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Ichneumonidae (Hymenoptera) Biodiversity of Karlıova (Bingöl) in Türkiye

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ABSTRACT

This faunistic research was carried out to determine the species of Ichneumonidae (Hymenoptera) collected from Karlıova district of Bingöl province between 2022-2023. Adults of Ichneumonidae specimens collected from flowering plants and weeds in the deep passes and valleys of Karlıova district of Bingöl province samples were collected by entomological net (atrap) on vegetation period and between the altitudes of 1761-1963 m. As a results of this research, 10 different subfamilies (Anomaloninae Viereck, 1918; Banchinae Wesmael, 1845; Campopleginae Forster, 1869; Cremastinae Forster, 1869; Cryptinae Kirby, 1837; Cylloceriinae Wahl, 1990; Ichneumoninae Latreille, 1802; Ophioninae, Shuckard, 1840; Pimplinae Wesmael, 1845 and Tryphoninae Shuckard, 1840) belonging to 16 genera, 256 individuals were collected and 18 species were identified. Among these 18 identified species, 15 species, except three species, were determined as new records for Bingöl province, *Cremastus spectator* Gravenhorst, 1829 and *Aritranis longicauda* (Kriechbaumer, 1873) species were determined as new records for the Eastern Anatolia Region.

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Keywords
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ÖZET

Bu faunistik araştırma, Bingöl ili Karlıova ilçesinden 2022-2023 yılları arasında toplanan Ichneumonidae türlerinin belirlenmesi amacıyla yapılmıştır. Bingöl ili Karlıova ilçesi derin geçit ve vadilerindeki çiçekli bitki ve yabancı otlardan toplanan Ichneumonidae örneklerinin erginleri, vejetasyon döneminde ve 1761-1963 m rakımlar arasında entomolojik ağ (atrap) ile toplanmıştır. Bu araştırma sonucunda 10 farklı alt familya (Anomaloninae Viereck, 1918; Banchinae Wesmael, 1845; Campopleginae Forster, 1869; Cremastinae Forster, 1869; Cryptinae Kirby, 1837; Cylloceriinae Wahl, 1990; Ichneumoninae Latreille, 1802; Ophioninae, Shuckard, 1840; Pimplinae Wesmael, 1845 and Tryphoninae Shuckard, 1840)'ya bağlı 16 cinse ait 256 birey toplanmış ve 18 tür tespit edilmiştir. Tespit edilen 18 türden 3 tür hariç 15 tür Bingöl ili için yeni kayıt, *Cremastus specator* Gravenhorst, 1829 ve *Aritranis longicauda* (Kriechbaumer, 1873) türü ise Doğu Anadolu Bölgesi için yeni kayıt olarak belirlenmiştir.

Bitki Koruma

Araştırma Makalesi

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Anahtar Kelimeler
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Biyoçeşitlilik
Yeni kayıtlar
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Türkiye

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INTRODUCTION

The Ichneumonidae, known as "ichneumon wasps", "ihneumonids", "Darwin wasps" are a family of parasitoid wasps of the insect of Hymenoptera.

They are one of the most diverse groups within Hymenoptera with roughly 25,000 species described (Yu et al., 2016).

They fulfill an important role as regulators of insect populations, in natural and semi-natural systems, making them promising agents for biological control (Klopfstein et al., 2019).

The Ichneumonidae constitute one of the largest families in the animal kingdom. This family is important because

their larvae can be either endo or ectoparasitoids of larvae or pupae of holometabolous insects and Chelicerata (Fernandes et al., 2019).

In recent studies in Türkiye, the number of Ichneumonidae species was updated to 1451. (Barik, 2022; Birol, 2022; Çoruh, 2002; Doğru, 2022; Ataş & Çoruh, 2022; Çoruh, & Riedel, 2022; İneciklioğlu, 2022; Kolarov & Çoruh, 2022; Korkmaz & Çoruh, 2022; Teymuroğlu & Çoruh, 2022; Çoruh, Kolarov & Ercelep, 2022a; Çoruh, Tezcan & Gülperçin 2022b; Kaplan, 2023; Ataş & Çoruh, 2023; Barik & Çoruh, 2023a, Barik & Çoruh, 2023 b; Narmanlıoğlu & Çoruh, 2023; Kaplan, 2024; Ayhan & Çoruh, 2024; Çoruh & Kolarov, 2024; Korkmaz & Çoruh, 2024).

The study is conducted to identify Ichneumonidae (Hymenoptera) species in Karlıova district of Bingöl province and to contribute to Ichneumonidae biodiversity.

MATERIALS and METHODS

Data sampling

Adults of Ichneumonidae specimens collected from flowering plants and weeds in the deep passes and valleys of Karlıova district of Bingöl province (Figures 1, 2) constitute the material of the study. Adult samples - were collected by entomological net (atrap) in the years 2022-2023 vegetation period and between the altitudes of 1761-1963 m (Table 1).

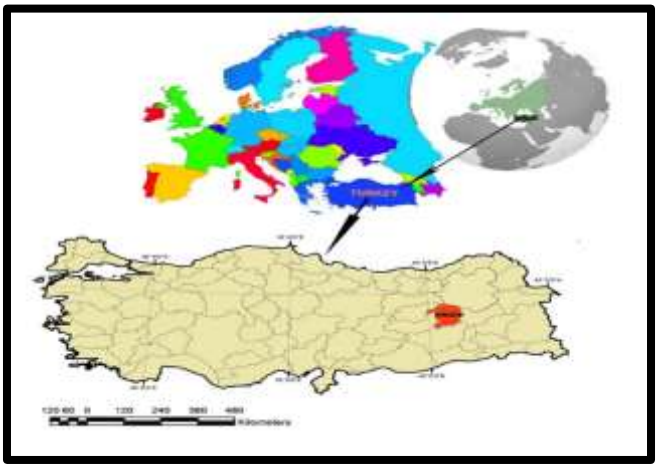


Figure 1. Map of study area.
Şekil 1. Araştırma alanın haritası.

Figure 2. Research localities.
Şekil 2. Çalışma alanından lokaliteler.

Study area

Survey studies were carried out in the Karlova district of Bingöl province. The research area's unique characteristics—deep gorges and valleys, location between mountains and small lakes at different altitudes, and outflow of water resources—were effective in choosing it as the study area.

