



The Braconid Biodiversity (Hymenoptera: Ichneumonoidea: Braconidae) of Bingöl and Diyarbakır Provinces (Eastern of Türkiye)

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ABSTRACT

In this study, a total of 19 braconid species have been collected in Bingöl province and Diyarbakır around *Euphorbia macroclada* Boiss in the period between 2017 and 2023. The collected species belong to seven subfamilies: Agathidinae (one genus, one species), Braconinae (five genera, seven species), Cheloninae (one genus, five species), Euphorinae (one genus, one unidentified species), Microgastrinae (one genus, one species), Opiinae (one genus, one species), and Rogadinae (one genus, three species, with one unidentified species). All species are recorded for the first time from Bingöl and Diyarbakır (except for *Agathis anglica* Marshall (Agathidinae), *Chelonus obscuratus* Herrich-Schäffer (Cheloninae), *Bracon variator* Nees, and *Vipio mlokossewicz* Kokujev (Braconinae)), and as a first record in association with *Euphorbia macroclada*. An unidentified *Aleiodes* sp. (Rogadinae) collected from Diyarbakır, it is likely to be a new species, however, it is recommended not to be named until more specimens are collected, as it is just a single specimen, and is missing some of its body parts (as broken antenna and some legs). A full description with illustrations is provided.

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ÖZET

Bu çalışmada, Bingöl ve Diyarbakır illerinde 2017-2023 yılları arasındaki dönemde *Euphorbia macroclada* Boiss çevresinde toplamda 19 braconid türü toplanmıştır. Toplanan türler yedi altfamilyaya aittir: Agathidinae (bir cins, bir tür), Braconinae (beş cins, yedi tür), Cheloninae (bir cins, beş tür), Euphorinae (bir cins, bir tanımlanamayan tür), Microgastrinae (bir cins, bir tür), Opiinae (bir cins, bir tür) ve Rogadinae (bir cins, üç tür, bir tanımlanamayan tür). Tüm türler Bingöl ve Diyarbakır için ilk kayıt niteliğindedir. *Agathis anglica* Marshall (Agathidinae), *Chelonus obscuratus* Herrich-Schäffer (Cheloninae), *Bracon variator* Nees ve *Vipio mlokossewicz* Kokujev (Braconinae) hariç ve *Euphorbia macroclada* ile ilişkili ilk kayıttır. Diyarbakır'dan toplanan tanımlanamayan *Aleiodes* sp. (Rogadinae) yeni bir tür olma olasılığı yüksektir, ancak daha fazla örnek toplanana kadar adının açıklanmaması önerilmektedir. Çünkü bu sadece tek bir örnektir ve vücudunun bazı kısımları (kırık anten ve bazı bacaklar gibi) eksiktir. Bu tür resimleri ile birlikte tam bir tanımlama sağlanmıştır.

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INTRODUCTION

The cosmopolitan family Braconidae (Hymenoptera: Ichneumonoidea) is one of the most species-rich families in the order Hymenoptera (Quicke & van Achterberg, 1990; Wharton, 1993; Quicke, 2015; Chen & van Achterberg, 2019), with more than 21,220 described species in more than 1100 genera (Yu et al., 2016). Braconids are often black, brown with reddish markings, and some exhibit amazing colors and patterns (Gadallah et al., 2021). Over 40 braconid subfamilies are currently recognized in the family Braconidae (Chen & van Achterberg, 2019).

Members of the family are mostly recognized by the following combination of characters: second metasomal tergite is fused with third tergite (secondarily flexible in Aphidiinae); vein 2m-cu of fore wing is absent (except in extremely few cases); vein 1RS+M of fore wing is present; vein 1r-m of hind wing is present basal to the separation of veins R1 and RS (van Achterberg, 1993).

The monophyly of Braconidae is conspicuously supported in numerous molecular studies (examples are those by van Achterberg, 1984; Quicke & van Achterberg, 1990; Sharanowski et al., 2011; Li et al., 2016; Quicke et al., 2020). Many of the braconid members are important as biological control agents against more than 120 pest species of the orders Coleoptera, Diptera, Hemiptera, and Lepidoptera, that cause serious damage to various agricultural, horticultural, and forestry plants and trees (Wharton, 1993; Austin & Dowton, 2000).

The braconid fauna of Bingöl and Diyarbakır is largely incomplete due to the paucity of faunal studies, as well as the greater taxonomic complexity of the family. Examples of the important faunistic works concerning this family in both regions are those by Ölmez & Ulusoy (2003), Güz & Kiliçer (2005), Güler & Çağatay (2007), Beyarslan et al. (2014), Çetin Erdoğan (2014), Beyarslan & Deveci (2019), Beyarslan & Şahin (2019), Beyarslan et al. (2020), Beyarslan & Çakıcı (2021).

The aim of the present work is to increase this knowledge about this family in two of the largely ignored Turkish provinces, Bingöl and Diyarbakır.

MATERIAL and METHOD

The study area

Bingöl province has interesting ecological features as it is located in a transition region between the rainy and long winter climate of Türkiye's Eastern Anatolia Region and the hot and dry Southeastern Anatolia Region (Behçet, 2025). Bingöl Province is in the Upper Euphrates section of the Eastern Anatolia Region. It is surrounded by Muş to the east, Erzurum and Erzincan to the north, Tunceli and Elazığ to the west, and Diyarbakır to the south. Bingöl Province is located between 38° 53' 10" N 40° 30' 60" E (Figure 1, Table 1).



Figure 1. Sampling sites in Bingöl and Diyarbakır.

Şekil 1. Bingöl ve Diyarbakır'da örnek toplanan lokaliteler.

The province has seven districts outside the city center, namely Adaklı, Genç, Karlıova, Kiğı, Solhan, Yayladere, and Yedisu. The city center is located on a plain overlooking a branch of the Göynük River, which joins the Murat River near Genç District, in the northwest corner of the Çapakçur plain at an altitude of 1151 meters above sea level. Bingöl, on the Elazığ-Tatvan road, was previously established in the valley here, but because of the rapid development of the city after the 1950s, it was moved to the dominant plain (Anonymous 2025a).

