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New knowledge about Megachilidae and Halictidae (Hymenoptera: Apoidea) fauna from Diyarbakır and Bingöl provinces

Diyarbakır ve Bingöl illerinden Megachilidae ve Halictidae (Hymenoptera: Apoidea) faunası hakkında yeni bilgiler

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ABSTRACT

The data about the bee fauna of Diyarbakır and Bingöl provinces of eastern Türkiye is quite limited. This study was conducted between 2016 and 2017 to determine Megachilidae and Halictidae (Hymenoptera: Apoidea) bee diversity of these two provinces. Adult samples were collected by atrap and killed with ethyl acetate. As a result of the evaluation of the collected bee samples, a total of 28 species (17 species from Megachilidae family and 11 species from Halictidae family) were identified from these provinces. Four species of them are known as cleptoparasites. In terms of the plant-bee relationship, eighteen of the species identified are polylectic, while five are oligolectic. Collection localities of all identified species were provided. With the current study, the number of known species belonging to the Megachilidae and Halictidae fauna of both provinces increased from 45 to 65.

INTRODUCTION

Megachilidae (Hymenoptera: Apoidea) family, represented by over 4000 species in the world, is one of the richest long-tongued bee groups (Michener 2007). Unlike other bee groups, pollen collection is carried out by female individuals with dense hairs on the ventral metasoma called scopa. Some *Megachile* and *Osmia* species are used as commercial pollinators in agricultural areas for the second half of the 20th century (Delaplane and Mayer 2000, Maeta and Kitamura

1964, 1965, 1974). Although more than 450 Megachilidae species were recorded in Türkiye (Güler and Çağatay 2006), it is known that only 29 of these species are distributed in Diyarbakır province and 15 of them are in Bingöl province (Kaplan 2022a, 2022b, Özbek and Zanden 1994, Özbek 2013a, 2013b, Warncke 1991).

Halictidae is one of the most diverse families throughout the Apoidea superfamily and it is represented by nearly 70

genera and more than 4000 species worldwide. Besides, members of this family are widely distributed in all around the world (Michener 2007, Packer 2023, Pesenko et al. 2000, Pesenko 2007). In Türkiye, *Halictus* spp. and *Lasioglossum* spp. are the richest genera among other members with consisting nearly 200 species (Dikmen 2018). As a result of their high abundance in nature, they can be considered as an indispensable pollinator group for ecosystems (Dikmen 2007). Despite their abundance and diversity in Türkiye, only a few records had been published about the bee fauna of Bingöl and Diyarbakır so far (Dikmen and Aytakin 2011). While Warncke (1975, 1984) had reported only seven species from these provinces, Kaplan (2022a) reported 17 species so far.

Diyarbakır and Bingöl provinces are two neighbouring cities in the east of Türkiye. Diyarbakır has a hot and dry climate with abundant agricultural land and fewer forest areas, whereas Bingöl province has a cold and rainy climate, minimal agricultural land, and extensive forest and pasture areas.

This is a faunistic study on the Megachilidae and Halictidae fauna of Bingöl and Diyarbakır provinces of eastern Türkiye with data about general and local distribution with new location for the recorded species.

MATERIALS AND METHODS

Bee samples were collected by insect net (atrap) with weekly sampling during March-September at various localities in Bingöl and Diyarbakır provinces located in eastern of Türkiye between 2016 and 2017 (Figure 1). After sampling bees were killed using ethyl acetate and then pinned in the laboratory. Meanwhile, all samples were collected by Emin Kaplan, and identified by Yasemin Güler and Fatih Dikmen.

