

## کمک به دانش زنبورهای خانواده ( Megachilidae (Hymenoptera:Apoidea ) در استان یزد، ایران

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### چکیده

بررسی و مطالعه‌ای برای تعیین زنبورهای گرده‌افشان خانواده Megachilidae در استان یزد واقع در مرکز ایران در طول سال‌های ۸۹-۹۱ انجام شده است. نمونه‌ها با استفاده از تور حشره‌گیری از زیستگاه‌های مختلف جمع‌آوری شدند. در مجموع، از ۴۴۳۶ نمونه زنبور جمع‌آوری شده گرده‌افشان خانواده Megachilidae، متعلق به ۱۳ جنس، ۱۸ زیرجنس و ۵۵ گونه بودند. ۶ گونه شامل *Osmia peregrina* (*Helicosmia*)، *Megachile semicircularis* (*Eutricharaea*)، *Megachile basilaris* (*Entricharea*)، *Megachile seraxensis* (*Pseudomegachile*)، *Megachile sanguinipes* و *ovasi Icteranthidium* برای اولین بار از ایران رکورد زده شدند. گیاهان میزبان این زنبورها و پراکنش جغرافیایی گونه‌های شناخته شده در استان یزد نیز آورده شده است.

واژه‌های کلیدی: Megachilidae، رکورد جدید، گیاهان میزبان، استان یزد

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Table 3- List of host plants in association with megachilid bees in the Yazd Province, Iran

Plant family	Plant species	Megachilid bees		
		No. of species	No. of specimens	Percentage
Amaranthaceae	<i>Amaranthus retroflexus</i> L.	1	3	0.07
Apiaceae	<i>Anethum graveolens</i> L.	10	269	6.62
	<i>Foeniculum vulgare</i> Miller	2	51	1.26
Asteraceae	<i>Achillea wilhelmesii</i> L.	5	53	1.31
	<i>Arctium lappa</i> L.	11	71	1.75
	<i>Calendula officinalis</i> Fisch	1	1	0.02
	<i>Carthamus oxyacantha</i> Bieb	6	38	0.94
	<i>Carthamus tinctorius</i> L.	4	21	0.52
	<i>Centaurea bruguierana</i> Bornm	20	304	7.49
	<i>Centaurea cyanus</i> L.	9	34	0.84
	<i>Centaurea iberica</i> Trev	2	8	0.2
	<i>Centaurea virgata</i> Lam	27	422	10.39
	<i>Cirsium arvense</i> L.	17	400	9.85
	<i>Echium ilicifolius</i> L.	2	21	0.51
	<i>Helianthus annuus</i> L.	12	99	2.43
	<i>Helichrysum leucocephalum</i> Boiss	18	61	1.5
	<i>Lactuca sativa</i> L.	1	2	0.05
	<i>Senecio cineraria</i> Digigalos	2	30	0.73
Brassicaceae	<i>Descurainia sophia</i> L.	3	32	0.79
	<i>Lepidium draba</i> L.	9	53	1.31
	<i>Malcolmia africana</i> L.	2	22	0.54
Convolvulaceae	<i>Convolvulus arvensis</i> L.	6	65	1.6
Cucurbitaceae	<i>Cucurbita melo</i> var. <i>reticulata</i> L.	1	10	0.25
	<i>Cucurbita pepo</i> L.	7	29	0.71
Euphorbiaceae	<i>Euphorbia</i> sp. L.	2	35	0.86
Fabaceae	<i>Cicer arietinum</i> L.	6	30	0.74
	<i>Glycyrrhiza glabra</i> L.	10	110	2.71
	<i>Medicago sativa</i> L.	19	249	6.13
Lamiaceae	<i>Mentha longifolia</i> L.	1	20	0.49
	<i>Teucrium polium</i> L.	1	2	0.05
	<i>Thymus kotschyanus</i> Boiss	7	81	1.99
Leguminosae	<i>Melilotus officinalis</i> L.	1	5	0.12
Liliaceae	<i>Allium cepa</i> L.	9	62	1.53
	<i>Muscaria armeniacum</i> Leichtl	1	15	0.37
	<i>Stachys setifera</i> CA Mey	1	2	0.05
Malvaceae	<i>Malva neglecta</i> Wallr	3	23	0.57
	<i>Malva sylvestris</i> L.	5	107	2.63
Mimosaceae	<i>Prosopis farcta</i> Banks & Sol	12	195	4.8
Papilionaceae	<i>Alhagi camelorum</i> Fisch	25	459	11.3
	<i>Astragalus dschuparensis</i> Freyn & Bornm	5	45	1.11
	<i>Sophora alopecuroides</i> L.	5	124	3.05
Plantaginaceae	<i>Plantago lancqolata</i> L.	1	1	0.02
Portulacaceae	<i>Portulaca oleraceae</i> L.	6	18	0.44
Punicaceae	<i>Punicae granatum</i> L.	6	80	1.97
Rosaceae	<i>Malus domestica</i> Borkh	1	3	0.07
	<i>Prunus amygdalus</i> Batsch	1	15	0.36
	<i>Prunus cerasus</i> L.	1	24	0.59
Rubiaceae	<i>Galium aparin</i> L.	2	10	0.25
Rutaceae	<i>Ruta graveolens</i> L.	2	35	0.86
Zygophyllaceae	<i>Peganum harmala</i> L.	15	212	5.22

*ovasi* was new for Iran. This species was previously reported only from Turkey as an endemic species by Warncke (1980) and there is no supplementary data on its nesting biology and flower preferences (Müller, 2013). Here, we introduced *Helichrysum leucocephulum* (Asteraceae) as first known food plant for *I. ovasi*. Tribe Megachilini with 33 species was the most diverse tribe within family Megachilidae in Yazd province of which six species were new for Iran. Hitherto, *M. seraxensis* was considered an endemic species occurring in Uzbekistan, but present study indicates new extension of the bee from Central Asia to South-West Asia. Other new record bees of the tribe often have more distribution, particularly in the Middle East. Then, our data indicates extension of the species toward east.

Our finding showed that most number of species have been collected on *Centaurea virgata* Lam (27 species) followed by *Alhagi camelorum* Fisch (25 species) and *Centaurea bruguierana* Bornm (20 species). However, only one megachlid species has been collected on some plant species (Table 3). The results also showed that the most number of specimens have been collected on *Alhagi camelorum* Fisch (459 specimens, 11.3% of all collected specimens) followed by *Centaurea virgata* Lam (422 specimens, 10.39%) and *Cirsium arvense* L. (400 specimens, 9.85%) (Table 3). These results revealed that the megachlid bees well adapted to flowering plants of the family Asteraceae and Fabaceae in desert area.

Despite several studies on Megachilidas of Iran which have been published previously by different authors (Warnke, 1980, 1981; Talebi *et al.*, 1995; Khaghaninia, 2010, 2011; Khodaparast & Monfared, 2012; Nadimi *et al.*, 2013a,b), many areas of the country still remain unexplored. Identification of Megachilid bees and documenting their distributions and food plants is the first step towards their conservation. The present study provide an initiatory data on the bees in Yazd province; therefore, oncoming researches could be focused on others aspects including biodiversity, nesting biology and flower preferences of bees.

Table 2- Comparison of the number of recorded species belonging to different subfamilies and tribes of Megachilidae in the present study with previous records from Iran

Subfamilies and tribes	Previously recorded species	Collected species from Yazd province	Newly recorded species	Total number of recorded species in Iran
<b>FideliinaePararhophitini</b>	1	1		1
<b>Megachilinae Lithurgini</b>	3	1		3
<b>Osmiini</b>	70	6	1	71
<b>Anthidiini</b>	73	13	1	73
<b>Dioxyini</b>	2	1		2
<b>Megachilini</b>	64	33	7	71
<b>Total</b>	213	55	9	221

on *A. camelorum*; Yazd, Dehno, 26.IV.2012, 2♀♀, 05.V.2012, 1♀ on *C. arvense*; Yazd, Ghasem abad, 09.V.2012, 1♀ on *C. cyanus*; Yazd, Hamidia, 01.V.2012, 1♀ on *A. camelorum*, 02.V.2012, 1♀ on *A. camelorum*; Yazd, Najaf abad, 06.V.2012, 1♀ on *A. graveolens*; Yazd, Rezvan shahr, 11.V.2012, 1♀ on *P. harmala*, leg. L. Dehghan.

Distribution: Algeria, America, Canada, China, Cyprus, Egypt, Greece, India, Iran, Jordan, Kazakhstan, Kyrgyzstan, Morocco, North Europe, Syria, Tajikistan, Tunisia, Turkey, Turkmenistan, Uzbekistan (Warncke, 1988a; Banaszak & Romasenko, 1998; Ungricht *et al.*, 2008; Grace, 2010; Khodaparast & Monfared, 2012; Müller, 2013; Nadimi *et al.*, 2013).

### ***Osmia (Helicosmia) fasciata (Latreille, 1811)***

Material examined: Iran, Yazd province: Taft, Tezerjan, 15.VI.2013, 1♀ on *C. virgata*; Yazd, Dehno, 24.IV.2012, 1♀ on *C. arvense*, Yazd, Fahraj, 29.IV.2012, 1♀ on *C. arvense*; Yazd, Fajr, 25.IV.2012, 1♀ on *C. arvense*; Yazd, Hamidia, 01.V.2012, 1♀, 02.V.2012, 1♀ on *C. arvense*, leg. L. Dehghan.

Distribution: Iran, Jordan, Palestine, Syria, Turkey (Grace, 2010; Khodaparast & Monfared, 2012; Müller, 2013).

### ***Osmia (Helicosmia) peregrina (Warncke, 1988) \****

Material examined: Iran, Yazd province: Mehriz, Arnan, 19.VII.2013, 5♀♀ on *H. annuus*; Mehriz, Manshad, 16.VII.2013, 3♂♂ on *H. annuus*, 1♀ on *C. virgata*, 1♀ on *M. sylvestris*; Taft, Dashtak, 01.VIII.2012, 1♀, 26.VII.2013, 2♂♂, 1♀ on *A. camelorum*; Yazd, 15.V.2011, 1♀ on *C. cyanus*, 02.V.2012, 1♀ on *C. arvense*, leg. L. Dehghan.

