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The Wild Bee Fauna of Afyonkarahisar Province: Andrenidae, Anthophoridae and Megachilidae (Hymenoptera: Apoidea)

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A b s t r a c t : The study was conducted in 17 boroughs belonging to Afyonkarahisar province between 2006 and 2009. A total number of 568 bee samples were examined. 50 species belonging to Andrenidae (1), Anthophoridae (3) and Megachilidae (46) families were identified and nearly all of which were reported for the first time from Afyonkarahisar province. *Osmia (Melanosmia) nigriventris* (ZETTERSTEDT 1838) and *Icteranthidium croceum* (MORAWITZ 1878) from Megachilidae were also new records for the bee fauna of Turkey.

Key words : Apoidea, Bees, Fauna, New Records, Afyonkarahisar, Turkey.

Introduction

Bees (Anthophila) are member of the superfamily Apoidea which contains also Sphecoform wasps (ENGEL & GRIMALDI 2005). Apidae, Anthophoridae, Megachilidae, Colletidae, Andrenidae, Halictidae and Melittidae can be counted as the Palaearctic bee families (MICHENER 2000). Bees in general, have very important role in pollination of angiosperms and the greatest amount of commercial crops are pollinated by the help of them (DIAS et al. 1999; MICHENER 2000; ENGEL 2001). Megachilidae, Anthophoridae and *Bombus* LATREILLE species are being used in agriculture for their helps in pollination since the early 20th century (FREE 1993). MICHENER (2000) indicated that the total number of bee species in the world could have been 20.000. Moreover, by careful inspections this number would become higher as 30.000. According to current data, Megachilidae includes 3.150 species, *Andrena* 1112 species and *Xylocopa* 469 species in the world (MICHENER 2000). A total number of 1219 Megachilidae species are distributed in Palaearctic (BANASZAK & ROMASENKO 1998).

The faunistic studies on the pollinator bees of Turkey are limited. Because of that, there is no any updated checklist of the bee fauna of Turkey. Moreover, the distribution data of the currently known species are insufficient. The studies in connection with *Andrena* spp. were mostly carried out by WARNCKE (1965, 1969, 1974, 1975) and ÖZBEK (1976). Up to now, 317 species belonging to *Andrena* genus were determined in Turkish fauna (SCHEUCHL & GUSENLEITNER 2009). The most comprehensive studies on the fauna of Anthophoridae are ÖZBEK & BANASZAK (1985) and TERZO (1998). Several studies were carried out by ÖZBEK (1979a, 1979b), ÖZBEK & ZANDEN (1992a, 1992b, 1993, 1994,

1996), WARNCKE (1980, 1988a, 1988b, 1990, 1991a, 1991b, 1991c, 1991d, 1991e, 1992a, 1992b) and GÜLER & ÇAĞATAY (2006) reporting Megachilidae species in Turkish fauna. As a result of these studies, 461 Megachilidae species are recorded in the fauna of Turkey (GÜLER & ÇAĞATAY 2006).

Afyonkarahisar (also called simply Afyon) is a province in the western Turkey (37°45'N and 39°17'N; 29°40'E and 31°43'E). It is located in the meeting point of the Middle Anatolia, Aegean and Mediterranean regions of Turkey. Besides, it contains many different habitats such as high mountains, a natural park (Akdağ Natural Park), swamps and lakes. These features bring it a very diversified and rich flora. There are 1800 plant species and subspecies belonging to 110 families. Moreover, there are 234 endemic plants exist in Afyonkarahisar province. The majority of the plant taxa belong to Asteraceae (190), Fabaceae (147), Lamiaceae (109) and Brassicaceae (100) families (KARGIOĞLU 2001). Those plants are also the most favourable plants that visited by bees. The diversity in the flora might be a clue of the bee diversity of this region. However, there were not any studies to expose the bee fauna of Afyonkarahisar since ever. The main aim of this study is to expose the bee fauna of Afyonkarahisar.

Material and Methods

Field studies were performed in Afyonkarahisar province between 2006 and 2009, including 17 boroughs (Başmakçı, Bayat, Bolvadin, Çay, Çobanlar, Dazkırı, Dinar, Emirdağ, Hocalar, İhsaniye, İncehisar, Kızılören, Central, Sandıklı, Sinanpaşa, Sultandağı, Şuhut) and covered a total area of 14.570 km². All the specimens were caught on plants by sweep-net and aspirators while they were searching for nectar or pollen. The specimens were pinned and labeled according to current taxonomic rules and were examined with stereoscopic binocular microscope.

The identification of the species were made according to SCHEUCHL (2000) and TERZO et al. (2007) for Anthophoridae; OSYCHNYUK et al. (1978), WARNCKE (1980, 1992a), DORN & WEBER (1988), BANASZAK & ROMASENKO (1998), MICHENER (2000), AMIET et al. (2004) and SCHEUCHL (2006) for Megachilidae. The diagnosis of *Andrena flavipes* PANZER species was carried out by Dr. Tomozei (Museum of Natural Sciences "Ion Borcea" Bacău, Romania).

The systematical order, nomenclature and geographical distributions are reviewed according to ÖZBEK (1979b), WARNCKE (1965, 1969, 1980, 1982a, 1982b, 1988a, 1992a), ZANDEN (1986), COMBA & COMBA (1991), ÖZBEK & ZANDEN (1992a, 1992b, 1993, 1994, 1996), BANASZAK & ROMASENKO (1998), AMIET et al. (2004), GÜLER (2004), TOMOZEI (2003), BAN & TOMOZEI (2006), GÜLER & ÇAĞATAY (2006), SCHEDL (2007), ANLAŞ et al. (2009) and HAZIR et al. (2010).

All the collected specimens were deposited in the Plant Protection Museum of the Plant Protection Central Research Institute of Turkey, Ankara (Turkey).

The species are listed below in the alphabetical order within families and genera.

