



## New Records of Ichneumonidae (Hymenoptera) Species from the Aras Valley, Türkiye

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### ABSTRACT

The aim of this study is to identify Ichneumonidae species in the "New Aras Valley" and to reveal their diversity. This study was carried out in different habitats and ecosystems of the Aras Valley between May-October months in 2023-2024, and 343 Ichneumonidae individuals were collected during field visits every 15 days and identified at genus and species level. Digital photographs of the morphological characteristics of these species were also taken, along with labeling information on their zoogeographic distribution, distribution in Türkiye, sample numbers, collection locations, and the plants they visited. As a result of this study, a total of 16 genera and 16 species belonging to 9 subfamilies (Anomaloninae Viereck, 1918; Banchinae Wesmael, 1845; Campopleginae Förster, 1869; Cremastinae Forster, 1869; Cryptinae Kirby, 1837; Diplazontinae Viereck, 1918; Ichneumoninae Latreille, 1802; Phygadeuontinae Förster, 1869 and Tersilochinae Schmiedeknecht, 1910) were identified. Of these identified species, *Dicaelotus ruficoxatus* (Gravenhorst, 1829) is a new record for our country, while *Temelucha signata* (Holmgren 1860) and *Enizemum ornatum* (Gravenhorst, 1829) are a new record for Eastern Anatolia and the Aras Valley.

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## Türkiye Aras Vadisi (Türkiye) 'nin Yeni Kayıt Ichneumonidae (Hymenoptera) Türleri

### ÖZET

Bu çalışmada amaç, "Yeni Aras Vadisi"ndeki Ichneumonidae türlerini tespit etmek ve Ichneumonidae çeşitliliğini ortaya koymaktır. Bu çalışma, Aras Vadisi'nin değişik habitat ve ekosistemlerinde 2023-2024 yılları arasında Mayıs-Ekim ayları arasında yürütülmüş, 15 günde bir gidilen arazi ziyaretlerinde 343 adet Ichneumonidae bireyi toplanmış, cins ve tür düzeyinde teşhis edilmiştir. Ayrıca bu türlerin morfolojik karakterine ait kısımların dijital fotoğrafları çekilmiş, zoocoğrafik dağılımı, Türkiye'deki yayılışları, örnek sayıları, toplandığı yerler ve ziyaret ettiği bitkiler ile ilgili etiket bilgileri de verilmiştir. Bu çalışma sonucunda, toplam 9 altfamilyaya bağlı (Anomaloninae Viereck, 1918; Banchinae Wesmael, 1845; Campopleginae Förster, 1869; Cremastinae Forster, 1869; Cryptinae Kirby, 1837; Diplazontinae Viereck, 1918; Ichneumoninae Latreille, 1802; Phygadeuontinae Förster, 1869 ve Tersilochinae Schmiedeknecht, 1910) 16 cins içinde yer alan 16 tür tespit edilmiştir. Tespit edilen bu türlerden, *Dicaelotus ruficoxatus* (Gravenhorst, 1829) Türkiye için yeni kayıt durumunda iken, *Temelucha signata* (Holmgren 1860) ve *Enizemum ornatum* (Gravenhorst, 1829) da Doğu Anadolu ve Aras Vadisi için yeni kayıt olarak belirlenmiştir.

### Bitki Koruma

### Araştırma Makalesi

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### Anahtar Kelimeler

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## INTRODUCTION

Hymenoptera, a large order of insects that includes sawflies, wasps, bees, and ants, is home to over 150,000 living species (Peters et al., 2017) and over 2.000 extinct species (Aguilar et al., 2013). The family Ichneumonidae, with

approximately 25.000 species, is one of the most diverse groups of the order Hymenoptera (Yu et al., 2016).

Among all hymenopteran parasitoids, the family Ichneumonidae is one of the most diverse, widely distributed, and host-specific groups. Ichneumon wasps (Hymenoptera: Ichneumonidae) are important parasitoids of other insects, especially several agricultural pests (Ghahari & Jussila, 2011). Its members play a crucial role in the functioning of natural and agricultural ecosystems by reducing or maintaining host populations to low levels, leading to considerable success in their role as bioindicators of land use and human impact (Mazón and Bordera 2014).

While some studies on Ichneumonidae have been conducted in Türkiye, they are more limited compared to studies conducted in other countries. The most detailed study was conducted by Kolarov (1995), who published a catalogue titled "A catalog of the Turkish Ichneumonidae," listing a total of 393 Ichneumonidae species. Studies began in the Thrace region, continued in the Northeastern Anatolia region, and finally, the Mediterranean region joined the study. Over the intervening 30 years, this number has been updated to approximately 1,508 species (Dalan, 2024; Çoruh & Dalan, 2024; Dalan & Çoruh, 2025).

Aras Valley Ichneumonidae species have been tried to be revealed in some previous studies (Pekel, 1999; Pekel et al., 2000; Çoruh et al., 2002; Özbek et al., 2003; Çoruh et al., 2004; Çoruh & Özbek, 2005; Çoruh et al., 2005a,b; Çoruh et al., 2007; Çoruh & Özbek, 2008; Kolarov et al., 2009; Riedel et al., 2010, Çoruh & Kolarov, 2010; Çoruh et al., 2011; Çoruh & Özbek, 2011; Kolarov & Çalmaşur, 2011; Şahan & Tunaz, 2021; Çoruh & Kolarov, 2012; Korukcu & Çoruh, 2024).

The Aras Valley, chosen as the location for this study, boasts a rich flora and fauna thanks to its topographic and geographic structure, and is a significant source of insect diversity. Numerous Ichneumonidae specimens were collected from the valley between 1999 and 2012, providing new records and contributing significantly to the Ichneumonidae literature. However, in recent years, the construction of dams and lakes, including the valley itself, has alienated it from its original landscape, and new roads have significantly altered it. The aim of this study is to identify the Ichneumonidae species in this "New Aras Valley," where no detailed faunal study has been conducted for approximately 15 years, and to compare these species with previously collected specimens to demonstrate the impact of the degraded landscape on Ichneumonidae diversity.

## MATERIAL and METHODS

### Material

The study material consists of Ichneumonidae adults collected from natural areas, orchards, agricultural areas, and weeds determined along the Aras Valley (Erzurum-Iğdır) (Figure 1), in the central district of Horasan, Çiftlik, Küme evler (Culture Houses), Tavşancık (Table 1), along the old Erzurum-Kars Road, along the Erzurum-Horasan road, and in Yaycı (Fig.1) in the central district of Iğdır (Table 1). Some images of the study area are given in Fig.2.

Table 1. Localities speceies are collected  
 Çizelge 1. Türlerin toplandığı lokaliteler

Localities		Coordinates	Altitudes
ERZURUM	HORASAN	Along Erzurum-Horasan road	40° 03' 21" K / 42° 12' 20" D 1530-1540 m
			40° 04' 21" K / 42° 15' 01" D 1530-1540 m
		Along old Erzurum- Kars road	40° 04' 05" K / 42° 14' 12" D 1540 m
		Çiftlik	40° 4' 23" K / 42° 15' 03" D 1500 m
		Çiftlik	40° 04' 08" K / 42° 14' 11" D 1530 m
		Küme evler	40° 3' 35" K / 42° 13' 34" D 1500 m
		Tavşancık	40° 3' 35" K / 42° 13' 34" D 1510 m
			40° 03' 41" K / 42° 13' 27" D 1530 m
			40° 06' 20" K / 42° 22' 12" D 1510 m
			40° 06' 55" K / 42° 22' 20" D 1532 m
		40° 06' 25" K / 42° 22' 36" D 1540 m	
İĞDIR	CENTRAL	Yaycı	39° 95' 041" K / 43° 96' 099" D 866 m



Figure 1. Map of study area.

*Şekil 1. Araştırma alanının Türkiye'deki konumu.*



Figure 2. Research localities.

*Şekil 2. Çalışma alanından bazı lokalitelerin görünümü.*

## Method

The thesis work commenced in 2023, with the study material developed through sampling from various localities at differing altitudes along the Aras Valley, designated as the study area for the 2023-2024 period in May-October months (Figure 2 and Table 1).