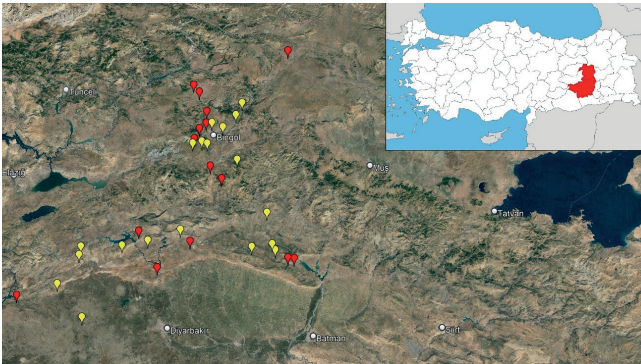


Figure 1. Sampling locations of the study, the map on the top displays the location of Bingöl and Diyarbakır provinces of Türkiye and the pinpoints displays the localities that Megachilidae (yellow) and Halictidae (red) members had been caught

Terminology follows Michener (2007). The materials are deposited in Emin Kaplan's individual collection of the Department of Plant Protection, Faculty of Agriculture, Bingöl University (Bingöl, Türkiye) and The Nazife Tuatay Plant Protection Museum of the Plant Protection Central Research Institute, Ankara (Türkiye).

The identification of the species was made according to Warncke (1988, 1991, 1992), Zanden (1992), Banaszak and Romasenko (1998), Michener (2007), Amiet et al. (2004), Scheuchl (2006), and Bogusch (2023) for Megachilidae, and Pesenko (1978, 1984, 1985, 1986), Pesenko et al. (2000), Amiet et al. (2001), and Dikmen (2012) for Halictidae.

RESULTS

A total 34 Halictidae and Megachilidae specimens from 34 locations were collected with two years of sampling. The results of identification of these samples at the species level were given below.

Family Megachilidae

Subfamily Megachilinae

Tribe Dioxyini

Genus *Ensliniana* Alfken, 1938

Ensliniana bidentata (Friese, 1899)

Material examined: Diyarbakır: Ergani, Sallar, 38° 16' 01.70" N, 39° 38' 59.32" E, 962 m, 11.05.2017, ♀.

Previous records: Nevşehir (Heinrich 1977), Konya, Ağrı, Erzurum as *Dioxys bidentata anatolica* Heinrich, 1977 (Özbek and Zanden 1993).

General distribution: Algeria, Israel, Jordan, Morocco, Portugal, Spain, Syria, Tunisia, Türkiye (Bogusch 2023).

Tribe Megachilini

Genus *Coelioxys* Latreille, 1809

Subgenus *Allocoelioxys* Tkalcu, 1974

Coelioxys (Allocoelioxys) afra Lepelletier 1841

Material examined: Bingöl: Altınışık, 38° 49' 29.77" N, 40° 26' 59.07" E, 1605 m, 20.07.2017, ♀.

Previous records: Erzincan, Erzurum, İzmir (Özbek 1979a, Özbek and Zanden 1994), Ankara, Antalya, Bitlis, Bursa, Eskişehir, Hakkâri, Kars, Konya, Kütahya, Nevşehir, Niğde, Van (Warncke 1992), Bilecik (Özbek and Schwarz 2016).

General distribution: South, Eastern and Central Europe, Great Britain, Caucasus, Asia Minor, Central Asian part of the former USSR, North Africa (Banaszak and Romasenko 1998).

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

Material examined: Bingöl: Çiçekyayla, 38° 49' 22.64" N, 40° 28' 22.17" E, 1442, 20.07.2017, ♀.

Previous records: Erzurum (Özbek 1979a), Adana, Ankara, Bayburt, Çankırı, Erzincan, Erzurum, Hakkâri, Kars, Konya, Kütahya, Manisa, Nevşehir, Niğde, Siirt, Sivas, Van (Warncke 1992), Erzincan, Erzurum, Şanlıurfa (Özbek and Zanden 1994).

General distribution: South, Eastern and Central Europe, Caucasus, Algeria (Banaszak and Romasenko 1998).

Genus *Megachile* Latreille, 1802

Subgenus *Creightonella* Cockerell, 1908

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

Material examined: Bingöl: Yenibaşlar, 39° 58' 46.96" N, 40° 41' 05.14" E, 1142 m, 7.08.2016, ♀.