Karlıova district is located in the Upper Euphrates Section of the Eastern Anatolia Region. The settlement, located in the northeast of the Central district of Bingöl province, is located in the middle part of the mountains, which extend roughly in the east-west direction and are mostly 3000 m high (Karagöl Mountains 3057 m, Bingöl Mountain 3193 m, Satan Mountains 2,839 m, Şerafettin Mountains 2388 m). The region, whose altitude exceeds 1900 meters and where high flat areas cover a large area, also has the feature of being the hydrographic border where several rivers (Peri Stream, Göynük Stream, Murat River) receive their sources. The district's surface area is 1,311 km². Its ratio to the provincial surface area is 16.60%. The district's altitude above sea level is 1,940 meters. Its distance from the city center is 70 km. Sunrise can be watched within the borders of this district (Anonymous, 2024 a,b).

The study material was collected from 10 different localities (Karlıova center, Çukurtepe, Hacılar, Göynük, Yoncalık, Halifan, Hasanova, Kargapazarı, Viranşehir and Ortaköy) in the Karlıova district of Bingöl province (Table 1).

Laboratory studies

All the materials that make up the study were collected and photographed by the first author. Ichneumonid adults transported to the laboratory were prepared for identification, subfamily density composition was made according to the discriminatory taxonomic characters and preserved. After the field studies were completely completed, genus and species information was obtained, identified samples were used in the identification of the samples, some of the identifications were made in the Hikmet Özbek Taxonomy Laboratory by second author, while the unidentified samples were identified by Dr. J. KOLAROV (Bulgaria).

After the species were identified, the appearance of each species was monitored using the digital shooting unit (Canon EOS 1100D camera, Canon EF 100 mm, f/2.8L Macro lens, Kaiser digital shooting unit) installed in the Ataturk University Biodiversity Application and Research Center and the Lenovo Research brand camera Helicon focus 6.7.1. program. The names of species and their distribution in world and associated plants were used in a limited number from Yu et al. (2016) catalog.

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

Locality	Altitude (m)	Cordinates	
ÇUKURTEPE	1881	39°24'14.76"K	41° 2'5.64"D
ÇUKURTEPE	1874	39°24'13.68"K	41° 2'10.68"D
ÇUKURTEPE	1919	39°25'6.96"K	41° 2'17.16"D
ÇUKURTEPE	1920	39°25'7.68"K	41° 2'17.16"D
ÇUKURTEPE	1941	39°25'11.28"K	41° 2'29.04"D
HACILAR	1444	39° 5'47.40"K	40°48'52.92"D
GÖYNÜK	1761	39° 9'2.52"K	40°53'54.96"D
YONCALIK	1936	39°20'8.16"K	41° 4'39.72"D
YONCALIK	1937	39°20'2.40"K	41° 4'46.92"D
YONCALIK	1938	39°20'4.20"K	41° 4'49.08"D
YONCALIK	1936	39°20'6.36"K	41° 4'45.48"D
HALİFAN	1694	39° 8'37.32"K	40°52'1.20"D
HALİFAN	1684	39° 8'31.20"K	40°51'55.80"D
HALİFAN	1728	39° 8'45.24"K	40°52'26.40"D
HALİFAN	1727	39° 8'44.88"K	40°52'26.04"D
HASANOVA	1961	39°10'19.92"K	41° 2'16.80"D
KARGAPAZARI	1963	39°18'46.08"K	41° 8'22.20"D
KARGAPAZAR)	1956	39°18'47.88"K	41° 8'18.96"D
KARGAPAZARI	1816	39°18'44.99"K	41° 5'52.61"D
KARGAPAZARI	1826	39°18'44.74"K	41° 5'56.26"D
KARGAPAZARI	1803	39°17'33.36"K	41° 4'27.48"D
KARGAPAZARI	1802	39°17'41.28"K	41° 4'23.16"D
VİRANŞEHİR	1897	39°23'15.72"K	40°58'19.92"D
VİRANŞEHİR	1894	39°23'15.00"K	40°58'19.56"D
KARLIOVA	1866	39°17'43.44"K	40°59'48.12"D
KARLIOVA	1857	39°17'43.08"K	40°59'43.08"D
KARLIOVA	1861	39°17'33.00"K	40°59'45.24"D
KARLIOVA	1863	39°17'33.72"K	40°59'48.48"D
KARLIOVA	1785	39°18'8.28"K	41° 1'32.16"D
KARLIOVA	1786 m	39°18'10.44"K	41° 1'32.52"D
KARLIOVA	1788 m	39°18'6.48"K	41° 1'33.60"D
KARLIOVA	1793 m	39°18'2.16"K	41° 1'20.64"D
ORTAKÖY	1967 m	39°24'6.84"K	40°53'16.44"D
ORTAKÖY	1981 m	39°24'7.56"K	40°53'15.72"D
ORTAKÖY	1955 m	39°23'50.28"K	40°53'32.64"D
ORTAKÖY	1909 m	39°23'47.76"K	40°53'39.12"D
ORTAKÖY	1931 m	39°23'52.44"K	40°53'35.16"D
ORTAKÖY	1925 m	39°23'52.80"K	40°53'33.72"D
ORTAKÖY	1929 m	39°23'54.96"K	40°53'33.72"D
ORTAKÖY	1973 m	39°24'19.80"K	40°53'27.60"D
ORTAKÖY	1971 m	39°24'21.24"K	40°53'25.80"D
ORTAKÖY	1784 m	39°23'32.28"K	40°53'13.20"D

RESULTS

During field studies, 256 specimens belonging to 16 genera belonging to subfamilies Anomaloninae Viereck, 1918; Banchinae Wesmael, 1845; Campopleginae Forster, 1869; Cremastinae Forster, 1869; Cryptinae Kirby, 1837; Cylloceriinae Wahl, 1990; Ichneumoninae Latreille, 1802; Ophioninae Shuckard, 1840; Pimplinae Wesmael, 1845 and Tryphoninae Shuckard, 1840 were collected and 18 species were identified. Of these, *Cremastus spectator* Gravenhorst, 1829 and *Aritranis longicauda* (Kriechbaumer, 1873) were determined to be new East Anatolia Region. The species are listed below:

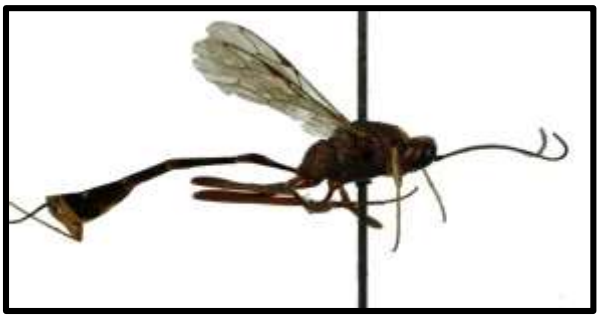
Anomaloninae Viereck, 1918

Anomalon cruentatum (Geoffroy, 1785) (Figure 3-1a).

