: R. Khodaparast.

General distribution: Iran (Warncke, 1979; Grace, 2010; Khodaparast & Monfared, 2012).

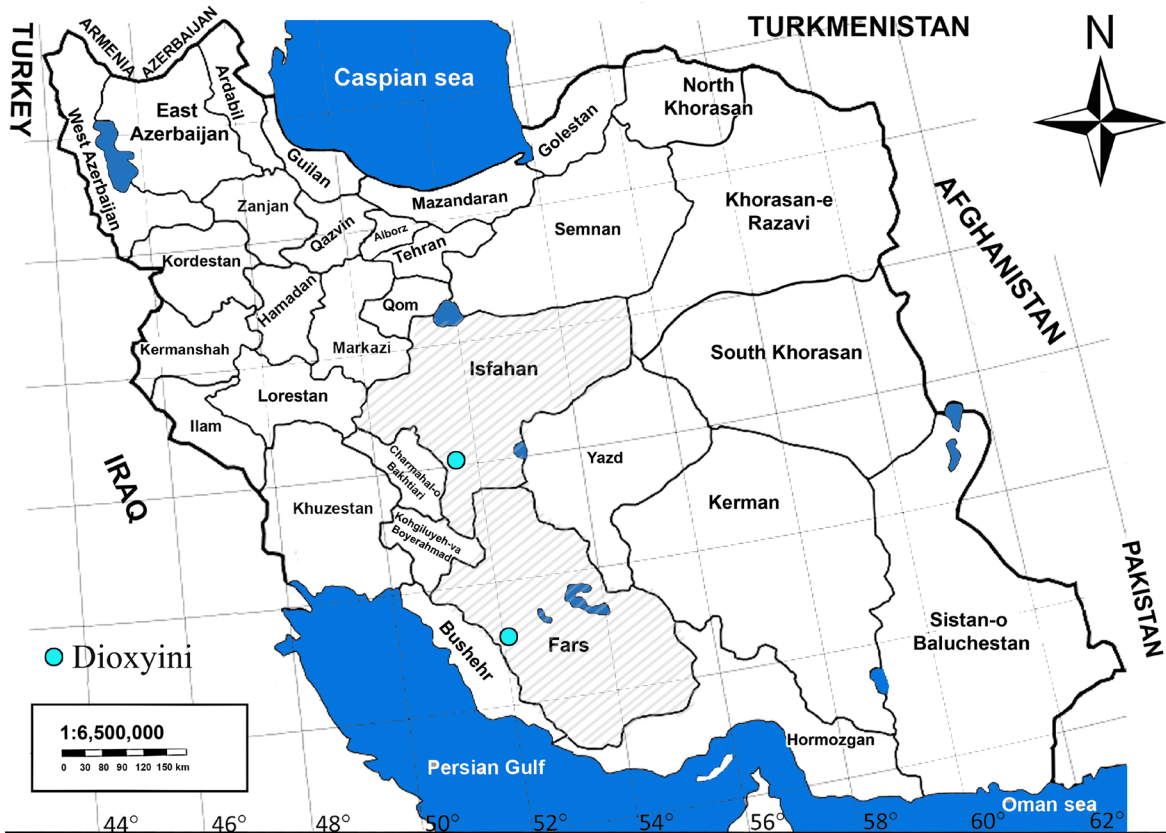


Figure 1. Distribution map of Dioxyini species in Iran based on the collected specimens in the present study.

Tribe: Anthidiini Ashmead, 1899 (Fig. 2)***Anthidiellum (Anthidiellum) strigatum (Panzer, 1805)***

Material examined: Fars, Sepidan, 2250m, 4.VIII.2010, 1♂; Kerman, Jiroft, 720m, 1.X.2009, 1♀; Fars, Shiraz, Besat, 1556m, 27.VIII.2011, 1♀; Isfahan, Mobarakeh, 1645m, 27.V.2013, 2♂♂ and 1♀; Isfahan, Najaf Abad, Ghale Sefid, 1653m, 5.VII.2013, 1♂; Fars, Shiraz, 1846m, 1♂; Isfahan, Karvan, Jafar Abad, 2035, 1♂; Isfahan, Mobarakeh, Sera Rud, 1646m, 28.VIII.2012, 1♂; Isfahan, Tiran, Khamiran, 2018m, 7.VII.2012, 1♂. Swept, leg.: A. Keshtkar.

General distribution: Europe, Caucasus, Kazakhstan, Siberia Western, Central Asia (Banaszak & Romasenko, 1998; Aguib et al., 2010), Iran (Popov, 1935; Warncke, 1981; Nadimi et al., 2014).

Anthidium (Anthidium) bischoffi Mavromoustakis, 1954

Material examined: Fars, Kazeroun, Bidzard, 721m, 17.V.2010, 1♂; Fars, Kazeroun, Bidzard, 20.V.2010, 1♀. Swept, leg.: R. Khodaparast.

General distribution: Egypte, Sina, Algeria (Mavromoustakis, 1954; Warncke, 1980; Aguib et al., 2010).

Anthidium (Anthidium) florentinum (Fabricius, 1775)

Material examined: Fars, Sepidan, 2250m, 4.VIII.2010, 4♂♂ and 8♀♀; Kohgiluyeh-va Boyer-Ahmad, Yasouj, 1870m, 30.VI.2010, 2♀♀; Fars, Eqlid, 2266m, 3.VIII.2010, 4♂♂; Kohgiluyeh-va Boyer-Ahmad, Yasouj, 1870m, 11.IV.2010, 2♀♀; Isfahan, Najaf Abad, Ghaleh Sefid, 1653m, 29.VI.2010, 1♂ and 1♀; Fars, Shiraz, Delgosha, 1552m, 21.V.2012, 2♂♂; Fars, Shiraz, Jannat, 1573m, 25.V.2012, 1♀; Isfahan, Flavarjan, 1650m, 15.VII.2012, 3♂♂; Fars, Shiraz, 1700m, 31.VII.2009, 1♂; Fars, Shiraz, Eram, 1569m, 29.VII.2012, 2♂♂; Isfahan, Kooshk, 1552m, 24.VIII.2012, 2♂♂, Isfahan, Flavarjan, 1650m, 6.VII.2012, 2♂♂ and 1♀; Isfahan, Zodan, 1606m, 28.VIII.2012, 2♂♂ and 2♀♀; Fars, Shiraz, 1500m, 30.V.2012, 1♀; Isfahan, Chadegan, Zayandehrud, 2070m, 19.VII.2012, 1♂; Fars, Shiraz, 1700m, 22.VII.2012, 1♂; Chaharmahal-o Bakhtiari, Babahaydar, 2243.38m, 23.VIII.2013, 7♂♂; Chaharmahal-o Bakhtiari, Soureshjan, 2091m, 28.VIII.2014, 3♂♂; Fars, Kazeroon, Siakh Darengon, 1840m, 20.IX.2016, 4♀♀. Swept, leg.: M. Zakikhani.

General distribution: USA (Comba & Comba, 1991), South and Central Europe, Siberia, Asia Minor, Central Asia, Caucasus, Syria (Banaszak & Romasenko, 1998), Iran (Warncke, 1980; Izadi et al., 1999; Khaghaninia et al., 2010; Nadimi et al., 2014).

Anthidium (Anthidium) taeniatum Latreille, 1809

Material examined: Kohgiluyeh-va Boyer-Ahmad, Yasouj, 1870m, 9.VII.2009, 1♂; Isfahan, Fereydan, Bazmeh, 2442m, 4.VII.2012, 1♂; Fars, Sepidan, 2250m, 16.IX.2013, 1♂; Fars, Sepidan, 2250m, 2.IX.2013, 1♂; Chaharmahal-o Bakhtiari, Hosein Abad, 2200m, 24.VIII.2013, 1♂. Swept, leg.: A. Monfared.

General distribution: North Africa (Morocco, Algeria, Tunisia), Europe (Spain, France, Italy, Greece, Croatia, Bulgaria), Turkey, Asia Minor, Asia Central (Warncke, 1980; Ornos et al., 2008), Iran (Esmaili & Rastegar, 1974; Warncke, 1981; Grace, 2010; Monfared et al., 2012).

Anthidium (Gulanthidium) anguliventre Morawitz, 1888

Material examined: Fars, Noorabad, 920m, 30.VI.2009, 1♂; Fars, Noorabad, 920m, 28.VI.2009, 1♂; Fars, Noorabad, Basharjan, 1100m, 3.VII.2009, 1♀; Kohgiluyeh-va Boyer-Ahmad, Yasouj,

1870m, 4.VI.2010, 2♂♂; Fars, Kazeroun, Bidzard, 721m, 4.VI.2010, 2♂♂; Fars, Shiraz, Ghasre Ghomsheh, 1750m, 21.VII.2013, 2♂♂. Swept, leg.: A. Monfared.

General distribution: Central Asia, Lebanon, Pakistan, Palestine, Syria ([Warncke, 1980, 1981](#)), Turkey, Iran ([Grace, 2010](#)).

Anthidium (Proanthidium) undulatum Dours, 1873

Material examined: Noorabad, Basharjan, 1100m, 28.VI.2009, 1♂; Fars, Kazeroun, Bidzard, 721m, 4.VIII.2010, 1♂; Fars, Darab, 1105m, 9.VII.2011, 1♂; Isfahan, Chadegan, Zayanderud, 2070m, 8.VII.2012, 1♀. Swept, leg.: A. Monfared.

General distribution: France, Algeria, Croatia, Greece, Turkey, Azerbaijan, Iran ([Ascher & Pickering, 2020](#)), Iran ([Warncke, 1981](#); [Khodaparast & Monfared, 2012](#); [Nadimi et al., 2014](#)).

Anthidium (Anthidium) cingulatum Lateralille, 1809

Material examined: Ardebil, Meshkinshahr, Moeil, 2500m, 5.VIII.2009, 1♂ and 1♀. Swept, leg.: A. Monfared.

General distribution: North Africa (Morocco, Algeria, Libya), South and Central Europe, Siberia ([Banaszak & Romasenko, 1998](#)), Ukraine, Turkey, Caucasus, Iran ([Warncke, 1980](#)), Oran ([Lepeletier, 1841](#)), Medea ([Saunders, 1908](#)), Tebessa ([Aguib et al., 2010](#)), Iran ([Ascher & Pickering, 2020](#)).

Anthidium (Anthidium) gussakovskiji Mavromoustakis, 1939

Material examined: Kohgiluyeh-va Boyer-Ahmad, Tangetamoradi, 1400m, 4.VI.2010, 1♂ and 1♀; Isfahan, Baharestan, 1608m, 15.V.2013, 1♀. Fars, Sepidan, Swept, leg.: A. Monfared.

General distribution: Turkey ([Warncke, 1981](#); [Grace, 2010](#)), Iran ([Monfared et al., 2012](#); [Nadimi et al., 2014](#)).

Anthidium (Anthidium) christianseni Mavromoustakis, 1956

Material examined: Chaharmahal-o Bakhtiari, Chelgerd, 2390m, 28.VIII.2014, 1♀. Swept, leg.: A. Monfared.

General distribution: Lebanon, Turkey, Iran ([Ascher & Pickering, 2020](#)).

Anthidium (Anthidium) loti Perris, 1852

Material examined: Chaharmahal-o Bakhtiari, Cheshmeh Shaykhalikhan, 2756m, 23.VIII.2013, 6♂♂ and 1♀; Chaharmahal-o Bakhtiari, Chelgerd, 2390m, 28.VIII.2014, 1♂ and 1♀. Swept, leg.: A. Monfared.

General distribution: Greece, Turkey, Cyprus ([Grace, 2010](#)), Romania ([Zanden & Matache, 1986](#); [Ban-Calefariu, 2009](#)), Iran ([Warncke, 1981](#); [Esmaili & Rastegar, 1974](#); [Nadimi et al., 2014](#)).

Anthidium (Paroanthidium) oblongatum Illiger, 1806

Material examined: Kerman, Jiroft, Esfandadge, 720m, 19.IX.2009, 1♂; Isfahan, Meymeh, 2059m, 31.VIII.2012, 1♂; Chaharmahal-o Bakhtiari, Chelgerd, 2390m, 28.VIII.2014, 2♀♀. Swept, leg.: R. Khodarahmi.

General distribution: Iran (Esmaili & Rastegar, 1974; Warncke, 1981), Romania (Aftene, 1972; Pascu, 1996; Aftene, 1973; Zanden & Matache, 1986; Ban-Calefariu, 2009; Tomozii & Toma, 2011), Turkey (Grace, 2010).

Anthidium (Proanthidium) wuestneii Mocsáry, 1887

Material examined: Isfahan, Chadegan, Zayanderud, 2070m, 19. VII. 2012, 1♀. Swept, leg.: R. Khodarahmi.

General distribution: Iran, Lebanon, Syria (Warncke, 1981), Greece, Turkey (Grace, 2010).

Anthidium (Proanthidium) trispinosum Friese, 1925

Material examined: Isfahan, Semirom, 2627.29m, 25.VI.2009, 1♂; Kohgiluyeh-va Boyer-Ahmad, Kakan, 2326.26m, 25.VI.2009, 1♂ and 1♀; Kohgiluyeh-va Boyer-Ahmad, Kakan, 2326.26m, 27.VI.2009, 2♂♂. Swept, leg.: A. Monfared.

General distribution: Turkey, Azerbaijan, Iran (Ascher & Pickering, 2020).

Anthidium (Gulanthidium) rotundum Warncke, 1980

Material examined: Fars, Shiraz, Ghasre Ghomsheh, 1750m, 30.VI.2013, 1♂. Swept, leg.: S. Kiani.

General distribution: Egypt, Greece, Iran, Lebanon, Syria, Turkey (Warncken, 1980, 1981; Grace, 2010; Ascher & Pickering, 2020).

Afranthidium (Mesanthidium) carduele Morawitz, 1876

Material examined: Fars, Shiraz, Shahrak Golestan 1700m, 28.V.2014, 1♂ and 1♀. Swept, leg.: S. Kiani.

General distribution: Spain, Greece, Bulgaria, Turkey, Middle East and Caucasus (Ornosa et al., 2008; Warncke, 1980; Aguib et al., 2010).

Pseudoanthidium (Pseudoanthidium) scapulare (Latreille, 1809)

Material examined: Fars, Noorabad, Mehrenjan 1200m, 1.VII.2009, 1♀; Fars, Noorabad, Doshmanzeyare, 1966m, 21.IV.2010, 1♂; Fars, Noorabad, Doshmanzeyare, 1966m, 23.III.2010, 1♀; Isfahan, Aran & Bidgol, 947m, 11.VIII.2013, 1♀; Fars, Noorabad, Doshmanzeyare, 1966m, 27.V.2013, 1♀; Fars, Shiraz, Ghasre Ghomsheh, 1750m, 21.VII.2013, 1♀. Swept, leg.: A. Monfared.

General distribution: Spain, Greece, Bulgaria, Turkey, Middle East and Caucasus (Ornosa et al., 2008; Warncke, 1980; Aguib et al., 2010).

Icteranthisdium ferrugineum (Fabricius, 1787)

Material examined: Fars, Kamfiroz, 1700m, 22.VIII.2013, 2♂♂; Isfahan, Zodan, 1606m, 28.VIII.2012, 1♂. Swept, leg.: A. Monfared.

General distribution: Mauritania (Western Sahara), Morocco, Egypt, Algeria (Warncke, 1980; Aguib et al., 2010), Iran (Warncke, 1981; Grace, 2010).

Icteranthidium cimbiciforme (Smith, 1854)

Material examined: Isfahan, Chadegan, Zayanderud, 2070m, 8.VIII.2012, 2♀♀. Swept, leg.: R. Khodarahmi.

General distribution: Greece, Turkey, Caucasus, Iran (Ascher & Pickering, 2020).

Icteranthidium limbiferum (Morawitz, 1875)

Material examined: Isfahan, Karvan, Jafar Abad, 2035m, 29.VI.2012, 1♀. Swept, leg.: R. Khodarahmi.

General distribution: Central Asia, Lebanon (Warncke, 1980), Turkey (Grace, 2010), Iran (Popov, 1967; Esmaili & Rastegar, 1974; Warncke, 1981; Grace, 2010; Nadimi et al., 2014).

Trachusa (Archianthidium) pubescens (Morawitz, 1872)

Material examined: Kohgiluyeh-va Boyer-Ahmad, Yasouj, 1870m, 9.VII.2009, 1♂ and 4♀♀; Kohgiluyeh-va Boyer-Ahmad, Yasouj, 1870m, 27.V.2009, 1♀; Isfahan, Semirom, 2627.29m, 26.VI.2009, 1♂. Swept, leg.: A. Monfared.

General distribution: Russia, Europe, Africa, Georgia, Turkey, Syria, Lebanon, Iran, Turkmenistan (Fateryga et al., 2018).

