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RESEARCH ARTICLE

A contribution to the fauna of Crabronidae (Hymenoptera, Apoidea) in South-Western Iran

Mitra Atbaei[1] Majid Fallahzadeh[2] Toshko Ljubomirov[3*]

*[1]Department of Entomology, Jahrom branch, Islamic Azad University, Jahrom, Iran, e-mail: mitra.atbaei@gmail.com [2]Department of Entomology, Jahrom branch, Islamic Azad University, Jahrom, Iran, e-mail: mfalahm@yahoo.com [3]Institute of Biodiversity and Ecosystem Research, Sofia, Bulgaria, e-mail: toshkoljubomirov@gmail.com *Corresponding author*

Abstract: This study increases about three times the number of species of Crabronidae (Insecta: Hymenoptera) previously known from the south Iranian province of Fars. We include 91 species, most of them being relatively widely distributed in south Palaearctic. Three genera and 32 species represent first records for Iran. A description of the previously unknown male of *Miscophus gratiosus* de Andrade, 1960 is provided. Character variation in *Cerceris vagans* Radoszkowski, 1877, *Liris niger* (Fabricius, 1775), and *Solierella compedita* (Piccioli, 1869) is discussed.

Key words: Crabronidae, new records, distribution, Iran, Fars Province.

Introduction

The hymenopteran family Crabronidae is found worldwide, but is predominantly tropical. It contains 8773 extant species in 242 genera (Aguiar *et al.* 2013). Crabronid wasps are most commonly collected in open, sandy areas. Adults of this group include medium-sized (general body length about 10–20 mm) and very small and inconspicuous insects. Because the members of the family are predators dependent upon their prey for survival and distribution, crabronid wasps are found in areas where their hosts are more or less abundant. The Zagros Mountains form the largest mountain area in Iran having length of about 1400 km. It is an important area of biodiversity because of its wide altitudinal range providing diverse climates throughout the area and its relatively old formation. It was been formed as a result of a collision of the Arabian and the Iranian plates primarily during the Miocene (10 to 14 million years ago). The eastern part of the mountain massive contains several ecosystems,

among which more prominent are the forest steppe areas with a semi-arid climate and the open arid areas. In fact, the crabronid fauna of the Eastern Zagros should be expected to be rather diverse, especially if one takes into consideration the displacement and geological history of the area. Fars province (coordinates 27°–31°N, 50°–55°E) covers approximately 122400 km² and is situated in south-western Iran. Fars can be roughly divided into three geographic regions: (1) north and northwest area, with mild summers, and moderately cold winters; (2) central region, with hot dry summers, and relatively rainy mild winters; (3) south and southeast area, with very hot summers and moderate winters. This latter region (where all the traps that we have used for collecting material were located) is arid and semi-arid. Due to the unique climate conditions, many tropical and sub-tropical plants such as date palm, citrus, pistachio and pomegranate are grown in this area. The natural habitat is composed of rocky and clay soils covered with low desert vegetation like wild almond (*Amygdalus scoparia*) and *Astragalus* spp. Up to now only 28 species of Crabronidae have been reported from the eastern Zagros Mountains in Fars Province of Iran (Table 1).

Material and methods

Specimens were collected in Malaise traps from twelve localities in the province of Fars (Table 2, Figure 1). All specimens were extracted from the traps and sorted every two or three weeks and stored in 70% ethanol. Specimens were studied using a Zeiss Stemi 2000-C light stereomicroscope and measurements were taken with the aid of an ocular scale. High resolution images were taken with a Axio Cam ERc 5s digital camera attached to the same stereomicroscope. Illustrations were obtained by merging an image series, covering different focal planes (typically 6), into a single in-focus image with Helicon Focus 6© software. The final illustrations were post-processed for contrast in Adobe Photoshop CS2 ® software in order to enhance clarity and crop the subject. Specimens are deposited at the Insect Collection of Jahrom Branch, Islamic Azad University, Iran (JIAU) and the Institute of Biodiversity and Ecosystem Research, Sofia, Bulgaria (IBER). Morphological terminology used in the description of the male of *Miscophus gratiosus* largely follows Bohart & Menke (1976). The segments of the antennal flagellum and tarsi are numbered in Arabic numerals, the metasomal segments in Roman numerals. Abbreviations in the text include: ASD, antennal socket diameter: diameter of the antennal socket measured transversally; CAL, length of the clear area of the fore wing: length of the fore wing membrane beyond the venation at the level of the end of the marginal cell; FWL, forewing length: length of the forewing measured from the apex of the humeral plate to the wing tip; FWW, forewing width: the distance between the anterior and posterior margin of the fore wing at straight line; IF $1\ldots11_{lw}$, flagellomere length/width index: maximum flagellomere length divided by maximum flagellomere width in dorsal view for flagellomere 1 to 11, respectively; HH, head height: distance between lowermost part of clypeal disc and uppermost point of vertex contour in head adjusted in frontal view when the contour of lateral ocellus matches the contour of vertex; HW, head width: maximum distance between outer ocular contours in frontal view; MPD, midocellar – postocellar distance: the shortest distance between mid and hind ocellus; Od: midocellar diameter: diameter of midocellus measured transversally; OOD, oculo-ocellar distance: the distance between hind ocellus and closer ocular orbit; POD, postocellar distance: the shortest distance between hind ocelli; SOD, antennal socket – ocular distance: the shortest distance between antennal socket rim and closer ocular orbit; WFA, lower frontal width: the distance between inner ocular orbits at the level of lower margin of antennal socket; WFM, maximal frontal width: the greatest distance of the frons between inner ocular orbits in frontal view; WFO, upper frontal width: the distance between inner ocular orbits at the level of the mid ocellus.

Results

Over a year period (between June 2012 and July 2013), a total of 1184 specimens of Crabronidae were collected, representing 91 species. We have found thirty two species and three genera, *Ammoplanops*, *Mimumesa*, and *Spilomena* that are new for Iran and 79 species new for the Fars Province. Species list and local distribution of crabronid wasps is presented below.

Ammatomus A. Costa, 1859

Ammatomus coarctatus (Spinola, 1808)

Material: Iran: Fars Province, south-east of Kherameh, 18-25.VI.2013, 2♀♀, leg. E. Izadi.

Distribution in Iran: Khorasan, Razavi; Qazvin; Semnan (de Beaumont 1957; Puławski 1973). First record for the province of Fars.

General distribution: South Europe, Turkey, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, Iran, North Africa.

Ammatomus mesostenus (Handlirsch, 1888)

Material: Iran: Fars Province, Fasa, 12-13.VI.2013, 1♂, leg. S. Azadi; south of Khonj, 16-20.VI.2013; 20-21.VI.2013, 1♂, 1♀, leg. M. Atbaei.

Distribution in Iran: Fars, Sistan & Baluchestan (de Beaumont 1970; Puławski 1973).

General distribution: Iraq, Israel, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, East China, Arabian Peninsula, Iran, Afghanistan, North Africa, Sudan.

Ammoplanellus Gussakovskij, 1931

Ammoplanellus simplex (Gussakovskij, 1952)

Material: Iran: Fars Province, Fasa, 30.V.-3.VI.2013, 1♀, leg. S. Azadi.

General distribution: South Europe, Turkey, Syria, Tajikistan, Kazakhstan, Arabian Peninsula, Mongolia. New record for Iran.

Ammoplanops Gussakovskij, 1931

Genus *Ammoplanops* includes 15 species known from Turkmenistan, Uzbekistan, Kazakhstan, southern Unated States and Mexico. The genus is recorded for the first time from Iran.

Ammoplanops carinatus Gussakovskij, 1931

Material: Iran: Fars Province, south-east of Kherameh, 18-25.VI.2013, 3♀♀, leg. E. Izadi.

General distribution: Uzbekistan, Kazakhstan, Mongolia. New record for Iran.

Ammoplanus Giraud, 1869

Ammoplanus transcaspicus Gussakovskij, 1931

Material: Iran: Fars Province, south of Khonj, 9-15.III.2013; 5-16.VI.2013, 2♀♀, leg. M. Atbaei.

General distribution: Turkmenistan, Tajikistan, Kazakhstan, southern Siberia, Mongolia. New record for Iran.

Table 1. Crabronidae species previously known from Fars province.

Valid name	Source	Name in the report
Ammatomus mesostenus (Handlirsch, 1888)	Puławski 1973: 282	*Ammatomus mesostenus*
Ammatomus rufonodis rufonodis (Radoszkowski, 1877)	Puławski 1973: 283	*Ammatomus rufonodis* [*rufonodis*]
Astata boops boops (Schrank, 1781)	Fallahzadeh *et al.* 2009: 236	*Astata boops*
Astata kashmirensis Nurse, 1909	Fallahzadeh *et al.* 2009: 236	*Astata kashmirensis*
Bembecinus iranicus Schmid-Egger, 2004	Schmid-Egger 2004: 24b; Lehr *et al.* 2007: 9	*Bembecinus asiaticus iranicus*
Bembecinus tridens (Fabricius, 1781)	Fallahzadeh *et al.* 2009: 236; Saghaei *et al.* 2010: 20	*Bembecinus tridens*
Bembix oculata Panzer, 1801	Fallahzadeh *et al.* 2009: 237; Saghaei *et al.* 2010: 21	*Bembix oculata*
Ectemnius continuus continuus (Fabricius, 1804)	Leclercq 1954: map 29	*E.* [*ctemnius*] (*H.* [*ypocrabro*]) *continuus*
Ectemnius continuus continuus (Fabricius, 1804)	Fallahzadeh *et al.* 2009: 237	*Ectemnius continuus*
Ectemnius crassicornis (Spinola, 1808)	Leclercq 1999: 49; Dollfuss 2004b: 768	*Ectemnius crassicornis*
Ectemnius crassicornis (Spinola, 1808)	Jacobs 2006: 108	*Ectemnius* (*Thyreocerus*) *crassicornis*
Ectemnius lituratus (Panzer, 1803)	Fallahzadeh *et al.* 2006: 125; Fallahzadeh *et al.* 2009: 237	*Ectemnis lituratus*
Gastrosericus funereus Gussakovskij, 1931	Pulawski 1995: 62, 63	*Gastrosericus funereus*
Gastrosericus waltlii Spinola, 1839	Pulawski 1995: 161, 163	*Gastrosericus waltlii*
Gorytes quinquecinctus (Fabricius, 1793)	Fallahzadeh *et al.* 2006: 125; Fallahzadeh *et al.* 2009: 237	*Gorytes quinquecinctus*
Larra anathema anathema (Rossi, 1790)	Ebrahimi 2014: 36	*Larra anathema*
Lestica clypeata clypeata (Schreber, 1759)	Fallahzadeh *et al.* 2009: 237	*Lestica clypeata*
Lindenius anatolicus de Beaumont, 1967	Dollfuss 2006: 524	*Lindenius anatolicus*
Mimesa scheuchli Schmid-Egger, 2014	Schmid-Egger 2014: 581	*Mimesa scheuchli*
Oxybelus quatuordecimnotatus Jurine, 1807	Dollfuss 2008: 489	*Oxybelus quatuordecimnotatus*
Oxybelus subspinosus Klug, 1835	Dollfuss 2008: 494	*Oxybelus subspinosus*
Palarus variegatus variegatus (Fabricius, 1781)	Lehr *et al.* 2007: 11	*Palarus variegatus*
Philanthus triangulum triangulum (Fabricius, 1775)	Fallahzadeh *et al.* 2009: 237; Saghaei *et al.* 2010: 19; Ebrahimi 2014: 49	*Philanthus triangulum*
Psenulus meridionalis de Beaumont, 1937	Dollfuss 2004a: 113	*Psenulus meridionalis*
Psenulus pan de Beaumont, 1967	Dollfuss 2004a: 114	*Psenulus pan*
Sphecius antennatus (Klug, 1845)	Ebrahimi 2014: 34	*Sphecius antennatus*
Stizoides crassicornis (Fabricius, 1787)	Ohl 1999: 112, 114	*Stizoides crassicornis*
Tachysphex brullii brullii (F. Smith, 1856)	Ebrahimi 2014: 40	*Tachysphex brullii*
Tachysphex costae (Destefani, 1881)	Pulawski 2007: 223, 224	*Tachysphex costae*
Tachysphex speciosissimus Morice, 1897	Pulawski 2007: 599, 600	*Tachysphex speciosissimus*

Astata Latreille, 1796

Astata boops boops (Schrank, 1781)

Material: Iran: Fars Province, Fasa, 7-12.VI.2013, 1♂, leg. S. Azadi; south-east of Kherameh, 10-19.V.2013, 1♀, leg. E. Izadi; south of Khonj, 16-20.VI.2013, 1♀, leg. M. Atbaei; Neyriz-Jaafarabad, 29.VII.-10.VIII.2012, 1♂, leg. M. Khosroabadi.