Abbreviation:

NP.....Natural Park

Results and Discussion

As a result of the taxonomic investigation of the collected specimens (N: 568), 17 genera and 50 species belonging to Andrenidae (1), Anthophoridae (3) and Megachilidae (46) families of Apoidea (Hymenoptera) were determined from Afyonkarahisar Province (Turkey). Except for *Anthidium* (s.str.) *diadema* LATREILLE 1809, all of the determined species in here were reported for the first time from this province. 26 of them were also reported for the first time from Aegean Region. *Osmia* (*Melanosmia*) *nigriventris* (ZETTERSTEDT 1838) and *Icteranthidium croceum* (MORAWITZ 1878) from Megachilidae were new records for the Turkish fauna.

Fam. Andrenidae

Subfam. Andreninae

Andrena (*Zonandrena*) *flavipes* PANZER 1799

Distribution: West Palaearctic (BAN & TOMOZEI 2006), Turkey: Kocaeli, Adana, Konya, Hatay, Adapazarı, Eskişehir, Nevşehir, Balıkesir, Tekirdağ (WARNCKE 1965), Çanakkale, İstanbul, Bilecik, Burdur, İzmir, Denizli, Bolu, Samsun (WARNCKE 1965), Erzurum, Iğdır, Tunceli, Elazığ (ÖZBEK 1976), Manisa (ANLAŞ et al.2009), Kırşehir (HAZIR et al. 2010), Afyonkarahisar, Ankara, Antalya, Aydın, Çankırı, Karaman, Kastamonu, Kayseri, Kütahya, Mersin and Muğla (E. Scheuchl, personal communication).

Material examined: Sandıklı, Akdağ NP, 1480m, 25.06.2007, 5 ♀ ♀; Sandıklı, Daylık, 985m, 26.06.2007, 1 ♀; Çobanlar, Central, 991m, 28.06.2007, 1 ♀; Emirdağ, Gömü, 955m, 24.07.2007, 18 ♀ ♀; Çay, Aydoğmuş, 1046m, 25.07.2007, 3 ♀ ♀; Dinar, Yapağılı, 844m, 26.07.2007, 1 ♀; Sandıklı, Gürsu, 1000m, 27.07.2007, 4 ♀ ♀; Bolvadin, Dişevler, 968m, 17.04.2008, 3 ♀ ♀; Şuhut, Demirbel, 1134m, 19.04.2008, 1 ♀ ♀; Şuhut, İsalı, 1078m, 13.05.2008, 1 ♀; Emirdağ, Davulga, 987m, 04.06.2008, 1 ♀; Dinar, Cumhuriyet, 1109m, 05.06.2008, 1 ♀; Çay, Karamık, 1018m, 16.06.2008, 1 ♀; Sandıklı, Hüdai Thermal Springs, 1007m, 18.06.2008, 2 ♀ ♀; Çay, Çayryazı, 1014m, 17.07.2008, 4 ♀ ♀; Çay, Armutlu, 1030m, 25.04.2009, 1 ♀; Çay, Armutlu, 1030m, 26.04.2009, 1 ♀.

Fam. Anthophoridae

Subfam. Xylcopinae

Tribe Xylcopini

Xylcopa (*Copoxyla*) *iris* (CHRIST 1791)

Distribution: Northwest Africa, Southern and Central Europe, Turkey, Iran (WARNCKE 1982b), Afghanistan, Syria (SCHEDL 2007), Turkey: Ankara, Erzurum, Adana, Niğde, Antalya, İçel, Kars, Hakkari, Konya, Ağrı, Muğla (WARNCKE 1982b).

Material examined: Emirdağ, Salihler, 908m, 24.05.2006, 1 ♀; Bolvadin, Hamidiye, 975m, 28.06.2007, 1 ♀; Emirdağ, Bademli, 1042m, 28.06.2007, 1 ♀; Sultandağı, Yeşilçiftlik, 998m, 25.07.2007, 1 ♀; Sultandağı, Dutağacı, 1489m, 04.06.2008, 1 ♀.

***Xylocopa (s.str.) valga* GERSTAECKER 1872**

Distribution: North Africa, South Eastern Europe, Iran, Turkey, China, Mongolia (WARNCKE 1982b), Turkey: Artvin, Erzurum, Erzincan, Kars, Konya, Isparta, Kayseri, Van, Hakkari (WARNCKE 1982b).

Material examined: Şuhut, Başören, 1624m, 07.06.2006, 1♀; Başmakçı, Ovacık, 1228m, 07.06.2006, 1♀; Sinanpaşa, Tokuşlar, 1162m, 08.06.2006, 1♂; Sandıklı, Karadinek, 1068m, 20.06.2006, 1♀; Şuhut, Aydın, 1138m, 16.06.2006, 1♀; Bayat, İmrallı, 1355m, 19.06.2006, 1♂; Central, Saadet, 1176m, 20.06.2006, 3♀♀, 1♂; Şuhut, Tekke, 1381m, 22.06.2006, 1♀; Emirdağ, Kılıçlar, 915m, 23.06.2006, 1♀; Dazkırı, Çiftlik, 1218m, 04.07.2006, 1♀; İhsaniye, Oğulbeyli, 1112m, 25.06.2007, 1♀; Çay, Armutlu, 1011m, 27.06.2007, 1♀; Sultandağı, Yeşilçiftlik, 998m, 25.07.2007, 1♀; Çay, Aydoğmuş, 1046m, 25.07.2007, 1♀; Hocalar, Devlethan, 1036m, 27.07.2007, 1♀; Emirdağ, Bademli, 1042m, 04.06.2008, 1♂; Sultandağı, Dutagacı, 1489m, 04.06.2008, 2♂♂; Dinar, Cumhuriyet, 1109m, 05.06.2008, 1♀, 1♂; Dazkırı, Yukarı Yenice, 904m, 05.06.2008, 1♀; Sandıklı, Hüdai Thermal Springs, 1007m, 05.06.2008, 1♀; Çay, Cumhuriyet, 1011m, 16.06.2008, 1♀; Çay, Karamık, 1018m, 16.06.2008, 1♀; Başmakçı, Çığrı, 1124m, 17.06.2008, 1♀; Çay, Cumhuriyet, 1011m, 19.06.2008, 1♀.

