

Distribution of the Tribe Osmiini Bees (Hymenoptera: Megachilidae) of Turkey Part I: The Genera *Heriades*, *Stenoheriades*, *Hofferia* and *Hoplitis*

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ABSTRACT: In the present study, research materials consisting of approximately 1600 samples, which have been collected from almost the entire country since the 1960s, but mainly from the eastern Anatolia region of Turkey, were evaluated, 103 species and 2 subspecies in 4 genera, *Heriades*, *Stenoheriades*, *Hofferia* and *Hoplitis*, were recognized. Of these, *Hoplitis (Anthocopa) saxialis* (Zanden, 1994) is new for Turkey as well the Asian Continent. *Hoplitis (Hoplitis) manicata* (Morice, 1901), *H. (H.) pici* (Friese, 1899) and *H. (Micreriades) mazzucchi* are new for the eastern Anatolia region. Erzurum is the easternmost distribution records of the first two species for that of *H. mazzucchi* Bitlis is the easternmost distribution record. Many new distributional data were added for each species and the plant species they visited were included. Concerning to zoogeographical view of the point, although present species could be included in various chorotypes they are mainly consantrated in the Mediterranean basin. Moreover, about 60% of the Anatolian species are associated with Europe and about 40% are Asian species, and those of 13 species live three of the continents, Europe, Asia and Africa. With the present knowledge 18 species and subspecies could be accepted as Anatolian endemics.

Key words: Hymenoptera: Megachilidae, Osmiini, *Heriades*, *Stenoheriades*, *Hofferia*, *Hoplitis*, fauna, new records, chorotype, Turkey

Türkiye’de Osmiini Tribüsüne Giren Arı Türleri (Hymenoptera: Megachilidae)’nin Dağılımları, Kontrol Listesi ve Zoocoğrafik Özellikleri

ÖZET: Bu çalışmada; Türkiye’nin hemen her yöresinden, özellikle de Doğu Anadolu Bölgesi’nden 1960’lı yıllardan bu yana toplanan 1600 civarındaki arı örneği değerlendirilmiştir. Daha önceki tespitlerle birlikte *Heriades*, *Stenoheriades*, *Hofferia* ve *Hoplitis* cinslerine ait 103 tür ve 2 alttür belirlenmiştir. Bu türlerden, *Hoplitis (Anthocopa) saxialis* (Zanden, 1994) Türkiye ve Asya Kıtası için, *H. (Hoplitis) manicata* (Morice, 1901), *H. (H.) pici* (Friese, 1899) ve *H. (Micreriades) mazzucchi* ise Doğu Anadolu Bölgesi için yeni kayıt durumundadır. *Hoplitis manicata* ve *H. pici* türleri için Erzurum, *H. mazzucchi* için ise Bitlis doğuda yayılım gösterdikleri son lokasyonlardır. Listelenen türlerin çoğu için yeni yayılma alanları eklenmiş ve ziyaret ettikleri bitki türleri verilmiştir. Zoocoğrafik yönden bakıldığında; bulunan türler, değişik korolojik kategorilerden oluşmakta ise de genelde Akdeniz Havzası’nda yoğunlaştıkları görülmektedir. Ayrıca Anadolu’daki türlerin yaklaşık %60’ı Avrupa ile ilgili, %40’ı Asya türleri, 13 tür de üç kıtada da bulunmaktadır. Mevcut bilgiler doğrultusunda 18 tür ve alttürün Anadolu için endemik oldukları dikkati çekmektedir.

Anahtar Kelimeler : Hymenoptera: Megachilidae, Osmiini, *Heriades*, *Stenoheriades*, *Hofferia*, *Hoplitis*, fauna, yeni kayıtlar, korotip, Türkiye

INTRODUCTION

The osmiine bees constitute a tribe Osmiini within the family Megachilidae (Hymenoptera), which is one of the nine currently recognised families of bees (Engel, 2005; Michener, 2007). The tribe Osmiini currently comprise 15 genera and approximately 1160 species worldwide; occur on all continents, with the exception of South America, Australia and Antarctica (Michener, 2007; Praz et al., 2008; Ungricht et al., 2008; Michez et al., 2009; Müller, 2013). They are especially diversified in the Mediterranean and desert climates of southern Africa, south-western North America and the Palaearctic (Müller, 2013). The Palaearctic region includes about 700 species in 10 genera, including taxa from Cyprus and the Caucasus; approximately 230 species have been recorded so far in Europe (Müller, 2013).

Recently, the molecular phylogeny of Praz et al. (2008) results in certain main taxonomic changes in comparison to the classification of Michener (2007): the former genera *Stenosmia* and *Hoplosmia* are

reduced to the subgeneric rank in *Hoplitis* and *Osmia*, respectively, *Micreriades* and *Anthocopa* recognised as the subgenera of *Hoplitis*, and the subgenus *Nasutosmia* is transferred from *Hoplitis* to *Osmia*. It further enables a clearer suprageneric subdivision of the Osmiini than that suggested by Michener (2007). Additionally, new combinations of the genus *Chelostoma* clearly emerged as the sister group of all other osmiine bees and therefore deserves the same rank as the *Heriades* group and the *Osmia* group, which are often recognised as subtribes Heriadina and Osmiina, respectively (Engel, 2005; Ungricht et al., 2008). Furthermore, new combinations and synonymies have occurred in several species. As a result, the number of Osmiini bee species was indicated as being roughly 1160 species worldwide, although more recently this number decreased to 1,000 species (Müller, 2012).

Faunal and systematic studies of the tribe Osmiini in Turkey commenced more than a century ago during the time of the Ottoman Empire. For

scientists, Anatolia represented a fantastic land of explorations, the interest of which greatly exceeds a simple and aseptic scientific treatment. Both amateur and professional entomologists visited Anatolia in 19th century; Schletterer (1889) described *Chelostoma diodon* from Amasya, that of *Heriades (Michenerella) punctuliferus* from Adana. Friese (1899) described *Hoplitis (Anthocopa) obtuse*, and *H. (Chlidoplitis) lysholmi* from İçel that of *H. (Hoplitis) pici* from the Bursa provinces. Chronologically, Kohl (1905) described *H. (Anthocopa) duckeana* from Kayseri; again Friese (1921) described *Stenoheriades asiaticus* from Taurus, Adana. Later, *H. (Anthocopa) agis* was described by Benoist (1929) from Taurus Mts. Starting in the 1970s Tkalcu (1978, 1979, 1992, 2000a, 2000b, Zanden (1980, 1984, 1991, 1992, 1994) and Warncke (1988a, 1988b, 1990, 1991a, 1991b, 1991c, 1991d, 1991e, 1991f, 1992b) made invaluable contributions; in addition to the new records, many species and subspecies were described by these bee specialists from Anatolia. Warncke made several research trips to Turkey to collect bees as well as other insects. As a native worker, Özbek is the first contributor and conducted several faunal studies both alone and with Zanden (Özbek, 1979a, 1979b; Özbek and Zanden, 1992a, 1992b, 1996). Recently, Güler and Çağatay (2006) and Güler (2011) carried out faunal studies on various tribes of Megachilidae, including Osmiini in Central Anatolia. More recently, *Chelostoma* Latreille species of Turkey were studied by Özbek (2011). Additionally, nest structure and biological studies were made on *Hoplitis (H.) monstrabilis* Tkalcu and *O. (Ozbekosmia) avosetta* Warncke in Erzurum and Antalya, respectively (Rozen et al., 2009; 2010).

The aim of this paper is to present the distribution, diversity and latest knowledge of Turkish Osmiini bees, and briefly discuss biogeographical affinities as well as possible routes of dispersion.

MATERIAL AND METHOD

This paper is based on the materials that have been collected from almost all over the country, particularly from eastern Anatolia, since the 1960s by the author and his colleagues in the Plant Protection Department at Atatürk University. Additionally, in the course of our joint studies on "Nesting Biology and Immature Stages of Bees" with J. G. Rozen and J. S. Ascher (AMNH, USA), numerous specimens were collected and included. In the determination of the material, reference materials were used that have been already determined by B. Tkalcu, K. Warncke and G. Zanden and deposited in the EMET. Undetermined specimens were determined and conformed by A. Müller, and partly determined by B. Tkalcu, K. Warncke, and T. Griswold. In the listing

of the taxa the species has not been found in any specimen in this work, only in the quoted literature. The provinces were presented in alphabetical order and the name of the province from which a particular species was recorded for the first time is given in bold type. The material was deposited in the EMET, certain specimens were included in the AMNH, and a few specimens were also kept by A. Müller. The chorotype of the species has been defined according to Vigna Taglianti et al. (1999).

Abbreviations:

AMNH: American Museum of Natural History, New York United States; EMET: Ataturk University, Faculty of Agriculture, Entomology Museum, Erzurum, Turkey.

Countries: **Europe**: A: Austria, AL: Albania, ARM: Armenia, AZ: Azerbaijan, BA: Bosnia-Herzegovina, B: Belgium, BG: Bulgaria, BIH: Bosnia and Herzegovina, BY: Belarus, CH: Switzerland, CZ: Czech Republic, D: Germany, DK: Denmark, E: Spain, E(Ba): Balearic Islands, EST: Estonia, F: France, F (Co): Corsica, FL: Finland, GE: Georgia, GB: Great Britain, GR: Greece, GR (Cr): Crete, H: Hungary, HR: Croatia, I: Italy, I(Sa): Sardinia, I(Si): Sicily, IRL: Ireland, L: Luxembourg, LV: Latvia, LT: Lithuania, M: Malta, MC: Monaco, MD: Moldova, ME: Montenegro, MK: Macedonia, MT: Malta, NL: The Netherlands, N: Norway, PL: Poland, P: Portugal, RO: Romania, RUS: Russia, RUS (SR):_Southern European Russia, RUS (FS): Far Eastern Siberia, S: Sweden, SCG: Serbia and Montenegro, SLO: Slovenia, SK: Slovakia, SP: Serbia, UA: Ukraine. **Africa**: AG: Algeria, DZ: Algeria, E (Ca): Canary Island (Spain), LAR: Libya, MA: Morocco, TN: Tunisia. **North (N.) Asia**: KS: Kazakhstan, KZ: Kyrgyzstan, MGL: Mongolia, RC: China, TJ: Tajikistan, TM: Turkmenistan, UZ: Uzbekistan, CN: China, SG: Singapore. **Southwestern (SW) Asia**: AFG: Afghanistan, CY: Cyprus, JOR: Jordan, IL: Israel, IR: Iran, IQ: Iraq, PAK: Pakistan, SYR: Syria, RL: LB: Lebanon, TR: Turkey. The underlined countries have type localities.

Names of people: AM: Andreas Müller, CG: Coşkun Güçlü, EY: Erol Yıldırım, HÖ: Hikmet Özbek, GT: Göksel Tozlu, GvdZ: G. van der Zanden, JGR: J. G. Rozen, JSA: J. S. Ascher, İA: İrfan Aslan, LG: Levent Gültekin, RH: Rüstem Hayat, SÇ: Saliha Çoruh, TK: B. Tkalcu, WR: K. Warncke.

RESULTS

In the present study, six species in the genus *Heriades*, two species in the genus *Stenoheriades*, one species in the genus *Hofferia* and 91 species and two subspecies in the genus *Hoplitis* were recognized. Among the material collected from Erzurum, three specimens are two different new

Hoplitis species, which will be described after additional specimens collected.

Genus *Heriades* Spinola, 1808

The genus *Heriades* has Holarctic distribution, currently, there are 110 described species worldwide, 22 of which occur in the Palearctic.

Species account

1. *Heriades (Heriades) crenulatus* Nylander, 1856

Distribution-Europe: A, BG, BIH, CH, CZ, D, E, F, GR, H, HR, I, M, MK, P, PL, RO, RUS, SK, SLO, UA; Serbia, Montenegro, Caucasus. **Africa:** S. Africa, DZ, MA, TN. **N. Asia:** KZ. **SW. Asia:** KZ, TR. **W-Palearctic chorotype.**

Previous records: Osmaniye (Friese, 1921); Amasya, Antalya, Edirne, Erzurum (on *Carduus* sp., *Centaurea* sp.), İstanbul, Sinop (Özbek and Zanden, 1992b), Ankara, Afyon, Yozgat (Güler, 2011).

Material: Sinop: 20.VII.1977, 1♀, leg. HÖ, det. GvdZ.

Plant association: *Carduus* sp. and *Centaurea* sp. (Özbek and Zanden, 1992b). Oligolectic on Asteraceae (Amiet et al., 2004; Westrich, 1989).

2. *Heriades (Heriades) rubicola* Pérez, 1890

Synonyms: *Heriades copetica* Morawitz, 1892; *H. crenulatus aurantifer* Cockerell, 1931

Distribution-Europe: A, BG, CH, E, F, GR, HR, I, M, MK, P, SK, SLO. **N. Africa:** DZ, MA, TN. **N. Asia:** KS, KZ, TM. **SW. Asia:** CY, IL, JOR, SYR, TR. **West Palearctic**

Previous records: Antalya, İçel (Özbek and Zanden, 1992b).

Material: Antalya: Konyaalti, 36.86972_30.64722, 21.V.2009, 1♀2♂♂, leg. JGR, JSA, HÖ, det. AM; 24.V.2009, 1♀; 25.V.2009, 1♀; 26.V.2009, 1♀, leg. JSA, HÖ, det. AM; Konyaalti Beach, 36.85694_30.63000, 29.V.2009, 1♀, 1♂, leg. JSA, HÖ, det. AM (EMET and AMNH). **Remark:** this species has a large distribution range in Europe and Asia. Although an intensive collection has been conducted particularly, in eastern Anatolia no sample has been collected. It has been recorded from Antalya and İçel provinces so far.