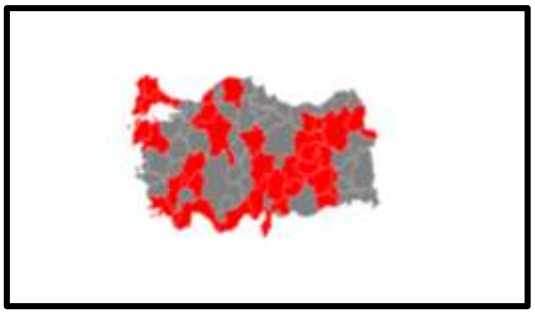
Material examined: Göynük: 39° 9' 2.52" N, 40° 53' 54.96" E, 1761 m, 20.X.2022, 5 ♀♀. Çukurtepe: 39° 25' 11.28" N, 41° 2' 29.04" E, 1941 m, 06.XI.2022, 4 ♀♀. Halifan: 39° 8' 31.20" N, 40° 51' 55.80" E, 1684 m, 20.XI.2022, ♂, ♀; 39° 8' 37.32" N, 40° 52' 1.20" E, 1694 m, 20.XI.2022, 2 ♀♀; 39° 8' 44.88" N, 40° 52' 26.04" E, 1727 m, 20.XI.2022, 3 ♂♂; 39° 8' 45.24" N, 40° 52' 26.40" E, 1728 m, 20.XI.2022, 2 ♂♂, ♀. Viranşehir: 39° 23' 15.00" N, 40° 58' 19.56" E, 1894 m, 02.VII.2023, 5 ♂♂, 2 ♀♀. Ortaköy: 39° 23' 47.76" N, 40° 53' 39.12" E, 1909 m, 26.VII.2023, 2 ♀♀; 39° 23' 52.80" N, 40° 53' 33.72" E, 1925 m, 26.VIII.2023, 5 ♂♂; 39° 23' 54.96" N, 40° 53' 33.72" E, 1929 m, 26.VIII.2023, 5 ♂♂. Karlıova: 39° 18' 2.16" N, 41° 1' 20.64" E, 1793 m, 23.IX.2023, 3 ♂♂, 5 ♀♀.

Distribution: Oriental and Palaearctic, known from Türkiye (Figure 3-1b,Table 2).

Associate plants: *Anthriscus sylvestris* (L.), *Peucedanum oreoselinum* (L.) (Yu et al., 2016).

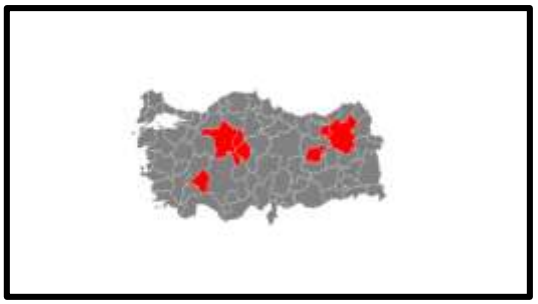


1a



1b

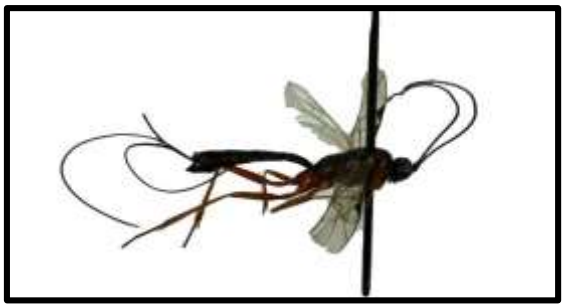
2a



2b

3a

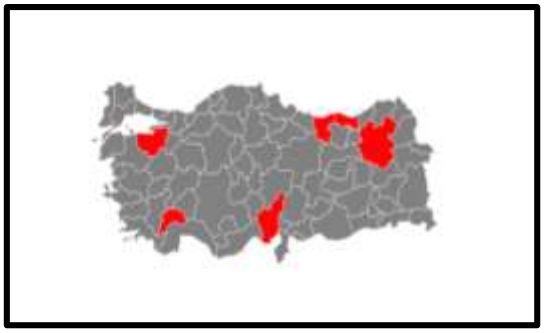
3b



4a

4b

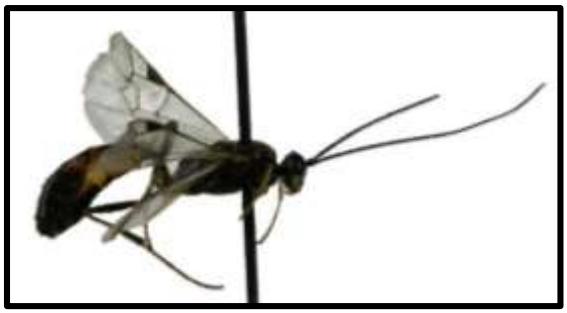
5a



5b

6a

6b

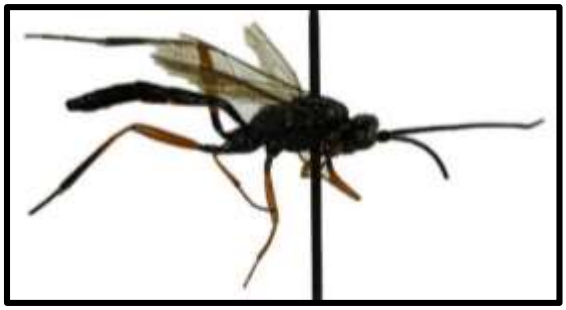


7a

7b

8a

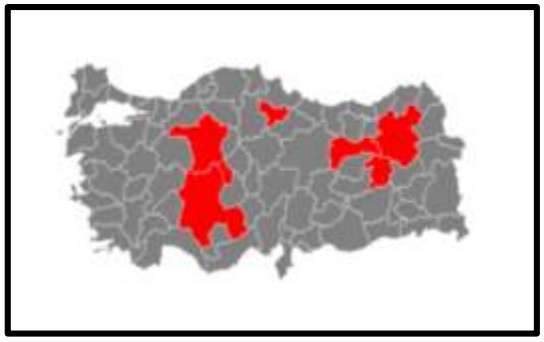
8b



9a

9b

10a



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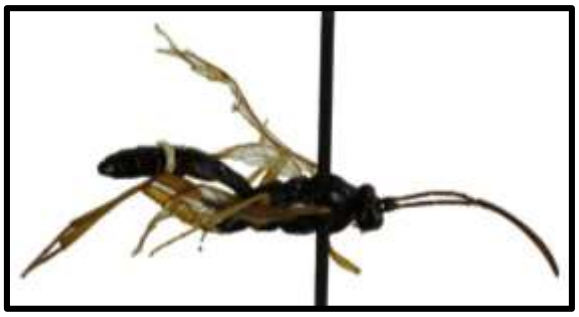
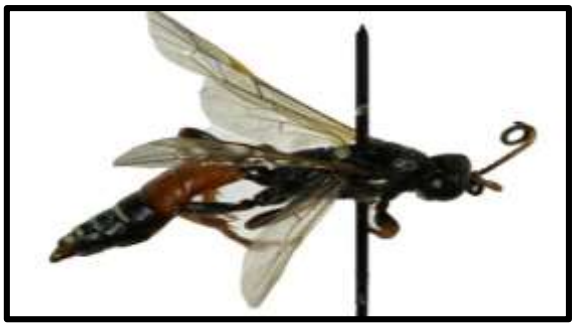