Due to being open to the humid-cool air masses coming from the north and the altitude factor, Bingöl and its surroundings have hot summers and cold winters. According to the data of the General Directorate of Meteorology, the annual average temperature in Bingöl is 12.1 degrees. Annual precipitation is 873.7 mm, the number of days with snowfall is 24.5 days, and the number of days with frost is 94.1 days (Anonymous, 2024a).

Diyarbakır is in the central part of the Southeastern Anatolia Region. It is bordered in the east by Batman and Muş, and in the west by Şanlıurfa, Adıyaman, Malatya, to the north are Elazığ and Bingöl, and to the south are Mardin provinces. It is located on a plain at the eastern edge of the basalt plateau of Karacadağ, about 100 m above the Tigris Valley. It is characterised by a harsh continental climate. Summers are very hot, but winters are not as cold as those in the Eastern Anatolia Region. The main reason for this is that the Southeastern Taurus Mountains block the cold winds coming from the north. The city has an average annual precipitation of 496 millimeters, and 2% of this precipitation falls in the summer months. As you move towards the foothills of the mountains in the north, precipitation increases (Anonymous 2025b).

The steppe is the dominant vegetation in Diyarbakır. Herbaceous plants are more abundant in the steppe vegetation. The surrounding mountains are covered with oak forests in places. The forested areas do not even cover one-tenth of the total surface area of the province (Anonymous, 2024b).

Table 1. Localities' species are collected.

Çizelge 1. Türlerin toplandığı lokaliteler.

Number	Province	District	Locality	Altitude (m)	Coordinates	
1	Bingöl	Bingöl	Celtiksuyu	1015	38° 51' 10" N	40° 35' 10" E
2	Bingöl	Bingöl	Celtiksuyu	1045	38° 52' 57" N	40° 35' 21" E
3	Bingöl	Bingöl	Çiçekyayla	1511	38° 49' 22" N	40° 27' 48" E
4	Bingöl	Bingöl	Garip	992	38° 46' 50" N	40° 33' 17" E
5	Bingöl	Bingöl	Ekinyolu	1036	38° 54' 00" N	40° 34' 17" E
6	Bingöl	Bingöl	Kırkağıl	1731	38° 54' 48" N	40° 22' 42" E
7	Bingöl	Bingöl	Kurudere	1145	38° 54' 37" N	40° 28' 33" E
8	Bingöl	Bingöl	Sancak	1587	39° 54' 30" N	40° 22' 34" E
9	Bingöl	Bingöl	Sancaklı	1451	38° 60' 28" N	40° 28' 45" E
10	Bingöl	Bingöl	Sarıççek	1045	38° 53' 43" N	40° 35' 56" E
11	Bingöl	Bingöl	Üçyaka	1704	38° 50' 37" N	40° 27' 11" E
12	Bingöl	Bingöl	Yukarıağaçeli	1425	38° 58' 41" N	40° 42' 36" E
13	Bingöl	Bingöl	Yukarıpınar	1470	38° 51' 11" N	40° 28' 70" E
14	Bingöl	Genç	Ardıcdibi	1091	38° 46' 28" N	40° 36' 54" E
15	Bingöl	Genç	Derenköy	1363	38° 45' 30" N	40° 40' 80" E
16	Bingöl	Genç	Doğanca	1164	38° 42' 51" N	40° 32' 44" E
17	Bingöl	Genç	Yayla Bucağı	1345	38° 38' 18" N	40° 31' 41" E
18	Bingöl	Karlıova	Kalencik	1770	39° 90' 14" N	40° 45' 70" E
19	Bingöl	Karlıova	Kaynarpınar	1767	39° 23' 2.8" N	40° 45' 42" E
20	Bingöl	Karlıova	Viranşehir	1843	39° 22' 41" N	40° 57' 56" E
21	Bingöl	Kiğı	Demirakanat	1289	39° 13' 30" N	40° 19' 55" E
22	Bingöl	Solhan	Hazarşah	1313	38° 58' 27" N	40° 35' 25" E
23	Bingöl	Yayladere	Güneşlik	1371	39° 12' 10" N	40° 10' 43" E
24	Bingöl	Yedisu	Karapolat	1440	39° 26' 55" N	40° 29' 30" E
25	Diyarbakır	Diyarbakır	Yukarıkılıçtaşı	597	37° 56' 49" N	40° 14' 54" E
26	Diyarbakır	Çermik	Göktepe	716	38° 50' 34" N	39° 22' 31" E
27	Diyarbakır	Çınar	Yuvacık	558	37° 48' 56" N	40° 25' 15" E
28	Diyarbakır	Ergani	Yakacık	888	38° 15' 58" N	39° 50' 50" E
29	Diyarbakır	Ergani	Pınarkaya	860	38° 14' 56" N	39° 42' 50" E
30	Diyarbakır	Hani	Çardaklı	805	38° 20' 27" N	40° 22' 37" E
31	Diyarbakır	Hani	Serenköy	817	38° 24' 10" N	40° 30' 14" E
32	Diyarbakır	Hazro	Ormankaya	995	38° 17' 55" N	40° 46' 50" E
33	Diyarbakır	Kulp	Güllük	862	38° 28' 80" N	40° 53' 54" E
34	Diyarbakır	Kulp	İnkaya	789	38° 20' 54" N	41° 20' 51" E
35	Diyarbakır	Kulp	Zeyrek	864	38° 28' 60" N	40° 51' 31" E
36	Diyarbakır	Lice	Savat Bucağı	925	38° 17' 55" N	40° 46' 50" E

Collection and identification

The present study is based on 37 braconid specimens collected around *Euphorbia macroclada* in different areas of Bingöl and Diyarbakır provinces using a sweep net in the period of 2017-2023 (Figure 1, Table 1). The specimens were prepared for examination and identification. For identification to the subfamily level, we use van Achterberg's key (1993). For the generic and specific levels, we used Nixon (1986), Simbolotti & van Achterberg (1999), Sharkey et al. (2009), van Achterberg & Long (2010), van Achterberg (2011), Edmardash & Gadallah (2023), Shaw et al. (2022) [Agathidinae], Quicke (1987), Beyarslan & Fischer (1990), Tobias (1995), Beyarslan et al. (2006, 2008), Quicke et al. (2022) [Braconinae], Aydoğdu (2008), Edmardash & Gadallah (2019), Ranjith & Priyadarsanan (2023) [Cheloninae], van Achterberg & Haeselbarth (2003) [Euphoridae], Fernandez-Triana & van Achterberg (2017), Shaw et al. (2024) [Microgastrinae], van Achterberg (2023) [Opiinae]; van Achterberg & Shaw (2016), van Achterberg et al. (2020) [Rogadinae]. Distribution of species is based on Yu et al. (2016) and Gadallah et al. (2022).

