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The tribe *Osmiini* (Hymenoptera: Megachilidae) in the north of Iran: new records and distributional data

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Abstract

New records and a distributional map are provided for species of the tribe *Osmiini* in the north of Iran. Twenty five species of osmiine bees were collected and identified in the North of Iran during 2009-2010. Among them are six species including *Osmia* (*Hoplosmia*) *bidentata* MORAWITZ 1876, *Hoplitis* (*Alcidamea*) *ciliaris* (PÉREZ 1902), *Heriades* (*Heriades*) *truncorum* (LINNAEUS 1758), *Heriades* (*Rhopaloheriades*) *clavicornis* MORAWITZ 1875, *Chelostoma* (*Chelostoma*) *diodon* SCHLETTERER 1889 and *Chelostoma* (*Gyrodromella*) *rapunculi* (LEPELETIER 1841), which are recorded for the first time from Iran. The monotypic subgenus *Rhopaloheriades* is mentioned for the first time from Iran. Distribution of all species and flower preferences of the species recorded for the first in Iran are briefly discussed.

Zusammenfassung

Vorliegende Arbeit behandelt das Vorkommen von Osmiini (Hymenoptera: Megachilidae) im Nordiran. Im Zeitraum 2009-2010 gelang der Nachweis von 25 Arten dieser Tribus. *Osmia* (*Hoplosmia*) *bidentata* MORAWITZ 1876, *Hoplitis* (*Alcidamea*) *ciliaris* (PÉREZ 1902), *Heriades* (*Heriades*) *truncorum* (LINNAEUS 1758), *Heriades* (*Rhopaloheriades*) *clavicornis* MORAWITZ 1875, *Chelostoma* (*Chelostoma*) *diodon* SCHLETTERER 1889 und *Chelostoma* (*Gyrodromella*) *rapunculi* (LEPELETIER 1841) stellen Neunachweise für den Iran dar. Auch die Untergattung *Rhopaloheriades* war bislang aus dem Iran nicht bekannt.

Introduction

Pollination is a key function of bees in natural and agricultural ecosystems. Bee pollinators are a key component of global biodiversity, providing vital ecosystem services to crops and wild plants (POTTS et al. 2010). The great majority of flowering plants rely on wild bees for pollination, with more than 17.000 indentified species (MICHENER 2007). The tribe Osmiini NEWMAN 1834 (Hymenoptera: Megachilidae) is a diverse group and contains 15 genera and 1.160 species worldwide. They are especially diversified in mediterranean and deserted climates of southern Africa, southwestern North America and the Palaearctic. With 10 genera and about 700 species, the Palaearctic osmiine bee's fauna is particularly diverse (MÜLLER 2012). Several *Osmia* species in Europe (e.i. *O. cornuta* (LATREILLE 1805)), Asia (e.i. *O. cornifrons* (RADOSZKOWSKI 1887) and North America (e.i. *O. lignaria* SAY 1837) are commercially used to pollinate the flowers of fruit trees (BOSCH & KEMP 2002).

The huge diversity of wild bees fundamentally has been unknown, particularly with regard to the plants that they visit and crops that they pollinate. The identification and classification of many important pollinator groups is inadequate so that many species are still undescribed. Increased awareness of the important role native bees play as pollinators has led to many initiatives throughout the world to document the bee fauna.

The Iranian bee fauna, which comprises more than 500 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). ASCHER & PICKERING (2012) listed about 132 megachilid species in "Discover Life's bee species guide and world checklist". We summarized here some data for Osmiine bees, which are one of the large tribes of megachilid bees in Iran.

Material and Methods

Based on an extensive survey, Osmiine bees were collected from different lowland to highland habitats (maximum about 2400 m) at weekly interval throughout flowering season in the northern regions of Iran during 2009-2010. The bees were collected using 16 malaise traps; 8 traps were set up in northern slopes and 8 traps in southern slopes of Alborz Mountains in both agro and natural ecosystem. North of Iran is characterized by two different ecological zones that separated by Alborz Mountains: Hyrcanian (Caspian) and Iran-o-Turanian zones. Hyrcanian Zone include Alborz Range forest steppe, Caspian Hyrcanian mixed forest and Caspian lowland desert. Iran-o-Turanian Zone includes both mountain and plain areas dominated by desert climate and hot summer (HESHMATI 2007). These zones form diverse and vast regions of mountain, lush irrigated lowlands, wetland and desert with a great biodiversity of bees which is associated with the diverse flora, topographical irregularity and the xeric landscapes (GRACE 2010). Additional bee material was collected by sweep net while bees were active near flowering plants. Information for each specimen caught, such as location and altitude of the collection site, were recorded with a GPS device (Garmin geko 301). The specimens were killed in jars containing ethyl acetate. The insects were later pinned, prepared according to the

standard methods and stored until their identification to species level. All collected specimens are deposited in the insect collection of the Department of Entomology, Tarbiat Modares University, Tehran, Iran.