Distribution in Iran: Alborz; Ardabil; Fars; Tehran (Fallahzadeh *et al.* 2009; Ebrahimi 2014).

General distribution: Europe, Great Briatin, Turkey, Syria, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, North China, Arabian Peninsula, Iran, North Africa.

Astata costae costae A. Costa, 1867

Material: Iran: Fars Province, Fasa, 1-7.I.2013, 1♀, leg. S. Azadi; south of Khonj, 15-22.III.2013; 16-20.VI.2013, 2♀♀, leg. M. Atbaei.

Distribution in Iran: Mazandaran (de Beaumont 1957). First record for the province of Fars.

Table 2. Positions of Malaise traps in Fars province and the time period for the sampling.

Locality	Geographical coordinates and elevation	Time period of the trap exposition	Collector
1. North-west of Navayegan village	28°40′N; 54°49′E; 1511 m	10-21.VI.2012; 21-25.VI.2012	A. Haghighi
2. South-east of Darab	28°42′N; 54°34′E; 1124 m	7-14.VIII.2012	A. Haghighi
3. North-west of Darab	28°48′N; 54°28′E; 1345 m	1-8.VII.2012	A. Haghighi
4. Fasa	28°54′29′′N; 53°39′35′′E; 1343 m	1-7.I.2013; 7-17.I.2013; 17-24.I.2013; 24.I.-19.III.2013; 19.III.-12.IV.2013; 12-15.IV.2013; 15-30.IV.2013; 30.IV.-7.V.2013; 7-10.V.2013; 10-24.V.2013; 24-30.V.2013; 30.V.-3.VI.2013; 3-7.VI.2013; 7-12.VI.2013; 12-13.VI.2013	S. Azadi
5. Jahrom	28°30′04′′N; 53°35′16′′E; 1053 m	1-25.IV.2013	B. Majnon Jahromi
6. South-east of Kherameh	29°28′44′′N; 53°20′21′′E; 1594 m	10-19.V.2013; 31.V.-12.VI.2013; 12-18.VI.2013; 18-25.VI.2013	E. Izadi
7. North-west of Kherameh	29°30′42′′N; 53°18′55′′E; 1588 m	10-24.I.2013; 19-27.V.2013; 27-31.V.2013	E. Izadi
8. South of Khonj	27°53′31′′N; 53°26′42′′E; 527 m	10-21.II.2013; 21-27.II.2013; 27.II.-2.III.2013; 2-3.III.2013; 3-4.III.2013; 4-9.III.2013; 9-15.III.2013; 15-22.III.2013; 22.III.-6.IV.2013; 6-11.IV.2013; 11-17.IV.2013; 17-23.IV.2013; 23-27.IV.2013; 27.IV.-11.V.2013; 11-18.V.2013; 18-20.V.2013; 20-24.V.2013; 24.V.-5.VI.2013; 5-16.VI.2013; 16-20.VI.2013; 20-21.VI.2013; 21-24.VI.2013; 24-26.VI.2013; 26-27.VI.2013; 27.VI.-1.VII.2013; 1-5.VII.2013	M. Atbaei
9. West of Karmostaj	27°31′N; 54°26′E; 771 m	5-7.V.2012; 20-31.III. 2013; 5.VI.-6.VII.2013; 6-11.VII.2013	A. Falahatpisheh
10. South of Lar	27°38′N; 54°16′E; 784 m	16-20.V.2012; 20.IV.-5.V. 2013; 7-16.V.2103; 20.V.-5.VI.2013; 5-16.VI.2013	A. Falahatpisheh
11. Neyriz-Ghatruyeh	29°10′N; 54°41′E; 1610 m	10-15.IX.2012; 15.IX.-15.X.2012	M. Khosroabadi
12. Neyriz-Jaafarabad	29°16′N; 54°19′E; 1795 m	20-29.VII.2012; 29.VII.-10.VIII.2012; 10.VIII.-9.IX.2012; 9-14.IX.2012; 14-15.IX.2012; 15-26.IX.2012; 26.IX.-15.X.2012; 15-21.X.2012	M. Khosroabadi

General distribution: South Europe, Turkey, Turkmenistan, Tajikistan, Kazakhstan, North Africa.

***Astata lubricata* Nurse, 1903**

Material: Iran: Fars Province, Jahrom, 1-25.IV.2013, 1♂, leg. B. Majnon Jahromi.

General distribution: Arabian Peninsula, North Africa (Egypt), India. New record for Iran.

***Astata minor* Kohl, 1885**

Material: Iran: Fars Province, Fasa, 3-7.VI.2013, 1♂, leg. S. Azadi.

Distribution in Iran: East Azerbaijan (Ebrahimi 2014; Samin *et al.* 2015). First record for the province of Fars.

General distribution: Europe, Turkey, Israel, Turkmenistan, Uzbekistan, Kazakhstan, Siberia, Russian Far East, North Africa.

***Astata quettae* Nurse, 1903**

Material: Iran: Fars Province, south-east of Kherameh, 18-25.VI.2013, 2♀♀, leg. E. Izadi; south of Khonj, 27.VII.-2.III.2013; 22.III.-6.IV.2013; 27.IV.-11.V.2013; 20-24.V.2013, 4♀♀, leg. M. Atbaei.

Distribution in Iran: Ilam (Sakenin *et al.* 2010a). First record for the province of Fars.

General distribution: South Europe, Turkey, Kazakhstan, southern Siberia, North China, Mongolia, Iran, Pakistan, India.

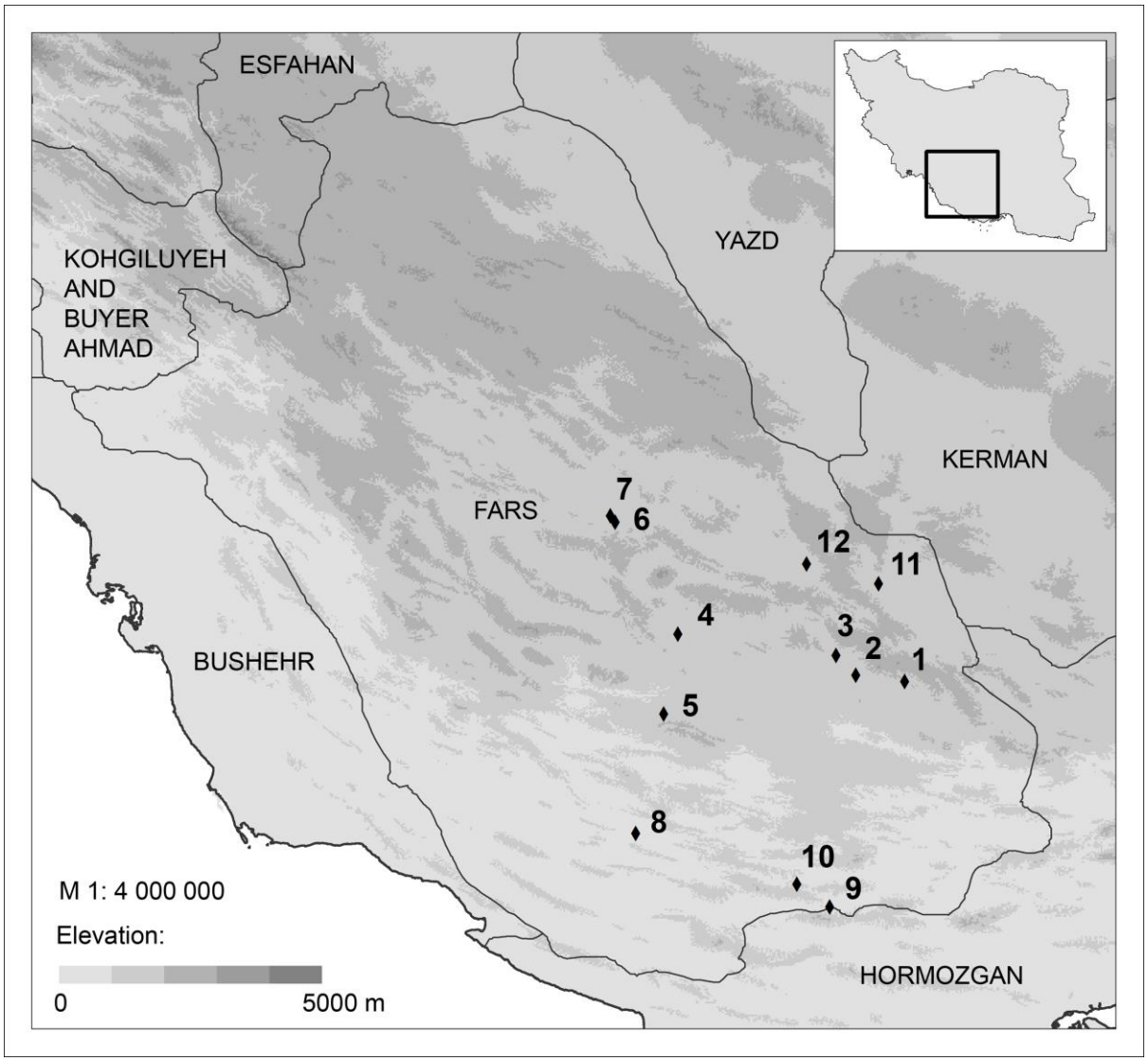

Figure 1. Locations of sampling sites in Fars province (1 = north-west of Navayegan village; 2 = south-east of Darab; 3 = north-west of Darab; 4 = Fasa; 5 = Jahrom ; 6 = south-east of Kherameh; 7 = north-west of Kherameh; 8 = south of Khonj; 9 = west of Karmostaj; 10 = south of Lar; 11 = Neyriz-Ghatruyeh; 12 = Neyriz-Jaafarabad).

Bembecinus A. Costa, 1859

Bembecinus birecikensis Schmid-Egger, 2004

Material: Iran: Fars Province, west of Karmostaj, 6-11.VII.2013, 1♀, leg. A. Falahatpisheh; south of Lar, 7-16.V.2013; 20.V.-5.VI.2013, 2 ♀♀, leg. A. Falahatpisheh.

General distribution: Turkey. New record for Iran.

Bembecinus khuzestani Schmid-Egger, 2004

Material: Iran: Fars Province, west of Karmostaj, 20-31.III.2013; 5.VI.-6.VII.2013, 2♀♀, leg.

A. Falahatpisheh.

Distribution in Iran: Khuzestan (Schmid-Egger 2004). First record for the province of Fars.

General distribution: Iran.

***Bembecinus proximus* (Handlirsch, 1892)**

Material: Iran: Fars Province, south-east of Kherameh, 10-19.V.2013, 1♂, leg. E. Izadi; south of Khonj, 24.V.-5.VI.2013; 16-20.VI.2013; 20-21.VI.2013; 21-24.VI.2013; 24-26.VI.2013; 26-27.VI.2013; 27.VI.-1.VII.2013, 9♂♂, 3♀♀, leg. M. Atbaei; west of Karmostaj, 6-11.VII.2013, 1♂, leg. A. Falahatpisheh.

Distribution in Iran: East Azerbaijan (Sakenin *et al.* 2011). First record for the province of Fars.