Previous records: Antalya, Aydın, Bitlis, Erzincan, Erzurum, Hakkari, İçel, İzmir, Iğdır, Konya, Muş, Sinop (Özbek 1979b, Özbek and Zanden 1994), Ankara, Eskişehir (Güler and Çağatay 2006).

General distribution: South, Eastern and Central Europe, Caucasus, Central Asian part of the former USSR, North Africa (Banaszak and Romasenko 1998).

Subgenus *Megachile* Latreille, 1802

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

Material examined: Bingöl: Balpınar, 38° 50' 06.26" N, 40° 24' 18.26" E, 1829 m, 20.07.2017, ♀.

Previous records: All of Türkiye (Özbek and Zanden 1994), Ankara, Eskişehir, Sivas (Güler and Çağatay 2006).

General distribution: South, Eastern and Central Europe, Caucasus, Central Asian part of the former USSR, North Africa, Canada (Banaszak and Romasenko 1998).

***Megachile (Megachile) deceptoris* Pérez, 1890**

Material examined: Bingöl: Çeltiksuyu, 38° 52' 13.72" N, 40° 34' 06.19" E, 1019 m, 20.07.2017, ♀.

Previous records: Balıkesir (Özbek and Zanden 1994), Ankara, Çankırı, Eskişehir, Kayseri (Güler and Çağatay 2006).

General distribution: South, Eastern and Central Europe, Turkmenistan, West Kazakhstan (Banaszak and Romasenko 1998).

Tribe Osmiini

Genus *Chelostoma* Latreille, 1809

Subgenus *Chelostoma* Latreille, 1809

***Chelostoma (Chelostoma) mocsaryi* Schletterer, 1889**

Material examined: Diyarbakır: Dicle, Bozbaba, 38° 20' 28.52" N, 40° 05' 32.33" E, 834 m, 11.05.2017, ♀; Hazro, Ormankaya, 38° 17' 59.97" N, 40° 46' 48.65" E, 952 m, 14.05.2017, ♀.

Previous records: Adana, Ankara, Aydın, Amasya, Antalya, Artvin, Bursa, Erzincan, Erzurum, Hakkari, Hatay, Kayseri, Konya, Nevşehir, Mersin, Osmaniye, Şırnak, Van (Özbek 2011).

General distribution: South, Eastern and Central Europe, Caucasus, Asia Minor (Banaszak and Romasenko 1998).

Genus *Heriades* Spinola, 1808

Subgenus *Heriades* Spinola, 1808

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

Material examined: Bingöl: Yenibaşlar, 39° 58' 46.96" N, 40° 41' 05.14" E, 1142 m, 7.08.2016, ♀.

Previous records: Antalya (Özbek 2013a), Bursa, Erzurum, Iğdır, İstanbul (Özbek and Zanden 1992b).

General distribution: Europe, Caucasus, Asia Minor, Central Asian part of the former USSR, North Africa (Banaszak and Romasenko 1998).

Genus *Hoplitis* Klug, 1807

Subgenus *Hoplitis* Klug, 1807

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

Material examined: Bingöl: Çayboyu, 38° 54' 45.97" N 40° 28' 47.88" E, 1111 m, 7.05.2016, ♀.

Previous records: Amasya (Zanden 1980), Isparta (Özbek and Zanden 1992a), Ankara (Güler and Çağatay 2006), Afyonkarahisar (Güler 2011), Erzincan, Erzurum (Özbek 2013a).

General distribution: Austria, Albania, Algeria, Armenia, Azerbaijan, Bulgaria, Czechia, Corsica, Greece, Hungary, Croatia, Italy, Macedonia, Romania, Southern European Russia, Serbia and Montenegro, Slovakia, Türkiye, Ukraine (Crimea) (Müller 2022).

Subgenus *Alcidamea* Cresson, 1864

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

Material examined: Diyarbakır: Ergani, Bademli, 38° 17' 28.88" N, 39° 55' 57.66" E, 957 m, 12.05.2017, ♀.

