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Contributions to the knowledge of Agathidinae fauna of the Eastern Anatolia Region of Turkey

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Abstract: In this study, Agathidinae (Braconidae: Hymenoptera) fauna of the Elazığ, Erzincan, Malatya, and Tunceli provinces of the Eastern Anatolia Region was investigated during the years 2007 and 2008. During the study period, 17 species were identified belonging to the genera *Agathis* Latreille, 1804; *Bassus* Fabricius, 1804; and *Disophrys* Förster, 1862. Two species were recorded from Turkey for the first time: *Agathis tatarica* Telenga, 1933 and *Bassus tegularis* (Thomson, 1895). All of these species are new to the fauna of the 4 provinces of the Eastern Anatolia Region.

Key words: Hymenoptera, Braconidae, Agathidinae, Eastern Anatolia, fauna

1. Introduction

The Eastern Anatolia Region is one of the 7 geographical regions of Turkey and is located in the easternmost part of the country. It is bounded by Turkey's Central Anatolia Region on the west, its Black Sea Region on the north, its Southeastern Anatolia Region and Iraq on the south, and Iran, Azerbaijan, Armenia, and Georgia on the east. The 14 provinces in the Eastern Anatolia Region are Ağrı, Ardahan, Bingöl, Bitlis, Elazığ, Erzincan, Erzurum, Hakkari, Iğdır, Kars, Malatya, Muş, Tunceli, and Van (Figure). This region presents markedly continental or montane ecogeographic characters (Casale and Vigna Taglianti, 1999). Although there are comprehensive studies on Agathidinae fauna in different regions in Turkey (Shenefelt, 1970; Nixon, 1986; Zettel and Beyarslan, 1992; Simbolotti and van Achterberg, 1999; Çetin and Beyarslan, 2001; Beyarslan et. al., 2002a, 2002b; Çetin Erdoğan and Beyarslan, 2004; Çetin Erdoğan, 2005, 2010; Çetin Erdoğan and Beyarslan, 2006, 2009; Çetin Erdoğan et al., 2009), knowledge of the Agathidinae of the Eastern Anatolia Region is based on a few studies with records from the region.

Of these studies, those by Zettel and Beyarslan (1992), Simbolotti and van Achterberg (1999), Güçlü and Özbek (2002), and Çetin Erdoğan (2010) contain only a few records of agathidines from the provinces of Erzurum, Hakkari, and Malatya.

The aim of the present study is to contribute to the knowledge of the Agathidinae fauna of the Eastern Anatolia Region by evaluating the materials collected from the Elazığ, Erzincan, Malatya, and Tunceli provinces. As even the distribution of more common species is not well documented for the region, I believe that the additional records in this paper will illuminate the distribution of the species in the region.

2. Materials and methods

The material was collected from various habitats in different localities of Elazığ, Erzincan, Malatya, and Tunceli provinces by sweeping with insect nets between June and August during 2007 and 2008 (Figure). Distributional information provided here for each species comes from Yu et al. (2006). The works of Simbolotti and van Achterberg (1992, 1999) were used for taxonomical examination and identification of the materials. The material is kept in the collections of the Department of Biology at Trakya University, Edirne, Turkey (TU).

3. Results

3.1. *Agathis* Latreille, 1804

3.1.1. *Agathis anglica* Marshall, 1885

Material examined: ELAZIĞ: Baskil-Canbeyler, 38°33′24″N, 38°49′00″E, 1116 m, 03.07.2007, 3♀♀, 1♂; Baskil-Topalkent, 38°28′15″N, 38°50′46″E, 903 m, 03.06.2007, 5♀♀; Keban-Sağdıçlar, 38°46′19″N, 38°50′45″E, 1221 m, 04.04.2007, 1♀; ERZİNCAN: Tercan-Elmalı, 39°34′17″N, 40°08′35″E, 1350 m, 24.8.2008,