Plant association: Oligolectic on Asteraceae (Amiet et al., 2004).

3. *Heriades (Heriades) truncorum* (Linnaeus, 1758)

Synonyms: *Apis xanthogastris* Schrank, 1802; *Osmia punctatissima* Lepeletier, 1841; *Heriades mordax* Schletterer, 1889

Distribution-Europe: A, AL, ARM, B, BG, CH, CZ, D, DK, E, F, FIN, FL, GE, GB, GR, H, HR, I, L, LT, LV, MK, NL, P, PL, RO, RUS, S, SK, SLO, UA. **N. Africa:** DZ, MA. **N. Asia:** KS, KZ, RUS. **SW. Asia:** CY, IL, IR, SYR, TR. **West Palearctic chorotype.**

Previous records: Bursa, Erzurum, Iğdır, İstanbul (Özbek and Zanden, 1992b).

Material: **Antalya:** Konyaalti, 36.86972_30.64722, 21.V.2009, 2♀♀2♂♂, leg. JGR, JSA, HÖ, det. AM (ANHM); 24.V.2009, 2♀♀, 1♂, leg. JSA, HÖ; 26.V.2009, 2♀♀, leg. JSA, HÖ, det. AM.

Plant association: *Centaurea solstitialis*, *Arctium lappa*, *Onopordum* sp. (Özbek and Zanden, 1992b); oligolectic on Asteraceae with a distinct preference for the subfamily Asteroideae (Amiet et al., 2004).

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

Synonym: *Heriades (Michenerella) dalmaticus* Maidl, 1922

Distribution: **Europe:** BG?, GR? **N. Asia:** KZ, TJ, UZ. **SW. Asia:** IR, TR. **Turano-Anatolian.**

Previous records: Şanlıurfa (Özbek and Zanden, 1992b).

Remark: male is unknown, is very rare in Turkey. *Heriades hissaricus*, which was known so far from Central Asia, Iran and Turkey. Müller (2013) noted that the new European records indicate that *H. hissaricus* has a much larger distribution area than hitherto thought. However, as the male of *H. hissaricus* is not yet known, the European specimens might possibly represent a still undescribed species, which cannot be distinguished from *H. hissaricus* in the female sex.

5. *Heriades (Michenerella) punctuliferus* Schletterer, 1889

Synonym: *Heriades (Michenerella) dalmaticus* Maidl, 1922

Distribution-Europe: BG, GR, HR, I(Si), M. **SW. Asia:** CY, IL, RL, SYR, TR.

East-Mediterranean chorotype.

Previous records: Hatay as *H. punctuliferus* (Özbek and Zanden, 1992b); Adana (type locality), Antalya (Özbek and Zanden, 1992b) as *Heriades syriaca* Benoist (Özbek and Zanden, 1992b) on *Centaurea solstitialis* and *Salvia* sp.

Material: **Aksaray:** 27 km SE of Aksaray, 38.23333_34.30000, 18.VII.1998, 1♀, leg. Schmid-Egger, det. AM (AMNH).

Plant association: *Centaurea solstitialis* and *Salvia* sp. (Özbek and Zanden, 1992b); *Dittrichia viscosa*, *Calamintha nepeta* (Standfuss et al., 2003). Polylectic (Müller, 2013).

6. *Heriades (Rhopaloheriades) clavicornis* Morawitz, 1875

Distribution-Europe: ARM, GR. **N. Asia:** TJ, Turkestan. **SW. Asia:** CY, IL, IR, RL, SYR, TR.

Previous records: Nevşehir (Zanden, 1989); Antalya, İçel, Konya, Nevşehir (Özbek and Zanden, 1992b). **Turano-European chorotype.**

Plant association: probably oligolectic on Asteraceae (Müller, 2013).

Genus *Stenoheriades* Tkalcu, 1984

Stenoheriades occurs in the Palaearctic and Afrotropical region (Michener, 2007). It contains 9 described species, 4 of which occur in the Palaearctic (Müller, 2013).

Species account

1. *Stenoheriades asiaticus* (Friese, 1921)

Distribution: Europe: BG, GR, HR. **SW. Asia:** IL, JOR, RL, SYR, TR. **East-Mediterranean**

Previous records: Antalya, İçel, Kahramanmaraş, Konya, Şanlıurfa (type locality), Taurus Mts. (Friese, 1921; Benoist, 1935; Zanden, 1989; Özbek and Zanden, 1992b).

Plant association: oligolectic on Asteroideae (Asteraceae) (Müller, 2013).

2. *Stenoheriades hofferi* (Tkalcu, 1984)

Distribution: Europe: BG. **SW. Asia:** TR **E.-Mediterranean (Aegean)**.

Previous records: Ankara (Tkalcu, 1984; Müller, 2013).

Note: female is unknown.

Genus *Hofferia*, Tkalcu, 1984

Hofferia is confined to the Palaearctic region. It contains two species (Müller, 2013).

Species account

1. *Hofferia schmiedeknechti* (Schletterer, 1889)

Distribution: Europe: BG, GR, MK, RO. **SW Asia:** IL, JOR, SYR, TR. **East-Mediterranean**.

Previous records: Taurus Mts. Benoist (1929) as *Heriades tumida* Benoist, and *Hr. gibba* Benoist; Antalya (Özbek and Zanden, 1992b).

Plant association: oligolectic on Asteraceae (Müller, 2013).

Genus *Hoplitis*, Klug, 1807

Hoplitis is the most diverse osmiine genus in terms of number of species: 356 species have been described so far, 288 of which occur in the Palaearctic (Müller, 2013).

Species account

1. *Hoplitis (Alcidamea) acanthophora* (Morawitz, 1875).

Distribution: N. Asia: TJ. **SW Asia:** TR. **Turanian chorotype**

Previous records: Hakkari, Malatya (Özbek and Zanden, 1992a).

2. *Hoplitis (Alcidamea) acuticornis* (Dufour & Perris, 1840)

Synonym: *Osmia dentiventris* Morawitz, 1877

Distribution-Europe: A, AL, AND, ARM, CH, CZ, D, E, F, GR, H, HR, I, L, MK, P, RO, RUS, SK, SLO, UA. **N. Africa:** DZ, E (Ca), P (Ma), TN. **N. Asia:** KS, KZ, TJ, TM. **SW. Asia:** CY, IL, IR, JOR, SYR, TR. **West Palearctic chorotype.**

Previous records: Ankara (Alfken, 1935); Osmaniye (Friese, 1921); Erzurum (Özbek, 1979b) on *Onobrychis viciifolia*; Erzurum, Hakkari, İçel, Kars, Kayseri, Nevşehir, Sivas, Tunceli, Van (Warncke, 1991f); Isparta, Erzurum (Özbek and Zanden, 1992a).

Material: Antalya: Korkuteli, 7 km SW of Kargın, 36°37'51" N 30°59'04" E, 23.V.2009, 1♂, leg. HÖ, det. AM; 26.V.2009, 1♂, leg. JSA, JGR, HÖ, det. AM. (EMET); 4 km E of Saklikent, 30.V.2009, 1♂, leg. JGR, JSA, HÖ, det. AM; E of Saklikent, 25.V.2009, 1♂, leg. JGR, JSA, HÖ, det. AM (ANHM); Erzurum: Atatürk University Campus, 1850 m, 24.VI.1997, 1♀, leg. HÖ, det. AM; Atatürk Üniv. Kampus, 1850m, 03.VI.1996, ♀, leg. HÖ, det. HÖ; 17.VI.1995, 2♀♀, leg. HÖ, det. HÖ; 01.VII.1996, 2♀♀1♂, EY, det. HÖ; 08.VII.1993, 1♀, leg. HÖ, det. GvdZ; 17.VII.1995, 2♀♀, leg. HÖ, det. HÖ; Merkez, 14.VII.1971, 1♀, leg. HÖ, GvdZ; 07.VI.1972, 1♂, leg. HÖ, det. TK; 12.VII.1970, 1♂, leg. HÖ, det. TK; Çat, Çirişli, 2000m, 01.VII.2002, 1♀, leg. HÖ, det. AM; Ilica, Toprakkale, 03.VII.2008, 1♀, leg. JGR, HÖ, det. AM; Palandöken, 2200m, 01.VII.1996, 1♀, leg. EY, det. HÖ; 07.VII.1996, 1♀, leg. EY, det. HÖ; 03.VII.1996, 1♀, leg. EY, det. HÖ; 12.VII.1995, 1♀, leg. E. Kılıç, det. HÖ; 24.VII.1992, leg. EY, det. GvdZ; 28.VII.1992, 1♀, leg. EY, det. GvdZ; 01.VIII.1996, 2♀♀, leg. S. Fırat, det. HÖ; Köprüköy, Örentaş, 04.VII.2004, 1♀, leg. HÖ, det. AM; Köprüköy, Kayabaşı, 14.VI.2004, 1600m, 1♂, leg. HÖ, det. AM; Köşkköyü, 14.VII.1992, 2♀♀, leg. HÖ, det. GvdZ; Oltu, Uzunoluk, 02.VII.1995, leg. HÖ, det. HÖ; Palandöken, 2000m, 02.VII.1996, 1♀, leg. EY, det. HÖ; Çat, Çirişli, 2000-2100m, 12.VI.2001, 1♂1♀, leg. HÖ, det. HÖ and AM; Pasinler, Rabat, 2400m, 01.VII.1996, 1♀, leg. EY, det. HÖ; 11.VII.1996, 1♀, leg. EY, det. HÖ; Tortum, 08.VII.1996, 1♀, leg. LG, det. HÖ. **Konya:** Güneysınır, Güragaç, 1020m, 02.VI.2002, 1♂, leg. M. Kesdek, det. HÖ.

Plant association: *Onobrychis viciifolia* (Özbek, 1979b), polylectic with a strong preference for Fabaceae (Müller, 2013).

3. *Hoplitis (Alcidamea) antennata* (Morawitz, 1876)

Distribution-Europe: ARM. **SW. Asia:** TR.

Anatolo-Armenian.

Previous records: Kars (Warncke, 1991f)

Remark: it has very restricted distribution range both in Turkey and abroad, it is a rare species, so far known only from Kars Province although intensive material has been collected from Erzurum and neighboring provinces. **Anatolo-Armenian endemic.**

4. *Hoplitis (Alcidamea) bicallosa* (Morawitz, 1876)

Distribution- Europe: GE, GR. **SW. Asia:** TR. **East-Mediterranean chorotype.**

Previous records: Antalya, Kars, Konya (Warncke, 1991f).

Material: Antalya: 7 km S of Kargin, 24.V.2009, 1♀, leg. JSA, HÖ, det. AM. (*O. viciifolia*) (ANHM).

Plant association: possibly oligolectic on Fabaceae (Müller, 2013).

5. *Hoplitis (Alcidamea) bispinosa* Zanden, 1992

Distribution-Europe: GR. **SW. Asia:** TR. **East-Mediterranean (Aegean).**

Previous records: Hakkari (type locality) (Zanden, 1992).

Remark: distribution range of *H. bispinosa* is very narrow, known from only Turkey and Greece; so far no additional record occurred in Turkey after type locality.

6. *Hoplitis (Alcidamea) brachypogon* (Pérez, 1879).

Synonym: *Osmia seyrigi* Benoist, 1934

Distribution-Europe: AL, BG, E, E, GR, GR (Cr), HR, I, P. **SW. Asia:** IR, SYR, TR.

Mediterranean chorotype.

Previous records: Ankara (Alfken, 1935) as *Osmia carsophila* Ducke; Ankara, Hakkari, İçel, Karaman, Uşak (Warncke, 1991f) as *O. brachypogon (Alcidamea) carsophila* Ducke.

Material: Bilecik: Merkez, 600m, 15.VI.1995, 1♀, leg. EY, det. GvdZ.

Plant association: possibly oligolectic on Fabaceae (Müller, 2013).

7. *Hoplitis (Alcidamea) campanularis* (Morawitz, 1877)

Distribution: Europe: AL, BG, E, GE, GR, HR, I, SLO; Yugoslavia. N. Africa: DZ, MA. **SW. Asia:** IL, TR. **Mediterranean chorotype.**

Previous records: Hakkari, Kars, Mardin (Warncke, 1991f); Sivas (Özbek and Zanden, 1992a).

Plant association: probably oligolectic on Campanulaceae (e.g. *Asyneuma*) (Müller, 2013).

8. *Hoplitis (Alcidamea) caucasica* (Friese, 1920)

Distribution-Europe: Caucasus. **SW. Asia:** TR. **Anatolo-Caucasian.**

Previous records: Erzurum (Özbek, 1979b), on *Onobrychis* sp., *Melilotus* sp.; Gümüşhane (Zanden, 1989); Erzurum (Warncke, 1991f).

Plant association: *Onobrychis* sp., *Melilotus* sp. (Özbek, 1979b).

9. *Hoplitis (Alcidamea) caularis* (Morawitz, 1875)

Distribution- Europe: RUS, UA. N. Asia: KS, KZ, RC, TM, UZ. **SW Asia:** SYR, TR.

Centralasiatic-European.

Previous records: Erzurum (Zanden, 1989); Van (Warncke 1991f); Hakkari, Kahramanmaraş

(Özbek and Zanden, 1992b) as *Hoplitis (Alcidamea) turcestanica* Dalla Torre.

Plant association: Fabaceae (Müller, 2013).