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

General distribution: Algeria, Austria, Caucasus, Croatia, Egypt, France, France (Corsica), Greece, Hungary, Iraq, Iran, Italy, Jordan, Kazakhstan, Kyrgyzstan, Lebanon, Morocco, Portugal, Romania, Serbia and Montenegro, Slovakia, Slovenia, Spain, Southern European Russia, Switzerland, Syria, Tajikistan, Tunisia, Türkiye, Ukraine, Uzbekistan (Müller 2022).

Subgenus *Anthocopa* Lepeletier and Serville, 1825

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

Material examined: Diyarbakır: Ergani, Yapraklı, 38° 16' 32.57" N, 39° 38' 39.00" E, 977 m, 11.05.2017, ♀.

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

General distribution: Austria, Albania, Belgium, Bulgaria, Caucasus, China, Czechia, France, Germany, Greece, Hungary, Italy, Kazakhstan, Netherlands, Portugal, Romania, Russia, Slovakia, Spain, Switzerland, Türkiye, Ukraine (Müller 2022).

Genus *Osmia* Panzer, 1806

Subgenus *Allosmia* Tkalcu, 1974

***Osmia (Allosmia) rufohirta* Latreille, 1811**

Material examined: Diyarbakır: Hazro, Mutluca, 38° 16' 44.84" N, 40° 53' 50.71" E, 1017 m, 13.05.2017, ♀.

Previous records: Ankara (Alfken, 1935), Antalya, Aydın, Denizli, Karaman (Özbek and Zanden 1992a), Adana, Diyarbakır, Erzincan, Erzurum, Hatay, İzmir (Özbek 2013b).

General distribution: Albania, Austria, Armenia, Azerbaijan, Belarus, Belgium, Bulgaria, Croatia, Czechia, France, France (Corsica), Georgia, Germany, Greece, Hungary, Israel and Palestine, Iran, Italy, Jordan, Kazakhstan, Lebanon, Liechtenstein, Luxembourg, Malta, Macedonia, Morocco, North-western China, Portugal, Romania, Southern European Russia, Serbia and Montenegro, Slovakia, Slovenia, Spain, Switzerland, Syria, Türkiye, Ukraine (Müller 2022).

Subgenus *Helicosmia* Thomson, 1872

***Osmia (Helicosmia) aurulenta* (Panzer, 1799)**

Material examined: Diyarbakır: Kulp, Zeyrek, 38° 28' 01.59" N, 40° 51' 22.28" E, 872 m, 28.05.2016, ♀.

Previous records: Eskişehir, Hatay (Fahringer and Friese 1921), Erzurum, Tunceli (Özbek 1979b), Ağrı, Ankara, Bitlis, Hakkari, Karaman, Konya, Nevşehir, Siirt (Warncke 1988), Artvin, Erzincan, Mersin (Özbek and Zanden 1992a), Kayseri (Güler and Çağatay 2006), Bayburt, Bilecik, Burdur, Tokat (Özbek 2013b).

General distribution: Albania, Austria, Andorra, Armenia, Azerbaijan, Belgium, Bulgaria, Bosnia and Herzegovina, Belarus, Croatia, Czechia, Denmark, France, France (Corsica), Germany, Georgia, Greece, Hungary, Iran, Ireland, Italy, Lebanon, Liechtenstein, Lithuania, Luxembourg, Macedonia, Malta, Moldova, Netherlands, Norway, Poland, Portugal, Romania, Russia, Serbia and Montenegro, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye, Ukraine, United Kingdom (Müller 2022).

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

Material examined: Diyarbakır: Ergani, Akçoban, 37° 56' 56.21" N, 39° 41' 19.67" E, 970 m, 27.04.2017, ♂.

Previous records: Amasya, İstanbul, Osmaniye (Fahringer 1922), Kahramanmaraş (Fahringer and Friese 1921), Erzurum, Kars, Iğdır (Özbek 1979b), Adana, Ankara, Antalya, Bilecik, Hakkari, Mersin, Karaman, Kars, Konya, Sivas (Warncke, 1988); Aydın, Bursa, Erzincan, Sinop (Özbek and Zanden 1992a), Afyonkarahisar (Güler 2011), Artvin, Eskişehir, Yalova (Özbek 2013b).