Results

Results of research on the bee fauna of northern Iran revealed 25 species of osmiine bees that belong to 5 genera and 13 subgenera, including information on distributional data and plant preferences. Of these, we report here 6 species and one subgenus records of osmiine bees for the first time in Iran. Distributional map of all collected bees are provided (Fig. 1). The newly recorded taxa are indicated by an asterisk (*).

Chelostoma (*Chelostoma*) *emarginatum* (NYLANDER 1856)

Material examined: Guilan province: Heiran (N 38° 23' 711" E 48° 36'556", 814 m), 6♀♀ 9. V.2010; Gandvash Bala-Heiran (N 38° 23' 825" E 48° 36' 629", 822 m), 2♀♀ 30.V.2010; Shahraj Bala-Rudsar (N: 36° 45' E 50° 20', 1600 m), 2♀♀ 7.VI.2010.

Distribution: Austria, Azerbaijan, Bulgaria, Bosnia and Herzegovina, Switzerland, Czech Republic, Spain, France, Greece, Hungary, Croatia, Italy, Sicily, Macedonia, Portugal, Romania, Serbia and Montenegro, Slovakia, Slovenia, Turkey, Iran (GRACE 2010; MÜLLER 2012).

Flower preferences: Oligolectic on *Ranunculus* (Ranunculaceae) and possibly also on closely related genera (AMIET et al. 2004; SEDIVY et al. 2008; GRACE 2010; MÜLLER 2012).

**Chelostoma* (*Chelostoma*) *diodon* SCHLETTERER 1889

Material examined: Qazvin Province: Sharifabad-Alamout (N= 36° 27', E= 50°28', 2359 m), 6♀♀ 2.VI.2009.

Distribution: Greece, Cyprus, Palestine, Jordan, Syria, Turkey (UNGRICHT et al. 2008; GRACE 2010), new record for Iran.

Flower preferences: Oligolectic on Asteraceae with a clear preference for Asteroideae, such as *Anthemis libanotica* and *Bellis perennis* (SEDIVY et al. 2008; GRACE 2010; MÜLLER 2012).

Chelostoma (*Gyrodromella*) *proximum* SCHLETTERER 1889

Material examined: Guilan province: Deylaman- Siahkal (N= 36° 55' E= 49° 53', 1520 m), 1♂ 14.VI.2010.

Distribution: Azerbaijan, Georgia, Russia, Ukraine, Russian Far East, Turkmenistan, Caucasus, China, Iran, Turkey (BANASZAK & ROMASENKO 1998; GRACE 2010).

Flower preferences: Probably Oligolectic on Campanulaceae (BANASZAK & ROMASENKO 1998; MÜLLER 2012).

***Chelostoma* (*Gyrodromella*) *rapunculi* (LEPELETIER 1841)**

Material examined: Tehran province: Shahrestanak- Chalus road (N= 35° 57' 583" E= 51° 22' 339", 2305 m), 1♀ 6.VI.2010.

Distribution: Europe, Algeria, Morocco, Northern Asia, Palestine, Turkey, Canada, USA [Introduced]. (BANASZAK & ROMASENKO 1998; AMIET et al. 2004; UNGRICHT et al. 2008; MÜLLER 2012), new record for Iran.

Flower preferences: Oligolectic on *Campanula* and possibly also on closely related genera (WESTRICH 1989; BANASZAK & ROMASENKO 1998; AMIET et al. 2004; SEDIVY et al. 2008; GRACE 2010; MÜLLER 2012).

***Haetosmia vechti* (PETERS 1974)**

Material examined: Tehran province: Peykanshahr (N= 35° 44' 30.80" E= 51° 09' 57.70", 1273 m), 4♀♀2♂♂ 7.IX.2009, 1♀1♂ 8. IX.2009, 1♀2♂♂ 27.V.2010, 2♂♂ 15.VI.2009, 2♀♀1♂ 25.VIII.2010.

Distribution: Greece, Palestine, Iran, Turkey (BANASZAK & ROMASENKO 1998; GRACE 2010; MÜLLER 2012).