The Aras Valley is a valley formed by the Aras River, which runs east-west along the Erzurum-Iğdır highway south of the Kars Plateau (Anonymous, 2025a). While the river absorbs one of its main tributaries, the Kötek Stream, it has evolved into a deep valley bordered by the Aras Mountains to the south and surrounded by steep cliffs to the west (Anonymous, 2025a). Its topographic and geographical structure boasts a rich flora and fauna, and it is also a significant source of insect diversity (Anonymous, 2025a). Its microclimate and soil structure allow for the growth of numerous fruit and vegetable species (Anonymous, 2025b). However, recent dams and lakes, including the valley itself, have alienated it from its original landscape, and new roads have significantly altered it.

Sample collection times were chosen between 11:00 and 16:00 during the day. Samples were taken from orchards gardens with dense flowering habitats and weeds (Figure 2).

Collected insect samples were brought to the laboratory in containers containing 70% alcohol. Label information, including the altitude and collection dates of the insects, was also recorded. The elevation and coordinates of the study areas were measured using a GPS device.

### Laboratory studies

Adult ichneumonid specimens brought to the laboratory were prepared for identification, evaluated based on their distinctive taxonomic characters, classified to subfamily level, and stored. After fieldwork was complete, genus and species were identified. The identifications were made by Dr. Saliha ÇORUH (Atatürk University, Agricultural Faculty, Türkiye) and the unidentified specimens were identified by Dr. Janko Kolarov (Plovdiv University, Pedagogical Faculty, Bulgaria).

After the collected species were identified, they were stored in the Plant Protection Department Museum. Dorsal ventral and lateral photographs of the specimens were taken at the Atatürk University Biodiversity Application and Research Center using a Leica Macroscope, a Canon 70 DSLR camera, and the Canon EOS utility program. Multiple photographs were taken using Adobe Photoshop CS6. Some photographs were taken with a Canon EOS 1100D camera, a Canon EF 100 mm, f/2.8L Macro lens, and a Kaiser digital camera. These photographs were then combined using the Helicon Focus 6.7.1 program on a Lenovo computer. Dr. Melek GÜÇLÜ assisted in the photography. Species names, associated plant data, and global distribution were generated using the Yu et al. (2016) catalog.

### RESULTS

As a result of this study, a total of 16 genera and 16 species belonging to 9 subfamilies were identified; one species belonging to one genus from Anomaloninae Viereck, one species belonging to one genus from Banchinae Wesmael, one species belonging to one genus from Campopleginae Förster, two different species belonging to two genera from Cremastinae Förster, three species belonging to three genera from Cryptinae Kirby, three species belonging to three genera from Diplazontinae Viereck, two species belonging to two genera from Ichneumoninae Latreille, two species belonging to two genera from Phygadeuontinae Förster and one species belonging to one genus from Tersilochinae Schmiedeknecht. Among these identified species, *Dicaelotus ruficoxatus* (Gravenhorst, 1829) is a new record for Türkiye, while *Temelucha signata* (Holmgren, 1860) and *Enizemum ornatum* (Gravenhorst, 1829) are a new records for Eastern Anatolia and the Aras Valley. The species are listed below (Table 2).

#### Anomaloninae Viereck, 1918

*Anomalon cruentatum* (Geoffroy, 1785) (Figure 3a).

Material examined: Erzurum: Horasan, Küme evler, 40° 03' 45" K, 42° 13' 31" D, 21.VII.2023, 1530 m, 6 ♂♂, 5 ♀♀, 40° 03' 35" K, 42° 13' 34" D, 21.VII.2023, 1500 m, 4 ♂♂, 3 ♀♀; Çiftlik, 40° 04' 08" K, 42° 14' 11" D, 1530 m, 21.V.2024, 5 ♂♂, 6 ♀♀, 40° 05' 25" K, 42° 18' 36" D, 1530 m, 21.V.2024, 4 ♂♂, 2 ♀♀; Tavşancık, 40° 06' 20" K, 42° 22' 12" D, 1510 m, 21.V.2024, 3 ♂♂, 5 ♀♀, 40° 06' 25" K, 42° 22' 36" D, 1540 m, 21.V.2024, 4 ♂♂, 2 ♀♀. Iğdır: Central, Yaycı, 39° 95' 041" K, 43° 96' 099" D, 866 m, 09.X.2024, 2 ♂♂, 4 ♀♀.

Hosts: Coleoptera: *Gonocephalum rusticum* Olivier. Lepidoptera: *Agrotis ipsilon* Hufnagel, *Cerura palestinensis* Bartel, *Ptilodon capucina* (L.).

Associated plants: *Anthriscus sylvestris* (L.), *Peucedanum oreoselinum* (L.).

Distribution: Oriental and Palaearctic, known from Türkiye (Table 3).

#### Banchinae Wesmael, 1845

*Lissonota (Loxonota) flavovariegata* (Lucas, 1849) (Figure 3b)

Material examined: Erzurum: Horasan, Central, 40° 4' 54" K, 42° 18' 29" D, 1530 m, 05.IX.2024, ♂, 2 ♀♀, Horasan, Çiftlik, 40° 4' 23" K, 42° 15' 03" D, 16.VI.2023, 1500 m, 2 ♀♀; 40° 03' 35" K, 42° 13' 34" D, 21.VII.2023, 1530 m, 3 ♂♂, 2 ♀♀, 40° 3' 25" K, 42° 12' 28" D, 29.VII.2023, 1530 m, 2 ♀♀; Tavşancık, 40° 6' 20" K, 42° 22' 12" D, 1510 m, 11.VII.2024, 2 ♂♂, ♀; Old Erzurum- Kars Road, 40° 04' 05" K, 42° 14' 12" D, 1540 m, 22.V.2024, ♂, 2 ♀.

Distribution: Palaearctic, known from Türkiye (Table 3).

#### Campopleginae Förster, 1869

*Campoletis crassicornis* (Tschek, 1871) (Figure 3c).

Table 2. Data of collected species

*Çizelge 2. Toplanan türlere ait veriler*

Data of collected species: Individual numbers (IN), vertical distribution (VD), seasonal dynamics (SD), geographical regions (GR), zoogeographical regions (ZR), first record in Türkiye (FRT).

Vertical distribution (VD) (meter): A: 750-1000, B: 1001-1500, C: 1501-1750. Seasonal dynamics (SD): M: May, J: June, Jl: July, Aug: August, S: September, O: October. Geographical regions (GR): AR: Aegean Region, BSR: Black Sea Region, CAR: Central Anatolia Region, EAR: Eastern Anatolia Region, MR: Marmara Region, MtR: Mediterranean Region, SAR: Southeastern Anatolia. Zoogeographical regions (ZR): E: Europe, NEAR: Nearctic, ORR: Oriental, P: Palearctic, WP: West Palearctic.