10. *Hoplitis (Alcidamea) claviventris* (Thomson, 1872)

Distribution-Europe: all European countries including Caucasus. N. Asia: KZ, MGL, RC, RUS, RUS(FS). **SW. Asia:** TR. **Asiatic-European.**

Previous records: Eskişehir (Fahringer, 1913); Antalya, Aydın, İçel, Muğla, Rize (Warncke, 1991c) as *O. foveolata* (Mor.).

Plant association: polylectic with a preference for Fabaceae (Müller, 2013).

11. *Hoplitis (Alcidamea) ciliaris* (Pérez, 1902)

Distribution-Europe: BG, E, GR, HR, MK. **SW. Asia:** IL, IR, TR. **Asiatic-European chorotype.**

Previous records: Erzincan, Hakkari, Konya (Warncke, 1991f).

Material: Erzurum: Atatürk University Campus, 1850m, 03.VI.1996, 1♀ (*O. viciifolia*), leg. HÖ, det. HÖ. Gümüşhane: Köse, 10.VII.1995, 1♀, leg. İA, det., GvdZ.

Plant association: *O. viciifolia*.

12. *Hoplitis (Alcidamea) curvipes* (Morawitz, 1871)

Distribution: Europe: AZ, BG, E, F, GR, I, I(Si). **SW. Asia:** SYR, TR. **Turano-European.**

Previous records: Konya (Zanden, 1983), Erzurum (Özbek and Zanden, 1992a).

Plant association: probably oligolectic on *Allium* (Alliaceae) (Müller, 2013).

13. *Hoplitis (Alcidamea) decaocta* (Warncke, 1991f)

Distribution-SW Asia: TR. **Anatolian endemic.**

Previous records: Van (type locality), Kırşehir (Warncke, 1991f).

Remark: male unknown.

Flower preferences: Hedysareae (Fabaceae) (Müller, 2013).

14. *Hoplitis (Alcidamea) eburnea* (Warncke, 1991)

Distribution: SW. Asia: IL, SYR, TR. **SW-Asiatic chorotype.**

Previous records: Hakkari (type locality), Sivas (Warncke, 1991f).

Material: Diyarbakır: Silvan, 12.V.1995, 1♂, leg. EY, det. GvdZ.

Plant association: possibly oligolectic on *Haplophyllum* (Rutaceae) (Müller, 2013).

Remark: I suspect after type material Diyarbakır is the first location for *H. eburnea* in Turkey.

15. *Hoplitis (Alcidamea) fulva* (Eversmann, 1852)

Synonym: *Osmia grandis* Morawitz, 1872

Distribution-Europe: ARM, AZ, H, RO, RUS (SR). **N. Asia:** KZ, MGL, RC, RUS (FS). **SW. Asia:** JOR, SYR, TR **Asiatic-European chorotype.**

Previous records: Amasya, Ankara (Alfken, 1935), Aksaray, Amasya, Ankara, Elazığ, Kayseri, Konya, Sivas, Şanlıurfa, Tunceli (Warncke 1991f), Aksaray, Kayseri, Hatay (Özbek and Zanden, 1992a), Afyonkarahisar (Güler, 2011).

Material: **Kars:** Sarıkamış, Karakurt, 1500m, 24.VI.1989, 1♀, leg. HÖ, det. GvdZ.

Plant association: polylectic with a preference for Fabaceae (Banaszak and Romasenko, 2001).

16. *Hoplitis (Alcidamea) galbula* (Warncke, 1991)

Distribution-Europe: GR. **SW Asia:** TR. **East-Mediterranean (Aegean).**

Previous records: Hakkari (type locality).

Remark: female unknown, after type locality no material has been collected in Turkey.

17. *Hoplitis (Alcidamea) garzetta* (Warncke, 1991)

Distribution: **SW Asia:** TR. **Anatolian endemic.**

Previous records: Bitlis (type locality); Hakkari, Konya (Warncke, 1991f).

18. *Hoplitis (Prionohoplitis) grossepunctata* (Kohl, 1905)

Distribution: **Europe:** ARM, GR. **SW. Asia:** TR. **East-Mediterranean.**

Previous records: Kayseri (type locality), Nevşehir, Van (Zanden, 1989); Bitlis, Elazığ, İçel, Karaman (Warncke, 1991f).

Plant association: possibly oligolectic on *Allium* (Alliaceae) (Müller, 2013).

19. *Hoplitis (Alcidamea) leucomelana* (Kirby, 1802)

Synonyms: *Apis caulicola* Schrank, 1802; *A. zonata* Gravenhorst, 1807; *Osmia parvula* Dufour & Perris, 1840; *Heriades bidenticulatus* Costa, 1863

Distribution-Europe: A, AL, AZ, ARM, B, BG, CH, CZ, D, DK, E, F, FL, GB, H, HR, I, FL, L, LT, LV, MK, NL, P, PL, RO, RUS, S, SK, SLO, UA. **N. Africa:** Algeria, DZ. **N. Asia:** China, MGL, KS, KZ, RC, RC (SW), RUS (FS), TJ. **SW. Asia:** IR, TR. **West-Palaearctic chorotype**

Previous records: Erzurum, Iğdır (Özbek, 1979a), Erzurum, Hakkari, Kars, Konya, Nevşehir (Özbek and Zanden 1992a).

Material: **Artvin:** Yusufeli, Altıparmak, 05.VII.1994, 1♂, leg. EY, det. GvdZ. Bilecik: Merkez, 600m, 15.VI.1995, 3♀♀, leg. EY, det. GvdZ and HÖ. **Erzincan:** Bahçekültürleri Araştırma Merkezi, 07.VII.1993, 1♀, leg. EY, det. HÖ. Erzurum: Atatürk Üniv. Kampus, 39.90250_41.23500, 2000m, 11.VII.2007; 1♂, leg. JSA, HÖ, JGR, det. AM (AMNH); 28.VIII.1996, 1♀, EY, det. HÖ; Palandöken, 13.VII.1993, 1♂, EY, det.

GvdZ; Olur, Süngübayır, 21.V.1994, 1♀, leg. İA, det. GvdZ; Oltu, 25.VI.1971, 1♀, leg. HÖ, det. TK; Çamlıbel, 1700m, 14.VII.1996, 2♀♀1♂, leg. EY, det. GvdZ; Çamlıbel, 16.VII.2004, 1♀, leg. HÖ, det. HÖ; Pasinler, 28.VII.1992, 1♀, leg. EY, det. GvdZ; Tortum, Kaledibi, 05.VII.1992, 1♂, leg. HÖ, det. GvdZ. **Iğdır:** Merkez, 25.V.1971, 1♂, leg. HÖ, det. TK. **Nevşehir:** Göreme, 17.VII.1998, 1♂, leg. Schmid-Egger, det. AM (AMNH).

Plant association: *Convolvulus* sp. and *Melilotus officinalis* (Özbek and Zanden 1992a). Polylectic with a preference for Fabaceae; additional Crassulaceae, Lamiaceae, Asteraceae, Lythraceae and Rosaceae (Amiet et al., 2004; Müller, 2013).

20. *Hoplitis (Alcidamea) limassolica* (Mavromoustakis, 1937)

Distribution-SW. Asia: CY, IL, JOR, TR.

Previous records: Hatay, Kahramanmaraş, Kilis, Siirt, Şanlıurfa (Warncke, 1991f).

Plant association: possibly mesolectic on Fabaceae and Boraginaceae (*Echium*, *Anchusa*).

The females possess long and curved bristles on the tarsi of their forelegs, which probably serve to extract pollen from narrow-tubed flowers, e.g. *Anchusa* (Müller, 2013).

21. *Hoplitis (Alcidamea) mollis* Tkalcu, 2000

Distribution-Europe: BG. **SW. Asia:** JOR, SYR, TR. **East-Mediterranean chorotype.**

Previous records: Bayburt, Elazığ, Erzincan, Erzurum (type locality) (*Onobrychis viciifolia*), Konya (Özbek, 1979b) as *O. mollis*; Ankara, Bayburt, Bitlis, Elazığ, Hakkari, İçel, Karaman, Kayseri, Kırıkkale, Konya, Nevşehir, Niğde, Sivas (Warncke, 1991f) as *Hoplitis (Alcidamea) curtula* (Perez); Erzurum (Özbek and Zanden, 1996).

Material: **Antalya:** ca. 6 km E of Saklikent, 31.V.2009, 1♀, leg. JGR, JSA, HÖ, det. AM (ANHM). **Erzincan:** Gülkaymak, 1200m, 25.V.2001, 1♀, leg. RH, det. AM. **Erzurum:** Tafta, 06.VII.1970, 1♀, leg. HÖ, det. AM.

Remark: In the 1970s this species was extremely abundant in the *O. viciifolia* fields in the research area of Atatürk University, Erzurum. Unfortunately, this habitat was completely destroyed and large buildings were constructed.

Plant association: *Onobrychis viciifolia* (Özbek, 1979a; Özbek and Zanden, 1996). Müller (2013) noted that it is possibly oligolectic on Fabaceae. *Hoplitis mollis* could be accepted an efficient pollinator of *O. Viciifolia*.

22. *Hoplitis (Alcidamea) ozbeki* Tkalcu, 2000

Distribution-Europe: Caucasus. **SW. Asia:** TR. **Southwest-Asiatic (Anatolo-Caucasian).**

Previous records: Erzurum (type locality) (Tkalcu, 2000).

Material: Erzurum: Atatürk University Campus, 12.VI.1970, 1♀; 02.VII.1970, 1♀; 09.VII.1970, 1♀;

24.VII.1970, 1♀ (*O. viciifolia*), all material leg. HÖ, det. GvdZ; Palandöken, 2200m, 23.VII.1997, 1♂, leg. EY, det. HÖ; Pasinler, Çalıyazı, 2300m, 13.VII.1997, 11♂♂, leg. EY, det. AM and HÖ.

Plant association: *Onobrychis viciifolia*. *Hoplitis ozbeki* could be accepted an efficient pollinator of *O. Viciifolia*.

23. *Hoplitis (Alcidamea) praestans* (Morawitz, 1894)

Synonym: *Osmia lineola* Pérez, 1859

Distribution-Europe: A, CH, E, F, GR, H, HR, I, RO, RUS, SK, SLO, UA; Caucasus, Yugoslavia. **N. Africa:** DZ, ET, MA, TN. **N. Asia:** KS, KZ, TJ, UZ. **SW. Asia:** IL, IR, JOR, TR. **West Palearctic.**

Previous records: İçel (Zanden, 1980); Antalya, Hakkari, İçel, Kars, Konya (Warncke, 1991f); Antalya, Erzurum, Van (Özbek and Zanden, 1992a).

Material: Antalya: 7 km SW of Kargın, 26.V.2009, 1♂, leg. JSA, HÖ, JGR, det. AM. Erzurum: Palandöken, 2200m, 07.VII.1996, 1♂, leg. EY, det. GvdZ; Tortum, Çakılı, 04.VII.1991, 1♀, leg. EY, det. T. Griswold.

Plant association: ooligolectic on Campanulaceae (Amiet et al., 2004).

24. *Hoplitis (Alcidamea) stellaris* (Warncke, 1991)

Distribution-Europe: GR. **SW. Asia:** JOR, SYR, **TR. East-Mediterranean.**

Previous records: Van (type locality), Denizli (Warncke, 1991f).

Remark: interestingly, since the description of this species from Van additional records occurred neighboring countries but still female has not been known.

Plant association: *Allium* (Alliaceae) (Müller, 2013).

25. *Hoplitis (Alcidamea) subbutea* (Warncke, 1991)

Distribution-Europe: GR. **N. Asia:** KZ. **SW Asia:** IL, SYR, **TR. Asiatic-European.**

Previous records: Hakkari (type locality), Adıyaman, Nevşehir, Sivas (Warncke, 1991f).

Plant association: Campanulaceae (Müller, 2013).

26. *Hoplitis (Alcidamea) tridentata* (Dufour and Perris, 1840)

Synonyms: *Osmia melanoleuca*, 1934; *H. (Tridentosmia) tridentata asensioi* Tkalcu, 1975

Distribution-Europe: A, B, BG, ARM, CH, CZ, D, E, F, GE, GR, H, HR, I, LT, NL, P, PL, RUS, SK, SLO, UA. **N. Africa:** DZ, ET, MA. **N. Asia:** KS, KZ, UZ. **SW. Asia:** IL, IR, SYR, TR. **West Palearctic.**

Previous records: Erzurum (Özbek, 1979a), Amasya (Zanden, 1980), Bitlis, Erzurum, Kars, Konya, Nevşehir, Tunceli (on *Cirsium* sp.) (Özbek and Zanden, 1992a).

Material: **Artvin:** Yusufeli, Altıparmak, 05.VII.1994, 1♀, leg. GT, det. GvdZ; 2-8km SW Altıparmak, 1300m, 25-27.VI.2005, 1♀1♂, leg. HÖ, det. AM. **Bilecik:** 600m, 1♂1♀, leg. EY, det. GvdZ. Erzurum: Atatürk Üniv. Kampus, 1850m, 17.V.1996, 1♀, leg. HÖ, det. HÖ; 03.VI.1996, 1♀, leg. HÖ, det. HÖ; 20.VI.1996, 1♀, leg. HÖ, det. HÖ; 26.VI.1996, 1♀ (all specimens on *O. viciifolia*), leg. HÖ, det. AM; 03.VII.1996, 1♂, leg. EY, det. HÖ; 08.VII.1993, 1♀, leg. HÖ, det. GvdZ; 24.VIII.1992, 2♀♀, leg. HÖ, det. GvdZ and HÖ; 20.IX.1982, 2♀♀, leg. HÖ, det. HÖ; Çat, 25km Erzurum, 2000m, 11.VII.2002, 1♂, leg. ÖÇ, det. AM; Oltu, Çamlıbel, 1600m, 26.VII.2000, 1♀, leg. HÖ, det. AM; Pasinler, Rabat, 2400m, 11.VII.1996, 2♀♀, leg. EY, det. HÖ; Uzundere, Şelale, 1100m, 09.VI.1996, 1♂, leg. EY, det. AM.