Distribution: Syria, Turkey (Grace, 2010; Müller, 2013), new record for Iran.

### ***Osmia (Helicosmia) signata (Erichson, 1835)***

Material examined: Iran, Yazd province: Abarkooh, 10.VI.2011, 1♀ on *C. virgata*, leg. L. Dehghan.

Distribution: Albania, Algeria, Balearic Islands, China, Corsica, Cyprus, Egypt, Europe, France, Greece, Iran, Italy, Jordan, Morocco, Palestine, Portugal, Sardinia, Sicily, Spain, Turkey, Turkmenistan, Ukraine (Warncke, 1988a; Ungricht *et al.*, 2008; Grace, 2010; Müller, 2013; Nadimi *et al.*, 2013).

### ***Osmia (Osmia) cornuta (Latreille, 1805)***

Material examined: Iran, Yazd province: Mehriz, Bandakosadat, 28.III.2012, 3♀♀ on *P. cerasus*, 3♀♀ on *P. amygdalus*; Mehriz, Manshad, 03.IV.2012, 24♀♀, 27.IV.2012, 4♀♀ on *P. cerasus*; Mehriz, Sar Yazd, 06.IV.2012, 18♀♀ on *P. cerasus*; Taft, Ali abad, 10.IV.2012, 48♀♀, 15.III.2013, 2♀♀ on *M. armeniacum*, 3♀♀ on *P. amygdalus*; Taft, Tezerjan, 15.V.2013, 3♀♀ on *M. domestica*, leg. L. Dehghan.

Distribution: Algeria, Central Asia, Cyprus, Egypt, Europe, Iran, Tunisia, Turkey, Turkmenistan (Peters, 1978; Banaszak & Romasenko, 1998; Ungricht *et al.*, 2008; Grace, 2010; Müller, 2013; Nadimi *et al.*, 2013).

## **Discussion**

This survey on the bees of the family Megachilidae in Yazd province follows the same approach as other previous main surveys of the bee fauna in Iran (Khodaparast and Monfared, 2012; Nadimi *et al.*, 2013a, b). Megachilid bee fauna of Yazd province consists of 55 species in 13 genera and six tribes (Table 2). Previously, there were no reports on bees in the province; therefore, all collected bees were new for the regions with eight new records for Iranian bee fauna. Of six osmiine bees, *O. peregrina* was new for Iran. This species was previously reported from Turkey and Syria and there is no information about its nesting biology and flower preferences (Müller, 2013). In present study, *O. peregrina* was collected from three different plant family including Asteraceae, Papilionaceae and Malvaceae in different regions that suggesting a polylectic bee. Of thirteen Anthidiine bees, *I.*

***Megachile (Pseudomegachile) saussurei (Radoszkowski, 1874)***

Material examined: Iran, Yazd province: Yazd, Gerdefaramarz, 04.VI.2012, 4♂♂ on *P. harmala*, 6♀♀ on *C. arvensis*, leg. L. Dehghan.

Distribution: Iran, Spain, Turkey (Popov, 1967b, Özbek & Zanden, 1994; Romasenko & Banaszak, 2002; Grace, 2010).

***Megachile (Pseudomegachile) schnabli (Radoszkowski)***

Material examined: Iran, Yazd province: Mehriz, Mehdi abadebahadoran, 31.V.2013, 6♀♀ on *A. camelorum*; Taft, Rahat abad, 14.VI.2013, 2♀♀ on *C. bruguierana*; Taft, Saleh abad, 28.VI.2013, 2♀♀ on *H. annuus*; Taft, Tezerjan, 15.VI.2013, 3♀♀ on *C. virgata*, leg. L. Dehghan.

Distribution: Iran (Khodaparast & Monfared, 2012; Grace, 2010).

***Megachile (Pseudomegachile) seraxensis\****

Material examined: Iran, Yazd province: Yazd, Shahedieh, 29.V.2012, 2♂♂ on *M. neglecta*, leg. L. Dehghan

Distribution: Turkmenistan (Ascher & Pickering, 2013), new record for Iran.

***Megachile (Pseudomegachile) cf. tecta (Radoszkowski, 1888)***

Material examined: Iran, Yazd province: Mehriz, Manshad, 17.VI.2011, 2♀♀ on *M. officinalis*, 10♀♀ on *H. annuus*; Mehriz, Tangechenar, 12.VII.2013, 3♀♀ on *M. officinalis*; Taft, Dashtak, 01.VIII.2012, 1♀ on *A. camelorum*; Taft, Rahat abad, 14.VI.2013, 13♀♀ on *C. bruguierana*; Taft, Saleh abad, 28.VI.2013, 2♀♀ on *A. camelorum*; Taft, Sanich, 26.VII.2013, 2♀♀ on *C. virgata*, *C. tinctorius*; Taft, Shirdeh, 16.VII.2012, 4♀♀ on *A. camelorum*; Taft, Sirdeh, 30.VII.2013, 5♀♀ on *A. camelorum*; Taft, Tezerjan, 15.VI.2013, 2♀♀ on *M. sativa*, leg. L. Dehghan.

Distribution: China (Ascher & Pickering, 2013).

***Megachile (Xanthosarus) maritima (Kirby, 1802)***

Material examined: Iran, Yazd province: Mehriz, Manshad, 01.VI.2011, 3♀♀ on *A. lappa*; Taft, Sirdeh, 30.VII.2013, 1♂, 3♀♀ on *C. tinctorius*; Sadoogh, Nodooshan, 02.VIII.2013, 1♂ on *M. sativa*, leg. L. Dehghan.

Distribution: Iran, Turkey (Grace, 2010).

***Radoszkowskiana barrei (Radoszkowski, 1893)***

Material examined: Iran, Yazd province: Mehriz, Mehdi abadebahadoran, 31.V.2013, 1♀, 01.VI.2013, 1♀; Taft, Tezerjan, 15.VI.2013, 1♀; Yazd, Shahedieh, 29.V.2012, 1♀, all specimens were collected on *A. camelorum*, leg. L. Dehghan. Cleptoparasite of *Megachile* spp.

Distribution: Iran, Turkey (Popov, 1967; Grace, 2010).

**Tribe: Osmiini**

***Heriades (Michenerella) hissaricus (Popov, 1955)***

Material examined: Iran, Yazd province: Mehriz, Manshad, 05.VI.2011, 4♂♂, 2♀♀ on *A. lappa*, leg. L. Dehghan.

Distribution: Iran, Turkey (Grace, 2010; Khodaparast & Monfared, 2012; Müller, 2013).

***Osmia (Helicosmia) caerulescens (Linnaeus, 1758)***

Material examined: Iran, Yazd province: Ardakan, Agda, 07.V.2011, 1♀ on *A. wilhelmessii*; Mehriz, Arnan, 19.VII.2013, 6♀♀ on *M. sativa*; Mehriz, Manshad, 12.VII.2013, 1♀ on *C. virgata*, 16.VII.2013, 5♂♂ on *M. sativa*, 3♀♀ on *M. sylvestris*; Sadoogh, 10.V.2012, 1♀ on *A. camelorum*; Sadoogh, Ashkezar, 08.V.2012, 2♀♀ on *A. camelorum*; Taft, Dashtak, 16.VII.2012, 1♀ on *A. camelorum*, 26.VII.2013, 3♂♂ on *L. draba*, 120♀♀ on *A. camelorum*, 1♂ on *S. setifera*, 2♂♂ on *M. sativa*; Taft, Shirdeh, 10.VIII.2013, 10♀♀ on *A. camelorum*; Taft, Sirdeh, 30.VII.2013, 26♀♀



Gerdefaramarz, 04.VI.2012, 2♀♀ on *C. cyanus*; Yazd, Ghasem abad, 13.VI.2012, 2♀♀ on *C. tinctorius*; Yazd, Shahedieh, 29.V.2012, 22♀♀ on *A. cepa*, leg. L. Dehghan.

Distribution: Egypt, Iraq, Turkey (Grace, 2010; Ascher & Pickering, 2013).

***Megachile (Pseudomegachile) flavipes (Spinola, 1838)***

Material examined: Iran, Yazd province: Yazd, Najaf abad, 25.V.2012, 2♀♀ on *P. harmala*, leg. L. Dehghan.

Distribution: Iran (Morice, 1921).

***Megachile (Pseudomegachile) foersteri (Gerstaecker, 1869)***

Material examined: Iran, Yazd province: Abarkooh, 28.VI.2011, 1♀ on *H. annuus*, leg. L. Dehghan.

Distribution: Greece, Iran, Palestine, Syria, Turkey (Grace, 2010).