Taxa name	IN	VD	SD	GR	ZR	FRT
<b>HYMENOPTERA</b>						
<b>ICHNEUMONIDAE LATREILLE, 1802</b>						
<b>ANOMALONINAE VIERECK, 1918</b>						
<b>Genus <i>Anomalon</i> Panzer, 1804</b>						
<i>Anomalon cruentatum</i>	55	A, B, C	M, Jl, O	AR, BSR, CAR, EAR, MR, MtR, SAR	ORR, P	Kohl, 1905
<b>BANCHINAE WESMAEL, 1845</b>						
<b>Genus <i>Exetastes</i> Gravenhorst, 1829</b>						
<i>Lissonota (Loxonota) flavovariegata</i>	18	B, C	M, J, Jl, S	AR, BSR, CAR, EAR, MR, MtR, SAR	P	Aubert, 1972
<b>CAMPOPLEGINAE FORSTER, 1869</b>						
<b>Genus <i>Campoletis</i> Förster, 1869</b>						
<i>Campoletis crassicornis</i>	17	A, C	M, Jl, Aug, O	BSR, EAR, MR, MtR	E, WP	Kolarov & Beyarslan, 1995
<b>CREMASTINAE FORSTER, 1869</b>						
<b>Genus <i>Pristomerus</i> Curtis, 1836</b>						
<i>Pristomerus rivalis</i>	8	C	M	EAR	P	Pekel & Özbek, 2000
<b>Cins: <i>Temelucha</i> Förster, 1869</b>						
<i>Temelucha signata</i>	6	C	M, Aug	CAR	P	Kolarov & Yurtcan, 2009**
<b>CRYPTINAE KIRBY, 1837</b>						
<b>Genus <i>Aptesis</i> Förster, 1850</b>						
<i>Aptesis senicula</i>	21	A, C	M, Jl, Aug, O	BSR, EAR, MR, MtR	A, WP	Beyarslan & Kolarov, 1994
<b>Genus <i>Aritranis</i> Förster, 1869</b>						
<i>Aritranis director</i>	17	A, C	M, Aug, O	BSR, EAR, MtR	NEAR, P	Gürbüz & Kolarov, 2008
<b>Genus <i>Cryptus</i> Fabricius, 1804</b>						
<i>Cryptus viduatorius</i>	59	A, C	M, Jl, Aug, S, O	BSR, EAR, MR, MtR, SAR	P	Kolarov, 1987
<b>DIPLAZONTINAE VIERECK, 1918</b>						
<b>Genus <i>Enizemum</i> Förster, 1869</b>						
<i>Enizemum ornatum</i>	18	A, C	M, Jl, S, O	BSR, MtR	NEAR, ORR, P	Biröl, 2010**
<b>Genus <i>Promethes</i> Förster, 1869</b>						
<i>Promethes sulcator</i>	15	B, C	M, Jl	AR, CAR, EAR, MR, MtR	NEAR, ORR, P	Düzgüneş, 1982
<b>Genus <i>Syrphophilus</i> Dasch, 1964</b>						
<i>Syrphophilus bizonarius</i>	13	C	Jl, Aug	AR, BSR, CAR, EAR, MR, MtR	NEAR, ORR, P	Sedivy, 1959
<b>ICHNEUMONINAE LATREILLE, 1802</b>						
<b>Genus <i>Colpognathus</i> Wesmael, 1845</b>						
<i>Colpognathus celerator</i>	22	C	M, Jl, Aug	BSR, EAR, MtR	P	Çoruh & Özbek, 2008
<b>Genus <i>Dicaelotus</i> Wesmael, 1845</b>						
<i>*Dicaelotus ruficoxatus</i>	10	A, C	M, O	*	E, WP	New record for Türkiye
<b>PHYGADEUONTINAE FORSTER, 1869</b>						
<b>Genus <i>Gelis</i> Thunberg, 1827</b>						
<i>Gelis agilis</i>	27	A, C	M, O	BSR, EAR, MR	P	Fahringer, 1922
<b>Genus <i>Mesoleptus</i> Gravenhorst, 1829</b>						
<i>Mesoleptus laevigatus</i>	22	A, B, C	M, Jl, O	BSR, EAR, MR	P	Fahringer, 1922
<b>TERSILOCHINAE SCHMIEDEKNECHT, 1910</b>						
<b>Genus <i>Aneuclis</i> Förster, 1869</b>						
<i>Aneuclis incidens</i>	15	A, C	M, O	AR, BSR, EAR, MR, MtR, SAR	P	Sedivy, 1959

\* New record for Türkiye

\*\* New record for East Anatolia

Table 3. Provinces and references of collected species in Türkiye  
*Çizelge 3. Türkiye'deki türlerin dağılışı gösterdiği iller ve ilgili referanslar*