General distribution: Arabian Peninsula, Iran, Pakistan, Nepal, India, Sri Lanka.

***Bembecinus schwarzi* de Beaumont, 1967**

Material: Iran: Fars Province, north-west of Navayegan village, 10-21.VI.2012, 1♀, leg. A. Haghighi; south-east of Darab: 7-14.VIII.2012, 1♀, leg. A. Haghighi; south-east of Kherameh, 31.V.-12.VI.2013, 1♀, leg. E. Izadi; south of Khonj, 27.VI.-1.VII.2013, 1♂, leg. M. Atbaei; west of Karmostaj, 6-11.VII.2013, 1♂, leg. A. Falahatpisheh; Neyriz-Jaafarabad, 10.VIII.-9.IX.2012, 2♀♀, leg. M. Khosroabadi.

General distribution: Iraq, Turkey. New record for Iran.

***Bembecinus validior* Gussakovskij, 1952**

Material: Iran: Fars Province, west of Karmostaj, 5.VI.-6.VII.2013, 1♂, leg. A. Falahatpisheh.

Distribution in Iran: Sistan & Baluchestan (Sakenin *et al.* 2010a). First record for the province of Fars.

General distribution: Turkey, Israel, Turkmenistan, Tajikistan, Kazakhstan, Iran, North Africa (Egypt).

***Bembix* Fabricius, 1775**

***Bembix gracilis* Handlirsch, 1893**

Material: Iran: Fars Province, south of Khonj, 16-20.VI.2013, 1♀, leg. M. Atbaei.

Distribution in Iran: Gilan (Sakenin *et al.* 2010a). First record for the province of Fars.

General distribution: South-east Europe, Turkey, Azerbaijan, Turkmenistan, Tajikistan, Kazakhstan, Iran.

***Bembix oculata oculata* Panzer, 1801**

Material: Iran: Fars Province, north-west of Navayegan village, 21-25.VI.2012, 1♀; Fasa, 10-24.V.2013; 24-30.V.2013; 3-7.VI.2013, 1♂, 2♀♀, leg. S. Azadi; south of Khonj, 21-24.VI.2013, 1♂, leg. M. Atbaei.

Distribution in Iran: East Azerbaijan; Fars; Gilan; Hormozgan; North Khorasan; Khorasan, Razavi; South Khorasan; Markazi; Mazandaran; Qazvin; Sistan & Baluchestan; Tehran (Morice 1921; Gussakovskij 1933; de Beaumont 1957, 1970; Fallahzadeh *et al.* 2009; Ghazi-Soltani *et al.* 2010a,b; Saghaei *et al.* 2010; Ebrahimi 2014).

General distribution: Europe, Canary Islands, Turkey, Syria, Israel, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, North China, Arabian Peninsula, Iran, Afghanistan, North Africa, Sudan.

***Cerceris* Latreille, 1802**

***Cerceris deserticola* F. Morawitz, 1890**

Material: Iran: Fars Province, Neyriz-Jaafarabad, 29.VII.-10.VIII.2012, 1♀, leg. M. Khosroabadi.

General distribution: Turkey, Turkmenistan, Tajikistan, Kazakhstan. New record for Iran.

***Cerceris eryngii eryngii* Marquet, 1875**

Material: Iran: Fars Province, south-east of Kherameh, 31.V.-12.VI.2013, 1♀, leg. E. Izadi.

Distribution in Iran: West Azerbaijan, Hamadan, Qazvin (de Beaumont 1957; Sakenin *et al.* 2011; Samin *et al.* 2015). First record for the province of Fars.

General distribution: South Europe, Turkey, Uzbekistan, Kazakhstan, southern Siberia, Arabian Peninsula, Iran.

***Cerceris flavilabris flavilabris* (Fabricius, 1793)**

Material: Iran: Fars Province, south-east of Kherameh, 10-19.V.2013; 31.V.-12.VI.2013; 12-18.VI.2013; 18-25.VI.2013, 5♂♂, 4♀♀, leg. E. Izadi; north-west of Kherameh, 10-24.I.2013; 19-27.V.2013, 2♂♂, leg. E. Izadi.

Distribution in Iran: Alborz; Khorasan, Razavi; Qazvin; Tehran (de Beaumont 1957; Ebrahimi 2014). First record for the province of Fars.

General distribution: Europe, Turkey, Armenia, Turkmenistan, Uzbekistan, Kazakhstan, southern Siberia, north China, Iran, North Africa.

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

Material: Iran: Fars Province, south-east of Kherameh, 31.V.-12.VI.2013; 18-25.VI.2013, 2♂♂, 3♀♀, leg. E. Izadi; north-west of Kherameh, 19-27.V.2013, 1♂, 1♀, leg. E. Izadi.

Distribution in Iran: Ardabil; Azerbaijan, East; Gilan; Mazandaran; Qazvin, Tehran (Morice 1921; de Beaumont 1957, 1970; Sakenin *et al.* 2010a; Ebrahimi 2014). First record for the province of Fars.

General distribution: Europe, Great Briatin, Turkey, Iraq, Georgia, Armenia, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, southern Siberia, North China, Arabian Peninsula, North Iran, North Africa.

***Cerceris specularis specularis* A. Costa, 1867**

Material: Iran: Fars Province, south of Khonj, 27.IV-11.V.2013, 1♂, leg. M. Atbaei.

General distribution: South Europe, Turkey, Syria, Georgia, Uzbekistan, Tajikistan, Kazakhstan, North Africa. New record for Iran.

***Cerceris spinipectus accola* Kohl, 1916**

Material: Iran: Fars Province, Fasa, 24.I.-19.III.2013, 1♀, leg. S. Azadi.

Distribution in Iran: Golestan, Kermanshah (Sakenin *et al.* 2010a). First record for the province of Fars.

General distribution: Armenia, Georgia, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, Iran, Afghanistan.

***Cerceris vagans* Radoszkowski, 1877**

Material: Iran: Fars Province, south-east of Kherameh, 10-19.V.2013; 31.V.-12.VI.2013; 18-25.VI.2013, 3♂♂, 4♀♀, leg. E. Izadi; north-west of Kherameh, 10-24.I.2013; 10-24.I.2013, 1♂, 1♀, leg. E. Izadi; south of Khonj, 24.V.-5.VI.2013; 16-20.VI.2013; 21-24.VI.2013; 27.VI.-1.VII.2013, 4♂♂, 2♀♀, leg. M. Atbaei; south of Lar, 20.V.-5.VI.2013, 1♀, leg. A. Falahatpisheh.

Remarks on variation in certain morphological characters:

First metasomal tergum is all or partly red in six males, but all black in the other two. Fourth metasomal tergum in both males and females varies from all black or black except for a whitish narrow preapical band to almost all pale yellow. Length of first tergum in males also varies, the ratio of its length measured along the midline and maximal width ranges from 1.0 to 1.2. The most obvious variation in *Cerceris vagans* is the amount of the red and pale (yellowish to whitish) on the first and fourth metasomal terga.

Distribution in Iran: Kerman; South Khorasan; Qazvin; Sistan & Baluchestan; Tehran (de Beaumont 1957, 1970). First record for the province of Fars.

General distribution: Turkey, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, Arabian Peninsula, Iran, Afghanistan, Pakistan.

***Crossocerus* Le Peletier-de-Saint-Fargeau & Brullé, 1835**

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

Material: Iran: Fars Province, Fasa, 15-30.IV.2013; 24-30.V.2013, 1♂, 1♀.

Distribution in Iran: Azerbaijan, East; Isfahan (Dollfuss 2006; Ghazi-Soltani *et al*. 2009, 2010a). First record for the province of Fars.

General distribution: Europe, Great Briatin, Turkey, Kazakhstan, Iran, Korea, North Africa.

***Dasyproctus* Le Peletier-de-Saint-Fargeau & Brullé, 1835**

***Dasyproctus arabs* (Kohl, 1894)**

Material: Iran: Fars Province, north-west of Navayegan village, 21-25.VI.2012, 1♂; Fasa, 7-17.I.2013, 1♀, leg. S. Azadi; south of Khonj, 18.20.V.2013; 16-20.VI.2013, 1♂, 2♀♀, leg. M. Atbaei; west of Karmostaj, 5.VI.-6.VII.2013, 1♂, leg. A. Falahatpisheh.

Distribution in Iran: Sistan & Baluchestan (Leclercq 1954). First record for the province of Fars.

General distribution: Israel, Jordan, Arabian Peninsula, Iran, Pakistan.

***Didineis* Wesmael, 1852**

***Didineis wuestneii* Handlirsch, 1888**

Material: Iran: Fars Province, Neyriz-Jaafarabad, 15-26.IX.2012, 1♀, leg. M. Khosroabadi.

General distribution: Southern Europe, Turkey, Azerbaijan. New record for Iran.

Diodontus Curtis, 1834

Diodontus hyalipennis Kohl, 1892

Material: Iran: Fars Province, Fasa, 24-30.V.2013, 1♀, leg. S. Azadi; south of Khonj, 21-27.II.2013; 2-3.III.2013; 27.IV-11.V.2013, 3♂♂, 1♀, leg. M. Atbaei.

General distribution: Southern Europe, Azerbaijan, Arabian Peninsula, Kazakhstan, southern Siberia, Mongolia, North Africa. New record for Iran.

Diodontus minutus minutus (Fabricius, 1793)

Material: Iran: Fars Province, Fasa, 24.I.-19.III.2013; 19.III.-12.IV.2013; 12-15.IV.2013; 15-30.IV.2013; 30.IV.-7.V.2013; 10.24.V.2013; 24-30.V.2013; 30.V.-3.VI.2013; 3-7.VI.2013; 7-12.VI.2013; 12-13.VI.2013, 5♂♂, 36♀♀, leg. S. Azadi; south-east of Kherameh, 10-19.V.2013; 10-19.V.2013; 31.V.-12.VI.2013; 12-18.VI.2013; 18-25.VI.2013, 4♂♂, 65♀♀, leg. E. Izadi; north-west of Kherameh, 10-24.I.2013; 19-27.V.2013; 27-31.V.2013, 2♂♂, 18♀♀, leg. E. Izadi; south of Khonj, 10-21.II.2013; 21-27.II.2013; 27.VII.-2.III.2013; 2-3.III.2013; 3-4.III.2013; 4-9.III.2013; 9.-15.III.2013; 15-22.III.2013; 22.III.-6.IV.2013; 6-11.IV.2013; 11-17.IV.2013; 17-23.IV.2013; 23-27.IV.2013; 27.IV-11.V.2013; 18-20.V.2013; 20-24.V.2013; 24.V.-5.VI.2013; 16-20.VI.2013; 21-24.VI.2013; 24-26.VI.2013; 1-5.VII.2013, 66♂♂, 68♀♀, leg. M. Atbaei; west of Karmostaj, 5.VI.-6.VII.2013, 2♀♀, leg. A. Falahatpisheh.

Distribution in Iran: Alborz; Khorasan, Razavi; Tehran (Gussakovskij 1933; Ebrahimi *et al.* 1995; Ebrahimi 2014). First record for the province of Fars.

General distribution: Europe, Great Briatin, Turkey, Iraq, Turkmenistan, Tajikistan, Kazakhstan, southern Siberia, Iran, Afghanistan, North America.

Diodontus temporalis Kohl, 1901

Material: Iran: Fars Province, south of Khonj, 2-3.III.2013; 3-4.III.2013; 18-20.V.2013, 6♀♀, leg. M. Atbaei.

General distribution: Turkey, Israel, Jordan, Kazakhstan. New record for Iran.

Diodontus tristis (Vander Linden, 1829)

Material: Iran: Fars Province, south-east of Kherameh, 31.V.-12.VI.2013; 18-25.VI.2013, 2♂♂, 1♀, leg. E. Izadi; north-west of Kherameh, 19.27.V.2013, 1♂, 1♀, leg. E. Izadi.