***Megachile (Pseudomegachile) rubripes (Morawitz, 1875)***

Material examined: Iran, Yazd province: Ardakan, 15.V.2011, 1♂ on *A. camolorum*; Ardakan, Aghda, 25. IV.2011, 1♂, 2♀♀ on *A. camolorum*; Bafq, Asfij, 07.V.2011, 22♂♂, 24.IV.2012, 3♂♂, 1♀, 06.VI.2012, 1♂, 8♀♀ on *A. camolorum*; Mehriz, bahadoran, 01.VI.2013, 2♀♀ on *H. annuus*; Mehriz, Golafshan, 23.VI.2012, 8♂♂, 2♀♀ on *A. wilhelmesii*; Mehriz, Khormiz, 02.VI.2013, 3♀♀ on *A. wilhelmesii*; Mehriz, Dareh, 16.VI.2012, 11♂♂, 2♀♀ on *C. virgata*; Mehriz, Mehdi abadebahadoran, 10.VI.2011, 1♀, 10.VI.2012, 43♂♂, 30♀♀ on *A. camolorum*, *S. alopecuroides*, *P. granatum*, 31.V.2013, 1♂, 2♀♀ on *A. camolorum*; Meybod, Ebrahim abad, 18.VI.2012, 6♂♂, 5♀♀ on *A. camolorum*; Sadoogh, 10.V.2012, 59♂♂, 22♀♀ on *A. camolorum*; Sadoogh, Ashkezar, 08.V.2012, 21♂♂, 18♀♀ on *A. camolorum*; Sadoogh, Khezh abad, 13.V.2012, 27♂♂, 16♀♀ on *M. sativa*, 13.VI.2012, 3♂♂, 26♀♀ on *H. annuus*; Sadoogh, Nodooshan, 02.VIII.2013, 8♀♀ on *C. arvensis*; Sadoogh, Zarch, 03.VI.2012, 39♂♂, 36♀♀ on *A. camolorum*; Taft, 14.VI.2013, 2♂♂, 4♀♀ on *A. camolorum*; Taft, Nir, 21.VI.2013, 2♀♀ on *C. virgate*; Taft, Rahat abad, 16.V.2012, 2♂♂, 3♀♀ on *C. bruguierana*; Taft, Sanich, 01.VIII.2012, 1♂, 2♀♀, 26.VII.2013, 1♂, 24♀♀ on *C. virgate*; Taft, Sirdeh, 30.VII.2013, 4♀♀ on *A. camolorum*; Taft, Tezerjan, 15.VI.2013, 6♂♂, 27♀♀ on *C. virgate*; Taft, Zeyn abad, 30.V.2012, 10♂♂, 7♀♀ on *A. camolorum*; Yazd, 25.IV.2011, 1♂, 02.VI.2011, 1♂, 4♀♀, 18.VII.2013, 1♀ on *A. camolorum*; Yazd, Ahmad abad, 05.VI.2012, 10♂♂, 73♀♀ on *A. camolorum*; Yazd, Akramieh, 05.V.2012, 58♂♂, 4♀♀, 07.V.2012, 10♂♂, 6♀♀ on *A. camolorum*; Yazd, Bondar abad, 18. V.2012, 14♂♂, 37♀♀ on *A. camolorum*; Yazd, Dehno, 26.IV.2012, 21♂♂, 7♀♀ on *C. arvense*, 24.V.2012, 56♂♂, 6♀♀ on *D. Sophia*, 29.III.2013, 2♂♂ on *C. arietinum*, 03.V.2013, 1♂, 1♀ on *M. africana*; Yazd, Fahraj, 29.IV.2012, 9♂♂, 11♀♀ on *S. cineraria*; Yazd, Fajr, 25.IV.2012, 12♂♂, 2♀♀ on *A. camolorum*; Yazd, Gerdefaramarz, 04.VI.2012, 4♂♂, 2♀♀ on *A. camolorum*; Yazd, Ghasem abad, 09.V.2012, 8♂♂ on *P. harmala*, *L. draba*, 5♀♀ on *A. graveolens*, *F. vulgare*, *M. neglecta*, *C. pepo*, *P. oleraceae*, 10.V.2013, 8♀♀ on *C. oxyacantha*; Yazd, Hamidia, 01.V.2012, 51♂♂, 3♀♀, 02.V.2012, 4♂♂, 1♀ on *A. camolorum*; Yazd, Hoseyn abade rismani, 12.V.2012, 114♂♂, 24♀♀ on *A. camolorum*; Yazd, Najaf abad, 17.VI.2011, 2♀♀ on *P. harmala*, 06. V.2012, 23♂♂, 5♀♀, 15.V.2012, 54♂♂, 21♀♀,

20.V.2012, 19♂♂, 8♀♀, 21.V.2012, 7♂♂, 21♀♀, 25.V.2012, 1♂, 6♀♀, 05.VII.2013, 1♂ on *M. sativa*; Yazd, Shahedieh, 11.V.2012, 7♂♂, 4♀♀, on *T. kotschyanus*, *G. glabra*, 29.V.2012, 27♂♂, 50♀♀, 17.V.2013, 5♂♂, 5♀♀ on *A. cepa*; Yazd, Sharaf abad, 24.VI.2012, 1♂ on *P. farcta*, leg. L. Dehghan.

Distribution: China, Turkey(Grace, 2010; Ascher & Pickering, 2013).

***Megachile (Pseudomegachile) sanguinipes (Morawitz, 1875) \****

Material examined: Iran, Yazd province: Sadoogh, Zarch, 03.VI.2012, 1♀ on *A. camolorum*, leg. L. Dehghan.

Distribution: Palestine, Turkey (Grace, 2010), new record for Iran.

Distribution: Egypt, North Africa, Palestine, Turkey (Özbek & Zanden, 1994; Grace, 2010; Ascher & Pickering, 2013).

***Megachile (Eutricharaea) rotundata (Fabricius, 1793)***

Material examined: Iran, Yazd province: Yazd, Fajr, 25.IV.2012, 4♂♂ on *M. sativa*; Yazd, Gerdefaramarz, 04.VI.2012, 20♂♂ on *C. arvensis*, leg. L. Dehghan.

Distribution: Cyprus, Europe, Greece, North Africa, Southern and Eastern America, Turkey (Özbek & Zanden, 1994; Banaszak & Romasenko, 1998; Amiet *et al.*, 2004; Ornos *et al.*, 2007; Ban-Calefariu, 2009; Grace, 2010).

***Megachile (Eutricharaea) semicircularis (van der Zanden, 1996) \****

Material examined: Iran, Yazd province: Abarkooh, 07.VI.2013, 1♀ on *M. africana*; Mehriz, Manshad, 24.VI.2013, 3♀♀ on *C. officinalis*, 16.VII.2013, 1♀ on *C. virgata*; Mehriz, bahadoran, 01.VI.2013, 4♂♂ on *C. arvensis*; Mehriz, Mehdi abadebahadoran, 31.V.2013, 4♀♀ on *A. camelorum*; Sadoogh, Nodoooshan, 02.VIII.2013, 3♀♀ on *M. sativa*; Taft, 14.VII.2013, 1♀ on *P. farcta*; Taft, Nir, 21.VI.2013, 1♀ on *P. harmala*; Taft, Sanich, 26.VII.2013, 9♀♀ on *C. virgata*; Taft, Zeyn abad, 14.VI.2013, 5♀♀ on *A. camelorum*; Yazd, 18.VII.2013, 15♀♀ on *C. arvensis*; Yazd, Najaf abad, 17.V.2013, 1♀, 15.VII.2013, 4♀♀ on *P. harmala*, leg. L. Dehghan.

Distribution: Greece, Turkey (Zanden, 1996; Grace, 2010), new record for Iran.

***Megachile (Eutricharaea) sp.***

Material examined: Iran, Yazd province: Yazd, Gerdefaramarz, 04.VI.2012, 6♂♂ on *C. arietinum*, 4♂♂ on *P. harmala*, leg. L. Dehghan

***Megachile (Megachile) pilicrus (Morawitz, 1877)***

Material examined: Iran, Yazd province: Mehriz, Golafshan, 23. VI.2012, 1♂, 25♀♀ on *C. virgata*; Mehriz, Manshad, 08.VI.2012, 21♂♂, 26♀♀ on *A. lappa*; Mehriz, Dareh, 16.VI.2012, 18♂♂, 66♀♀ on *C. virgata*; Mehriz, Manshad, La, 20.VII.2012, 4♂♂ on *A. dschuparensis*; Taft, Sanich, 01.VII.2012, 1♂ on *C. virgate*; Taft, Shirdeh, 16.VII.2012, 2♀♀ on *A. camelorum*, leg. L. Dehghan.

Distribution: Europe, Greece, Iran, Turkey (Dorn & Weber, 1988; Özbek & Zanden, 1994; Banaszak & Romasenko, 1998; Stöckl, 2002; Amiet *et al.*, 2004; Güler & Cagatay, 2006; Matache & Ban, 2006; Ornos *et al.*, 2007; Ban-Calefariu, 2009; Grace, 2010).

***Megachile (Pseudomegachile) cinnamomea (Alfken, 1926) \****

Material examined: Iran, Yazd province: Bafq, 10.VIII.2011, 2♀♀ on *A. camelorum*; Bafq, Asfij, 06.VI.2012, 1♀ on *A. camelorum*; Mehriz, Mehdi abade bahadoran, 10.VI.2011, 2♀♀ on *A. camelorum*; Taft, Shirdeh, 16.VII.2012, 1♀ on *A. camelorum*; Taft, Zeyn abad, 30.V.2012, 4♀♀ on *A. camelorum*; Sadoogh, Zarch, 03.VI.2012, 4♀♀ on *A. camelorum*; Yazd, Ghasem abad, 13.VI.2012, 30♀♀ on *G. glabra*, 5♀♀ on *A. cepa*; Yazd, Shahedieh, 29.V.2012, 48♀♀ on *P. farcta*, leg. L. Dehghan.

Distribution: North Africa, United Arab Emirates (Grace, 2010; Ascher & Pickering, 2013), new record for Iran.

***Megachile (Pseudomegachile) farinosa (Smith, 1853)***

Material examined: Iran, Yazd province: Bafq, Bahabad, 06.VI.2012, 3♀♀ on *A. camelorum*; Mehriz, bahadoran, 01.VI.2013, 2♀♀ on *A. camelorum*; Mehriz, Golafshan, 23.VI.2012, 4♀♀ on *C. virgata*, *A. lappa*, *E. ilicifolius*; Mehriz, Mehdi abadebahadoran, 10.VI.2012, 2♀♀ on *G. glabra*, 31.V.2013, 2♀♀ on *S. alopecuroides*; Sadoogh, Zarch, 03.VI.2012, 4♀♀ on *A. camelorum*; Taft, Dashtak, 01.VIII.2012, 2♀♀ on *C. virgata*,

26.VII.2013, 3♀♀ on *A. camelorum*; Taft, Nir, 21.VI.2013, 3♀♀ on *C. virgate*; Taft, Rahat abad, 14.VI.2013, 11♀♀ on *C. bruguierana*; Taft, Shirdeh, 16. VII.2012, 1♀ on *H. annuus*; Taft, Tezerjan, 15.VI.2013, 1♀ on *C. virgate*; Taft, Zeyn abad, 30.V.2012, 3♀♀ on *P. farcta*; Yazd,

***Megachile (Eutricharaea) cf. fertoni (Pérez, 1896)***

Material examined: Iran, Yazd province: Yazd, Fajr, 25.IV.2012, 3♀♀ on *C. arvense*, leg. L. Dehghan.

Distribution: Balearctic Islands, Turkey (Ornosa *et al.*, 2007; Grace, 2010).

***Megachile (Eutricharaea) cf. flabellipes (Pérez, 1895)***

Material examined: Iran, Yazd province: Yazd, Fajr, 25.IV.2012, 40♀♀ on *C. arvense*, 20♀♀ on *M. sativa*, leg. L. Dehghan.