***Xylocopa (s.str.) violacea* (LINNAEUS 1758)**

Distribution: North Africa, Southern and Central Europe, Iran, Iraq, Turkey (WARNCKE 1982b), Cyprus, Syria (SCHEDL 2007), Turkey: Antalya, Bursa, Isparta, Hakkari, Niğde, İçel, Konya (WARNCKE 1982b).

Material examined: Başmakçı, Ovacık, 1228m, 07.06.2006, 2♀♀; Sandıklı, Akdağ NP, 1462m, 21.06.2006, 1♀; Dazkırı, Çiftlik, 1145m, 04.07.2006, 1♀; Dazkırı, Çiftlik, 1218m, 04.07.2006, 1♀; Sandıklı, Akdağ NP, 1117m, 05.07.2006, 1♀; Sandıklı, Akdağ NP, 1494m, 16.08.2006, 1♀; Sultandağı, Yeşilçiftlik, 998m, 25.07.2007, 1♀; Şuhut, Başören, 1880m, 26.07.2007, 1♀; Dinar, Cumhuriyet, 1109m, 05.06.2008, 1♂; Çay, Armutlu, 1011m, 27.06.2007, 1♂; Çay, Cumhuriyet, 1011m, 16.06.2008, 1♀; Dinar, Avşar, 1115m, 17.06.2008, 1♀; Başmakçı, Çığrı, 1124m, 17.06.2008, 1♀.

Fam. Megachilidae**Subfam. Lithurginae****Tribe Lithurgini*****Lithurgus chrysurus* FONSCOLOMBE 1834**

Distribution: Italy, Greece, Bulgaria, the former USSR, Syria, Israel, Spain, Turkey, Iran, Rhodes (ZANDEN 1986), South America (COMBA & COMBA 1991), South, East and Middle Europe, Caucasus (BANASZAK & ROMASENKO 1998), Turkey: Edirne (ZANDEN 1986), Kayseri, Erzurum (ÖZBEK & ZANDEN 1994), Ankara, Eskişehir, Çankırı (GÜLER 2004).

Material examined: Emirdağ, Kılıçlar, 915m, 23.06.2006, 1♂; Sinanpaşa, Tazlar, 1326m, 14.08.2006, 6♀♀; Şuhut, Güneytepe, 1134m, 16.08.2006, 6♀♀; Şuhut, Arızlı, 1110m, 16.08.2006, 4♀♀; Şuhut, Uzunpınar, 1250m, 16.08.2006, 1♀; Sinanpaşa, Balmahmut, 1071m, 24.07.2007, 9♀♀; Bayat, Doğlat, 1219m, 24.07.2007, 6♀♀; Çay, Orhaniye, 984m, 27.06.2007, 4♀♀, 12♂♂; Hocalar, Devlethan, 1036m, 27.06.2007, 1♀; Emirdağ, Kılıçlar, 910m, 15.07.2008, 4♀♀, 21♂♂.

***Lithurgus cornutus* (FABRICIUS 1787)**

Distribution: Japan, China, Taiwan, Morocco, Italy, the former Yugoslavia, the former USSR, Romania, Hungary, Iran, Greece, Turkey (ZANDEN 1986), South, East and Middle Europe, Caucasus, West Kazakhstan, North Africa (BANASZAK & ROMASENKO 1998), Turkey: Eastern Anatolia (ÖZBEK & ZANDEN 1994), Çankırı, Ankara, Eskişehir, Kayseri (GÜLER 2004).

Material examined: Başmakçı, Akkoyunlu, 970m, 04.07.2006, 1♀; Sinanpaşa, Tazlar, 1326m, 14.08.2006, 1♀; Şuhut, Arızlı, 1110m, 16.08.2006, 1♀; Çay, Orhaniye, 984m, 27.06.2007, 4♀♀; Bayat, Doğlat, 1219m, 24.07.2007, 1♀; Sandıklı, Gürsu, 1000m, 24.07.2007, 1♀; Sultandağı, Yeşilçiftlik, 998m, 25.07.2007, 1♀; Sultandağı, Taşköprü, 987m, 19.06.2008, 1♀; İncehisar, Alanyurt, 1386m, 15.07.2008, 1♀; Emirdağ, Kılıçlar, 910m, 15.07.2008, 3♀♀; Bayat, Central, 1213m, 15.07.2008, 1♀; Dinar, Pınarlı, 1013m, 16.07.2008, 1♀.

Subfam. Megachilinae**Tribe Anthidiini*****Anthidiellum strigatum* (PANZER 1805)**

Distribution: Mexico (COMBA & COMBA 1991), Europe, Caucasus, West Kazakhstan, West Siberia, Central Asian part of the former USSR, Far East Russia, North Africa (BANASZAK & ROMASENKO 1998), Turkey: Konya, Ankara, Antakya, İçel, İzmir, Manisa, Nevşehir, Karaman, Kahramanmaraş, Şanlıurfa, Muğla (WARNCKE 1980), Antalya, Aydın, Isparta, Erzurum, Artvin, Samsun, Çanakkale (ÖZBEK & ZANDEN 1993), Çankırı (GÜLER & ÇAĞATAY 2006).

Material examined: Şuhut, Tekke, 1381m, 22.06.2006, 1♂; Sandıklı, Akdağ NP, 1480m, 26.06.2007, 1♀; Sultandağı, Train station, 976m, 25.07.2007, 2♂♂; Dazkırı, Hasandede, 1108m, 26.07.2007, 2♂♂.

