KSÜ Tarım ve Doğa Derg 28 (3), 778-792, 2025
KSU J. Agric Nat 28 (3), 778-792, 2025
https://doi.org/10.18016/ksutarimdoga.vi.1588413

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

Neveen S. GADALLAH[1], Emin KAPLAN[2]✉, Yusuf A. EDMARDASH[3]
[1]Department of Entomology, Faculty of Science, Cairo University, Giza, Egypt, [2]Bingol University, Faculty of Agriculture, Department of Plant Protection, Bingol-Türkiye, [3]Department of Entomology, Faculty of Science, Cairo University, Giza, Egypt,
[1]https://orcid.org/0000-0002-4381-9599, [2]https://orcid.org/0000-0002-9194-7018, [3]https://orcid.org/0000-0002-3365-0822
✉: eminkaplan021@gmail.com

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 mlokossewiczi* 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.

Plant Protection

Research Article

Article History
Geliş Tarihi : 20.11.2024
Kabul Tarihi : 27.03.2025

Keywords
Hymenoptera
Braconidae
Bingöl
Diyarbakır
Euphorbia macroclada

Bingöl ve Diyarbakır İllerinin (Türkiye'nin Doğusu) Braconid Biyoçeşitliliği (Hymenoptera: Ichneumonoidea: Braconidae)

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 mlokossewiczi* 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 resimleriyle birlikte tam bir tanımlama sağlanmıştır.

Bitki Koruma

Araştırma Makalesi

Makale Tarihçesi
Received : 20.11.2024
Accepted : 27.03.2025

Anahtar Kelimeler
Hymenoptera
Braconidae
Bingöl
Diyarbakır
Euphorbia macroclada

Atıf Şekli: Gadallah, N.S., Kaplan, E., & Edmardash, Y.A. (2025). Bingöl ve Diyarbakır İllerinin (Türkiye'nin Doğusu) Braconid Biyoçeşitliliği (Hymenoptera: Ichneumonoidea: Braconidae). *KSÜ Tarım ve Doğa Derg 28* (3), 778-792. https://doi.org/10.18016/ksutarimdoga.vi.1588413

To Cite : Gadallah, N.S., Kaplan, E., & Edmardash, Y.A. (2025). The Braconid Biodiversity (Hymenoptera: Ichneumonoidea: Braconidae) of Bingöl, and Diyarbakır Provinces (Eastern Türkiye). *KSÜ Tarım ve Doğa Derg 28* (3), 778-792. https://doi.org/10.18016/ksutarimdoga.vi.1588413

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 & Kilinçer (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).