Distribution: Southern and Eastern Europe, Greece, Turkey (Ornosa *et al.*, 2007; Grace, 2010).

***Megachile (Eutricharaea) cf. leachella (Curtis, 1828)***

Material examined: Iran, Yazd province: Mehriz, Damgahan, 25.VI.2012, 1♀ on *H. leucocephulum*; Mehriz, Golafshan, 23.VI.2012, 7♀♀ on *M. neglecta*, 8♀♀ on *A. lappa*; Mehriz, Manshad, La, 08.VI.2012, 1♀ on *T. kotschyanus*, 20.VII.2012, 3♀♀ on *A. dschuparensis*; Meybod, Firooz abad, 18.VI.2012, 2♀♀ on *H. annuus*; Sadoogh,

Ashkezar, 08.V.2012, 1♀, 13.VI.2012, 4♀♀ on *A. camelorum*; Sadoogh, Zarch, 06.VI.2012, 6♀♀ on *A. camelorum*; Taft: Shirdeh, 16.VII.2012, 1♀ on *M. sativa*; Taft, Sirdeh, 11.VII.2012, 1♀ on *C. virgata*; Yazd, Akramieh, 05.V.2012, 5♀♀, 07.V.2012, 2♀♀ on *C. arietinum*; Yazd, Dehno, 26.IV.2012, 1♂, 1♀ on *C. arvense*; Yazd, Fahraj, 29.IV.2012, 5♀♀ on *C. cyanus*; Yazd, Fajr, 25.IV.2012, 1♀ on *P. harmala*; Yazd, Gerdefaramarz, 04.VI.2012, 1♀ on *L. draba*; Yazd, Kheyr abad, 02.V.2012, 3♀♀, 17.VI.2012, 1♀ on *F. vulgare*; Yazd, Najaf abad, 06.V.2012, 9♀♀ on *A. graveolens*, leg. L. Dehghan.

Distribution: Europe (Özbek & Zanden, 1994; Banaszak & Romasenko, 1998; Matache & Ban, 2006; Ornosa *et al.*, 2007; Ban-Calefariu, 2009; Grace, 2010).

***Megachile (Eutricharaea) minutissima (Radoszkowski, 1876)***

Material examined: Iran, Yazd province: Ardakan, Aghda, 07.V.2011, 16♂♂, 4♀♀ on *S. cineraria*; Bafq, 03.VII.2011, 1♂, 1♀ on *A. camelorum*; Bafq, Asfij, 24.IV.2012, 1♂, 06.VI.2012, 16♀♀ on *A. camelorum*; Mehriz, Arnan, 19.VII.2013, 1♂ on *R. graveolens*; Mehriz, bahadoran, 01.VI.2013, 1♂, 1♀ on *P. granatum*; Mehriz, Dahook, 04.VII.2013, 2♂♂, 5♀♀ on *S. alopecuroides*; Mehriz, Golafshan, 23.VI.2012, 9♂♂, 1♀ on *H. annuus*; Mehriz, Manshad, 01.VI.2011, 1♂ on *H. annuus*; Mehriz, Mehdi abadebahadoran, 10.VI.2012, 12♂♂, 60♀♀, 31.V.2013, 9♂♂, 20♀♀ on *M. sativa*; Mehriz, Tangechenar, 12.VII.2013, 5♀♀ on *E. sp.*; Meybod, Ebrahim abad, 18.VI.2012, 4♀♀ on *A. camelorum*; Sadoogh, Ashkezar, 08.V.2012, 17♂♂, 13♀♀ on *A. camelorum*; Sadoogh, Kheyr abad, 13.V.2012, 3♂♂, 3♀♀ on *M. sativa*, 13.VI.2012, 2♀♀ on *H. annuus*; Sadoogh, Nodooshan, 02.VIII.2013, 2♀♀ on *C. arvensis*; Sadoogh, Zarch, 03.VI.2012, 18♂♂, 12♀♀ on *A. camelorum*; Taft, 14.VI.2013, 5♀♀ on *A. camelorum*; Taft, Dashtak, 26.VII.2013, 3♂♂, 5♀♀ on *C. virgata*; Taft, Sirdeh, 30.VII.2013, 6♂♂, 2♀♀ on *C. virgata*; Taft, Rahat abad, 19.V.2012, 2♀♀ on *C. bruguierana*; Taft, Tezerjan, 15.VI.2013, 2♂♂ on *C. virgata*; Taft, Zeyn abad, 30.V.2012, 27♂♂, 12♀♀ on *A. camelorum*; Yazd, 25.IV.2011, 1♂, 02.VI.2011, 1♀, 18.VII.2013, 1♀ on *P. harmala*; Yazd, Akramieh, 05.V.2012, 17♂♂, 3♀♀, 07.V.2012, 3♂♂, 1♀ on *L. draba*; Yazd, Bondar abad, 18.V.2012, 9♂♂, 4♀♀ on *A. wilhelmessii*; Yazd, Dehno, 26.IV.2012, 13♂♂ on *C. arvense*, 24.V.2012, 24♂♂, 1♀ on *D. Sophia*; Yazd, Fahraj, 29.IV.2012, 3♂♂ on *C. arietinum*; Yazd, Fajr, 25.IV.2012, 5♂♂ on *P. oleraceae*; Yazd, Gerdefaramarz, 04.VI.2012, 3♀♀ on *A. graveolens*; Yazd, Ghasem abad, 09.V.2012, 5♂♂, 7♀, 10.V.2012, 41♂♂, 33♀♀ on *C. oxyacantha*; Yazd, Hamidia, 01.V.2012, 10♂♂, 3♀♀, 02.V.2012, 2♂♂ on *C. oxyacantha*; Yazd, Hoseyn abaderismani, 12.V.2012, 95♂♂, 39♀♀ on *A. graveolens*; Yazd, Mohammad abad, 20.V.2012, 3♂♂, 3♀♀ on *A. graveolens*; Yazd, Najaf abad, 06.V.2012, 8♀♀, 15.V.2012, 72♂♂, 15♀♀ on *M. sylvestris*, 21.V.2012, 1♂, 25.V.2012, 1♂ on *A. graveolens*, 10.V.2013, 1♀, 17.V.2013, 1♂, 1♀, 15.VII.2013, 2♂♂ on *C. pepo*; Yazd, Shahedieh, 11.V.2012, 15♂♂, 8♀♀ on *G. glabra*, 29.V.2012, 18♂♂, 1♀ on *A. cepa*, leg. L. Dehghan.

***Megachile (Eutricharaea) anatolica (Rebmann, 1968)***

Material examined: Iran, Yazd province: Abarkooh, 03.VII.2011, 1♀ on *A. camelorum*; Mehriz, Damgahan, 30.VI.2012, 3♀♀ on *H. leucocephulum*, 08.VII.2012, 3♀♀ on *C. virgata*; Mehriz, Honza, 22.V.2012, 1♀ on *A. wilhelmessii*; Sadoogh, 10.V.2012, 1♀ on *A. camelorum*; Sadoogh, Zarch, 03.VI.2012, 16♀♀ on *A. camelorum*; Taft, Dashtak, 01.VIII.2012, 1♀ on *A. camelorum*; Taft, Rahat abad, 13.V.2012, 3♀♀ on *C. bruguierana*, 19.V.2012, 3♀♀ on *A. camelorum*; Taft, Sanich, 01.VII.2012, 9♀♀ on *C. virgata*; Taft, Shirdeh, 16.VII.2012, 1♀ on *A. camelorum*; Taft, Zeyn abad, 30.V.2012, 7♀♀ on *A. camelorum*; Yazd, Bondar abad, 18.V.2012, 2♀♀ on *C. cyanus*, 2♀♀ on *C. oxyacantha*; Yazd, Hoseyn abade rismani, 12.V.2012, 7♀♀ on *P. harmala*; Yazd, Mohammad abad, 20.V.2012, 5♀♀ on *M. sativa*; Yazd, Najaf abad, 16.V.2012, 1♀ on *A. graveolens*, 1♀ on *P. oleraceae*, 1♀ on *L. draba*, 21.V.2012, 2♀♀ on *C. pepo*; Yazd, Shahedieh, 29.V.2012, 2♀♀ on *P. farcta*, leg. L. Dehghan.

Distribution: Greece, Turkey (Grace, 2010).

***Megachile (Eutricharaea) apicalis (Spinola, 1808)***

Material examined: Iran, Yazd province: Yazd, Fajr, 25.IV.2012, 6♀♀ on *C. arvensis*, leg. L. Dehghan.

Distribution: Canada, Cyprus, Greece, North Africa, Palestine, Turkey (Dorn & Weber 1988; Özbek & Zanden, 1994; Banaszak & Romasenko, 1998; Stöckl, 2002; Amiet *et al.*, 2004; Ornosa *et al.*, 2007; Ban-Calefariu, 2009; Grace, 2010).

***Megachile (Eutricharaea) basilaris (Mavromoustakis, 1952) \****

Material examined: Iran, Yazd province: Yazd, Najaf abad, 06.V.2012, 2♀♀ on *P. harmala*, leg. L. Dehghan.

Distribution: Cyprus, Turkey, Uzbekistan (Grace, 2010; Ascher & Pickering, 2013), new record for Iran.

***Megachile (Eutricharaea) cf. concinna (Smith, 1879)***

Material examined: Iran, Yazd province: Yazd, Gerdefaramarz, 04.VI.2012, 10♀♀ on *M. sativa*, leg. L. Dehghan.

Distribution: Holarctic (Ascher & Pickering, 2013), new record for Iran.