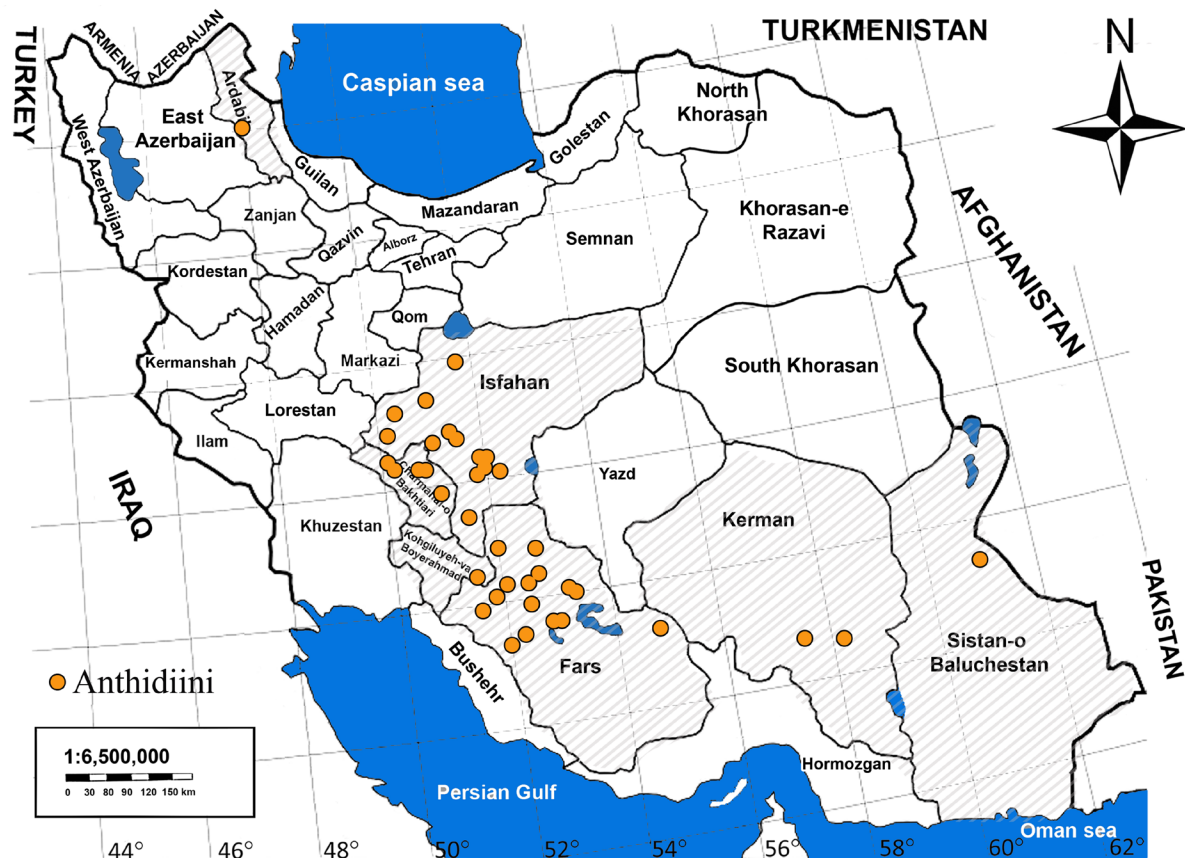


Figure 2. Distribution map of Anthidiini species in Iran based on the collected specimens in the present study.

Tribe: Osmiini Newman, 1834 (Fig. 3)***Heriades (Heriades) truncorum (Linnaeus, 1758)***

Material examined: Isfahan, Sadegh Abad, 1784m, 3.VI.2012, 1♂; Isfahan, Chadegan, 2070m, 7.VI.2012, 1♂. Swept, leg.: R. Khodarahmi.

General distribution: USA (Washington), Morocco, Spain, Europe, Algeria, Morocco, Kyrgyzstan, Kazakhstan, Far Eastern Siberia, Cyprus, Palestine, Syria, Turkey (Banaszak & Romasenko, 1998; Müller, 2012; Grace, 2010; Ascher & Pickering, 2020).

Heriades (Michenerella) hissaricus popov, 1955

Material examined: Fars, Kazeroun, Bidzard, 721m, 4.VII.2010, 1♂, 3♀♀. Swept, leg.: R. Khodaparast.

General distribution: Iran, Turkey (Grace, 2010; Khodaparast & Monfared, 2010; Müller, 2012).

Heriades (Rhopaloheriades) clavicornis Morawitz, 1875

Material examined: Fars, Shiraz, Sadra, 1800m, 18.V.2014, 1♂. Swept, leg.: S. Kiani.

General distribution: Greece, Lebanon, Turkey, Armenia, Tajikistan, Iran (Grace, 2010; Ascher & Pickering, 2020).

Hoplitis (Pentadentostmia) rufopicta (Morawitz, 1875)

Material examined: Fars, Noorabad, Aalivand, 980m, 3.VII.2009, 2♀♀; Kerman, Jiroft, 720m, 1.X.2009, 1♀. Swept, leg.: A. Monfared.

General distribution: Iran, Afghanistan, Pakistan, Tajikistan (Ascher & Pickering, 2020).

Hoplitis (Hoplitis) uncaticornis (Stanek, 1969)

Material examined: Kohgiluyeh-va Boyer-Ahmad, Yasouj, Kakan, 2326.26m, 27.VI.2009, 2♀♀; Kohgiluyeh-va Boyer-Ahmad, Yasouj, Tangetamoradi, 1400m, 4.VI.2010, 1♂; Fars, Shiraz, Sadra, 1800m, 18.V.2014, 1♂; Fars, Shiraz, Shahrak Golestan, 1700m, 30.VI.2013, 1♂. Swept, leg.: A. Monfared.

General distribution: Iran, Turkey, Syria (Ascher & Pickering, 2020).

Hoplitis (Hoplitis) eremophila (Warncke, 1991)

Material examined: Isfahan, Semirom, Cheshme sard, 2436m, 4.VI.2013, 2♂♂ and 7♀♀. Swept, leg.: R. Khodarahmi.

General distribution: Crete, Turkey, Syria (Grace, 2010; Ascher & Pickering, 2020).

Hoplitis (Alcidamea) leucomelana (Kirby, 1802)

Material examined: Fars, Shiraz, Shahrak Golestan 1700m, 24.V.2014, 1♂; Fars, Kamfiroz, 1700m, 22.VIII.2013, 1♂. Swept, leg.: A. Monfared.

General distribution: Russia, European, North Africa (Proshchalykin, 2007), Turkey (Grace, 2010).

Hoplitis (Pentadentoscia) minor (Morawitz, 1877)

Material examined: Isfahan, Mobarakeh, Ghahnavieh, 1668m, 27.V.2013, 1♂. Swept, leg.: R. Khodarahmi.

General distribution: Jordan, Armenia, Iran, Turkestan, Afghanistan ([Ascher & Pickering, 2020](#)), Syria ([Grace, 2010](#)).

Hoplitis (Pentadentoscia) nitidula (Morawitz, 1877)

Material examined: Isfahan, Mobarakeh, Ghahnavieh, 1668m, 27.V.2013, 1♂ and 1♀. Swept, leg.: R. Khodarahmi.

General distribution: Iran, Palearctic-Tunisia, Russia, Armenia, Kazakhstan, Pakistan, Tajikistan ([Ascher & Pickering, 2020](#)).

Hoplitis (Anthocopa) unispina (Alfken, 1935)

Material examined: Isfahan, Khansar, 2425m, 24.V.2012, 1♂. Swept, leg.: R. Khodarahmi.

General distribution: Turkey, Syria ([Ascher & Pickering, 2020](#)).

Hoplitis (Hoplitis) mutica (Warncke, 1991)

Material examined: Kohgiluyeh-va Boyer-Ahmad, Yasouj, Kakan, 2326m, 25.VI.2009, 1♀; Kohgiluyeh-va Boyer-Ahmad, Yasouj, 1870m, 20.IV.2009, 1♀, Swept, leg.: A. Monfared.

General distribution: Iran, Turkey, Syria ([Ascher & Pickering, 2020](#)).

Hoplitis (Alcidamea) acuticornis (Dufour & Perris, 1840)

Material examined: Kohgiluyeh-va Boyer-Ahmad, Yasouj, Sarabid, 1200m, 30.IV.2010, 2♀. Kohgiluyeh-va Boyer-Ahmad, Yasouj, 1870m, 9.V.2010, 1♂. Swept, leg.: A. Monfared.

General distribution: Russia, Europe, Africa, Armenia, Turkey, Cyprus, Syria, Jordan, Iran, Turkmenistan, Tajikistan, Kyrgyzstan, Kazakhstan ([Fatoryga et al., 2018](#)), Greece, Cyprus ([Grace, 2010](#)).

Hoplitis (Hoplitis) flabellifera (Morice, 1901)

Material examined: Fars, Abadeh, 1800m, 14.V.2009, 1♂; 1300m, 2.IV.2010, 4♀♀, 3♂♂; Fars, Kharestan, 1992m, 12.V.2011, 5♀♀, 4♂♂. Swept, leg.: A. Monfared.

General distribution: Turkey, Syria, Armenia, Iran ([Ascher & Pickering, 2020](#)).

Osmia (Helicosmia) dives Mocsavy, 1977

Material examined: Kohgiluyeh-va Boyer-Ahmad, Yasouj, Tangetamoradi, 1400m, 4.VI.2010, 1♀; Kohgiluyeh-va Boyer-Ahmad, Yasouj, Kakan, 2326.26m, 24.VII.2010, 1♀; Fars, Abadeh, 1800m, 26.VI.2011, 1♂; Fars, Shiraz, Shahrak Golestan, 1700m, 21.V.2014, 1♀; Fars, Shiraz, Shahrak Golestan, 1700m, 28.V.2014, 1♀. Swept, leg.: A. Monfared.

General distribution: Croatia, Hungary, Greece, Cyprus, Turkmenistan, Uzbekistan, Kyrgyzstan ([Grace, 2010](#); [Ascher & Pickering, 2020](#)).

Osmia (Helicosmia) caerulescens (Linnaeus, 1758)

Material examined: Kohgiluyeh-va Boyer-Ahmad, Yasouj, Gachsaran, 726m, 24.V.2009, 1♀; Fars, Sepidan, 2250m, 4.VII.2010, 1♀; Fars, Abadeh, 1800m, 26.IV.2011, 1♀; Isfahan, Karvan, 2035m, 23.V.2012, 1♂; Isfahan, Sadegh Abad, 1784, 3.VI.2012, 1♀; Isfahan, Flavarjan, 1650m, 31.V.2013, 1♀; Isfahan, Dehaghan, Astaneh, 2399, 4.VI.2013, 1♀; Isfahan, Najaf Abad, Ghaleh Sefid, 1653m, 5.VII.2013, 1♀; Isfahan, Marq, 1556m, 21.VI.2013, 1♂; Isfahan, Semirom, Cheshmesar, 2627.29m, 4.VI.2013, 1♀; Fars, Sepidan, 2250m, 4.VIII.2013, 1♀; Fars, Sepidan, 2250m, 25.IV.2014, 1♂; Fars, Sepidan, 2250m, 11.IV.2014, 1♂; Fars, Sepidan, 2250m, 2.V.2014, 1♂. Kohgiluyeh-va Boyer-Ahmad, Yasouj University, 1812m, 05.IX.2016, 1♂. Swept, leg.: M. Zakikhani.

General distribution: Russia, Europe, Africa, Georgia, Armenia, Azerbaijan, Turkey, Cyprus, Syria, Jordan, Iran, Turkmenistan, Tajikistan, Uzbekistan, Kyrgyzstan, Kazakhstan, China, North America (introduced), India, New Zealand (Fateryga et al., 2018).

Osmia (Hemiosmia) difficilis Morawitz, 1875

Material examined: Isfahan, Semirom, Abshar, 2627m, 26.VI.2009, 1♀; Fars, Abadeh, 1800m, 14.V.2009, 1♂; Fars, Kharestan, 1992m, 12.V.2011, 15♂♂ and 1♀; Fars, Sepidan, 2250m, 16.V.2014, 1♀. Swept, leg.: A. Monfared.

General distribution: Turkey, Iran, Kyrgyzstan, Tajikistan, Russia (Ascher & Pickering, 2020).

Osmia (Helicosmia) fasciata Latreille, 1811

Material examined: Khuzestan, Shadegan, 10m, 22.III.2009, 1♀; Kerman, Kahnuj, 505m, 28.IV.2010, 1♀; Fars, Shiraz, 1500m, 7.V.2011, 1♂; Fars, Noorabad, Zirdu, Tolekohneh, 980m, 31.III.2011, 1♂; Fars, Shiraz, Shahrak Golestan, 1700m, 28.V.2014, 2♀♀. Swept, leg.: A. Monfared.

General distribution: Jordan, Palestine, Syria, Turkey (Grace, 2010; Müller, 2012), Iran (Khodaparast & Monfared, 2012).

Osmia (Helicosmia) gutturalis Warncke, 1988

Material examined: Fars, Shiraz, 1500m, 7.V.2011, 1♀; Isfahan, Fereydan, Bazmeh, 2490m, 4.VII.2012, 1♀. Swept, leg.: S. Kiani.

General distribution: Iran, Turkey (Grace, 2010; Ascher & Pickering, 2020).

Osmia (Helicosmia) signata Erichson, 1835

Material examined: Alborz, Karaj, Shahrestanak, 2190 m, 23.V.2009, 1♀; Fars, Shiraz, Shahrak Golestan, 1828, 8.V.2012, 2♀♀; Isfahan, Mehdi Abad, 1993 m, 23.V.2012, 1♂; Isfahan, Chadegan, Zayanderud, 2070 m, 8.VII.2012, 1♀; Isfahan, Qahdarijan, 1600 m, 11.V.2013, 1♂; Isfahan, Tiran, Khamiran, 2018 m, 3.V.2013, 1♂. Swept, leg.: A. Monfared.

General distribution: Russia, Europe, Africa, Turkey, Cyprus, Syria, Jordan, Iran, Turkmenistan, China (Fateryga et al., 2018).

Osmia (Helicosmia) subcornuta Morawitz, 1875

Material examined: Kerman, Jiroft, Sarbijan, 780 m, 28.V.2010, 1♀. Swept, leg.: S. Salehi.

General distribution: Croatia, Greece, Turkey, Armenia, Iran, Tajikistan, Turkmenistan (Ascher & Pickering, 2020).

Osmia (Helicosmia) aeruginosa Warncke, 1988

Material examined: Fars, Kharestan, 1992m, 12.V.2011, 1♂. Swept, leg.: R. Khodaparast.

General distribution: Iran, Turkey (Ascher & Pickering, 2020).

Osmia (Hoplosmia) bidentata Morawitz, 1876

Material examined: Isfahan, Fereydan, Bazmeh, 2442m, 4.VII.2012, 2♂♂ and 2♀♀. Swept, leg.: R. Khodarahmi.

General distribution: Russia, Europe, Africa, Armenia, Azerbaijan, Turkey, Syria, Jordan, Iran (Fateryga et al., 2018).

Osmia (Pyrosmia) cephalotes Morawitz, 1875

Material examined: Fars, Kharestan, 1992m, 12.V.2011, 1♀; Isfahan, Golpaygan, 1861m, 29.III.2013, 1♀. Swept, leg.: R. Khodaparast.

General distribution: Russia, Europe, Georgia, Armenia, Azerbaijan, Turkey, Cyprus, Syria, Jordan, Iran, Turkmenistan, Uzbekistan (Fateryga et al., 2018).

Osmia (Pyrosmia) laticauda Stanck, 1969

Material examined: Fars, Kharestan, 1992m, 12.V.2011, 1♀; Kohgiluyeh-va Boyer-Ahmad, Yasouj, Sarabid, 1200m, 30.IV.2010, 1♀. Swept, leg.: A. Monfared.

General distribution: Turkey, Greece, Iran (Ascher & Pickering, 2020).

Osmia (Metallinella) brevicornis (Fabricius, 1798)

Material examined: Fars, Sepidan, 2250m, 2.V.2014, 4♀♀; Fars, Sepidan, 2250m, 25.IV.2014, 2♀♀. Swept, leg.: S. Kiani.

General distribution: Russia, Europe, North of Africa, Armenia, Azerbaijan, Turkey, Cyprus, Iran, Afghanistan, Turkmenistan, Tajikistan, Uzbekistan, Kyrgyzstan, Kazakhstan (Fateryga et al., 2018).

Osmia (Osmia) bicornis (Linnaeus, 1758)

Material examined: Kohgiluyeh-va Boyer-Ahmad, Yasouj, Kakan, 2326.26m, 16.V.2009, 1♀. Swept, leg.: A. Monfared.

General distribution: Russia, Europe, N Africa, Georgia, Armenia, Azerbaijan (Fateryga et al., 2018), Turkey, Cyprus, Syria, Iran, Turkmenistan, Kyrgyzstan, Kazakhstan (Grace, 2010).

Osmia (Osmia) apicata Smith, 1853

Material examined: Kohgiluyeh-va Boyer-Ahmad, Yasouj, Sarabid, 1200m, 30.IV.2010, 3♂♂ and 5♀♀. Swept, leg.: A. Monfared.

General distribution: Italy, Slovenia, Greece, European Russia, Georgia, Iran, (Ascher & Pickering, 2020).

Osmia (Osmia) cerinthidis Morawitz, 1876

Material examined: Fars, Sepidan, Bahraghan, 2161m, 8.IV.2010, 1♀. Swept, leg.: S. Kiani.

General distribution: Russia, Europe, Georgia, Armenia, Azerbaijan, Turkey, Iran, China (Fateryga et al., 2018).

Osmia (Osmia) cornuta (Latreille, 1805)

Material examined: Kerman, Jiroft, Sarbijan, 780m, 19.III.2010, 1♀; Kohgiluyeh-va Boyer-Ahmad, Yasouj, 1870, 15.III.2010, 1♀. Swept, leg.: A. Monfared.