Plant association: *Onobrychis viciifolia*, *Cirsium* sp. (Özbek and Zanden, 1992a), polylectic with a strong preference for Fabaceae (Müller, 2013).

27. *Hoplitis (Alcidamea) verruciventris* (Morawitz, 1886)

Distribution-Europe: AZ; Caucasus. **SW. Asia:** TR. **Anatolo-Caucasian.**

Previous records: Konya (Zanden, 1980); Kırşehir, Nevşehir (Warncke, 1991f).

Remark: although this species occurred in Azerbaijan and Caucasus an extensive collection conducted in eastern part of Turkey, particularly from Erzurum it has not been recorded from this area so far.

28. *Hoplitis (Alcidamea) xanthoprymna* (Warncke, 1991)

Distribution: SW. Asia: **TR. Anatolian Endemic.**

Previous records: Konya (type locality).

Note: male unknown.

29. *Hoplitis (Anthocopa) bifoveolata* (Alfken, 1935)

Distribution: SW. Asia: **IL, JOR, SYR, TR. SW-Asiatic chorotype.**

Previous records: Konya (Zanden, 1989), Bitlis, Erzurum, Tunceli, Van (Özbek and Zanden, 1992a) as *Anthocopa. anipuncta* (Alfken).

Plant association: *Centaurea solstitialis*, *C. iberica*, *Onopordum* sp. (Özbek & Zanden, 1992a). Asteroideae and Cichorioideae (Asteraceae) (Müller, 2013).

30. *Hoplitis (Anthocopa) furcula* (Morawitz, 1875)

Distribution-Europe: ARM, GR. **N. Asia:** KZ. **SW. Asia:** TR. **Asiatic Europea.**

Previous records: Ankara (Stanek, 1969); Amasya (Özbek and Zanden, 1992a).

Material: **Diyarbakır:** Silvan, 12.VI.1995, 1♂, leg. EY, det. T. Griswold.

31. *Hoplitis (Anthocopa) jakovlevi* (Radoszkowski, 1874)

Synonyms: *Osmia serrilabris* Morawitz, 1875; *O. quadridentata* Fonscolombe, 1879

Distribution-Europe: ARM, F, I, I (Si), RUS (SR). **N. Africa:** DZ, TN. **N. Asia:** China, RC, KS, KZ, TJ, TM. **SW. Asia:** IR, TR. **West Palearctic.**

Previous records: Erzurum (Özbek, 1979a; Özbek and Zanden, 1992a) as *Anthocopa (Anthocopa) serrilabris* (Morawitz).

Material: **Artvin:** Yusufeli, Demirkent, 06.VII.1994, 1♀, leg. EY, det. GvdZ; Sarıgöl, 05.VII.1994, 05.VII.1994, 1♂, leg. GT, leg. H.Ö. **Erzincan:** Üzümlü, 02.IX.1993, 1♀, leg. GT, det. GvdZ. Erzurum: Oltu, Anzav Deresi, 800m, 31.VIII.1996, 1♂, leg. GT, det. GvdZ; 31.VIII.1996, 1♀, leg. İA, det. H.Ö.

Plant association: probably oligolectic on Malvaceae (Müller, 2013).

32. *Hoplitis (Anthocopa) mocsaryi* (Friese, 1895)

Distribution: **Europe:** A, ARM, E, F, F(Co), GR, H, RUS, SK. **SW. Asia:** IR, TR. **Turano-European.**

Previous records: Kayseri (Kohl, 1905), Yarbaşı (Tokat), (Friese, 1921).

Flower preferences: oligolectic on *Linum* (Linaceae) (Müller, 2013).

Hoplitis (Anthocopa) nicolaei Müller, 2012

Distribution: **Europe:** GR. **Southwestern Asia:** JOR, TR. **East-Mediterranean chorotype.**

Previous records: Hakkari, Mardin and Siirt.

Plant association: Polylectic (Müller, 2013).

33. *Hoplitis (Anthocopa) papaveris* (Latreille, 1799)

Synonym: *Osmia hyalinipennis* Lapeletier, 1841

Distribution-Europe: A, AL, B, BG, CH, CZ, D, E, F, GR, H, I, I(Sa), I(Si), NL, P, RO, RUS, SK, UA; Caucasus. **N. Asia:** KZ, RC. **SW. Asia:** TR. **Asiatic-European.**

Previous records: Anatolia (Alfken, 1935), Erzurum (Özbek and Zanden, 1992a).

34. *Hoplitis (Anthocopa) perezii* (Ferton, 1895)

Synonym: *Osmia papaveris convolvuli* Ducke, 1899

Distribution-Europe: ARM, BG, E, F, F (Co), GR, HR, I, I (Si), MK, UA. **N. Africa:** MA. **N. Asia:** KS, KZ, TJ, TM, UZ. **SW. Asia:** AFG, IL, TR. **West Palearctic.**

Previous records: Erzurum, Iğdır (Özbek, 1979a), Nevşehir (Zanden, 1980), Sivas (Özbek and Zanden, 1992a).

Material: **Erzincan:** Merkez, 1250m, 1♂, leg. EY, det. GvdZ. Erzurum: Atatürk University Campus, 29.VII.1992, 1♀, leg. H.Ö, det. GvdZ; 03.VI.1996, 1♂, leg. H.Ö, det. H.Ö; 30.VI.2007, 1♂, leg. JSA, JGR, H.Ö, det. JSA; 10.VII.2004, 1♀, leg. JGR, H.Ö, det. JSA; 01.VII.2004, 1♀, leg. JGR, H.Ö; det. AM; 30.VI.2007, 1♀1♂, leg. JGR, H.Ö, det. AM;

17km W of Erzurum, 02.VII.2007, 1♀♀, leg. JSA, H.Ö, JGR; 16km E of Erzurum, 04.VII.2007, 1♀1♂, leg. JSA, H.Ö, JGR, det. AM (AMNH); Aşkale, Ortabahçe, 09.VIII.1994, 1♀, leg. EY, det. H.Ö; Palandöken, 23.VII.1999, 1♂, leg. EY, det. AM; Oltu, 20.VII.1990, 1♂, leg. RH, det. GvdZ; Kurupınar, 1250m, 12.VII.2004, 1♀, leg. H.Ö, det. AM; 4kms WSW of Oltu, 03.VII.2001, 2♀♀, leg. JGR, H.Ö, det. T. Griswold; Uzunoluk, 12.VII.2004, 1♀, leg. JGR, H.Ö, det. AM.; Pasinler, Rabat, 2200m, 13.VI.1996, 1♂, leg. H.Ö, det. H.Ö; 5km NE of Pasinler, 1♀, leg. JSA, H.Ö, det. JSA; Uzundere, Dikyar, 11.VII.1996, 1♂, leg. İA, det. H.Ö. **Diyarbakır:** Silvan, 12.V.1990, 1♂1♀, leg. EY, det. T. Griswold and H.Ö.

Plant association: oligolectic on Convolvulaceae (Müller, 2013).

35. *Hoplitis (Anthocopa) picicornis* (Morawitz, 1895)

Distribution: **N. Asia:** KS, TJ, TM. **SW. Asia:** AFG, IR, TR. **Turano-Anatolian.**

Previous records: Erzincan (Özbek and Zanden, 1996).

Plant association: Asteraceae (Müller, 2013).

36. *Hoplitis (Anthocopa) saxialis* (Zanden, 1994)

Distribution-Europe: GR, RUS(SR); Caucasus. **SW. Asia:** TR. **Europo-Anatolian chorotype.**

Material: **Erzurum:** Tekman, Tekman Yaylası, 2450 m, 20.VII.2009, 1♀, leg. C. Güçlü, det. AM (A. Müller's collection).

Remark: it is new for Turkey as well Asia continent, a rare species, was represented by one specimen in Turkey. Its distribution range is very narrow outside of Turkey too.

Flower preferences: unknown.

37. *Hoplitis (Anthocopa) serainae* Müller 2012

Distribution-Europe: GR. **Southwestern Asia:** JOR, TR.

38. *Hoplitis (Anthocopa) agis* (Benoist, 1929)

Distribution-Europe: AZ, GR. **SW. Asia:** IL, IR, TR. **Turano-European chorotype.**

Previous records: Taurus (type locality) (Benoist, 1929).

Material: **Erzurum:** Olur, Süngübayır, 26.VII.1995, 1♀, leg. İA, det. GvdZ; Oltu, Kaleboğazı, 28.VII.1990, 1♀, leg. EY, det. GvdZ.

39. *Hoplitis (Anthocopa) bisulca* (Gerstaecker, 1869)

Synonym: *Osmia lanosa* Pérez, 1879

Distribution-Europe: E, F, GR, H, I, P. **N. Africa:** DZ, LAR, TN. **SW. Asia:** IL, JOR, SYR, TR. **Europeo-Mediterranean chorotype.**

Previous records: Ankara (Alfken, 1935), Şanlıurfa (Zanden, 1980), Adana, Erzurum, İçel, Kars, Nevşehir (Özbek and Zanden, 1992a).

Material: **Bayburt:** Aydıntepe, 01.VIII.1992, 1♀1♂. leg. HÖ, det. GvdZ. **Bilecik:** Merkez, 600m, 15.VI.1995, 1♀, leg. EY, det. GvdZ. **Erzurum:** Atatürk Üniv. Kampus, 23.VII.1992, 1♂, leg. HÖ, det. GvdZ; 22km WSW of Oltu, 40.47166_41.77777, 08.VII.2007, 1♀, leg. JSA, HÖ, JGR, det. AM.

Plant association: oligolectic on Dipsacaceae (e.g. *Scabiosa*, *Cephalaria*) (Müller, 2013).

40. *Hoplitis (Anthocopa) dalmatica* (Morawitz, 1871)

Distribution: **Europe:** AL, AND, CH, E, F, GR, H, HR, I, I(Sa), MK, SLO. **SW. Asia:** TR. **Europa-Anatolian.**

Previous records: Erzurum (Özbek and Zanden, 1992a) on *Cirsium* sp.

Plant association: oligolectic on Dipsacaceae (Amiet et al., 2004; Westrich, 1989).

Remark: it is a widespread species in Europe, among the Asian countries it occurs only in Turkey, is a rare species; Erzurum is the easternmost distribution record of *H. dalmatica*.

41. *Hoplitis (Anthocopa) duckeana* (Kohl, 1905)

Distribution: **N. Asia:** TJ. **SW. Asia:** SYR, TR. **Turano-Anatolian.**

Previous records: Kayseri (type locality), Şanlıurfa (Zanden, 1980), Nevşehir (Özbek and Zanden, 1992a).

Material: **Konya:** Güneysınır, Güragaç, 1017m, 23.VI.1999, 1♀, leg. M. Kesdek, det. AM; Güragaç, 16.VII.2000, 2♀♀, leg. M. Kesdek, det. HÖ. **Şanlıurfa:** Karaköprü, 16.VI.1992, 1♂, leg. RH, det. GvdZ.

Remark: *Hoplitis duckeana* is an Asian species; Konya is the westernmost distribution record of this species.

Plant association: probably oligolectic on Dipsacaceae (Müller, 2013).

42. *Hoplitis (Anthocopa) urfensis* (Zanden, 1984)

Distribution-SW. Asia: SYR, TR. **Southwest-Asiatic.**

Previous records: Şanlıurfa (type locality).

Plant association: Possibly oligolectic on Carduoideae (Asteraceae) (Müller, 2013).

Remark: it is very rare species, after type specimens no additional material has been collected from Turkey; its distribution range is very narrow, known only from Turkey and Syria.

43. *Hoplitis (Anthocopa) wadicola* (Alfken, 1935)

Distribution: **SW. Asia:** IL, TR. **SW-Asiatic chorotype.**

Remark: I could not detect the locality (s) that this species was recorded.

44. *Hoplitis (Anthocopa) anipuncta* (Alfken, 1935)

Distribution-SW. Asia: CY, IL, JOR, SYR, TR. **SW-Asiatic chorotype.**

Previous records: Konya (Zanden, 1989), Bitlis, Erzurum, Tunceli, Van (Özbek and Zanden, 1992a).

Material: **Antalya:** Düzc̄am, 02.VIII.1992, 1♀, leg. HÖ, det. HÖ. **Bayburt:** Aydıntepe, 01.VIII.1992, 5♀♀, leg. HÖ, det. HÖ; Demirözü, 14.VIII.1992, 4♀♀, leg. H. Bostan, det. HÖ. **Bilecik:** Merkez, 15.VII.1995, 1♀, leg. EY, det. HÖ. **Erzincan:** Merkez, 30.VII.1991, 1♀, leg. EY, det. HÖ. **Erzurum:** Atatürk Üniv. Kampus, 30.VIII.1991, 1♀, leg. EY, det. HÖ; 21.VI.1996, 3♂♂, leg. HÖ, det. HÖ; Palandöken, 17.VII.1996, 1♀, leg. EY, det. HÖ; Pasinler, 13.VIII.1996, 1♀, leg. L. Gültekin, det. HÖ; Pasinler, Rabat, 2300m, 27.VIII.1996, 1♀, EY, det. HÖ; Rabat, 2200m, 13.VI.1996, 1♀, leg. HÖ, det. HÖ. **Isparta:** Isparta-Konya yolu boyunca, 21.VII.1991, 4♀♀, leg. HÖ, det. GvdZ. **Muş:** Merkez, 10.VIII.1996, 1♀, leg. S. Başak, det. HÖ. **Tokat:** Merkez, 1500m, 19.VIII.1992, 5♀♀, leg. HÖ, det. HÖ; Merkez, 900m, 19.VIII.1992, leg. EY, det. HÖ. **Yozgat:** Ankara-Yozgat yolu, 22.VII.1991, 2♀♀, leg. HÖ, leg. GvdZ.