***Anthidium* (s.str.) *cingulatum* LATREILLE 1809**

Distribution: South and Central Europe, Siberia, North Africa, Caucasus (COMBA & COMBA 1991; BANASZAK & ROMASENKO 1998), Turkey: Ankara, İçel, Konya, Kars, Erzincan, Artvin, İstanbul, Van, Ağrı, Sivas, Nevşehir, Erzurum, Karaman (WARNCKE 1980), Eskişehir (GÜLER & ÇAĞATAY 2006).

Material examined: Dazkırı, Çiftlik, 1218m, 04.07.2006, 1♂; Emirdağ, Bademli, 1112m, 28.06.2007, 1♀; Şuhut, Başören, 1880m, 26.07.2007, 1♂; Dinar, Avşar, 1115m, 17.07.2008, 1♂; Dinar, Avşar, 1884m, 16.07.2008, 1♂.

***Anthidium* (s.str.) *diadema* LATREILLE 1809**

Distribution: South and Eastern Europe, Central Asian part of the former USSR, North Africa (BANASZAK & ROMASENKO 1998), Turkey: Erzurum (ÖZBEK 1979b), Ankara, Nevşehir, Sivas, Şanlıurfa, Bayburt, İstanbul, Hakkari, Ağrı (WARNCKE 1980), Antakya, Van, Muş, Antalya, Amasya, Karaman, Nevşehir, Afyon (ÖZBEK & ZANDEN 1993), Eskişehir, Kayseri, Sivas (GÜLER & ÇAĞATAY 2006).

Material examined: Emirdağ, Kılıçlar, 915m, 23.06.2006, 5♀♀, 1♂; Çay, Orhaniye, 984m, 27.06.2007, 1♀; Central, Gözsüzlü, 983m, 27.06.2007, 4♀♀, 4♂♂; Hocalar, Yağcı, 1404m, 27.06.2007, 1♀, 1♂; Çobanlar, Central, 991m, 28.06.2007, 1♀, 2♂♂; Central, Çavdarlı, 1005m, 25.06.2007, 2♂♂; Sultandağı, Taşköprü, 987m, 19.06.2008, 2♂♂; İncehisar, Alanyurt, 1386m, 15.07.2008, 1♂.

***Anthidium (s.str.) florentinum* (FABRICIUS 1775)**

Distribution: USA (COMBA & COMBA 1991), South and Central Europe, Siberia, Anatolia, Central Asian part of the former USSR, Caucasus, Syria (BANASZAK & ROMASENKO 1998), Turkey: Ankara, Denizli, İçel, Bursa, Kars, Aydın (WARNCKE 1980), Eskişehir, Antalya, İzmir, Isparta, Antakya, Iğdır, Konya, Erzurum, Muğla, Artvin (ÖZBEK & ZANDEN 1993), Yozgat (GÜLER & ÇAĞATAY 2006).

Material examined: Emirdağ, Kılıçlar, 910m, 06.06.2006, 1♂; Bolvadin, Derekarabağ, 972m, 28.06.2007, 2♀♀, 8♂♂.

***Anthidium (s.str.) loti* PERRIS 1852**

Distribution: South and Central Europe, Siberia, Anatolia, Central Asian part of the former USSR, North Kazakhstan (BANASZAK & ROMASENKO 1998), Turkey: Erzurum (ÖZBEK 1979b), Amasya, Ankara, Konya, Nevşehir, İçel, Şanlıurfa, Isparta (WARNCKE 1980), Denizli, Aydın, İzmir, Erzurum (ÖZBEK & ZANDEN 1993), Kayseri, Eskişehir (GÜLER & ÇAĞATAY 2006).

Material examined: Şuhut, Başören, 1880m, 26.07.2007, 1♂; Sandıklı, Dutağacı, 1525m, 16.07.2008, 1♀, 3♂♂; Başmakçı, Çığrı, 1124m, 17.06.2008, 1♀.

***Anthidium (s.str.) manicatum* (LINNAEUS 1758)**

Distribution: Europe, Central and North Asia, Caucasus, North Africa, North America, Brazil, Uruguay, Argentina (BANASZAK & ROMASENKO 1998), Turkey: Ardahan, Erzurum, (ÖZBEK 1979b), Artvin, Konya, İçel, Amasya, Edirne (WARNCKE 1980), Tunceli, Erzincan, Kars, Bursa (ÖZBEK & ZANDEN 1993), Ankara, Yozgat (GÜLER & ÇAĞATAY 2006).

Material examined: Sinanpaşa, Balmahmut, 1071m, 24.07.2007, 1♀; Sinanpaşa, Balmahmut, 1071m, 24.07.2007, 1♀; Çay, Cumhuriyet, 1011m, 19.06.2008, 1♂.

***Anthidium (s.str.) punctatum* LATREILLE 1809**

Distribution: Caucasus, Central Asia, Europe, North Kazakhstan, Mongolia, Siberia (BANASZAK & ROMASENKO 1998), Turkey: Konya, Erzurum, Sivas, Nevşehir, Çanakkale, Van, Antakya, Kars (WARNCKE 1980).

Material examined: Sinanpaşa, Çukurca, 1654m, 20.06.2006, 1♀; Başmakçı, Akkoyunlu, 954m, 17.07.2008, 1♀; Başmakçı, Çığrı, 1124m, 17.06.2008, 1♀.

***Anthidium (s.str.) wustneii* MOCSARY 1887**

Distribution: Greece, Lebanon, Syria, Armenia (WARNCKE 1980), Iran (WARNCKE 1982a), Turkey: Muğla, Antalya, Denizli, Erzurum, Erzincan (ÖZBEK & ZANDEN 1993).

Material examined: Sultandağı, Yeşilçiftlik, 998m, 25.07.2007, 1♂.

***Anthidium (Gulanthidium) rotundum* WARNCKE 1980**

Distribution: Iran, Lebanon, Turkey (WARNCKE 1980), Turkey: Hakkari (WARNCKE 1980).

Material examined: Bolvadin, Central, 985m, 23.06.2006, 1♀; Sandıklı, Daylık, 985m, 26.06.2007, 1♀.