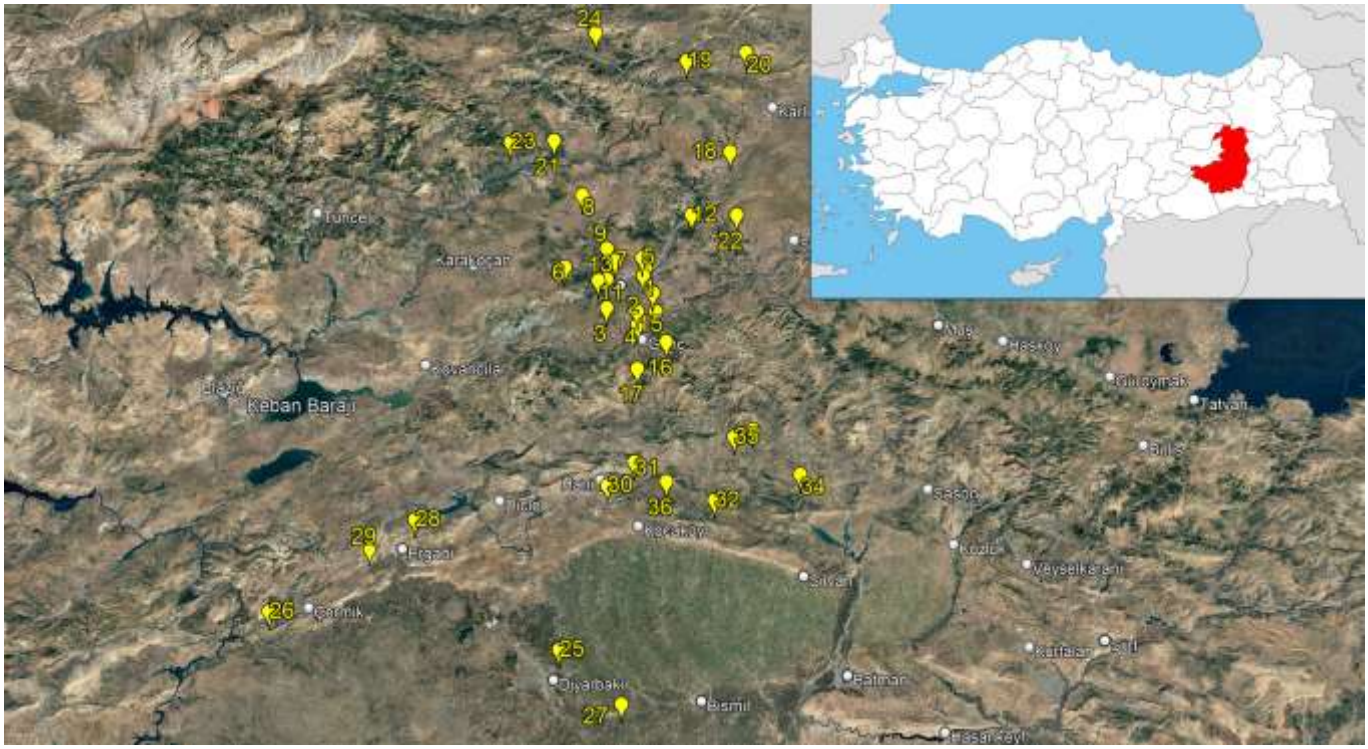

Figure 1. Sampling sites in Bingöl and Diyarbakır.
Şekil 1. Bingöl ve Diyarbakır'da örnek toplanan lokaliteler.

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)	Cordinates	
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	Sarıçiçek	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	Ardıçdibi	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	Demirkanat	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, Içel, Kahramanmaraş (Beyarslan, 1986), Adapazarı, Afyonkarahisar, Antalya, Bilecik, Bursa, Çanakkale, Edirne, Gaziantep, Istanbul, 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), Izmir 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: Karlıova, 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 Maramara 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 Erdogan, 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: Sarıçıçek [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: Karlıova, 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, Içel, Kırklareli, Tekirdağ-Ganos (Beyarslan, 1991), Amasya (Fahringer, 1922), Artvin (Güçlü & Özbek, 2011), Holzschlägen (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 mlokossewiczi Kokujev, 1898

Vipio mlokossewiczi 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. mlokossewiczi* 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, Kaynarpınar [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), Aydin, 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-Karaşeyh (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 (Aydogdu & 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-Ayvacik (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, Ardıçdibi [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 Maramara 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).

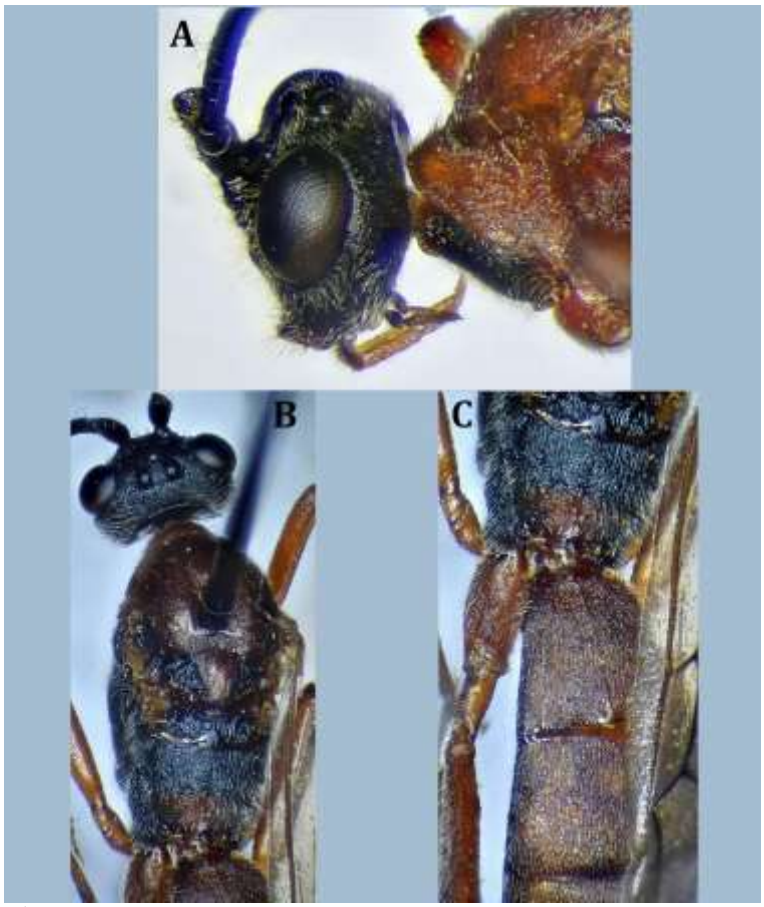

Figure 3. *Aleiodes* sp. (male). A, lateral view of head and part of mesosoma; B, dorsal view of head and mesosoma; C, dorsal view of propodeum and first two metasomal tergites.

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 T_1 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; T_1 0.8× as long as its apical width, T_1 and T_2 longitudinally rugulose, with distinct medio-longitudinal carina; medio-basal area of T_2 wide and short, smooth; T_3 longitudinally rugose, smooth apically.