List of abbreviations: AS = Abdominal sternites, 1CU1 = first abscissa of cubital vein, 2CU1 = second abscissa of cubital vein, cu-a = cubito-anal transverse vein, 1-M = first abscissa of medial vein, 1r-m = radio-medial transverse vein, 1-SR+M = first abscissa of sectio-radial vein amalgamated with median vein, 2-SC+R = second abscissa of sectio-radial vein amalgamated with radial vein, 3-SR = third abscissa of sectio-radial vein, M+CU (=M+CU1) = medial vein amalgamated with cubital vein, MOD = Maximum diameter of lateral ocellus, OOL = ocular-ocellar length, r = first abscissa of radial vein, r-m = radio-medial transverse vein, T = abdominal tergites.

RESULTS

In total, there are 19 braconid species in 11 genera and seven subfamilies: Agathidinae (one genus, one species), Braconinae (five genera, seven species), Cheloninae (one genus, five species), Euphorinae (one genus, one unidentified species), Microgastrinae (one genus, one species), Opiinae (one genus, one species), and Rogadinae (one genus, three species, of which one is unidentified). A faunistic list comprising the species, previous records from Türkiye, and extralimital distribution is provided for each species. All specimens are deposited in the Efflatoun Bey Collection, Cairo University, Faculty of Science, Entomology Department (EFC) (Cairo, Egypt) and Bingöl University, Agriculture Faculty, Department of Plant Protection (Bingöl, Türkiye).

List of species

Subfamily Agathidinae

Agathis anglica Marshall, 1885

Agathis anglica Marshall, 1885: 265, ♀, ♂.

Material examined: 1♀, Bingöl: Kurudere [38° 54' 37" N, 40° 28' 33" E], 1145 m, 7.v.2023, sweep net, leg. Emin Kaplan.

Previous records from Türkiye: Imbros & Tenedos Islands (Beyarslan et al., 2002a); Eastern Anatolia (Çetin Erdoğan, 2013), Diyarbakır, Mardin, and Şanlıurfa provinces (Çetin Erdoğan, 2014), Marmara region (Çetin Erdoğan & Beyarslan, 2001), East Black Sea region (Çetin Erdoğan & Beyarslan, 2009), Erzurum Province (Güçlü & Özbek (2002), Central Anatolia Region (Çetin Erdoğan & Beyarslan, 2016), Aegean region, Southeastern region (Çetin Erdoğan et.al, 2009)

Extralimital distribution: Egypt (Edmardash & Gadallah, 2023), Morocco, Europe, Thailand, Ukraine (Shaw et al., 2022).

Comments. *Agathis anglica* was previously recorded from Diyarbakır by Çetin Erdoğan (2013). First record for Bingöl and in association with *Euphorbia macroclada* Boiss.

Subfamily Braconinae

Bracon (Bracon) intercessor Nees, 1834

Bracon intercessor Nees, 1834: 71, ♀, ♂.

Material examined: 1♂, Bingöl: Sancak [39° 54' 30" N, 40° 22' 34" E], 1587 m, 29.v.2023, sweep net, leg. Emin Kaplan.

Previous records from Türkiye: Adana, Antalya, Burdur, Hatay, Isparta, İçel, Kahramanmaraş (Beyarslan, 1986), Adapazarı, Afyonkarahisar, Antalya, Bilecik, Bursa, Çanakkale, Edirne, Gaziantep, İstanbul, Izmit, Kırklareli, Tekirdağ (Beyarslan & İnanç, 1995), Aegean region (Beyarslan et al., 2002b), Haymana (Güler & Çağatay, 2007), East Black Sea (Beyarslan & Cetin Erdogan, 2010), Erzurum (Beyarslan, 1999; Güçlü & Özbek, 2011), Çanakkale (Beyarslan et al., 2002a), Ganos Mountains (Beyarslan et al., 2006), İzmir Province (Civelek et al., 2002), North-eastern Anatolia (Beyarslan, 2016), Northern Türkiye (Beyarslan et al., 2008), South-eastern Anatolia (Beyarslan et al., 2014), Western Black Sea region (Beyarslan et al., 2005), Bitlis (Beyarslan & Şahin, 2019).

Extralimital distribution: Afghanistan, Europe, Iran, Israel/Palestine, Kazakhstan, Russia, Syria, Turkmenistan.
Comment. This is the first record of *B. intercessor* in association with *E. macroclada* Boiss.

***Bracon (Glabrobracon) lividus* Telenga, 1936**

Bracon lividus Telenga, 1936: 390, ♀.

Material examined: 1♀, Bingöl: Genç, Derenköy [38° 45' 30" N, 40° 40' 80" E], 1363 m, 8.v.2022, sweep net, leg. E. Kaplan; 1♀, Bingöl: Kırkağıl [38° 54' 48" N, 40° 22' 42" E], 1731 m, 27.v.2022, sweep net, leg. E. Kaplan; 1♂, Bingöl: Yukarıağaçeli [38° 58' 41" N, 40° 42' 36" E], 1425 m, 31.v.2023, sweep net, leg. E. Kaplan; 1♀, Bingöl: Karlhova, Kalencik [39° 90' 14" N, 40° 45' 70" E], 1770 m, 6.vi.2023, sweep net, leg. E. Kaplan.