***Anthidium (Proanthidium) undulatifforme* FRIESE 1917**

Distribution: Armenia, Israel, Spain, Greece, Turkey (WARNCKE 1980), Turkey: Nevşehir, Konya, Şanlıurfa, Denizli (WARNCKE 1980).

Material examined: Sandıklı, Hüdai Thermal Springs, 1007m, 05.06.2008, 1 ♀.

***Eoanthidium nasicum* (FRIESE 1917)**

Distribution: Israel, Syria, Turkey (WARNCKE 1980), Turkey: İçel, Nevşehir, Erzurum, Şanlıurfa (WARNCKE 1980), Isparta, Antalya (ÖZBEK & ZANDEN 1993).

Material examined: Dazkırı, Hasandede, 1108m, 26.07.2007, 1 ♂.

***Icteranthidium cimbiciforme* (SMITH 1854)**

Distribution: South, Eastern and Central Europe, Caucasus, Turkey, Kazakhstan, Central Asian part of the former USSR, North Africa (BANASZAK & ROMASENKO 1998), Turkey: Ağrı, Ankara, Çanakkale, Hakkari, Erzincan, Malatya, İçel, Van, Erzurum, Sivas (WARNCKE 1980), Antalya, Aydın, Nevşehir (ÖZBEK & ZANDEN 1993), Eskişehir (GÜLER & ÇAĞATAY 2006).

Material examined: Çay, Aydoğmuş, 1046m, 25.07.2007, 2 ♀ ♀, 3 ♂ ♂.

***Icteranthidium croceum* (MORAWITZ 1878)**

Distribution: Caucasus, Kazakhstan (WARNCKE 1980), Turkey: New record for Turkey.

Material examined: Sultandağı, Yeşilçiftlik, 998m, 25.07.2007, 1 ♀.

***Pseudoanthidium (Paranthidiellum) lituratum* (PANZER 1801)**

Distribution: Asia, Europe, North Africa (COMBA & COMBA 1991; BANASZAK & ROMASENKO 1998), Turkey: Ağrı, Ankara, Burdur, İçel, Kayseri, Nevşehir, Samsun, Sivas, Kilis, Hakkari, Kahramanmaraş, Erzurum, Çanakkale, Denizli, Şırnak, Şanlıurfa (WARNCKE 1980), Eskişehir, Kars, Muğla, Antalya, İzmir (ÖZBEK & ZANDEN 1993).

Material examined: Bolvadin, Hamidiye, 975m, 28.06.2007, 1 ♂.

***Pseudoanthidium (Royanthidium) melanurum* (KLUG 1832)**

Distribution: Greece, Bulgaria, Spain, Italy, Israel, Morocco, Caucasus, Turkistan, Germany, Turkey, Tunisia (WARNCKE 1980), Turkey: Erzurum, Kars (WARNCKE 1980), Antalya (ÖZBEK & ZANDEN 1993).

Material examined: Sinanpaşa, Yörükmezarı, 1716m, 27.07.2007, 4 ♀ ♀; Hocalar, Yağcı, 1404m, 27.07.2007, 1 ♀.

***Rhodanthidium (s.str.) caturigense* (GIRAUD 1863)**

Distribution: Albania, Caucasus, Greece, France, Italy, Turkey, Israel, Lebanon (WARNCKE 1980), Turkey: Nevşehir, Konya, İçel, Kars (WARNCKE 1980), Erzurum (ÖZBEK & ZANDEN 1993).

Material examined: Dazkırı, Yukarı Yenice, 904m, 05.06.2008, 1 ♀; Dazkırı, Yukarı Yenice, 876m, 17.06.2008, 1 ♂.

Rhodanthidium (s.str.) septemdentatum (LATREILLE 1809)

Distribution: South and Central Europe (BANASZAK & ROMASENKO 1998), Turkey: Amasya, Antakya, Ankara, Denizli, İstanbul, Çanakkale, Karaman, Konya, Nevşehir, Aydın (WARNCKE 1980), Erzincan, Erzurum (ÖZBEK & ZANDEN 1993).

Material examined: Dazkırı, Örtülü, 1002m, 17.06.2008, 1♂.

Trachusa laticeps (MORAWITZ 1873)

Distribution: Algeria, Greece, France, Spain, Turkey (WARNCKE 1980), Turkey: Ankara (WARNCKE 1980), Antalya, Erzurum (ÖZBEK & ZANDEN 1993).

Material examined: Dinar, Pınarlı, 1013m, 16.07.2008, 2♀♀.

Trachusa pubescens (MORAWITZ 1873)

Distribution: South Europe, Ukraine, Russia, Hungary, Turkey, Caucasus, South Africa (BANASZAK & ROMASENKO 1998), Turkey: Ankara, Antakya, Konya (WARNCKE 1980), Aydın, Erzurum, Isparta, Antalya (ÖZBEK & ZANDEN 1993), Kayseri, Kırşehir (GÜLER & ÇAĞATAY 2006).

Material examined: Kızılören, Soğucak, 1540m, 05.07.2006, 1♀.

Tribe O s m i n i

Heriades (s.str.) crenulatus NYLANDER 1856

Distribution: South, Eastern and Central Europe, Asia Minor, Caucasus, North Africa (COMBA & COMBA 1991; BANASZAK & ROMASENKO 1998; AMIET et al.2004), Turkey: Erzurum, Sinop, Antalya, Amasya, İstanbul, Edirne, Osmaniye (ÖZBEK & ZANDEN 1992b), Ankara, Yozgat (GÜLER & ÇAĞATAY 2006).

Material examined: Sinanpaşa, Tazlar, 1326m, 14.08.2006, 6♀♀.