General distribution: Russia, Europe, Africa, Georgia, Armenia, Azerbaijan, Turkey, Cyprus, Syria, Iran, Turkmenistan, Kazakhstan (Fateryga et al., 2018).

Osmia (Osmia) nigrohirta, Friese 1899

Material examined: Fars, Sepidan, 2250m, 17.VI.2013, 2♀♀. Swept, leg.: S. Kiani.

General distribution: Greece, Lebanon, Turkey, Iran (Grace, 2010), Caucasus (Ascher & Pickering, 2020).

Osmia (Odontanthocopa) ligurica Morawitz, 1868

Material examined: Fars, Noorabad, 920m, 23.III.2010, 1♂. Swept, leg.: A. Monfared.

General distribution: Morocco, Portugal, France, Corsica, Albania, Greece, Armenia, Iran, Turkey, (Ascher & Pickering, 2020).

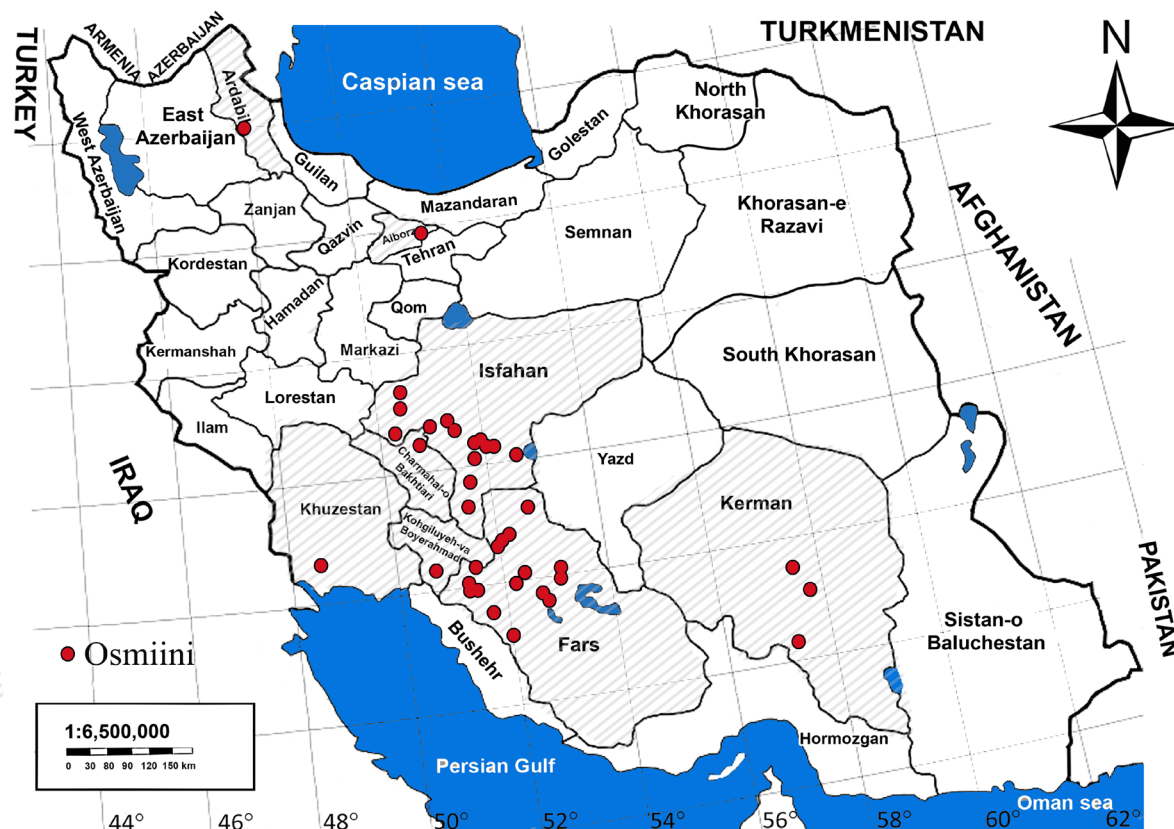


Figure 3. Distribution map of Osmiini species in Iran based on the collected specimens in the present study.

Tribe: Lithurgini Newman, 1834 (Fig. 5)***Lithurgus (Lithurgus) chrysurus* Fonscolombe, 1834**

Material examined: Fars, Noorabad, Javid, 1400m, 1.VII.2009, 1♀; Isfahan, Semirom, 2627.29m, 26.VI.2009, 1♂; Kohgiluyeh-va Boyer-Ahmad, Yasouj, Kakan, 2326.26m, 24.VII.2009, 1♂; 2♀♀; Kohgiluyeh-va Boyer-Ahmad, Yasouj, Tangetamoradi, 1400m, 4.VI.2010, 4♀♀; Isfahan, Najaf Abad, Ghaleh Sefid, 1653m, 29.VI.2012, 1♂; Isfahan, Flavarjan, 1650m, 6.VII.2012, 1♂ and 1♀; Fars, Sepidan, 2250m, 5.VII.2013, 1♀; Fars, Sepidan, 2250m, 12.VII.2013, 1♂ and 1♀. Fars, Shiraz Zarghan, 1620m, 15.VII.2016. 2♀. Swept, leg.: M. Zakikhani.

General distribution: Iran, Lebanon (Warncke, 1981; Grace, 2010), Greece, Italy, Bulgaria, the former USSR, Syria, Israil, Spain, Turkey, Rodos (Zanden, 1986), South America (Comba & Comba, 1991), South, East and Central Europe, Asia Minor, Caucasus (Banaszak & Romasenko, 1998; Khaghaninia, 2010).

***Lithurgus (Lithurgus) tibialis* Morawitz, 1875**

Material examined: Fars, Sepidan, 2250m, 12.VII.2013, 1♂. Swept, leg.: S. Kiani.

General distribution: Iran, Greece, Cyprus, Turkey (Grace, 2010), Portugal, Malta, Italy, United Arab Emirates, Pakistan, Uzbekistan, Afghanistan, (Ascher & Pickering, 2020).

***Lithurgus (Lithurgus) cornutus* (Fabricius, 1787)**

Material examined: Isfahan, Zazeran, 1608m, 15.VII.2012, 1♀. Swept, leg.: R. Khodarahmi.

General distribution: Iran (Warncke, 1981), South, East and Central Europe, Asia Minor, North of Africa, Kazakhstan, Caucasus (Banaszak & Romasenko, 1998), Japan, China, Taiwan, Morocco, Italy, Yugoslavia, the former USSR, Romania, Hungary, Greece, Turkey (Zanden, 1986).

Tribe: Megachilini Latreille, 1802 (Fig. 4)***Megachile (Eutricharaea) marginata* Smith, 1853**

Material examined: Fars, Noorabad, 920m, 1.V.2009, 1♂; Fars, Noorabad, 920m, 2.V.2009, 1♂ and 2♀♀; Fars, Noorabad, 920m, 3.VIII.2009, 2♂♂ and 2♀♀; Fars, Kazeroun, Bidzard, 721m, 20.V.2010, 8♀♀; Fars, Kazeroun, Bidzard, 721m, 19.V.2010, 13♀♀; Fars, Kazeroun, Bidzard, 721m, 17.V.2010, 2♂♂; Fars, Kazeroun, Bidzard, 721m, 4.VII.2010, 11♂♂; Fars, Neyeiz, 1587m, 10.VII.2011, 1♀; Fars, Estahban, 1730m, 10.VII.2011, 1♂; Fars, Firoozabad, 1315m, 8.VII.2011, 1♀; Fars, Fasa, 1336, 10.VII.2011, 3♂♂ and 1♀; Fars, Shiraz, Afif Abad, 1573m, 13.VII.2012, 1♀; Isfahan, Mobarake, 1645m, 28.VIII.2012, 1♀; Isfahan, Chadegan, Zayandehrud, 2070m, 8.VII.2012, 1♂; Fars, Kazeroun, Bidzard, 721m, 4.VI.2012, 1♀; Fars, Kazeroun, Bidzard, 721m, 8.VII.2012, 2♂♂; Chaharmahal-o Bakhtiari, Hosein Abad, 2200m, 22.VII.2013, 1♂. Swept, leg.: A. Monfared.

General distribution: Libya (Ascher & Pickering, 2020).

***Megachile (Eutricharaea) minutissima* Radoskowski, 1895**

Material examined: Sistan-o Baluchestan, Zahean, Siahdak, 2190m, 5.VI.2010, 1♂; Sistan-o Baluchestan, Zahean, Siahdak, 2190m, 11.IV.2010, 1♀; Sistan-o Baluchestan, Zahean, Siahdak, 2190m, 24.V.2010, 1♀; Sistan-o Baluchestan, Zahean, siahdak, 2190m, 22.IV.2010, 1♂; Sistan-o Baluchestan, Zahean, Siahdak, 2190m, 2.V.2010, 2♂♂; Shiraz, Besat, 1556m, 23.VII.2011, 1♀;

Shiraz, Besat, 1556m, 27.VIII.2011, 1♀; Fars, Evaz, 917m, 9.VII.2011, 2♂♂; Isfahan, Sadegh Abad, 1784m, 3.VI.2012, 1♂; Isfahan, Zazeran, 1608m, 15.VII.2012, 4♂ and 1♀; Isfahan, Baharan, 1608, 28.VIII.2012, 1♂; Isfahan, Najaf Abad, Ghaleh Sefid, 1653m, 29.VI.2012, 2♂♂; Isfahan . Aran & Bidgol, 947m, 11.VIII.2013, 1♂; Isfahan, Marq, 1556m, 21.VI.2013, 3♂♂; Isfahan, Dorcheh Piaz, 1608m, 23.VIII.2013, 2♂♂; Isfahan, Mobarakeh, 1645m, 18.VII.2013, 18♂♂ and 2♀♀; Isfahan .Mobarakeh, 1645m, 23.VIII.2013, 3♂♂ and 1♀; Isfahan, Mobarakeh, Ghahnavieh, 1668m, 27.V.2013, 3♂♂. Swept, leg.: M. Sorayamohtat.

General distribution: Egypt, Turkey (Grace, 2010), North of Africa, Palestine (Özbek & Van Der Zanden, 1994; Ascher & Pickering, 2020).

Megachile (Eutricharaea) leachella Curtis, 1828

Material examined: Fars, Noorabad, Javid, 1400m, 1.VII.2009, 1♀; Kerman, Jiroft, 720m, 1.X.2009, 1♀; Fars, Fasa, 1336m, 7.V. 2010, 1♀; Sistan-o Baluchestan, Zabol, 480m, 6.V.2010, 1♂; Sistan-o Baluchestan, Zabol, 480m, 5.VI.2010, 1♀; Sistan-o Baluchestan, Zabol, 480m, 1.V.2010, 1♀. Fars, Fasa, 1336m, 10.VII.2011, 1♂ and 1♀; Fars, Shiraz, Besat, 1556m, 23.VII.2011, 1♂; Fars, Shiraz, Jannat, 1573m, 25.VIII.2011, 1♀; Fars, Firoozabad, Jaidasht, 1315m, 8.VII.2011, 1♀; Fars, Shiraz, Eram, 1569m, 2.VI. 2012, 1♀; Fars, Shiraz, Eram, 1569m, 10.V.2012, 1♀. Isfahan, Si-o-se Pol, 1538m, 19.IX.2012, 2♀♀; Isfahan, Felavarjan, 1650m, 15.VII.2012, 1♂ and 2♀♀; Isfahan, Chadegan, Zayanderud, 2070m, 8.VII.2012, 1♂; Isfahan, Chadegan, Zayanderud, 2070m, 7.VII.2012, 1♀; Isfahan, Isfahan University of Technology (IUT) Courtyard, 1676m, 16.V.2012, 1♂; Fars, Shiraz, Shahrak Golestan 1700m, 25.VIII.2013, 1♀; Isfahan, Meymeh, 2059m, 9.VII.2013, 1♂; Isfahan, Najaf Abad, Ghaleh Sefid, 1653m, 5.VII.2013, 2♀♀; Chaharmahal-o Bakhtiari, Hosein Abad, 2200m, 24.VIII.2013, 2♂♂ and 1♀; Chaharmahal-o Bakhtiari, Faradonbeh, 2169m, 24.VIII.2013, 1♂; Isfahan, Dorcheh Piaz, 1608m, 23.VIII.2013, 1♂; Chaharmahal-o Bakhtiari, Hosein Abad, 2200m, 20.VIII.2014, 1♂; Fars, Shiraz, Shahrak Golestan, 1700m 29.IV.2014, 1♂. Swept, leg.: A. Monfared.

General distribution: Caucasus, Asia, Europe, Siberia, Russain Far East, North of Africa, North of America, Iran (Banaszak & Romasenko, 1998; khaghaninia et al., 2010), United Kingdom, Halland, Austria, Armenia (Ascher & Pickering, 2020).

Megachile (Eutricharaea) burdigalensis Benoist, 1940

Material examined: Isfahan, Najaf Abad, Ghaleh Sefid, 1653m, 29.VI.2012, 1♂; Isfahan, Najaf Abad, Ghaleh Sefid, 1653m, 7.VII.2012, 1♀; Isfahan, Najaf Abad, Ghaleh Sefid, 1653m, 5.VII.2013, 1♀; Chaharmahal-o Bakhtiari, Faradonbeh, 2169m, 24.VIII.2013, 1♂ and 1♀; Chaharmahal-o Bakhtiari, Chelgerd, 2390m, 23.VIII.2013, 2♂♂ and 1♀. Swept, leg.: R. Khodarahmi.

General distribution: France, Slovenia, Armenia, Kazakhstan (Ascher & Pickering, 2020).

Megachile (Eutricharaea) nitidicollis Morawitz, 1893

Material examined: Sistan-o Baluchestan, Zahedan, 1390m, 5.VI.2010, 1♀; Golestan, Gorgan, 128.95m, 12.VI.2010, 1♂. Swept, leg.: M. Soraya.

General distribution: Armenia, Uzbekistan (Ascher & Pickering, 2020).

Megachile (Euticharaea) apicalis (Spinola, 1808)

Material examined: Fars, Noorabad, Mehrenjan, 1200m, 1.VII.2009, 1♀; Fars, Sepidan, 2250m, 4.VIII.2010, 1♂; Fars, Firoozabad, 1315m, 8.VII.2011, 1♀; Isfahan, Fereydan, Bazmeh, 2442m,

4.VII.2012, 1♂; Isfahan, Flavarjan, 1650m, 6.VII.2012, 1♂; Isfahan, Zazeran, 1608m, 15.VII.2012, 1♂; Isfahan, Isfahan University of Technology (IUT) Courtyard, 1676m, 16.V.2012, 1♂; Isfahan, Chadegan, Zayanderud, 2070m, 8.VII.2012, 1♂; Isfahan, Flavarjan, 1650m, 31.V.2013, 1♂ and 1♀; Fars, Shiraz, Shahrake Golestan, 1700m, 29.VII.2013, 1♂; Chaharmahal-o Bakhtiari, Cheshmeh Shaykhalikhan, 2755.94m, 23.VIII.2013, 1♂ and 1♀; Chaharmahal-o Bakhtiari, Hosein Abad, 2200m, 24.VIII.2013, 1♂; Fars, Shiraz, Shahrak Golestan, 1700m, 29.VIII.2013, 1♂; Fars, Firoozabad, 1315m, 9.V.2014, 1♀; Chaharmahal-o Bakhtiari, Mal-khalifeh, 2600m, 20.VIII.2014, 4♂♂ and 1♀; Chaharmahal-o Bakhtiari, Soureshjan, 2091m, 28.VIII.2014, 4♂♂. Swept, leg.: A. Monfared.

General distribution: Russia, Europe, North Africa, Georgia, Azerbaijan, Turkey, Cyprus, Iran, Pakistan, Uzbekistan, Kazakhstan, North America (Fateryga et al., 2018).

Megachile (Eutricharaea) pilidens Alfken, 1924

Material examined: Isfahan, Felavarjan, 1650m, 15.VII.2012, 1♀. Fars, Sepidan, 2250m, 16.IX.2013, 1♂; Chaharmahal-o Bakhtiari, Mal-khalifeh, 2600m, 23.VIII.2013, 1♀; Chaharmahal-o Bakhtiari, Mal-khalifeh, 2600m, 20.VIII.2014, 1♂ and 1♀; Chaharmahal-o Bakhtiari, Mal-khalifeh, 2600m, 28.VIII.2014, 2♂♂ and 2♀♀. Swept, leg.: R. Khodarahmi.

General distribution: Caucasus, Asia, Europe, Siberia, Russian Far East, North Africa, North America (Banaszak & Romasenko, 1998), Iran (Ascher & Pickering, 2020; Khaghaninia et al., 2010).

Megachile (Eutricharaea) deceptor Paraz, 1890

Material examined: Sistan-o Baluchestan, Zahedan, Sornae, 1385m, 1.V.2010, 1♂; Sistan-o Baluchestan, Zahedan, Sornae, 1385m, 6.V.2010, 1♂. Swept, leg.: M. Soraya.

General distribution: Morocco, Portugal, Tunisia, France, Greece, Turkey, Azerbaijan, Russia, Pakistan (Ascher & Pickering, 2020), Russia, Europe, North Africa, Azerbaijan, Turkey, Pakistan, Turkmenistan, Kazakhstan (Fateryga et al., 2018).