Previous records from Türkiye: Bitlis (Beyarslan & Şahin, 2019), Marmara, Mediterranean regions of Türkiye (Beyarslan, 1999), North-eastern Anatolia (Beyarslan, 2016), East Black Sea region (Beyarslan & Çetin Erdoğan, 2010), Imbros & Tenedos Islands (Beyarslan et al., 2002a), South-eastern Anatolia (Beyarslan et al., 2014).

Extralimital distribution: Armenia, Cyprus, Germany, Greece, Hungary, Iran, Israel/Palestine, Russia.

Comments. This is the first record of *B. lividus* in Bingöl, and in association with *E. macroclada*.

***Bracon (Glabrobracon) variator* Nees, 1811**

Bracon variator Nees, 1811: 7, ♀.

Material examined: 1♀, Diyarbakır: Lice, Savat Bucağı [38° 17' 55" N, 40° 46' 50" E], 925 m, 14.v.2023, sweep net, leg. E. Kaplan.

Previous records from Türkiye: Mediterranean regions of Türkiye (Beyarslan, 1986), Thrakien Gebiet (Beyarslan, 1987), Mediterranean and Marmara regions (Beyarslan, 1999), Ankara Province (Güler & Çatağay, 2001), Aegean region (Beyarslan et al., 2002b), Erzurum (Güçlü & Özbek, 2011), Imbros & Tenedos Islands (Beyarslan et al., 2002a), Western Black Sea region (Beyarslan et al., 2005), Ganos Mountain (Thrace region) (Beyarslan et al., 2006), Northern Türkiye (Beyarslan et al., 2008), East Black Sea region (Beyarslan & Çetin Erdoğan, 2010), Fifteen not mentioned localities in Türkiye (Papp, 2012), South-eastern Anatolia (Beyarslan et al., 2014), North-Eastern Anatolia (Beyarslan, 2016), Bitlis Province (Beyarslan & Şahin, 2019).

Extralimital distribution: Azerbaijan, Europe, Iran, Israel/Palestine, Jordan, Kazakhstan, Syria, Turkmenistan.

Comments. *Bracon variator* was previously recorded in Bingöl (Beyarslan & Şahin, 2019), and in association with *E. macroclada*. It was reported on *Euphorbia* sp. as one of its plant associates in Bitlis Province by Beyarslan & Şahin, 2019.

***Glyptomorpha (Glyptomorpha) pectoralis* (Brullé, 1832)**

Vipio pectoralis Brullé, 1832: 382, ♀, ♂.

Material examined: 1♂, Bingöl: Sarıççek [38° 53' 43" N, 40° 35' 56" E], 1045 m, 16.v.2019, sweep net, leg. E. Kaplan; 1♂, Bingöl: Yayladere, Güneşlik [39° 12' 10" N, 40° 10' 43" E], 1371 m, 13. vi.2019, sweep net, leg. E. Kaplan; 1♂, Diyarbakır, Çermik, Göktepe [38° 50' 34" N, 39° 22' 31" E], 716 m, 24.iii.2019; 1♀, Bingöl: Karlhova, Viranşehir [39° 22' 41" N, 40° 57' 56" E], 1843 m, 1.iv.2019, sweep net, leg. E. Kaplan; 1♀, Bingöl: Çiçekyayla [38° 49' 22" N, 40° 27' 48" E], 1511 m, 23.v.2019, sweep net, leg. E. Kaplan; 1♂, Diyarbakır: Kulp, İnkaya [38° 20' 54" N, 41° 20' 51" E], 789 m, 12.iv.2019, sweep net, leg. E. Kaplan; 1♂, Bingöl: Genç, Doğanca [38° 42' 51" N, 40° 32' 44" E], 1164 m, 16.v.2019, sweep net, leg. E. Kaplan.

Previous records from Türkiye: Adana, Adıyaman, Edirne, Erzurum (Beyarslan, 1991), Mediterranean and Marmara regions (Beyarslan, 1999; Beyarslan et al., 2006), North-eastern Anatolia (Beyarslan, 2016), Marmara (Beyarslan & İnanç, 1994), Aegean region (Beyarslan et al., 2002b), Western Black Sea region (Beyarslan et al., 2005), East Black Sea (Beyarslan & Cetin, 2010), South-eastern Anatolia (Beyarslan et al., 2014), Bitlis Province (Beyarslan et al., 2014; Beyarslan & Şahin, 2019).

Extralimital distribution: Afghanistan, Azerbaijan, Central Asia, China, Croatia, Europe, India, Iran, Israel/Palestine, Kazakhstan, Malaysia, North Africa, Mozambique, Pakistan, Russia, South Africa, Ukraine.

Comments. This is the first record of *G. pectoralis* in association with *E. macroclada*.

***Iphiaulax (Iphiaulax) impostor* (Scopoli, 1763)**

Ichneumon impostor Scopoli, 1763: 287, sex undetermined.

Material examined: 1♀, Bingöl: Sancaklı [38° 60' 28" N, 40° 28' 45" E], 1451 m, 12.v.2019, sweep net, leg. E. Kaplan.

Previous records from Türkiye: Bilecik, Belgrader wald (Fahringer, 1922), Imbros & Tenedos (Beyarslan et al., 2002a), Mediterranean and Marmara regions (Beyarslan, 1999), Kars & Erzurum Provinces (Özbek et al., 2009)

Extralimital distribution: Algeria, Azerbaijan, Central Asia, China, Croatia, Europe, Iran, Israel/Palestine, Japan, Korea, Morocco, Russia, Sudan, Ukraine.

Comments. This is the first record of *I. impostor* in association with *E. macroclada*.

***Pseudovipio castrator* (Fabricius, 1798)**

Ichneumon castrator Fabricius, 1798: 223, ♀.