Hoplosmia bidentata (MORAWITZ 1876)

Distribution: South and Central Europe, Caucasus, Turkey, Egypt (COMBA & COMBA 1991; BANASZAK & ROMASENKO 1998), Turkey: Ardahan, Bayburt, Erzurum (ÖZBEK 1979b), Ağrı, Antalya, Aydın, Balıkesir, Bitlis, İstanbul, İzmir, Kars, Kayseri, Nevşehir, Sivas, Van, (ÖZBEK & ZANDEN 1992a), Ankara, Eskişehir, Çankırı, Yozgat (GÜLER & ÇAĞATAY 2006).

Material examined: Dazkırı, Örtülü, 1013m, 03.07.2006, 1♀; Başmakçı, Akkoyunlu, 970m, 04.07.2006, 2♀♀; Emirdağ, Kılıçlar, 910m, 06.07.2006, 7♀♀; Çay, Orhaniye, 984m, 27.06.2007, 15♀♀; Çay, Deresenek, 1084m, 27.06.2007, 1♀; Emirdağ, Hisar, 1109m, 28.06.2007, 4♀♀; Sinanpaşa, Balmahtut, 1071m, 24.07.2007, 2♀♀; Sultandağı, Train station, 976m, 25.07.2007, 3♀♀.

Hoplitis (s.str.) manicata MORICE 1901

Distribution: South-Eastern and Central Europe, Balkan States, Algeria (BANASZAK & ROMASENKO 1998), Turkey: Isparta, Amasya (ÖZBEK & ZANDEN 1992a), Ankara (GÜLER & ÇAĞATAY 2006).

Material examined: Emirdağ, Kılıçlar, 915m, 23.06.2006, 1♀; Emirdağ, Hisar, 1109m, 28.06.2007, 1♀, 1♂; Emirdağ, Bademli, 1112m, 28.06.2007, 1♀.

***Hoplitis (s.str.) adunca* (PANZER 1798)**

Distribution: South, Eastern and Central Europe (COMBA & COMBA 1991), Caucasus, Asia Minor, Central Asian part of the former USSR, North Africa (WARNCKE 1992b; BANASZAK & ROMASENKO 1998; AMIET et al. 2004), Turkey: İstanbul (ÖZBEK & ZANDEN 1992a), Erzurum (ÖZBEK & ZANDEN 1996), Ankara (GÜLER & ÇAĞATAY 2006).

Material examined: Bayat, İmrallı, 1355m, 19.06.2006, 1 ♀.

***Hoplitis (Megalosmia) fulva* (EVERSMANN 1852)**

Distribution: South, East and Middle Europe, Caucasus, Turkey, Kazakhstan, China (BANASZAK & ROMASENKO 1998), Turkey: Amasya, Ankara, Şanlıurfa, Kayseri, Konya, Sivas, Elazığ, Tunceli (WARNCKE 1991b), Aksaray, Antakya (ÖZBEK & ZANDEN 1992a).

Material examined: Başmakçı, Akkoyunlu, 970m, 04.07.2006, 4 ♀ ♀; Emirdağ, Kılıçlar, 915m, 23.06.2006, 1 ♀; Bolvadin, Derekarabağ, 972m, 28.06.2007, 9 ♀ ♀, 2 ♂ ♂.

***Osmia (Helicosmia) caerulea* (LINNAEUS 1758)**

Distribution: Europe, Caucasus, Central Asia, North Africa, North America (BANASZAK & ROMASENKO 1998), Turkey: Erzurum, Artvin, Kars, Iğdır (ÖZBEK 1979a), Erzincan, Sinop, Konya, Aydın, Bursa, Ankara, İstanbul, Kahramanmaraş (ÖZBEK & ZANDEN 1992a), Sivas (GÜLER & ÇAĞATAY 2006).

Material examined: Sultandağı, Taşköprü, 967m, 22.05.2006, 1 ♀; Sultandağı, Dereçine, 982m, 23.05.2006, 1 ♀; Sultandağı, Dereçine, 1279m, 22.06.2006, 1 ♀; Sandıklı, Akdağ NP, 1480m, 26.06.2007, 1 ♀; Sandıklı, Akdağ NP, 1472m, 18.06.2008, 1 ♂.

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

Distribution: Southern Europe, Caucasus, Asia Minor, Turkmenistan, Crimea, Central Asia part of the former USSR (BANASZAK & ROMASENKO 1998), Turkey: Aydın, Antakya, Karaman, Antalya, İçel, Kars, Hakkari (WARNCKE 1988a), Van (ÖZBEK & ZANDEN 1992a), Ankara (GÜLER & ÇAĞATAY 2006).

Material examined: Emirdağ, Kılıçlar, 915m, 23.06.2006, 3 ♀ ♀; Emirdağ, Kılıçlar, 910m, 15.06.2007, 5 ♀ ♀; Emirdağ, Kılıçlar, 911m, 04.06.2008, 2 ♀ ♀; Sandıklı, Hüdai Thermal Springs, 1007m, 17.06.2008, 1 ♀; Dazkırı, Yukarı Yenice, 876m, 17.06.2008, 1 ♀.

***Osmia (Helicosmia) fulviventris* PANZER 1798**

Distribution: Middle Asia, Canada (COMBA & COMBA 1991), Europe, Caucasus, Anatolia, Kazakhstan, Canary Islands, Azores, Crimea, North Africa, Cyprus (WARNCKE 1988a; BANASZAK & ROMASENKO 1998), Turkey (AMIET et al. 2004), Turkey: Samsun, İstanbul, Bursa, Adana, Mardin, Karaman, Niğde, Adapazarı, Bilecik, Zonguldak, İçel, Kars, Şırnak, Hakkari (WARNCKE 1988a), Antalya (ÖZBEK & ZANDEN 1996), Ankara, Çankırı (GÜLER & ÇAĞATAY 2006).

Material examined: Çobanlar, Central, 988m, 24.05.2006, 1 ♂; Emirdağ, Kılıçlar, 911m, 04.06.2008, 1 ♂; Emirdağ, Kılıçlar, 908m, 16.06.2008, 1 ♂.