Megachile (Eutricharaea) flabellipes Pérez, 1895

Material examined: Fars, Shiraz, 1500m, 15.I.2009, 1♀; Fars, Kazeroun, Bidzard, 721m, 20.V.2010, 1♂; Fars, Kazeroun, Bidzard, 721m, 19.V.2010, 4♂♂; Kohgiluyeh-va Boyer-Ahmad, Yasouj, Tangetamoradi, 1400m, 4.VI.2010, 1♀. Swept, leg.: A. Monfared.

General distribution: Slovakia, Turkey, France, Austria, Greece, Iran (Ascher & Pickering, 2020).

Megachile (Pseudomegachile) rubripes Morawitz, 1875

Material examined: Kerman, Jiroft, 720m, 1.X.2009, 1♀; Fars, Kazeroun, Ghal-e sayyed, 987m, 17.V.2010, 2♀♀; Isfahan, Baharan, 1608, 28.VIII.2012, 1♂; Fars, Firoozabad, 1315m, 8.VII.2012, 1♂; Isfahan, Tiran, Khamiran, 2018m, 7.VII.2012, 1♀; Isfahan, Mobarakeh, Ghanavieh, 1668m, 27.V.2013, 2♂♂ and 1♀; Isfahan, Qahdarijan, 1600m, 11.V.2013, 1♀; Isfahan, Marq, 1556m, 21.VI.2013, 1♂; Chaharmahal-o Bakhtiari, Hosein Abad, 2200m, 24.VIII.2013, 2♀♀. Swept, leg.: A. Monfared.

General distribution: China, Turkey (Grace, 2010; Ascher & Pickering, 2020).

Megachile (Pseudomegachile) tecta Radoszkowski, 1888

Material examined: Chaharmahal-o Bakhtiari, Chelgerd, 2390m, 28.VIII.2014, 1♀. Swept, leg.: A. Monfared.

General distribution: China ([Ascher & Pickering, 2020](#)).

Megachile (Pseudomegachile) maxschwarzi Dorchin & Praz, 2018

Material examined: Isfahan, Felavarjan, 1650m, 31.V.2013, 2♂♂ and 1♀; Kerman, Jiroft, 720m, 1.X.2009, 1♂; Sistan-o Baluchestan, Zabol, 480m, 9.V.2010, 1♂; Sistan-o Baluchestan, Zabol, 480m, 1.V.2010, 1♂; Sistan-o Baluchestan, Zabol, 480m, 16.VI.2010, 1♀. Swept, leg.: S. Salehi.

General distribution: Turkmenistan ([Ascher & Pickering, 2020](#)).

Megachile (Pseudomegachile) schnabli Radoszkowski, 1893

Material examined: Fars, Kazeroun, Bidzard, 721m, 20.V.2010, 2♂♂; Fars, Kazeroun, Bidzard, 721m, 19.V.2010, 2♂♂. Swept, leg.: R. Khodaparast.

General distribution: Iran ([Grace, 2010, Khodaparast & Monfared, 2012](#)).

Megachile (Pseudomegachile) saussurei Radoszkowski, 1874

Material examined: Fars, Sepidan, 2250m, 4.VIII.2010, 1♀. Swept, leg.: S. Kiani.

General distribution: Iran, Turkey ([Popov, 1967; Özbek & van der Zanden, 1994](#)), Spain ([Romasenko & Banaszak, 2002](#)).

Megachile (Pseudomegachile) yezidica Dorchin & Praz, 2018

Material examined: Fars, Firoozabad, 1315m, 8.VII.2011, 1♀♀. Swept, leg.: A. Monfared.

General distribution: Iran, Turkey ([Dorchin & Praz, 2018](#)).

Megachile (Pseudomegachile) farinosa (Smith, 1853)

Material examined: Fars, Kazeroun, Bidzard, 721m, 4.VI.2010, 64♂♂ and 12♀♀; 19.V.2010, 27♂♂ and 11♀♀; 20.V.2010, 21♂♂ and 5♀♀; Fars, Ghirokarzin, Rikan, 750m, 8.VII.2011, 3♂♂ and 2♀♀; Fars, Firoozabad, 1315m, 8.VII.2011, 1♂; Fars, Shiraz, Shahrak Golestan, 1700m, 27.VIII.2011, 1♂. Swept, leg.: A. Monfared.

General distribution: Iran, Turkey, Cyprus, Greece, Egypt, Iraq ([Ascher & Pickering, 2020](#)).

Megachile (Pseudomegachile) foersteri (Geoffroy, 1785)

Material examined: Fars, Shiraz, Shahrak Golestan, 1700m, 28.V.2014, 1♀. Swept, leg.: S. Kiani.

General distribution: Greece, Iran, Palestine, Syria, Turkey ([Ascher & Pickering, 2020](#)).

Megachile (Chalicodoma) pyrenaica Lepeletier, 1841

Material examined: Kohgiluyeh-va Boyer-Ahmad, Yasouj, Kakan, 2326.26m, 25.II.2009, 1♀. Swept, leg.: A. Monfared.

General distribution: Russia: European part (North Caucasus), Western, Southern, and Eastern Europe, North Africa, Armenia, Turkey, Kazakhstan, Tajikistan ([Ascher & Pickering, 2020](#)).

Megachile (Chalicodoma) parietina (Geoffroy, 1785)

Material examined: Fars, Sepidan, 2250m, 17.VI.2013, 1♀. Sweep net, leg.: S. Kiani.

General distribution: Russia, Europe, Africa, Georgia, Azerbaijan, Turkey, Syria, Jordan, Tajikistan, Uzbekistan, Kyrgyzstan, Kazakhstan (Fateryga et al., 2018).

Megachile (Chalicodoma) albonotata Radoszkowski, 1886

Material examined: Kohgiluyeh-va Boyer-Ahmad, Yasouj, Sarabid, 1200m, 30.IV.2010, 1♂; Chaharmahal-o Bakhtiari, Mal-Khalifeh, 2600m, 20.VIII.2014, 1♂. Swept, leg.: A. Monfared.

General distribution: Portugal, Turkey, Turkmenistan, Greece, Italy, Spain (Ascher & Pickering, 2020).

Megachile (Chalicodoma) montenegrensis (Dours, 1873)

Material examined: Kohgiluyeh-va Boyer-Ahmad, Yasouj, Dashteroom, 1200m, 12.III.2009, 1♀; Fars, Shiraz, 1500m, 28.III.2009, 1♂; Fars, Kazeroun, Davan, 1150m, 22.III.2010, 1♂. Swept, leg.: A. Monfared

General distribution: Algeria, Greece, Iran, Syria, Uzbekistan, Afghanistan (Ascher & Pickering, 2020).

Megachile (Xanthosarus) maritima (Kirby, 1802)

Material examined: Kohgiluyeh-va Boyer-Ahmad, Yasouj, Kakan, 2326.26m, 9.VII.2009, 1♀; Fars, Eqlid, 2266m, 3.VIII.2010, 1♂. Swept, leg.: A. Monfared.

General distribution: Europe, Caucasus, Kazakhstan, Central Asian part of the former USSR (Comba & Comba, 1991), Far East Russia (Banaszak & Romasenko, 1998), Turkey (Özbek, 1979), Iran (Izadi et al., 1999; Khaghaninia et al., 2010).

Megachile (Megachile) octosignata Nylander, 1852

Material examined: Ardebil, Meshkinshahr, 2500m, 6.VIII.2009, 1♀. Swept, leg.: A. Monfared (New record).

General distribution: Russia, Europe, Georgia, Turkey (Fateryga et al., 2018), Portugal, Greece (Ascher & Pickering, 2020).

Megachile (Megachile) centuncularis (Linnaeus, 1758)

Material examined: Fars, Sepidan, 2250m, 4.VIII.2010, 1♀. Swept, leg.: S. Kiani.

General distribution: Iran, North America, Canada, United Kingdom, Greece, Algeria, India, Kazakhstan, Russia, Malaysia (Ascher & Pickering, 2020).

Megachile (Eutricharaea) leucomalla Gerstaecker, 1869

Material examined: Isfahan, Chadegan, Zayanderud, 2070m, 19.VII.2012, 1♂. Swept, leg.: R. Khodarahmi.

General distribution: Russia, Europe, Africa, Georgia, Turkey, Jordan, Kazakhstan (Fateryga et al., 2018).

Megachile (Creightonella) albisecta (Klug, 1817)

Material examined: Sistan-o Baluchestan, Zabol, 480m, 9.VI.2010, 1♂; Kohgiluyeh-va Boyer-Ahmad, Yasouj, Tangetamoradi, 1400m, 4.VI.2010, 1♀; Fars, Firoozabad, 1315m, 8.VII.2011, 4♂♂ and 2♀♀; Isfahan, Zarin Shahr, 1696m, 3.VI.2012, 1♂; Isfahan, Chadegan, Zayanderud, 2070m, 19.VII.2012, 1♀; Chaharmahal-o Bakhtiari, Hosein Abad, 2200m, 24.VIII.2013, 1♂; Fars, Shiraz, Shahrak Golestan 1700m, 21.V.2014, 2♂♂ and 1♀. Swept, leg.: A. Monfared.

General distribution: Russia, Europe, North Africa, Azerbaijan, Turkey, Cyprus, Syria, Iran, Turkmenistan, Uzbekistan, Kyrgyzstan (Fateryga et al., 2018).

Megachile (Creightonella) doriae Magretti, 1890

Material examined: Fars, Kazeroun, Ghaleseied, 987m, 17.V.2010, 1♀; Fars, Firoozabad, 1315m, 8.VII.2011, 1♂. Swept, leg.: A. Monfared.

General distribution: Greece, Egypt, Lebanon, Turkey, Iran (Ascher & Pickering, 2020), Turkey, Ankara. Syria, Lebanon (Grace, 2010).

Megachile (Xanthosarus) lagopoda (Linnaeus, 1761)

Material examined: Ardebil, Meshkinshahr, 2500m, 6.VIII.2009, 2♂♂. Swept, leg.: A. Monfared.

General distribution: Europe, Caucasus, Siberia, Central Asian part of the former USSR, Far East Russia, Japan, North Africa (Comba & Comba, 1991; Banaszak & Romasenko, 1998), Turkey (Özbek, 1979; Khaghaninia et al., 2010).

Coelioxys (Allocoelioxys) afra Lepeletier, 1841

Material examined: Isfahan, Dorcheh Piaz, 1608m, 4.VII.2012, 1♂; Fars, Shiraz, Ghasre Ghomsheh, 1750m, 21.VII.2013, 1♀. Swept, leg.: R. Khodarahmi.

General distribution: Turkmenistan, Kyrgyzstan, Uzbekistan, Egypt, Tunisia, Morocco, Algeria, Russia (Warncke, 1992b), South, Eastern and Central Europe, Great Britain, Asia Minor (Banaszak & Romasenko, 1998), from Western Europe to China and Indonesia (Java) (Proshchalykn & Lelej, 2004), and including all of Africa (Pasteels, 1977; Khaghaninia et al., 2010).

Megachile (Eutricharaea) dorsalis Perez, 1879

Material examined: Fars, Noorabad, Javid, 1400m, 1.VII.2009, 1♀; Kerman, Jiroft, 720m, 1.X.2009, 1♀; Fars, Fasa, 1336m, 7.V. 2010, 1♀; Sistan-o Baluchestan, Zabol, 480m, 6.V.2010, 1♂; Sistan-o Baluchestan, Zabol, 480m, 5.VI.2010, 1♀; Sistan-o Baluchestan, Zabol, 480m, 1.V.2010, 1♀. Fars, Fasa, 1336m, 10.VII.2011, 1♂ and 1♀; Fars, Shiraz, Besat, 1556m, 23.VII.2011, 1♂; Fars, Shiraz, Jannat, 1573m, 25.VIII.2011, 1♀; Fars, Firoozabad, Jaidasht, 1315m, 8.VII.2011, 1♀; Fars, Shiraz, Eram, 1569m, 2.VI. 2012, 1♀; Fars, Shiraz, Eram, 1569m, 10.V.2012, 1♀. Sistan-o Baluchestan, Zabol . Swept, leg.: A. Monfared.

General distribution: United Kingdom, Halland, Austria, Armenia (Ascher & Pickering, 2020).

Megachile (Eutricharaea) picicornis Morawitz, 1888

Material examined: Fars, Noorabad, Gazargah, 920m, 1.V.2009, 1♂; Fars, Noorabad, Gazargah, 920 m, 2.V.2009, 1♂ and 2♀♀; Fars, Noorabad, 920 m, 3.VIII.2009, 2♂♂ and 2♀♀; Fars, Kazeroun, Bidzard, 721m, 20.V.2010, 8♀♀; Fars, Kazeroun, Bidzard, 721 m, 19.V.2010,

13♀♀; Fars, Kazeroun, Bidzard, 721 m, 17.V.2010, 2♂♂; Fars, Kazeroun, Bidzard, 721 m, 4.VII.2010, 11♂♂; Fars, Neyeiz, 1587m, 10.VII.2011, 1♀; Fars, Estahban, 1730m, 10.VII.2011, 1♂; Fars, Firoozabad, 1315 m, 8.VII.2011, 1♀; Fars, Fasa, 1336, 10.VII.2011, 3♂♂ and 1♀; Fars, Shiraz, Afif Abad, 1573m, 13.VII.2012, 1♀; Isfahan, Mobarake, 1645m, 28.VIII.2012, 1♀; Isfahan, Chadegan, Zayandehrud, 2070m, 8.VII.2012, 1♂; Fars, Kazeroun, Bidzard, 721m, 4.VI.2012, 1♀; Fars, Kazeroun, Bidzard, 721m, 8.VII.2012, 2♂♂; Chaharmahal-o Bakhtiari, Hosein Abad, 2200m, 22.VII.2013, 1♂. Swept, leg.: A. Monfared.

General distribution: Libya (Ascher & Pickering, 2020).

Megachile (Pseudomegachile) ericetorum Lepeletier, 1841

Material examined: Fars, Shiraz, 1750m, 21.V.2014, 1♀, 1♂; Chaharmahal-o Bakhtiari, Shahrekord, Asad Abad, 2227m, 5.X.2016, 1♀. Swept, leg.: S. Kiani.

General distribution: Europe to Central Asia (Ascher & Pickering, 2020).

Megachile (Creightonella) n. sp., undescribed

Material examined: Fars, Kazeroun, Bidzard, 721m, 4.VI.2010, 1♂. Swept, leg: R. Khodaparast.

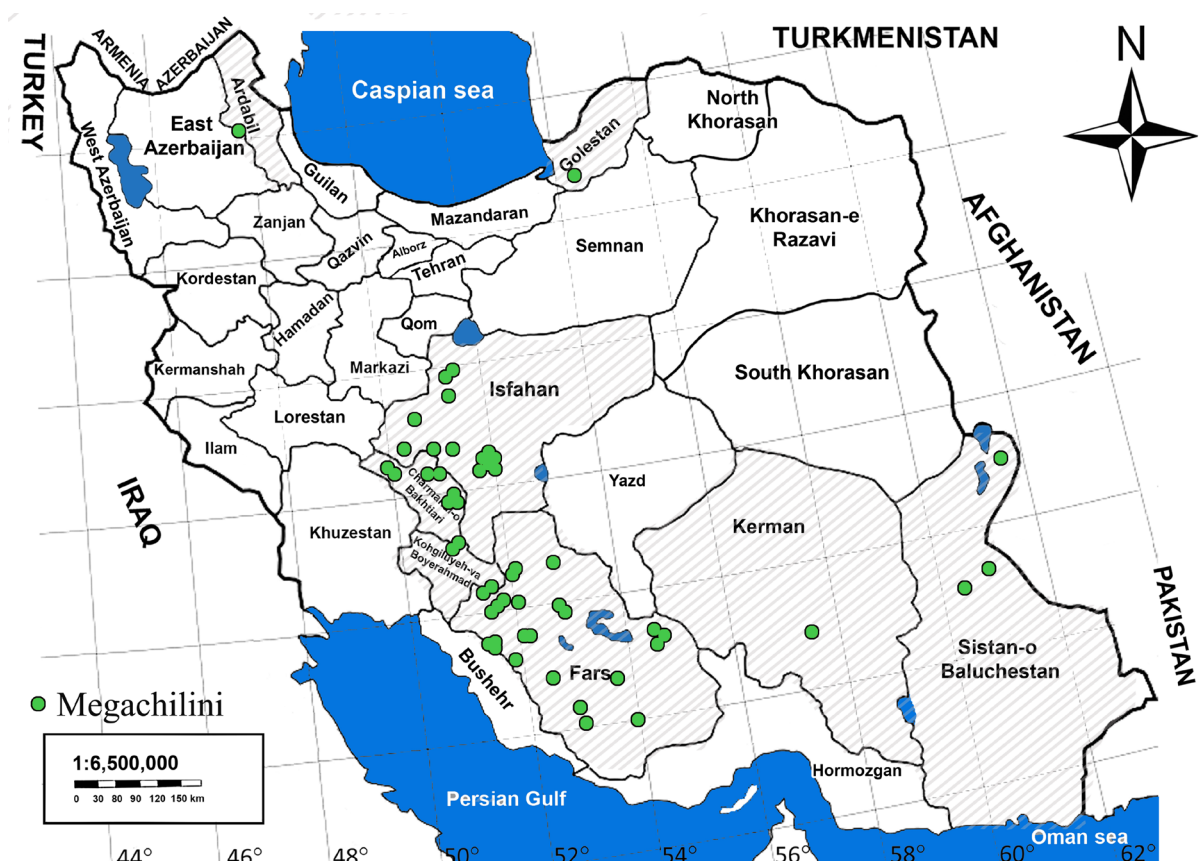


Figure 4. Distribution map of Megachilini species in Iran based on the collected specimens in the present study.