Remark: it is an Asiatic species, 7 provinces have been added to the distribution of *H. anipuncta*. Isparta is the westernmost distribution record of this species.

Plant association: *Centaurea solstitialis*, *C. iberica* and *Onopordum* sp. (Özbek and Zanden, 1992a); possibly oligolectic on Carduoideae (Asteraceae) (Müller, 2013).

45. *Hoplitis (Anthocopa) fasciculata* (Alfken, 1934)

Synonym: *Osmia idalia* Mavromoustakis, 1948

Distribution-Europe: GR, I. **SW. Asia:** CY, JOR, SYR, TR. **East-Mediterranean chorotype.**

Previous records: İzmir (Zanden, 1980); Erzurum, Van (Özbek and Zanden, 1992a) as *Anthocopa idalia* (Mavromoustakis) on *Centaurea iberica*; Erzurum (Özbek and Zanden, 1996) as *Anthocopa rugidorsis* (Pérez, 1895) = *fasciculata* Alfken, 1934.

Material: **Afyonkarahisar:** 15.VIII.1990, 1♂, leg. HÖ, det. AM. **Bayburt:** Aydıntepe, 01.VIII.1992, 1♀, leg. HÖ, det. AM. **Erzincan:** Merkez, 18.VII.1997, 1♂, leg. EY, det. AM. **Erzurum:** Atatürk Üniv. Kampus, 10.VIII.1995, 1♀, leg. H. Ö, det. A M; Hınıs, Yolüstü, 1700m, 21.VII.2003, 1♀, leg. HÖ, det. AM; Ilıca, Atlıkonak, 1750m, 27.VII.1994, 1♀1♂, leg. ÖÇ, det. HÖ. **Isparta:** Isparta-Konya yolu, 21.VII.1994, 1♂, leg. HÖ, det. AM. **Tokat:** ca 8km south of Tokat, 1500m, 19.VIII.1992, 1♀, leg. HÖ, det. AM.

Remark: five provinces have been added to the distribution of *H. fasciculata* and Erzurum is the easternmost distribution record of this species.

Plant association: *Centaurea*, *Scolymus* (Mavromoustakis, 1948); *C. iberica* (Özbek and Zanden, 1996). Probably oligolectic on Carduoideae (Asteraceae) (Müller, 2013).

46. *Hoplitis (Anthocopa) grumi* (Morawitz, 1894)

Synonyms: *Osmia jagnobensis* Morawitz, 1894; *O. bipartita* Friese, 1899; *Anthocopa (Anthocopa) cypriaca bayburtensis* Tkalcu, 1980

Distribution-Europe: E, N. **Africa:** MA, N. **Asia:** KS, KZ, TJ; Central Asian Ranges. **SW. Asia:** TR. **Centrasian-Mediterranean chorotype.**

Previous records: Nevşehir, Sivas (Zanden, 1980), Erzurum (Özbek and Zanden, 1992a) as *H. grumi* (*O. viciifolia*); Bayburt (Tkalcu, 1980, Özbek and Zanden, 1992a) as *Hoplitis cypriaca bayburtensis* on *Carduus* sp.; Erzurum, Hakkari (Özbek and Zanden, 1992a) as *Anthocopa bipartita* (Friese, 1899).

Material: Bayburt: Demirözü, 12.VII.1992, 1♀, leg. HÖ, det. HÖ. **Erzincan:** Merkez, 30.VII.1992, 1♂, leg. HÖ., det. HÖ. Erzurum: Atatürk Üniv. Kampus, 01.VII.1992, 1♂, leg. EY, det. H.Ö.; 09.VII.1995, 1♀, leg. H. Ö., det. A M; 14.VII.1997, 1♀, leg. EY, det. HÖ; 29.VII.1992, 1♂, leg. EY, det. HÖ; 29.VII.1992, 4♂♂, leg. HÖ, det. GvdZ; 17.VIII.1992, 1♂, leg. İA, det. HÖ; 08.VIII.1995, 1♀, leg. E. Kılıç, det. HÖ; ?.VI.1983, 1♀, leg. H. Erhan, det. HÖ; Dereboğazı, 11.VIII.1994, 1♂, leg. GT, det. HÖ; Güzelova, 2200m, 12.VIII.1992, leg. H. Ö, det. AM; Umudum Yaylası, 2800m, 08.VIII.1991, 8♀♀ leg. HÖ, det. GvdZ and HÖ; Güzelova, 2200m, 12.VIII.1992, 6♀♀, leg. HÖ, det. GvdZ; Güzelova, 2200m, 12.VIII.1992, 11♀♀, leg. EY and İA, det. GvdZ; Şenyurt, 2300m, 28.VII.1991, 2♀♀, leg. HÖ, det. HÖ; Pazaryolu, 07.VII.1996, 1♀, leg. E. Yıldırım, det. H.Ö; Pasinler, Büyükdere, 11.VII.1996, 1♀, leg. E. Yıldırım, det. AM; Palandöken, 13.VIII.1995, 1♀, leg. HÖ, det. AM. (A.M's coll.); Şenkaya, Penek, 09.VII.1992, 1♂, leg. HÖ, det. GvdZ. **Gümüşhane:** Köse, 10.VII.1995, 1♂, leg. İA, det. HÖ.

Plant association: *Carduus* sp., *O. viciifolia* (Özbek and Zanden, 1992a); *Origanum*, *Salvia*, *Sophora* (Marikovskaya, 1968). Possibly oligolectic on Carduoideae (Asteraceae) (Müller, 2013).

47. *Hoplitis (Anthocopa) brevispina* (Tkalcu, 2000)

Distribution-Europe: Caucasus. **SW. Asia:** TR. **SW-Asiatic (Anatolo-Caucasian).**

Previous records: Erzurum (type locality) (Tkalcu, 2000a).

Flower preferences: unknown.

Remark: it is a very rare species, no additional sample has been found although intensive collection made in Erzurum and neighboring provinces.

48. *Hoplitis (Anthocopa) caucasicola* Müller 2012

Distribution-Europe: GE, RUS(SR).

Southwestern Asia: TR

Previous records: Artvin (Müller, 2012).

Flower preferences: possibly oligolectic on Asteraceae (Müller, 2013).

49. *Hoplitis (Anthocopa) obtusa* (Friese, 1899)

Distribution: **Europe:** AL, GR, GR (Cr). **SW. Asia:** IL, JOR, RL, SYR, TR.

Previous records: Mersin (type locality), Konya (Zanden, 1987).

Flower preferences: Carduoideae and Cichorioideae (Asteraceae) (Müller, 2013).

Remark: it is a very rare species in Turkey, although one of the earliest described species from Anatolia so far known from Mersin and Konya.

50. *Hoplitis (Anthocopa) unispina* (Alfken, 1935)

Distribution: **SW. Asia:** IL, JOR, SYR, TR. **SW-Asiatic.**

Previous records: it is known from Turkey (Müller, 2013) but I could not reach the sources.

Plant association: Asteraceae (Müller, 2013).

51. *Hoplitis (Anthocopa) daniana* (Mavromoustakis, 1949)

Distribution: **SW. Asia:** IL, JOR, SYR, TR.

Previous records: recently recorded from Turkey (Müller, 2013). I could not reach the sources.

52. *Hoplitis (Anthocopa) yermasoyiae* (Mavromoustakis, 1938)

Distribution-Europe: AL, ARM, GR; Yugoslavia. **SW. Asia:** CY, IL, RL, SYR, TR. **East-Mediterranean chorotype.**

Previous records: Konya, Sivas, Şanlıurfa (Özbek and Zanden, 1992a).

Material: **Bayburt:** Demirözü, 16.VII.1992, 1♀, leg. H. Bostan, det. GvdZ. **Erzurum:** Atatürk Üniv., Kampus, 10.VI.1994, 1♀, leg. EY, det. GvdZ; Kargapazarı, Radar Yolu, 2700m, 20.VII.1987, 1♀ (on *Salvia* sp.), leg. HÖ, det. GvdZ; Güzelova, 2200m, 12.VII.1996, 1♀, leg. İA, det. GvdZ; Umudum Yaylası, 2800m, 08.VIII.1991, 1♀, leg. HÖ, det. HÖ; İspir, 30.VII.1990, 1♀, leg. EY, det. GvdZ; Oltu, Başaklı, 1700m, 18.VII.1992, leg. HÖ, det. GvdZ; 22kms W of Oltu, 07.VII.2008, 1♀, leg. JGR, HÖ, det. AM; Çat yolu, DS1 Gölet, 09.VII.2004, 1♀, leg. JGR, H.Ö, det. AM (AMNH); Şenkaya, Turnalı, 06.VII.1990, 1♀, leg. EY, det. GvdZ.

Plant association: Polylectic; Asteraceae, Cistaceae, *Papaver* (Müller, 2013).

52a. *Hoplitis (Anthocopa) yermasoyiae asiae* (Tkalcu, 1979)

Distribution-SW. Asia: TR. **Anatolian endemic!**

Previous records: Erzurum (type locality) in addition to the type specimens several specimens have been collected from Erzurum Province (Özbek and Zanden, 1992a).

Note: male unknown.

53. *Hoplitis (Chlidoplitis) heinrichi* Zanden, 1980

Distribution: **SW. Asia:** IR, SYR, TR. **SW-Asiatic.**

Previous records: Şanlıurfa (type locality).

Plant association: probably oligolectic on Fabaceae with a preference for Hedysareae (Müller, 2013).

Remark: no sample has been collected after type material.

54. *Hoplitis (Chlidoplitis) illustris* Zanden, 1992

Distribution: **SW. Asia:** IR, TR. **SW-Asiatic.**

Previous records: Nevşehir (type locality); Hakkari (Özbek and Zanden, 1996).

Plant association: probably oligolectic on Fabaceae with a preference for Hedysareae (Müller, 2013).

55. *Hoplitis (Chlidoplitis) onychophora* (Mavromoustakis, 1939)

Distribution: **SW. Asia:** IL, JOR, SYR, TR. **SW-Asiatic.**

Previous records: known from Turkey (Müller, 2013). I could not reach the sources.

Plant association: probably oligolectic on *Allium* (Alliaceae) (Müller, 2013).

56. *Hoplitis (Chlidoplitis) lysholmi* (Friese, 1899)

Distribution-Europe: GR (Lesbos, Rhodos). **SW. Asia:** IL, JOR, RL, SYR, TR. **Asiatic-European.**

Previous records: Mersin (one of the type localities) (Friese, 1899); Antalya, Sivas (Özbek and Zanden, 1992a).

Material: **Erzurum:** Oltu, Çamlıbel, 1700 m, 17.VII.2009, 1♀, leg. HÖ, det. HÖ.

Plant association: *Trifolium repens*, possibly oligolectic on Fabaceae (Müller, 2013).

57. *Hoplitis (Hoplitis) parasitica* (Warncke, 1991)

Distribution: **SW. Asia:** IR, TR. **SW-Asiatic.**

Previous records: Hakkari (type locality) (Warncke, 1991f).

Note: ceptoparasite of *Hoplitis (Annosmia) eremophila* and probably other species of the subgenus *Annosmia* (Warncke, 1991f).

58. *Hoplitis (Hoplitis) annulata crenulata* (Morawitz, 1871)

Synonyms: *Osmia pruinosa* Destefani, 1887; *O. crenulata* Morawitz, 1871; *O. (Annosmia) annulata cretica* Warncke, 1991

Distribution-Europe: ARM, AZ, BG, E, F, F (Co), GR, GR (Cr), HR, I, I (Sa), I (Si), P. N. **Africa:** DZ, MA, TN. **SW. Asia:** CY, IL, IR, RL, SYR, TR. **Europeo-Mediterranean.**

Previous records: Ankara (Alfken, 1935), Adıyaman, Ağrı, Ankara, Antalya, Çankırı, Erzincan, Erzurum, Eskişehir, Gaziantep, Hakkari, Hatay, Kahramanmaraş, Konya, İçel, Nevşehir, Niğde, Şanlıurfa, Van (Warncke, 1991e); Antalya, Eskişehir, İçel, Konya, Sinop, Şanlıurfa, Tunceli (Özbek and Zanden, 1992a) as *H. crenulata* (Morawitz). Some samples were collected on *Eryngium* sp. and *Centaurea* sp.