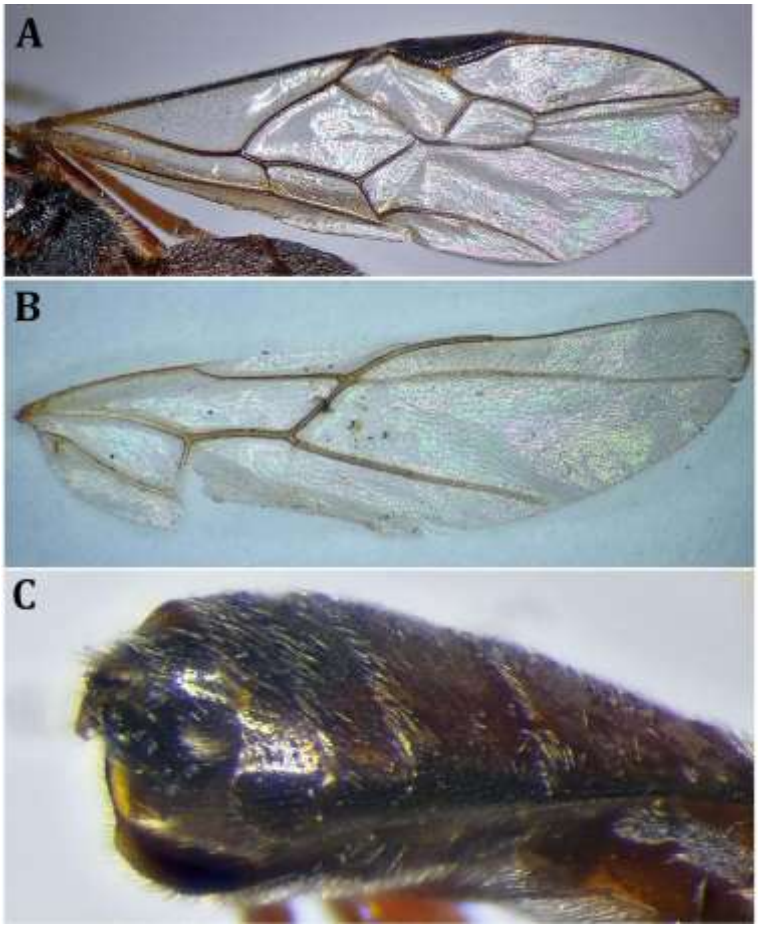

Figure 4. *Aleiodes* sp. (male). A fore wing; B, hind wing; C, lateral view of metasoma (part).
Şekil 4. *Aleiodes* sp. (erkek). A. ön kanat; B, arka kanat; C, metasoma'nın yan görünümü.

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×); T_1, T_2 and basal half of T_3 longitudinally striated, with distinct medio-longitudinal carina (in *A. sibiricus*, T_1 and T_2 densely finely rugose, but irregularly rugose on posterior quarter of T_2, both with indistinct medio-longitudinal carina, basal half of T_3 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 T_2 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 mlokossewiczi* 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 T_2 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.

ACKNOWLEDGEMENTS

The authors would like to thank Bingöl University for their contributions to laboratory and field studies.

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.

REFERENCES

Ameri, A., Talebi, A.A. & Ebrahimi, E. (2018). A taxonomic study on genus *Chelonus* Panzer, 1806 (Hymenoptera: Braconidae: Cheloninae) from Hormozgan province with five new records for Iranian fauna. *In Proceedings of the 23rd Iranian Plant Protection Congress, Gorgan University of Agricultural Sciences and Natural Resources. 27-30 August 2018 (p. 962).*

Anonymous. (2024a). Bingöl geographical and climate features. *https://tr.wikipedia.org/wiki/Bing%C3%B6l_(il (Access date: November 1, 2024).*

Anonymous. (2024b). Republic Of Turkey Ministry Of Agriculture And Forestry Diyarbakır Provincial Directorate Of Agriculture And Forestry. Climate and Vegetation, *https://diyarbakir.tarimorman.gov.tr/Menu/32/Iklimi-Ve-Bitki-Ortusu (Access date: November 1, 2024).*

Anonymous. (2025). Bingöl Geographical Status. *https://bingol.csb.gov.tr/cografi-durumu-i-1393 (Access date: March 25, 2024).*

Anonymous. (2025b). Diyarbakır province. *https://tr.wikipedia.org/wiki/Diyarbak%C4%B1r_(il) Access date: March 25, 2024).*

Austin, A. & Dowton, M. (2000). Hymenoptera: evolution, biodiversity, and biological control. Canberra: CSIRO, 512 pp.

Aydoğdu, M. (2008). A new species of the genus *Chelonus* Panzer, 1806 (Hymenoptera: Braconidae: Cheloninae) from Western Anatolia (Türkiye). *Biologia, 63*(2), 245-248.

Aydoğdu, M. (2017). İç Anadolu Bölgesi *Chelonus* Panzer, 1806 (Hymenoptera, Braconidae, Cheloninae) Faunası Üzerine Taksonomik bir Araştırma. *Journal of Tekirdag Agricultural Faculty, 14*(02), 64-70.