Flower preferences: Oligolectic on *Heliotropium* (Boraginaceae) (MAVROMOUSTAKIS 1954).

***Heriades* (*Heriades*) *truncorum* (LINNAEUS 1758)**

Material examined: Tehran province: Peykanshahr (N= 35° 44' 30.80" E= 51° 09' 57.70", 1273 m), 2♀♀ 7.VI.2009; Malard (N= 35° 40' 051" E= 50° 56' 869", 1168 m), 3♀♀ 18.V.2010, 3♀♀7♂♂ 25.V.20102, ♀1♂ 15.VI.2010, 1♀ 24.VIII.2010.

Distribution: Europe, Algeria, Morocco, Kyrgyzstan, Kazakhstan, Far Eastern Siberia, Cyprus, Palestine, Syria, Turkey (BANASZAK & ROMASENKO 1998; GRACE 2010; MÜLLER 2012), new record for Iran.

Flower preferences: Oligolectic on Asteraceae with a distinct preference for the subfamily Asteroideae (KAPYLA 1978; MACIEL de ALMEIDA CORREIA 1981; WESTRICH 1989; AMIET et al. 2004; MÜLLER 2012).

***Heriades* (*Rhopaloheriades*) *clavicornis* MORAWITZ 1875**

Material examined: Tehran province: Malard (N= 35° 40' 051" E= 50° 56' 869",1168 m), 1♀ 20.IV.2010; Shahrestanak- Chalus road (N= 35° 57' 583" E= 51° 22' 339", 2305 m), 1♀ 20.VI.2010.

Distribution: Armenia, Greece, Tajikistan, Turkestan, Cyprus, Palestine, Lebanon, Syria, Turkey (GRACE 2010; MÜLLER 2012), new record for Iran.

Flower preferences: Probably oligolectic on Asteraceae (MÜLLER 2012).

***Hoplitis* (*Hoplitis*) *flabellifera* (MORICE 1901)**

Material examined: Tehran province: Mahan (N= 36° 02' E= 51°11', 1881 m), 1♀ 22.V.2010.

Distribution: Armenia, Palestine, Iran, Jordan, Syria, Turkey (GRACE 2010; MÜLLER 2012).

Flower preferences: Polylectic with a strong preference for *Anchusa* (Boraginaceae) (MÜLLER 2012).

****Hoplitis* (*Alcidamea*) *ciliaris* (PÉREZ 1902)**

Material examined: Tehran province: Sarziarat- Chalus road (N= 35° 55' 173" E= 51° 06' 854", 1980 m), 1♂ 6.VI.2010, 1♀ 29.VI.2010, 1♂ 14.VII.2010; Shahrestanak-Chalus road (N= 35° 58' 271" E= 51° 21' 430", 2225 m), 1♂ 6.VI.2010; Arange- Chalus read (N= 35° 55' 120" E= 51° 06' 154",1891 m), 1♀ 15.VI.2010.

Distribution: France, Southern Continental Greece; Peleponessos, Croatia, Macedonia, Palestine, Turkey (WARNCKE 1991; GRACE 2010; MÜLLER 2012), new record for Iran.

Flower preferences: *Echium italicum* (Boraginaceae) (a new host).

***Hoplitis* (*Alcidamea*) *leucomelana* (KIRBY 1802)**

Material examined: Tehran province: Malard (N 35° 40' 051" E 50° 56' 869", 1168 m), 1♀ 18.V.2010; Arange- Chalus road (N 35° 55' 120" E 51° 05' 154", 1891 m), 11♀♀ 1♂ 15.VI.2010; Sarziarat- Chalus road (N 35° 55' 173" E 51° 06' 854", 1980 m), 3♀♀ 22.VI.2010, 1♀ 29.VI.2010, 1♀ 14.VII.2010.

Distribution: Europe, Algeria, Northern Asia, Iran, Turkey (GRACE 2010; MÜLLER 2012).

Flower preferences: Polylectic with a preference for Fabaceae; Flower visits reported include *Lotus corniculatus*, *Melilotus officinalis*, *Latyrus* sp. and *Convolvulus* sp. (GRACE 2010; MÜLLER 2012).

***Osmia* (*Allosmia*) *rufohirta* LATREILLE 1811**

Material examined: Guilan province: Ghazichak-Rudsar (N= 36° 45' 877" E= 50° 20' 018", 1787 m), 1♀ 22. IV.2010, 4♀♀ 10.V.2010; 2♀♀ 5♂♂ 24.V.2010; 1♀ 17.V.2010; Shahraj Bala-Rudsar (N= 36° 45' E= 50° 20', 1600 m), 2♀♀ 7.IV.2010, 1♀ 22.IV.2010; Ziaz-Rudsar (N= 36° 52' 547" E= 50° 13' 290", 537 m), 1♀ 31.V.2010.