Materials: Antalya: Konyaaltı, 29.V.2009, 6♂♂4♀♀, leg. JSA, HÖ, JGR, det. AM. as *H. annulata crenulata*. **Bayburt:** Demirözü, 20.VIII.1991, 1♂, leg. H. Bostan, det. GvdZ; Demirözü, Bayrampaşa, 31.VI.1992, 1♂, leg. H. Bostan, det. GvdZ. **Bilecik:** Merkez, 600m, 15.V.1995, 2♀♀, leg. EY, det. HÖ. **Bingöl:** Karlıova, Çobantaşı, 1555m, 10.VIII.2004, 1♂, leg. SÇ, CG, det. AM. Erzincan: Bahçekültürleri Araşt. Merkezi, 02.VIII.1994, 1♂, leg. GT, det. GvdZ; merkez, 14.VI.1994, 1♂, leg. EY, det. GvdZ; Merkez, 02.VII.1992, leg. RH, det. GvdZ; 18.VII.1997, 3♂♂, leg. EY, det. AM; Çağlayan, 1100m, 06.VII.2001, 1♀2♂♂, leg. HÖ, det. AM; Üzümlü, 16.VI.1994, 1♀, leg. EY, det. T. Griswold; Üzümlü, 16.VI.1994, 1♂, leg. EY, det. GvdZ; 08.VII.1993, 1♀, leg. EY, det. AM; Yeşilyayla, 39.75000_39.50000, 06.VII.2001, 1♀, leg. JGR, HÖ., det. T. Griswold; Bahçe Kültürleri Araştırma Merkezi, 07.VII.2001, 2♂♂, leg. JGR, HÖ, det. T. Griswold (AMNH). Erzurum: Atatürk University Campus, 23.VII.1992, 1♂ (*Echium* sp.), leg. HÖ, det. HÖ; 20.VII.1993, 1♂, leg. EY, det. HÖ; 08.VII.1993, 1♂, leg. HÖ, det. HÖ; 10.VIII.1992, 1♂, leg. EY, det. GvdZ; 29.VII.1992, 1♂, leg. HÖ, det. GvdZ. **İçel:** Erdemli, 25.V.1992, 2♂♂, leg. HÖ, det. GvdZ. **Sivas:** Erzincan-Sivas yolu, 20km from Sivas, 13.VIII.1987, 1♂, leg. HÖ, det. GvdZ.

Plant association: *Eryngium* sp. and *Centaurea* sp. (Özbek and Zanden, 1992a). Oligolectic on *Echium* (Boraginaceae) (Müller, 2013).

59. *Hoplitis (Hoplitis) chukar* (Warncke, 1991)

Distribution: **SW. Asia:** TR. **Anatolian endemic.**

Previous records: Hakkari (type locality), Konya (Warncke, 1991e).

60. *Hoplitis (Hoplitis) elaziga* (Warncke, 1991)

Distribution: **SW. Asia:** TR. **Anatolian endemic**

Previous records: Elazığ (type locality), Ankara (Warncke, 1991e).

61. *Hoplitis (Hoplitis) eremophila* (Warncke, 1991)

Distribution-SW. Asia: SYR, TR. **SW-Asiatic.**

Previous records: Hakkari (type locality), Bitlis (Warncke, 1991e); Erzurum (Özbek and Zanden, 1996).

Material: Erzurum: Palandöken, 21.VI.1994, 1♀ (*Astragalus* sp.), leg. EY, det. T. Griswold.

Plant association: *Astragalus* sp., Fabaceae (Müller, 2013).

62. *Hoplitis (Hoplitis) fulica* (Warncke, 1991)

Distribution: TR. **Anatolian endemic.**

Previous records: Van (type locality) (Warncke, 1991e).

Plant association: Fabaceae (Müller, 2013).

63. *Hoplitis (Annosmia) gentilis* (Warncke, 1991) ??????

Distribution: TR. **Anatolian endemic.**

Previous records: Konya (type locality) (Warncke, 1991e).

Plant association: *Astragalus* (Fabaceae) (Müller, 2013).

64. *Hoplitis (Hoplitis) idaensis* (Warncke, 1991)

Distribution: Europe: GR(Cr). **SW. Asia:** TR. **East-Mediterranean (Aegean)**

Previous records: Adiyaman, Konya (Warncke, 1991e)

Plant association: Fabaceae (Müller, 2013).

65. *Hoplitis (Hoplitis) monticola* Müller 2012

Distribution-Europe: GR. **Southwestern Asia:** TR. **East-Mediterranean (Aegean).**

Previous records: Antalya (Müller, 2012).

Plant association: unknown

66. *Hoplitis (Hoplitis) mutica* (Warncke, 1991)

Distribution-Southwestern Asia: IR, SYR, TR. **SW-Asiatic.**

Previous records: Konya (type locality); Adiyaman, Ankara, Hakkari, İçel, Karaman, Nevşehir, Niğde, Şanlıurfa, Van (Warncke, 1991e).

Plant association: Fabaceae (Müller, 2013).

67. *Hoplitis (Hoplitis) uncaticornis* (Stanek, 1969)

Distribution SW. Asia: IR, SYR, TR. **SW. Asiatic.**

Previous records: İçel (type locality); Sivas (Zanden, 1980); Şanlıurfa (Warncke, 1991e); Konya, Nevşehir (Özbek and Zanden, 1992a).

Material: Adiyaman: Gölbaşı, 20km E, 09.V.2002, 37°44'25"N 37°55'28"E, 600m, leg. HÖ, det. HÖ. **Erzurum:** Çat, Çirişli, 30km S of Çat, 2000-2100m, 12.VI.2001, 2♂♂, leg. HÖ, det. AM. **Kahramanmaraş:** 32km W, 37°38'14"N 36°38'09"E, 500m, 14.V.2002, 1♂, leg. HÖ, det. HÖ. **Şanlıurfa:** Atatürk Barajı, 500m, 09.V.2002, 1♂, leg. HÖ, det. HÖ.

Plant association: probably oligolectic on Fabaceae (Müller, 2013).

Remark: Warncke (1991e) described *H. uncaticornis cursoria* from Şanlıurfa as a subspecies.

68. *Hoplitis (Hoplitis) adunca* (Panzer, 1798)

Synonyms: *Osmia spinolae* Lepeletier, 184; *O. aduncoides* Strand, 1910; *Hoplitis (Hoplitis) adunca contraria* Tkalcu, 1974

Distribution-Europe: A, AL, ARM, B, BG, CH, CZ, D, DK, E, F, F (Co), FL, GR, H, HR, I, I (Sa), I (Si), L, LT, LV, NL, P, PL, RUS, SK, SCG, SLO, UA; Caucasus. **N. Africa:** DZ, LAR, MA, TN. **N. Asia:** KS, RUS (FS), TM. **SW. Asia:** TR. **West Palearctic.**

Previous records: İstanbul, Zonguldak (Friese, 1922), Erzurum (Özbek and Zanden, 1996), Ankara (Güler and Çağatay, 2006), Afyonkarahisar (Güler, 2011).

Material: Diyarbakır: Silvan, 12.V.1995, 1♀, leg. EY, det. GvdZ. **Erzurum:** Olur, Süngübayır, 01VII.1991, 1♀, leg. İA, det. GvdZ.

Remarks: although *H. adunca* is a widespread species in Europe, N. Africa, and N. Asia, among the Middle East countries it occurs only in Turkey. This is yet further proof of the exceptionally high biodiversity in Turkey.

Plant association: Oligolectic on *Echium* (Boraginaceae) (Amiet et al., 2004).

69. *Hoplitis (Hoplitis) bombiformis* Zanden, 1991

Distribution: SW. Asia: TR. **Anatolian Endemic.**

Previous records: Hakkari (type locality), Van (Özbek and Zanden, 1996).

Remark: male unknown, it is a rare species, apart from the four females, mentioned in the description, only one female was recorded from Van so far.

70. *Hoplitis (Hoplitis) carinata* (Stanek, 1969)

Distribution- Europe: ARM, AZ, BG, GR, MK. **SW. Asia:** JOR, TR, SYR. **E. Mediterranean chorotype.**

Previous records: Konya (type locality) (Stanek, 1969); Erzurum, Malatya, İçel, Nevşehir, Sivas (Özbek and Zanden, 1992a).

Material: Antalya: 7km S of Kargin, 02.VI.2009, 1♀1♂, leg. JSA, HÖ; 4km E of Saklıkent, 36.86944_30.51666, 30.V.2009, 1♂; Saklıkent yolu, Şeklik Mevkii, 03.VI.2009, 1♂; ca. 6km E of Saklıkent, 03.VI.2009, 1♂, leg. JGR, JSA, HÖ, det. AM. (AMNH). **Artvin:** Yusufeli, Taşkıran, 1350m, 06.VII.2003, 1♀, leg. İA, det. AM. **Diyarbakır:** Silvan, 12.V.1995, 4♀♀1♂, leg. EY, det. HÖ. **Erzurum:** Atatürk University Campus, 1850m, 22.VII.1995, 1♀, leg. HÖ, det. AM (on *O. vicifolia*); 18.VII.2003, 1♀, leg. JGR, HÖ, det. AM;

06.VII.1992, 1♀, leg. EY, 2♀♀, det. AM.; 21.VI.1996, 1♂, leg. HÖ, det. HÖ; 24.VI.1997, 4♂♂, leg. HÖ, det. AM and HÖ; 26.VI.2008, 1♂; 29.VI.2001, 2♀♀, leg. JGR, HÖ, det. AM; 06.VII.2007, 1♀, leg. JSA, HÖ, JGR, det. AM; 03.VII.2007, 2000m, 2♂♂, leg. JGR, JSA, HÖ, det. AM (AMNH); 18.VII.2003, 1♀, leg. JGR, HÖ, det. AM; 01.VII.1995, 1♀; 09.VII.1995, 2♀♀, leg. HÖ, det. HÖ; 3km E of Pasinler, 40° 00' 108 N 41° 43' 601 E, 04.VII.2008, 2♂♂, leg. JGR, HÖ, det. AM (EMET); 5km NE of Pasinler, 40.01400_41.72460, 1♂, leg. JGR, JSA, HÖ, det. AM (AMNH); Aşkale, 1950m, 16.VII.1999, 1♂, leg. EY, det. HÖ; Dumlu, 1850m, 25.VI.2002, 1♀, leg. ÖÇ, det. AM; Olur, Süngübayır, 26.VII.1995, 1♀, leg. İA, det. AM; 25.VI.2001, 1♀, leg. JGR, HÖ, det. AM. **Iğdır:** Tuzluca, 26.V.1971, 1♂, leg. HÖ, det. HÖ.

Plant association: *Onobrychis viciifolia*; oligolectic on Fabaceae (e.g. *Onobrychis*, *Medicago*, *Melilotus*, *Lotus*, *Vicia*), an important pollen sources are flowers of the Hedysareae (e.g. *Onobrychis*) (Özbek, 1979b; Özbek and Zanden, 1992a; Müller, 2013).

71. *Hoplitis (Hoplitis) erzurumensis* Tkalcu, 2000

Distribution: SW Asia: TR. IL. SW-Asiatic chorotype.

Previous records: Erzurum (Tkalcu, 2000a) on *O. viciifolia*

Material: Erzurum: Atatürk University Campus, 39.90250_41.23500, 03.VII.2007, 1♀1♂, leg. JGR, JSA, HÖ, det. AM; 39.90250_41.23500, 28.VI.2001, 1♀, leg. JGR, HÖ, det. AM; 09.VII.2007, 1♀, leg. JSA, HÖ, JGR, det. AM; Merkez, 40.00000_41.50000, 02.VII.2007, 1♀, leg. JGR, HÖ, det. AM (ANHM). **Şanlıurfa:** Siverek, Karabahçe, 37.77805_39.74055, 09.V.2002, 2♂♂, leg. JGR, HÖ, det. AM (AMNH); 09.V.2002, 1♂, leg. JGR, HÖ, det. AM (EMET).

Remark: Erzurum is the easternmost distribution record of this species.

Plant association: *Onobrychis viciifolia*; probably oligolectic on Fabaceae (e.g. *Onobrychis*, *Medicago*, *Trifolium*) (Özbek, 1979b; Müller, 2013).

72. *Hoplitis (Hoplitis) flabellifera* (Morice, 1901)

Synonyms: *Osmia conjuncta* Alfken, 1935; *O. stichi* (Alfken, 1935).

Distribution: Europe: ARM. SW. Asia: IL, IR, JOR, SYR, TR. East-Mediterranean chorotype.

Previous records: İçel, Sivas (Özbek and Zanden, 1992a) as *Osmia stichi* Alfken; Erzurum, İçel (Özbek and Zanden, 1996).

Material: **Diyarbakır:** Dicle Üniv. Kampus, 700m, 01.VI.2002, 1♀, leg. HÖ, det. AM; **Erzurum:** Atatürk Üniv. Kampus, 2000m, 16.VI.1995, 1♂, leg. HÖ, det. HÖ. **Şanlıurfa:** Siverek, Karabahçe, 860m,

37° 46' 41" N, 39° 44' 26" E, 09.V.2002, 1♂, leg. JGR, HÖ, det. AM.

Plant association: Polylectic with a strong preference for *Anchusa* (Boraginaceae) and/or closely related genera. Additional pollen sources are Fabaceae, Brassicaceae and *Echium* (Boraginaceae) (Müller, 2013). The females possess curved bristles on the tarsi of their forelegs (Müller, 2013). Similar specialised bristles developed either on the mouthparts or on the forelegs are known to occur in many other bee taxa where they serve to remove pollen from narrow-tubed flowers (Thorp, 2000).

73. *Hoplitis (Hoplitis) lapidaria* (Morawitz, 1877)

Distribution: Europe: ARM. SW. Asia: TR. Anatolo-Armenian.

Previous records: İçel, Nevşehir (Warncke, 1991e).

Remark: male unknown, distribution range is restricted both in Turkey and abroad, is a rare species.

74. *Hoplitis (Hoplitis) libanensis* (Morice, 1901)

Distribution: SW. Asia: IL, JOR, RL, SYR, TR. SW. Asiatic chorotype.