Aydoğdu, M. & Beyarslan, A. (2002). The *Chelonus* Jurine (Hymenoptera: Braconidae: Cheloninae) species of the Marmara Region. *Turkish Journal of Zoology, 26*, 1-13.

Aydoğdu, M. & Beyarslan, A. (2006). *Microchelonus* Széplıgetı, 1908 (Hymenoptera: Braconidae: Cheloninae) species from Marmara, Western and Black Sea regions of Turkey. *Linzer biologische Beiträge, 38*(1), 397-407.

Aydoğdu, M. & Beyarslan, A. (2007). Parasitoid species of the genera *Ascogaster* and *Chelonus* (Hymenoptera: Braconidae: Cheloninae) from the Marmara, Western and Middle Black sea regions of Turkey. *Acta Entomologica Slovenica, 15*, 75–90.

Aydoğdu, M. & Beyarslan, A. (2011). Additional notes on *Chelonus* Panzer, 1806 Fauna of Turkey with new records (Hymenoptera, Braconidae, Cheloninae). *Journal of the Entomological Research Society,* 13, 75-81.

Behçet, L.(2025). A New Annual *Veronica* (Plantaginaceae) From Bingöl, Türkiye. *KSU J. Agric. Nat. 28* (2), 423-431. DOI: 10.18016/ksutarimdoga.vi.1576018

Beyarslan, A. (1985). Die im Mittelmeergebiet der Turkei vertretenen Cheloninae-Arten (Hym: Braconidae) und ihre Verbreitung. *Turkish Journal of Zoology, 9*, 12–19.

Beyarslan, A. (1986). Türkiye'nin Akdeniz Bölgesinde saptanan *Bracon* F. (Hym.: Braconidae: Braconinae) türleri üzerinde araştirmalar I. *Doğa, (A2) 10* (1), 39-52.

Beyarslan, A. (1987). Trakya Bögesinde Braconinae (Hym.: Braconidae) faunasi üzeride sistematik araştirmalar. Türkiye I. Entomoloji Kongresi, Izmir. *Entomoloji Derneği yayinlari*, *13-16 Ekim 1987. 3*, 595-604.

Beyarslan, A. (1988). Zwei neue Arten der Familie Braconidae (Hym.) aus der Türkei. Zeitschrift der Arbeitsgemeinschaft Österrische. *Entomologen, 39* (3-4), 71-76.

Beyarslan, A. (1991). Die Arten der Tribus Vipionini Telenga aus der Türkei (Hym.: Braconidae: Braconinae). *Linzer biologische Beiträge*, *2372*, 495-519.

Beyarslan, A. (1999). Liste der Braconinae-Arten der Mittelmeer- und Marmara Region der Türkei (Hymenoptera: Braconidae). *Entomofauna, 20* (5), 93-120.

Beyarslan A. (2015a). Taxonomical investigations on the fauna of Opiinae (Hymenoptera: Braconidae) in Ardahan, Erzurum, Iğdır, and Kars provinces of the Turkish northeastern Anatolian region. *Turkish Journal of Zoology, 39*, 820-831.

Beyarslan, A. (2015b). Taxonomic survey on the Rogadinae Förster, 1862 (Hymenoptera, Braconidae) in the northeastern Anatolian region, Turkey. *Turkish Journal of Zoology, 39*, 811-819.

Beyarslan, A. (2016). Taxonomic investigations on the Braconinae fauna (Hymenoptera, Braconidae) in north-eastern Anatolian region, Turkey, with the description of a new species. *Zootaxa, 4079* (1), 1-33.

Beyarslan, A. (2019). Taxonomic studies on the Opiinae (Hymenoptera, Braconidae) fauna of the Turkish central part of eastern Anatolia Region (Bingöl, Bitlis, Muş and Van). *Acta Biologica Turcica, 33*(1), 1-7.

Beyarslan, A. & Çakici, M. (2021). Contribution to the Rogadinae (Hymenoptera, Braconidae) fauna of Turkey. *Natura Somogyiensis, 37*, 65-78.

Beyarslan, A. & Çetin Erdoğan, Ö. (2010). New data on zoogeography and taxonomy of the East Black Sea Region species of Braconinae (Hymenoptera: Braconidae) in Turkey. *Journal of the Entomological Research Society, 12* (2), 51-56.

Beyarslan, A. & Devici, R. (2019). taxonomic studies on the Brachistini (Hymenoptera, Braconidae, Brachistinae) fauna of the eastern Anatolia region (Bingöl, Bitlis, Muş, and Van) from Turkey. *Journal of Science and Technology, 9*(2), 63-66.

Beyarslan, A. & Fischer, M. (1990). Bestimmungsschlüssel zur Identifikation der palaarktischen *Bracon*-Arten des Subgenus *Glabrobracon* Tobias (Hym.: Braconidae: Braconinae). *Annalen des Naturhistorischen Museums in Wien, 91*(B), 137-145.