Distribution in Iran: Alborz; Mazandaran; Tehran (de Beaumont 1957; Ebrahimi *et al.* 1995; Ebrahimi 2014). First record for the province of Fars.

General distribution: Europe, Great Briatin, Turkey, Tajikistan, Kazakhstan, southern Siberia, Russian Far East, Iran.

Dryudella Spinola, 1843

Dryudella tricolor eurygnatha (Pulawski, 1967)

Material: Iran: Fars Province, Fasa, 30.V.-3.VI.2013, 1♀, leg. S. Azadi; south of Khonj, 15-22.III.2013; 16-20.VI.2013, 1♂, 1♀, leg. M. Atbaei; west of Karmostaj, 1-5.V.2013, 1♂, leg. A. Falahatpisheh.

Distribution in Iran: Qazvin; Tehran (de Beaumont 1957; Ebrahimi 2014). First record for the province of Fars.

General distribution: South-east Europe, Turkey, Iran.

***Ectemnius* Dahlbom, 1845**

***Ectemnius confinis* (Walker, 1871)**

Material: Iran: Fars Province, south-east of Kherameh, 10-19.V.2013; 31.V.-12.VI.2013; 18-25.VI.2013, 4♂♂, leg. E. Izadi.

Distribution in Iran: West Azerbaijan; Mazandaran; Sistan & Baluchestan (Leclercq 1954; Leclercq 1993). First record for the province of Fars.

General distribution: Europe, Turkey, Jordan, Turkmenistan, Uzbekistan, Kazakhstan, Iran, North Africa.

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

Material: Iran: Fars Province, south-east of Kherameh, 31.V.-12.VI.2013; 18-25.VI.2013, 2♂♂, leg. E. Izadi.

Distribution in Iran: Alborz; Ardabil; East Azerbaijan; West Azerbaijan; Bushehr; Chahar Mahaal & Bakhtiari; Fars; Gilan; Golestan; Hamadan; Ilam; Isfahan; Kermanshah; North Khorasan; Khorasan, Razavi; South Khorasan; Khuzestan; Kohgiluyeh & Boyer-Ahmad; Kurdistan; Lorestan; Markazi; Mazandaran; Qazvin; Qom; Semnan; Tehran; Yazd; Zanjan (Radoszkovsky 1871; Leclercq 1954; de Beaumont 1957; Leclercq 1999; Ghahari *et al.* 2007; Fallahzadeh *et al.* 2009; Sakenin *et al.* 2011a; Ebrahimi 2014).

General distribution: Europe, Great Briatin, Turkey, Syria, Jordan, Azerbaijan, Tajikistan, Kyrghyzstan, Kazakhstan, southern Siberia, North China, Mongolia, Russian Far East, Iran, Korea, Japan, North Africa, North America, Cuba.

***Ectemnius rugifer* (Dahlbom, 1845)**

Material: Iran: Fars Province, south-east of Kherameh, 10-19.V.2013; 10-19.V.2013; 18-25.VI.2013, 3♂♂, 1♀, leg. E. Izadi; north-west of Kherameh, 19-27.V.2013, 1♂, leg. E. Izadi; west of Karmostaj, 5-7.V.2013, 1♀, leg. A. Falahatpisheh; south of Lar, 16-20.V.2013, 1♂, leg. A. Falahatpisheh; Neyriz-Jaafarabad, 9-14.IX.2012, 1♂, leg. M. Khosroabadi.

General distribution: Europe, Turkey, southern Siberia. New record for Iran.

***Gastrosericus* Spinola, 1839**

***Gastrosericus funereus* Gussakovskij, 1931**

Material: Iran: Fars Province, Fasa, 17.I.2013; 7-12.VI.2013, 2♀♀, leg. S. Azadi; Jahrom, 1-25.IV.2013, 1♀, leg. B. Majnon Jahromi; south-east of Kherameh, 18-25.VI.2013, 1♀, leg. E. Izadi; south of Khonj, 17-23.IV.2013; 27.IV-11.V.2013; 20-24.V.2013; 21-24.VI.2013; 24-26.VI.2013; 1-5.VII.2013, 1♂, 6♀♀, leg. M. Atbaei.

Distribution in Iran: Fars (Pulawski 1995).

General distribution: Turkey, Turkmenistan, Tajikistan, Kazakhstan, Arabian Peninsula, Iran, Pakistan, North Africa, North India.

***Gastrosericus waltlii* Spinola, 1839**

Material: Iran: Fars Province, Neyriz-Jaafarabad, 15-21.X.2012, 1♀, leg. M. Khosroabadi.

Distribution in Iran: Fars, Kerman (Pulawski 1995; Samin *et al.* 2015).

General distribution: Turkey, Syria, Georgia, Azerbaijan, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, North China, Mongolia, Arabian Peninsula, Iran, Pakistan, Africa, India, Sri Lanka.

***Harpactus* Shuckard, 1837**

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

Material: Iran: Fars Province, south-east of Kherameh, 10-19.V.2013, 1♀, leg. E. Izadi; south of Khonj, 6-11.IV.2013; 17-23.IV.2013; 11-18.V.2013; 18-20.V.2013; 16-20.VI.2013, 3♂♂, 2♀♀, leg. M. Atbaei.

Distribution in Iran: Alborz; East Azerbaijan; Sistan & Baluchestan; Tehran (Ebrahimi 2000b; 2014; Ghazi-Soltani *et al.* 2010a,b,c). First record for the province of Fars.

General distribution: Europe, Turkey, Kazakhstan, southern Siberia, North China, Mongolia, Arabian Peninsula, Iran, North Africa.

***Holotachysphex* de Beaumont, 1940**

***Holotachysphex hologna thus* (Morice, 1897)**

Material: Iran: Fars Province, Neyriz-Jaafarabad, 20-29.VII.2012, 1♂, leg. M. Khosroabadi.

General distribution: South-east Europe, Israel, Arabian Peninsula, Africa, India, Sri Lanka. New record for Iran.

***Holotachysphex mochii* (de Beaumont, 1947)**

Material: Iran: Fars Province, Fasa, 3-7.VI.2013; 7-12.VI.2013; 12-13.VI.2013, 1♂, 3♀♀, leg. S. Azadi; south-east of Kherameh, 31.V.2013, 1♀, leg. E. Izadi.

Distribution in Iran: Khorasan, Razavi (Pulawski 1992). First record for the province of Fars.

General distribution: Turkey, Israel, Iran, North Africa.

***Larra* Fabricius, 1793**

***Larra anathema anathema* (Rossi, 1790)**

Material: Iran: Fars Province, south-east of Kherameh, 10-19.V.2013, 1♂, leg. E. Izadi.

Distribution in Iran: Alborz; Ardabil; East Azerbaijan; West Azerbaijan; Fars; Gilan; Khuzestan; Mazandaran (Esmaili & Rastegar 1974; Ghahari *et al.* 2009; Ghazi-Soltani *et al.* 2010a,b; Ebrahimi 2014).

General distribution: Europe, Great Briatin, Turkey, Israel, Turkmenistan, Tajikistan, Kazakhstan, North China, Arabian Peninsula, Iran, North Africa.

***Lestica* Billberg, 1820**

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

Material: Iran: Fars Province, south-east of Kherameh, 10-19.V.2013, 1♀, leg. E. Izadi; north-west of Kherameh, 10-24.I.2013, 1♀, leg. E. Izadi.

Distribution in Iran: Alborz; East Azerbaijan; Fars; Ilam; Markazi; Mazandaran; Sistan & Baluchestan (Gussakovskij 1933; de Beaumont 1957; Leclercq 1993; Ghazi-Soltani *et al.* 2006, 2009; 2010a,c; Fallahzadeh *et al.* 2009; Ebrahimi 2014).

General distribution: Europe, Turkey, Syria, Lebanon, Israel, Iraq, Turkmenistan, Uzbekistan, Kyrghyzstan, Kazakhstan, southern Siberia, Iran, North Africa.

Lindenius Le Peletier-de-Saint-Fargeau & Brullé, 1835

Lindenius panzeri (Vander Linden, 1829)

Material: Iran: Fars Province, Fasa, 30.V.-3.VI.2013; 12-13.VI.2013, 2♂♂, leg. S. Azadi; south-east of Kherameh, 10-19.V.2013; 31.V.-2013; 18-25.VI.2013, 10♀♀, leg. E. Izadi; north-west of Kherameh, 10-24.I.2013, 1♀, leg. E. Izadi.

General distribution: Europe, Great Briatin, Turkey, Turkmenistan, Uzbekistan, Tajikistan, Kyrghyzstan, Kazakhstan, southern Siberia, North-east China, Mongolia, North Africa, India. New record for Iran.

Lindenius pygmaeus armatus (Vander Linden, 1829)

Material: Iran: Fars Province, Fasa, 30.IV.-7.V.2013; 7-10.V.2013; 10-24.V.2013; 24-30.V.2013; 3-7.VI.2013, 6♀♀, leg. S. Azadi; south-east of Kherameh, 10-19.V.2013; 31.V.-12.VI.2013, 7♀♀, leg. E. Izadi; north-west of Kherameh, 27-31.V.2013, 1♀, leg. E. Izadi.

Distribution in Iran: Mazandaran; Qazvin, Tehran (de Beaumont 1957). First record for the province of Fars.

General distribution: Europe, Turkey, Syria, Jordan, Turkmenistan, Uzbekistan, Tajikistan, Kyrghyzstan, Kazakhstan, Iran.

Liris Fabricius, 1804

Liris festinans praetermissus (Richards, 1928)

Material: Iran: Fars Province, south of Khonj, 24.V.-5.VI.2013, 1♂, leg. M. Atbaei.

Distribution in Iran: This species was announced to inhabit in Iran without any precise localities (de Beaumont *et al.* 1973; Schmidt & Bitsch 2007). First record for the province of Fars.

General distribution: South Europe, Turkey, Kazakhstan, Arabian Peninsula, Iran, Afghanistan.

Liris niger niger (Fabricius, 1775)

Material: Iran: Fars Province, Fasa, 7-17.I.2013; 3-7.VI.2013, 1♂, 1♀, leg. S. Azadi; Neyriz-Ghatruyeh: 10-15.IX.2012, 1♀, leg. M. Khosroabadi.

Remarks on variation in certain characters:

Clypeal disc in the male is polished medioapically and the tegument of this area as well as the anterior mandibular surface is reddish. In the three females coloration of the ventral scape surface and the middle part of the clypeus preapically varies from completely black to intensely dark red; the clypeal disc medioapically can be completely polished or intensively punctuate to microgranulose. Part of these character states (red coloration on the scape and clypeus apically and glabrous area on clypeal disc preapically) are diagnostic for *Liris agilis* F. Smith.

Distribution in Iran: Alborz; Ardabil; Azerbaijan, East; Bushehr; Golestan; Mazandaran; Sistan & Baluchestan; Tehran (Gussakovskij 1933; de Beaumont 1970; Ghahari *et al.* 2009; Ghazi-Soltani *et al.* 2010a,b; Ebrahimi 2014; Samin *et al.* 2015). First record for the province of Fars.

General distribution: Europe, Turkey, Israel, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, Mongolia, Arabian Peninsula, Iran, Afghanistan, North Africa, India, Burma, Malaysia.

***Liris subtessellatus subtessellatus* (F. Smith, 1856)**

Material: Iran: Fars Province, Neyriz-Ghatruyeh: 10-15.IX.2012, 1♀, leg. M. Khosroabadi.

Distribution in Iran: Kerman; Markazi; Sistan & Baluchestan; Tehran (Gussakovskij 1933; Ebrahimi 2014). First record for the province of Fars.

General distribution: Iraq, Iran, China, Japan, India, Sri Lanka, Thailand, Malaysia, Indonesia, Philippines, Marshall Islands, Hawaiian Islands, Solomon Islands, Fiji Islands.

***Mimesa* Shuckard, 1937**

***Mimesa caucasica* Maidl, 1914**

Material: Iran: Fars Province, south-east of Kherameh, 10-19.V.2013; 18-25.VI.2013, 1♂, 1♀, leg. E. Izadi.