***Osmia (Helicosmia) melanogaster* SPINOLA 1806**

Distribution: Central Asia part of the former USSR, Cyprus, South, Eastern and Central Europe, Turkey, Egypt, North Africa (BANASZAK & ROMASENKO 1998), Turkey: Eskişehir, Erzurum, Erzincan, Van, Şanlıurfa, Konya, İçel, Zonguldak (ÖZBEK & ZANDEN 1992a).

Material examined: Sinanpaşa, Balmahmut, 1060m, 20.06.2006, 1♀; Emirdağ, Kılıçlar, 911m, 04.06.2006, 2♀♀; Emirdağ, Kılıçlar, 915m, 23.06.2006, 7♀♀; Sandıklı, Daylık, 985m, 26.06.2007, 2♀♀; Çay, Çayır yazı, 1014m, 17.06.2008, 29♀♀; Emirdağ, Kılıçlar, 910m, 15.07.2008, 1♀; Dazkırı, Yukarı Yenice, 876m, 17.06.2008, 12♀♀; Sandıklı, Hüdai Thermal Springs, 1007m, 17.06.2008, 1♀; İscehisar, Karakaya, 1173m, 19.06.2006, 6♀♀.

***Osmia (Melanosmia) nigriventris* (ZETTERSTEDT 1838)**

Distribution: North, Eastern and Central Europe, North-Eastern Asia, Russian Far East, North America (BANASZAK & ROMASENKO 1998), Turkey: New record for Turkey.

Material examined: Emirdağ, Kılıçlar, 915m, 23.06.2006, 2♀♀; Bolvadin, Central, 985m, 23.06.2006, 1♀; Central, Çavdarlı, 1005m, 25.06.2007, 1♀; Dinar, Avşar, 1115m, 17.06.2008, 2♀♀; Çay, Çayır yazı, 1014m, 17.06.2008, 1♂; Sandıklı, Hüdai Thermal Springs, 1007m, 18.06.2008, 13♀♀; Çay, Cumhuriyet, 1011m, 19.06.2008, 1♀.

***Osmia (s.str.) cerinthidis* MORAWITZ 1876**

Distribution: South, Eastern and Middle Europe, Anatolia, Iran, Sicily (BANASZAK & ROMASENKO 1998), Turkey: Erzurum (ÖZBEK 1979a), Kars, Erzincan, Konya, Bursa, Sivas, Artvin, Amasya, Eskişehir, Ankara (ÖZBEK & ZANDEN 1992a).

Material examined: Şuhut, Demirbel, 1134m, 19.04.2008, 1♀.

Tribe Megachilini

***Chalicodoma (Allochalicodoma) hungarica* MOCSARY 1877**

Distribution: South, Eastern and Central Europe, Asia Minor, Algeria (BANASZAK & ROMASENKO 1998), Turkey: All of Turkey (ÖZBEK & ZANDEN 1994).

Material examined: Şuhut, Kumalar Mountain, 2192m, 22.06.2006, 1♀.

***Chalicodoma (s.str.) parietina* (GEOFFROY 1785)**

Distribution: South, Eastern and Central Europe, Caucasus, Central Asian part of the former USSR, North Africa (COMBA & COMBA 1991; BANASZAK & ROMASENKO 1998), Turkey: Erzurum, Erzincan, Kars, Muş (ÖZBEK 1979b), Konya (GÜLER & ÇAĞATAY 2006).

Material examined: Sinanpaşa, Tazlar, 1326m, 08.06.2006, 1♀; İscehisar, Karakaya, 1173m, 19.06.2006, 1♀; Kızılören, Menteş, 1238m, 05.07.2006, 2♀♀; Emirdağ, Bademli, 1042m, 04.06.2008, 1♀; Başmakçı, Çığrı, 1144m, 05.06.2008, 2♀♀; Sinanpaşa, Tazlar, 1610m, 18.06.2008, 3♀♀.

***Chalicodoma (s.str.) pyrenaica* (LEPELETIER 1841)**

Distribution: South and Central Europe, Kazakhstan, Caucasus, Tadzhikistan, North Africa (BANASZAK & ROMASENKO 1998), Turkey: Ankara, Bursa, Kayseri, Erzurum (ÖZBEK & ZANDEN 1994).

Material examined: Şuhut, Kumalar Mountain, 2192m, 22.06.2006, 1 ♀.

***Chalicodoma (Pseudomegachile) ericetorum* (LEPELETIER 1841)**

Distribution: Europe, Caucasus, Anatolia, Central Asia, North Africa (COMBA & COMBA 1991; BANASZAK & ROMASENKO 1998), Turkey: Balıkesir, Ağrı (ÖZBEK & ZANDEN 1996), Ankara, Eskişehir (GÜLER & ÇAĞATAY 2006).

Material examined: Şuhut, Kumalar Mountain, 2192m, 22.06.2006, 1 ♂.

***Coelioxys (s.str.) rufescens* LEPELETIER 1825**

Distribution: Algeria, Asia Minor, Buriatia, Caucasus, China, Central Siberia, Europe, Kazakhstan, Central Asian part of the former USSR, Pamirs, North Africa (BANASZAK & ROMASENKO 1998), Turkey: Erzurum, Kars (ÖZBEK 1979a), İzmir, Tokat, Iğdır, Hakkari (ÖZBEK & ZANDEN 1994).

Material examined: Sandıklı, Hüdai Thermal Springs, 1007m, 05.06.2008, 1 ♀.

***Coelioxys (Allocoelioxys) echinata* FÖRSTER 1853**

Distribution: Caucasus, Europe, Turkey, North Africa (BANASZAK & ROMASENKO 1998), Turkey: Iğdır, Sivas (ÖZBEK & ZANDEN 1994).

Material examined: Emirdağ, Hisar, 1109m, 28.06.2007, 1 ♀; Emirdağ, Bademli, 1112m, 28.06.2007, 1 ♂.