Distribution: South, Central and Eastern Europe, Turkmenistan, Caucasus, Algeria, Morocco, Tunisia, China; Turkestan, Jordan, Syria, Turkey (BANASZAK & ROMASENKO 1998; GRACE 2010; MÜLLER 2012).

Flower preferences: Polylectic with a preference for Fabaceae (BANASZAK & ROMASENKO 1998; MÜLLER 2012).

***Osmia* (*Helicosmia*) *caerulescens* (LINNAEUS 1758)**

Material examined: Tehran province: Malard (N= 35° 40' 135" E= 50° 56' 944", 1168 m), 1♂ 15.VI.2010, 1♀ 22.VI.2010, 1♂ 6.VII.2010, 2♀♀ 27. IV.2010; Firouz Abad-Rey (N= 35° 32' E= 51° 29', 1019 m), 2♀♀ 16.V.2010; Peykanshahr (N= 35° 44' 30.80" E= 51° 09' 57.70", 1273 m), 1♀ 20.IV.2010, 4♂♂ 10.VI.2010, 1♂ 3.VI.2010, 1♀ 10.VI.2010, 1♀ 26.VI.2010, 1♀ 29.VI.2010; Mahan- Chalus road (N= 36° 02' E= 51°11', 1881 m), 1♀ 22.V.2010; Shahrestanak- Chalus road, (N= 35° 57' 583" E= 51° 22' 339", 2305 m), 1♀ 8.VI.2010; Hasanakdar- Chalus road (N= 35° 57' E= 51° 22', 2300 m), 1♀ 13.VII.2010.

Distribution: South-, Central- and Eastern Europe, North Eourpe, Algeria, Egypt, Morocco, Tunisia, Kyrgyzstan, Kazakhstan, China, Tajikistan, Turkmenistan, Uzbekistan, Cyprus, Iran, Jordan, Syria, Turkey, Canada, USA, India (BANASZAK & ROMASENKO 1998; GRACE 2010; MÜLLER 2012).

Flower preferences: Polylectic, prefers Fabaceae, Lamiaceae, Boraginaceae and Antirrhineae (BANASZAK & ROMASENKO 1998; GRACE 2010; MÜLLER 2012).

***Osmia* (*Helicosmia*) *dimidiata* MORAWITZ 1870**

Material examined: Guilan province: Astaneh Ashrafieh (N= 37° 15' E= 49° 56', -13 m), 7♀♀ 9.VII.2009; Siahkal (N= 37° 09' E= 49° 52', 46 m), 6♀♀ 14.VI.2009.

Distribution: South Europe, Asia minor, Caucasus, Morocco, Kyrgyzstan, Turkmenistan, Cyprus, Palestine, Iran, Lebanon, Turkey (BANASZAK & ROMASENKO 1998; GRACE 2010; MÜLLER 2012).

Flower preferences: Probably oligolectic on Asteraceae, visiting *Cirsium syriacum*, *Calendula persica*, *Centaurea hyalolepis*, *Statice sinuata*, *Echium sericeum*, *Scolymus hispanicus* and *Marrubium vulgare apolum* (GRACE 2010; MÜLLER 2012).

***Osmia* (*Helicosmia*) *leaiana* (KIRBY 1802)**

Material examined: Guilan province: Gandvash Bala-Heiran (N= 38° 23' 825" E= 48° 36' 629", 822 m), 1♀ 30. V.2010.

Distribution: Europe, Caucasus, the Pyrenees, the Alps, Algeria, Morocco, Tunisia, Kazakhstan, Iran, Turkey (BANASZAK & ROMASENKO 1998; GRACE 2010; MÜLLER 2012).

Flower preferences: Oligolectic on Asteraceae, visiting *Centaurea*, *Cirsium*, *Calendula*, *Hypocheris*, *Taraxacum*, *Leontodon*, *Onopordum*, *Eryngium* and *Salvia* (BANASZAK & ROMASENKO 1998; GRACE 2010; MÜLLER 2012).