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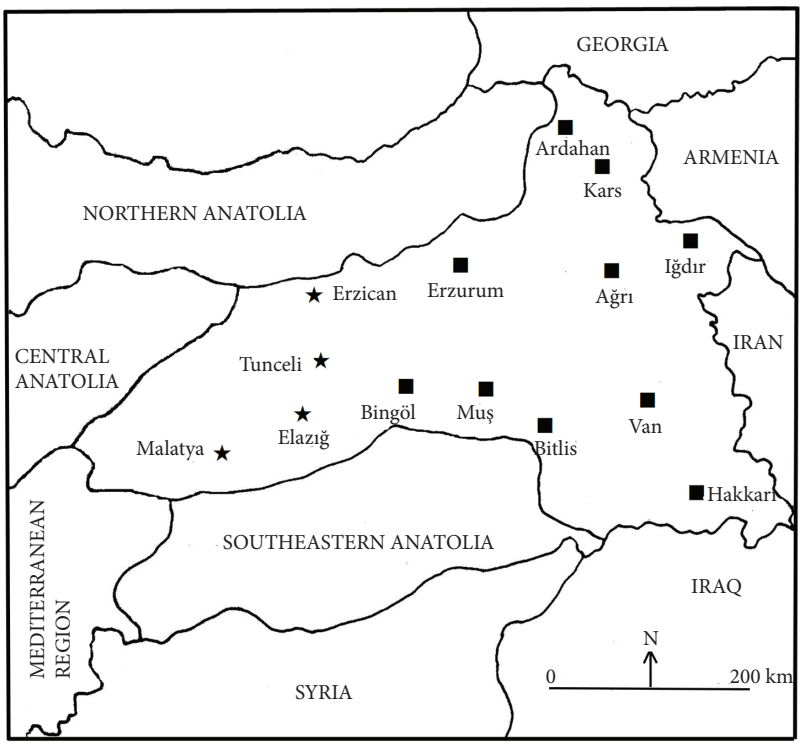

Figure. Provinces situated in the Eastern Anatolia Region, Turkey. Asterisks indicate the sampled provinces in the present study.

1♂; MALATYA: Akçadağ Anadolu Öğretmen Lisesi, 38°16′55″N, 38°02′52″E, 1015 m, 3.6.2007, 1♀; Battalgazi, 38°27′50″N, 38°25′14″E, 707 m, 10.6. 2008, 1♀; Hekimhan, 38°49′44″N, 37°55′00″E, 1094 m, 1.6.2007, 16♀♀, 6♂♂.

Distribution: Palaearctic: Albania, Armenia, Austria, Azerbaijan, Bulgaria, China, Croatia, Cyprus, Finland, former Yugoslavia, France, Germany, Greece, Hungary, Italy, Kazakhstan, Mongolia, Morocco, Netherlands, Poland, Romania, Russia, Slovenia, Spain, Sweden, Switzerland, Syria, Tajikistan, Turkey, Ukraine, United Kingdom.

3.1.2. *Agathis berkei* Çetin Erdoğan, 2010

Material examined: ERZİNCAN: Üzümlü-Geyikli 39°43′36″N, 39°40′00″E, 1391 m, 23.08.2008, 2♀♀; TUNCELİ: Pertek-Beydamı, 38°56′40″N, 39°28′22″E, 1267 m, 28.08.2008, 2♀♀.

Distribution: Palaearctic: Turkey.

3.1.3. *Agathis fischeri* Zettel and Beyarslan, 1992

Material examined: ERZİNCAN: Tercan-Elmalı, 39°34′17″N, 40°08′35″E, 1350 m, 24.8.2008, 1♀.

Distribution: Palaearctic: Turkey.

3.1.4. *Agathis fulmeki* Fischer, 1957

Material examined: MALATYA: Akçadağ Anadolu Öğretmen Lisesi, 38°16′55″N, 38°02′52″E, 1015 m, 3.6.2007, 7♂♂.

Distribution: Palaearctic: Austria, Bulgaria, France, Greece, Hungary, Morocco, Spain, Turkey.

3.1.5. *Agathis fuscipennis* (Zetterstedt, 1838)

Material examined: ELAZIĞ: Baskil-Hacımustafa, 38°38′34″N, 38°51′07″E, 1436 m, 04.07.2007, 2♀♀; MALATYA: Akçadağ Anadolu Öğretmen Lisesi, 38°16′55″N, 38°02′52″E, 1015 m, 3.6.2007, 1♀, 1♂; Hekimhan, 38°49′44″N, 37°55′00″E, 1094 m, 1.6.2007, 1♀; TUNCELİ: Pülümür-Kangallı, 39°27′10″N, 39°51′43″E, 1343 m, 14.6.2008, 1♂.

Distribution: Palaearctic: Austria, Bulgaria, France, Germany, Hungary, Netherlands, Poland, Russia, Sweden, Spain, Tunisia, Turkey, United Kingdom.

3.1.6. *Agathis griseifrons* Thomson, 1895

Material examined: MALATYA: Hekimhan, 38°49′44″N, 37°55′00″E, 1094 m, 1.6.2007, 1♀.

Distribution: Palaearctic: Albania, Armenia, Austria, Azerbaijan, Bulgaria, Finland, former Yugoslavia, France, Germany, Greece, Hungary, Ireland, Italy, Kazakhstan, Mongolia, Netherlands, Norway, Poland, Romania, Russia, Slovenia, Sweden, Switzerland, Korea, Lithuania, Turkey, Ukraine.