Previous records: Antalya (Özbek and Zanden, 1996).

Flower preferences: Possibly oligolectic on Fabaceae (Müller, 2013).

75. *Hoplitis (Hoplitis) linguaria* (Morawitz, 1876)

Distribution: Europe: Caucasus. N. Asia. SW. Asia: TR. SW-Asiatic (Anatolo-Caucasian) chorotype.

Previous records: Osmaniye! (Friese, 1921), Ankara (Alfken, 1935), Nevşehir (Zanden, 1987).

Material: **Erzurum:** Aşkale, 2km NW of Geçitköyü, 39.74396_41.45340, 05.VII.2007, 1♀, leg. JSA, HÖ, JGR, det. AM (AMNH); Atatürk University Campus, 24.VI.1997, 1♀, leg. HÖ, det. AM; 01.VII.1995, 1♀, leg. HÖ, det. HÖ; 08.VII.1993, 17♀♀, 1♂, leg. HÖ, det. GvdZ, HÖ and AM; 09.VII.1995, 5♀♀, leg. HÖ, det. HÖ; 12.VII.1993, 1♀, leg. EY, det. HÖ; 14.VII.1993, 2♀♀, leg. EY, det. GvdZ; 19.VII.1994, 1♀, leg. EY, det. GvdZ; 20.VII.1993, 13♀♀, leg. EY, det. AM; 22km SW of Oltu, 40.47277_41.77638, 11.VII.2004, 1♀, leg. JGR, HÖ, det. AM (ANHM); Oltu, Çamlıbel, 1750m, 04.VII.2004, 1♀, leg. HÖ, det. AM.

Remark: new records for Erzurum Province as well the eastern Anatolia.

Plant association: possibly oligolectic on *Onosma* (Boraginaceae) (Müller, 2013).

76. *Hoplitis (Hoplitis) manicata* (Morice, 1901)

Distribution-Europe: A, AL, BG, CZ, F (Co), GR, GR (Cr), HR, I, MK, RO, SCG, SK, UA. N.

Africa: Morocco, **SW. Asia:** TR. **Mediterranean chorotype.**

Previous records: Amasya (Zanden, 1980), Isparta (Özbek and Zanden, 1992a), Ankara (Güler and Çağatay, 2006), Afyonkarahisar (Güler, 2011).

Material: Erzurum: Bayırbağ, 05.VII.1995, 1♂, leg. HÖ, det. T. Grisworld. **Erzurum:** Palandöken, 01.VII.1995, 1♂, leg. EY, det. HÖ.

Remark: A new record for the eastern Anatolia region, Erzurum is the easternmost distribution record of this species.

Plant association: Oligolectic on *Echium* (Boraginaceae) (Müller, 2013). Additional flower records: *Olea*, *Ficus* (Banaszak and Romasenko, 2001).

77. *Hoplitis (Hoplitis) monstrabilis* Tkalcu, 2000

Distribution-SW. Asia: JOR, TR. **SW-Asiatic chorotype.**

Previous records: Erzurum (type locality) (Tkalcu, 2000a).

Material: Erzurum: Atatürk University Campus, 39.90250_41.23500, 2000m, 11.VII.2007, 2♀♀, leg. JSA, HÖ, JGR, det. JSA (AMNH); 39.90250_41.23500, 10.VII.2008, 1♀, leg. JGR, HÖ, det. AM (EMET); 10.VII.2008, 1♀, leg. JGR, HÖ, det. JSA; 09.VII.2009, leg. JGR, HÖ, det. JSA; 10.VII.2004, 1♀, leg. JGR, HÖ, det. AM; 09.VII.2008, 1♀, leg. JGR, HÖ, det. AM; 6kms NW of Tekman, 08.VII.2007, 1♂, JSA, HÖ, JGR, det. AM (AMNH); 10.VII.2004, 40.00000_41.50000, 1♀, leg. JGR, HÖ, det. AM.; Tekman, Taşkesen, 1650m, 05.VII.2007, 2♀♀ (*O. viciifolia*), leg. HÖ, det. AM.

Plant association: *Onobrychis viciifolia*; oligolectic on Fabaceae, an important pollen source are Hedysareae, e.g. *Onobrychis* (Müller, 2013). Several brood cell provisions were found to be composed of *Onobrychis pollens* (Rozen et al., 2009).

Remarks: in the locality at the Atatürk University Campus I have already collected the type specimens of *H. monstrabilis* on *O. viciifolia* and later we (JGR and HÖ) collected several specimens from the same place, the habitat on the university campus was completely destroyed in last 2-3 years and new buildings were established. It is interesting that since 1970s Erzurum Province was searched more intensively, but with the exception of two specimens from Tekman, all materials were collected only from the habitat on the campus. At the same locality we searched the nesting biology of *H. monstrabilis* (Rozen et al., 2009).

78. *Hoplitis (Hoplitis) pallicornis* (Friese, 1895)

Distribution: Europe: AL, GR (Cr), HR, I, MK, SLO. **SW. Asia:** IL, JOR, SYR, TR. **East-Mediterranean chorotype.**

Previous records: Ankara (Alfken, 1935), İçel (Zanden, 1987), Antalya, Eskişehir, Kahramanmaraş, Nevşehir (Özbek and Zanden, 1992a).

Material: Antalya: 7km SW of Kargın, 36° 37' 571" N 30° 59' 704" E, 24.V.2009, 1♂, leg. JSA, JGR, HÖ, det. AM (EMET); Altinyaka, 36.55598_30.35005, 28.V.2009, 1♀1♂, leg. JSA, HÖ, JGR, det. AM (AMNH); 7km S of Kargın, 36.37571_30.59704, 24.V.2009, 2♂♂ (EMET); 02.VI.2009, 1♀1♂, leg. JSA, HÖ, det. AM; Konyaalti Beach, 29.V.2009, 1♀; 8km W of Doyran, 36.89997_30.45991, 30.V.2009, 1♀; Saklıkent yolu, Şekliik Mevkii, 03.VI.2009, 2♀♀; Saklıkent, 36.84444_30.31666, 31.V.2009, 1♂; Karacaören Bridge (W side, NE of Kocaaliler), 23.V.2009, 1♂, JSA, HÖ, JGR, det. AM (AMNH). **İçel:** Erdemli, 23.V.1992, 1♀, leg. HÖ, det. AM.

Plant association: polylectic with a preference for Boraginaceae (especially *Echium*) and Fabaceae (Müller, 2013). Additional flower records: *Salvia*, *Onosma* (Gogala, 1999).

79. *Hoplitis (Hoplitis) pici* (Friese, 1899)

Distribution: Europe: GR, HR, RO. **SW. Asia:** SYR, TR. **East-Mediterranean chorotype.**

Previous records: Bursa (Type locality); Hatay (Warneke, 1991a) as *O. palaestina* (Ben.).

Material: Antalya: Altinyaka, 36.55598_30.35005, 28.V.2009, 3♀♀; 4km NNE of Altinyaka, 28.V.2009, 1♀; 4km E of Saklıkent, 36.86944_30.51666, 30.V.2009, 1♂; 4km S of Akseki, 27.V.2009, 1♂, leg. JSA, HÖ, JGR, det. AM (AMNH). **Erzurum:** Tortum, Kaledibi, 1600m, 25.V.1997, 1♂, leg. HÖ, det. AM. **İçel:** Tarsus, Çamlıyayla, 25.V.1992, 1♀, leg. HÖ, det. AM. **İzmir:** Bornova, 50m, 07.V.1996, 1♂, leg. HÖ, det. AM.

Remark: new record for eastern Anatolia and Erzurum is the easternmost distribution record for this species.

Plant association: probably oligolectic on *Muscari* (Hyacinthaceae) (Müller, 2006; 2013). The females are equipped with conspicuous hooked bristles on the galeae of their proboscis. These specialised bristles serve to scrape pollen out of the urn-shaped *Muscari* flowers, which have a very small opening (Müller, 2013).

80. *Hoplitis (Hoplitis) strymonia* Tkalcu, 1999

Distribution: Europe: BG. **SW. Asia:** TR **East-Mediterranean (Aegean) chorotype.**

Note: male unknown. Locality could not be detected.

Flower preferences: Fabaceae (e.g. *Trifolium*) (Müller, 2013).

81. *Hoplitis (Megahoplitis) tigrina* (Morawitz, 1871)

Synonyms: *Osmia tricuspitata* Sichel, 1873; *O. deserti* Benoist, 1934

Distribution-Europe: GR. **N. Africa:** DZ, MA; Sahara. **SW. Asia:** IR, SYR, TR. **Mediterranean chorotype.**

Previous records: Osmaniye (Friese, 1921), Ankara (Alfken, 1935), Elazığ (Zanden, 1987), Erzurum, Van (Özbek and Zanden, 1992a).

Material: İzmir: Selçuk, Havutçulu, 600m, 1♂, leg. HÖ, det. AM. Van: Erciş, Çakırbey, 29.VII.1978, 1♂ (on *Carduus* sp.), leg. HÖ, det. GvdZ.

Plant association: *Carduus* sp. (present study). Probably oligolectic on Carduoideae (Asteraceae) (Müller, 2013).

82. *Hoplitis (Megahoplitis) bombiformis*
Zanden, 1991

Distribution: SW. Asia: TR. **Anatolian Endemic.**

Previous records: Hakkari (type locality), Van (Özbek and Zanden, 1996).

Remark: male unknown, it is a rare species, apart from the four females, mentioned in the description, only one female was recorded from Van so far.

83. *Hoplitis (Micreriades) antalyae* Tkalcu, 2000

Distribution: Europe: GR(Chios, Ikaria, Lesvos, Rhodes). **SW. Asia:** TR.

Previous records: Antalya (Tkalcu, 2000a)

Remark: female unknown, *H. antalyae*, formerly known only from Turkey, recently it has been recorded from several islands of the Aegean (Müller, 2013).

84. *Hoplitis (Micreriades) haemi* Tkalcu, 2000

Synonym: *Hoplitis (Micreriades) pisidiae* Tkalcu, 2000

Distribution: Europe: BG, GR. **SW. Asia:** TR. Previous record: Isparta (type locality) as *H. pisidiae* (Tkalcu, 2000a)

Remark: female unknown.

85. *Hoplitis (Micreriades) lebanotica*
(Mavromoustakis, 1955)

Distribution: SW. Asia: JOR, RL, TR.

Previous records: Şanlıurfa (Zanden, 1989), Aksaray, Hatay, Konya (Özbek and Zanden, 1992a).

86. *Hoplitis (Micreriades) mazzucchi* (Schwarz and Gusenleitner, 2005)

Distribution-Europe: A, BG, GR, H, SK, SLO. **SW. Asia:** TR. **East-Mediterranean (Aegean) chorotype.**

Previous records: Konya (Özbek and Zanden, 1992a) as *Hoplitis (Micreriades) tenuispina* (Alfken, 1937).

Material: Bitlis: Tatvan, Nemrut Mountain 2000m, 23.VII.2003, 1♂, leg. HÖ, det. AM. **Erzurum:** Palandöken, 2200m, 23.VII.1997, 1♂, leg. EY, det. AM.

Remark: new record for eastern Anatolia and Bitlis is the easternmost distribution record for this species.

87. *Hoplitis (Pentadentoscia) gallinula*
(Warncke, 1991)

Distribution-SW. Asia: JOR, SYR, TR. **SW-Asiatic chorotype.**

Previous records: Şanlıurfa (type locality) (Warncke, 1991a); Erzurum (Özbek and Zanden, 1996).

Material: Bilecik: Merkez, 600m, 15.VI.1995, 1♀, leg. EY, det. GvdZ. Erzurum: Atatürk Üniv. Kampus, 12.VIII.1992, 1♀ (*O. vicifolia*), leg. HÖ, det. GvdZ; Arıbahçe, 2000-2400m, 20.VII.2001, 1♂, leg. EY, det. HÖ; Güzelova, 2200m, 12.VIII.1992, 1♀, EY, det. GvdZ; Palandöken, 28.VII.1992, 1♀, leg. EY, det. GvdZ; Pasinler, Rabat, 2400m, 11.VII.1996, 1♀2♂, leg. EY, det. HÖ and GvdZ.

Remark: Bilecik is the westernmost distribution record of this species.

Plant association: Possibly mesolectic on *Allium* (Alliaceae) and Fabaceae (Müller, 2013).

88. *Hoplitis (Pentadentoscia) laevifrons*
(Morawitz, 1872)

Distribution-Europe: A, ARM, BG, CZ, H, I, MK, RUS, SK, SCG, SLO. **N. Asia:** Turkestan. **SW. Asia:** PAK, TR. **Extralimital:** Oriental (India). **Asiatic-European chorotype.**

Previous records: Ankara (Stanek, 1969), Erzurum (Özbek, 1979b; Konya, Nevşehir, Şanlıurfa (Zanden, 1980), Bolu, Erzurum, Karaman (Özbek and Zanden, 1992a).

Material: Erzurum: Palandöken, 2200m, 07.VI.1996, 1♂, leg. EY, det. AM; Köprüköy, Çobandede, 04.VII.2004, 1♂, leg. JSA, HÖ, JGR, det. AM (ANHM).

89. *Hoplitis (Pentadentoscia) ridibunda*
(Warncke, 1991)

Distribution: SW. Asia: TR. **Anatolian endemic!**

Previous records: Hatay (type locality), Elazığ, İçel (Warncke, 1991a).

Material: Erzurum: Kargapazarı Mt., 2300m, 15.VII.2002, 1♂, leg. HÖ, det. AM.