Taxa name	Provinces	References
<b>ANOMALONINAE VIERECK, 1918</b>		
<b>Genus <i>Anomalon</i> Panzer, 1804</b>		
<i>Anomalon cruentatum</i>	Adana, Adiyaman, Afyonkarahisar, Ankara, Antalya, Balıkesir, Batman, Bayburt, Bingöl, Bolu, Çanakkale, Denizli, Diyarbakır, Edirne, Elazığ, Erzincan, Erzurum, Gaziantep, Gümüşhane, Iğdır, Hatay, Isparta, İstanbul, Kahramanmaraş, Kars, Kastamonu, Kayseri, Kırklareli, Malatya, Mardin, Mersin, Muğla, Tekirdağ, Tunceli, Yozgat and Zonguldak	Kohl, 1905; Sedivy, 1959; Kolarov, 1989; Özdemir & Kılıncıer, 1990; Öncüer, 1991; Yurtcan et al., 1994; Kolarov, 1995; Kolarov et al., 1997a; Kolarov et al., 2002; Gürbüz, 2004; Çoruh et al., 2004; Akkaya, 2005; Kolarov & Gürbüz, 2006; Beyarslan et al., 2006; Okyar & Yurtcan, 2007; Bolu et al., 2007; Gürbüz et al., 2008; Buncukçu, 2008; Kırtaç, 2008; Gürbüz et al., 2009a,b; Özdemir & Güler, 2009; Hepdurgun et al., 2009; Çıkman et al., 2009; Birol, 2010; Gürbüz et al., 2011; Çoruh et al., 2014b; Kolarov et al., 2014; Özdan, 2014; Kolarov et al., 2016; Çoruh & Kolarov, 2016; Özdan & Gürbüz, 2016; Kolarov et al., 2017; Özek & Avcı, 2017; Sarı, 2017; Sarı & Çoruh, 2018; Özdan & Gürbüz, 2019; Kırtaç & Gürbüz, 2020; Barik, 2022; Kaplan & Riedel, 2022; Doğru, 2022; Çoruh et al., 2022b; Dalan, 2024
<b>BANCHINAE WESMAEL, 1845</b>		
<b>Genus <i>Lissonota</i> (<i>Loxonota</i>) Aubert, 1993</b>		
<i>Lissonota flavovariegata</i>	Adiyaman, Ankara, Antalya, Bayburt, Bolu, Burdur, Çankırı, Edirne, Elazığ, Erzincan, Erzurum, Gaziantep, Giresun, Gümüşhane, Isparta, İzmir, Kırşehir, Nevşehir, Kars, Konya, Ordu, Trabzon and Yozgat	Aubert, 1972; Kolarov, 1995; Kolarov & Beyarslan, 1994b; Özdemir, 1996; Pekel, 1999; Kolarov et al., 2002; Gürbüz, 2005; Çoruh et al., 2014b; Kolarov et al., 2017; Çoruh et al., 2018; Sarı & Çoruh, 2018; Teymuroğlu & Çoruh, 2021, 2022; Çoruh & Riedel, 2022; Birol, 2022; İnceklioğlu, 2022; Barik & Çoruh, 2023b; Korukcu & Çoruh, 2024
<b>CAMPOPLEGINAE FORSTER, 1869</b>		
<b>Genus <i>Campoletis</i> Förster, 1869</b>		
<i>Campoletis crassicornis</i>	Adana, Bingöl, Burdur, Bursa, Erzurum, Giresun and Trabzon	Kolarov & Beyarslan, 1995; Çoruh et al., 2013; Çoruh et al., 2016; Çoruh et al., 2018; Çaylak, 2019; Çaylak & Çoruh, 2020b; Kolarov et al., 2021; Dalan, 2024; Korukcu & Çoruh, 2014
<b>CREMASTINAE FORSTER, 1869</b>		
<b>Genus <i>Pristomerus</i> Curtis, 1836</b>		
<i>Pristomerus rivalis</i>	Erzurum	Pekel & Özbek, 2000; Çoruh et al., 2014b; Sarı, 2017; Sarı & Çoruh, 2018
<b>Genus <i>Temelucha</i> Förster, 1869</b>		
<i>Temelucha signata</i>	Kayseri	Kolarov & Yurtcan, 2009; Çoruh, 2022.
<b>CRYPTINAE KIRBY, 1837</b>		
<b>Genus <i>Aptesis</i> Förster, 1850</b>		
<i>Aptesis senicula</i>	Adana, Bursa, Erzurum, Mersin, Tunceli and Rize	Kolarov & Beyarslan, 1994a; Kolarov et al., 2014; Çoruh et al., 2014b; Kolarov et al., 2016; Çoruh, 2019; Çaylak & Çoruh, 2020b; Barik & Çoruh 2023a
<b>Genus <i>Aritranis</i> Förster, 1869</b>		
<i>Aritranis director</i>	Antalya, Burdur, Erzurum, Isparta, Trabzon and Rize	Gürbüz & Kolarov, 2008; Gürbüz et al., 2009b; Özdan & Gürbüz 2016; Çoruh et al., 2014a; Sarı, 217; Sarı & Çoruh, 2018; Çoruh, 2019
<b>Genus <i>Cryptus</i> Fabricius, 1804</b>		
<i>Cryptus viduatorius</i>	Erzurum, Bayburt, Bilecik, Bingöl, Bursa Diyarbakır, Isparta, İstanbul, Kırklareli and Mersin	Kolarov, 1987; Öncüer, 1991; Beyarslan & Kolarov, 1994; Kolarov, 1995; Kolarov et al., 1997a; Gürbüz & Kolarov, 2008; Çoruh & Çoruh, 2008; Gürbüz et al., 2009a; Çoruh & Çoruh, 2012; Özdan, 2014; Çoruh et al., 2014a,b; Kolarov et al., 2016; Çoruh & Kolarov, 2016; Çoruh et al., 2016; Özdan & Gürbüz, 2016; Sarı & Çoruh, 2018; Çoruh et al., 2018; Çoruh, 2019; Yılmaz, 2020; Birol, 2022; Kaplan & Riedel, 2022; Barik & Çoruh, 2023a; Dalan, 2024; Dalan & Çoruh, 2025
<b>DIPLAZONTINAE VIERECK, 1918</b>		
<b>Genus <i>Enizemum</i> Förster, 1869</b>		
<i>Enizemum ornatum</i>	Bolu and Isparta	Birol, 2010; Klopstein, 2014
<b>Genus <i>Promethes</i> Förster, 1869</b>		
<i>Promethes sulcator</i>	Afyonkarahisar, Ankara, Antalya, Ardahan, Çankırı, Edirne, Erzurum, Isparta, Kahramanmaraş, Kayseri, Kırşehir, Konya, Mersin, Muğla and Tekirdağ	Düzgüneş, 1982; Öncüer, 1991; Kolarov, 1995; Yurtcan et al., 1999; Özdemir, 2001; Çoruh, 2011; Çoruh et al., 2014b; Kolarov, 2015; Doğru, 2022; Bulak Korkmaz & Çoruh, 2022; İnceklioğlu, 2022; Barik & Çoruh, 2023b; Korukcu & Çoruh, 2024
<b>Genus <i>Syrphophilus</i> Dasch, 1964</b>		
<i>Syrphophilus bizonarius</i>	Adana, Afyon, Antalya, Ankara, Burdur, Bursa, Çankırı, Denizli, Edirne, Eskişehir, Erzurum, Giresun, Hatay, İstanbul, Isparta, Kahramanmaraş, Kırklareli, Konya, Mersin, Niğde, Rize, Sinop, Tekirdağ and Trabzon.	Sedivy, 1959; Öncüer, 1991; Kolarov, 1989; Kolarov, 1995; Yurtcan et al., 1999; Özdemir, 2001; Gürbüz, 2005; Gürbüz et al., 2011; Kolarov et al., 2014; Kolarov, 2015; Kolarov et al., 2016; Kolarov et al., 2017; Çoruh et al., 2018; Çaylak & Çoruh, 2020a; Barik, 2022; Barik & Çoruh, 2023b.
<b>ICHNEUMONINAE LATREILLE, 1802</b>		
<b>Genus <i>Colpognathus</i> Wesmael, 1845</b>		
<i>Colpognathus celerator</i>	Erzurum, Giresun, Isparta, Ordu and Trabzon	Çoruh & Özbek, 2008; Özdan, 2014; Kolarov et al., 2014; Çoruh et al., 2016; Özdan & Gürbüz, 2019; Barik & Çoruh, 2023a.
<b>Genus <i>Dicaelotus</i> Wesmael, 1845</b>		
<i>Dicaelotus ruficoxatus</i>	*	New record fot Türkiye
<b>PHYGADEUONTINAE FORSTER, 1869</b>		
<b>Genus <i>Gelis</i> Thunberg, 1827</b>		
<i>Gelis agilis</i>	Anadolu, Bursa, Çanakkale, Edirne, Erzincan, Giresun, Kırklareli and Trabzon	Fahringer, 1922; Beyarslan & Kolarov, 1994; Kolarov et al., 1997b; Çoruh et al., 2016; Kolarov et al., 2016; Çoruh, 2019, Çaylak, 2019
<b>Genus <i>Mesoleptus</i> Gravenhorst, 1829</b>		

<i>Mesoleptus laevigatus</i>	Anadolu, Bilecik, Erzurum and Trabzon	Fahringer, 1922; Kolarov et al., 1997a; Çoruh et al., 2014b; Kolarov et al., 2014; Çoruh et al., 2022a
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**TERSILOCHINAE SCHMIEDEKNECHT 1910**

**Genus *Aneucelis* Förster, 1869**

<i>Aneucelis incidens</i>	Afyonkarahisar, Adana, Anadolu, Adıyaman, Antalya, Burdur, Edirne, Gaziantep, Kastamonu, Kütahya, Osmaniye and Van	Sedivy, 1959; Kasparyan, 1981; Öncüer, 1991; Kolarov, 1989; Kolarov, 1995; Kolarov & Beyarslan, 1994b; Klaim & Yurtcan, 2011; Çoruh & Dalan, 2024
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Material examined: Erzurum: Horasan, Along Erzurum-Horasan road, 40° 03' 21" K, 42° 12' 20" D, 11.VIII.2023, 1530 m, 2 ♂♂, 3 ♀♀; 40° 04' 21" K, 42° 15' 01" D, 17.VIII.2023, 1530 m, 2 ♂♂, 40° 2' 21" K, 42° 12' 20" D, 25.VII.2023, 1530 m, 4 ♂♂, Old Erzurum- Kars Road, 40° 04' 05" K, 42° 14' 12" D, 1540 m, 22.V.2024, 2 ♂♂, 2 ♀♀. Iğdır: Central, Yaycı, 39° 95' 041" K, 43° 96' 099" D, 866 m, 09.X.2024, ♂, ♀.

Hosts: Lepidoptera: *Archiearis notha* Hübner, *Udea ferrugalis* (Hübner).

Associated plants: *Peucedanum oreoselinum* (L.).

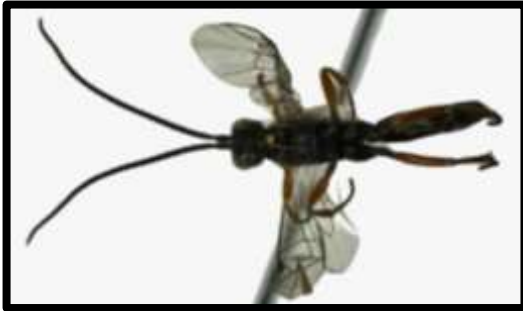
Distribution: Europe and West Palaearctic, known from Türkiye (Table 3).



a



b



c



d



e



f



g



h



i



j



k



l



m



n



Figure 3. Habitus of species: a) *Anomalon cruentatum* (Geoffroy, 1785); b) *Lissonota (Loxonota) flavovariegata* (Lucas, 1849); c) *Campoletis crassicornis* (Tschek, 1871); d) *Pristomerus rivalis* Narolsky, 1987; e) *Temelucha signata* (Holmgren, 1860); f) *Aptesis senicula* (Kriechbaumer, 1893); g) *Aritranis director* (Thunberg, 1822); h) *Cryptus viduatorius* Fabricius, 1804; i) *Enizemum ornatum* (Gravenhorst, 1829); j) *Promethes sulcator* (Gravenhorst, 1829); k) *Syrphophilus bizonarius* (Gravenhorst, 1829); l) *Colpognathus celerator* (Gravenhorst, 1807); m) *Dicaelotus ruficoxatus* (Gravenhorst, 1829); n) *Gelis agilis* (Fabricius, 1775); o) *Mesoleptus laevigatus* (Gravenhorst, 1820); p) *Aneucleis incidens* (Thomson, 1889).