3.1.7. *Agathis lugubris* (Förster, 1862)

Material examined: ELAZIĞ: Baskil-Canbeyler, 38°33′24″N, 38°49′00″E, 1116 m, 03.07.2007, 1♂;

MALATYA: Doğanşehir-Takaz, 38°00′35″N, 37°59′28″E, 1286 m, 14.7.2007, 2♀♀, 1♂; Doğanşehir-Reşadiye, 37°59′01″N, 38°00′50″E, 1346 m, 14.07.2007, 5♂♂.

Distribution: Palaearctic: France, Germany, Ireland, Netherlands, Norway, Poland, Sweden, Turkey, United Kingdom.

3.1.8. *Agathis malvacearum* Latreille, 1805

Material examined: ELAZIĞ: Cip Barajı, 38°40′48″N, 39°03′59″E, 1006 m, 4.6.2007, 1♀; MALATYA: Doğanşehir-Takaz, 38°00′35″N, 37°59′28″E, 1286 m, 02.06.2007, 1♂; TUNCELİ: Pertek-Beydamı, 38°56′40″N, 39°28′22″E, 1267 m, 28.08.2008, 1♀.

Distribution: Holarctic: Albania, Armenia, Azerbaijan, Bulgaria, Canada, Croatia, former Czechoslovakia, former Yugoslavia, Finland, France, Georgia, Germany, Greece, Hungary, Italy, Kazakhstan, Latvia, Lithuania, Macedonia, Moldova, Mongolia, Netherlands, Poland, Romania, Russia, Slovakia, Slovenia, Spain, Switzerland, Tajikistan, Turkey, Ukraine, United Kingdom, United States, Uzbekistan.

3.1.9. *Agathis rufipalpis* Nees, 1812

Material examined: ELAZIĞ: Baskil-Hacımustafa, 38°38′34″N, 38°51′07″E, 1436 m, 04.07.2007, 1♀; MALATYA: Doğanşehir-Reşadiye, 37°59′01″N, 38°00′50″E, 1346 m, 2.6.2007, 7♀♀, 6♂♂.

Distribution: Palaearctic: Belgium, Bulgaria, former Czechoslovakia, former Yugoslavia, Finland, France, Germany, Hungary, Ireland, Israel, Italy, Netherlands, Norway, Poland, Portugal, Romania, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom.

3.1.10. *Agathis tatarica* Telenga, 1933

Material examined: MALATYA: Darende, 38°32′13″N, 37°30′49″E, 1363 m, 1♀.

Distribution: Palaearctic: Kazakhstan, Mongolia, Russia.

New record for Turkey.

3.1.11. *Agathis umbellatarum* Nees, 1812

Material examined: ELAZIĞ: Baskil-Topalkent, 38°28′15″N, 38°50′46″E, 903 m, 03.06.2007, 1♀; Keban-Sağdıçlar, 38°46′19″N, 38°50′45″E, 1221 m, 04.06.2007, 1♂; Keban-Aşörgen, 38°47′52″N, 38°44′01″E, 762 m, 04.06.2007, 2♂♂; TUNCELİ: Marçik, 39°08′25″N, 39°38′12″E, 938 m, 14.06.2008, 1♀, 1♂.

Distribution: Palaearctic: Algeria, Azerbaijan, Bulgaria, Croatia, Cyprus, former Yugoslavia, France, Germany, Greece, Hungary, Israel, Italy, Kazakhstan, Kyrgyzstan, Macedonia, Moldova, Mongolia, Portugal, Russia, Spain, Tajikistan, Tunisia, Turkey, Turkmenistan, Ukraine, Uzbekistan.

3.1.12. *Agathis varipes* Thomson, 1895

Material examined: TUNCELİ: Pertek, 38°51′37″N, 38°17′56″E, 914 m, 15.06.2008, 1♀.

Distribution: Palaearctic: Finland, Germany, Greece, Hungary, Italy, Kazakhstan, Mongolia, Netherlands, Norway, Russia, Slovakia, Sweden, Switzerland, Tajikistan, Turkey, Ukraine, United Kingdom, Uzbekistan.

3.2. *Bassus* Fabricius, 1804

3.2.1. *Bassus conspicuus* (Wesmael, 1837)

Material examined: MALATYA: Akçadağ-Sarıhacı, 32°22′32″N, 37°53′17″E, 1367 m, 5.6.2007, 1♀, 9♂♂.

Distribution: Holarctic: Belgium, Canary Islands, China, Croatia, Finland, former Yugoslavia, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Korea, Netherlands, Poland, Russia, Slovenia, Spain, Sweden, Switzerland, Turkey.

3.2.2. *Bassus linguarius* (Nees, 1812)

Material examined: TUNCELİ: Kutudere, 39°17′29″N, 39°46′44″E, 941 m, 14.6.2008, 4♀♀, 5♂♂.