Material examined: 1♂, Bingöl: Üçyaka [38° 50' 37" N, 40° 27' 11" E], 1704 m, 13. vi.2023, sweep net, leg. E. Kaplan.
Previous records from Türkiye: Adana, Adiyaman, Antalya, Erzurum, İçel, Kırklareli, Tekirdağ-Ganos (Beyarslan, 1991), Amasya (Fahringer, 1922), Artvin (Güçlü & Özbek, 2011), Holzschlügen (Fahringer, 1926), Imbros & Tenedos Islands (Beyarslan et al., 2002a), Marmara (Beyarslan & Inanç, 1994; Beyarslan, 1999), North Türkiye (Beyarslan et al., 2008), North-eastern Anatolia (Beyarslan, 2016), South-eastern Anatolia (Beyarslan et al., 2014), Western Black Sea region (Beyarslan et al., 2005).

Extralimital distribution: Algeria, Azerbaijan, Croatia, Egypt, Europe, Iran, Israel, Palestine, Russia, Sudan, Ukraine.

Comments. This is the first record of *P. castrator* in Bingöl, and in association with *E. macroclada*.

***Vipio mlokossewiczii* Kokujev, 1898**

Vipio mlokossewiczii Kokujev, 1898: 295, ♀.

Material examined: 1♀, Bingöl: Solhan, Hazarşah [38° 58' 27" N, 40° 35' 25" E], 1313 m, 31.v.2023, sweep net, leg. E. Kaplan.

Previous records from Türkiye: Amasya-Merzifon-Tavsan, Afyon-Bolvadin-Kapaklı, Ordu-Akkus-Yakarıdüğencili, Ordu-Catalpınar (Beyarslan et al., 2008), South-eastern Anatolia (Beyarslan et al., 2014), Bingöl, Diyarbakır (Korkmaz & Kaplan, 2022).

Extralimital distribution: Afghanistan, Azerbaijan, Cyprus, Georgia, Iran, Israel/Palestine, Romania, Tajikistan, Turkmenistan, Uzbekistan.

Comments. This is the second record of *V. mlokossewiczii* from Bingöl and Diyarbakır, and the first record of it in association with *E. macroclada*. It was previously recorded from both provinces by Korkmaz & Kaplan (2022).

Subfamily Cheloninae

***Chelonus (Chelonus) elongatus* Szépligeti, 1898**

Chelonus elongatus Szépligeti, 1898: 208, ♂.

Material examined: 1♂, Diyarbakır: Yukarıkılıçtaşı [37° 56' 49" N, 40° 14' 54" E], 597 m, 29. iii 2018, sweep net, leg. E. Kaplan.

Previous records from Türkiye: Istanbul (Aydoğdu & Beyarslan, 2007), Bitlis (Beyarslan et al., 2020).

Extralimital distribution: China, Finland, Germany, Hungary, Iran, Poland, Serbia, Switzerland.

Comments: This is the second record of *C. elongatus* for the Turkish fauna, and the first record from Bingöl in association with *E. macroclada*.

***Chelonus (Chelonus) inanitus* (Linnaeus, 1767)**

Cynips inanita Linnaeus, 1767: 919, sex undetermined.

Material examined: 1♀, Bingöl: Sancak [39° 50' 30" N, 40° 22' 34" E], 1587 m, 29.v.2023, sweep net, leg. E. Kaplan; 1♀, Bingöl: Garip [38° 46' 50" N, 40° 33' 17" E], 992 m, 20.v.2018, sweep net, leg. E. Kaplan; 1♂, Bingöl: Celtiksuyu [38° 51' 10" N, 40° 35' 10" E], 1015 m, 23.vi.2023, sweep net, leg. E. Kaplan; 1♂, Bingöl: Karlıova, Kaynarıpınar [39° 23' 2.8" N, 40° 45' 42" E], 1767 m, 1.vi.2019, sweep net, leg. E. Kaplan; 1♂, Bingöl: Ekinyolu [38° 54' 00" N, 40° 34' 17" E], 1036 m, 12.vi.2021, sweep net, leg. E. Kaplan; 1♂, Bingöl: Yedisu, Karapolat [39° 26' 55" N, 40° 29' 30" E], 1440 m, 2.vi.2019, sweep net, leg. E. Kaplan.

Previous records from Türkiye: Eskişehir-Alpu-Karakütük (Aydoğdu, 2017), Iğdır-Merkez (Beyarslan et al., 2020), Imbros & Tenedos Islands (Beyarslan et al., 2002a), Erciyes-Dağı (Kohl, 1905), Eregli (Fahringer, 1922), Marmara (Aydoğdu & Beyarslan, 2002), Giresun-Dereli-Kümbet, Trabzon-Maçka-Ocaklı (Aydogdu & Beyarslan, 2011), Marmara, western and middle Black Sea region (Aydogdu & Beyarslan, 2007).

Extralimital distribution: Algeria, China, Croatia, Egypt, Europe, Iran, Israel/Palestine, Kazakhstan, Korea, Russia, USA (introduced).

Comments. This is the first record of *inanitus* in association with *E. macroclada*.

***Chelonus (Chelonus) obscuratus* Herrich-Schäffer, 1838**

Chelonus obscuratus Herrich-Schäffer, 1838: 154, ♀, ♂.

Material examined: 1♂, Bingöl: Genç, Yayla Bucağı [38° 38' 18" N, 40° 31' 41" E], 1345 m, 15.v.2023, sweep net, leg. E. Kaplan.

Previous records from Türkiye: Adana, Antalya, Burdur, Gaziantep, Kahramanmaraş, Icel, Isparta (Beyarslan, 1985), Eskişehir-Sivrihisar-Babadat (Aydoğdu, 2017), Aydın, Denizli (Beyarslan et al., 2002), Bilecik, Kastamonu, Sinop (Aydoğdu & Beyarslan, 2007), Eastern Mediterranean region of Türkiye (Sertkaya & Bayram, 2005), Giresun (Aydoğdu & Beyarslan, 2011), Bingöl (Korkmaz & Kaplan, 2022), Van, Gaziantep (Beyarslan et al., 2020).

Extralimital distribution: China, Egypt, Europe, Israel/Palestine, Kazakhstan, Russia, Tunisia, Ukraine (Yu et al., 2016), Iran (Ameri et al., 2018).