Beyarslan, A. & İnanç, F. (1994). Marmara Blgesi Braconinae (Hym.: Braconidae) Faunası -zerinde Taksonomik Araştırmalar I. Türkiye III. Biyolojik Mücadele Kongresi Bildirileri, Entomoloji Derneği Yayınları, 25- 28 Ocak 1994, İzmir, *7*, 67- 82.

Beyarslan, A. & İnanç, F. (1995). Marmara Blgesi' nin Doğu Kesiminin Braconidae (Hym.) Faunasının Tespiti. *Proje No: TBAG- 1135, pp. 240*

Beyarslan, A. & Şahin, F. (2019). Ectoparasitoid Braconinae species (Hymenoptera: Braconidae) of plant pest (Coleoptera, Diptera, Lepidoptera and Hymenoptera) determined from Bingöl, Bitlis, Muş and Van provinces of Turkey. *Munis Entomology & Zoology*, *14*(1), 130-147.

Beyarslan, A., Inanç, F., Çetin, Ö. & Aydoğdu, M. (2002a). Braconiden von den turkischen Inseln Imbros und Tenedos (Hymenoptera, Braconidae, Agathidinae, Braconinae, Cheloninae, Microgastrinae). *Entomofauna, 23*, 173-188.

Beyarslan, A., Inanç, F., Çetin, Ö. & Aydoğdu, M. (2002b). Braconidae species of the Turkish Aegean region. In: Melika, G, Thuroczy C, editors. Parasitic Wasps: Evolution, Systematics, Biodiversity, and Biological Control. International Symposium: Parasitic Hymenoptera: *Taxonomy and Biological Control, Kőszeg, Hungary. Budapest: Agroinform Kiadó & Nyomda Kft., 14–17 May 2001,* pp. 285–290.

Beyarslan, A., Çetin Erdoğan, Ö. & Aydoğdu, M. (2005). A Survey of Braconinae (Hymenoptera, Braconidae) of Turkish Western Black Sea Region. *Linzer biologische Beiträge, 37* (1), 195-213.

Beyarslan, A., Aydogdu, M. & Çetin Erdoğan, Ö. (2006). A survey of Turkish *Glyptomorpha* (Hymenoptera, Braconidae, Braconinae) fauna with redescription of *G. baetica* from a new host. *Biologia*, *61*, 139-143.

Beyarslan, A., Aydogdu, M. & Erdoğan, Ö. (2008). The Subfamily Braconinae in Northern Turkey, with new records of *Bracon* species for the Western Palaearctic (Hymenoptera: Braconidae). *Linzer biologische Beiträge*, *40* (2), 1341-1361.

Beyarslan, A., Gözüaçık. C. & Özgen, I. (2014). First research on Braconinae fauna of South-eastern Anatolia region with new localities of Turkey (Hymenoptera: Braconidae). *Entomofauna, 35* (10), 177-204.

Beyarslan, A., Çolak, R.D. & Şahsuvaroğlu, Ö. (2020). Contribution to the knowledge of Cheloninae (Hymenoptera, Braconidae) of some provinces of eastern Turkey. *Scientific Bulletin of Uzhgorod University Biology, 49* (2020), 53–64

Çetin Erdoğan, O. (2013). Contributions to the knowledge of Agathidinae fauna of the eastern Anatolia region of Turkey. *Turkish Journal of Zoology, 37*, 195–199.

Çetin Erdoğan, O. (2014). A contribution on the subfamily Agathidinae (Hymenoptera: Braconidae) in Diyarbakır, Mardin, and Şanliurfa provinces of Turkey. *Turkish Journal of Zoology*, *38*, 102-103.

Çetin Erdoğan, O. & Beyarslan, A. (2001). The Agathidinae (Hymenoptera: Braconidae) fauna of the Marmara region. *Turkish Journal of Zoology, 25*, 257–268.

Çetin Erdoğan Ö. & Beyarslan A. (2016) Faunistic survey on the Agathidinae (Hymenoptera: Braconidae) in the Central Anatolia Region with a new record for the Turkish fauna: *Bassus tegularis* (Thomson, 1895). *Turkish Journal of Zoology, 40*: 448-453.

Çetin Erdoğan, Ö. & Beyarslan, A. (2009). A study on the Agathidinae (Braconidae: Hymanoptera) species from East Black Sea region. *Turkiye Entomoloji Dergisi, 33*(1), 73-80.

Çetin Erdoğan, Ö., van Achterberg C. & Beyarslan, A. (2009) On the Zoogeographical Distribution of the Genus Agathis Latreille, 1804 (Hymenoptera: Braconidae: Agathidinae) in Turkey. Journal of the Entomological Research Society. *11* (1), 17-25.

Chen, X. X. & van Achterberg, C. (2019). Systematics, phylogeny, and evolution of braconid wasps: 30 years of progress. *Annual Review of Entomology*, *64*, 1-24.