11a

11b



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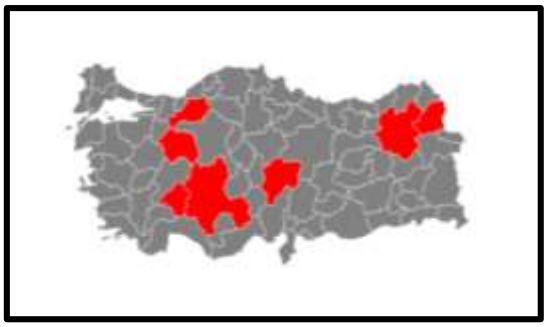


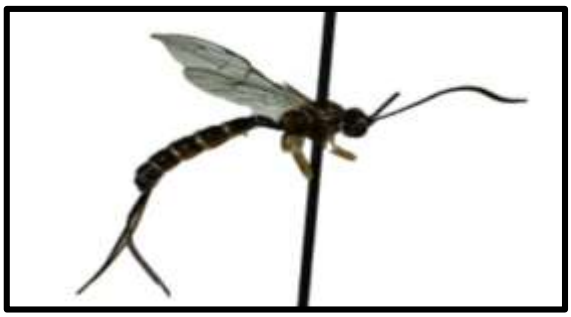
12b

13a

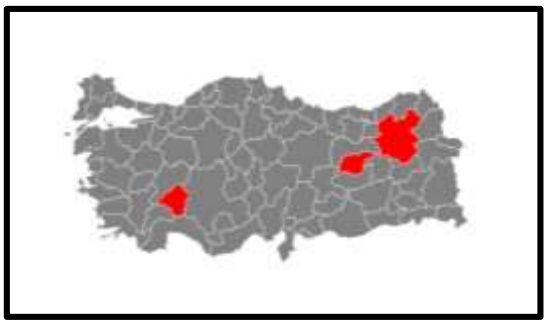
13b

14a

14b



15a



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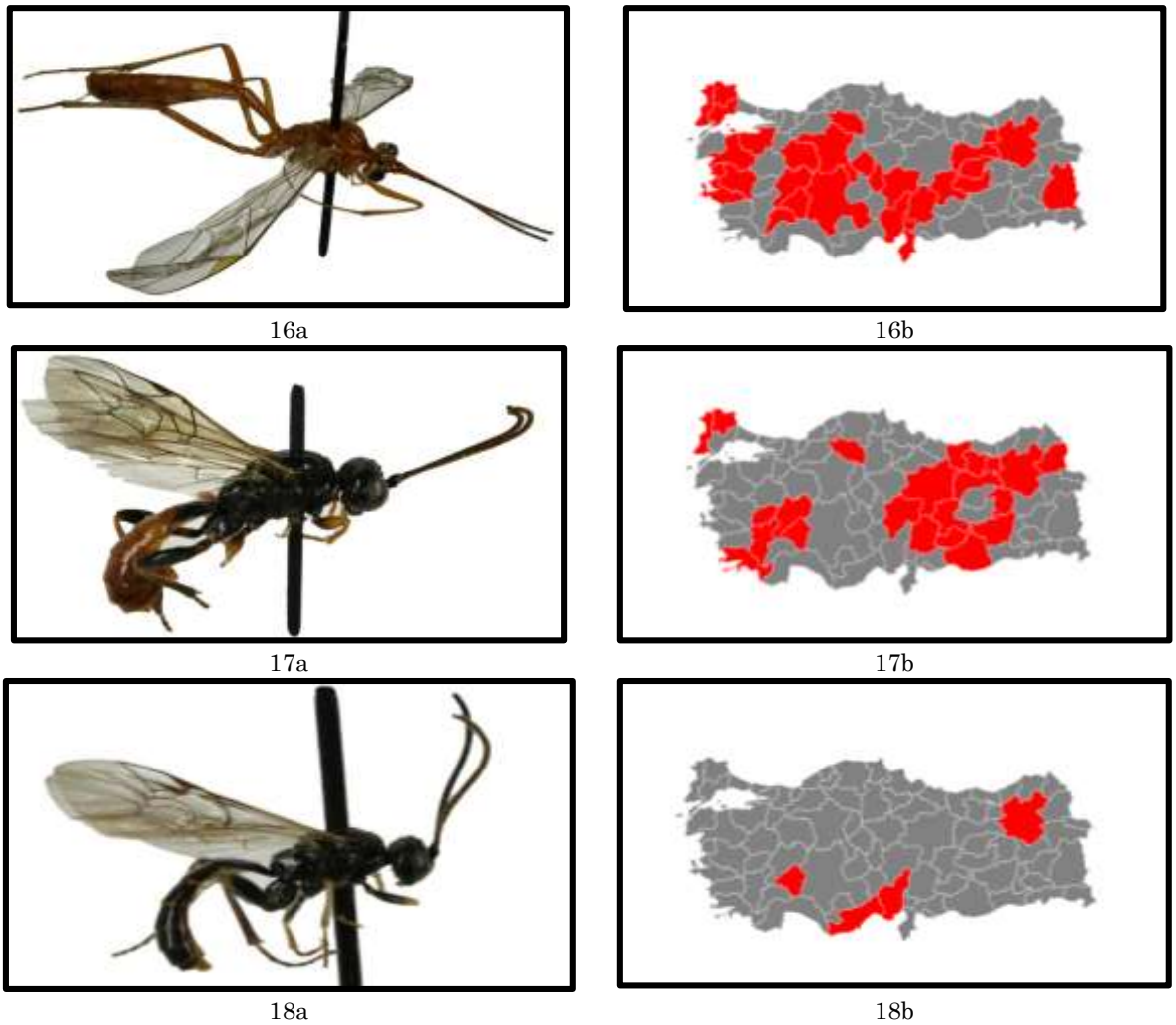