Şekil 3. Türlerin habitusu: a) *Anomalon cruentatum* (Geoffroy, 1785); b) *Lissonota (Loxonota) flavovariegata* (Lucas, 1849); c) *Campoletis crassicornis* (Tschek, 1871); d) *Pristomerus rivalis* Narolsky, 1987; e) *Temelucha signata* (Holmgren, 1860); f) *Aptesis senicula* (Kriechbaumer, 1893); g) *Aritranis director* (Thunberg, 1822); h) *Cryptus viduatorius* Fabricius, 1804; i) *Enizemum ornatum* (Gravenhorst, 1829); j) *Promethes sulcator* (Gravenhorst, 1829); k) *Syrphophilus bizonarius* (Gravenhorst, 1829); l) *Colpognathus celerator* (Gravenhorst, 1807); m) *Dicaelotus ruficoxatus* (Gravenhorst, 1829); n) *Gelis agilis* (Fabricius, 1775); o) *Mesoleptus laevigatus* (Gravenhorst, 1820); p) *Aneucleis incidens* (Thomson, 1889).

### Cremastinae Förster, 1869

*Pristomerus rivalis* Narolsky, 1987 (Figure 3d).

Material examined: Erzurum: Horasan, Çiftlik, 40° 04' 08" K, 42° 14' 11" D, 1530 m, 21.V.2024, 3 ♂♂, 2 ♀♀; Tavşancık, 40° 06' 25" K, 42° 22' 36" D, 1540 m, 21.V.2024, 2 ♂♂, ♀.

Distribution: Palaearctic, known from Türkiye (Table 3).

Remarks: This species has only been collected in Türkiye in 1996 from the Palandöken Mountains and has never been seen since. It is a rare species for our Türkiye.

*Temelucha signata* (Holmgren, 1860) (Figure 3e).

Material examined: Erzurum: Horasan, Along Erzurum-Horasan road, 40° 3' 21" K, 42° 12' 20" D, 11.VIII.2023, 1530 m, 2 ♂♂; Küme evler, 40° 03' 41" K, 42° 13' 27" D, 1530 m, 02.V.2024, 2 ♂♂, 2 ♀♀.

Host: Lepidoptera: *Rhyacionia buoliana* (Denis & Schiffermüller).

Associated plants: *Peucedanum oreoselinum* (L.).

Distribution: Palaearctic, known from Türkiye (Table 3).

Remark: This species is a new record for Eastern Anatolia and the Aras Valley.

### Cryptinae Kirby, 1837

*Aptesis senicula* (Kriechbaumer, 1893) (Figure 3f).

Material examined: Erzurum: Horasan, Çiftlik, 40° 04' 08" K, 42° 14' 11" D, 1530 m, 21.V.2024, 4 ♂♂, 3 ♀♀; Küme evler, 40° 03' 45" K, 42° 13' 31" D, 21.VII.2023, 1530 m, 5 ♀♀; Along Erzurum-Horasan road, 40° 03' 21" K, 42° 12' 20" D, 11.VIII.2023, 1530 m, 2 ♂♂ 2 ♀♀. Iğdır: Central Merkez, Yaycı, 39° 95' 041" K, 43° 96' 099" D, 866 m, 09.X.2024, 3 ♂♂, 2 ♀♀.

Distribution: Europe and West Palaearctic, known from Türkiye (Table 3).

*Aritranis director* (Thunberg, 1822) (Figure 3g).

Material examined: Erzurum: Along Erzurum-Horasan road, 40° 3' 21" K, 42° 12' 20" D, 11.VIII.2023, 1530 m, 3 ♂♂; Tavşancık, 40° 06' 20" K, 42° 22' 12" D, 1510 m, 21.V.2024, 2 ♂♂, 4 ♀♀, 40° 06' 25" K, 42° 22' 36" D, 1540 m, 21.V.2024, 2 ♂♂, 2 ♀♀. Iğdır: Central, Yaycı, 39° 95' 041" K, 43° 96' 099" D, 866 m, 09.X.2024, 3 ♂♂, ♀.

Hosts: Lepidoptera: *Lasiocampa quercus* (L.); *Leucoma salicis* (L.); *Phlyctaenia coronata* (Hufnagel); *Zygaena*

*carniolica* (Scopoli); *Zygaena trifolii* (Esper).

Associated plants: *Euphorbia nicaeensis* All., *Peucedanum oreoselinum* (L.).

Distribution: Neractik, Palaearctic, known from Türkiye (Table 3).

*Cryptus viduatorius* Fabricius, 1804 (Figure 3h)

Material examined: Erzurum: Horasan, 40° 4' 54" K, 42° 18' 29" D, 1530 m, 05.IX.2024, 8 ♂♂, 2 ♀♀, Çiftlik, 40° 05' 25" K, 42° 18' 36" D, 1530 m, 21.V.2024, 7 ♂♂, 6 ♀♀; Tavşancık, 40° 06' 55" K, 42° 22' 20" D, 10.VII.2023, 1532 m, 4 ♂♂, 2 ♀♀, 40° 06' 20" K, 42° 22' 12" D, 1510 m, 11.VII.2024, 4 ♂♂, 6 ♀♀; Along Erzurum-Horasan road, 40° 03' 21" K, 42° 12' 20" D, 11.VIII.2023, 1530 m, 2 ♂♂, 8 ♀♀; Eski Erzurum- Kars Yolu, 40° 04' 05" K, 42° 14' 12" D, 1540 m, 22.V.2024, 2 ♂♂, 2 ♀♀. Iğdır: Central, Yaycı, 39° 95' 041" K, 43° 96' 099" D, 866 m, 09.X.2024, 3 ♂♂, 3 ♀♀.

Hosts: Coleoptera: *Saperda populnea* (L.). Lepidoptera: *Alsophila aescularia* Denis & Schiffermüller, *Loxostege sticticalis* (L.), *Phlogophora meticulosa* (L.), *Sparganothis pilleriana* Denis & Schiffermüller.

Associated plants: *Anethum graveolens* L., *Angelica sylvestris* L., *Daucus carota* L., *Euphorbia nicaeensis* All., *Euphorbia virgata* Waldst & Kit., *Ferula communis* L., *Heracleum sphondylium* L., *Medicago sativa* L., *Peucedanum oreoselinum* (L.).

Distribution: Palaearctic, known from Türkiye (Table 3).

### Diplazontinae Viereck, 1918

*Enizemum ornatum* (Gravenhorst, 1829) (Figure 3i)

Material examined: Erzurum: Horasan, 40° 4' 54" K, 42° 18' 29" D, 1530 m, 05.IX.2024, 2 ♂♂, 2 ♀♀, Çiftlik, 40° 05' 25" K, 42° 18' 36" D, 1530 m, 21.V.2024, 2 ♂♂, 2 ♀♀; Tavşancık, 40° 06' 55" K, 42° 22' 20" D, 10.VII.2023, 1532 m, 4 ♂♂, 2 ♀♀, 40° 06' 20" K, 42° 22' 12" D, 1510 m, 11.VII.2024, ♂, ♀. Iğdır: Central, Yaycı, 39° 95' 041" K, 43° 96' 099" D, 866 m, 09.X.2024, ♂, ♀.

Hosts: Diptera: *Episyrphus balteatus* (De Geer), *Eupeodes corollae* (F.), *Eupeodes lapponicus* (Zetterstedt), *Eupeodes luniger* (Meigen), *Neocnemodon fulvimanus* (Zetterstedt), *Neocnemodon vitripennis* (Meigen), *Platycheirus scutatus* (Meigen), *Scaeva pyrastris* (L.), *Sphaerophoria scripta* (L.), *Syrphus arcuatus* (Fallen), *Syrphus ribesii* (L.), *Syrphus torvus* Osten Sacken. Lepidoptera: *Discestra trifolii* (Hufnagel).