Civelek, H.S., Yoldas, Z. & Weintraub, P. (2002). The parasitoid complex of Liriomyza huidobrensis in cucumber greenhouses in Izmir Province, western Turkey. *Phytoparasitica, 30*(3), 285-287.

Edmardash, Y.A. & Gadallah, N.S. (2019). Revision of the subfamily Cheloninae (Hymenoptera: Braconidae) from Egypt, with description of two new species. *Annales Zoologici, 69*(2), 339-380.

Edmardash, Y.A. & Gadallah, N.S. (2023). First review of the subfamily Agathidinae Haliday, 1833 (Hymenoptera: Braconidae) in Egypt, with new records and the description of a new species of *Camptothipsis* Enderlein, 1920. *Annales de la Société entomologique de France,* (N.S.), *59*(5), 363-382.

Fabricius, J.C. (1793). Entomologia systematica emendata et aucta. *Tom. II. Hafniae. 519 pp.*

Fabricius, J.C. (1798). Supplementum entomologiae systematicae. *Hafniae. 572 pp.*

Fahringer, J. (1922). Hymenopterologische Ergebnisse einer Studienreise nach der Türkei und Kleinasien. Ibid, *88* (9): 149-222.

Fahringer, J. (1926). Opuscula braconologica. Band 1. Palaearktischenregion. Lieferung 2e3. Opuscula braconologica, Fritz Wagner, Wien (pp. 61e220).

Fernández-Triana, J.L. & van Achterberg, C. (2017). Order Hymenoptera, family Braconidae, subfamily Microgastrinae from the Arabian Peninsula. In A. van Harten (Ed.), Arthropod fauna of the UAE (*Vol. 6,* pp. 275-321). Abu Dhabi: Department of the President's Affairs, 775 pp.

Gadallah, N.S., Ghahari, H. & Quicke, D.L.J. (2021). Further addition to the braconid fauna of Iran (Hymenoptera: Braconidae). *Egyptian Journal of Biological Pest Control, 31*, 32.

Gadallah, N.S., Ghahari, H., Shaw, S.R. & Quicke, D.L..J. (2022). Chapter 1. Introduction of the Braconidae of the Middle East (Hymenoptera) Taxonomy, Distribution, Biology, and Biocontrol Benefits of Parasitoid Wasps. *Elsevier Academic Press, London, UK. 614 pp.*

Güçlü, C. & Özbek, H. (2002). The subfamily Agathidinae (Hymenoptera, Braconidae) of Erzurum Province. *Journal of Entomological Research Society*, *4*, 7-19.

Güçlü, C. & Özbek, H. (2011). A Contribution to the Knowledge of the Subfamily Brachistinae (Hymenoptera: Braconidae) in Turkey. *Journal of Entomological Research Society, 13* (3),15-26,

Guler, Y. & Cagatay, N. (2001). Systematical studies on the genus *Bracon* (*Glabrobracon*) (Hymenoptera: Braconidae: Braconinae) in Ankara Province. *Turkish Journal of Zoology, 25* (3), 275-285.

Guler, Y. & Cagatay, N. (2007). A study on the genus *Bracon* Fabricius, 1804 (Hymenoptera: Braconidae: Braconinae) in Ankara Province in Turkey. *Munis Entomology & Zoology, 2* (2), 517-524.

Güz, N. & Kilinçer, N. (2005). Aphid parasitoids (Hymenoptera: Braconidae: Aphidiinae) on weeds from Ankara, Turkey. *Phytoparasitica, 33*(4), 359-366.

Herrich-Schäffer, G.A.W. (1838). Faunae Insectorum Germaniae initiae oder Deutschlands Insecten. Hymenoptera. Auseinandersetzung der Gattung Chelonus (Jurine). *Regensburg. Heft 154.*

İnanç, F. & Beyarslan, A. (1997). Microgastrinae (Hymenoptera, Braconidae) species collected from some provinces of Gaziantep and Sanliurfa. *Turkiye Entomoloji Dergisi, 21*(3), 213-223.

İnanç, F. & Beyarslan, A. (2001). Die Microgastrinae-Fauna der ostmarmara region der Turkei (Hymenoptera: Braconidae). *Entomofauna, 22*(11), 221-244.

Kohl, F.F. (1905). Hymenopteren In Penther A. und E. Zederbauer, Ergebnisse einer naturwissenschaftlichen Reise zum Erdschias Dagh. (Klein Asien), Annalen Naturhistorischen Hofmuseums. *Wien, 20*, 1- 227.

Kokujev, N.R. (1898). Fragments Braconologiques. VI. Sur quelques especes du genre *Vipio*. *Trudy Russkago Entomologicheskago Obshchestva, 32*, 291-317.

Korkmaz, Y.B. & Kaplan, E. (2022). New data on Braconidae (Hymenoptera: Ichneumonoidea) fauna of Turkey. *Natura Somogyiensis*, *39*, 27-34.