16a 16b

17a 17b

18a 18b

Figure 3. a) Habitus, b) Distribution of Türkiye: 1) *Anomalon cruentatum* (Geoffroy, 1785); 2) *Exetastes adpressorius* (Thunberg, 1822); 3) *Lissonota (Loxonota) lineata* Gravenhorst, 1829; 4) *Lissonota* (*Lissonota*) *pleuralis* Brischke, 1880; 5) *Campoletis crassicornis* (Tschek, 1871); 6) *Cremastus geminus* Gravenhorst, 1829; 7) *C. spectator* Gravenhorst, 1829; 8) *Aritranis longicauda* (Kriechbaumer, 1873); 9) *Cryptus viduatorius* Fabricius, 1804; 10) *Latibulus argiolus* (Rossi, 1790); 11) *Cylloceria melancholica* (Gravenhorst, 1820); 12) *Spilichneumon occisorius* (Fabricius, 1793); 13) *Virgichneumon maculicauda* (Perkins, 1953); 14) *Ophion mocsaryi* Brauns, 1889; 15) *Perithous septemcinctorius* (Thunberg, 822); 16) *Netelia fuscicornis* (Holmgren, 1860); 17) *Tryphon thomsoni* Roman, 1939; 18) *T. psilosagator* Aubert, 1966.

Şekil 3. a) Habitus, b) Türkiye dağılışları: 1) Anomalon cruentatum (Geoffroy, 1785); 2) Exetastes adpressorius (Thunberg, 1822); 3) Lissonota (Loxonota) lineata Gravenhorst, 1829; 4) Lissonota (Lissonota) pleuralis Brischke, 1880; 5) Campoletis crassicornis (Tschek, 1871); 6) Cremastus geminus Gravenhorst, 1829; 7) C. spectator Gravenhorst, 1829; 8) Aritranis longicauda (Kriechbaumer, 1873); 9) Cryptus viduatorius Fabricius, 1804; 10) Latibulus argiolus (Rossi, 1790); 11) Cylloceria melancholica (Gravenhorst, 1820); 12) Spilichneumon occisorius (Fabricius, 1793); 13) Virgichneumon maculicauda (Perkins, 1953); 14) Ophion mocsaryi Brauns, 1889; 15) Perithous septemcinctorius (Thunberg, 822); 16) Netelia fuscicornis (Holmgren, 1860); 17) Tryphon thomsoni Roman, 1939; 18) T. psilosagator Aubert, 1966

Banchinae Wesmael, 1845

Exetastes adpressorius (Thunberg, 1822) (Figure. 3-2a)

Material examined: Çukurtepe: 39° 24' 14.76" N, 41° 2' 5.64" E, 1881 m, 10.VII.2022, 2 ♂♂, 2 ♀♀. Göynük: 39° 9' 2.52" N, 40° 53' 54.96" E, 1761 m, 20.X.2022, 2 ♀♀. Hacılar: 39° 5' 47.40" N, 40° 48' 52.92" E, 1444 m, 20.X.X.2022, 3 ♂♂. Karlıova: 39° 17' 43.08" N, 40° 59' 43.08" E, 1857 m, 02.VII.2023, ♂, 39° 17' 43.44" N, 40° 59' 48.12" E, 1866, m, 02.VII.2023, 4 ♂♂, 2 ♀♀.

Distribution: Nearctik and Palaearctic, known from Türkiye (Figure 3-2b,Table 2).

Table 2. Provinces and references of collected species in Türkiye
Çizelge 2. Türkiye'deki türlerin dağılış gösterdiği iller ve ilgili referanslar