General distribution: Southern Europe, Georgia, Azerbaijan, Turkmenistan, Tajikistan, Kyrghyzstan, Kazakhstan, North China, Mongolia. New record for Iran.

***Mimumesa* Malloch, 1933**

Genus *Mimumesa* includes 31 species known from Europe, Turkey, Iraq, Israel, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, Siberia, China, Japan, Taiwan and North America. The genus is recorded for the first time from Iran.

***Mimumesa unicolor* (Vander Linden, 1829)**

Material: Iran: Fars Province, Fasa, 24-30.V.2013; 3-7.VI.2013; 12-13.VI.2013, 2♂♂, 3♀♀, leg. S. Azadi; south-east of Kherameh, 10-19.V.2013; 10-19.V.2013; 31.V.-12.VI.2013; 18-25.VI.2013, 1♂, 24♀♀, leg. E. Izadi; north-west of Kherameh, 10-24.I.2013; 19-27.V.2013; 27-31.V.2013, 2♂♂, 31♀♀, leg. E. Izadi.

General distribution: Europe, Great Briatin, Turkey, Iraq, Israel, Turkmenistan, Uzbekistan, Kyrghyzstan, Kazakhstan, southern Siberia, North China, Afghanistan, Pakistan. New record for Iran.

***Miscophus* Jurine, 1807**

***Miscophus luctuosus* de Andrade, 1960**

Material: Iran: Fars Province, west of Karmostaj, 5.VI.-6.VII.2013, 1♀, leg. A. Falahatpisheh.

General distribution: South-east Europe, Turkey. New record for Iran.

***Miscophus mimeticus* Honoré, 1944**

Material: Iran: Fars Province, west of Karmostaj, 5-7.V.2013, 1♂, leg. A. Falahatpisheh.

General distribution: Kazakhstan, Mongolia, Arabian Peninsula, North Africa (Egypt). New record for Iran.

***Miscophus papyrus* de Andrade, 1954**

Material: Iran: Fars Province, Fasa, 30.V.-3.VI.2013, 1♂, leg. S. Azadi; south of Khonj, 22.III.-6.IV.2013; 23-27.IV.2013; 18-20.V.2013, 1♂, 3♀♀, leg. M. Atbaei.

General distribution: Arabian Peninsula, North Africa. New record for Iran.

***Miscophus gratiosus* de Andrade, 1960**

Material: Iran: Fars Province, Fasa, 7-17.I.2013, 1♀, leg. S. Azadi; south of Khonj, 15-22.III.2013; 22.III.-6.IV.2013; 17-23.IV.2013; 20.24.V.2013; 22.III.-6.IV.2013; 16-20.VI.2013; 20-21.VI.2013; 21-24.VI.2013, 2♂♂,7♀♀, leg. M. Atbaei.

Description of male *Miscophus gratiosus* de Andrade, 1960, (hitherto unknown):

Structure and sculpture. Head in frontal view slightly transverse (HH:HW = 0.8); in lateral view maximal length of gena 0.5× [of maximal eye length and with lower frons convex, protruding in front of the ocular contour at about 1.1× Od. Clypeus with disc convex basomedially and almost flat laterally, its surface glabrous and shiny, with few micropunctures; clypeal free margin arcuate laterally, its median portion triangularly protruding in middle, separated by lateral portions by deep semicircular concavity (Fig. 2).

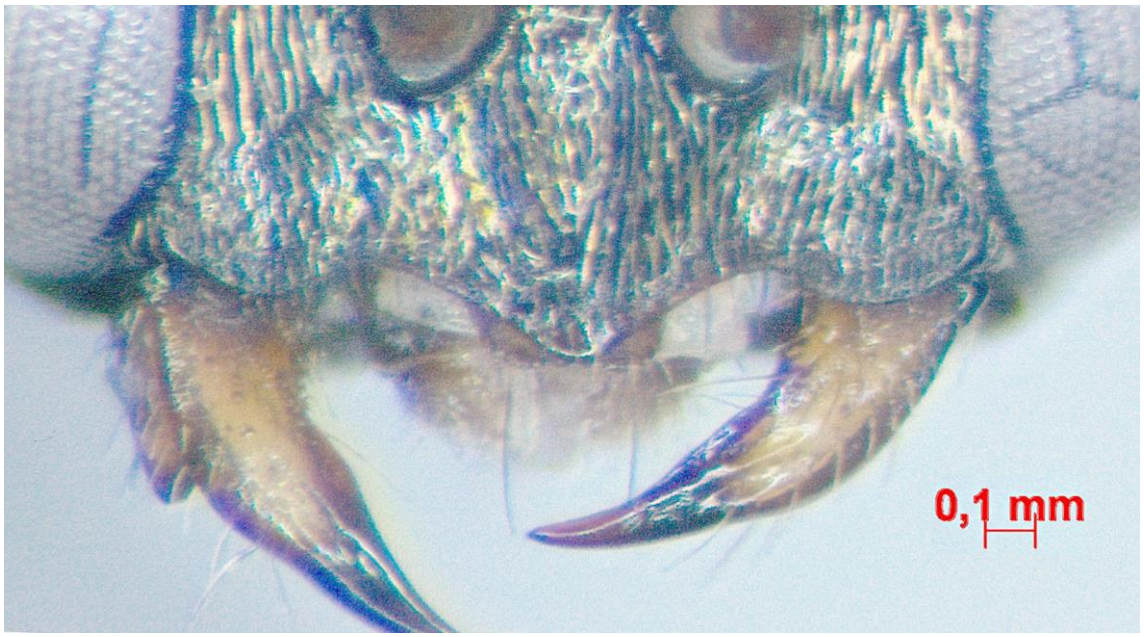

Figure 2. *Miscophus gratiosus* de Andrade, 1960. frontal view of clypeus in male.

Inner ocular orbits slightly sinuous, not strongly converging toward clypeus or vertex, (WFA:WFM:WFO=13:14:12); WFM 2.0× of ocular width in frontal view; ASD=SOD; frons shiny and glabrous, sparsely regularly micropunctate (puncture diameter about 0.2× Od, punctures separated by 1.0-2.5× their own diameter), sparser in upper half; frontal line weak, with small pit in the middle of its length. Vertex shiny, sparsely micropunctate throughout (puncture diameter about 0.2× Od, punctures separated by 1.0-1.5× their own diameter), weakly and broadly concave at the hind ocular orbit behind posterior ocelli; ocelli displaced anteriorly on vertex: the distance between the imaginary line connecting hind ocular margins and the hind ocellus twice greater than hind ocellar diameter, MPD:OOD:POD:Od = 3:2:3:2. Gena shiny and glabrous, rather sparsely micropunctate (puncture diameter less than 0.1× Od, punctures separated by 8-10× their own diameter); upper fourth of genal surface slightly concave. Mandibles with lower edge triangularly dilated just beyond notch. Antenna stout, scape swollen, its length 1.8× maximal width; IF 1 $_{lw}$ = 1.2, IF 2-10 $_{lw}$ = 1.6, IF 11 $_{lw}$ = 1.4. Pronotum silky shiny, with ill-defined micropunctation; pronotal collar shiny, with well impressed, wide transversal sulcus and with prominent, short median swelling. Mesoscutum

and mesoscutellum shiny, polished, regularly micropunctate throughout (puncture diameter about 0.2× Od, punctures separated by 1.5-2.0× their own diameter); anterior part of mesoscutum in middle with wide and deep concavity. Mesopleuron shiny, glabrous, sparsely micropunctate (puncture diameter about 0.2-0.3× Od, punctures separated by 2.0-2.5× their own diameter); the upper portion of mesopleuron (above scrobal groove) convex, shiny and polished; episternal sulcus with short transverse carinuale; scrobal groove shallow but distinct, with glabrous bottom. Metanotal disc shiny and regularly micropunctate (puncture diameter about 0.1× Od, punctures separated by 1.0-1.5× their own diameter). Metapleuron in anterior half shiny and polished, without punctation; its posterior half longitudinally striate over shiny background. Propodeum long (length of the dorsal propodeal surface 1.6× length of posterior surface); dorsal propodeal surface shiny, with uneven tegument and sharp transverse carinae and with well-developed median furrow, which is bisected by sharp median carina (Fig. 3); propodeal side shiny, unevenly sculptured and oblique sharp carinae; hind surface of propodeum transversally carinate over shiny background, concave in the middle of upper half. Wings. First recurrent vein of fore wing joining at M before 1r at distance not greater than Od or interstitial with latter; petiole of second submarginal cell 2.4× shorter than cell height; FWL:FWW = 3; FWL:CAL = 4.1. Metasoma. Terga I- III shiny, regularly micropunctate (puncture diameter about 0.2× Od, punctures separated by 1.0-1.5× their own diameter); terga IV-VII and sterna I-VII shiny, with ill-defined micropunctures (puncture diameter less than 0.1× Od, punctures separated by 1.0-2.0× their own diameter), denser on sterna; apical margins of terga I-VII unsculptured.

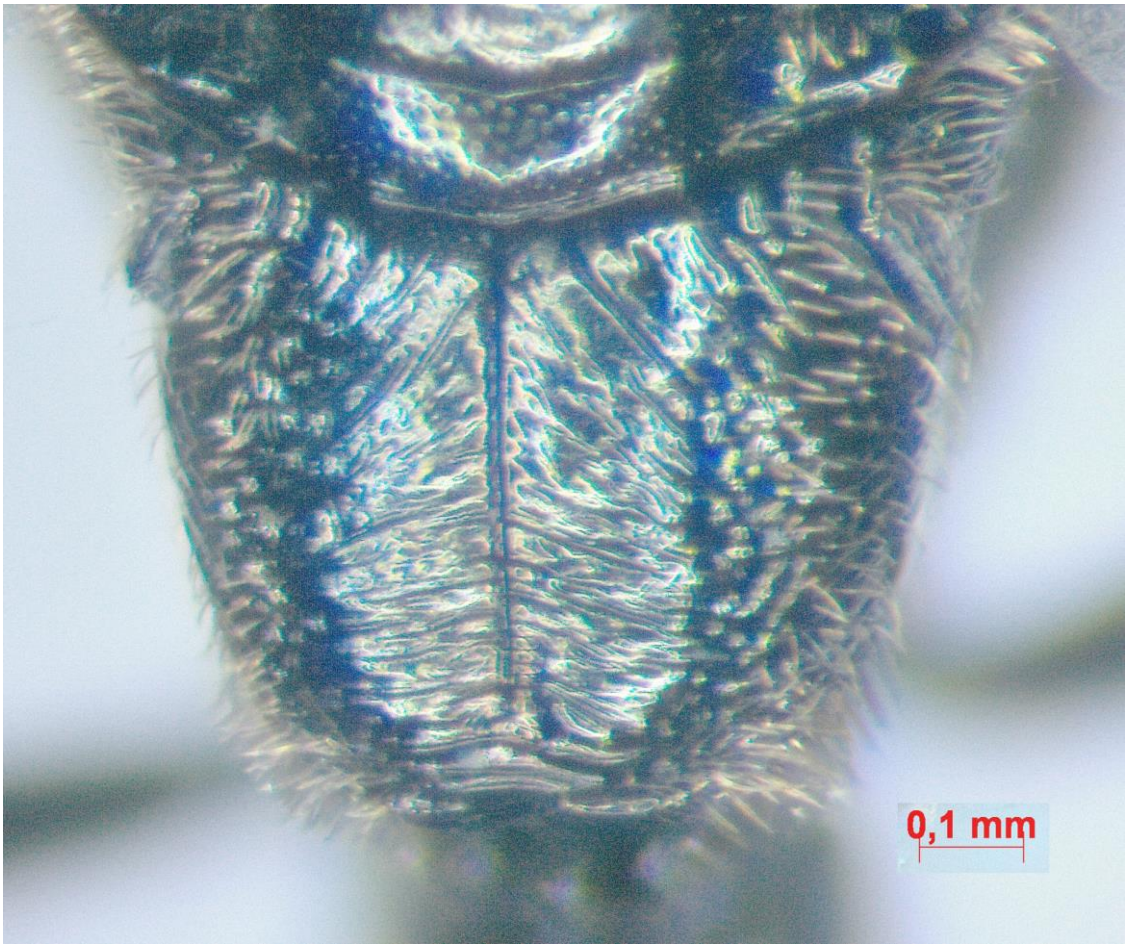

Figure 3. *Miscophus gratiosus* de Andrade, 1960. dorsal view of propodeum in male.