***Osmia* (*Helicosmia*) *melanogaster* SPINOLA 1808**

Material examined: Guilan province: Gandvash Bala-Heiran (N= 38° 23' 825", E= 48° 36' 629",822 m), 7♀♀ 3♂♂ 30.V.2010; Ghazichak-Rudsar (N= 36° 45' 877", E= 50° 20' 018", 1787 m) 1♀ 24.V.2010, 4♀♀ 7.VI.2010; Shahraj Bala- Rudsar (N= 36° 45', E= 50° 20', 1600 m), 2♀♀ 7.VI.2010.

Distribution: South, Eastern and Central Europe, Caucasus, Algeria, Egypt, Libya, Morocco, Tunisia, Cyprus, Palestine, Iran, Jordan, Syria, Turkey (BANASZAK & ROMASENKO 1998; GRACE 2010; MÜLLER 2012).

Flower preferences: Oligolectic on Carduoideae (Asteraceae) (MÜLLER 2012).

***Osmia* (*Helicosmia*) *niveata* (FABRICIUS 1804)**

Material examined: Mazandaran province: Marzan Abad (N= 36° 27' 279" E= 51° 18' 073", 513 m), 4♀♀ 15.VI.2010; Mashala Abad-Abbas Abad (N= 36° 42' E= 51° 04', -6 m), 1♀ 13.VI.2010; Guilan province: Ziaz-Rudsarr (N= 36° 52' 287" E =50° 13' 634", 450 m), 7♀♀ 2♂♂ 22. IV.2010, 10♀♀ 26.IV.2010; Heiran (N 38° 23' 711" E 48° 36' 556", 814 m), 18♀♀ 9. V.2010; Shahraj Bala-Rudsar (N 36° 45' E 50° 20', 1600 m), 2♀♀ 4♂♂ 24.V.2010, 1♀ 7. VI.2010; Ziaz-Rudsar (N 36° 52' 547" E 50° 13' 290", 537 m), 1♀ 17. V.2010; Orkom-Rudsar (N 36° 45' 739" E 50° 18' 198" 1245 m), 1♀ 17.V.2010.

Distribution: Europe, Northern Africa, Turkestan, Cyprus, Palestine, Iran, Jordan, Lebanon, Syria, Turkey (GRACE 2010; MÜLLER 2012).

Flower preferences: Oligolectic on Asteraceae with a distinct preference for Carduoideae (WESTRICH 1989; AMIET et al. 2004; MÜLLER 2012).

***Osmia* (*Helicosmia*) *signata* ERICHSON 1835**

Material examined: Guilan province: Ghazichak-Rudsar (N 36° 45' 877" E 50° 20' 018", 1787m m), 1♀ 7. IV.2010.

Distribution: Albania, Spain, Balearic Islands, France, Corsica, Greece, Crete, Italy, Sardinia, Sicily, Portugal, Ukraine, Algeria, Egypt, Morocco, China, Turkmenistan, Cyprus, Palestine, Iran, Jordan, Syria, Turkey (GRACE 2010; MÜLLER 2012).

Flower preferences: Oligolectic on Asteraceae (MÜLLER 2012).

***Osmia* (*Hoplosmia*) *scutellaris* MORAWITZ 1868**

Material examined: Tehran province: Parandak 1♀ 2009; Gachsar- Chalus road (N= 36° 06', E= 51° 18', 2287 m), 1♂ 12.VI.2010; Guilan province: Gandvash Bala-Heiran (N= 38° 23' 825", E= 48° 36' 629", 822 m), 7♀♀2♂♂ 30.V.2010; Ziaz-Rudsar (N= 36° 52' 453", E= 50°13' 413", 490 m), 1♀ 12.IV.2010.

Distribution: South and Central Europe, Caucasus, Algeria, Morocco, Tunisia, Cyprus, Palestine, Jordan, Syria, Turkey (BANASZAK & ROMASENKO 1998; GRACE 2010; MÜLLER 2012).

Flower preferences: Oligolectic on Asteraceae with a preference for Cichorioideae (MÜLLER 2012).

****Osmia* (*Hoplosmia*) *bidentata* MORAWITZ 1876**

Material examined: Tehran province: Sarziarat-Chalus road (N= 35° 55' 173", E= 51° 06' 854", 1980 m), 2♂♂ 14.VII.2010.

Distribution: South- and Central-Europe, Caucasus, Egypt, Far Eastern Siberia, Palestine, Jordan, Syria, Turkey (BANASZAK & ROMASENKO 1998; GRACE 2010; MÜLLER 2012), new record for Iran.