Taxa name	Provinces	References
ANOMALONINAE VIERECK, 1918		
Genus *Anomalon* Panzer, 1804		
Anomalon cruentatum	Adana, Adıyaman, Afyon, Ankara, Antalya, Balıkesir, Batman, Bayburt, Bingöl, Bolu, Çanakklae, Denizli, Diyarbakır, Edirne, Elazığ, Erzincan, Erzurum, Gaziantep, Gümüşhane, Hatay, Iğdır, Isparta, İstanbul, Kahramanmaraş, Kars, Kastamonu, Kayseri, Kırklareli, Malatya Mardin, Mersin, Muğla, Tekirdağ, Tunceli, Yozgat Zonguldak.	Kohl, 1905; Sedivy, 1959; Kolarov, 1989; Kılınçer, 1990; Öncüer, 1991; Yurtcan, Beyaslan & Kolarov, 1994; Kolarov, 1995, Kolarov, Beyarlan & Yurtcan, 1997a; Kolarov, Yurtcan & Beyaslan, 2002; Gürbüz, 2004; Çoruh, Özbek & Kolarov, 2004; Akkaya, 2005; Kolarov & Gürbüz, 2006; Beyarslan, Yurtcan, Erdoğan & Aydoğdu, 2006; Okyar & Yurtcan, 2007; Bolu, Özdemir & Özgen, 2007; Buncukçu, 2008; Kırtay, 2008; Gürbüz, Ljubomirov, Kolarov, Yurtcan, Tabur, Çoruh & Buncukçu, 2008; Gürbüz, Aksoylar & Buncukcu, 2009a; Gürbüz, Kırtay & Birol, 2009b; Özdemir & Güler, 2009; Hepdurgun, Turanlı & Kaplan, 2009, Çıkman, Beyaslan & Yurtcan, 2009; Birol, 2010; Gürbüz, Kolarov, Özdan & Tabur, 2011; Çoruh, Kolarov & Özbek, 2014b; Kolarov, Yıldırım, Çoruh & Yüksel, 2014; Kolarov, Çoruh & Çoruh, 2016; Çoruh & Kolarov, 2016, Özdan & Gürbüz, 2016; Kolarov, Çoruh & Çoruh, 2017; Özek & Avcı, 2017; Sarı, 2017; Sarı & Çoruh, 2018; Özdan & Gürbüz, 2019; Kıraç & Gürbüz, 2020; Barik, 2022; Kaplan & Riedel, 2022; Doğru, 2022; Çoruh, Tezcan & Gülperçin, 2022b..
BANCHINAE WESMAEL, 1845		
Genus *Exetastes* Gravenhorst, 1829		
Exetastes adpressorius	Anadolu, Ankara, Bayburt, Erzurum, Isparta, Kırıkkale, Kırşehir, Tunceli, Isparta.	Fahringer, 1921; Aubert, 1978; Kolarov, 1995; Kolarov & Beyarslan, 1994b; Özdemir, 1996; Pekel, 1999; Çoruh et al., 2014b, Kolarov et al., 2014, Çoruh & Çalmaşur, 2016; Çoruh, Kolarov & Çoruh, 2018; Özdan & Gürbüz, 2019; Doğru, 2022; Çoruh & Riedel, 2022; Birol, 2022.
Genus *Lissonota* (*Loxonota*) Aubert, 1993		
Lissonota (Loxonota) lineata	Anadolu, Diyarbakır, Erzurum, Erzincan, Hatay, Osmaniye.	Öncüer, 1991; Kolarov, 1995; Akkaya, 2005; Gürbüz et al., 2011; Çoruh & Çoruh, 2012; Kolarov et al., 2017; Çoruh & Riedel, 2022.
Genus *Lissonota* (*Lissonota*) Gravenhorst, 1829		
Lissonota (*Lissonota*) *pleuralis*	Bursa, Çanakkale, Erzincan, Erzurum, Giresun.	Kolarov et al., 1997a, Kolarov et al., 1997b, Kolarov et al., 2017, Çoruh & Riedel, 2022.
CAMPOPLEGINAE FORSTER, 1869		
Genus *Campoletis* Förster 1869		
Campoletis crassicornis	Adana, Burdur, Bursa, Erzurum, Giresun, Trabzon.	Kolarov & Beyarslan, 1995; Çoruh, Gürbüz, Kolarov, Yurtcan & Buncukçu Özdan, 2013, Çoruh et al., 2018; Çaylak, 2019, Çaylak & Çoruh, 2020b; Kolarov, Çoruh & Ercelep, 2021.
CREMASTINAE FORSTER, 1869		
Genus *Cremastus* Gravenhorst, 1829		
Cremastus geminus	Anadolu, Erzurum, Kırklareli	Kolarov, 1997; Kolarov & Beyarslan, 1999; İnecikliоğlu, 2022; Pekel & Özbek, 2000; Çoruh et al., 2014b.
Cremastus spectator	Isparta, Tekirdağ	Kolarov, 1997; Gürbüz, 2005; İnecikliоğlu, 2022.
CRYPTINAE KIRBY, 1837		
Genus *Aritranis* Förster 1869		
Aritranis longicauda	Isparta	Gürbüz & Kolarov, 2008; Gürbüz et al, 2009a,b; Özdan, 2014; Çoruh, 2019.
Genus *Cryptus* Fabricius 1804		
Cryptus viduatorius	Bayburt, Bilecik, Bursa, Diyarbakır, Erzurum, İçel, Isparta, İstanbul, Kırklareli, Rize	Kolarov, 1987; Öncüer, 1991; Beyarslan & Kolarov, 1994; Kolarov, 1995, 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 Çoruh et al., 2016, Kolarov et al., 2016, Sarı & Çoruh, 2018; Çoruh et al., 2018; Çoruh, 2019; Yılmaz, 2020; Kaplan & Riedel, 2022; Barik & Çoruh, 2023a; Birol, 2022.
Genus *Latibulus* Gistel 1848		
Latibulus argiolus	Amasya, Ankara, Bingöl, Erzurum, Erzincan, Konya	Fahringer, 1922; Horstmann, 1986; Kolarov, 1995; Kolarov et al., 2014, Çoruh et al., 2014b, Kolarov & Yurtcan, 2008, Kolarov & Çalmaşur, 2011; Çoruh, 2019; Kaplan & Riedel, 2022.
CYLLOCERIINAE WAHL, 1990		
Genus *Cylloceria* Schiødte, 1838		
Cylloceria melancholica	Ardahan	Çoruh, Özbek & Kolarov, 2002; Çoruh et al., 2014b.
SUBFAMILY ICHNEUMONINAE LATREILLE, 1802		
Genus *Spilichneumon* Thomson, 1894		
Spilichneumon occisorius	Bolu, Eskişehir, Erzurum, Isparta, Kars, Kayseri, Konya.	Özdemir, 1996; Özbek, Çoruh & Kolarov, 2003; Özdan, 2014; Riedel, Çoruh & Özbek, 2010; Çoruh, 2017; Riedel, Diller & Çoruh, 2018; Birol, 2022.
Genus *Virgichneumon* Heinrich, 1977		
Virgichneumon maculicauda	Bayburt, Erzurum	Riedel et al., 2010; Çoruh et al., 2011; Çoruh et al., 2014b, Çoruh, 2017
OPHIONINAE SHUCKARD, 1840		
Genus *Ophion* Fabricius, 1798		
Ophion mocsaryi	Adana, Bayburt, Edirne, Erzurum, Isparta, Mersin	Kolarov, 1989; Kolarov et al., 2000; Kolarov & Gürbüz, 2006; Çoruh & Çoruh, 2008; Gürbüz et al., 2009a, Altıparmak, 2010; Gürbüz et al., 2011; Çoruh et al., 2014b, İnecikliоğlu, 2022.
PIMPLINAE WESMAEL, 1845		
Genus Cins *Perithous* Holmgren, 1859		
Perithous septemcinctorius	Erzurum, Isparta, Tunceli	Kolarov & Gürbüz, 2004; Çoruh & Kolarov, 2010; Kolarov et al., 2014;

		Çoruh, 2016.
TRYPHONINAE SHUCKARD, 1840		
Genus *Netelia* Gray 1860		
Netelia fuscicornis	Afyon, Adana, Ankara, Balıkesir, Bayburt, Burdur, Bursa, Çankırı, Edirne, Elazığ, Erzurum, Erzincan, Eskişehir, İzmir, Isparta, Hatay, Kahramanmaraş, Kayseri, Kırklareli, Kırşehir, Konya, Malatya, Manisa, Nevşehir, Osmaniye, Tekirdağ, Tunceli, Van.	Tolkanitz, 1981; Kohl, 1905; Delrio, 1975; Kolarov, 1987; Kolarov, 1994; Öncüer, 1991; Kolarov & Beyaslan, 1994b; Kolarov, 1995; Kolarov et al., 1997a; Kolarov, Özbek & Yıldırım, 1999; Özdemir, 2001; Yurtcan et al., 2002; Yurtcan et al., 2006, Gürbüz & Kolarov, 2006; Beyarslan et al., 2006; Kırtay, 2008; Eroğlu et al., 2011; Yaman, 2014; Çoruh & Çalmaşur, 2016; Çoruh, 2019; Yurtcan, Çoruh, Kolarov, Özdan, Gürbüz & Erkaya, 2021.
Genus *Tryphon* Fallén, 1813		
Tryphon thomsoni	Adıyaman, Afyon, Bayburt, Bingöl, Çankırı, Denizli, Diyarbakır, Edirne, Erzincan, Erzurum, Giresu, Gümüşhane, Isparta, Kahramanmaraş, Kars, Kayseri, Kırklareli, Malatya, Muğla, Sivas, Şanlıurfa Uşak.	Kolarov & Beyarslan, 1994a; Kolarov et al., 1999; Çoruh, Özbek & Kolarov, 2005, Yurtcan & Beyarslan, 2006; Gürbüz & Kolarov, 2006; Gürbüz et al., 2009a,b; Kolarov & Çoruh, 2012; Yaman, 2014; Çoruh et al., 2014a,b, Kolarov et al., 2016; Çoruh, 2019; İnecikliоğlu, 2022.
Tryphon psilosagator	Adana, Erzurum, Isparta, İçel .	Kolarov & Beyarslan 1994a; Kolarov et al., 1999; Gürbüz & Kolarov, 2006; Çoruh et al., 2014b; Çoruh, 2019.