General distribution: Albania, Algeria, Austria, Andorra, Armenia, Azerbaijan, Belgium, Bulgaria, Bosnia and Herzegovina, Belarus, Canada, China, Croatia, Cyprus, Czechia, Denmark, Egypt, Estonia, France, France (Corsica), Finland, Germany, Georgia, Greece, Hungary, India, Iran, Israel and Palestine, Italy, Jordan, Kazakhstan, Kyrgyzstan, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Macedonia, Malta, Moldova, Morocco, Netherlands, Norway, Pakistan, Poland, Portugal, Romania, Russia, Serbia and Montenegro, Slovakia, Slovenia, Spain, Sweden, Switzerland, Syria, Tajikistan, Tunisia, Turkmenistan, Türkiye, Ukraine, United Kingdom, USA, Uzbekistan (Müller 2022).

Subgenus *Metallinella* Tkalcu, 1966

***Osmia (Metallinella) brevicornis leucogastra* Morawitz, 1875**

Material examined: Diyarbakır: Çermik, Başarı Bucağı, 38° 06' 03.95" N, 39° 31' 16.19" E, 940 m, 27.04.2017, ♂.

Previous records: Antalya, Artvin, Diyarbakır, Erzurum, Tokat (Özbek 2013b).

General distribution: Afghanistan, Armenia, Azerbaijan, Bulgaria, Caucasus, Cyprus, Georgia, Greece, Iran, Iraq, Kazakhstan, Kyrgyzstan, Macedonia, Southern European Russia, Tajikistan, Turkmenistan, Türkiye, Ukraine (Crimea), Uzbekistan (Müller 2022).

Subgenus *Pyrosmia* Tkalcu, 1975

***Osmia (Pyrosmia) cephalotes longiceps* Morawitz, 1875**

Material examined: Diyarbakır: Silvan, Dolapdere, 38° 18' 51.84" N, 40° 53' 45.96" E, 956 m, 13.05.2017, ♂.

Previous records: Mersin (Zanden 1991), Adana, Antalya, Hakkari, Hatay, Mersin, İzmir, Kayseri, Mardin, Muğla, Nevşehir, Siirt, Şanlıurfa, Van (Warncke 1992), Diyarbakır, Isparta (Özbek and Zanden 1992a), Artvin, Bingöl, Erzurum (Özbek 2013b).

General distribution: Armenia, Azerbaijan, Bosnia and Herzegovina, Croatia, Cyprus, Georgia, Greece, Hungary, Iran, Israel and Palestine, Italy, Jordan, Lebanon, Romania, Serbia and Montenegro, Slovenia, Southern European Russia, Syria, Turkmenistan, Türkiye, Ukraine (Müller 2022).

Osmia (Pyrosmia) gallarum Spinola, 1808

Material examined: Diyarbakır: Hani, Süslü, 38° 23' 27.97" N, 40° 19' 13.30" E, 1072 m, 12.05.2017, ♀.

Previous records: Muş (Özbek 1979b), Ankara, Antalya, Aydın, Eskişehir, Gümüşhane, Hakkari, Kars, İstanbul, Mersin, İzmir, Konya, Muğla, Nevşehir, Niğde, Siirt, Şanlıurfa, (Warncke 1992), Artvin, Bilecik, Erzincan, Erzurum, Isparta (Özbek 2013b).

General distribution: Albania, Algeria, Austria, Bulgaria, Croatia, Czechia, Germany, France, Greece, Hungary, Italy, Luxembourg, Macedonia, Morocco, Poland, Portugal, Romania, Serbia and Montenegro, Slovakia, Slovenia, Spain, Switzerland, Tunisia, Türkiye, Ukraine (Müller 2022).