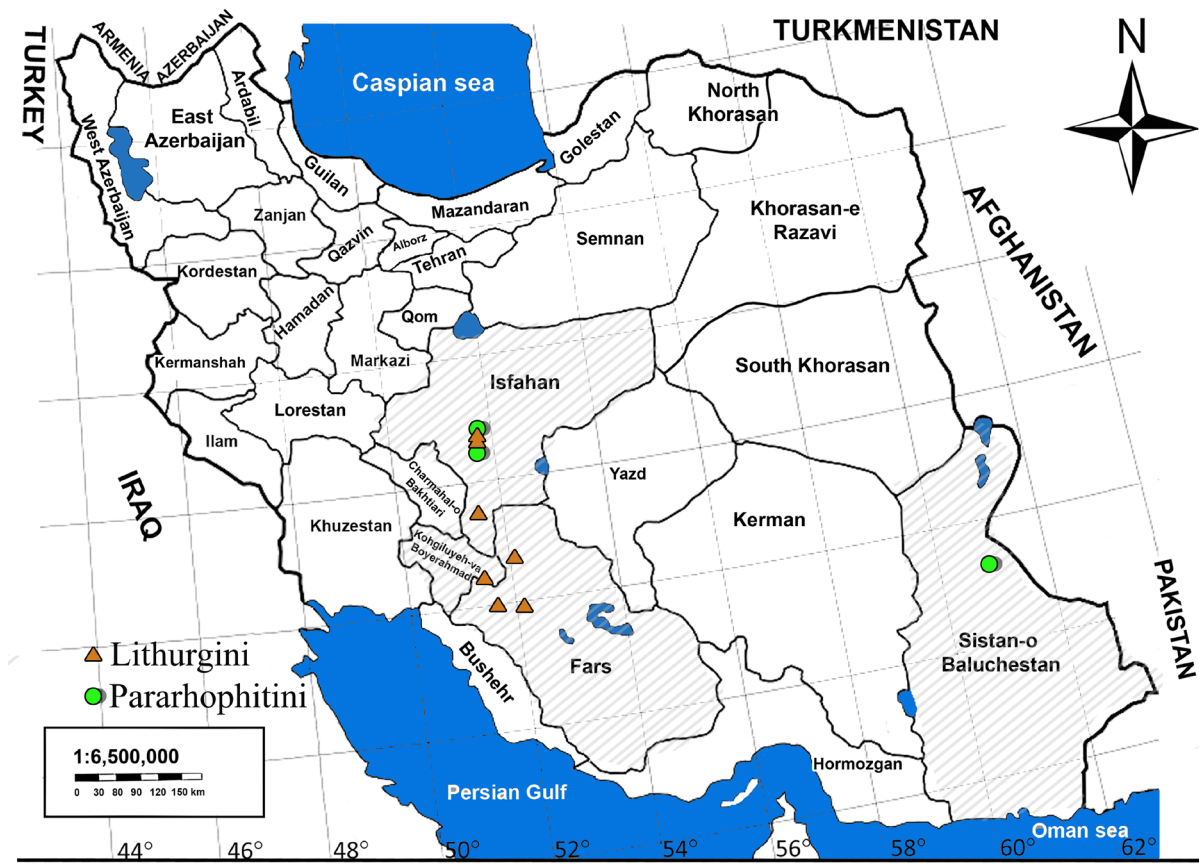


Figure 5. Distribution map of Lithurgini & Pararhophitini species in Iran based on the collected specimens in the present study.

Discussion

In total, 88 species of Megachilidae identified among 3678 specimens collected from various regions of provinces of country. We found 243 species recorded for Iran fauna previously in the literature (Table 2). Species of the family Megachilidae mostly live in a range of various climates for example, the tribe Osmini, as one of the most important groups, is distributed in the regions with lower temperature, such as Ardabil province in the northwest as well as in hot and dry areas such as Kerman and Khuzestan provinces in the south. As it is shown in the distribution maps of the Megachilidae of Iran (Figs 1, 2, 3, 4, 5), many regions in different provinces of Iran are still not sampled or the collected specimens are not identified yet. In this study, we tried to compile a list of bees of the Iranian megacillid family that were reported in various sources (Table 2) as much as possible. There are many suspicious species records, which are results of incorrect or incomplete identification, For example The distribution of *Eoanthidium judaeense* reported by Khodaparast & Monfared (2012) and Falamarzi et al. (2017) in Iran, has been questioned by Kasperek (2020a). It is necessary to confirm the identity of many recorded species, wherever they are deposited. On the other hand, because many parts of Iran have not been explored, the current list can be essentially updated in near future.

Table 2. A list of the family Megachilidae of Iran (based on our available literature).

Tribe	Species name	References
Anthidiini	<i>Afranthidium alaemon</i> (Warncke, 1981)	(Warncke, 1981; Grace, 2010)
	<i>Afranthidium carduele</i> Morawitz, 1876	(Warncke, 1981; Grace, 2010; Dehghan-Dehnavi, 2015; Kiani-Bakiani et al., 2016; Falamarzi et al., 2017)
	<i>Afranthidium pusillum</i> (Morawitz, 1895)	(Warncke, 1980, 1981; Grace, 2010)
	<i>Anthidiellum brevisculum</i> (Mavromoustakis, 1949)	(Warncke, 1981)
	<i>Anthidiellum crenulatum</i> (Warncke, 1982)	(Warncke, 1981; Grace, 2010)
	<i>Anthidiellum strigatum</i> (Panzer, 1805)	(Popov, 1935; Warncke, 1981; Grace, 2010; Nadimi et al., 2014; Dehghan-Dehnavi, 2015; Keshtkar et al., 2015; Kiani-Bakiani et al., 2016; Falamarzi et al., 2017; Khodarahmi Ghahnavieh & Monfared, 2019)
	<i>Anthidium akanthurum</i> Nadimi & Talebi, 2014	(Nadimi et al., 2014)
	<i>Anthidium amabile</i> Alfken, 1932	(Warncke, 1981; Grace, 2010)
	<i>Anthidium anguliventre</i> Morawitz, 1888	(Warncke, 1981; Grace, 2010; Khodaparast & Monfared, 2012; Nadimi et al., 2014; Dehghan-Dehnavi, 2015; Kiani-Bakiani et al., 2016; Falamarzi et al., 2017; Khodarahmi Ghahnavieh & Monfared, 2019)
	<i>Anthidium bischoffi</i> Mavromoustakis, 1954	(Popov, 1967; Warncke, 1980, 1981; Grace, 2010; Khodaparast & Monfared, 2012)
	<i>Anthidium brevithorace</i> (Warncke, 1981)	(Warncke, 1981; Grace, 2010)
	<i>Anthidium caspicum</i> Morawitz, 1880	(Mavromoustakis, 1968; Warncke, 1980, 1981; Grace, 2010)
	<i>Anthidium christianseni</i> Mavromoustakis, 1956	(Mavromoustakis, 1968; Warncke, 1981; Grace, 2010; Nadimi et al., 2014)
	<i>Anthidium cingulatum</i> Latreille, 1809	(Alfken, 1935; Popov, 1967; Esmaili & Rastegar, 1974; Warncke, 1981; Grace, 2010; Khaghaninia et al., 2010)
	<i>Anthidium dalmaticum</i> Mocsáry, 1884	(Esmaili & Rastegar, 1974)
	<i>Anthidium diadema</i> Latreille, 1809	(Warncke, 1981; Grace, 2010; Rasekh-Adel et al., 2012; Falamarzi et al., 2017)
<i>Anthidium florentinum</i> (Fabricius, 1775)	(Morice, 1921; Alfken, 1935; Alfken & Blüthgen, 1937; Popov, 1967; Esmaili & Rastegar, 1974; Warncke, 1981; Talebi et al., 1995; Karimpour et al., 2002; Izadi et al., 1999; Izadi et al., 2004; Khaghaninia et al., 2010; Tavakoli et al., 2010; Grace, 2010; Keshtkar et al., 2015; Khodaparast & Monfared, 2012; Monfared et al., 2012; Nadimi et al., 2014; Dehghan-Dehnavi, 2015; Keshtkar et al., 2015; Khodarahmi Ghahnavieh & Monfared, 2019)	
<i>Anthidium gussakovskiji</i> Mavromoustakis, 1939	(Warncke, 1981; Grace, 2010; Monfared et al., 2012; Nadimi et al., 2014; Dehghan-Dehnavi, 2015; Falamarzi et al., 2017; Khodarahmi Ghahnavieh & Monfared, 2019)	
<i>Anthidium loti</i> Perris, 1852	(Esmaili & Rastegar, 1974; Warncke, 1981; Grace, 2010; Nadimi et al., 2014)	
<i>Anthidium manicatum</i> Linnaeus, 1758	(Warncke, 1981; Grace, 2010; Nadimi et al., 2014)	

Table 2. Countinued.

Tribe	Species name	References
Anthidiini	<i>Anthidium oblongatum</i> (Illiger, 1806)	(Esmaili & Rastegar, 1974; Warncke, 1981; Grace, 2010; Khodarahmi Ghahnavieh & Monfared, 2019)
	<i>Anthidium philorum</i> Friese, 1899	(Nadimi et al., 2014)
	<i>Anthidium punctatum</i> Latreille, 1809	(Warncke, 1981; Grace, 2010; Nadimi et al., 2014)
	<i>Anthidium</i> cf. <i>rotundum</i> Warncke, 1980	(Warncke, 1981; Grace, 2010; Nadimi et al., 2014; Dehghan-Dehnavi et al., 2015)
	<i>Anthidium</i> aff. <i>septemspinusum</i> Lepeletier, 1841	(Monfared et al., 2012)
	<i>Anthidium soikai</i> Mavromoustakis, 1968	(Mavromoustakis, 1968; Warncke, 1980, 1981; Grace, 2010; Dehghan-Dehnavi et al., 2015)
	<i>Anthidium</i> cf. <i>spinoventre</i> Friese, 1899	(Warncke, 1981; Grace, 2010; Nadimi et al., 2014)
	<i>Anthidium sublustre</i> Warncke, 1981	(Warncke, 1981; Grace, 2010)
	<i>Anthidium syriacum</i> Pérez, 1911	(Warncke, 1981; Grace, 2010)
	<i>Anthidium taeniatum</i> Latreille, 1809	(Esmaili & Rastegar, 1974; Warncke, 1981; Grace, 2010; Monfared et al., 2012; Dehghan-Dehnavi, 2015; Kiani-Bakiani et al., 2016; Khodarahmi Ghahnavieh & Monfared, 2019)
	<i>Anthidium taschenbergii</i> Morawitz, 1894	(Warncke, 1980, 1981; Grace, 2010)
	<i>Anthidium tessellatum</i> Spinosa, 1838	(Warncke, 1981)
	<i>Anthidium trispinosum</i> Friese, 1925	(Monfared et al., 2012)
	<i>Anthidium undulatum</i> Dours, 1873	(Warncke, 1981; Nadimi et al., 2014; Khodaparast & Monfared, 2012; Falamarzi et al., 2017; Khodarahmi Ghahnavieh & Monfared, 2019)
	<i>Anthidium wuestneii</i> Mocsáry, 1887	(Warncke, 1981; Grace, 2010; Dehghan-Dehnavi, 2015; Khodarahmi Ghahnavieh & Monfared, 2019)
	<i>Eoanthidium insulare</i> (Morawitz, 1874)	(Mavromoustakis, 1937; Warncke, 1980, 1981; Grace, 2010; Nadimi et al., 2014)
	<i>Eoanthidium</i> aff. <i>judaense</i> Mavromoustakis, 1945)	(Khodaparast & Monfared, 2012; Falamarzi et al., 2017)
	<i>Eoanthidium nasicum</i> (Friese, 1917)	(Warncke, 1981; Grace, 2010; Nadimi et al., 2014; Falamarzi et al., 2017)
	<i>Icteranthidium abbasi</i> (Warncke, 1981)	(Warncke, 1981; Grace, 2010)
	<i>Icteranthidium angulosum</i> (Warncke, 1981)	(Warncke, 1981; Grace, 2010)
	<i>Icteranthidium capitum</i> (Warncke, 1981)	(Warncke, 1981; Grace, 2010)
	<i>Icteranthidium cimbiciforme</i> (Smith, 1854)	(Friese, 1898; Alfken & Blüthgen, 1937; Mavromoustakis, 1968; Popov, 1967; Esmaili & Rastegar, 1974; Warncke, 1980, 1981; Grace, 2010; Khodarahmi Ghahnavieh & Monfared, 2019)
	<i>Icteranthidium decoloratum</i> Alfken, 1932	(Popov, 1967; Warncke, 1980, 1981; Grace, 2010)
<i>Icteranthidium fedtschenkoi</i> (Morawitz, 1875)	(Warncke, 1981; Grace, 2010; Nadimi et al., 2014)	
<i>Icteranthidium ferrugineum discoidale</i> (Latreille, 1809)	(Grace, 2010; Dehghan-Dehnavi et al., 2015; Falamarzi et al., 2017; Khodarahmi Ghahnavieh & Monfared, 2019)	
<i>Icteranthidium grohmanni</i> (Spinola, 1838)	(Esmaili & Rastegar, 1974; Grace, 2010; Nadimi et al., 2014)	
<i>Icteranthidium laterale</i> (Latreille, 1809)	(Warncke, 1981; Grace, 2010; Nadimi et al., 2014; Khodarahmi Ghahnavieh & Monfared, 2019)	

Table 2. Countinued.

Tribe	Species name	References
Anthidiini	<i>Icteranthidium limbiferum</i> (Morawitz, 1875)	(Popov, 1967; Esmaili & Rastegar, 1974; Warncke, 1981; Grace, 2010; Nadimi et al., 2014; Dehghan-dehnavi et al., 2015; Khodarahmi Ghahnavieh & Monfared, 2019)
	<i>Icteranthidium obsoletum</i> (Warncke, 1981)	(Warncke, 1981; Grace, 2010)
	<i>Icteranthidium ovasi</i> (Warncke, 1980)	(Dehghan Dehnavi et al., 2015)
	<i>Icteranthidium ruficorne</i> (Morawitz, 1875)	(Nadimi et al., 2014)
	<i>Icteranthidium subangulosum</i> (Warncke, 1981)	(Warncke, 1981; Grace, 2010)
	<i>Icteranthidium urfanum</i> (Warncke, 1980)	(Warncke, 1980, 1981; Grace, 2010)
	<i>Icteranthidium venustum</i> Morawitz, 1877	(Nadimi et al., 2014)
	<i>Plesianthidium trachusiforme</i> (Friese, 1913)	(Monfared et al., 2012)
	<i>Pseudoanthidium arenosum</i> (Warncke, 1981)	(Warncke, 1981; Grace, 2010)
	<i>Pseudoanthidium</i> cf. <i>stigmaticorne</i> (Dours, 1873)	(Khodarahmi, 2014)
	<i>Pseudoanthidium</i> cf. <i>tenellum</i> (Mocsary, 1881)	(Khodarahmi, 2014)
	<i>Pseudoanthidium cribratum</i> (Morawitz, 1875)	(Warncke, 1981; Grace, 2010)
	<i>Pseudoanthidium eximium</i> (Giraud, 1863)	(Warncke, 1981; Grace, 2010)
	<i>Pseudoanthidium melanurum</i> (Klug, 1832)	(Nadimi et al., 2014)
	<i>Pseudoanthidium nanum</i> (Mocsary, 1881)	(introduced Fateryga et al., 2018; Ascher & Pickering, 2020)
	<i>Pseudoanthidium puncticolle</i> (Morawitz, 1888)	(Warncke, 1981; Grace, 2010)
	<i>Pseudoanthidium reticulatum</i> (Mocsáry, 1884)	(Warncke, 1981; Grace, 2010)
	<i>Pseudoanthidium scapulare</i> (Latreille, 1809)	(Khodaparast & Monfared, 2012; Nadimi et al., 2014; Falamarzi et al., 2017; Kiani-Bakiani et al., 2016; Khodarahmi Ghahnavieh & Monfared, 2019)
	<i>Rhodanthidium aculeatum</i> (Klug, 1832)	(Warncke, 1981; Grace, 2010)
	<i>Rhodanthidium caturigense</i> (Giraud, 1863)	(Nadimi et al., 2014)
	<i>Rhodanthidium exsectum</i> (Pasteels, 1969)	(Warncke, 1981; Grace, 2010)
	<i>Rhodanthidium septemdentatum</i> (Lepeletier, 1841)	(Khaghaninia et al., 2010)
	<i>Rhodanthidium superbum</i> Morawitz, 1884	(Esmaili & Rastegar, 1974)
	<i>Stelis fossulata</i> Mocsáry, 1883	(Ungnricht et al., 2008; Grace, 2010)
	<i>Stelis gigantea</i> Friese, 1921	(Warncke, 1985; Grace, 2010)
	<i>Stelis nasuta</i> (Latreille, 1809)	(Warncke, 1985)
	<i>Stelis orientalis</i> Warncke, 1992	(Warncke, 1992c; Grace, 2010)
	<i>Stelis ornatula</i> (Klug, 1807)	(Warncke, 1985)
	<i>Stelis pentelica</i> Mavromoustakis, 1963	(Warncke, 1985)
	<i>Stelis phaeoptera</i> (Kirby, 1802)	(Warncke, 1985)
<i>Stelis scutellaris</i> Morawitz, 1894	(Warncke, 1985; Grace, 2010)	
<i>Stelis signata</i> (Latreille, 1809)	(Warncke, 1985; Nadimi et al., 2014; Dehghan-Dehnavi et al., 2015)	

Table 2. Countinued.