Comments. This is the second record of *C. obscuratus* in Bingöl, and the first record in association with *E. macroclada*. As it was first recorded from Bingöl by Korkmaz & Kaplan (2022).

***Chelonus (Chelonus) scabrator* (Fabricius, 1793)**

Ichneumon scabrator Fabricius, 1793: 174, sex undetermined.

Material examined: 1♂, Bingöl: Yukarıpınar [38° 51' 11" N, 40° 28' 70" E], 1470 m, 12. vi.2023, sweep net, leg. E. Kaplan.

Previous records from Türkiye: Bayburt-Konursu, Gümüşhane-Şiran-Karşeyh (Aydoğdu & Beyarslan, 2011), Central Anatolia (Aydoğdu, 2017), Marmara, Western and Middle Black Sea regions (Aydoğdu & Beyarslan, 2007), Afyon, Bursa, Edirne, Istanbul, İzmit, Denizli, Muğla, Tekirdağ, Uşak (Aydoğdu & Beyarslan, 2002), Ganos Mountain (Thrace region) (Beyarslan et al., 2006), Uplands of Türkiye (1000-2000m) (Lozan, 2005).

Extralimital distribution: China, Europe, Iran, Kazakhstan, Russia, Ukraine.

Comments. This is the first record of *C. scabrator* in Bingöl, and in association with *E. macroclada*.

***Chelonus (Microchelonus) ibericus* (Tobias, 2001)**

Microchelonus (Microchelonus) ibericus Tobias, 2001:

Material examined: 1♂, Bingöl: Kiğı, Demirkanat [39° 13' 30" N, 40° 19' 55" E], 1289 m, 29.v.2021, sweep net, leg. E. Kaplan.

Previous records from Türkiye: Ankara (Papp, 2014).

Extralimital distribution: Czech Republic, Spain.

Comments. This is the first record of *C. ibericus* in Bingöl, and in association with *E. macroclada*.

Subfamily Euphorinae

***Syntretus* sp.**

Material examined: 1♂, Bingöl: Celtiksuyu [38° 52' 57" N, 40° 35' 21" E], 1045 m, 20.v.2023, sweep net, leg. E. Kaplan.

Comments. The genus *Syntretus* is represented in Türkiye by three species: *S. daghestanicus* Tobias, 1976, *S. elegans* (Ruthe, 1856), and *S. ocularis* van Achterberg & Haeselbarth, 2003. But because of the bad condition of the specimen we have, in addition to being a male specimen, we could not identify it to the species level. This is also the first plant association for the genus.

Subfamily Microgastrinae

***Microplitis tuberculifer* (Wesmael, 1837)**

Microgaster tuberculifer Wesmael, 1837: 43, ♂, ♀.

Material examined: 1♂, Diyarbakır: Hazro, Ormankaya [38° 17' 55" N, 40° 46' 50" E], 995 m, 15.v.2023, sweep net, leg. E. Kaplan.

Previous records in Türkiye: Mediterranean area of Türkiye (Beyarslan, 1988), Istranca Mountains (İnanç & Beyarslan, 2001), Thrace region, Gaziantep and Şanlıurfa (İnanç and Beyarslan, 1997), East Marmara region (İnanç & Beyarslan, 2001), Aegean region (Beyarslan et al., 2002b).

Extralimital distribution: Azerbaijan, China, Croatia, Europe, India, Japan, Kazakhstan, Korea, Kyrgyzstan, Mongolia, Morocco, Russia, Ukraine, Uzbekistan, Vietnam.

Comments. This is the first record of *M. tuberculifer* in Bingöl, and in association with *E. macroclada*.

Subfamily Opiinae

***Biosteres (Biosteres) analis* (Wesmael, 1835)**

Opius analis Wesmael, 1835: 130, ♀.

Material examined: 1♀, Diyarbakır: Ergani, Yakacık [38° 15' 58" N, 39° 50' 50" E], 888 m, 24. iii.2019, sweep net, leg. E. Kaplan.

Previous records from Türkiye: Bilecik-Ayvacık (Beyarslan, 2015a).

Extralimital distribution: Europe, Russia.

Comments. This is the first record of *B. analis* in Bingöl, and in association with *E. macroclada*.

Subfamily Rogadinae

Aleiodes aestuosus (Reinhard, 1863)

Rhogas aestuosus Reinhard, 1863: 265, ♀.

Material examined: 1♀, Diyarbakır: Kulp, Zeyrek [38° 28' 60" N, 40° 51' 31" E], 864 m, 21.v.2017, sweep net, leg. E. Kaplan.

Previous records from Türkiye: no locality cited (van Achterberg et al., 2020).

Extralimital distribution: Afghanistan, Albania, Armenia, Azerbaijan, Bulgaria, Cyprus, Georgia, Greece, Iran, Iraq, Israel/Palestine, Jordan, Russia, Syria, Tunisia, Turkmenistan, Uzbekistan.

Comments. This is the first record of *A. aestuosus* in Bingöl and in association with *E. macroclada*.

Aleiodes schirjajewi (Kokujev, 1898)

Rhogas reticulator var. *schirjajewi* Kokujev, 1898: 299, ♂.

Material examined: 1♂, Diyarbakır: Hani, Serenköy [38° 24' 10" N, 40° 30' 14" E], 817 m, 14.v.2017, sweep net, leg. E. Kaplan; 1♂, Diyarbakır: Hani, Çardaklı [38° 20' 27" N, 40° 22' 37" E], 805 m, 14.v.2017, sweep net, leg. E. Kaplan; 1♀, Diyarbakır: Kulp, Güllük [38° 28' 80" N, 40° 53' 54" E], 862 m, 21.v.2017, sweep net, leg. E. Kaplan; 1♂, Bingöl: Genç, Ardicdibi [38° 46' 28" N, 40° 36' 54" E], 1091 m, 26.v.2017, sweep net, leg. E. Kaplan; 1♂, Diyarbakır: Çınar, Yuvacık [37° 48' 56" N, 40° 25' 15" E], 558 m, 26.iv.2017.