Family Halictidae Thomson, 1869

Subfamily Nomioidinae

Tribe Nomioidini

Genus *Ceylalictus* Strand, 1913

***Ceylalictus variegatus* (Olivier, 1789)**

Material examined: Diyarbakır: Hani, Çardaklı, 38° 18' 56.31" N, 40° 24' 06.29" E, 1057 m, 12.05.2017, ♀; Silvan, Babakaya, 38° 15' 09.18" N, 41° 01' 25.08" E, 777 m, 12.05.2017, ♀.

Previous records: Erzurum (Özbek 1979c); Antalya, Mersin, Kahramanmaraş (Dikmen 2012)

General distribution: Common in the Western Palaearctic (Pesenko et al. 2000), Iran, Israel, Cyprus, Egypt, Libya, Türkiye, Greece (Grace 2010).

Subfamily Nomiinae

Tribe Nomiini

Genus *Nomiapis* Cockerell, 1919

***Nomiapis diversipes* (Latreille, 1806)**

Material examined: Diyarbakır: Çüngüş, Şeyhandede, 38° 01' 31.26" N, 39° 16' 39.54" E, 740 m, 28.04.2017, ♀.

Previous records: Erzurum (Özbek 1979c), Ankara (Dikmen ve Çağatay 2007), Afyon (Güler et al. 2011), Kahramanmaraş (Dikmen 2012).

General distribution: Western Palaearctic, From Spain to Kyrgyzstan (Pesenko et al. 2000).

Subfamily Halictinae

Tribe: Halictini

Genus *Evylaeus* Robertson, 1902

***Evylaeus marginatus* (Brulle, 1832)**

Material examined: Bingöl: Çiçekdere, 38° 56' 57.98" N, 40° 27' 04.84" E, 1379 m, 27.05.2017, ♀.

Previous records: Adapazarı, Ankara, Antalya, Balıkesir, Bilecik, Bursa, Erzincan, Erzurum, İstanbul, Karaman, Muğla, Nevşehir, Samsun, Sivas, Trabzon, Uşak (Warncke 1975), Afyon (Güler et al. 2011), Niğde, Mersin, Isparta, Burdur, Antalya (Dikmen 2012)

General distribution: Germany, Czech Republic, Morocco, France, Hungary, Spain, Switzerland, Italy, Poland, Russia, Slovakia, Slovenia, Greece, Eastern Palaearctic, (Polaszek 2004), Armenia, Israel, Pakistan, Nepal (Pauly 2007).

***Evylaeus laticeps* Schenck, 1868**

Material examined: Bingöl: Genç, Şehitköy, 38° 39' 48.18" N, 40° 29' 31.00" E, 1308 m, 26.05.2017, ♀.

Previous records: Amasya, Ankara, Ardahan, Bursa, Erzurum, İstanbul, Kırıkkale, Konya, Kütahya, Nevşehir, Sinop, Tekirdağ, Tunceli, Zonguldak, (Warncke 1975), Antalya, Denizli, Mersin (Dikmen 2012).

General distribution: Germany, Austria, Belgium, Czech Republic, France, England, Spain, Switzerland, Italy, Hungary, Macedonia, Poland, Russia, Slovakia, Slovenia, Greece (Polaszek 2004).

***Evylaeus politus* (Schenck, 1853)**

Material examined: Diyarbakır: Dicle, Yeşilsirt, 38° 20' 25.58" N, 40° 03' 30.70" E, 797 m, 12.05.2017, ♀.

Previous records: Antalya (Ascher and Pickering 2020), Afyon (Güler et al. 2011), Adana, Hatay, Mersin, Muğla, Niğde (Dikmen 2012).

General distribution: Germany, Austria, Belgium, Czech Republic, France, Spain, Switzerland, Italy, Hungary, Macedonia, Poland, Russia, Slovakia, Slovenia, Greece, North

Africa (Polaszek 2004), Iran, Israel, Egypt, Türkiye, Turkestan (Pauly 2007).