Tribe	Species name	References
Anthidiini	<i>Stelis simillima</i> Morawitz, 1876	(Warncke, 1985; Grace, 2010)
	<i>Trachusa heinzi</i> Dubitzky, 2007	(Fateryga et al., 2020; Ascher & Pickering, 2020)
	<i>Trachusa pubescens</i> (Morawitz, 1872)	(Esmaili & Rastegar, 1974; Warncke, 1980; Grace, 2010; Monfared et al., 2012)
Dioxyini	<i>Metadioxys formosa</i> (Morawitz, 1875)	(Grace, 2010; Khodaparast & Monfared, 2012; Dehghan-Dehnavi et al., 2015)
Lithurgini	<i>Lithurgus chrysurus</i> Fonscolombe, 1834	(Khaghaninia et al., 2010; Grace, 2010; Khodaparast & Monfared, 2012; Dehghan-Dehnavi et al., 2015; Kiani-Bakiani et al., 2016; Falamarzi et al., 2017; Khodarahmi Ghahnavieh & Monfared, 2019)
	<i>Lithurgus cornutus</i> (Fabricius, 1787)	(Tavakkoli et al., 2010; Khaghaninia et al., 2010; Grace, 2010; Khodarahmi Ghahnavieh & Monfared, 2019)
	<i>Lithurgus tibialis</i> Morawitz, 1875	(Grace, 2010; Kiani-Bakiani et al., 2016)
Megachilini	<i>Coelioxys acanthura</i> (Illiger, 1806)	(Nadimi et al., 2013b)
	<i>Coelioxys</i> cf. <i>acanthopyga</i> Alfken, 1940	(Falamarzi et al., 2017)
	<i>Coelioxys afra</i> Lepeletier, 1841	(Khaghaninia et al., 2010; Nadimi et al., 2013b; Dehghan-Dehnavi et al., 2015; Falamarzi et al., 2017; Khodarahmi Ghahnavieh & Monfared, 2019)
	<i>Coelioxys argentea</i> Lepeletier, 1841	(Dehghan-Dehnavi et al., 2015; Falamarzi et al., 2017)
	<i>Coelioxys artemis</i> Schwarz, 2001	(Schwarz, 2001)
	<i>Coelioxys aurolimbata</i> Förster, 1853	(Warncke, 1992b; Grace, 2010)
	<i>Coelioxys brevis</i> Eversmann, 1852	(Morice, 1921; Dehghan-Dehnavi et al., 2015; Nadimi et al., 2013b)
	<i>Coelioxys caudata</i> Spinola, 1838	(Kiani-Bakiani et al., 2016; Falamarzi et al., 2017)
	<i>Coelioxys conoidea</i> (Illiger, 1806)	(Morice, 1921; Alfken, 1935; Dehghan-Dehnavi et al., 2015; Nadimi et al., 2013b)
	<i>Coelioxys decipiens</i> Spinola, 1838	(Nadimi et al., 2013b; Dehghan-Dehnavi et al., 2015; Falamarzi et al., 2017)
	<i>Coelioxys echinata</i> Förster, 1853	(Grace, 2010)
	<i>Coelioxys echinatus</i> Förster, 1853	(introduced Fateryga et al., 2018; Ascher & Pickering, 2020)
	<i>Coelioxys elongata</i> Lepeletier, 1841	(Morice, 1921; Grace, 2010; Nadimi et al., 2013b)
	<i>Coelioxys emarginata</i> Förster, 1853	(Nadimi et al., 2013b)
	<i>Coelioxys haemorrhoea</i> Förster, 1853	(Nadimi et al., 2013b)
	<i>Coelioxys inermis</i> (Kirby, 1802)	(Nadimi et al., 2013b)
	<i>Coelioxys iranica</i> Warncke, 1992	(Warncke, 1992b; Grace, 2010; Falamarzi et al., 2017)
	<i>Coelioxys obtusa</i> Pérez, 1884	(Grace, 2010)
	<i>Coelioxys polycentris</i> Förster, 1853	(Grace, 2010)
	<i>Coelioxys quadridentata</i> (Linnaeus, 1758)	(Nadimi et al., 2013b)
<i>Coelioxys rufescens</i> Lepeletier & Audinet-Serville, 1825	(Alfken, 1935; Grace, 2010)	
<i>Coelioxys semenowi</i> Morawitz, 1894	(Nadimi et al., 2013b)	

Table 2. Countinued.

Tribe	Species name	References
Megachilini	<i>Coelioxys warncke</i> Schwarz & Gusenleitner, 2003	(Schwarz & Gusenleitner, 2003; Grace, 2010)
	<i>Megachile centuncularis</i> (Linnaeus, 1758)	(Grace, 2010; Khodaparast & Monfared, 2012; Khodarahmi Ghahnavieh & Monfared, 2019)
	<i>Megachile albisecta</i> (Klug, 1817)	(Khodaparast & Monfared, 2012; Sorayamohtat et al., 2012; Dehghan-Dehnavi et al., 2015; Falamarzi et al., 2017; Khodarahmi Ghahnavieh & Monfared, 2019)
	<i>Megachile albonotata</i> Radoszkowski, 1886	(Khodarahmi Ghahnavieh & Monfared, 2019)
	<i>Megachile anatolica</i> Rebmman, 1968	(Sorayamohtat et al., 2012; Khodaparast & Monfared, 2012; Keshtkar et al., 2015; Falamarzi et al., 2017; Dehghan-Dehnavi et al., 2015)
	<i>Megachile apicalis</i> Spinola, 1808	(Khodaparast & Monfared, 2012; Keshtkar et al., 2015; Dehghan-Dehnavi et al., 2015; Falamarzi et al., 2017)
	<i>Megachile asiatica</i> Morawitz, 1875	(Khodarahmi Ghahnavieh & Monfared, 2019)
	<i>Megachile auripubens</i> Rebmman, 1970	(Grace, 2010)
	<i>Megachile basilaris</i> (Mavromoustakis, 1952)	(Dehghan-Dehnavi et al., 2015)
	<i>Megachile burdigalensis</i> Benoist, 1940	(Khodarahmi Ghahnavieh & Monfared, 2019)
	<i>Megachile cinnamomea</i> (Alfken, 1926)	(Dehghan-Dehnavi et al., 2015)
	<i>Megachile circumcincta</i> (Kirby, 1802)	(introduced Fateryga et al., 2018; Ascher & Pickering, 2020)
	<i>Megachile concinna</i> Smith, 1879	(Talebi et al., 1995; Esmaili & Rastegar, 1974; Izadi et al., 1999)
	<i>Megachile deceptor</i> Paraz, 1890	(Dehghan-Dehnavi et al., 2015; Falamarzi et al., 2017)
	<i>Megachile dolosa</i> Alfken, 1936	(Falamarzi et al., 2017)
	<i>Megachile doriae</i> Magretti, 1890	(Khodaparast & Monfared, 2012)
	<i>Megachile dorsalis</i> Pérez, 1879	(Khodaparast & Monfared, 2012)
	<i>Megachile ericetorum</i> Lepeletier, 1841	(Nazari et al., 2019; Ascher & Pickering, 2020)
	<i>Megachile farinosa</i> Smith, 1853	(Khodaparast & Monfared, 2012; Dehghan-Dehnavi et al., 2015; Keshtkar et al., 2015; Falamarzi et al., 2017)
	<i>Megachile cf. fertoni</i> Pérez, 1896	(Khodaparast & Monfared, 2012; Dehghan-Dehnavi et al., 2015; Keshtkar et al., 2015; Falamarzi et al., 2017)
<i>Megachile flabellipes</i> Pérez, 1895	(Khodaparast & Monfared, 2012; Dehghan-Dehnavi et al., 2015)	
<i>Megachile flavipes</i> Spinola, 1838	(Esmaili & Rastegar, 1974; Dehghan-Dehnavi et al., 2015)	
<i>Megachile foersteri</i> (Geoffroy, 1785)	(Grace, 2010; Dehghan-Dehnavi et al., 2015)	
<i>Megachile insignis</i> van der Zanden, 1996	(Falamarzi et al., 2017)	
<i>Megachile iranica</i> Rebmman, 1970	(Grace, 2010)	
<i>Megachile lagopoda</i> (Linnaeus, 1761)	(Khaghaninia et al., 2010)	
<i>Megachile leachella</i> Curtis, 1828	(Khaghaninia et al., 2010; Dehghan-Dehnavi et al., 2015; Falamarzi et al., 2017; Khodarahmi Ghahnavieh & Monfared, 2019)	
<i>Megachile lefeborei</i> (Lepeletier, 1841)	(introduced Fateryga et al., 2018; Ascher & Pickering, 2020)	

Table 2. Countinued.

Tribe	Species name	References
Megachilini	<i>Megachile leucomalla</i> Gerstaecker, 1869	(Khaghaninia et al., 2010; Falamarzi et al., 2017; Khodarahmi Ghahnavieh & Monfared, 2019)
	<i>Megachile marginata</i> Smith, 1853	(introduced Fateryga et al., 2018; Ascher & Pickering, 2020)
	<i>Megachile maritima</i> (Kirby, 1802)	(Khaghaninia et al., 2010; Khodaparast & Monfared, 2012; Dehghan-Dehnavi et al., 2015)
	<i>Megachile maxschwarzi</i> Dorchin & Praz, 2018	(Sorayamohtat et al., 2012)
	<i>Megachile minutissima</i> Radoszkowski, 1876	(Khodaparast & Monfared, 2012; Dehghan-Dehnavi et al., 2015; Keshtkar et al., 2015; Falamarzi et al., 2017)
	<i>Megachile montenegrensis</i> Dours, 1873	(Khodaparast & Monfared, 2012)
	<i>Megachile nigriventris</i> Schenck, 1870	(Khaghaninia et al., 2010)
	<i>Megachile nitidicollis</i> Morawitz, 1875	(Sorayamohtat et al., 2012)
	<i>Megachile octosignata</i> Nylander, 1852	New record
	<i>Megachile orientalis</i> Morawitz, 1895	(Falamarzi et al., 2017)
	<i>Megachile parietina</i> (Geoffroy, 1785)	(Patiny et al., 2009)
	<i>Megachile picicornis</i> Morawitz, 1853	(Khodaparast & Monfared, 2012; Keshtkar et al., 2015; Falamarzi et al., 2017; Khodarahmi Ghahnavieh & Monfared, 2019)
	<i>Megachile pilicrus</i> Morawitz, 1878	(Grace, 2010; Dehghan-Dehnavi et al., 2015)
	<i>Megachile pilidens</i> Alfken, 1924	(Khaghaninia et al., 2010; Ascher & Pickering, 2020)
	<i>Megachile pyrenaica</i> (Lepeletier, 1841)	(Tavakoli et al., 2010)
	<i>Megachile rotundata</i> (Fabricius, 1787)	(Khaghaninia et al., 2010; Dehghan-Dehnavi et al., 2015; Khodarahmi Ghahnavieh & Monfared, 2019)
	<i>Megachile rubripes</i> (Morawitz, 1875)	(Khodaparast & Monfared, 2012; Dehghan-Dehnavi et al., 2015; Falamarzi et al., 2017)
	<i>Megachile sanguinipes</i> (Morawitz, 1875)	(Dehghan-Dehnavi et al., 2015; Khodarahmi Ghahnavieh & Monfared, 2019)
	<i>Megachile saussurei</i> Radoszkowski, 1874	(Sorayamohtat et al., 2012; Dehghan-Dehnavi et al., 2015; Falamarzi et al., 2017)
	<i>Megachile schnabli</i> Radoszkowski, 1893	(Khodaparast & Monfared, 2012; Dehghan-Dehnavi et al., 2015)
	<i>Megachile semicircularis</i> (Van der Zanden, 1996)	(Dehghan-Dehnavi et al., 2015; Falamarzi et al., 2017)
	<i>Megachile seraxensis</i> Radoszkowski, 1893	(Dehghan-Dehnavi et al., 2015)
	<i>Megachile sericans</i> Fonscolombe, 1832	(Esmaili & Rastegar, 1974)
<i>Megachile</i> sp. (Undescribed species)	Collected by Khodaparast & Monfared, 2012, Monfared (2 specimens collected by Monfared, 2018; Unpublished)	
<i>Megachile tecta</i> Radoszkowski, 1888	(Dehghan-Dehnavi et al., 2015)	
<i>Megachile versicolor</i> Smith, 1844	(Khaghaninia et al., 2010)	
<i>Megachile walkeri</i> Dalla Torre, 1896	(Falamarzi et al., 2017)	
<i>Megachile yezidica</i> Dorchin & Praz, 2018	(Dorchin & Praz, 2018; Ascher & Pickering, 2020)	
<i>Radoszkowskiana barrei</i> (Radoszkowski, 1893)	(Schwarz, 2001; Grace, 2010; Dehghan-Dehnavi et al., 2015)	
<i>Radoszkowskiana rufiventris</i> (Spinola, 1838)	(Grace, 2010)	

Table 2. Countinued.

Tribe	Species name	References
Osmiini	<i>Chelostoma diodon</i> Schletterer, 1889	(Nadimi et al., 2013a)
	<i>Chelostoma distinctum</i> (Stoeckert, 1929)	(Fateryga et al., 2018; Ascher & Pickering, 2020)
	<i>Chelostoma emarginatum</i> (Nylander, 1856)	(Nadimi et al., 2013a)
	<i>Chelostoma proximum</i> Schletterer, 1889	(Nadimi et al., 2013a)
	<i>Chelostoma rapunculi</i> (Lepeletier, 1841)	(Nadimi et al., 2013a)
	<i>Haetosmia vechti</i> (Peters, 1974)	(Nadimi et al., 2013a)
	<i>Heriades clavicornis</i> Morawitz, 1875	(Nadimi et al., 2013a; Kiani-Bakiani et al., 2016)
	<i>Heriades crenulatus</i> Nylander, 1856	(Khaghaninia et al., 2013)
	<i>Heriades hissaricus</i> Popov, 1955	(Khodaparast & Monfared, 2012; Dehghan-Dehnavi et al., 2015)
	<i>Heriades truncorum</i> (Linnaeus, 1758)	(Nadimi et al., 2013a; Khodarahmi Ghahnavieh & Monfared, 2019)
	<i>Hoplitis acutellaris</i> (Morawitz, 1868)	(Tavakkoli et al., 2010)
	<i>Hoplitis acuticornis</i> (Dufour & Perris, 1840)	(Monfared et al., 2012)
	<i>Hoplitis agis</i> (Benoist, 1929)	(Grace, 2010)
	<i>Hoplitis anthocopoides</i> (Schenck, 1853)	(Khaghaninia et al., 2013)
	<i>Hoplitis aravensis</i> (Zanden, 1992)	(Falamarzi et al., 2017)
	<i>Hoplitis ciliaris</i> (Perez, 1902)	(Nadimi et al., 2013a)
	<i>Hoplitis eremophila</i> (Warncke, 1991)	(Khodarahmi, 2014)
	<i>Hoplitis fasciculata</i> (Alfken, 1934)	(Falamarzi et al., 2017)
	<i>Hoplitis flabellifera</i> (Morice, 1901)	(Khodaparast & Monfared, 2012; Nadimi et al., 2013a)
	<i>Hoplitis iranica</i> (Warncke 1991)	(Grace, 2010)
	<i>Hoplitis jakovlevi</i> (Radoskowski, 1874)	(Grace, 2010)
	<i>Hoplitis jejuna</i> Popov, 1952	(Ungricht et al., 2008; Grace, 2010)
	<i>Hoplitis karakalensis</i> (Popov, 1936)	(Grace, 2010)
	<i>Hoplitis</i> aff. <i>lapidaria</i> (Morawitz, 1877)	(Khodarahmi, 2014)
	<i>Hoplitis leucomelana</i> (Kirby, 1802)	(Nadimi et al., 2013a; Kiani-Bakiani et al., 2016)
	<i>Hoplitis manicata</i> (Morice, 1901)	(Khaghaninia et al., 2013)
	<i>Hoplitis minor</i> (Morawitz, 1877)	(Khodarahmi Ghahnavieh & Monfared, 2019)
	<i>Hoplitis mocsaryi</i> (Friese, 1895)	(introduced Fateryga et al., 2018; Ascher & Pickering, 2020)
	<i>Hoplitis mutica</i> (Warncke, 1991)	(Monfared et al., 2012)
	<i>Hoplitis nitidula</i> (Morawitz, 1877)	(Grace, 2010; Falamarzi et al., 2017; Khodarahmi Ghahnavieh & Monfared, 2019)
	<i>Hoplitis parasitica</i> (Warncke, 1991)	(Grace, 2010)
	<i>Hoplitis persica</i> (Warncke, 1991)	(Ungricht et al., 2008; Grace, 2010)
	<i>Hoplitis picicornis</i> (Morawitz, 1895)	(Grace, 2010)
	<i>Hoplitis praestans</i> (Morawitz, 1893)	(Grace, 2010)
<i>Hoplitis rufopicta</i> (Morawitz, 1875)	(Khodaparast & Monfared, 2012; Falamarzi et al., 2017)	
<i>Hoplitis semilinguaria</i> Tkalcu, 1992	(Ungricht et al., 2008; Grace, 2010)	

Table 2. Countinued.