***Megachile (Eutricharaea) deceptoria (Pérez, 1890)***

Material examined: Iran, Yazd province: Bafq, Asfij, 24.IV.2012, 5♂♂ on *A. camelorum*; Mehriz, Damgahan, 25.VI.2012, 1♂ on *C. virgata*; Mehriz, Golafshan, 23.VI.2012, 2♂♂ on *S. alopecuroides*; Meybod, Ebrahim abad, 18.V.2012, 2♂♂ on *A. camelorum*; Sadoogh, 10.V.2012, 7♂♂ on *A. camelorum*; Sadoogh, Ashkezar, 08.V.2012, 3♂♂ on *A. camelorum*; Sadoogh, Khezr abad, 13.V.2012, 1♂, 13.VI.2012, 1♂ on *M. sativa*; Sadoogh, Zarch, 03.VI.2012, 1♂ on *P. farcta*; Taft, Dashtak, 26.VII.2013, 1♂ on *A. camelorum*; Taft, Rahat abad, 16.V.2012, 2♂♂, 19.V.2012, 4♂♂ on *C. bruguierana*; Taft, Sirdeh, 30.VII.2013, 1♂ on *A. camelorum*; Taft, Zeyn abad, 30.V.2012, 6♂♂ on *A. camelorum*; Yazd, Akramieh, 07.V.2012, 7♂♂ on *D. Sophia*; Yazd, Dehno, 26.IV.2012, 4♂♂, 05.V.2012, 5♂♂, 24.V.2012, 7♂♂ on *C. arvensis*; Yazd, Fahraj, 29.IV.2012, 3♂♂ on *C. arvensis*; Yazd, Gerdefaramarz, 04.VI.2012, 1♂ on *C. cyanus*; Yazd, Ghasem abad, 09.V.2012, 2♂♂ on *P. harmala*; Yazd, Hamidia, 01.V.2012, 3♂♂, 02.V.2012, 12♂♂ on *L. draba*; Yazd, Hoseyn abaderismani, 12.V.2012, 18♂♂ on *A. wilhelmessii*; Yazd, Mohammad abad, 20.V.2012, 5♂♂ on *P. oleraceae*; Yazd, Najaf abad, 06.V.2012, 14♂♂ on *P. oleraceae*, 15.V.2012, 2♂♂, 21.V.2012, 5♂♂ on *C. oxyacantha*, 25.V.2012, 2♂♂ on *A. graveolens*, 05.VII.2013, 2♂♂ on *C. pepo*; Yazd, Shahedieh, 29.V.2012, 1♂ on *G. glabra*, 1♂ on *A. cepa*, leg. L. Dehghan.

Distribution: Europe, Greece, Turkey (Özbek & Zanden, 1994; Banaszak & Romasenko, 1998; Ornosa *et al.*, 2007; Grace, 2010).

***Coelioxys (Coelioxys) conoidea (Illiger, 1806)***

Material examined: Iran, Yazd province: Mehriz, Damgahan, 03.VII.2013, 1♂ on *H. leucocephalum*; Mehriz, Mehdi abadebahadoran, 01.VI.2013, 1♂ on *A. camelorum*; Taft, Dashtak, 26.VII.2013, 3♀♀ on *A. camelorum*; Taft, Sirdeh, 30.VII.2013, 1♀ on *A. camelorum*, leg. L. Dehghan. Cleptoparasite of *Chalicodoma ericetorum*, *M. lagopoda* (Linnaeus, 1761), *M. maritima* (Kirby, 1802) (Warncke, 1992; Banaszak & Romasenko, 1998; Amiet *et al.*, 2004).

Distribution: Cyprus, Europe, Greece, Iran, North Africa, Turkey (Morice, 1921; Alfken, 1935; Warncke, 1992; Banaszak & Romasenko, 1998; Amiet *et al.*, 2004; Wu, 2006; Grace, 2010).

***Coelioxys (Liothyrapis) decipiens (Spinola, 1838)***

Material examined: Iran, Yazd province: Mehriz, Mehdi abadebahadoran, 10.VI.2012, 13♂♂, 2♀♀ on *A. camelorum*, 02.VI.2013, 2♂♂ on *A. camelorum*, 1♂ on *P. granatum*; Meybod, Ebrahim abad, 18.VI.2012, 6♂♂ on *A. camelorum*; Sadoogh: 10.V.2012, 1♀ on *A. camelorum*; Sadoogh, Ashkezar, 08.V.2012, 1♂ on *A. camelorum*; Sadoogh, Zarch, 06.VI.2012, 12♂♂, 1♀ on *A. camelorum*; Taft, Zeyn abad, 30.V.2012, 14♂♂, 3♀♀ on *P. farcta*; Yazd, Ahmad abad, 05.V.2012, 2♂♂, 1♀, 05.VI.2012, 2♂♂, 1♀ on *C. arvensis*; Yazd, Bondar abad, 18.V.2012, 1♀ on *C. arvensis*; Yazd, Dehno, 24.V.2012, 16♂♂ on *C. arvensis*; Yazd, Gerdefaramarz, 04.VI.2012, 3♂♂ on *P. oleraceae*; Yazd, Ghasem abad, 12.V.2012, 3♂♂ on *A. graveolens*; Yazd, Hamidia, 01.V.2012, 5♂♂ on *L. draba*; Yazd, Najaf abad, 15.V.2012, 2♂♂ on *P. harmala*, 2♂♂ on *C. cyanus*, 2♂♂ on *M. sativa*, 1♂ on *C. pepo*; Yazd, Shahedieh, 29.V.2012, 1♂ on *T. kotschyanus*, 5♂♂ on *G. glabra*, 3♀♀ on *A. cepa*, leg. L. Dehghan. Cleptoparasite of *M. nigripes* (Spinola, 1838), *M. flavipes* (Warncke, 1992).

Distribution: Central Asia, China, Cyprus, Egypt, Germany, Greece, India, Middle East, Northern Africa, Palestine, Turkey (Warncke, 1992; Gupta, 1993; Wu, 2006; Grace, 2010).

***Coelioxys (Mesocoelioxys) argentea (Lepelletier, 1841)***

Material examined: Iran, Yazd province: Mehriz, Mehdi abadebahadoran, 10.VI.2012, 1♂, 02.VI.2013, 3♀♀ on *P. granatum*; Meybod, Ebrahim abad, 18.VI.2012, 3♂♂ on *A. camelorum*; Taft, Tezerjan, 15.VI.2013, 1♂, 1♀ on *C. virgata*, leg. L. Dehghan. Cleptoparasite of *M. (Creightonella) albisecta* (Grace, 2010).

Distribution: Cyprus, Greece, Palestine, Turkey (Grace, 2010).

***Coelioxys sp.***

Material examined: Iran, Yazd province: Mehriz, Mehdi abadebahadoran, 02.VI.2013, 1♂ on *C. virgata*; Yazd, Ghasem abad, 12.V.2012, 1♂ on *C. virgate*, leg. L. Dehghan.

***Megachile (Creightonella) albisecta (Klug, 1817)***

Material examined: Iran, Yazd province: Mehriz, Manshad, 08.VI.2012, 3♂♂, 10♀♀ on *A. lappa*; Meybod, Firooz abad, 18.VI.2012, 6♂♂, 6♀♀ on *H. annuus*, leg. L. Dehghan.

Distribution: Cyprus, Europe, Greece, Iran, North Africa, Palestine, Turkey (Dorn & Weber, 1988; Özbek & Zanden, 1994; Banaszak & Romasenko, 1998; Stöckl, 2000; Ormosa *et al.*, 2007; Ban-Calefariu, 2009; Grace, 2010; Khodaparast & Monfared, 2012).

***Megachile (Creightonella) sp.***

Material examined: Iran, Yazd province: Taft, Sirdeh, 30.VII.2013, 7♀♀ on *C. tinctorius*, leg. L. Dehghan.

1♂ on *A. camelorum*; Taft, Nir, 21.VI.2013, 2♂♂ on *A. camelorum*; Taft, Rahat abad, 19.V.2012, 1♂, 14.VI.2013, 2♂♂, 1♀, 14.VII.2013, 1♂ on *C. bruguierana*; Taft, Saleh abad, 28.VI.2013, 4♂♂ on *P. farcta*; Taft, Sanich, 01.VII.2012, 2♂♂ on *C. virgata*; Taft, Shirdeh, 16.VII.2012, 2♂♂ on *A. camelorum*; Taft, Sirdeh, 11.VII.2012, 2♂♂ on *A. camelorum*; Yazd, Najaf abad, 24.IV.2012, 2♂♂, 17. V.2013, 1♂, 1♀ on *C. arvense*; Yazd, Shahedieh, 29.V.2012, 1♂ on *G. glabra*; Yazd, Sharaf abad, 24.VI.2012, 19♂♂ on *A. cepa*, leg. L. Dehghan.

Distribution: Central Asia, Iran, Lebanon, Turkey (Warncke, 1980b; Grace, 2010).

***Icterantheidium ovasi* (Warncke, 1980) \***

Material examined: Iran, Yazd province: Mehriz, Damgahan, 30.VI.2012, 2♀♀ on *H. leucocephulum*, leg. L. Dehghan.

Distribution: Turkey (Grace, 2010), new record for Iran.

***Stelis (Protostelis) signata* (Latreille, 1809)**

Material examined: Iran, Yazd province: Taft, Sanich, 01.VII.2012, 1♀ on *C. virgata*, leg. L. Dehghan. Cleptoparasite of *A. strigatum*.

Distribution: Europe, Greece, Iran, Iraq, Lebanon, Palestine, Turkey (Warncke, 1992b; Grace, 2010).

**Tribe: Dioxyini**

***Metadioxys formosa* (Morawitz, 1875)**

Material examined: Iran, Yazd province: Mehriz, Damgahan, 03.VII.2013, 1♀ on *H. leucocephulum*; Taft, Nir, 21.VI.2013, 2♂♂ on *C. bruguierana*; Taft, Saleh abad, 28.VI.2013, 7♂♂ on *C. bruguierana*, leg. L. Dehghan. Cleptoparasite of Anthidiini (Michener, 2007).

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

**Tribe: Megachilini**

***Coelioxys (Allocoelioxys) afra* (Lepeletier, 1841)**

Material examined: Iran, Yazd province: Bafq, 24.VI.2011, 4♀♀ on *A. camelorum*; Mehriz, Mehdi abadebahadoran, 31.V.2013, 2♂♂, 2♀♀ on *P. granatum*; Taft, Sirdeh, 30.VII.2013, 3♂♂ on *C. virgata*, leg. L. Dehghan. Cleptoparasite of *Megachile pilidens* Alfken, 1924, *M. leachella* Curtis, 1828, *M. apicalis* Spinola, 1808 (Warncke, 1992; Banaszak & Romasenko, 1998; Amiet *et al.*, 2004).