Genus *Halictus* Latreille, 1804

***Halictus resurgens* Nurse, 1903**

Material examined: Bingöl: Kurudere, 38° 54' 41.84" N, 40° 27' 24.10" E, 1127 m, 13.07.2016, ♂; Genç, Yaylabağı, 38° 37' 45.24" N, 40° 30' 45.83" E, 1248 m, 21.07.2017, ♀; Sancak, Sudüğünü, 39° 03' 32.78" N, 40° 24' 11.34" E, 1582 m, 5.08.2016, ♂.

Previous records: Adana, Adıyaman, Ankara, Antalya, Balıkesir, Bilecik, Gaziantep, Hakkari, Hatay, İstanbul, Konya, Mardin, Siirt, Şırnak, Şanlıurfa, Van (Dikmen and Aytekin 2011), Afyon, Burdur, Hatay, Denizli (Dikmen 2012).

General distribution: Northeastern Africa to Central Asia (Polaszek 2004).

***Halictus saji* Blüthgen, 1923**

Material examined: Bingöl: Karlıova, Toklular, 39° 16' 10.81" N, 40° 59' 88.91" E, 1804 m, 12.07.2016, ♀.

Previous records: Adana, Ağrı, Ankara, Ardahan, Erzurum, Konya, Giresun (Warncke 1975), Erzurum (Özbek 1979c), Antalya, Hakkari, Şırnak, Van (Warncke 1984), Ankara (Dikmen and Çağatay 2007), Bitlis, Kars, Niğde, Erzincan (Dikmen and Aytekin 2011).

General distribution: Austria, Germany, Hungary, Italy, northwestern Russia, Slovenia, eastern Palaearctic (Polaszek 2004).

Genus *Lasioglossum* Curtis, 1833

***Lasioglossum quadrinotatum* (Kirby, 1802)**

Material examined: Bingöl: Balpınar, 38° 50' 05.26" N, 40° 24' 18.26" E, 1830 m, 27.05.2017, ♀; Diyarbakır: Lice, Gürbeyli, 38° 26' 54.31" N, 40° 42' 48.20" E, 854 m, 14.05.2017, ♀.

Previous records: Edirne, Erzurum (Warncke 1975), Afyon (Güler et al. 2011), Antalya, Muğla (Dikmen 2012).

General distribution: Common in the Western Palaearctic (Pesenko et al. 2000).

Genus *Seladonia* Robertson, 1918

***Seladonia seladonia* (Fabricius 1794)**

Material examined: Bingöl: Kurudere, 38° 54' 41.84" N, 40° 27' 24.10" E, 1127 m, 13.07.2016, 2♀.

Previous records: Adana, Karaman, Sivas, Erzurum (Warncke 1975), Ankara (Dikmen and Çağatay 2007), Afyon (Güler et al. 2011).

General distribution: Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Türkiye, France, Greece, Hungary, Italy, Macedonia, Poland, Portugal, Slovakia, Slovenia, Spain, Switzerland, Ukraine, East Palaearctic (Polaszek 2004).

***Seladonia smaragdula* (Vachal, 1895)**

Material examined: Diyarbakır: Eğil, Selmanköy, 38° 11' 45.04" N, 40° 08' 46.13" E, 809 m, 12.05.2017, ♀.

Previous records: Adana, Antalya, Bursa, İstanbul, Samsun (Warncke 1975), Erzurum (Özbek 1979c), Ankara, Hakkari (Warncke 1984), Afyon (Güler et al. 2011), Hatay, Isparta, Karaman, Kahramanmaraş, Mersin, Niğde (Dikmen 2012).

General distribution: Western Palaearctic (Pesenko et al. 2000), Eastern Palaearctic (Polaszek 2004).

Genus *Sphecodes* Latreille, 1804

***Sphecodes longulus* Hagens, 1882**

Material examined: Diyarbakır: Silvan, Ormandışı, 38° 14' 37.69" N, 41° 01' 16.34" E, 760 m, 12.05.2017, ♀.

Previous records: Adıyaman, Antalya, Aydın, Bursa, Erzurum, Hakkari, Kars, Konya, Şanlıurfa (Özbek et al. 2015).

General distribution: From Europe to Asia, it reaches through Russian Far East (Özbek et al. 2015).