Previous records from Türkiye: East Marmara region (Aydoğdu & Beyarslan, 2006).

Extralimital distribution: Bulgaria, Hungary, Iran, Italy, Kazakhstan, Moldova, Russia, Ukraine.

Comments. This is the second record of *A. schirjajewi* for Türkiye, it was first recorded by Beyarslan (2015) from Marmara, and the first record of it in Bingöl and in association with *E. macroclada*.

Aleiodes sp.

Figures 2 (A-C), 3(A-C), 4(A-C)



Figure 2. *Aleiodes* sp. (male). A, lateral habitus; B, frontal view of head; C, fronto-ventral view of head showing hypoclypeal depression.

Şekil 2. *Aleiodes* sp. (erkek). A, lateral habitus; B, başın önden görünümü; C, hipoklipeal çöküntüsünü gösteren başın fronto-ventral görünümü.

Colour (Figures 2A-C, 2B). Head black (except clypeus, hypoclypeal depression, and mandible reddish); eye and ocelli black, palpi reddish yellow, antenna entirely black; mesosoma dark reddish (except axillae, metanotum, basal half of propodeum, posterior area of mesopleuron, and metapleuron are black); all legs reddish brown (including coxae); metasoma reddish brown, black at apex. Fore wing (Figure 4A) hyaline with black pterostigma and veins, with vein M+CU1 yellowish at base, vein 1-SR+M mostly yellowish; hind wing hyaline, with pale brown veins (Figure 4B).



Figure 3. *Aleiodes* sp. (male). A, lateral view of head and part of mesosoma; B, dorsal view of head and mesosoma; C, dorsal view of propodeum and first two metasomal tergites.

Şekil 3. *Aleiodes* sp. (erkek). A, başın ve mesosoma kısmının lateral görünümü; B, baş ve mesosoma kısmının dorsal görünümü; C, propodeumun ve ilk iki metasomal tergitin dorsal görünümü.

Head (Figures 2B, C, 3A, B). Occipital carina complete dorsally and ventrally; antenna with basal segments of flagellum distinctly longer than wide; OOL 1.6× MOD, finely coriaceous-rugulose; vertex rugose; clypeus 5.0× wider than long, ventral margin rather thin, indistinctly protruding medially (when seen in lateral view); width of hypoclypeal depression 0.26× minimum width of face; length of eye 1.3× length of temple in dorsal view; face behind antennal toruli transversely ridged; frons behind posterior ocellus transversely rugose; clypeus located near lower level of eye; malar space 1.3× as long as basal width of mandible; mandible not massive, sickle-shaped, sharply pointed at apex.

Mesosoma (Figures 2A, 3B, C). Lateral side of pronotum rugose; mesoscutal lobes finely punctate, with smooth interspaces; scutellum finely, superficially punctate, without lateral carina; axilla and metanotum coarsely longitudinally ridged; scutellar depression relatively large, densely carinated longitudinally; propodeum longitudinally ridged, more or less smooth posteriorly, with middle longitudinal carina not reaching posterior margin, with lateral complete longitudinal carina; mesopleuron smooth anteriorly and ventrally, remaining longitudinally rugulose; metapleuron coarsely puncto-rugose. *Legs* long and slender; hind coxa large, reaching 3/4th T₁ laterally; hind femur slender, 5.7× as long as its maximum width; hind tibia distinctly long, 12.5× as long as its apical width, distinctly curved along its outer side (except at basal third), with two subequal spurs; hind basitarsus 6.0× as long as wide; inner hind tibial spur 0.3× hind basitarsus; tarsal claws without pecten. *Fore wing* (Figure 4A) densely setose along its whole length, base normally setose; vein r 0.57× vein 3-SR; vein 1CU1 oblique, 0.25× vein 2CU1; vein r-m indistinctly sclerotized, 0.5× vein 3-SR; second submarginal cell relatively long; vein cu-a

inclivous, straight; vein 1-M slightly curved to nearly straight; hind wing (Figure 3B) with marginal cell gradually widened towards apex, its apical width 2.0× as wide as its width at level of hamuli; 2-SC+R subquadrate; vein m-cu entirely absent; M+CU: 1-M= 62: 38; vein 1r-m 0.8× 1-M.

Metasoma (Figs 2A, 4C). Densely finely pubescent, with whitish suberect setae; T₁ 0.8× as long as its apical width, T₁ and T₂ longitudinally rugulose, with distinct medio-longitudinal carina; medio-basal area of T₂ wide and short, smooth; T₃ longitudinally rugose, smooth apically.