Vestiture. Head (except for upper half of frons and vertex), mesosoma (except for pronotum, upper portion of mesopleuron (above scrobal groove), mesoscutum, mesoscutellum, metapleuron, dorsal propodeal surface and anterior half of propodeal side) covered with semiapressed to semierect yellowish pubescence (setal length 0.8-1.2× Od), pubescence longest and somewhat denser on clypeal disc, lower half of the frons, occipital area behind ocelli, and propodeal side. Upper half of frons, vertex, antennae, pronotum, mesoscutum, mesoscutellum, metapleuron, legs and metasoma covered with semiapressed to semierect shorter whitish pubescence (setal length 0.3-0.5× Od). Inner and outer mandibular surface (except apically) and fore margin of labrum laterally with stout and longer reflective setae (setal length 1.0-1.3× Od). Both wing surfaces with erected brownish pubescence (setal length 0.3× Od).

Coloration. Dark brassy-blackish with metallic greenish reflection. Mandibles (except for dark red apex), ventral surface of scape, maxillar and labial palpi, tegula, humeral plate, forewing veins C, Sc&R, M&Cu and A1, hindwing veins, femora at extreme apex, tibiae (except for large darkened macula on external surface), foretibial spur (except for reddish brown tip) and tarsomeres 1-4 of all legs light testaceous to yellow. Hind margin of metasomal terga discolored. Pedicel, flagellum, wing veins (except of the fore mentioned parts in yellowish), pterostigma, apical spurs of mid and hind tibiae, apical spines on tibiae and tarsi and tarsomere 5 of all legs, dark brown. Wing membrane transparent, slightly infumate at anterior margin beyond marginal cell. Eyes light violet, with wide oblique stripes in greyish emerald color. Length 4.7-4.8 mm (n=2). FWL 2.7-2.9 mm (n=2).

Variation. The upper portion of the mesopleuron (above scrobal groove) in the larger of the two examined specimens has rather sparse, pin prick punctation, while in the smaller specimen it is completely polished; first recurrent vein of fore wing in the specimen with longer fore wing joining at M before 1r at a distance about 0.9× Od, while in the specimen with shorter fore wing it is interstitial with 1r; transverse carinae of the propodeal dorsum in one of the specimens are oblique in the anterior third. At least the first two character states presumably correlate with the size of the relevant body parts.

Sex association. The association of the two male specimens with the females of *gratiosus* (as described by de Andrade (1960: 100-102)) is based on the prolonged propodeum (length of dorsal surface 1.6× length of posterior surface), on a presence of a prominent concavity in the middle of the anterior margin of mesoscutum, on the sculpture of the mesosoma, and on the similarity of the color patterns of body and appendages. Also, 2 males and 5 females of this species were collected at the same location and during the same time period.

General distribution: At present *Miscophus gratiosus* is known from Syria and Greece. New record for Iran.

Nysson Latreille, 1802

Nysson barrei (Radoszkowski, 1893)

Material: Iran: Fars Province, south of Khonj, 16-20.VI.2013; 20-21.VI.2013; 27.VI.-1.VII.2013, 2♂♂, 2♀♀, leg. M. Atbaei.

General distribution: Turkmenistan, Uzbekistan, Tajikistan, Arabian Peninsula, Kazakhstan, North Africa. New record for Iran.

Remark: The proposed synonymy of genus *Synnevrus* with *Nysson* is adopted here because it has been recently announced by Nemkov & Lelej (2013).

Oxybelus Latreille, 1796

Oxybelus arabicus Guichard, 1990

Material: Iran: Fars Province, south of Khonj, 10-21.II.2013, 1♀, leg. M. Atbaei.

General distribution: Jordan, Arabian Peninsula. New record for Iran.

Oxybelus haemorrhoidalis Olivier, 1812

Material: Iran: Fars Province, Fasa, 7-17.I.2013; 3-7.VI.2013, 2♂♂, leg. S. Azadi; south of Khonj, 10-21.II.2013; 27.II.-2.III.2013; 3-4.III.2013; 4-9.III.2013, 15-22.III.2013; 22.III.-6.IV.2013; 11-17.IV.2013; 17-23.IV.2013; 23-27.IV.2013; 27.IV-11.V.2013; 18-20.V.2013; 20-24.V.2013; 24.V.-5.VI.2013; 16-20.VI.2013; 27.VI.-1.VII.2013, 49♂♂, 34♀♀, leg. M. Atbaei.

Distribution in Iran: Isfahan; Kerman; Mazandaran; Sistan & Baluchestan; Yazd (de Beaumont 1957, 1970; Dollfuss 2008). First record for the province of Fars.

General distribution: Europe, Turkey, Syria, Azerbaijan, Turkmenistan, Uzbekistan, Kyrghyzstan, Kazakhstan, southern Siberia, North China, Mongolia, Iran, Afghanistan, Korea, Japan, North Africa.

Oxybelus lamellatus lamellatus Olivier, 1812

Material: Iran: Fars Province, Fasa, 7-17.I.2013, 1♂, leg. S. Azadi; south-east of Kherameh, 18-25.VI.2013, 1♀, leg. E. Izadi; south of Khonj, 15-22.III.2013; 18-20.V.2013; 20-24.V.2013; 24.V.-5.VI.2013; 16-20.VI.2013; 20-21.VI.2013; 21-24.VI.2013; 27.VI.-1.VII.2013; 1-5.VII.2013, 137♂♂, 18♀♀, leg. M. Atbaei; west of Karmostaj, 5-7.V.2013, 1♂, leg. A. Falahatpisheh.

Distribution in Iran: Qazvin; Sistan & Baluchestan; Tehran; Yazd (de Beaumont 1957, 1970; Dollfuss 2008; Ebrahimi 2014). First record for the province of Fars.

General distribution: South Europe, Turkey, Jordan, Turkmenistan, Uzbekistan, Tajikistan, Kyrghyzstan, Kazakhstan, Arabian Peninsula, Iran, North Africa, India, Sri Lanka, Mauritania, Sudan, Cameron.

Oxybelus latro Olivier, 1812

Material: Iran: Fars Province, south-east of Kherameh, 31.V.-12.VI.2013; 12-18.VI.2013; 18-25.VI.2013, 8♂♂, 3♀, leg. E. Izadi; northwest of Kherameh, 10-24.I.2013; 19-27.V.2013; 27-31.V.2013, 6♂♂, leg. E. Izadi.

Distribution in Iran: Ardabil; East Azerbaijan; Khorasan, Razavi; Mazandaran; Qazvin; Tehran (de Beaumont 1957; Ghazi-Soltani *et al.* 2009, 2010a; Ebrahimi 2014). First record for the province of Fars.

General distribution: Europe, Turkey, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, North China, Iran, Afghanistan.

Oxybelus quatuordecimnotatus Jurine, 1807

Material: Iran: Fars Province, Fasa, 7-17.I.2013; 24.I.-19.III.2013, 2♂♂, leg. S. Azadi; south-east of Kherameh, 10-19.V.2013; 10-19.V.2013; 10-19.V.2013; 31.V.-12.VI.2013; 18-25.VI.2013, 12♂♂, 17♀♀, leg. E. Izadi; north-west of Kherameh, 10-24.I.2013; 19-27.V.2013; 27-31.V.2013, 11♂♂, 10♀♀, leg. E. Izadi; south of Khonj, 15-22.III.2013; 17-23.IV.2013; 27.IV-11.V.2013; 18-20.V.2013; 20-24.V.2013; 24.V.-5.VI.2013; 16-20.VI.2013; 21-24.VI.2013; 27.VI.-1.VII.2013; 1-5.VII.2013, 53♂♂, 15♀♀, leg. M. Atbaei;

west of Karmostaj, 5.VI.-6.VII.2013, 2♀♀, leg. A. Falahatpisheh; Neyriz-Jaafarabad, 9-14.IX.2012; 15-21.X.2012, 1♂, 1♀, leg. M. Khosroabadi.

Distribution in Iran: Fars; Isfahan; Kerman; Khorasan, Razavi; Mazandaran; Qazvin; Tehran (Morice 1921; de Beaumont 1957, 1970; Dollfuss 2008; Ebrahimi 2014).

General distribution: Europe, Turkey, Syria, Israel, Jordan, Turkmenistan, Uzbekistan, Tajikistan, Kyrghyzstan, Kazakhstan, western Siberia, North China, Mongolia, Arabian Peninsula, Iran, Afghanistan, North Africa.

***Oxybelus subspinosus* Klug, 1835**

Material: Iran: Fars Province, Neyriz-Jaafarabad, 10.VIII.-9.IX.2012, 1♀, leg. M. Khosroabadi.

Distribution in Iran: Fars; Isfahan; Kerman; Khuzestan (de Beaumont 1970; Dollfuss 2008; Sakenin *et al.* 2011).

General distribution: Europe, Turkey, Syria, Israel, Jordan, Armenia, Turkmenistan, Uzbekistan, Tajikistan, Kyrghyzstan, Kazakhstan, North China, Mongolia, Arabian Peninsula, Iran, Afghanistan, North Africa.

***Oxybelus tinklyi* Guichard, 1990**

Material: Iran: Fars Province, south of Khonj, 24.V.-5.VI.2013; 16-20.VI.2013; 20-21.VI.2013; 27.VI.-1.VII.2013, 9♂♂, 6♀♀, leg. M. Atbaei.

General distribution: Syria, Israel, Jordan, Arabian Peninsula, Senegal. New record for Iran.

***Oxybelus variegatus* Wesmael, 1852**

Material: Iran: Fars Province, Fasa, 7-17.I.2013; 17-24.I.2013; 7-12.VI.2013, 1♂, 3♀♀, leg. S. Azadi; south-east of Kherameh, 10-19.V.2013; 10-19.V.2013; 31.V.-12.VI.2013; 18-25.VI.2013, 9♂♂, 3♀♀, leg. E. Izadi; north-west of Kherameh, 10-24.I.2013; 27-31.V.2013, 11♂♂, 4♀♀, leg. E. Izadi; south of Khonj, 10-21.II.2013; 27.VII.-2.III.2013; 15-22.III.2013; 22.III.-6.IV.2013; 17-23.IV.2013; 27.IV-11.V.2013; 18-20.V.2013; 20-24.V.2013; 16-20.VI.2013, 10♂♂, 4♀♀, leg. M. Atbaei; west of Karmostaj, 20-31.III.2013, 1♀, leg. A. Falahatpisheh; Neyriz-Jaafarabad, 9-14.IX.2012, 3♀♀, 15.21.X.2012, 1♂, leg. M. Khosroabadi.

Distribution in Iran: Isfahan; Mazandaran; Qazvin; Tehran (de Beaumont 1957; Dollfuss 2008). First record for the province of Fars.

General distribution: Europe, Turkey, Syria, Turkmenistan, Uzbekistan, Tajikistan, Kyrghyzstan, Kazakhstan, Iran.

***Palarus* Latreille, 1802**

***Palarus bisignatus* F. Morawitz, 1890**

Material: Iran: Fars Province, south of Khonj, 27.VI.-1.VII.2013, 1♂, leg. M. Atbaei.

General distribution: Turkmenistan, Uzbekistan, Kazakhstan, Arabian Peninsula, Pakistan. New record for Iran.

***Palarus funerarius* F. Morawitz, 1889**

Material: Iran: Fars Province, Fasa, 10-24.V.2013; 30.V.-3.VI.2013; 3-7.VI.2013, 1♂, 2♀♀, leg. S. Azadi.