Associated plants: *Peucedanum oreoselinum* (L.), *Salix* sp.

Distribution: Nearctic, Oriental, Palaearctic, known from Türkiye (Table 3).

Remarks: This species is a new record for the Eastern Anatolia Region and Erzurum is the third locality where the species has been identified.

*Promethes sulcator* (Gravenhorst, 1829) (Figure 3j)

Material examined: Erzurum: Horasan, Tavşancık, 40° 06' 55" K, 42° 22' 20" D, 10.VII.2023, 1532 m, ♂, 2 ♀♀, Tavşancık, 40° 06' 20" K, 42° 22' 12" D, 1510 m, 21.V.2024, 3 ♂♂, 2 ♀♀; Küme evler, 40° 3' 35" K, 42° 13' 34" D, 21.VII.2023, 1500 m, 3 ♂♂ 4 ♀♀.

Hosts: Diptera: *Delia radicum* (L.), *Episyrphus balteatus* (De Geer), *Melanostoma mellinum* (L.), *Platycheirus fulviventris* (Macquart), *Platycheirus perpallidus* (Verrall), *Platycheirus scutatus* (Meigen), *Sphaerophoria robusta* (Meigen), *S. rueppelli* (Wiedemann). Lepidoptera: *Cnephasia longana* (Haworth), *Pieris brassicae* (L.).

Associated plants: *Angelica sylvestris* L., *Oryza sativa* (L.), *Phragmites australis* (Cav.), *Picea abies* (L.), *P. excelsa* (Lam.), *Poa pratensis* L., *Triticum aestivum* L.

Distribution: Nearctic, Oriental, Palaearctic, known from Türkiye (Table 3).

*Syrphophilus bizonarius* (Gravenhorst, 1829) (Figure 3k)

Material examined: Erzurum: Horasan, Tavşancık, 40° 06' 55" K, 42° 22' 20" D, 10.VII.2023, 1532 m, 5 ♂♂, 2 ♀♀; Along Erzurum-Horasan road, 40° 03' 21" K, 42° 12' 20" D, 11.VIII.2023 1530 m, ♂, 5 ♀♀.

Hosts: Diptera: *Atherigona soccata* Rondani, *Delia radicum* (L.), *Episyrphus balteatus* (De Geer), *Eupeodes corollae* (F.), *Eupeodes luniger* (Meigen), *Hypera* sp., *Loxostege sticticalis* (L.), *Neocnemodon vitripennis* (Meigen), *Sphaerophoria scripta* (L.).

Associated plant: *Angelica* sp., *Betula nana* L., *Epilobium angustifolium* L., *Oryza sativa* L., *Poa pratensis* L., *Veronica anagallis-aquatica* L.

Distribution: Nearctic, Oriental, Palaearctic, known from Türkiye (Table 3).

### Ichneumoninae Latreille, 1802

*Colpognathus celerator* (Gravenhorst, 1807) (Figure 3l)

Material examined: Erzurum: Horasan, Çiftlik, 40° 04' 08" K, 42° 14' 11" D, 1530 m, 21.V.2024, 3 ♂♂, ♀, 40° 05'

25° K, 42° 18' 36" D, 1530 m, 21.V.2024, 2 ♂♂, 3 ♀♀; Tavşancık, 40° 06' 55" K, 42° 22' 20" D, 10.VII.2023, 1532 m, 5 ♂♂ 2 ♀♀; Along Erzurum-Horasan road, 40° 03' 21" K, 42° 12' 20" D, 11.VIII.2023 1530 m, ♂, 5 ♀♀.

Hosts: Lepidoptera: *Ostrinia nubilalis* (Hubner), *Pennisetia hylaeiformis* (Laspeyres), *Ypsolopha dentella* (J.C.Fabricius).

Associated plants: *Anthriscus sylvestris* (L.), *Chaerophyllum aromaticum* L., *Cornus mas* L., *Corylus avellana* L., *Daucus carota* L., *Ferulago sylvatica* (Besser) Rchb., *Fraxinus excelsior* L., *Heracleum sphondylium* L., *Oryza sativa* L., *Peucedanum oreoselinum* (L.), *Picea excelsa* (L.).

Distribution: Palaearctic, known from Türkiye (Table 3).

\**Dicaelotus ruficoxatus* (Gravenhorst, 1829) (Figure 3m)

Material examined: Erzurum: Horasan, Çiftlik, 40° 04' 08" K, 42° 14' 11" D, 1530 m, 21.V.2024, 2 ♂♂, 2 ♀♀; Küme evler, 40° 03' 41" K, 42° 13' 27" D, 1530 m, 02.V.2024, ♂, 4 ♀♀. Iğdır: Merkez, Yaycı, 39° 95' 041" K, 43° 96' 099" D, 866 m, 09.X.2024, ♂,

Associated plants: *Anthriscus sylvestris* (L.) Hoffm, *Daucus carota* L., *Heracleum sphondylium* L.

Distribution: Europea, West Palaearctic, new for Türkiye (Table 3).

### Phygadeuontinae Förster, 1869

*Gelis agilis* (Fabricius, 1775) (Figure 3n)

Material examined: Erzurum: Horasan, Çiftlik, 40° 04' 08" K, 42° 14' 11" D, 1530 m, 21.V.2024, 3 ♂♂, 5 ♀♀, 40° 05' 25" K, 42° 18' 36" D, 1530 m, 21.V.2024, 2 ♂♂, 5 ♀♀; Tavşancık, 40° 06' 20" K, 42° 22' 12" D, 1510 m, 21.V.2024, 5 ♂♂, 3 ♀♀. Iğdır: Central, Yaycı, 39° 95' 041" K, 43° 96' 099" D, 866 m, 09.X.2024, 2 ♂♂, 2 ♀♀.

Hosts: This species obtained from 137 different hosts.

Associated plants: *Lonicera* sp., *Mentha longifolia* (L.), *Picea excelsa* (Lam.), *Prunus* sp., *Quercus robur* L. and *Salix* sp.

Distribution: Palaearctic, known from Türkiye (Table 3).

Remarks: This species was first identified by Fahringer (1922), but the locality in Türkiye was not specified (Yu et al., 2016).

*Mesoleptus laevigatus* (Gravenhorst, 1820) (Figure 3o)

Material examined: Erzurum: Horasan, Tavşancık, 40° 06' 55" K, 42° 22' 20" D, 10.VII.2023, 1532 m, ♂, 2 ♀♀, Tavşancık, 40° 06' 20" K, 42° 22' 12" D, 1510 m, 21.V.2024, 3 ♂♂, 2 ♀♀; Küme evler, 40° 3' 35" K, 42° 13' 34" D, 21.VII.2023, 1500 m, 3 ♂♂ 4 ♀♀. Iğdır: Cental, Yaycı, 39° 95' 041" K, 43° 96' 099" D, 866 m, 09.X.2024, 4 ♂♂, 3 ♀♀.

Hosts: Diptera: *Sarcophaga pseudoscoparia* (Kramer). Hymenoptera: *Neodiprion sertifer* (Geoffroy).

Associated plants: *Chaerophyllum bulbosum* L., *Daucus carota* L., *Euphorbia nicaeensis* All., *Euphorbia virgata* Waldst. & Kit., *Fraxinus excelsior* L., *Heracleum sphondylium* L., *Listera ovata* (L.), *Picea excelsa* (Lam.), *Prunus cerasifera* Ehrh., *Quercus* sp., *Rubus* sp.

Distribution: Palaearctic, known from Türkiye (Table 3).

### Tersilochinae Schmiedeknecht, 1910

*Aneulis incidens* (Thomson, 1889) (Figure 3p)

Material examined: Erzurum: Horasan, Çiftlik, 40° 04' 08" K, 42° 14' 11" D, 1530 m, 21.V.2024, 2 ♂♂, 2 ♀♀, 40° 05' 25" K, 42° 18' 36" D, 1530 m, 21.V.2024, 2 ♂♂, 4 ♀♀. Iğdır: Central, Yaycı, 39° 95' 041" K, 43° 96' 099" D, 866 m, 09.X.2024, 2 ♂♂, 3 ♀♀.