Flower preferences: Oligolectic on Asteraceae (*Carduus*, *Onopordum*, *Arctium lappa*, *Centaurea iberica*, *C. glastifolia*, *C. solstitialis*) (BANASZAK & ROMASENKO 1998; GRACE 2010; MÜLLER 2012).

Osmia (*Metallinella*) *brevicornis* (FABRICIUS 1798)

Material examined: Tehran province: Malard (N= 35° 40' 135", E= 50° 56' 944", 1168 m), 1♂ 27.IV.2010; Mazandaran province: Marzan Abad (N= 36° 27' 279", E= 51° 18' 073", 513 m), 1♂ 14.IV.2010.

Distribution: South eastern- and Central-Europe, Caucasus, Algeria, Morocco, Tunisia, northern Asia, Cyprus, Iran, Turkey (BANASZAK & ROMASENKO 1998; GRACE 2010; MÜLLER 2012).

Flower preferences: Oligolectic on Brassicaceae (BANASZAK & ROMASENKO 1998; MÜLLER 2012).

Osmia (*Monosmia*) *apicata* SMITH 1853

Material examined: Tehran province: Arange (N= 35° 55' 120", E= 51° 05' 15", 1891 m), 1♀ 25.V.2010; Sarziarat (N= 35° 55' 173", E= 51° 06' 854", 1980 m), 1♂ 25.V.2010.

Distribution: Albania, Armenia, Bulgaria, Italy, Georgia, Greece, Croatia, Macedonia, Russia, Serbia and Montenegro, Slovenia, Palestine, Iran, Jordan, Syria, Turkey (GRACE 2010; MÜLLER 2012).

Flower preferences: Oligolectic on *Onosma* sp. (Boraginaceae) (MÜLLER 2012).

Osmia (*Osmia*) *bicornis* (LINNAEUS 1758)

Material examined: Guilan province: Heiran (N=38° 23' 711" E=48° 36' 556", 814 m), 11♀♀ 9. V.2010; Gandvash Bala-Rudsar (N=38° 23' 825" E=48° 36' 629", 822 m), 1♀ 30.V.2010; Eshmankomachal-Astaneh Ashrafieh (N= 37° 22' 061", E= 49° 57' 964", -16 m), 1♀ 5. IV.2010; Ziaz-Rudsar (N= 36° 52' 453", E= 50°13' 413", 490 m), 1♀ 5. IV.2010; Ziaz-Rudsar (N 36° 52' 547" E 50° 13' 290", 537 m), 4♀♀ 1♂ 5. IV.2010; Orkom-Rudsar (N= 36° 45' 739", E= 50° 18' 198", 1245 m), 1♀ 12. IV.2010; Tehran province: Mahan-Chalus road (N 36° 02' E 51°11', Altitude: 1881 m a.s.l), 1♀ 22.V.2010; Arange- Chalus road (N= 35° 55' 120", E= 51° 05' 154", 1891 m), 1♀ 28.V.2010.

Distribution: Europe, Algeria, Morocco, Tunisia, Kyrgyzstan, Kazakhstan, Far Eastern Siberia, Turkmenistan, Cyprus, Palestine, Iran, Syria, Turkey (BANASZAK & ROMASENKO 1998; GRACE 2010; MÜLLER 2012).

Flower preferences: Polylectic, prefer Rosaceae and Fabaceae (BANASZAK & ROMASENKO 1998; MÜLLER 2012).

***Osmia* (*Osmia*) *cerinthidis* MORAWITZ 1876**

Material examined: Tehran province: Gachsar- Chalus road (N 36° 06' E 51° 18', 2287 m), 1♀ 22.V.2010.

Distribution: South- and Central-Europe, Iran, Turkey (BANASZAK & ROMASENKO 1998; GRACE 2010; MÜLLER 2012).

Flower preferences: Oligolectic on *Cerinthe* sp. (Boraginaceae) (MÜLLER 2012).

***Osmia* (*Osmia*) *cornuta* (LATREILLE 1805)**

Material examined: Tehran province: Mahan- Chalus road (N 36° 02' E 51°1', 1881 m), 1♀ 15.IV.2010

Distribution: Europe, Egypt, Algeria, Tunisia, Turkmenistan, Turkestan,Cyprus, Iran, Turky (BANASZAK & ROMASENKO 1998; GRACE 2010; MÜLLER 2012).

Flower preferences: Polylectic; prefers Rosaceae (WESTRICH 1989; BANASZAK & ROMASENKO 1998; AMIET et al. 2004).