Distribution: Palaearctic: Armenia, Belgium, Bulgaria, Croatia, Finland, former Yugoslavia, France, Germany, Hungary, Italy, Kazakhstan, Mongolia, Netherlands, Poland, Slovenia, Spain, Switzerland, Turkey, United Kingdom.

3.2.3. *Bassus tegularis* (Thomson, 1895)

Material examined: MALATYA: Çiftlik, 38°20′01″N, 38°27′31″E, 909 m, 18.7.2007, 1♀.

Distribution: Palaearctic: Bulgaria, France, Former Yugoslavia, Germany, Italy, Netherlands, Norway, Poland, Sweden, United Kingdom.

New record for Turkey.

3.2.4. *Bassus tumidulus* (Nees, 1812)

Material examined: MALATYA: Doğanşehir-Polatdere, 38°08′55″N, 37°57′46″E, 1195 m, 2.6.2007, 1♂.

Distribution: Palaearctic: Austria, Azerbaijan, Belarus, Belgium, Bulgaria, China, Croatia, Finland, former Czechoslovakia, former Yugoslavia, France, Georgia, Germany, Greece, Hungary, Ireland, Italy, Japan, Kazakhstan, Korea, Latvia, Lithuania, Moldova, Mongolia, Morocco, Netherlands, Norway, Poland, Portugal, Russia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom.

3.3. *Disophrys* Förster, 1862

3.3.1. *Disophrys caesa* (Klug, 1835)

Material examined: MALATYA: Doğanşehir-Polatdere, 38°08′55″N, 37°57′46″E, 1195 m, 2.6.2007, 1♀; Doğanşehir-Reşadiye, 37°59′01″N, 38°00′50″E, 1346 m, 2.6.2007, 1♀; Sultansuyu harası, 38°20′36″N, 38°03′35″E, 881 m, 14.7.2007, 2♀♀.

Distribution: Holarctic: Algeria, Armenia, Azerbaijan, Bulgaria, former Yugoslavia, France, Germany, Hungary, Iran, Italy, Morocco, Portugal, Romania, Russia, Spain, Switzerland, Turkey.

4. Discussion

Checking the relevant literature, it appears that 18 species have been listed so far from provinces located to the east of Turkey (Zettel and Beyarslan, 1992; Simbolotti and van Achterberg, 1999; Güçlü and Özbek, 2002; Çetin Erdoğan, 2010). *Agathis fischeri*, *A. berkei*, *A. griseifrons*, *A. tatarica*, *A. varipes*, *Bassus conspicuus*, *B. linguarius*, and *B. tegularis* are included in the species list of the region in this study. Of these, *Agathis tatarica* and *Bassus tegularis* are first records for Turkey.

The known records of *A. fischeri* in Turkey are from the Southern Anatolia Region (Zettel and Beyarslan, 1992). So far, there are no data on the presence of this species from a different region in Turkey. *A. fischeri* reported in this study is the first record of the species for the Eastern Anatolia Region.

Up to the present, *A. berkei* has been recorded by Çetin Erdoğan (2010) from a single locality in eastern Turkey (Malatya). I have observed this species in different areas in this study (4 females from Erzincan and Tunceli).

Agathis griseifrons was reported only from Rize Province in the Eastern Black Sea Region (Simbolotti and van Achterberg, 1999). It is recorded throughout the west from Europe to Russia. The presence of *A. griseifrons* in Malatya is the second record for Anatolia.

In Malatya-Darende, a female of *A. tatarica* was collected at an altitude of 1363 m. Until now, it was only known from Kazakhstan, Mongolia, and Russia; it is new for Turkey.

The current knowledge of *Agathis varipes* is based on 3 geographical regions in Turkey: the Aegean, Black Sea, and Mediterranean regions (Çetin Erdoğan et al., 2009). The presence of *A. varipes* in this study is the first record for the Eastern Anatolia Region.

Bassus conspicuus has been recorded in the Western Black Sea Region and the Aegean Region, including Bolu-Mengen-Kıyaslar and Uşak (Çetin Erdoğan and Beyarslan, 2006). I have recorded 10 specimens from Malatya-Sarıhacı in this study.

To date, *Bassus linguarius* has been recorded by Çetin and Beyarslan (2001) from a single locality in the Marmara Region (Bilecik). It is also known to occur in Armenia, close to eastern Turkey (Simbolotti and van Achterberg, 1992). A second record is given from Tunceli in the Eastern Anatolia Region in this present study.

Bassus tegularis is recorded here for the first time from Turkey (1 female from 909 m at Malatya-Çiftlik).

Although several earlier publications reported the occurrence of *Agathis montana*, *A. breviseta*, *A. nigra*, *A. glaucoptera*, *A. syngenesiae*, *Bassus tumidulus*, and *Earinus elator* in the Eastern Anatolia Region (Zettel and Beyarslan, 1992; Güçlü and Özbek 2002), none of these were recorded in this study.

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