Distribution: Caucasus, Central Asia, Cyprus, England, Egypt, Europe, Greece, Iran, Northern Africa, Palestine, Turkey (Warncke, 1992; Banaszak & Romasenko, 1998; Amiet *et al.*, 2004; Ortiz-Sánchez *et al.*, 2009; Grace, 2010; Khaghaninia *et al.*, 2010).

***Coelioxys (Allocoelioxys) brevis* (Eversmann, 1852)**

Material examined: Iran, Yazd province: Mehriz, Golafshan, 23.VI.2012, 2♂♂ on *M. sativa*; Mehriz, Mehdi abadebahadoran, 01.VI.2013, 5♀♀ on *A. camelorum*; Taft, Rahat abad, 14.VI.2013, 2♂♂, 2♀♀ on *P. harmala*; Yazd, Shahedieh, 29.V.2012, 6♂♂ on *A. camelorum*, leg. L. Dehghan. Cleptoparasite of *M. pilidens*, *M. apicalis*, *M. leachella* (Warncke, 1992; Banaszak & Romasenko, 1998; Amiet *et al.*, 2004).

Distribution: Caucasus, Central Asia, Cyprus, Europe, Greece, Iran, Northern Africa, Palestine, Turkey (Morice, 1921; Warncke, 1992; Banaszak & Romasenko, 1998; Amiet *et al.*, 2004; Ortiz-Sánchez *et al.*, 2009; Grace, 2010).

***Anthidium (Anthidium) gussakovskiji (Mavromoustakis, 1939)***

Material examined: Iran, Yazd province: Mehriz, Damgahan, 14.VII.2012, 1♀ on *H. leucocephulum*, leg. L. Dehghan.

Distribution: Iran, Turkey (Warncke, 1981; Grace, 2010).

***Anthidium (Anthidium) soikai (Mavromoustakis, 1968)***

Material examined: Iran, Yazd province: Mehriz, Damgahan, 03.VII.2013, 1♂ on *H. leucocephulum*; Taft, Dashtak, 26.VII.2013, 1♀ on *A. camelorum*, leg. L. Dehghan.

Distribution: Iran (Warncke, 1981; Grace, 2010).

***Anthidium (Anthidium) taeniatum (Latreille, 1809)***

Material examined: Iran, Yazd province: Bafq, 14.VI.2011, 1♂ on *M. sativa*, leg. L. Dehghan.

Distribution: Attica, Greece, Iran, Palestine, Turkey (Warncke, 1981; Grace, 2010).

***Anthidium (Anthidium) wüstneii (Mocsary, 1887)***

Material examined: Iran, Yazd province: Mehriz, Damgahan, 27.VI.2012, 11♂♂ on *H. leucocephulum*, 03.VII.2013, 27♂♂ on *G. aparin*; Mehriz, Madvar, 08.VII.2012, 20♂♂ on *C. virgata*; Taft, Dashtak, 26.VII.2013, 1♂ on *A. camelorum*, 1♂ on *M. longifolia*, 1♂ on *C. iberica*, leg. L. Dehghan.

Distribution: Greece, Iran, Lebanon, Syria, Turkey (Warncke, 1981; Grace, 2010).

***Anthidium (Gulanthidium) anguliventre (Morawitz, 1888)***

Material examined: Iran, Yazd province: Mehriz, Damgahan, 14.VII.2012, 1♀ on *H. leucocephulum*; Taft, Nir, 21.VI.2013, 13♂♂, 9♀♀ on *G. aparin*; Taft, Rahat abad, 14.VI.2013, 2♂♂, 2♀♀, 14.VII.2013, 6♂♂, 10♀♀ on *C. bruguierana*; Taft, Saleh abad, 28.VI.2013, 15♂♂, 17♀♀ on *C. bruguierana*; Taft, Tezerjan, 15.VI.2013, 1♀ on *C. virgata*; Yazd, Dehno, 24.V.2013, 3♀♀ on *C. arvense*; Yazd, Najaf abad, 17.V.2013, 1♀, 15.VII.2013, 1♂, 1♀ on *C. arvense*, leg. L. Dehghan.

Distribution: Central Asia, Iran, Lebanon, Pakistan, Palestine, Syria, Turkey (Warncke, 1980b; Warncke, 1981; Grace, 2010).

***Anthidium (Gulanthidium) rotundum (Warncke, 1980)***

Material examined: Iran, Yazd province: Mehriz, Damgahan, 03.VII.2013, 6♂♂; Taft, Nir, 21.VI.2013, 11♂♂; Taft, Saleh abad, 28.VI.2013, 15♂♂; Taft, Rahat abad, 14.VII.2013, 5♂♂, all specimens were collected on *C. bruguierana*, leg. L. Dehghan.

Distribution: Egypt, Greece, Iran, Lebanon, Syria, Turkey (Warncke, 1980; Warncke, 1981; Grace, 2010; Grace, 2010; Ascher & Pickering, 2013).

***Icteranthidium ferrugineum discoidale (Latreille, 1809)***

Material examined: Iran, Yazd province: Bafq, 30.V.2011, 2♂♂ on *P. farcta*; Mehriz, Damgahan, 30.VI.2012, 1♂ on *H. leucocephulum*; Mehriz, Madvar, 08.VII.2012, 2♂♂ on *T. kotschyanus*; Mehriz, Manshad, 20.VII.2012, 2♂♂ on *T. kotschyanus*; Taft, 30.V.2012, 1♂ on *P. farcta*; Taft, Nir, 21.VI.2013, 2♂♂ on *P. farcta*; Taft, Sanich, 01.VII.2012, 3♂♂ on *C. virgata*; Yazd, Shahedieh, 24.VI.2012, 8♀♀ on *T. kotschyanus*, leg. L. Dehghan.

Distribution: Cyprus, Iran, Turkey (Warncke, 1981; Grace, 2010).

***Icteranthidium limbiferum (Morawitz, 1875)***

Material examined: Iran, Yazd province: Bafq, 30.V.2011, 2♂♂ on *A. camelorum*; Mehriz, Damgahan, 27.VI.2012, 1♂ on *H. leucocephulum*; Mehriz, Madvar, 08.VII.2012, 5♂♂ on *A. camelorum*; Mehriz, Manshad, 05.VI.2011, 1♂ on *A. dschuparensis*, 20.VII.2012, 1♂ on *T. kotschyanus*, 1♂ on *A. lappa*; Sadoogh, Zarch, 3.VI.2012, 1♂ on *A. camelorum*; Taft, 30.V.2012,

on *H. annuus*, *M. sativa*; Yazd, Najaf abad, 15.VII.2013, 7♂♂, 4♀♀ on *M. sativa*; Yazd, Shahedieh, 29.V.2012, 2♂♂ on *A. camelorum*, 2♂♂ on *S. alopecuroides*, 1♂ on *T. kotschyanus*, 1♂ on *G. glabra*, 1♂ on *M. sylvestris*, leg. L. Dehghan.

Distribution: Cyprus, Greece, Iran, Lebanon, Palestine, Syria, Turkey (Cockrell, 1910; Warncke, 1980a; Van der Zanden 1986; Banaszak & Romasenko, 1998; Amiet *et al.*, 2004; Grace, 2010).

### Tribe: Anthidiini

#### ***Afrantheidium (Mesanthidium) carduele (Morawitz, 1876)***

Material examined: Iran, Yazd province: Bafq, 26.VIII.2013, 10♂♂, 6♀♀ on *A. camelorum*; Mehriz: Dahook, 04.VII.2013, 7♂♂ on *A. camelorum*; Mehriz, Damgahan, 03.VII.2012, 1♂ on *H. leucocephulum*, 03.VII.2013, 1♂ on *T. polium*; Mehriz, Manshad, 24.VI.2013, 9♂♂ on *C. virgata*; Mehriz, Tangechenar, 12.VII.2013, 1♂ on *A. dschuparensis*; Taft, Dashtak, 26.VII.2013, 3♂♂ on *A. camelorum*, leg. L. Dehghan.

Distribution: Greece, Iran, Palestine, Syria, Turkey (Warncke, 1981; Grace, 2010).

#### ***Anthidiellum (Anthidiellum) strigatum (Panzer, 1805)***

Material examined: Iran, Yazd province: Taft, Dashtak, 26.VII.2013, 6♂♂, 4♀♀ on *A. camelorum*; Taft, Nir, 21.VI.2013, 1♂, 1♀ on *A. camelorum*; Taft, Rahat abad, 24.VII.2013, 4♂♂ on *C. bruguierana*; Taft, Sakhvid, 31.VII.2013, 1♂ on *A. camelorum*; Taft, Sanich, 11.VIII.2012, 3♂♂ on *C. virgata*; Taft, Sirdeh, 11.VII.2012, 2♂♂, 30.VII.2013, 2♂♂, 3♀♀ on *A. camelorum*; Yazd, 18.VII.2013, 1♂, 1♀ on *M. sativa*; Yazd, Abrand abad, 20.VII.2013, 1♂ on *P. lancqolata*, 22.VII.2013, 1♀ on *H. leucocephulum*; Yazd, Najaf abad, 15.VII.2013, 1♂ on *M. sativa*, leg. L. Dehghan.

Distribution: Central Asia, Cyprus, Europe, Greece, Iran, Iraq, Lebanon, North Aferica, Palestine, Russia, Syria, Turkey (Warncke, 1980b; Banaszak & Romasenko, 1998; Stöckl, 2000; Amiet *et al.*, 2004; Proshchalykin, 2007; Grace, 2010).