Associate plants: *Angelica sylvestris* L., *Chaerophyllum aromaticum* L., *C. bulbosum* L., *Chrysothamnus nauseosus speciosus* (Nutt.) H. M. Hall & Clem., *Corylus avellana* L., *Daphne gnidium* L., *Daucus carota* L., *Euphorbia segueriana* Wall Art., *Euphorbia virgata* Waldst. & Kit., *Ferula communis* L., *Fraxinus excelsior* L., *Heracleum sphondylium* (Eltrot), *Juniperus communis* L., *Pastinaca sativa L.*, *Peucedanum oreoselinum* (L.), *Phacelia* sp., *Prunus cerasifera* Ehrh., *Quercus sessiliflora* Salisb., *Reseda lutea* L., *Rubus idaeus* L., *Salsola pestifer* A.Nelson, *Thapsia villosa* L. (Yu et al., 2016).

Lissonota (Loxonota) lineata Gravenhorst, 1829 (Figure 3-3a).

Material examined: Çukurtepe: 39° 24' 13.68" N, 41° 2' 10.68" E, 1874 m, 15.VII.2022, 2 ♂♂. Göynük: 39° 9' 2.52" N, 40° 53' 54.96" E, 1761 m, 20.X.2022, 2 ♂♂. Yoncalık: 39° 20' 4.20" N, 41° 4' 49.08" E, 1938 m, 15.XI.2022, 4 ♂♂, 2 ♀♀. Ortaköy: 39° 24' 7.56" N, 40° 53' 15.72" E, 1981 m, 02.VII.2023, 3 ♂♂, ♀. Viranşehir: 39° 23' 15.72" N, 40° 58' 19.92" E, 1897 m, 02.VII.2023, 3 ♂♂.

Distribution: Palaearctic, known from Türkiye (Figure 3-3b, Table 2).

Lissonota (*Lissonota*) *pleuralis* Brischke, 1880 (Figure 3-4a).

Material examined: Çukurtepe: 39° 24' 14.76" N, 41° 2' 5.64" E, 1881 m, 10.VII.2022, 4 ♂♂. Halifan: 39° 8' 31.20" N, 40° 51' 55.80" E, 1684 m, 20.XI.2022, 2 ♂♂, 2 ♀♀. Kargapazarı: 39° 18' 47.88" N, 41° 8' 18.96" E, 1956 m, 20.XI.2022, ♀. Ortaköy: 39° 24' 21.24" N, 40° 53' 25.80" E, 1971 m, 26.VIII.2023, 3 ♂♂, 2 ♀♀.

Distribution: Palaearctic, known from Türkiye (Figure 3-4b, Table 2).

Associate plants: *Anethum graveolens* (Dill.), *Chaerophyllum bulbosum* L., *Cirsium lanceolatum* (L.), *Daucus carota sativus* L., *Epilobium angustifolium* L., *Fraxinus excelsior* L., *Heracleum sphondylium* (Eltrot), *Pastinaca graveolens* (L.), *Peucedanum oreoselinum* (L.), *Quercus sessiliflora* Salisb. (Yu et al., 2016).

Campopleginae Förster, 1869

Campoletis crassicornis (Tschek, 1871) (Figure 3-5a).

Material examined: Çukurtepe: 39° 24' 14.76" N, 41° 2' 5.64" E, 1881 m, 10.VII.2022, 3 ♀♀. Halifan: 39° 8' 44.88" N, 40° 52' 26.04" E, 1727 m, 20.XI.2022, 2 ♀♀.

Distribution: Europea and Palaearctic, known from Türkiye (Figure 3-5b, Table 2).

Associate plant: *Peucedanum oreoselinum* (L.) (Yu et al., 2016).

Cremastinae Forster, 1869

Cremastus geminus Gravenhorst, 1829 (Figure 3-6a).

Material examined: Halifan: 39° 8' 31.20" N, 40° 51' 55.80" E, 1684 m, 20.XI.2022, 2 ♀♀.

Distribution: Palaearctic, known from Türkiye (Figure 3-6b, Table 2).

Associate plant: *Peucedanum oreoselinum* (L.) (Yu et al., 2016).

Cremastus spectator Gravenhorst, 1829 (Figure 3-7a)

Material examined: Hasanova: 39° 10' 19.92" N, 41° 2' 16.80" E, 1961 m, 20.XI.2022, 2 ♀♀. Ortaköy: 39° 24' 6.84" N, 40° 53' 16.44" E, 1967 m, 02.VII.2023, 4 ♂♂, 2 ♀♀; 39° 24' 7.56" N, 40° 53' 15.72" E, 1981 m, 02.VII.2023, 2 ♀♀; 39° 23' 32.28" N, 40° 53' 13.20" E, 1784 m, 26.VIII.2023, 3 ♂♂.
Distribution: Palaearctic, known from Türkiye (Figure 3-7b, Table 2).

Associate plants: *Heracleum sphondylium* (Eltrot), *Inonotus hispidus* (Bull.) P. Karst. (Yu et al., 2016).

Remarks: *Cremastus spectator* is new East Anatolia.

Cryptinae Kirby, 1837

Aritranis longicauda (Kriechbaumer, 1873) (Figure 3-8a)

Material examined: Hacılar: 39° 5' 47.40" N, 40° 48' 52.92" E, 1444 m, 20.X.2022, 3 ♂♂, ♀. Hasanova: 39° 10' 19.92" N, 41° 2' 16.80" E, 1961 m, 20.XI.2022, ♀. Yoncalık: 39° 20' 8.16" N, 41° 4' 39.72" E, 1936 m, 15.XI.2022, ♂, 4 ♀♀. Karlıova: 39° 18' 6.48" N, 41° 1' 33.60" E, 1788 m, 02.VII.2023, ♂, 3 ♀♀. Ortaköy: 39° 24' 6.84" N, 40° 53' 16.44" E, 1967 m, 02.VII.2023, ♂, ♀.

Distribution: Europea and Palaearctic, known from Türkiye (Figure 3-8b, Table 2).

Associate plants: *Elymus sabulosus* M. Bieb., *Euphorbia segueriana* Necker (Yu et al., 2016).