Hosts: Coleoptera: *Anobium fagi* L., *Meligethes aeneus* (F.), *Meligethes viridescens* (F.).

Distribution: Palaearctic, known from Türkiye (Table 3).

Remarks: This species was identified for the first time in Erzurum province with this study.

## DISCUSSION

As a result of this study, 343 specimens belonging to 16 genera belonging to the subfamilies Anomaloninae Viereck, Banchinae Wesmael, Campopleginae Forster, Cremastinae Forster, Cryptinae Kirby, Diplazontinae Viereck, Ichneumoninae Latreille, Phygadeuontinae Förster, and Tersilochinae Schmiedeknecht were collected, and these were identified as belonging to 16 species (Table 2). When Table 2 was evaluated, the samples belonging to nine different subfamilies showed a distribution as 55 specimens from Anomaloninae (1 species), 18 from Banchinae (1

species), 17 from Campopleginae (1 species), 14 from Cremastinae (2 species), 97 from Cryptinae (3 species), 46 from Diplazontinae (3 species), 32 from Ichneumoninae (2 species), 49 from Phygadeuontinae (2 species) and 15 from Tersilochinae (1 species) (Figure 4a).

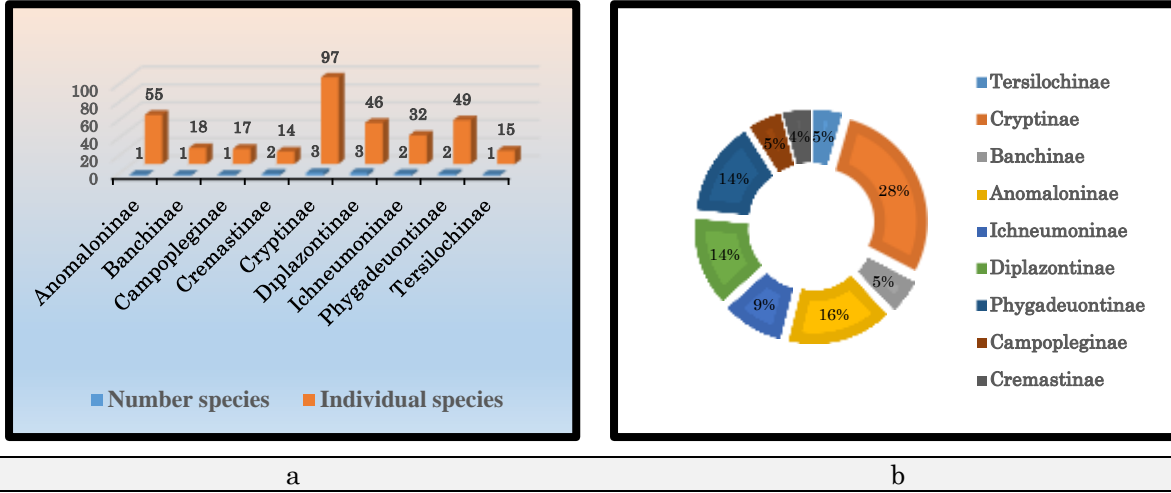


Figure 4. Number species of subfamilies: a) according to the number of species and individual species, b) according to the percentage of the number of individuals.

Şekil 4. Altfamilya tür sayısı: a) Birey ve tür sayısına göre, b) Birey sayısı yüzdesine göre.

When the density of the obtained samples was examined, Anomaloninae constituted 16.0% of the total sample number with 55 individuals, Banchinae constituted 5.2% with 18 individuals, Campopleginae constituted 4.9% with 17 individuals, Cremastinae constituted 4.0% with 14 individuals, Cryptinae constituted 28.2% with 97 individuals, Diplazontinae constituted 13.4% with 46 individuals, Ichneumoninae constituted 9.3% with 32 individuals, Phygadeuontinae constituted 14.2% with 49 individuals and Tersilochinae constituted 4.3% with 15 individuals (Figure 4b).

Cryptinae and Diplazontinae ranked first in terms of number of species, while Cryptinae and Anomaloninae ranked first in terms of number individual (Figure 4a,b).

Of the identified species, *Cryptus viduatorius* Fabricius (59), *Anomalon cruentatum* (Geoffroy) (55), *Gelis agilis* (Fabricius) (27), and *Colpognathus celerator* (Gravenhorst) (22) were considered common species in the region; *Pristomerus rivalis* Narolsky (8) and *Temelucha signata* (Holmgren) (6) were considered lesser-known species; and *Dicaelotus ruficoxatus* (Gravenhorst) was considered a new species recorded for the region.

The samples comprising the study material were collected from altitudes between 750 and 1750 m. Ten species were collected from the 750 to 1000 m range, four species from the 1001-1500 m range, and 16 species from the 1501-1750 m range. The highest number of individuals coming in the insect net was collected from the 1501-1750 m range, while the fewest samples were collected from the 1001-1500 m range (Figure 5a,6). This confirms the idea that the frequency of visits to the study localities and the collection preference are directly proportional.

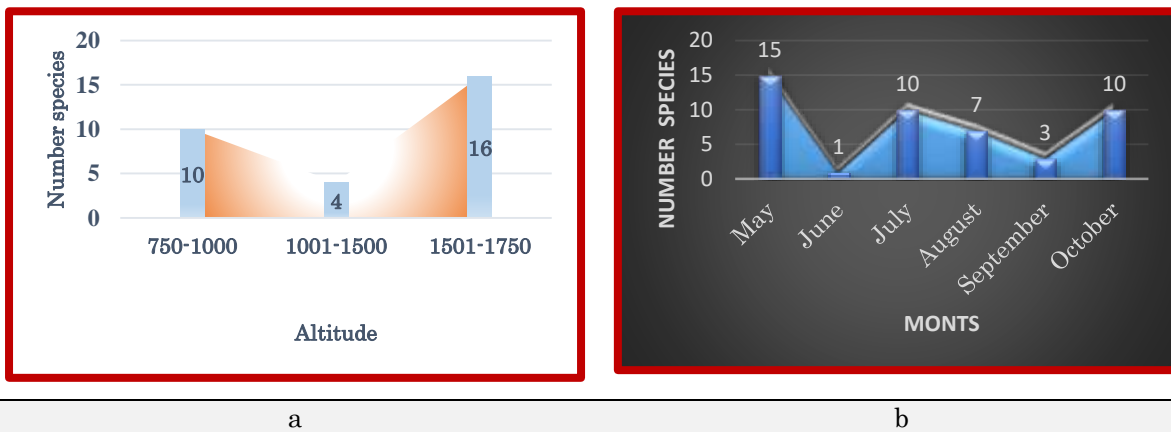


Figure 5. Number of species: a) according to the collected altitude (m), b) according to the collected mont.

Şekil 5. Türin sayısı: a) Toplanma rakımına göre (m), b) Toplanma aylarına göre.

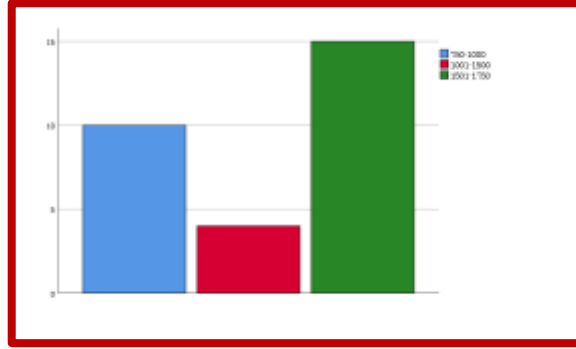


Figure 6. Difference between altitudes according to the chi-square test.

Şekil 6. Chi-square testine göre rakımlar arasındaki fark.

	Observed N	Expected N	Residual
750-1000	10	9,7	,3
1001-1500	4	9,7	-5,7
1501-1750	16	9,7	5,3
Total	29		

Test Statistics	
Chi-Square	6,276 <sup>a</sup>
df	2
Asymp. Sig.	,043

a. 0 cells (0,0%) have expected frequencies less than 5. The minimum expected cell frequency is 9,7.