***Osmia* (*Pyrosmia*) *cephalotes* MORAWITZ 1870**

Material examined: Guilan province: Gandvash Bala-Heiran (N= 38° 23' 825", E= 48° 36' 629", 822 m), 1♀ 30. V.2010; Mazandaran province: Lavij-Noor (N= 36° 22', E= 52° 02', 708 m), 1♀ 23.V.2010.

Distribution: South- and Eastern-Europe, Caucasus, Algeria, Libya, Morocco, Tunisia, Turkmenistan, Cyprus, Palestine, Iran, Jordon, Syria, Turkey (BANASZAK & ROMASENKO 1998; GRACE 2010; MÜLLER 2012).

Flower preferences: Polylectic with a preference for Fabaceae (BANASZAK & ROMASENKO 1998; GRACE 2010; MÜLLER 2012).

Discussion

In order to conserve organisms and their habitats we need to have knowledge of their exact geographic distributions. As a result, geographic records of bee species can provide useful data for these purposes. Before the present study, 60 species of osmiine bees were known in Iran (UNGRICHT et al. 2008). According to the results presented here, we introduced 40 percent of all reported species of this tribe in Iran.

Hoplitis is one of the large genera of Osmiini with 351 described species is numerically the most diverse osmiine genus, 283 of which occur in the Palaearctic (MÜLLER 2012). The genus *Hoplitis* KLUG is also distributed in the Nearctic and the Afrotropical region, a few species also occur in the Oriental region (MICHENER 2007). Before present study, 29 species were reported from Iran. We collected three species: *Hoplitis* (*Alcidamea*) *ciliaris*, *Hoplitis* (*Alcidamea*) *leucomelana* and *Hoplitis* (*Hoplitis*) *flabellifera* so that the former is new record for Iran.

Hoplitis ciliaris has narrow distribution and occurs in the northern Mediterranean coast from France to Turkey and Palestine. Nesting biology and flower preferences of the bee are unknown, and the only pollen sample available so far consists of pollen of Fabaceae (MÜLLER 2012). In addition to collecting the bee by malaise trap, some of the bees were swept in a side of orchard in southern slopes of Alborz Mountains on the flowers of *Echium italicum* L. 1753 (Boraginaceae) (Fig. 2). The plant is a new host of bee which is recorded here for first time. The genus *Osmia* PANZER is distributed in the Palaearctic and the Nearctic region, a few species also occurs in the Oriental and Neotropical region (MICHENER 2007; UNGRICHT, et al. 2008). *Osmia* as numerically second diverse genus of the osmiine tribe includes 333 and 203 described species in the world and the Palearctic, respectively (MÜLLER 2012). During the current study, fifteen *Osmia* species were identified that show the genus is greatest in term of number of species. Thirty-four species of this genus have been reported previously from Iran and here one new record species, *Osmia* (*Hoplosmia*) *bidentata* MORAWITZ, 1876 was added to the Iranian fauna. Two male specimens were swept on E. italicum in same time and place where *H. ciliaris* was collected by sweep net. It believes that the bee is oligolectic on Asteraceae, but GÜLER & SORKUN (2007) identified pollens from eleven plant families, therefore, they assume *O. bidentata* to be polylectic. The bee uses preexisting cavities, insect burrows in dead wood, hollow stems (e.g. *Phragmites*) and cavities in the soil as nesting sites. This species are distributed widely in the west Palearctic region (MÜLLER 2012).

The genus *Chelostoma* is distributed both in the Palaearctic and the Nearctic region, one single species reaches the Oriental region. Currently, there are 49 described *Chelostoma* species worldwide, 40 of which occur in the Palaearctic. The genus is most diverse in the eastern Mediterranean area of Europe and western Asia (MÜLLER 2012). Three species of the genus were reported previously from Iran. We found four species, two of which are new records for Iranian fauna: *Chelostoma* (*Chelostoma*) *diodon* and *Chelostoma* (*Chelostoma*) *rapunculi*.

Chelostoma diodon has wide distribution in Southwestern Asia so that Greece is the only other country so far the bee is reported (UNGRICHT et al. 2008; ÖZBEK 2011; MÜLLER 2012). Among the genus *Chelostoma*, *Ch. diodon* is the most common and abundant species occurring in Turkey, northwestern neighbour of Iran (ÖZBEK 2011). The bee was collected when entering old dried wood, where they nest (MAVROMOUSTAKIS 1951). The bee is oligolectic on Asteraceae with a clear preference for Asteroideae (SEDIVY et al. 2008; 2012).