Tribe	Species name	References
Osmiini	<i>Hoplitis serrilabris</i> (Morawitz, 1875)	(Grace, 2010)
	<i>Hoplitis tridentata</i> (Dufour & Perris, 1840)	(Grace, 2010)
	<i>Hoplitis uncaticornis</i> (Stanek, 1969)	(Monfared et al., 2012; Kiani-Bakiani et al., 2016)
	<i>Hoplitis unispina</i> (Alfken, 1935)	(Khodarahmi Ghahnavieh & Monfared, 2019)
	<i>Hoplosmia warncke</i> Tkalcu, 1992	(Ungricht et al., 2008; Grace, 2010; Müller, 2018)
	<i>Osmia aeruginosa</i> Warncke, 1988	(Khodaparast & Monfared, 2012)
	<i>Osmia andrenoides</i> Spionla, 1808	(Ascher & Pickering, 2020)
	<i>Osmia apicata</i> Smith, 1853	(Grace, 2010; Monfared et al., 2012; Nadimi et al., 2013a)
	<i>Osmia aurulenta</i> (Panzer, 1799)	(Tavakkoli et al., 2010; Grace, 2010)
	<i>Osmia bicornis</i> (Linnaeus, 1758)	(Grace, 2010; Monfared et al., 2012; Nadimi et al., 2013a)
	<i>Osmia bidentata</i> Morawitz, 1876	(Nadimi et al., 2013a; Khodarahmi Ghahnavieh & Monfared, 2019).
	<i>Osmia brevicornis</i> (Fabricius, 1798)	(Grace, 2010; Nadimi et al., 2013a; Kiani-Bakiani et al., 2016)
	<i>Osmia caerulescens</i> (Linnaeus, 1758)	(Grace, 2010; Khodaparast & Monfared, 2012; Nadimi et al., 2013a; Dehghan Dehnavi et al., 2015; Kiani-Bakiani et al., 2016; Khodarahmi Ghahnavieh & Monfared, 2019)
	<i>Osmia cephalotes</i> Morawitz, 1875	(Khodaparast & Monfared, 2012; Nadimi et al., 2013a; Khodarahmi Ghahnavieh & Monfared, 2019)
	<i>Osmia cerinthidis</i> Morawitz, 1876	(Grace, 2010; Khodaparast & Monfared, 2012; Nadimi et al., 2013a)
	<i>Osmia cornuta</i> (Latreille, 1805)	(Nadimi et al., 2013a; Dehghan-Dehnavi et al., 2015)
	<i>Osmia difficilis</i> Morawitz, 1875	(Grace, 2010; Khodaparast & Monfared, 2012; Kiani-Bakiani et al., 2016; Khodarahmi Ghahnavieh & Monfared, 2019)
	<i>Osmia dimidiata</i> Morawitz, 1870	(Grace, 2010; Nadimi et al., 2013a)
	<i>Osmia dives</i> Mocsáry, 1877	(Khodaparast & Monfared, 2012, 2013a; Kiani-Bakiani et al., 2016)
	<i>Osmia fasciata</i> Latreille, 1811	(Khodaparast & Monfared, 2012; Dehghan Dehnavi et al., 2015; Kiani-Bakiani et al., 2016; Falamarzi et al., 2017)
	<i>Osmia gutturalis</i> Warncke, 1988	(Grace, 2010; Khodaparast & Monfared, 2012; Khodarahmi Ghahnavieh & Monfared, 2019)
	<i>Osmia iranica</i> Warncke, 1991	(Ungricht et al., 2008)
	<i>Osmia laticauda</i> Stanck, 1969	(Khodaparast & Monfared, 2012)
	<i>Osmia leaiana</i> (Kirby, 1802)	(Khaghaninia et al., 2010; Nadimi et al., 2013a)
	<i>Osmia ligurica</i> Morawitz, 1868	(Grace, 2010; Khodaparast & Monfared, 2013b)
	<i>Osmia mediana</i> Engel, 2006	(Engel, 2006; Ungricht et al., 2008; Grace, 2010)
	<i>Osmia melanogaster</i> Spinola, 1808	(Grace, 2010; Nadimi et al., 2013a)
	<i>Osmia mustelina</i> Gerstaecker, 1869	(Grace, 2010)
	<i>Osmia nigrohirta</i> Friese, 1899	(Grace, 2010; Kiani-Bakiani et al., 2016)
	<i>Osmia niveata</i> (Fabricius, 1804)	(Grace, 2010; Khodaparast & Monfared, 2012; Nadimi et al., 2013a)
<i>Osmia oramara</i> Warncke, 1992	(Warncke, 1992a; Grace, 2010)	

Table 2. Countinued.

Tribe	Species name	References
Osmiini	<i>Osmia pedicornis</i> Cockerell, 1920	(Tavakkoli et al., 2010)
	<i>Osmia peregrina</i> (Warncke, 1988)	(Dehghan-Dehnavi et al., 2015)
	<i>Osmia rufa</i> (Linnaeus, 1758)	(Ascher & Pickering, 2020)
	<i>Osmia rufohirta</i> Latreille, 1811	(Khaghaninia et al., 2013; Nadimi et al., 2013a)
	<i>Osmia scutellaris</i> Morawitz, 1868	(Nadimi et al., 2013a)
	<i>Osmia signata</i> Erichson, 1835	(Grace, 2010; Nadimi et al., 2013a; Dehghan-Dehnavi et al., 2015; Keshtkar et al., 2015; Khodarahmi Ghahnavieh & Monfared, 2019)
	<i>Osmia subcornuta</i> Morawitz, 1875	(Khodaparast & Monfared, 2012; Salehi Sarbijan et al., 2012)
	<i>Osmia viridana</i> Morawitz, 1874	(Falamarzi et al., 2017)
	<i>Pseudoheriades grandiceps</i> Peters, 1988	(Ungricht et al., 2008; Grace, 2010)
Pararhophitini	<i>Pararhophites orobinus</i> Morawitz, 1876	(Sorayamohtat et al., 2012; Dehghan-Dehnavi et al., 2015; Khodarahmi Ghahnavieh & Monfared, 2019)

Lately, two species of Osmiini, including *Osmia cornuta* (Latreille, 1805) and *Osmia bicornis* (Linnaeus, 1758) have been in center of attention because of their role in pollination of almond and apple orchards in Europe (Maccagnani et al., 2007; Gruber et al., 2011; Sedivy & Dorn, 2014). Both species are distributed in Iran and many of the adjacent countries, including Russia, Georgia, Armenia, Azerbaijan (Fateryga et al., 2018), Turkey, Syria, Turkmenistan, Kyrgyzstan and Kazakhstan (Grace, 2010). *Osmia cornuta* was collected in the current study from Jiroft (Kerman) and Yasouj (Kohgiluyeh-va Boyer-Ahmad) and *O. bicornis* (Linnaeus, 1758) also was collected from Kakan (Yasouj, Kohgiluyeh-va Boyer-Ahmad). More samplings are needed to find the clear area of distribution for these two species throughout Iran. There were unreliable records of two species *Hoplitis adunca* (Panzer, 1798) [in Samin et al., 2017] and *Lithurgus cornutus fuscipennis* Lepelletier, 1841 [in Samin et al., 2015], which are excluded from the current list of valid records. Considering the suspicious data that appeared in both above mentioned publications, all other local records are also ignored, until accession to and examination of the voucher specimens.

An important aspect of faunistic studies is the accumulation of data about distribution of the pollinator bees for conservation purposes (IUCN, 2021). Regarding to conservation purpose, about bees' fauna of Iran as well as Megachilidae family needs to say that we need a comprehensive list of bees' species, which help us for monitoring or to get data on declining of species or about species in danger. Also, environmental concern about enhancing of using pesticide everywhere in crops, gardens and greenhouse especially on flowering weeds which visited by bees (Megachilid as well) for pollen and nectar. In the latter case, no support for solitary bees is provided by pesticide producers and consumers, and only Honey bees or bumblebees are examined in side effect tests. Iran is a country with most diverse fauna which most of its regions are not sampled yet for bees (See Figures 1, 2, 3, 4, 5). We hope our faunistic studies resulted to more knowledge about bees' diversity and distributions in all provinces in Iran and encourage other researchers to begin their research in all other scientific aspects of bees to more exploite of them.

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Conflict of Interests

The authors declare that there is no conflict of interest regarding the publication of this paper.

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References

- Aguib, S., Louadi, K. & Maximilian, S. (2010) Les Anthidiini (Megachilidae, Megachilinae) d'Algérie avec trois espèces nouvelles pour ce pays: *Anthidium* (*Anthidium*) *florentinum* (Fabricius, 1775), *Anthidium* (*Proanthidium*) *amabile* Alfken, 1932 et *Pseudoanthidium* (*Exanthidium*) *enslini* (Alfken, 1928). *Entomofauna*, 31 (12), 121–152.
- Alfken, J.D. (1935) Beitrag zur Kenntnis der Bienenfauna von Persien. *Mitteilungen aus dem Entomologischen Verein in Bremen*, 23, 21–24.
- Alfken, J.D. & Blütgen, P. (1937) Ergebnisse der österreichischen Demawend-Expedition 1836. Apidae, ausschliesslich *Bombus*- Arten. *Konowia*, 16, 97–106.
- Amiet, F., Herrmann, M., Müller, A. & Neumeyer, R. (2004) Fauna Helvetica 9, Apidae 4 (*Anthidium*, *Chelostoma*, *Coelioxys*, *Dioxys*, *Heriades*, *Lithurgus*, *Megachile*, *Osmia*, *Stelis*), Schweizerische Entomologische Gesellschaft, Terreaux, Neuchatel, Switzerland, 273 pp.
- Aftene, M. (1972) Speciiile familiei Megachilidae (Hymenoptera) citate în fauna României. *Comunicări și Referate*, 1972, 263–276. [in Romanian]
- Aftene, M. (1973) Specii de Megachilidae (Hymenoptera) din zona Văii Teleajenului. *Comunicări și Referate*, 1973, 131–134. [in Romanian]
- Ascher, J.S. & Pickering, J. (2020) Discover Life bee species guide and world checklist (Hymenoptera: Apoidea: *Anthophila*), Available from: <http://www.discoverlife.org/mp/20q?guide=Apoidea-species> [Accessed 10 January 2021].
- Baker, D.B. & Engel, M.S. (2006) A new subgenus of *Megachile* from Borneo with arolia (Hymenoptera: Megachilidae). *American Museum Novitates Number*, 3505, 1–12. [https://doi.org/10.1206/0003-0082\(2006\)505\[0001:ANSOMF\]2.0.CO;2](https://doi.org/10.1206/0003-0082(2006)505[0001:ANSOMF]2.0.CO;2)
- Banaszak, J. & Romasenko, L. (1998) *Megachilid bees of Europe: (Hymenoptera, Apoidea, Megachilidae)*. Pedagogical University, 239 pp.
- Ban-Caliefariu, C. (2009) Checklist of Megachilidae (Hymenoptera: Megachilidae) of Romania. *Travaux du Museum National d' Histoire Naturelle. Grigore Antipa*, 52, 303–311.
- Bzdyk, E.L. (2012) A revision of the *Megachile* subgenus *Litomegachile* Mitchell with an illustrated key and description of a new species (Hymenoptera, Megachilidae, Megachilini). *ZooKeys*, 221, 31–61. <https://doi.org/10.3897/zookeys.221.3234>

- Caliefariu, C.M. (2016) Tribe Anthidiini (Hymenoptera: Apoidea: Megachilidae) from Romania. *Travaux du Muséum National d'Histoire Naturelle. Grigore Antipa*, 59 (2), 115–128.
<https://doi.org/10.1515/travmu-2016-0019>
- Comba, L. & Comba, M. (1991) Catalogo Degli Apoidei Laziali (Hym.; Aculeta), *Fragmenta Entomologica*, 82, 1–117.
- Dehghan-Dehnavi, L., Talebi, A.A. Goldasteh, S.h. Vafaei-Shooshtari, R. & Nadimi, A. (2015) Contribution to the knowledge of Megachilidae (Hymenoptera: Apoidea) in the Yazd province, Iran. *Journal of Entomological Research*, 7 (1), 1–21.
- Dorchin, A. & Praz, C.J. (2018) Taxonomic revision of the Western Palaearctic bees of the subgenus *Pseudomegachile* (Hymenoptera, Apiformes, Megachilidae, Megachile). *Zootaxa*, 4524 (3), 251–307.
- Engel, M.S. (2004) A new species of the bee genus *Eoanthidium* with extraordinary male femoral organs from the Arabian Peninsula (Hymenoptera: Megachilidae). *Scientific Papers Natural History Museum the University of Kansas*, 34, 1–6. <https://doi.org/10.5962/bhl.title.8434>
- Engel, M.S. (2006) A new species of *Osmia* from Iran (Hymenoptera: Megachilidae). *Acta Entomologica Slovenica*, 14 (2), 123–130.
- Esmaili, M. & Rastegar, R. (1974) Identified species of Aculeate Hymenoptera of Iran. *Journal of Entomological Society of Iran*, 2, 43–46.
- Falamarzi, F. Habibpour, B., Mossadegh, M.S. & Monfared A. (2017) Species inventory of Megachilidae (Hymenoptera: Apoidea) in south of Fars province, Iran. *Entomofauna*, 6, 89–104.
- Fateryga, A.V., Ivanov, S.P. & Filatov M. (2018) Megachilid-bees (Hymenoptera: Megachilidae) of the Crimean Peninsula. *Entomofauna*, 11, 235–283.
- Fateryga, A.V., Proshchalykin, M.Y. & Maharramov, M.M. (2020) Bees of the tribe Anthidiini (Hymenoptera, Megachilidae) of Nakhchivan autonomous republic of Azerbaijan. *Entomological Review*, 100 (3), 323–336. <https://doi.org/10.1134/S0013873820030069>
- Friese, H. (1898) *Die Bienen Europa's (Apidae Europaeae) nach ihren Gattungen, Arten und Varietäten auf vergleichend morphologisch-biologischer Grundlage. Theil IV. Solitäre Apiden: Genus Eriades. Genus Trachusa. Genus Anthidium*. C. Lampe, Innsbruck, 303 pp.
- Gonzalez, V.H. & Griswold, T.L. (2007) A review of the north and central American *Megachile* subgenus *Argyropile* Mitchell (Hymenoptera: Megachilidae). *Zootaxa*, 1461, 1–14.
<https://doi.org/10.11646/zootaxa.1461.1.1>
- Gonzalez, V.H., Griswold, T., Praz, C.J. & Danforth, B.N. (2012) Phylogeny of the bee family Megachilidae (Hymenoptera: Apoidea) based on adult morphology. *Systematic Entomology*, 37 (2), 261–286. <https://doi.org/10.1111/j.1365-3113.2012.00620.x>
- Goodarzi, B. & Monfared, A. (2018) Identifying of Iranian species of the subgenus *Psithyrus* Lepeletier (Hym.; Apidae, *Bombus*). *Entomofauna*, 07, 97–120.
- Grace, A. (2010) *Introductory Biogeography to Bees of the Eastern Mediterranean and Near East*. Bexhill Museum, Sussex, United Kingdom, 284 pp.
- Gruber, B., Eckel, K., Everaars, J. & Dormann, C.F. (2011) On managing the red mason bee (*Osmia bicornis*) in apple orchards. *Apidologie*, 42, 564–576. <https://doi.org/10.1007/s13592-011-0059-z>
- IUCN (2021) The IUCN Red List of Threatened Species. Version 2020-3. Available from: <https://www.iucnredlist.org> [Accessed 10th February 2021].
- Izadi, H., Ebadi, R. & Talebi, A.A. (1999) Introduction of a part of fauna of pollinator bees in north of Fars province. *JWSS-Isfahan University of Technology*, 2 (4), 89–104.
- Izadi, H., Ebadi, R. & Talebi, A.A. (2004) Pollinator bees of north parts of Fars Province, Iran. *Proceeding of 15th International Plant Protection Congress*, Beijing, China, 436.