***Megachile (Eutricharaea) apicalis* SPINOLA 1808**

Distribution: Canada, Caucasus, South and Central Europe, Central Asian part of the former USSR, North Africa (BANASZAK & ROMASENKO 1998), Turkey: All of Turkey (ÖZBEK & ZANDEN 1994).

Material examined: Çay, Orhaniye, 984m, 27.06.2007, 3 ♀ ♀; Bayat, Doğlat, 1219m, 24.07.2007, 1 ♀; Başmakçı, Akkoyunlu, 970m, 04.07.2006, 1 ♀; Sinanpaşa, Tazlar, 1326m, 14.8.2006, 1 ♀.

***Megachile (Eutricharaea) deceptor* PEREZ 1890**

Distribution: Caucasus, South, Eastern and Central Europe, Turkmenistan, West Kazakhstan (BANASZAK & ROMASENKO 1998), Turkey: Balıkesir (ÖZBEK & ZANDEN 1994).

Material examined: Emirdağ, Kılıçlar, 915m, 23.06.2006, 4 ♀ ♀; Sultandağı, Yeşilçiftlik, 986m, 27.06.2007, 1 ♀; Bolvadin, Derekarabağ, 972m, 28.06.2007, 1 ♀.

***Megachile (Eutricharaea) leachella* CURTIS 1828**

Distribution: Europe, Caucasus, Asia, Siberia, Russian Far East, North Africa, North America (BANASZAK & ROMASENKO 1998), Turkey: İstanbul, Erzurum, Konya, Antalya, Muğla, Nevşehir, Şanlıurfa, İzmir, Ankara, Ağrı, Malatya, İçel (ÖZBEK & ZANDEN 1994).

M a t e r i a l e x a m i n e d : Şuhut, Tekke, 1381m, 22.06.2006, 1 ♀; Emirdağ, Ekizce, 930m, 23.06.2006, 1 ♀; Emirdağ, Kılıçlar, 915m, 23.06.2006, 1 ♀.

***Megachile (Eutricharaea) pilidens* ALFKEN 1924**

D i s t r i b u t i o n : South and Central Europe (COMBA & COMBA 1991), Caucasus, Anatolia, North Africa (BANASZAK & ROMASENKO 1998), Turkey: Erzurum (ÖZBEK 1979b), Aksaray, Nevşehir, İstanbul, Antalya, Balıkesir, Iğdır, İzmir, İçel, Van, Artvin (ÖZBEK & ZANDEN 1994), Ankara, Eskişehir, Kayseri (GÜLER & ÇAĞATAY 2006).

M a t e r i a l e x a m i n e d : Şuhut, Başören, 1619m, 26.06.2007, 3 ♀ ♀; Emirdağ, Hisar, 1109m, 28.06.2007, 1 ♀; Şuhut, Central, 1573m, 26.06.2007, 3 ♀ ♀; Sultandağı, Yeşilçiftlik, 986m, 27.06.2007, 1 ♀; Emirdağ, Kılıçlar, 908m, 16.06.2008, 1 ♀.

***Megachile (Eutricharaea) rotundata* (FABRICIUS 1787)**

D i s t r i b u t i o n : Europe, Caucasus, Central Asian part of the former USSR, Kazakhstan, North Africa, Far East Russia, North and South America, New Zeland (COMBA & COMBA 1991; BANASZAK & ROMASENKO 1998), Turkey: All of Turkey (ÖZBEK & ZANDEN 1994).

M a t e r i a l e x a m i n e d : Emirdağ, Hisar, 1109m, 28.06.2007, 1 ♀; Bolvadin, Derekarabağ, 972m, 28.06.2007, 6 ♀ ♀.

***Megachile (s.str.) pilicrus* MORAWITZ 1878**

D i s t r i b u t i o n : South, Eastern and Central Europe (Ukraine, Hungary, Germany) (COMBA & COMBA 1991), Caucasus, Central Asian part of the former USSR (BANASZAK & ROMASENKO 1998), Turkey: Erzurum (ÖZBEK & ZANDEN 1994), Ankara, Yozgat (GÜLER & ÇAĞATAY 2006).

M a t e r i a l e x a m i n e d : Bayat, Doğlat, 1219m, 24.07.2007, 1 ♀.

***Megachile (Xanthosarus) lagopoda* (LINNAEUS 1761)**

D i s t r i b u t i o n : Europe, Caucasus, Siberia, Central Asian part of the former USSR, Far East Russia, Japan, North Africa (COMBA & COMBA 1991; BANASZAK & ROMASENKO 1998), Turkey: All of Turkey (ÖZBEK 1979b).

M a t e r i a l e x a m i n e d : Sinanpaşa, Tazlar, 1590m, 24.07.2007, 1 ♀.

***Megachile (Xanthosarus) maritima* (KIRBY 1802)**

D i s t r i b u t i o n : Europe, Caucasus, Kazakhstan, Central Asian part of the former USSR (COMBA & COMBA 1991), Far East Russia (BANASZAK & ROMASENKO 1998), Turkey: Erzurum (ÖZBEK 1979b), Erzincan, Kars, Kayseri, Artvin, Iğdır, Ankara, Mersin (ÖZBEK & ZANDEN 1996), Çankırı, Eskişehir (GÜLER & ÇAĞATAY 2006).

M a t e r i a l e x a m i n e d : Sinanpaşa, Tazlar, 1590m, 24.07.2007, 1 ♀, 2 ♂ ♂.

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Zusammenfassung

Vorliegende Studie behandelt die bisher weitgehend unerforschte Bienenfauna der türkischen Provinz Afyonkarahisar, resultierend aus Aufsammlungen im Zeitraum 2006 bis 2009. Von den untersuchten 568 Exemplaren konnten 50 Arten festgestellt werden mit folgender Familienaufteilung: Andrenidae (1), Anthophoridae (3) und Megachilidae (46). *Osmia* (*Melanosmia*) *nigriventris* (ZETTERSTEDT 1838) und *Icteranthidium croceum* (MORAWITZ 1878) stellen Neufunde für die Türkei dar.

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