Distribution in Iran: Khuzestan (Pulawski & Prentice 2008). First record for the province of

Fars.
General distribution: South-east Europe, Turkey, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, Mongolia, Arabian Peninsula, Iran, Pakistan, India.

***Passaloecus* Shuckard, 1837**

***Passaloecus pictus* Ribaut, 1952**

Material: Iran: Fars Province, south-east of Kherameh, 18-25.VI.2013, 1♂, leg. E. Izadi.

General distribution: Europe, Turkey, Syria, North Africa, Brazil (introduced in Sao Paulo). New record for Iran.

***Pemphredon* Latreille, 1796**

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

Material: Iran: Fars Province, Fasa, 24-30.V.2013, 1♂, leg. S. Azadi; south-east of Kherameh, 10-19.V.2013; 10-19.V.2013; 31.V.-12.VI.2013; 18-25.VI.2013, 1♂, 3♀♀, leg. E. Izadi.

Distribution in Iran: Alborz; Isfahan; Qazvin; Tehran (Dollfuss 1995; Ebrahimi 1993, 2014). First record for the province of Fars.

General distribution: Europe, Great Briatin, Turkey, Israel, Uzbekistan, Kyrghyzstan, Kazakhstan, southern Siberia, North China, Iran, Afghanistan, Korea, Japan, North Africa.

***Pemphredon morio* Vander Linden, 1829**

Material: Iran: Fars Province, west of Karmostaj, 5-7.V.2013, 1♀, leg. A. Falahatpisheh.

General distribution: Europe, Great Briatin, Uzbekistan, Kyrghyzstan, Kazakhstan, southern Siberia, Japan. New record for Iran.

***Philanthus* Fabricius, 1790**

***Philanthus triangulum triangulum* (Fabricius, 1775)**

Material: Iran: Fars Province, south-east of Darab: 12.VII.-7.VIII.2012, 2♀♀; 1-8.VII.2012, 3♀♀, leg. A. Haghighi; Fasa, 1-7.I.2013; 7-17.I.2013; 12-15.IV.2013, 2♂♂, 2♀♀, leg. S. Azadi; Jahrom, 1-25.IV.2013, 2♂♂, 1♀, leg. B. Majnon Jahromi; south-east of Kherameh, 10-19.V.2013; 18-25.VI.2013, 1♂, 1♀, leg. E. Izadi; south of Khonj, 20-24.V.2013; 27.VI.-1.VII.2013; 5-16.VI.2013, 4♂♂, 2♀♀, leg. M. Atbaei; west of Karmostaj, 5-7.V.2013; 20-31.III.2013; 5.VI.-6.VII.2013; 6-11.VII.2013, 18♂♂, 14♀♀, leg. A. Falahatpisheh; south of Lar, 16-20.V.2013; 20.V.-5.VI.2013; 20.V.-5.VI.2013; 5-16.VI.2013, 21♂♂, 9♀♀, leg. A. Falahatpisheh.

Distribution in Iran: Alborz; Ardabil; East Azerbaijan; West Azerbaijan; Fars; Gilan; Golestan; Hormozgan; Ilam; Isfahan; Kermanshah; Khorasan, Razavi; South Khorasan; Markazi; Mazandaran; Qazvin; Semnan; Tehran (Morice 1921; de Beaumont, 1957, 1970; Esmaili & Rastegar 1974; Ghahari *et al.* 2007; Fallahzadeh *et al.* 2009; Ghazi-Soltani *et al.* 2010a,b,c; Saghaei *et al.* 2010; Sakenin *et al.* 2011a; Ebrahimi 2014; Samin *et al.* 2015).

General distribution: Europe, Great Briatin, Canary Islands, Turkey, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, southern Siberia, North China, Arabian Peninsula, Iran, Afghanistan, North Africa.

***Pison* Jurine, 1808**

***Pison atrum* (Spinola, 1808)**

Material: Iran: Fars Province, south-east of Kherameh, 31.V.-12.VI.2013, 1♀, leg. E. Izadi.

General distribution: Europe, Turkey, Kazakhstan, North Africa. New record for Iran.

***Pison sericeum* Kohl, 1888**

Material: Iran: Fars Province, Fasa, 30.V.-3.VI.2013, 1♂, leg. S. Azadi; north-west of Kherameh, 19-27.V.2013, 1♂, leg. E. Izadi.

Distribution in Iran: This species was announced to inhabit in Iran without any precise localities (Antropov 2007). First record for the province of Fars.

General distribution: South Europe, Turkey, Iran.

***Prosopigastra* A. Costa, 1867**

***Prosopigastra creon* (Nurse, 1903)**

Material: Iran: Fars Province, south of Khonj, 16-20.VI.2013, 1♀, leg. M. Atbaei.

Distribution in Iran: Mazandaran; Tehran (Puławski 1979). First record for the province of Fars.

General distribution: Israel, Armenia, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, Arabian Peninsula, Iran, Pakistan, Africa, India.

***Solierella* Spinola, 1851**

***Solierella compedita* (Piccioli, 1869)**

Material: Iran: Fars Province, Fasa, 7-17.I.2013; 30.V.-3.VI.2013; 3-7.VI.2013; 7-12.VI.2013, 9♂♂, 9♀♀, leg. S. Azadi; south-east of Kherameh, 10-19.V.2013; 31.V.-12.VI.2013; 18-25.VI.2013, 8♀♀, leg. E. Izadi; north-west of Kherameh, 10-24.I.2013, 1♂, 3♀♀, leg. E. Izadi; south of Khonj, 4-9.III.2013; 15-22.III.2013; 22.III.-6.IV.2013; 17-23.IV.2013; 27.IV-11.V.2013; 18-20.V.2013; 16-20.VI.2013, 9♂♂, 24♀♀, leg. M. Atbaei; west of Karmostaj, 5.VI.-6.VII.2013, 1♀, leg. A. Falahatpisheh.

Remarks on distribution and variation in certain morphological characters:

The distribution of *Solierella compedita* ranges from Europe and North Africa to Iran, Israel, Turkey and southern Kazakhstan. The species is also known from the larger Mediterranean Islands, e. g. Sardinia, Sicily, Lampedusa, Crete, and Cyprus. The rather large available material of this species from southern Iran (61 specimens) showed extensive intraspecific variation regarding the sculpture of the mesopleuron and the coloration of the legs (particularly femora and tibiae). In general, the upper portion of the mesopleuron (above scrobal groove) is shiny, with glabrous integument and sparse punctuation; in some specimens, however, the punctation becomes denser (punctures separated 1.0–1.5× their own diameter) over more or less uneven integument. Some color characters for the males and the females are noted in table 3 and table 4, respectively. Changes of character states for the sculpture of mesopleuron and for the coloration of the legs can be correlated with geographical distribution, thus clearly represent population variation. Specimens from Western and Central Europe are relatively strongly sculptured and have entirely dark legs. Specimens from Eastern Europe show more or less developed pale coloration at least on the apical part of the hind surface of mid femora while the specimens from south Iran have frequently extensive pale markings (Table 3 and 4). The data in tables 3 and 4 shows that

both in the males and the females the reduction of the light parts on the hind surface of the fore and mid femora is initiated from the proximal while on the tibiae it is initiated from the apical.

General distribution: Central and South Europe, North Africa, Turkey, Israel, South Kazakhstan. New record for Iran.

Table 3. Variations in the coloration of the femora and tibiae in 9 males of *Solierella compedita* from three localities in eastern Zagros Mountains.

character **specimen and locality**	**pale parts on the hind surface in femur 1**	**pale parts on the hind surface in femur 2**	**pale parts on the outer surface in tibia 1**	**pale parts on the outer surface in tibia 2**	**pale parts on the outer surface in tibia 3**
specimen 1/Fasa	absent	absent	fully occupying the surface	fully occupying the surface	present, occupying almost whole surface except at the apex
specimen 2/Fasa	absent	absent	present, occupying almost whole surface except at the apex	present, occupying almost whole surface except at the apex	present, occupying almost whole surface except at the apex
specimen 3/Fasa	absent	absent	fully occupying the surface	fully occupying the surface	present, occupying almost whole surface except at the apex
specimen 4/Fasa	absent	absent	fully occupying the surface	fully occupying the surface	present, occupying almost whole surface except at the apex
specimen 5/Fasa	absent	absent	fully occupying the surface	fully occupying the surface	present, occupying almost whole surface except at the apex
specimen 6/Fasa	absent	absent	present, occupying almost whole surface except at the apex	fully occupying the surface	present, occupying almost whole surface except at the apex
specimen 7/north-west of Kherameh	absent	absent	fully occupying the surface	fully occupying the surface	present, occupying almost whole surface except at the apex
specimen 8/south of Khonj	present apically, occupying surface about 0.5× Od apically	absent	fully occupying the surface	fully occupying the surface	present, occupying almost whole surface except at the apex
specimen 9/south of Khonj	absent	present apically, occupying surface about 1.5× Od	present, occupying almost whole surface except at the apex	fully occupying the surface	present, occupying almost whole surface except at the apex

Table 4. Variations in the coloration of the femora and tibiae in 22 females of *Solierella compedita* from three localities in eastern Zagros Mountains.

character specimen/locality	**pale parts on the hind surface in femur 1**	**pale parts on the hind surface in femur 2**	**pale parts on the outer surface in tibia 1**	**pale parts on the outer surface in tibia 2**	**pale parts on the outer surface in tibia 3**
specimen 1/Fasa	present apically, occupying surface about 0.5 × Od	absent	present proximally, occupying surface far beyond the half of the tibial length	present proximally, occupying surface far beyond the half of the tibial length	present proximally, occupying surface shortly beyond the half of the tibial length
specimen 2/Fasa	absent	absent	fully occupying the surface	fully occupying the surface	present proximally, occupying surface far beyond the half of the tibial length

specimen 3/Fasa	present apically, occupying surface about 1.5 × Od	absent	fully occupying the surface	fully occupying the surface	present proximally, occupying surface far beyond the half of the tibial length
specimen 4/Fasa	absent	absent	present proximally, occupying surface up to half of the tibial length	present proximally, occupying surface shortly beyond the half of the tibial length	present proximally, occupying surface far beyond the half of the tibial length
specimen 5/Fasa	absent	absent	present proximally, occupying surface far beyond the half of the tibial length	fully occupying the surface	present proximally, occupying surface far beyond the half of the tibial length
specimen 6/Fasa	absent	absent	present proximally, occupying surface shortly beyond the half of the tibial length	fully occupying the surface	present proximally, occupying surface shortly beyond the half of the tibial length
specimen 7/Fasa	present apically, occupying surface about 2.5× Od	present apically, occupying surface about 0.5× Od	present proximally, occupying surface up to half of the tibial length	fully occupying the surface	present proximally, occupying surface shortly beyond the half of the tibial length
specimen 8/south-east of Kherameh	absent	absent	present proximally, occupying surface about 1.0 × Od	present proximally, occupying surface up to half of the tibial length	present proximally, occupying surface up to half of the tibial length
specimen 9/south-east of Kherameh	present apically, occupying surface about 2.0× Od	absent	fully occupying the surface	fully occupying the surface	present proximally, occupying surface shortly beyond the half of the tibial length
specimen 10/south of Khonj	absent	absent	present, occupying almost whole surface except at the apex	present, occupying almost whole surface except at the apex	present, occupying almost whole surface except at the apex
specimen 11/south of Khonj	absent	absent	present, occupying almost whole surface except at the apex	present, occupying almost whole surface except at the apex	present, occupying almost whole surface except at the apex
specimen 12/south of Khonj	absent	absent	present proximally, occupying surface about 1.0 × Od	present proximally, occupying surface up to half of the tibial length	present proximally, occupying surface shortly beyond the half of the tibial length
specimen 13/south of Khonj	absent	absent	present proximally, occupying surface up to half of the tibial length	present proximally, occupying surface shortly beyond the half of the tibial length	present proximally, occupying surface shortly beyond the half of the tibial length
specimen 14/south of Khonj	absent	absent	fully occupying the surface	fully occupying the surface	present proximally, occupying surface far beyond the half of the tibial length
specimen 15/south of Khonj	absent	absent	fully occupying the surface	fully occupying the surface	present proximally, occupying surface far beyond the half of the tibial length
specimen 16/south of Khonj	absent	absent	present proximally, occupying surface far beyond the half of the tibial length	present proximally, occupying surface far beyond the half of the tibial length	present proximally, occupying surface far beyond the half of the tibial length
specimen 17/south of Khonj	absent	absent	fully occupying the surface	fully occupying the surface	present proximally, occupying surface far beyond the half of the tibial length
specimen 18/south of Khonj	absent	absent	absent	present proximally, occupying surface about 0.5× Od	present proximally, occupying surface up to half of the tibial length
specimen 19/south of Khonj	present apically, occupying surface about 0.5× Od	absent	present proximally, occupying surface far beyond the half of the tibial length	fully occupying the surface	present proximally, occupying surface shortly beyond the half of the tibial length
specimen 20/south of Khonj	absent	absent	present proximally, occupying surface up to half of the tibial length	present proximally, occupying surface shortly beyond the half of the tibial length	present proximally, occupying surface shortly beyond the half of the tibial length

specimen 21/south of Khonj	absent	absent	present proximally, occupying surface shortly beyond the half of the tibial length	present proximally, occupying surface shortly beyond the half of the tibial length	present proximally, occupying surface shortly beyond the half of the tibial length
specimen 22/south of Khonj	absent	absent	present proximally, occupying surface about 1.0× Od	present proximally, occupying surface up to half of the tibial length	present proximally, occupying surface shortly beyond the half of the tibial length