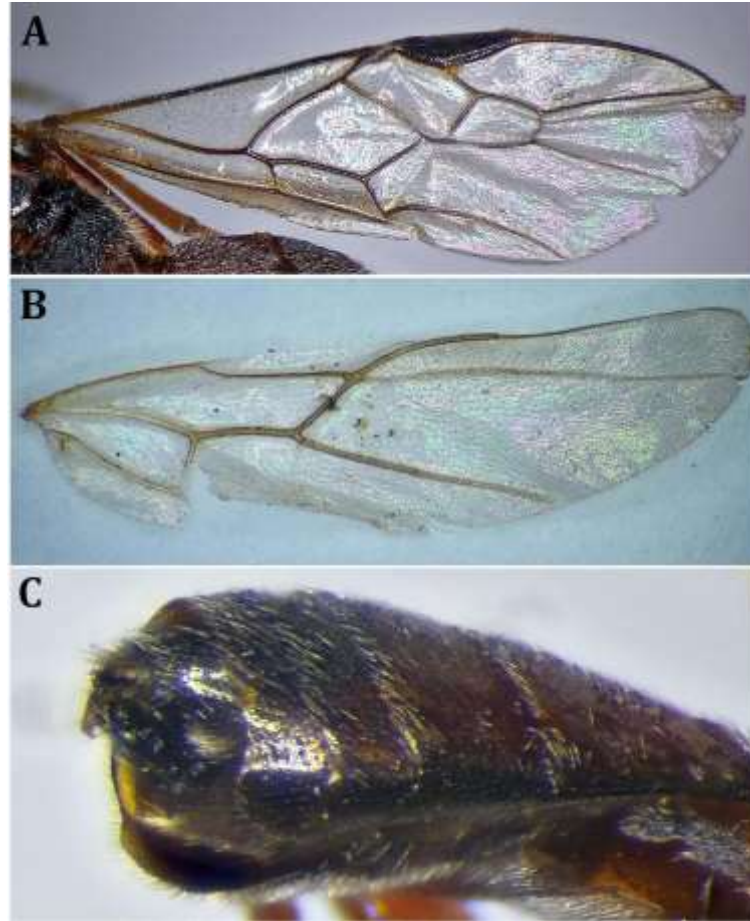


Figure 4. *Aleiodes* sp. (male). A fore wing; B, hind wing; C, lateral view of metasoma (part).
Şekil 4. *Aleiodes* sp. (erkek). A. ön kanat; B, arka kanat; C, metasoma'nın yan görünümü.

Material examined: 1♂, Diyarbakır: Ergani, Pınarkaya [38° 14' 56" N, 39° 42' 50" E], 860 m, 12.v.2017, sweep net, leg. E. Kaplan.

Remarks. Based on van Achterberg et al.'s key (2020: 19, couplet 3), our specimen agrees with *A. sibiricus* (Kokujev, 1903) in having anterior part of clypeus short and subparallel-sided, present near lower level of eye; hind femur slender; tarsal claws slender, without pecten; temple behind eye densely setose, convex and curved in dorsal view. However, it differs from *A. sibiricus* in having AS5-10 distinctly longer than broad (in *A. sibiricus*, AS5-10 as long as broad). Comparing with *A. sibiricus* description (van Achterberg et al., 2020: 227), it differs from it in the following combination of characters: frons coarsely transversely rugose (Figure 2B) (in *A. sibiricus*, frons smooth); OOL 1.6× MOD (in *A. sibiricus*, OOL 1.1× MOD); width of hypoclypeal depression 0.26× minimum width of face (in *A. sibiricus*, 0.5×); propodeum longitudinally rugose at base, nearly smooth posteriorly, with lateral protruding carina (in *A. sibiricus*, propodeum densely finely rugose, without lateral protruding carina); vein r of fore wing 0.57× vein 3-SR (in *A. sibiricus*, r 0.3× vein 3-SR); vein r-m 0.5× 3-SR (in *A. sibiricus*, r-m 0.7× 3-SR); hind femur 5.75× as long as its width (in *A. sibiricus*, hind femur 4.1× as long as wide); length of inner hind tibial spur 0.3× hind basitarsus (in *A. sibiricus*, 0.4×); T₁, T₂ and basal half of T₃ longitudinally striated, with distinct medio-longitudinal carina (in *A. sibiricus*, T₁ and T₂ densely finely rugose, but irregularly rugose on posterior quarter of T₂, both with indistinct medio-longitudinal carina, basal half of T₃ finely rugose); second submarginal cell of fore wing not short (in *A. sibiricus*, second submarginal cell of fore wing short).

Based on van Achterberg & Shaw (2016: 13, couplet 3), our specimen belongs to *Aleiodes apicalis* group for the following combination of characters: apical half of hind wing marginal cell gradually widened towards apex; metasomal T₂ with wide smooth, triangular area mediobasally; occipital carina reduced ventrally, not reaching hypostomal carina; and mesopleuron partly smooth and shiny. It is likely an undescribed species, but because the specimen is without incomplete antennae and the claws of the hind leg are missing, we have refrained from allocating a species name until more specimens are collected.

DISCUSSION

Taxonomic and faunistic knowledge of the braconid wasps in the Bingöl and Diyarbakır provinces is very poor due to the paucity of regional studies, in addition to some taxonomic complexities in the family Braconidae compared with the well-studied other Turkish provinces. The only recent studies concerning the family Braconidae in these two provinces under study were carried out by some authors (examples of those are Ölmez & Ulusoy, 2003; Çetin Erdoğan, 2013, 2014; Beyarslan, 2015a, b, 2019; Beyarslan & Devici, 2019; Beyarslan & Şahin, 2019; Beyarslan et al., 2020; Korkmaz & Kaplan, 2022).

In the present study, 19 braconid species in 11 genera and seven subfamilies (Agathidinae, Braconinae, Cheloninae, Euphorinae, Microgastrinae, Opiinae, and Rogadinae) are examined and identified using suitable, available keys, as well as by comparing with the original descriptions as closely as possible. All of the identified species are first recorded in association with *Euphorbia macroclada*, only *Bracon variator* was previously recorded in association with an unidentified *Euphorbia* sp. in Bingöl (Beyarslan & Şahin, 2019). On the other hand, all of them are recorded for the first time for Bingöl or Diyarbakır, except for four braconid species: *Agathis anglica* Marshall (Agathidinae) (Çetin Erdoğan, 2014), *Bracon variator* Nees (Beyarslan & Şahin, 2019), and *Vipio mlokoszewiczii* Kokujev (Korkmaz & Kaplan, 2022) (Braconinae), and *Chelonus obscurus* Herrich-Schäffer (Cheloninae) (Korkmaz & Kaplan, 2022).

Based on van Achterberg & Shaw (2016), this single *Aleiodes* specimen is found to belong to the *Aleiodes apicalis* group for the following reasons: apical half of hind wing marginal cell gradually widened towards apex; metasomal T₂ with a wide, smooth, triangular area mediobasally; occipital carina reduced ventrally, not reaching hypostomal carina; and mesopleuron partly smooth and shiny. Despite the possibility of intraspecific variation within species of this genus, on comparing this *Aleiodes* specimen precisely with other western Palaearctic species of the *apicalis* group (based on van Achterberg et al., 2020), it does not agree with any of them, so it is likely an undescribed species. But because of the bad condition of the specimen, we have refrained from allocating a species name until more specimens are collected.

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Author's Contributions

The authors declare that the contributions of the authors are equal.

Conflict of Interest Statement

There is no conflict of interest between the authors.

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