DISCUSSION

As a result of the identification of the specimens collected during the two-year study, the presence of 17 Megachilidae and 11 Halictidae species was determined in the study area. All Megachilidae species except *Osmia brevicornis leucogastra*, *O. cephalotes longiceps* and *Osmia rufohirta* and all Halictidae species except *Ceylalictus variegatus*, *Halictus saji*, *Lasioglossum quadrinotatum*, *Seladonia seladonia* and *Sphecodes longulus* species are new records for the fauna of provinces (Diyarbakır or Bingöl) where they were collected.

Among Megachilidae species, three species were known as cleptoparasite: One of them, *Ensliniana bidentata* is cleptoparasite on *Hoplitis (Anthocopa) zaianorum* (Benoist, 1927) (Müller 2022). Two other species, *Coelioxys (Allocoelioxys) afra* Lepeletier and C. (*A.*) *brevis* Eversmann, are cleptoparasites on some species as *Megachile apicalis*, *M. leachella* and *M. pilidens* in the subgenus *Eutricharaea* (Megachilidae: Megachile) (Grace 2010). Although they were collected from many provinces of Türkiye, both were recorded from Bingöl province for the first time. Eight of other Megachilidae species (*Hoplitis papaveris*, *Megachile*

albisecta, *M. apicalis*, *M. deceptor*, *Osmia rufohirta*, *O. aurulenta*, *O. caerulescens* and *O. cephalotes longiceps*) are polylectic species, i.e. visiting more than one plant family (Banaszak and Romasenko 1998). *Osmia brevicornis leucogastra*, *Chelostoma mocsaryi*, *Heriades truncorum*, *Hoplitis manicata*, *H. praestans* and *Osmia gallarum* are among the oligolectic bees because they have a narrower flower preference (Müller 2022).

For the Halictidae members reported from this region, all members are known to be polylectic species (Dikmen 2012) except *Nomiapis diversipes*. Moreover, while the members of the genus *Seladonia* are known as social, all the other species are known as solitary or subsocial (Pesenko et al. 2000). Only the members of the genus *Sphecodes* are cleptoparasites within this group.

In both provinces, vegetation was shaped by different habitats such as steppe, bush, forest, rocky, water and meadow. To date, more than 1000 plant taxa were identified in the area, 10% of which are endemic (Anonymous 2021). Generally, due to co-evolution, bee diversity is expected to be high in parallel with plant diversity. However, the number of Megachilidae and Halictidae species recorded from the study area to date does not sufficiently demonstrate this potential. In the future, if field studies are carried out at regular intervals in both provinces, this number will increase to reveal actual fauna of the region.

Author's Contributions

Authors declare the contribution of the authors is equal.

Statement of Conflict of Interest

The authors have declared no conflict of interest.

ÖZET

Türkiye'nin doğusundaki Diyarbakır ve Bingöl illerinin arı faunası hakkındaki veriler oldukça sınırlıdır. Bu çalışma, iki ilin Megachilidae ve Halictidae (Hymenoptera: Apoidea) arı çeşitliliğini belirlemek amacıyla 2016-2017 yılları arasında yürütülmüştür. Ergin örnekler atrap yardımıyla toplanmış ve etil asetat yardımıyla öldürülmüştür. Toplanan arı örneklerinin değerlendirilmesi sonucunda, bu illerden toplam 28 tür (Megachilidae familyasından 17 tür ve Halictidae familyasından 11 tür) tespit edilmiştir. Bunlardan dört tür kleptoparazit olarak bilinmektedir. Bitki-arı ilişkisi açısından, tespit edilen türlerin 18'i polilektik, beşi ise oligolektiktir. Tanımlanan tüm türlerin toplama lokaliteleri de belirtilmiştir. Bu çalışma ile her iki ilin Megachilidae ve Halictidae faunasına ait bilinen tür sayısı 45'ten 65'e yükselmiştir.

Anahtar kelimeler: Hymenoptera, tozlayıcı, fauna, arı çeşitliliği, Diyarbakır, Bingöl

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