***Solierella nigridorsum* Puławski, 1964**

Material: Iran: Fars Province, south of Khonj, 20-24.V.2013, 2♀♀, leg. M. Atbaei.

General distribution: Arabian Peninsula, North Africa (Egypt). New record for Iran.

***Spilomena* Shuckard, 1838**

Genus *Spilomena* includes 86 species known from all continents except for Antarctida. The genus is recorded for the first time from Iran.

***Spilomena roshanica* Gussakovskij, 1952**

Material: Iran: Fars Province, south-east of Kherameh, 10-19.V.2013, 1♀, leg. E. Izadi; west of Karmostaj, 5.VI.-6.VII.2013, 1♀, leg. A. Falahatpisheh.

General distribution: Tajikistan, Kazakhstan. New record for Iran.

***Stizus* Latreille, 1802**

***Stizus annulatus* (Klug, 1845)**

Material: Iran: Fars Province, north-west of Darab: 1-8.VII.2012, 1♂, leg. A. Haghighi.

Distribution in Iran: Golestan; South Khorasan (Radoszkovsky 1871; Gussakovskij 1933; de Beaumont 1957). First record for the province of Fars.

General distribution: Turkey, Israel, Azerbaijan, Turkmenistan, Tajikistan, South Kazakhstan, Iran, North Africa.

***Stizus rufiventris* Radoszkowski, 1877**

Material: Iran: Fars Province, west of Karmostaj, 5-7.V.2013, 2♀♀, leg. A. Falahatpisheh; south of Lar, 20.V.-5.VI.2013, 1♀, leg. A. Falahatpisheh.

Distribution in Iran: South Khorasan; Sistan & Baluchestan (Gussakovskij 1933; de Beaumont 1970). First record for the province of Fars.

General distribution: Turkey, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, Mongolia, Iran.

***Tachysphex* Kohl, 1883**

***Tachysphex cheops* de Beaumont, 1940**

Material: Iran: Fars Province, Neyriz-Jaafarabad, 29.VII.-10.VIII.2012; 14-15.IX.2012; 15-21.X.2012, 3♂♂, leg. M. Khosroabadi.

General distribution: Israel, North Africa. New record for Iran.

***Tachysphex consocius* Kohl, 1892**

Material: Iran: Fars Province, west of Karmostaj, 6-11.VII.2013, 1♂, leg. A. Falahatpisheh.

Distribution in Iran: East Azerbaijan; Mazandaran (Pulawski 2007; Samin *et al.* 2015). First record for the province of Fars.

General distribution: Europe, Turkey, Syria, Lebanon, Israel, Armenia, Azerbaijan, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, Arabian Peninsula, Iran, Afghanistan, India, Sri Lanka, Africa.

***Tachysphex dignus* Kohl, 1889**

Material: Iran: Fars Province, Neyriz-Jaafarabad, 29.VII.-10.VIII.2012, 1♀, leg. M. Khosroabadi.

Distribution in Iran: East Azerbaijan; Kurdistan; Sistan & Baluchestan (de Beaumont 1970; Pulawski 2007). First record for the province of Fars.

General distribution: Turkey, Syria, Israel, Turkmenistan, Kazakhstan, Arabian Peninsula, Iran, Pakistan.

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

Material: Iran: Fars Province, Fasa, 7-17.I.2013; 10-24.V.2013; 30.V.-3.VI.2013; 3-7.VI.2013, 7♂♂, leg. S. Azadi; Jahrom, 1-25.IV.2013, 1♂, 1♀, leg. B. Majnon Jahromi; south-east of Kherameh, 10-19.V.2013; 31.V.-12.VI.2013; 18-25.VI.2013, 1♂, 3♀♀, leg. E. Izadi; north-west of Kherameh, 10-24.I.2013, 1♂, leg. E. Izadi; Neyriz-Jaafarabad, 29.VII.-10.VIII.2012; 14-15.IX.2012; 15-21.X.2012, 3♀♀, leg. M. Khosroabadi.

Distribution in Iran: Ardabil; Golestan; Mazandaran; Sistan & Baluchestan (de Beaumont 1957; Ebrahimi 2014). First record for the province of Fars.

General distribution: Europe, Turkey, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, Arabian Peninsula, Iran, Afghanistan, Pakistan, North Africa.

***Tachysphex julliani* Kohl, 1883**

Material: Iran: Fars Province, Neyriz-Jaafarabad, 29.VII.-10.VIII.2012, 1♀, leg. M. Khosroabadi.

Distribution in Iran: Kerman; Mazandaran; Sistan & Baluchestan; Tehran (Gussakovskij 1933; Pulawski 2007). First record for the province of Fars.

General distribution: South Europe, Turkey, Lebanon, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, Arabian Peninsula, Iran, Pakistan, North Africa.

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

Material: Iran: Fars Province, Jahrom, 1-25.IV.2013, 1♂, leg. B. Majnon Jahromi; south of Khonj, 27.IV-11.V.2013, 1♂, leg. M. Atbaei; Neyriz-Jaafarabad, 14-15.X.2012, 1♀, leg. M. Khosroabadi.

Distribution in Iran: Kerman; Mazandaran; Semnan; Sistan & Baluchestan; Tehran (Pulawski 2007). First record for the province of Fars.

General distribution: Europe, Turkey, Israel, Lebanon, Georgia, Azerbaijan, Turkmenistan, Uzbekistan, Tajikistan, Kyrghyzstan, Kazakhstan, Mongolia, Arabian Peninsula, Iran, North Africa, India, Kenya.

***Tachysphex pompiliformis* (Panzer, 1803)**

Material: Iran: Fars Province, Fasa, 10-24.V.2013, 1♀, leg. S. Azadi; north-west of Kherameh, 10-24.I.2013, 1♀, leg. E. Izadi.

Distribution in Iran: Alborz; Ardabil; East Azerbaijan; Chahar Mahaal & Bakhtiari;

Khorasan, Razavi; Kurdistan; Mazandaran; Semnan; Tehran (Ebrahimi 2000a; Abd-Rabou *et al.* 2005; Ghahari *et al.* 2009; Sakenin *et al.* 2010a,b; Samin *et al.* 2010; Ebrahimi 2014). First record for the province of Fars.

General distribution: Europe, Great Briatin, Turkey, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, southern Siberia, North China, Mongolia, Russian Far East, Sakhalin Island, Korea, Pakistan, India, North Africa, North America.

***Tachysphex tarsinus* (Lepeletier de Saint-Fargeau, 1845)**

Material: Iran: Fars Province, west of Karmostaj, 5.VI.-6.VII.2013, 1♀, leg. A. Falahatpisheh.

Distribution in Iran: East Azerbaijan (Samin *et al.* 2015). First record for the province of Fars.

General distribution: Europe, Turkey, Tajikistan, Kazakhstan, southern Siberia, North China, Arabian Peninsula, North Africa, Mauritania.

***Tachytes* Panzer, 1806**

***Tachytes argenteus* Gussakovskij, 1933**

Material: Iran: Fars Province, south of Lar, 20.V.-5.VI.2013, 1♀, leg. A. Falahatpisheh.

Distribution in Iran: South Khorasan (Gussakovskij 1933; Puławski 1962). First record for the province of Fars.

General distribution: South-east Europe, Turkey, Turkmenistan, Kazakhstan, Arabian Peninsula, Iran.

***Tachytes freygessneri* Kohl, 1881**

Material: Iran: Fars Province, west of Karmostaj, 5-7.V.2013, 1♀, leg. A. Falahatpisheh.

Distribution in Iran: Ardabil, Tehran (de Beaumont, 1957; Puławski, 1962). First record for the province of Fars.

General distribution: South Europe, Turkey, Kazakhstan, North China, North Africa.

***Tachytes pygmaeus* Kohl, 1888**

Material: Iran: Fars Province, south of Khonj, 20-21.VI.2013, 1♀, leg. M. Atbaei; west of Karmostaj, 5-7.V.2013, 1♀, leg. A. Falahatpisheh.

Distribution in Iran: Khuzestan (Samin *et al.* 2015). First record for the province of Fars.

General distribution: Arabian Peninsula, Iran, Africa, India, Thailand.

***Tachytes xenoferus* Rohwer, 1911**

Material: Iran: Fars Province, south-east of Darab: 7-14.VIII.2012, 1♀, leg. A. Haghighi.

General distribution: Israel, Arabian Peninsula, Pakistan, Africa, India, Sri Lanka, Thailand, Taiwan. New record for Iran.

***Trypoxylon* Latreille, 1796**

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

Material: Iran: Fars Province, south of Khonj, 15-22.III.2013; 22.III.-6.IV. 2013, 2♂♂, leg. M. Atbaei.

Distribution in Iran: Markazi (Ebrahimi 2014). First record for the province of Fars.

General distribution: South Europe, Turkey, Syria, Israel, Armenia, Azerbaijan, Turkmenistan, Uzbekistan, Tajikistan, Pakistan, North Africa.

***Trypoxylon medium* de Beaumont, 1945**

Material: Iran: Fars Province, south of Lar, 16-20.V.2013, 1♂, leg. A. Falahatpisheh.

Distribution in Iran: Golestan (Pulawski 1984). First record for the province of Fars.

General distribution: Europe, Great Briatin, Turkey, Kazakhstan, southern Siberia.

***Trypoxylon scutatum scutatum* Chevrier, 1867**

Material: Iran: Fars Province, Fasa, 7-17.I.2013; 30.IV.-7.V.2013; 7-12.VI.2013, 1♂, 2♀♀, leg. S. Azadi; south-east of Kherameh, 31.V.-12.VI.2013; 18-25.VI.2013, 1♂, 3♀♀, leg. E. Izadi; north-west of Kherameh, 10-24.I.2013; 27-31.V.2013, 2♀♀, leg. E. Izadi.

Distribution in Iran: Alborz; Ardabil; East Azerbaijan; Mazandaran (de Beaumont 1957; Ghazi-Soltani *et al.* 2010a,b; Ebrahimi 2014). First record for the province of Fars.

General distribution: Europe, Turkey, Syria, Israel, Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, North Africa, Ethiopia.

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Correspondence: Mitra Atbaei, e-mail*:* *mitra.atbaei@gmail.com*
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