#### ***Anthidium (Anthidium) florentinum (Fabricius, 1775)***

Material examined: Iran, Yazd province: Ardakan, 15.V.2011, 5♂♂, 11♀♀ on *H. annuus*; Ardakan, Aghda, 30.IV.2011, 18♂♂ on *A. camelorum*; Bafq, 07.VI.2013, 4♂♂, 1♀ on *A. camelorum*; Mehriz, bahadoran, 01.VI.2013, 2♂♂, 10♀♀ on *A. Camelorum*; Mehriz, Harafteh, 14.VIII.2013, 12♂♂ on *M. sativa*; Mehriz, Khormiz, 02.VI.2013, 1♂, 9♀♀ on *M. sativa*; Mehriz, Madvar, 12.VIII.2013, 10♂♂ on *M. sativa*; Mehriz, Manshad, 04.VII.2013, 2♂♂ on *M. sylvestris*, 2♀♀ on *C. virgata*; Mehriz, Mehdi abadebahadoran, 10.VI.2011, 1♂ on *A. camelorum*, 31.V.2013, 1♂ on *A. camelorum*, 7♂♂ on *P. granatum*, 20♀♀ on *C. melo* var. *reticulates*; Sadoogh, Nodooshan, 02.VIII.2013, 25♂♂, 4♀♀ on *A. camelorum*; Sadoogh, Zarch, 05.V.2011, 10♂♂, 1♀, 06.VI.2012, 12♂♂ on *A. camelorum*; Taft, 14.VII.2013, 3♂♂, 4♀♀ on *P. farcta*; Taft, Dashtak, 16.VII.2012, 3♂♂, 5♀♀, 26.VII.2013, 10♂♂, 3♀♀ on *A. camelorum*; Taft, Nir, 21.VI.2013, 1♂ on *M. sativa*; Taft, Rahat abad, 14.VI.2013, 2♂♂ on *M. sativa*, 1♀ on *C. bruguierana*; Taft, Saleh abad,

28.VI.2013, 1♀ on *M. sativa*; Sanich, 01.VIII.2012, 2♂♂, 1♀ on *C. virgate*; Taft, Shirdeh, 10.VIII.2013, 1♂ on *A. camelorum*; Taft, Sirdeh, 11.VII.2012, 3♂♂, 3♀♀ on *A. camelorum*, 30.VII.2013, 4♂♂, 1♀ on *M. sativa*; Taft, Tezerjan, 15.VI.2013, 5♂♂, 4♀♀ on *C. virgata*; Yazd, 17.VI.2012, 29♂♂, 5♀♀, 18.VII.2013, 12♂♂, 2♀♀ on *A. retroflexush*; Yazd, Abrand abad, 22.VII.2013, 1♂ on *M. sativa*; Yazd, Kheyr abad, 09.VI.2012, 18♂♂, 6♀♀, 20.VII.2013, 2♂♂ on *M. sativa*; Yazd, Najaf abad, 05.VII.2013, 11♂♂, 3♀♀, 15.VII.2013, 3♂♂ on *M. sativa*, 4♂♂ on *M. sylvestris*, leg. L. Dehghan.

Distribution: Centarl Asia, Cyprus, Greece, Iran, Lebanon, Macedonia, Palestine, Southern and Central Europe, Syria, Turkey (Warncke, 1980b; Banaszak & Romasenko, 1998; Stöckl, 2000; Amiet *et al.*, 2004; Grace, 2010).



## Results

A total of 55 species of megachilid bees belonging to 2 subfamilies, 6 tribes and 13 genera are listed here in association with 50 plant species. The bee species and their plant associations are presented as follows:

*Pararhophites orobinus*, *Lithurgus* (*Lithurgus*) *chrysurus*, *Afranthidium* (*Mesanthidium*) *carduele*, *Anthidiellum* (*Anthidiellum*) *strigatum*, *Anthidium* (*Anthidium*) *florentinum*, *Anthidium* (*Anthidium*) *gussakovskiji*, *Anthidium* (*Anthidium*) *soikai*, *Anthidium* (*Anthidium*) *taeniatum*, *Anthidium* (*Anthidium*) *wüstneii*, *Anthidium* (*Gulanthidium*) *anguliventre*, *Anthidium* (*Gulanthidium*) *rotundum*, *Icteranthidium ferrugineum discoidale*, *Icteranthidium limbiferum*, *Icteranthidium ovasi*, *Stelis* (*Protostelis*) *signata*, *Metadioxys formosa*, *Coelioxys* (*Allocoelioxys*) *afra*, *Coelioxys* (*Allocoelioxys*) *brevis*, *Coelioxys* (*Coelioxys*) *conoidea*, *Coelioxys* (*Liothyraxis*) *decipiens*, *Coelioxys* (*Mesocoelioxys*) *argentea*, *Coelioxys* sp., *Megachile* (*Creightonella*) *albisecta*, *Megachile* (*Creightonella*) sp., *Megachile* (*Eutricharaea*) *anatolica*, *Megachile* (*Eutricharaea*) *apicalis*, *Megachile* (*Eutricharaea*) *basilaris*, *Megachile* (*Eutricharaea*) cf. *concinna*, *Megachile* (*Eutricharaea*) *deceptoria*, *Megachile* (*Eutricharaea*) cf. *fertoni*, *Megachile* (*Eutricharaea*) cf. *flabellipes*, *Megachile* (*Eutricharaea*) cf. *leachella*, *Megachile* (*Eutricharaea*) *minutissima*, *Megachile* (*Eutricharaea*) *rotundata*, *Megachile* (*Eutricharaea*) *semicircularis*, *Megachile* (*Eutricharaea*) sp., *Megachile* (*Megachile*) *pilicrus*, *Megachile* (*Pseudomegachile*) *cinnamomea*, *Megachile* (*Pseudomegachile*) *farinose*, *Megachile* (*Pseudomegachile*) *flavipes*, *Megachile* (*Pseudomegachile*) *foersteri*, *Megachile* (*Pseudomegachile*) *rubripes*, *Megachile* (*Pseudomegachile*) *sanguinipes*, *Megachile* (*Pseudomegachile*) *saussurei*, *Megachile* (*Pseudomegachile*) *schnabli*, *Megachile* (*Pseudomegachile*) *seraxensis*, *Megachile* (*Pseudomegachile*) cf. *tecta*, *Megachile* (*Xanthosarus*) *maritime*, *Radoszkowskiana barrei*, *Heriades* (*Michenerella*) *hissaricus*, *Osmia* (*Helicosmia*) *caerulescens*, *Osmia* (*Helicosmia*) *fasciata*, *Osmia* (*Helicosmia*) *peregrine*, *Osmia* (*Helicosmia*) *signata*, *Osmia* (*Osmia*) *cornuta*.

### Subfamily: Fideliinae

#### Tribe: Pararhophitini

##### *Pararhophites orobinus* (Morawitz, 1876)

Material examined: Iran, Yazd province: Mehriz, Fakhr abad, 22.V.2012, 1♀ on *P. harmala*; Taft, Rahat abad, 16.V.2012, 6♀♀, 19.V.2012, 10♀♀ on *P. harmala*; Yazd, Ghasem abad, 03.V.2013, 20♀♀ on *P. harmala*; Yazd, Mohammad abad, 20.V.2012, 1♀ on *P. harmala*; Yazd, Najaf abad, 09.V.2012, 1♂ on *A. graveolens*, 10.V.2013, 10♀♀ on *P. harmala*, 17.V.2013, 1♀ on *C. oxyacantha*, leg. L. Dehghan.

Distribution: Egypt, Iran (Isfahan, Fars, Samnan), Sinai (Michener, 2007; Grace, 2010; Ascher & Pickering, 2013).

### Subfamily: Megachilinae

#### Tribe: Lithurgini

##### *Lithurgus* (*Lithurgus*) *chrysurus* (Fonscolombe, 1834)

Material examined: Iran, Yazd province: Abarkoh, 17.V.2011, 1♂ on *A. camelorum*; Ardakan, Aghda, 15.VI.2011, 1♂ on *R. graveolens*; Mehriz, Golafshan, 18.VII.2011, 1♀, 23.VI.2012, 18♂♂ on *E. ilicifolius*; Mehriz, Manshad, 02.VII.2011, 5♂♂, 1♀, 08.VI.2012, 1♂, 20.VII.2012, 1♂, 24.VI.2013, 5♂♂, 6♀♀ on *A. lappa*, 04.VII.2013, 4♂♂ on *E. ilicifolius*, 1♀ on *M. sylvestris*; Mehriz, Manshad, La, 6.VII.2011, 2♂♂ on *T. kotschyanus*, 2♂♂ on *A. dschuparensi*; Mehriz, Dareh, 16.VI.2012, 23♂♂, 2♀♀ on *E. ilicifolius*;

Mehriz, Tangechenar, 12.VII.2013, 6♂♂, 5♀♀ on *A. camelorum*; Sadoogh, Zarch, 06.VI.2012, 1♂ on *A. camelorum*; Taft, Dehbala, 26.VI.2012, 12♂♂, 7♀♀ on *C. virgata*; Taft, Nir, 21.VI.2013, 1♀ on *A. camelorum*; Taft, Rahat abad, 14.VI.2013, 1♀ on *C. bruguierana*, 2♀♀ on *A. camelorum*; Taft, Saleh abad, 28.VI.2013, 7♀♀ on *A. camelorum*; Taft, Sanich, 01.VII.2012, 8♂♂, 8♀♀ on *C. virgata*; Taft, Shirdeh, 16.VII.2012, 2♂♂, 8♀♀ on *A. camelorum*, 11.VII.2012, 5♂♂, 20♀♀ on *A. camelorum*; Taft, Tezerjan, 15.VI.2013, 2♀♀ on *C. virgata*; Yazd, Kheyr abad, 17.VI.2012, 3♂♂