Remark: interestingly, altitudes in previously recorded localities are low, the specimen, which collected from Kargapazarı Mt, is very high. Moreover, with present data Erzurum is the eastern most distribution record of this species.

90. *Hoplitis (Pentadentoscia) tringa* (Warncke, 1991)

Distribution: S. Asia: IR, TR. **SW-Asiatic (Irano-Anatolian) chorotype.**

Previous records: Elazığ (type locality), Ankara, Karaman, Konya, Sivas (Warncke, 1991a).

Material: Diyarbakır: Dicle Üniv., Kampus, 700m, 01.VI.2002, 1♂, leg. HÖ, det. AM.

Plant association: Hedysareae (Fabaceae) (Müller, 2013).

91. *Hoplitis (Pentadentosmia) pomarina* (Warncke, 1991)

Distribution: Europe: GR, MK. SW. Asia: IR, TR. East-Mediterranean.

Previous records: Van (type locality), Ağrı, Hakkari, İçel, Kars, (Warncke, 1991a).

Plant association: *Centaurea solstitialis*, probably oligolectic on Carduoideae (Asteraceae) (Müller, 2013).

92. *Hoplitis (Pentadentosmia) rufopicta* (Morawitz, 1875)

Synonym: *Osmia laeviscutum* Alfken, 1935

Distribution: N. Asia: TJ, TM, UZ. SW. Asia: IL, IR, JOR, PAK, TR. Turano-Anatolian.

Previous records: Elazığ, Erzurum, Konya, Mersin, Nevşehir, Şanlıurfa (Özbek and Zanden, 1992a) as *Hoplitis (Tridentosmia) laeviscutum* (Alfken).

Plant association: probably oligolectic on Carduoideae (Asteraceae) (Müller, 2013) *Horaninowia ulicina*, *Tamarix* (Popov, 1967).

93. *Hoplitis (Platosmia) alchata* (Warncke, 1990)

Distribution: SW. Asia: TR. Anatolian endemic!

Previous records: Şanlıurfa (type locality).

94. *Hoplitis (Platosmia) recticauda* (Stanek, 1969)

Distribution: SW. Asia: TR. Anatolian endemic!

Previous records: İçel (type locality), Erzurum (Özbek, 1979b); Antalya, Erzurum, Hakkari (Warncke, 1990).

Material: **Bayburt:** Merkez, 13.VI.1992, 1♂, leg. H. Bostan, det. GvdZ; Demirözü, 15.VIII.1991, 1♀ (*O.viciifolia*), leg. H. Bostan, det. GvdZ. **Erzincan:** Bahçe Kültürleri Araştırma Merkezi, 02.VII.1993, 1♀, leg. EY, det. GvdZ. Erzurum: Abdurrahman Gazi, 14.VII.1996, 1♂, leg. E. Yanık, det. GvdZ; Aşkale, 14.VI.1995, 1♂, leg. GT, det. T. Grisworld; Olur, Süngübayır, 23.VII.1991, 1♂, leg. EY, det. GvdZ. **Tokat:** Merkez, 19.VIII.1992, 1♀, leg. EY, det. GvdZ.

Plant association: *Onobrychis viciifolia*.

95. *Hoplitis (Stenosmia) kotschisa* (Warncke, 1991)

Distribution: SW.: TR. Anatolian endemic!

Previous records: Ankara (type locality) (Warncke, 1991b).

Plant association: unknown.

Discussion

In the present paper 103 species and 2 subspecies in the genera *Heriades* (6), *Stenoheriades* (1), *Hofferia* (1), *Hoplitis* (95) of the tribe Osmiini were recognized occurring in Turkey. Among these

species, *Hoplitis (Anthocopa) saxialis* is new for Turkey as well the Asian Continent. *Hoplitis (Hoplitis) manicata*, *H. (H.) pici* and *H. (Micreriades) mazzucchi* are new for the eastern Anatolia Region. Erzurum is the easternmost distribution records of the first two species for that of *H. mazzucchi* Bitlis is the easternmost distribution record. Out of 100 species 45 species have type localities from Turkey, of which, 18 species (*Hoplitis*) are known only from Turkey.

From a zoo-geographical stand point, out of 103 species and 2 subspecies have been recorded from Turkey, of which, about 60% live in Europe and Anatolia, that of about 40% are Asian species and Anatolia is the westernmost distribution records of these species. Moreover, 13 species live three of the continents, Europe, Asia and Africa, especially in the North Africa. These species refer to West-Palaearctic chorotype, which is one of the most important chorotype, species widespread from Europe to the Ural Mountains and SW Asia, south to N. Africa west to Macaronesia. All of these species are abundant and have wide distribution ranges in Turkey too. There are certain species, such as *Hoplitis campanularis*, *H. bisulca* and *H. tigrina* that occur in three of the continents but they are concentrated in the Mediterranean basin. Therefore, these species could be treated in the Mediterranean chorotype; Hakkari is the easternmost distribution records of *H. campanularis*, Kars for the *H. bisulca*. *Hoplitis tigrina* has limited distribution range both in Turkey and abroad and Van is the easternmost distribution record of this species. These species could be treated in Anatolo-Balkano-N-African detailed distribution pattern of Mediterranean main chorotype. East-Mediterranean chorotype includes species occurring in the eastern countries of the Mediterranean basin, east of the Italian Peninsula and the Gulf of Sirte, east to the Black Sea. Some extensions occur east of Iran and the Middle East, south-west of the Sahara. There are more than 20 species in this chorotype, most species have wide distribution, although certain species are very rare: *Hofferia schmiedeknechti* has been recorded from Antalya, *Heriades punctuliferus* from Adana and Antalya, *Hoplitis bispinosa* from Hakkari, *H. stellaris* from Van and Denizli, *H. obtuse* from Antalya and Muğla. *Hoplitis ciliaris* is moderately distributed and **Hakkari is the easternmost distribution record of this species.** *Hoplitis pici* is new for the eastern Anatolia and it is moderately distributed both in Turkey and outside of Turkey. Erzurum is the easternmost distribution record for *H.pici* and *H. fasciculata*. Additionally, there are certain species, such as *Stenoheriades hofferi*, *Hoplitis strymonia* (both known only from Bulgaria and Turkey), *H. galbula*, *H. garzetta*, *H. idaensis* (all

the three species known only from Greece and Turkey) could be included in the Aegean sub-chorotype, which is one of the detail distribution patterns of the main chorotype of E-Mediterranean. All of the above mentioned species are rare in Turkey. Although *H. mazzucchi* occurs in various countries in the vicinities of Aegean and Black Sea it also could be included in the Aegean sub-chorotype. It was recorded from the Bitlis and Erzurum provinces, it is new for the eastern Anatolia and Bitlis is the easternmost distribution record for this species. The newly described species (Müller, 2012), *H. caucasicola* was recorded from Artvin, *H. monticola* from Antalya, *H. nicolaei* from Hakkari, Mardin and Siirt, and *H. serinae* from Antalya, Gaziantep, Hakkari, Kütahya, Nevşehir and Siirt provinces. Asiatic-European chorotype is one of the important chorotype, which has species widespread through the Eurasian, south to the Himalayan chain. Ten species could be included in this chorotype. Of these, *Hoplitis lysholmi*, *H. fulva*, and *H. laevifrons* are widespread species both in Turkey and abroad; those of *H. claviventris* and *H. papaveris* have large distribution ranges in Europe, but in the SW-Asiatic countries, they were recorded from only Turkey and the first species is moderately widespread that of the second one is rare in Turkey. Turano-European chorotype species widespread in Europe, mainly in southern and western countries, middle East, Anatolia, Caucasus, Iran, and W Turkestan. Four species could be included in this chorotype: although *Heriades clavicornis* is wide spread, *Hoplitis mocsaryi*, *H. agis* and *H. curvipes* are rare species and the type locality of *H. agis* is Turkey. Anatolo-Caucasian Subchorotype, which is one of the detail distribution patterns of the main chorotype of **Southwest-Asiatic chorotype**. *Hoplitis bicallosa*, *H. brevispina*, *H. linguaria*, *H. caucasica*, *H. ozbeki*, and *H. verruciventris* are included in this chorotype. They all have narrow distribution ranges both in Turkey and abroad.

The Asian species could be included mainly in the **Southwest-Asiatic chorotype** includes species that are widespread in the Middle East countries. This pattern includes the areas from eastern Mediterranean coastal regions east to the Sind, through the Arabian Peninsula, Mesopotamia and Iran north of Caucasus and SW Turkmenistan (both included). In this main chorotype approximately 25 species were listed. Among them *H. tringa*, *H. illustris*, and *H. parasitica* are known from only Anatolia and Iran they could be included in the Irano-Anatolian subchorotype. *Hoplitis tringa* is moderately distributed in Anatolia, *H. illustris* occurs in Hakkari and Nevşehir, *H. parasitica* known from only Hakkari (type locality). *Hoplitis eremophila* and *H. urfensis* are included in the Syro-Anatolian

subchorotype, *H. urfensis* known from only type locality, Şanlıurfa. Three species, *H. mutica*, *H. wadicola*, and *H. monstrabilis* are included in the Mesopotamian sub-chorotype. Although *H. mutica* is a wide-distributed species *H. wadicola* recorded in Ankara that of *H. monstrabilis* known only from type locality, Erzurum. Seven provinces have been added to the distribution of *H. anipuncta* and Isparta is the westernmost distribution record of this species. After type locality (Şanlıurfa) of *H. gallinula* samples have been collected from Bilecik and Erzurum, Bilecik is the westernmost distribution record of it. The Turano-Anatolian is the other chorotype that includes species in Anatolia and other Asian countries. The species (4 species) in this chorotype, in general, are rare in Anatolia: *Heriades hissaricus* is known from only Şanlıurfa, *Hoplitis acanthophora* occurs only in Turkey and Tajikistan, it has been recorded from Hakkari and Malatya provinces so far and Malatya is the westernmost distribution record of this species. Although *H. picicornis* occurs various countries in North and SW Asia it has been recorded only from Erzincan so far. *Hoplitis duckeana* and *H. rufopicta* are widespread in their distribution ranges, moderately distributed in Turkey; Konya is the westernmost distribution records of these two species. Among the species in the **Southwest-Asiatic chorotype** 18 species have been known only from Anatolia. Of course, it is difficult at present to correctly evaluate the distribution of the species to date considered as endemic without a better knowledge of the fauna of adjacent areas, as such the Caucasus and the Middle East. However, with the present data, 18 species and subspecies could be accepted or at least have high potential of being Anatolian endemics, thus conforming Anatolia as being an important centre of speciation and endemic species.

I purposed two new chorotypes: the first is the **“Euro-Anatolian”** species occurring in European countries and Anatolia. *Hoplitis dalmatica* and *H. saxialis* could be included in this chorotype. Both of these species are recorded from Erzurum, they are rare and Erzurum is the easternmost distribution records of them. The second chorotype, the **“Anatolo-Armanian”**, species occurring in Turkey and Armenia; *H. antennata* and *H. lapidaria* could be included in this chorotype. Both are rare species; *H. antennata* was recorded from Kars, *H. lapidaria* from İçel and Nevşehir.

In general, when we take a look at the main chorological patterns represented in the Osmani fauna of Turkey, most of the species occurring in Turkey are associated with the Mediterranean, particularly the East Mediterranean basin, including the Middle East. The East Mediterranean is a vast, biologically rich region, comprising Mediterranean

ecosystems, arid and semi-arid coastal and inland ecotones and landscapes of faunistic and floristic richness set in a geographical diverse mosaic. Topography is varied, with many mountainous regions but also low lying plains and coastal strips. The Middle East also has a great biodiversity of bees that are associated with the diverse flora, topographical irregularity and the xeric landscapes. All these features could explain evidently the high diversity of plants and animals as well Osmiini bees in Turkey. On the whole, the Anatolian Peninsula shows its nature of crossroads of different faunistic stocks, as highlighted by its Osmiini fauna too. In spite of the above mentioned data, I have to admit that, unfortunately, the taxonomy and fauna of the Turkish Osmiini is in a rather poor state. There are certain species of which only one sex is currently known (e.g. *Heriades hissaricu*, *Stenoheriades hofferi*, *Hoplitis decaocta*, *H. galbula*, *H. stellaris*, *H. xanthoprymna*, *H. yermasoyiae asiae*, *H. bombiformis*, *H. strymonia*, *H. antalyae*, *H. haemi*) as well as certain species with descriptions based solely on a single specimen. On the other hand, as Müller (2013) indicated, in fact, several tentatively accepted osmiine bee taxa have proved to be synonyms during the last few years and it is to be expected that further synonymisations will follow once more specimens become available for study. Additionally, because of the threat of terrorism very few field trips were conducted in South-eastern Anatolia. Of course, other parts of the country should be searched more intensively in right time of the season. Naturally, as a result of the intensive studies throughout the country, number of the species occurring in Turkey will be more than present records. However, we have to keep in mind that the loss of habitat due to destruction or external disturbance has been recognized as a worldwide problem, but in Turkey, the loss or degrade of habitats of great natural value is currently proceeding at an alarming rate. Because of these the number of both species and individual bees is declining. If rational decisions on the maintenance of biodiversity are not soon made, there will be no way out of the biodiversity crisis that has already become a threat. Preservation of a species habitat but not protection of the individual species is the only way to preserve the natural richness of Turkey. So measures must be taken to educate the people, since sadly the majorities of the Turkish people are not aware of the destruction that goes on. I am afraid some of the bee species are at the edge of extinction.

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