Li, Q., Wei, S. J., Tang, P., Wu, Q., Shi, M., Sharkey, M. J. & Chen, X.-X. (2016). Multiple lines of evidence from mitochondrial genomes resolve phylogeny and evolution of parasitic wasp in Braconidae. *Genome Biology and Evolution, 8*(9), 2651-2662.

Linnaeus, C. von (1767). Systema naturae. Tom. I. Pars II. 12th Edition. *Laurnetii Salvii, Holmiae. 1*(2):533-1328.

Lozan, I. (2005). Cheloninae wasps (Hymenoptera: Braconidae, Cheloninae) from uplands of Turkey. *Entomologist's Monthly Magazine, 141*, 151-160.

Marshall, T. (1885). Monograph of British Braconidae. Part I. *Transactions of the Entomological Society of London, 1885*, 1-280.

Nees von Esenbeck, C.G. (1811). chneumonides Adsciti, in Genera et Familias Divisi. *Magazin Gesellschaft Naturforschender Freunde zu Berlin, 5*(1811), 1- 37 pp.

Nees von Esenbeck, C.G. (1834). Hymenopterorum Ichneumonibus affinium monographiae, genera Europaea et species illustrantes. 1. *Stuttgartiae et Tubingae*, 320 pp.

Nixon, G.E.J. (1986). A revision of the European Agathidinae (Hymenoptera: Braconidae). Bulletin of the British Museum of Natural History. *Entomology*, *2*, 183–242.

Ölmez, S. & Ulusoy, M.R. (2003). A survey of aphid parasitoids (Hymenoptera: Braconidae: Aphidiinae) in Diyarbakır, Turkey. *Phytoparasitica, 31*, 524-528.

Özbek, H., Tozlu, G. & Çoruh, S. (2009). Parasitoids of the small poplar longhorn beetle, Saperda populnea (L.) (Coleoptera: Cerambycidae), in the Aras Valley (Kars and Erzurum Provinces), Turkey. *Turkish Journal of Zoology, 33*(1), 111-113.

Papp, J. (2012). A revision of the Bracon Fabricius species in Wesmael's collection deposited in Brussels (Hymenoptera: Braconidae: Braconinae). *European Journal of Taxonomy, 21*, 1-154.

Papp, J. (2014). Faunistic contributions to the Microchelonus Szépligeti species of the Palaearctic region, with descriptions of two new species (Hymenoptera: Braconidae: Cheloninae). *Acta Zoologica Academiae Scientiarum Hungaricae*, *60*(4), 325-358.

Quicke, D.L.J. (1987). The Old World genera of braconine wasps (Hymenoptera, Braconidae). *Journal of Natural History, 21*, 43-157

Quicke, D.L.J. (2015). The braconid and ichneumonid parasitoid wasps: biology, systematics, evolution and ecology. *Chichester: Wiley Blackwell, 688 pp.*

Quicke, D.L.J. & van Achterberg, C. (1990). Phylogeny of the subfamilies of the family Braconidae. *Zoologica Scripta, 21*, 403-416.

Quicke, D.L.J., Austin, A.D., Fagan-Jeffries, E.P., Hebert, P.D.N. & Butcher, B.A. (2020). Recognition of the Trachypetidae stat.n. as a new extant family of Ichneumonoidea (Hymenoptera), based on molecularand morphological evidence. *Systematic Entomology,* https://doi.org/10.1111/syen.12426

Quicke, D.L.J., Gadallah, N.S., Ghahari, H. & Shaw, S.R. (2022). Chapter 6. Subfamily Braconinae Nees von Esenbeck, 1811, pp. 178-238. In: Gadallah, N.S., Ghahari, H. & Shaw, S.R. (Eds). Braconidae of the Middle East (Hymenoptera) Taxonomy, Distribution, Biology, and Biocontrol Benefits of Parasitoid Wasps. *Academic Press, UK, 616 pp.*

Ranjith, A.P. & Priyadarsanan, D.R. (2023). New subgeneric reports of the genus *Chelonus* (Hymenoptera: Braconidae) from India and Sri Lanka with description of nine species. *Zootaxa*, *5278* (3), 461-492

Reinhard, H. (1863). Beiträge zur Kenntniss einiger Braconiden-Gattungen. *Berliner Entomologische Zeitschrift*, *7*, 248-274.

Scopoli, J.A. (1763). Entomologia carniolica. J.T. Trattner, *Vindobonae*, *30*+420+3pp.

Sertkaya, E. & Bayram, A. (2005). Parasitoid community of the loreyi leafworm Mythimna (Acantholeucania) loreyi: novel host-parasitoid associations and their efficiency in the eastern Mediterranean Region of Türkiye. *Phytoparasitica, 33* (5), 441-449.

Sharanowski, B.J., Dowling, A.P.G. & Sharkey, M.J. (2011). Molecular phylogenetics of Braconidae (Hymenoptera: Ichneumonoidea), based on multiple nuclear genes, and implications for classification. *Systematic Entomology, 36* (3), 549-572.