Unlike *Ch. diodon*, *Ch. rapunculi* is distributed widely throughout Europe and Northern Asia. This species were introduced to USA and Canada and now is considered as Holarctic species (ÖZBEK 2011). We collected specimens by malaise trap. The bee has a strong limitation in host range associated with pollen digestion so that exclusively collects pollen on Campanulaceae and is an oligolectic bee on *Campanula* (SEDIVY et al. 2008; MÜLLER 2012).

The genus *Heriades* has a wide distribution, it occurs in the Palaearctic, the Nearctic, the Afrotropical, the Oriental and marginally also in the Neotropical region. Currently, there are 112 described *Heriades* species worldwide, 24 of which occur in the Palaearctic. Hitherto, *Heriades* (*Heriades*) *crenulatus* NYLANDER, 1856 was the only species of the genus reported from Iran (KHAGHANINIA et al. 2011). *H. truncorum* and *H. clavicornis*

are here two new records for Iran. Both species were collected from southern slopes of Alborz Mountains.

Heriades truncorum is a predominantly west Palearctic species including Europe and the Mediterranean region (MÜLLER 2012). The bee was colleted by both malaise traps and sweeping on the plant, *Senecio* sp. (Asteraceae). The species nests in preexisting cavities. Data from malaise traps indicated that flight period is between mid-Junes to late Augest in the study areas.

Heriades clavicornis is a well known Middle East bee species. In the North it reaches as far as Greece and Armenia (MÜLLER 2012). Thus the present record is eastern extremity observation of this species in its range.The species belongs to subgenus *Rhopaloheriades* with the only one known species in the world. The two female bee specimens were collected by malaise traps in two different localities in Tehran and Alborz provinces. Based on palynological study, the bee is probably oligolectic on Asteraceae (MÜLLER 2012).

Since flora of Iran is exceptionally rich to provide an outstanding opportunity for faunistic studies of bees, the available data indicate that Irannian bee fauna, especially Osmiini, need more surveys to reveal.

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Fig. 1: Distributional map of the Tribe Osmiini in study areas: (**1**) *Chelostoma emarginatum*, (**2**) *Chelostoma diodon*, (**3**) *Chelostoma proximum*, (**4**) *Chelostoma rapunculi*, (**5**) *Haetosmia vechti*, (**6**) *Heriades truncorum*, (**7**) *Heriades clavicornis*, (**8**) *Hoplitis flabellifera*, (**9**) *Hoplitis ciliaris*, (**10**) *Hoplitis leucomelana*, (**11**) *Osmia rufohirta*, (**12**) *Osmia caerulescens*, (**13**) *Osmia dimidiate*, (**14**) *Osmia leaiana*, (**15**) *Osmia melanogaster*, (**16**) *Osmia niveata*, (**17**) *Osmia signata*, (**18**) *Osmia scutellaris*, (**19**) *Osmia bidentata*, (**20**) *Osmia brevicornis*, (**21**) *Osmia apicata*, (**22**) *Osmia bicornis*, (**23**) *Osmia cerinthidis*, (**24**) *Osmia cornuta*, (**25**) *Osmia cephalotes*.

Fig. 2: *Echium italicum*, a new host for *Hoplitis ciliaris*.

Buchbesprechung

BLÖSCH M. (2012): **Grabwespen – Illustrierter Katalog der einheimischen Arten.** 1. Auflage.-Verlag: Westarp Wissenschaften, Hohenwarsleben, NNB Scout Band 2.

Jeder, der sich mit dem Studium oder der Beobachtung von Insekten beschäftigt, wird Kontakt mit der Familie der Grabwespen bekommen. Die Herausgabe dieses Bandes wird daher vor allem an der steten Zunahme an Naturbeobachtern begründet. Die vorliegende Veröffentlichung gibt einen Einblick in die Vielfalt von 309 mitteleuropäische Arten dieser Familie. 137 in Deutschland vorkommenden Grabwespenarten (derzeit 246) werden großteils durch ausgezeichnete Farbfotografien vorgestellt.

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Zwei weitere Abschnitte dieses Buches beschäftigen sich mit dem Körperbau der Grabwespen und dem Umgang mit diesen Tieren. So wird darauf hingewiesen, dass der Mensch vieles zum Schutz und zur Ansiedlung dieser Tiere beitragen kann.

Ein Literaturverzeichnis und ein Artenregister vervollständigen diese Zusammenstellung.

Es ist eine sehr gelungene Veröffentlichung, sowohl für den entomologischen Laien, als auch für den Spezialisten.

J. Gusenleitner

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