**Table 1- Geographical characteristics of sampling localities in Yazd province of Iran during 2011-2013**

Locality	Geographical coordinates	Altitude (m)
Abarkuh	30°09'N, 52°48'E	1510
Ardakan, Aghda	32°21' N, 53°50' E	1020
Bafq	31°37'N, 55°22'E	994
Bafq, Asfij	31°40'N, 56°13'E	1900
Mehriz, Arnan	31°19'N, 54°10'E	1990
Mehriz, Bandakosadat	31°34'N, 54°72'E	2071
Mehriz, Dahook	31°34'N, 54°28'E	1450
Mehriz, Damgahan	31°31'N, 54°19'E	1970
Mehriz, Darah	31°33'N, 54°14'E	2364
Mehriz, Fakhr abad	31°36'N, 54°15'E	1821
Mehriz, Golafshan	31°31'N, 54°11'E	2432
Mehriz, Harofteh	31°39'N, 54°31'E	1398
Mehriz, Honza	31°38'N, 54°13'E	1980
Mehriz, Khormiz	31°31'N, 54°12'E	2364
Mehriz, Madvar	31°31'N, 54°12'E	2422
Mehriz, Manshad	31°31'N, 54°12'E	2422
Mehriz, Manshad, La	31°32'N, 54°14'E	2179
Mehriz, Mehdi abadebahadoran	31°22'N, 54°53'E	1478
Mehriz, Sar Yazd	31°36'N, 54°31'E	1380
Mehriz, Tangechenar	31°31'N, 54°16'E	2248
Meybod, Ebrahim abad	32°06'N, 54°05'E	1168
Meybod, Firooz abad	32°01'N, 54°12'E	1273
Sadoogh	32°03'N, 54°10'E	1930
Sadoogh, Ashkezar	31°59'N, 54°11'E	1165
Sadoogh, Khezr abad	31°51'N, 53°57'E	1710
Sadoogh, Nodooshan	32°02'N, 53°33'E	1931
Sadoogh, Zarch	31°58'N, 54°13'E	1188
Taft, Ali abad	31°42' N, 54°02' E	2042
Taft, Dashtak	31°39'N, 54°01'E	2214
Taft, Dehbala	31°37'N, 54°07'E	2409
Taft, Nir	31°35'N, 54°11'E	2436
Taft, Rahat abad	31°44' N, 54°10' E	1574
Taft, Saleh abad	31°30'N, 54°45'E	2112
Taft, Sakhvid	31°39'N, 53°58'E	2260
Taft, Sanich	31°36'N, 53°59'E	2328
Taft, Shirdeh	31°39'N, 54°01'E	2300
Taft, Sirdeh	31°40'N, 53°58'E	2280
Taft, Tezerjan	31°36'N, 54°11'E	2100
Taft, Zeyn abad	31°48' N, 54°15' E	1410
Yazd	31°40'N, 54°18'E	1218
Yazd, Abrand abad	31°57'N, 54°16'E	1196
Yazd, Ahmad abad	31°48'N, 54°28'E	1250
Yazd, Akramieh	31°52'N, 54°24'E	1226
Yazd, Bondar abad	32°02'N, 54°07'E	1150
Yazd, Dehno	31°48'N, 54°25'E	1246
Yazd, Fahraj	31°46'N, 54°35'E	1270
Yazd, Gerdefarmarz	31°57' N, 54°17' E	1197
Yazd, Ghasem abad	31°54' N, 54°13' E	1290
Yazd, Hamidia	31°49' N, 54°23' E	1247
Yazd, Hoseyn abaderismani	31°50'N, 54°25'E	1239
Yazd, Kheyr abad	31°51'N, 54°19'E	1275
Yazd, Mohamad abad	31°47'N, 54°25'E	1256
Yazd, Najaf abad	31°50' N, 54°23' E	1282
Yazd, Shahedieh	31°56'N, 54°18'E	1196
Yazd, Sharaf abad	32°05' N, 54°08' E	1135

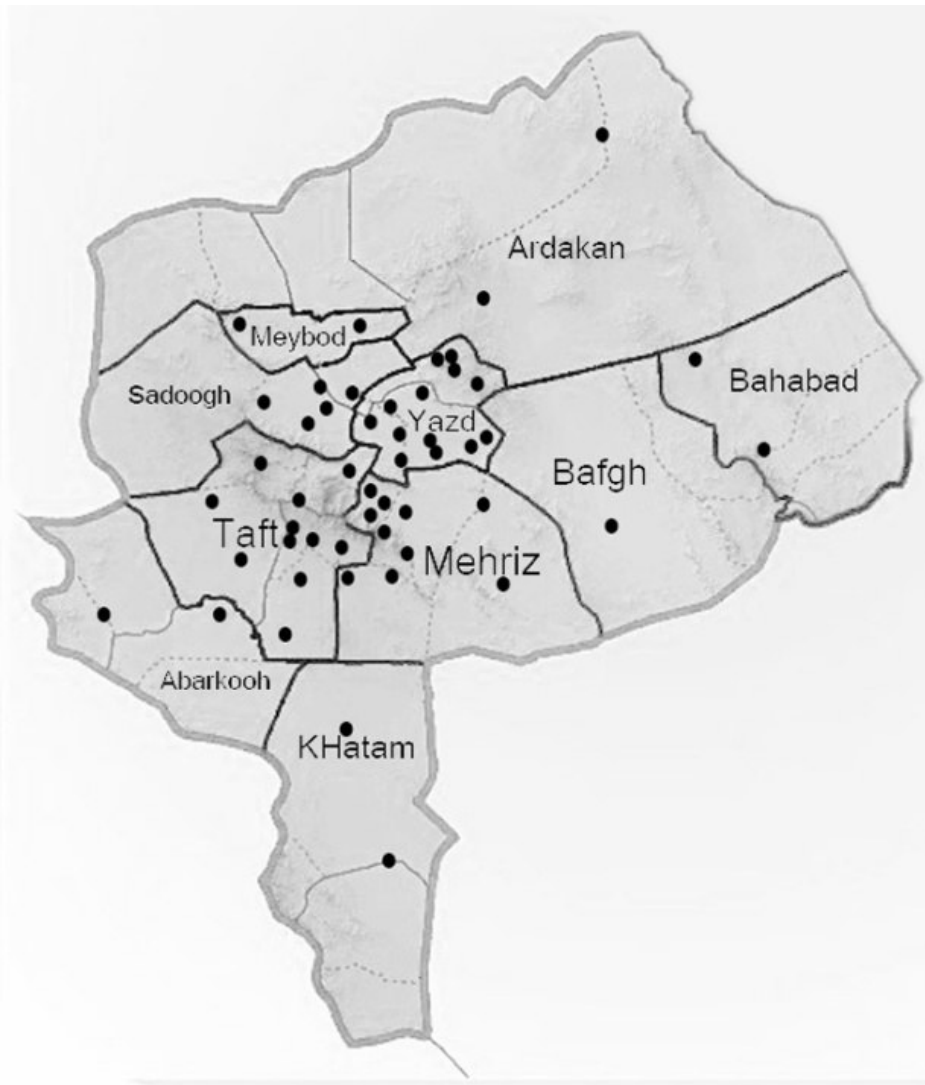


Fig. 1- The Yazd province map in which the Megachilidae bees were collected. Dark circles show actual locations of sampling

## INTRODUCTION

The Megachilidae are long-tongued bees in which the non-parasitic species have the scopa under the metasoma. They are among the main pollinators in most ecosystems and commonly known as leaf-cutter bees; but in reality the family comprises almost every type of nest building behaviour: leaf-cutters, daubers, carpenters, carders and soil nesters (Eardley *et al.*, 2010). Megachilidae is the third largest family of bees (Apoidea), containing more than 4000 described species worldwide (Michener, 2007; Ascher & Pickering, 2013). These solitary bees have both ecological and economic importance; they include many pollinators of natural, urban and agricultural vegetation. For example, *Megachile rotundata* (Fabricius) has been introduced to many parts of the world as a pollinator of alfalfa (Bohart, 1972; Michener, 2007; Pitts-Singer & Cane, 2011). Megachilidae also contains a large number of cleptoparasitic bees (cuckoo bees) including tribe Dioxyni and genus *Coelioxys*. Megachilidae are also notable as the primary source of invasive bees, including multiple species in the genera *Anthidium* Fabricius and *Megachile* Latreille (Cane, 2003; Michener, 2007). For instance, *A. manicatum* (Linnaeus) is perhaps the most widely distributed unmanaged bee species in the world. It was unintentionally introduced to North America in the late 1960s from Europe and it is now established transcontinentally as well as in South America, New Zealand and the Canary Islands (Jaycox, 1967; Smith, 1991; Miller *et al.*, 2002; Hoebeke & Wheeler, 2005; Maier, 2005; Zavortink & Shanks, 2008; Gibbs & Sheffield, 2009; Strange *et al.*, 2011). The Iranian bee fauna, which comprises more than 600 reported species, has been studied by several researchers (Popov, 1967; Esmaili & Rastegar, 1974; Warncke, 1979a,b, 1980, 1991; Talebi *et al.*, 1995; Izadi *et al.*, 2004; Engel, 2006; Izadi *et al.*, 2006; Monfared *et al.*, 2009; Korghand *et al.*, 2010; Khaghaninia *et al.*, 2010; Khaghaninia *et al.*, 2011; Khodaparast & Monfared, 2012; Nadimi *et al.*, 2013a,b). Ascher & Pickering (2013) listed about 163 Megachilidae species in "Discover Life's bee species guide and world checklist". Regarding our incomplete knowledge about Iranian Megachilid bees and no bee reports for Yazd province, the bee fauna of family Megachilidae is documented in the present paper.

## Materials and methods

Megachilidae bees were collected from different regions and vicinity of the Yazd province (Fig. 1) from February 2011 to July 2013. The Yazd province is a desertic region and located in center of Iran. Sampling locations coordinates were provided by Garmin etrex 10 GPS (Table 1). The specimens were collected using sweeping net. We surveyed most regions of the province and collected Megachilidae bee specimens. Following sampling bees were killed using ethyl acetate and then pinned in laboratory. Samples were then databased and received labels with information about location, date, collector name, host plant and a voucher code of bees. All samples were identified using keys provided by Banaszak *et al.* (1998), Amiet *et al.* (2004), Michener (2007) and Grace (2010). Also all species were identified or confirmed by different experts (Müller, Praz and Nadimi). Geographical data of sampling locality were shown in Table 1. Moreover, food plants of bee species from each locality were collected and identified by botanist (Zarezadeh) (Table 3). New records for Iran are indicated with an asterisk.

## Contribution to the knowledge of Megachilidae (Hymenoptera: Apoidea) in the Yazd province, Iran

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### Abstract

A survey was conducted to identify the part megachilid bees (Hymenoptera: Apoidea, Megachilidae) in the Yazd province located in central of Iran during 2011–2013. The specimens were collected using sweeping net from different habitats. In total, 4436 Megachilid specimens were collected from 13 genera, 18 subgenera and 55 species. Seven species including *Osmia (Helicosmia) peregrina*, *Megachile (Eutricharaea) semicircularis*, *Megachile (Entricharea) basilaris*, *Megachile (Pseudomegachile) cinnamomea*, *Megachile (Pseudomegachile) seraxensis*, *Megachile (Pseudomegachile) sanguinipes*, and *Icteranthidium ovasi* are new records for Iran. Host plant association and geographical distributions of the known species from Yazd province are given.

**Key words:** Megachilidae, New records, Host plant, Yazd province

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