Sharkey, M.J., Yu, D.S., van Noort, S., Seltmann, K. & Penev, L. (2009). Revision of the Oriental genera of Agathidinae (Hymenoptera, Braconidae) with an emphasis on Thailand including interactive keys to genera published in three different formats. *ZooKeys*, *21*, 19–54.

Shaw, S.R., Ghahari, H., Gadallah, N.S. & Quicke, D.L.J. (2022). Chapter 26. Subfamily Pambolinae Marshall, 1885, pp. 502–504. In: Gadallah NS, Ghahari H, Shaw SR (Eds). Braconidae of the Middle East (Hymenoptera) Taxonomy, Distribution, Biology, and Biocontrol Benefits of Parasitoid Wasps. *Elsevier Academic Press, London, UK, 616 pp.*

Shaw, M.R., Höcherl, A. & Fernandez-Triana, J. (2024). An illustrated key to the European genera of Microgastrinae parasitoid wasps (Hymenoptera: Braconidae) with a recent historical and biological prespective and a guide to available species level identification resources. *ZooKeys*, *1212*, 285-316.

Simbolotti, G. & van Achterberg, C. (1999). Revision of the West Palearctic species of the genus *Agathis* Latreille (Hymenoptera: Braconidae). *Zoologische Verhandelingen Leiden, 325*, 1-167.

Szépligeti, G. (1898). Beitrag zur Kenntnis der ungarischen Braconiden Braconiden, 3. Teil. *Természetrajzi Füzetek*, *21*, 381-396.

Telenga, L.A. (1936). Nasekomia per ponshatokrilie, sem. Braconidae, pedsem. Braconinae, Sigalphinae. *Fauna*, *SSSR,* 425-450

Tobias, V.I. (1995). Subfamily Braconinae, pp. 156-255. In G. S.Medvedev (Ed.), Hymenoptera, Part 4: Vol. 3. Keys to the insects of the European part of the USSR. *New Delhi: Oxonian Press, 900 pp.*

Tobias, V.I. (2001). Species of the genus Microchelonus Szépl. (Hymenoptera, Braconidae) with yellow abdominal spots and pale coloration of the body from the western Palaearctic region. *Entomologicheskoye Obozreniye*, *80*, 137-179.

van Achterberg, C. (1993). Illustrated key to the subfamilies of the Braconidae Hymenoptera: Ichneumonoidea), *Zoologische Verhandelingen Leiden, 283*, 1-189.

van Achterberg, C. (1984). Essay on the phylogeny of Braconidae (Hymenoptera: Ichneumonoidea). *Entomologisk Tidskrift*, *105*, 41-58.

van Achterberg, C. (2011). Order Hymenoptera, family Braconidae. The subfamily Agathidinae from the United Arab Emirates, with a review of the fauna of the Arabian Peninsula. *Arthropod fauna of the UAE 4*, 286-352.

van Achterberg, C. (2023). Illustrated key to the European genera of Opiinae (Hymenoptera, Braconidae), with the description of two new Palaearctic genera and two new species. *ZooKeys, 1176*, 79-115.

van Achterberg, C. & Haeselbarth, E. (2003). Revision of the genus *Syntretus* Foerster (Hymenoptera: Braconidae: Euphorinae) from Europe. *Zoologische Mededelingen, 77*(2), 9-78.

van Achterberg, C. & Long, K.D. (2010). Revision of the Agathidinae (Hymenoptera, Braconidae) of Vietnam, with the description of forty two new species and three new genera. *ZooKeys*, *54*, 1-184.

van Achterberg, C. & Shaw, M.R. (2016). Revision of the western Palaearctic species of *Aleiodes* Wesmael (Hymenoptera: Braconidae: Rogadinae). Part 1: Introduction, key to species groups, outlying distinctive species, and revisionary notes on some further species. *ZooKeys*, *639*, 1-164.

van Achterberg, C., Shaw, M.R. & Quicke, D.L.J. (2020). Revision of the western Palaearctic species of Aleiodes Wesmael (Hymenoptera, Braconidae, Rogadinae). Part 2: revision of the A. apicalis group. *ZooKeys, 919*, 1-259.

Wharton, R.A. (1993). Bionomics of the Braconidae. *Annual Review of Entomology, 38*, 121-143.

Wesmael, C. (1835). Monographie des Braconides de Belgique. *Nouveaux Mémoires de l'Academie Royale des Sciences et Belles-lettres Bruxelles, 9*, 1-252.

Wesmael, C. (1837). Monographie des Braconides de Belgique. (Suite.). *Nouveaux Mémoires de l'Academie Royale des Sciences et Belles-Lettres de Bruxelles, 10*, 1-68.

Yu, D.S., Achterberg van, C. & Horstmann, K. (2016). World Ichneumonoidea 2004. Taxonomy, Biology, Morphology and Distribution (Braconidae). *Taxapad 2005; (Scientific Names for Information Management) Interactive Catalogue on DVD/ CDROM. Vancouver.*