- Kasperek, M. (2020a) Revision of the Palaearctic *Trachusa interrupta* species complex (Apoidea: Anthidiini) with description of four new species. *Zootaxa*, 4728 (1), 1–48.
<https://doi.org/10.11646/zootaxa.4728.1.1>
- Kasperek, M. (2020b) Variation in *Eoanthidium judaeense* (Mavromoustakis, 1945) and *E. clypeare* (Morawitz, 1874) (Apoidea: Megachilidae: Anthidiini) in the Middle East: semispecies or cases of geographic dimorphism? *Zoology in the Middle East*, 66 (2), 1–22.
<https://doi.org/10.1080/09397140.2020.1729563>
- Keshtkar, A., Monfared, A. & Haghani, M. (2015) Collecting and identifying of pollinator bees (Hymenoptera, Apoidea) from urban parks and gardens of Shiraz city. *Entomofauna*, 4, 53–64.
- Karimpour, Y., Talebi, A.A., Fathipour, Y. (2002) Preliminary investigation on the fauna of the pollinator bees (Apoidea) in western part of Urmia lake. *Proceeding of the 15th Iranian Plant Protection Congress*, Kermanshah University, p. 165–166.
- Khaghaninia, S. Güler Y. & Mousavi M. (2010) Megachilids bees (Hymenoptera: Apoidea) of Aynali forests with four new records for Iran. *Munis Entomology and Zoology*, 5, 890–895.
- Khaghaninia, S., Güler, Y. & Gharagedaghi, Y. (2011) Megachilids Bees (Hymenoptera: Apoidea) of Horandgrass lands including a genus as a new record for Iran. *Global Conference on Entomology*, p. 158.
- Khaghaninia, S., Güler, Y. & Dikmen, F. (2013) New records for the bee fauna of Iran (Hymenoptera: Apoidea). *Zoology in the Middle East*, 59 (4), 319–325.
<https://doi.org/10.1080/09397140.2013.868134>
- Khodaparast, R. & Monfared, A. (2012) A survey of bees (Hymenoptera: Apoidea) from Fars Province, Iran. *Zootaxa*, 3445, 37–58. <https://doi.org/10.11646/zootaxa.3445.1.2>
- Khodaparast, R. & Monfared, A. (2013a) On the eucerine bees of Fars province, Iran (Hymenoptera: Apidae: Eucerini). *Zoology in the Middle East*, 59 (4), 326–341.
<https://doi.org/10.1080/09397140.2013.868135>
- Khodaparast, R. & Monfared, A. (2013b) Taxonomic studies on Osmiine bees (Hymenoptera, Apoidea: Megachilidae) of Fars Province (Iran). *Entomofauna*, 19, 229–260.
- Khodarahmi Ghahnavieh, R. & Monfared, A. (2019) A survey of the bees (Hymenoptera: Apoidea) from Isfahan Province, Iran. *Journal of Insect Biodiversity and Systematics*, 5 (3), 171–201.
- Khodarahmi Ghahnavieh, R. (2014) *Collecting and identifying of pollinator bees of superfamily of Apoidea (Hymenoptera) in the west of Isfahan*. (M.Sc Dissertation) School of Agriculture Sciences, The University of Yasouj, 156 pp.
- Kiani-Bakiani, S., Monfared, A. Hajiqanbar, H. & Azhari, Sh. (2016) A survey on Apoidea bees (Insecta: Hymenoptera) and their associated mites in Fars Province, Iran. *Journal of Insect Biodiversity and Systematics*, 02, 285–299.
- Lepelletier, A. (1841) *Histoire Naturelle des Insectes. Hyménoptères*, vol. 2, Roret, Paris, 680 pp.
- Maccagnani, B., Burgio, G., Stanisaveljevic, L.Z. & Maini, S. (2007) *Osmia cornuta* management in pear orchards. *Bulletin of Insectology*, 60 (1), 77–82.
- Mavromoustakis, G.A. (1937) Some new Asiatic bees of the subfamily Anthidiinae. *The Annals and Magazine of Natural History*, 19, 151–157. <https://doi.org/10.1080/00222933708655248>
- Mavromoustakis, G.A. (1954) New and little-known bees of the subfamily Anthidiinae (Apoidea). Part X. *Annals and Magazine of Natural History*, 7 (84), 919–924.
<https://doi.org/10.1080/00222935408651812>
- Mavromoustakis, G.A. (1968) New and little known bees of the family Megachilidae. *Bollettino del Museo Civico di Storia Naturale di Venezia*, 18, 125–149.
- Michener, C.D. (2007) *The Bees of the World*. The Johns Hopkins University Press. New Yourk, 953 pp.

- Monfared, A., Talebi, A.A., Tahmasbi, G., Ebrahimi, E. & Biesmeijer, J. (2009) Bumblebee diversity and abundance in the Iranian Alborz Mountains. *Zoology in the Middle East*, 46, 83–94.
<https://doi.org/10.1080/09397140.2009.10638332>
- Monfared, A., Azhari, Sh. & Khodaparast, R. (2012) Recording of forty species of Bees (Hymenoptera, Apoidea) from cold regions of Kohgiluyeh and Boyer-Ahmad Province, Iran. *Proceeding of the 20th Iranian Plant Protection Congress, Shiraz*. P. 222.
- Morice, F.D. (1921) Annotated lists of Aculeate Hymenoptera (except Heterogyna) and Chrysidids recently collected in Mesopotamia and north-west Persia. *Journal of the Bombay Natural History Society*, 28, 192–199.
- Müller, A. (2012) *Osmia* (*Orientosmia*) *maxschwarzi* sp. n., a new Palaearctic Osmiine bee with extraordinarily long mouthparts (Hymenoptera, Apiformes, Megachilidae). *Journal of the Swiss Entomological Society*, 85, 27–35.
- Müller, A. (2018) Palaearctic *Osmia* bees of the subgenus *Hoplosmia* (Megachilidae, Osmiini): biology, taxonomy and key to species. *Zootaxa*, 4415 (2), 297–329.
<https://doi.org/10.11646/zootaxa.4415.2.4>
- Nadimi, A., Talebi, A.A. & Fathipour, Y. (2013a) The tribe Osmiini (Hymenoptera: Megachilidae) in the north of Iran: new records and distributional data. *Entomofauna*, 34 (17), 205–220.
- Nadimi, A., Talebi, A.A. & Fathipour, Y. (2013b) A preliminary study of the cleptoparasitic bees of genus *Coelioxys* (Hymenoptera: Megachilidae) in northern Iran, with six new records. *Journal of Crop Protection*, 2 (3), 413–424.
- Nadimi, A., Talebi, A.A. Zhu, ChD. & Fathipour, Y. (2014) Study of the tribe Anthidiini (Hymenoptera: Megachilidae) in northern Iran, with the description of a new species. *North-Western Journal of Zoology*, 10 (2), 413–424.
- Nazari, S., Monfared, A., Nemati, A. & Azhari, S. (2019) A survey on bees (Insecta, Hymenoptera, Apoidea) and their associated mites in Chaharmahal and Bakhtiari province of Iran. *Journal of Insect Biodiversity and Systematics*, 5 (2), 107–120.
- Ornosa, C., Ortiz-Sánchez, F.J., Torres, F. (2008) Catálogo de los Megachilidae del Mediterráneo occidental (Hymenoptera, Apoidea). III. Anthidiini y Dioxyini. *Graellsia*, 64, 61–86.
<https://doi.org/10.3989/graeellsia.2008.v64.i1.55>
- Patiny, S., Rasmont, P. and Michez, D., (2009) A survey and review of the status of wild bees in the West-Palaearctic region. *Apidologie*, 40 (3), 313–331. <https://doi.org/10.1051/apido/2009028>
- Pasteels, J.J. (1977) Les Megachilini parasites (*Coelioxys* s. l.) d'Afrique noire. Subdivision générique et subgénérique. Descriptions d'espèces nouvelles et rectifications de nomenclature (Hymenoptera, Apoidea, Megachilidae). *Revue de Zoologie Africaine*, 91, 161–197.
- Popov, V.B. (1935) Beiträge zur Bienenfauna von Tadjikistan. *Trudy Akademiiya Nauk SSSR, Tadjhikskoi Bazino*, 5, 351–408.
- Popov, V.B. (1967) The bees (Hymenoptera: Apoidea) of Iran. *Trudy Zoologicheskogo Instituta Akademii nauk SSSR (Leningrad)*, 43, 184–216.
- Praz, C.J. (2017) Subgeneric classification and biology of the leafcutter and dauber bees (genus *Megachile* Latreille) of the western Palearctic (Hymenoptera, Apoidea, Megachilidae). *Journal of Hymenoptera Research*, 55, 1–54. <https://doi.org/10.3897/jhr.55.11255>
- Proshchalykin, M.Y. & Lelej, A.S. (2004) Bees of the subgenus *Allocoelioxys* Tkalcç of the genus *Coelioxys* Latreille (Hymenoptera: Apoidea: Megachilidae) from the Russian Far East. *Zootaxa*, 517, 1–6. <https://doi.org/10.11646/zootaxa.517.1.1>
- Proshchalykin, M.Y. (2007) The bees of the family Megachilidae (Hymenoptera, Apoidea) of Transbaikalia. *Far Eastern Entomologist*, 175, 1–18.

- Rasekh-Adel, M., Sadeghi-Nameghi, H. & Hosseini, M. (2012) Biodiversity of bees of Apoidea (Insecta: Hymenoptera) in lucerne and onion fields in Mashhad and Chenaran. *Iranian Journal of Plant Protection Science*, 43, 191–199.
- Romasenko, L.P. & Banaszak, J. (2002) Notes on the specific status of *Chalicodoma saussurei* (Radoszkowski, 1874) (Hymenoptera: Apoidea: Megachilidae). *Genus*, 13 (3), 397–404.
- Raw, A. (2006) A new subgenus and three new species of leafcutter bees, *Megachile* (*Austrosarus*) (Hymenoptera, Megachilidae) from central Brazil. *Zootaxa*, 1228, 25–34.
<https://doi.org/10.11646/zootaxa.1228.1.2>
- Salehi-Sarbijan, S., Khani, A., Izadi, H., Monfared, A., Khodaparast, R. & Sorayamohtat, M. (2012) Collecting and identification of pollinator bees of superfamily of Apoidea (Hymenoptera) of Southern Kerman Province. *Proceeding of the 20th Iranian Plant Protection Congress*, P. 125.
- Saunders, E. (1908) Hymenoptera aculeata collected in Algeria by the Rev. AE Eaton, MA, FES, and the Rev. Francis David Morice, MA, FES Part III. *Anthophila. Transactions of the Entomological Society of London*, 56, 177–274. <https://doi.org/10.1111/j.1365-2311.1908.tb02145.x>
- Sedivy, C. & Dorn, S. (2014) Towards a sustainable management of bees of the subgenus *Osmia* (Megachilidae; *Osmia*) as fruit tree pollinators. *Apidologie*, 45, 88–105.
<https://doi.org/10.1007/s13592-013-0231-8>
- Schmid-Egger, C. (2017) Order Hymenoptera, family Megachilidae genus *Pararhophites* Friese, 1898. Revision of the genus and description of a new species. *Arthropod fauna of the UAE*, 6, 462–476.
- Schwarz, M. & Gusenleitner, F. (2003) Ergebnis der Untersuchung einiger von Spinola beschriebener Apiden mit Bemerkungen und Ergänzungen. (Hymenoptera: Apidae). *Entomofauna*, 24 (17), 237–280.
- Schwarz, M. (2001) Revision der Gattung *Radoszkowskiana* Popov 1955 und ein Beitrag zur Kenntnis der Gattung *Coelioxys* Latreille 1809 (Hymenoptera: Apidae: Megachilinae). *Linzer Biologische Beiträge*, 33 (2), 1267–1286.
- Sheffield, C.S. (2013) A new species of *Megachile* Latreille subgenus *Megachiloides* (Hymenoptera, Megachilidae), *ZooKeys*, 283, 43–58. <https://doi.org/10.3897/zookeys.283.4674>
- Sorayamohtat, M., Ravan, S., Monfared, A., Salehi-Sarbijan, S. & Khodaparast, R. (2012) Collecting and Identification of Pollinator bees of superfamily of Apoidea (Hymenoptera) of North regions of Sistan and Baluchistan province. *Proceeding of the 20th Iranian Plant Protection Congress*, Shiraz University. P. 121.
- Talebi, A.A., Esmaili, M. & Tirgari, S. (1995) Bee Fauna of Alfalfa in Karaj. *Proceeding of the 12th Iranian Plant Protection Congress*, Iranian Research Institute of Plant Protection, Karaj, p. 93.
- Tavakoli, G. (2004) *Pollen bee fauna of dark legumes in Guilan province*. (MS.c Dissertation) School of Agriculture Sciences, The University of Guilan, 79 pp.
- Tavakoli, G., Hajizadeh, J. & Talebi, A.A. (2010) Introducing 39 pollinating bees (Hymenoptera: Apoidea) occurring on legume (Fabaceae) crops from Guilan province. *Proceedings of the 19th Iranian Plant Protection Congress*, Iranian Research Institute of Plant Protection, Tehran, p. 120.
- Tomozii, B. & Toma, V.C. (2011) New records of megachilid bees (Hymenoptera: Apiformes: Megachilidae) from Romania. *Studii și Comunicări, Complexul Muzeal de Științele Naturii "Ion Borcea" Bacău*, 24, 61–68.
- Özbek, H. (1979) Bees of the genera *Anthidium*, *Anthocopa*, *Hoplitis* and *Megachile* (Hymenoptera: Apoidea; Megachilidae) in some parts of eastern Anatolia. *Türkiye Bitki Koruma Dergisi*, 3 (2), 95–107.
- Özbek, H. & Van Der Zanden, G. (1994) A preliminary review of the Megachilidae of Turkey Part IV. Megachilini and Lithurgini (Hymenoptera: Apoidea). *Türkiye Entomoloji Dergisi*, 18 (3), 157–174.

- Ungricht, S., Müller, A. & Dorn, S. (2008) A taxonomic catalogue of the Palaearctic bees of the tribe Osmiini (Hymenoptera: Apoidea: Megachilidae). *Zootaxa*, 1865, 1–253.
<https://doi.org/10.11646/zootaxa.1865.1.1>
- Pascu M. (1996) Catalogul Suprafamiliei Apoidea (Hymenoptera) din colecțiile Muzeului de Istorie Naturală din Sibiu. I Colletidae, Halictidae, Andrenidae, Melittidae, Megachilidae, Anthophoridae. *Buletinul Informativ al Societății Lepidopterologice Române* 7, 283–296.
- Warncke, K. (1979) Beitrag zur bienenfauna des Iran. 9. Die Gattung *Dioxys* Lep. and Serv. *Bollettino del Museo Civico di Storia Naturale di Venezia*, 30, 181–182.
- Warncke, K. (1980) Die Bienengattung *Anthidium* Fabricius, 1804 in der Westpaläarktis und im Turkestanischen Becken. *Entomofauna*, 1, 119–209.
- Warncke, K. (1981) Beitrag zur Bienenfauna des Iran: 13. Die Bienengattung *Lithurgus*. *Bollettino del Museo Civico di Storia Natural di Venezia*, 31, 197–199.
- Warncke, K. (1985) Beitrag zur Bienenfauna des Iran. 21. Die Gattung *Stelis* Pz. *Bollettino del Museo Civico di Storia Natural di Venezia*, 34, 237–240.
- Warncke, K. (1991) Die Bienengattung *Osmia* Panzer 1806, ihre Systematik in der Westpalaarktis und ihre Verbreitung in der Türkei. 10. Die Untergattung *Alcidamea* CRESS. – *Linzer Biologische Beiträge*, 23 (2), 701–751.
- Warncke, K. (1992a) Die Bienengattung *Osmia* Panzer 1806, ihre Systematik in der Westpaläarktis und ihre Verbreitung in der Türkei 11. Die Untergattung *Pyrosmia* Tkalcu 1975, *Linzer Biologische Beiträge*, 24 (2), 893–921.
- Warncke, K. (1992b) Die westpaläarktischen Arten der Bienengattung *Coelioxys* Latr. (Hymenoptera, Apidae, Megachilinae). *Bericht der Naturf. Gesellsch. Augsburg*, 53, 31–77.
- Warncke, K. (1992c) Die westpalaarktischen Arten der Bienengattung *Stelis* Panzer, 1806. *Entomofauna*, 13 (22), 341–376.
- Westrich, P., Knapp, A. & Berney, I. (2015) *Megachile sculpturalis* Smith 1853 (Hymenoptera, Apidae), a new species for the bee fauna of Germany, now north of the Alps. *Eucera*, 9, 3–10.
- Zanden, G. & Matache, I. (1986) Family Megachilidae (Hymenoptera) in the collections of the "Grigore Antipa" Natural History Museum. *Travaux du Muséum d'Histoire Naturelle "Grigore Antipa"*, 28, 65–78.
- Zanden, G. (1986) Die paläarktischen Arten der Gattung *Lithurgus* Latreille, 1825 (Hymenoptera, Apoidea, Megachilidae). *Mitteilungen aus dem Zoologischen Museum in Berlin*, 62, 53–59.
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بررسی گونه‌های خانواده‌ی (Hymenoptera, Apoidea) Megachilidae موجود در موزه حشرات گرده‌افشان ایران - دانشگاه یاسوج

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چکیده: در این پژوهش، حضور و پراکنش ۸۸ گونه از زنبورهای خانواده Megachilidae از بین مجموعاً ۳۶۷۸ نمونه موجود در موزه حشرات گرده‌افشان ایران «دانشگاه یاسوج (IPIM)»، که در بهار و تابستان سال‌های ۲۰۰۹-۲۰۱۷ از مناطق مختلف ایران شامل استان‌های اردبیل، چهارمحال و بختیاری، فارس، گلستان، اصفهان، کرمان، خوزستان، کهگیلویه و بویراحمد، سیستان و بلوچستان و البرز جمع‌آوری شده بودند، ارایه شد. داده‌های مربوط به تعداد نمونه‌های هر گونه، نام و مختصات محل و نقشه‌های توزیع برای ایران و توزیع جهانی گونه‌ها (در صورت در دسترس بودن) ارایه شد. گونه *Megachile (Megachile) octosignata* Nylander 1852 برای اولین بار از ایران گزارش شد. تعداد ۱۹ گونه برای اولین بار از استان‌های کهگیلویه و بویراحمد و چهارمحال بختیاری گزارش شدند.

واژگان کلیدی: ایران، Megachilidae، زنبورهای گرده‌افشان، زنبورهای انگل