While the samples in this study were collected primarily in May, June, July, August, September, and October, the October sample was considered interesting for this region because of the cold weather. While this was directly proportional to the preferred months and the frequency of visits, the highest number of samples were collected in May and the lowest in June (Figure 5b).

The localities where the collected samples had previously been collected in Türkiye were also identified (Table 3). Accordingly, 13 of the species constituting this study had previously been recorded from the Eastern Anatolia Region, 12 from the Black Sea Region, and 11 from the Mediterranean Region. This situation is directly proportional to the density of the studied regions. The regions with the least species distribution were the Central Anatolia and the Aegean Region, with five species each, and the Southeastern Anatolia Region, with four species (Figure 7a,8). When examined on a provincial basis, it was also analyzed that samples had been collected from 53 different provinces in previous studies, with the most samples collected from Erzurum, Isparta, and Trabzon, and the least from Balıkesir, Ardahan, and Osmaniye.

When the zoogeographic distribution of the species in the study was evaluated, it was seen that 13 of the species in the study had a distribution area in the Palearctic, four in the Oriental and Nearctic, three in the Europe and West Palearctic (Figure 7b).

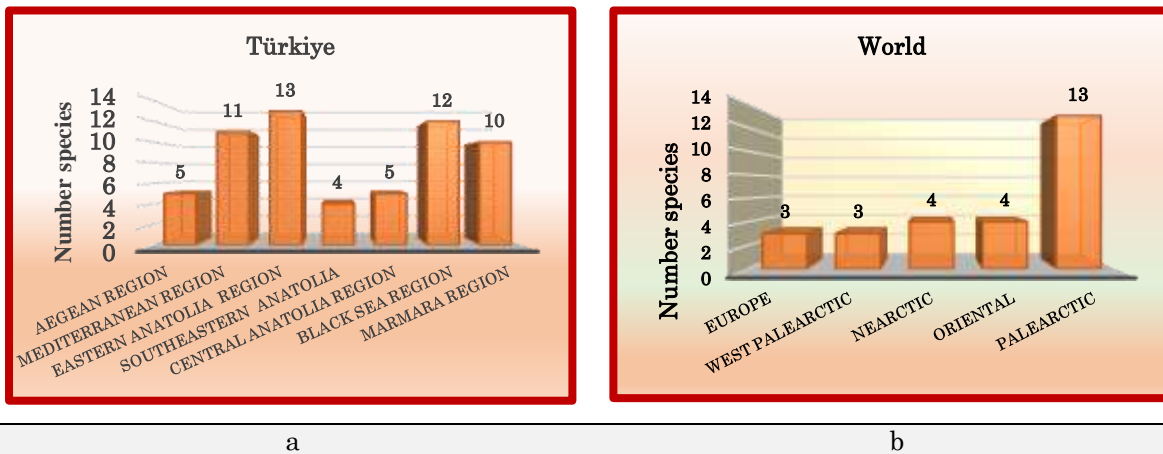


Figure 7. Distribution of species: a) according to the geographical area, b) general distribution.

Şekil 7. Tür dağılımı: a) coğrafik bölgelere göre, b) genel dağılıma göre.

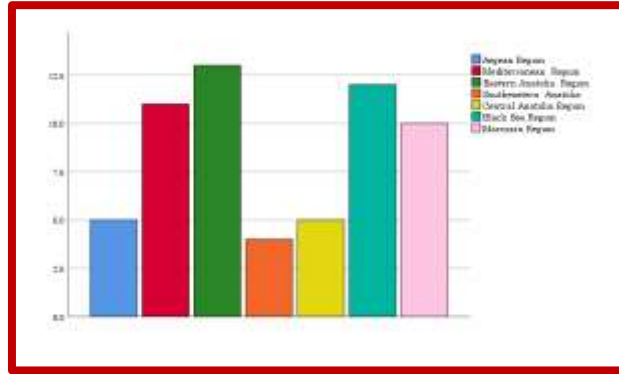


Figure 8. Difference between geographic regions to the chi-square test.

Şekil 8. Chi-square testine göre coğrafik bölgeler arasındaki fark

	Observed N	Expected N	Residual
Aegean Region	5	8,6	-3,6
Mediterranean Region	11	8,6	2,4
Eastern Anatolia Region	13	8,6	4,4
Southeastern Anatolia	4	8,6	-4,6
Central Anatolia Region	5	8,6	-3,6
Black Sea Region	12	8,6	3,4
Marmara Region	10	8,6	1,4
Total	60		

#### Test Statistics

Chi-Square	10,000 <sup>a</sup>
df	6
Asymp. Sig.	,125

a. 0 cells (0,0%) have expected frequencies less than 5. The minimum expected cell frequency is 8,6.

Preliminary data for this thesis was also published in a prepared article (Korukcu & Çoruh, 2024). This study was created by adding new data to that data.

While previous studies have shown that the subfamily Pimplinae is prominent in terms of individual and species density in the Old Aras Valley (Pekel, 1999; Pekel et al., 2000; Çoruh et al., 2002; Özbek et al., 2003; Çoruh et al., 2004; Çoruh & Özbek, 2005; Çoruh et al., 2005a,b; Çoruh et al., 2007; Çoruh & Özbek, 2008; Kolarov et al., 2009; Riedel et al., 2010, Çoruh & Kolarov, 2010; Çoruh et al., 2011; Çoruh & Özbek, 2011; Kolarov & Çalmaşur, 2011; Çoruh & Kolarov, 2012) from this subfamily were not found in this study. It is considered quite interesting that a very common and frequently caught species such as *Exeristes roborator* (F.) was not detected in the New Aras Valley. It is also interesting that none of the species reported as new records for Türkiye in the Aras Valley were found in this study. It is also surprising that *Dicaelotus ruficoxatus* (Gravenhorst), previously undetected in this region, is a new record for Türkiye in this study, and *Temelucha signata* (Holmgren) and *Enizemum ornatum* (Gravenhorst) is also a new record for Eastern Anatolia and the Aras Valley. *Colpotrochia tricolor* (Aubert) was documented as an endemic species in the study area, but this species was not found in this study.

As a result of the study, one of our objectives, the findings regarding the faunal and floral changes that the Aras Valley's biodiversity has undergone over time, have stood out. The increase in the number and size of dams on a stream is directly proportional to the extent of natural damage (Bayrakdar, 2004). Not only is the plant and animal diversity in the area where the water is collected being destroyed, but also agricultural lands, forests, and all kinds of historical and cultural assets in this region are being submerged.

The areas covered by the dam reservoir also provide habitat for many species. The construction of dams either destroys or forces the migration of species living along or near streams. For example, due to the dams planned to be built on the Çoruh River, many animal species living in these areas, such as the Maral Deer (*Cervus elaphus* L.), Roe Deer (*Capreolus capreolus* L.), Brown Bear (*Ursus arctos* L.), Badger (*Meles meles* (L.)), and Otter (*Lutra lutra* L.), will be threatened by the dam's waters (Sever, 2005). This destruction of natural vegetation and the extinction or forced migration of these species will lead to serious changes in the ecosystems of the regions (Sönmez, 2012).

While the changing climate brings with it a warming climate, the significant increase in humidity is causing

changes in plant and animal diversity. The disruption of the river's ecosystem due to changing water temperature and water retention has affected the insect fauna and the biodiversity of Ichneumonidae. This has been linked to the inability to identify species previously caught and the decline in insect numbers and species.

The structural changes that have been made have directly and indirectly threatened nature and will continue to do so.

The sustainability of life is directly linked to the preservation of biodiversity in nature. Therefore, planning every step with this awareness is crucial for the preservation and continuity of the ecological balance.

With this importance, the new taxonomic information obtained will inform and guide future faunal studies and Ichneumonidae volunteers.

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## Author's Contributions

Authors declare the contribution of the authors is equal.

## Conflict of Interest Statement

There is no conflict of interest between the authors.

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