Remarks: *Aritranis longicauda* is new East Anatolia.

Cryptus viduatorius Fabricius, 1804 (Figure 3-9a)

Material examined: Göynük: 39° 9' 2.52" N,40° 53' 54.96" E, 1761 m, 20.X.2022, 5 ♂♂. Çukurtepe: 39° 25' 6.96" N,41° 2' 17.16" E, 1919 m, 06.XI.2022, 4 ♀♀. Halifan: 39° 8' 44.88" N,40° 52' 26.04" E, 1727 m, 20.XI.2022, ♂, 2 ♀♀. Center: 39° 18' 8.28" N,41° 1' 32.16" E, 1785 m, 02.VII.2023, 5 ♂♂, 3 ♀♀. Ortaköy: 39° 23' 47.76" N,40° 53' 39.12" E, 1909 m, 26.VIII.2023, 5 ♂♂; 39° 23' 50.28" N,40° 53' 32.64" E, 1955 m, 26.VIII.2023, ♀; 39° 24' 19.80" K, 40° 53' 27.60" E, 1973 m, 26.VIII.2023, ♂, ♀.

Distribution: Palaearctic, known from Türkiye (Figure 3-9b, Table 2).

Associate plants: *Anethum graveolens* (Dill.), *Angelica sylvestris* L., *Daucus carota* L., *Daucus carota sativus* L., *Euphorbia nicaeensis* All., *Euphorbia virgata* Waldst. & Kit., *Ferula communis* L., *Heracleum sphondylium* (Eltrot), *Medicago sativa* L. *Peucedanum oreoselinum* (L.) (Yu et al., 2012).

Latibulus argiolus (Rossi, 1790) (Figure 3-10a)

Material examined: Çukurtepe: 39° 24' 13.68" K, 41° 2' 10.68" E, 1874 m, 15.VII.2022, ♂. Karlıova: 39° 18' 2.16" K, 41° 1' 20.64" D, 1793 m, 23.IX.2023, 3 ♂♂.

Distribution: Palaearctic, known from Türkiye (Figure 3-10b, Table 2).

Cylloceriinae Wahl, 1990

Cylloceria melancholica (Gravenhorst, 1820) (Figure 3-11a)

Material examined: Çukurtepe: 39° 24' 13.68" N, 41° 2' 10.68" E, 1874 m, 15.VII.2022, ♂. Karlıova: 39° 17' 33.00" N, 40° 59' 45.24" E, 1861 m, 02.VII.2023, 2 ♀♀; 39° 17' 33.72" N, 40° 59' 48.48" E, 1863 m, 02.VII.2023, 2 ♂♂.

Distribution: Nearctic and Palaearctic, known from Türkiye (Figure 3-11b, Table 2).

Associate plants: *Chaerophyllum aromaticum* L., *Heracleum sphondylium* (Eltrot), *Rubus idaeus* L. (Yu et al., 2016).

Remarks: Bingöl is second locality for *Cylloceria melancholica.*

Ichneumoninae Latreille, 1802

Spilichneumon occisorius (Fabricius, 1793) (Figure 3-12a.)

Material examined: Yoncalık: 39° 20' 2.40" N, 41° 4' 46.92" E, 1937 m, 15.XI.2022, 2 ♀♀; 39° 20' 4.20" N, 41° 4' 49.08" E, 1938 m, ♀. Ortaköy: 39° 23' 52.44" N, 40° 53' 35.16" E, 1931 m, 26.VII.2023, 2 ♂♂; 39° 24' 21.24" N, 40° 53' 25.80" E, 1971 m, 26.VIII.2023, 2 ♂♂, ♀.

Distribution: Palaearctic, known from Türkiye (Figure 3-12b, Table 2).

Associate plant: *Daucus carota* L., *Deschampsia cespitosa* (L.) P. Beauv., *Euphorbia virgata* Waldst. & Kit., *Heracleum sphondylium* (Eltrot), *Poa pratensis* L. (Yu et al., 2016).

Virgichneumon maculicauda (Perkins, 1953) (Figure 3-13a)

Material examined: Kargapazarı: 39° 17' 33.36" N, 41° 4' 27.48" E, 1803 m, 20.XI.2022, 3 ♂♂; 39° 18' 44.99" N, 41° 5' 52.61" E, 1816 m, ♂; 39° 18' 44.74" N, 41° 5' 56.26" E, 1826 m, 3 ♀♀. Viranşehir: 39° 23' 15.72" N, 40° 58' 19.92" E, 1897 m, 02.VII.2023, 4 ♀♀.

Distribution: Palaearctic, known from Türkiye (Figure 3-13b, Table 2).

Remarks: Bingöl province is third locality for *Virgichneumon maculicauda.*

Ophioninae Shuckard, 1840

Ophion mocsaryi Brauns, 1889 (Figure 3-14a)
Material examined: Çukurtepe: 39° 24' 14.76" N, 41° 2' 5.64" E, 1881 m, 10.VII.2022, 2 ♀♀; 39° 24' 13.68" N, 41°

2' 10.68" E, 1874 m, 15.VII.2022, 3 ♀♀. Kargapazarı: 39° 18' 46.08" N, 41° 8' 22.20" E, 1963 m, 20.XI.2023, 3 ♂♂.

Distribution: Palaearctic, known from Türkiye (Figure 3-14b, Table 2).

Associate plants: *Carum carvi* L., *Seseli libanotis* (L.) (Yu et al., 2016).

Pimplinae Wesmael, 1845

Perithous septemcinctorius (Thunberg, 1822) (Figure 3-15a)

Material examined: Kargapazarı: 39° 17' 33.36" N, 41° 4' 27.48" E, 1803 m, 20.XI.2022, ♂; 39° 18' 44.99" N, 41° 5' 52.61" E, 1816 m, 20.XI.2022, 3 ♀♀. Karlıova:39° 17' 33.00" N, 40° 59 '45.24" E, 1861 m, 02.VII.2023, ♀; 39° 17' 33.72" N, 40° 59' 48.48" E, 02.VII.2023, 1863 m, ♀; 39° 18' 8.28" N, 41° 1' 32.16" E, 1785, 02.VII.2023, 2 ♂♂; 39° 18' 10.44" N, 41° 1' 32.52" E, 1786 m, 02.VII.2023, 2 ♀♀.

Distribution: Nearctic and Palaearctic, known from Türkiye (Figure 3-15 b,Table 2).

Associate plants: *Ampelopsis hederacea* DC., *Carpinus* sp., *Chaerophyllum bulbosum* L., *Prunus domestica* L., *Prunus domestica insititia* (L.), *Pyrus communis* L. (Yu et al., 2016).

Tryphoninae Shuckard, 1840

Netelia fuscicornis (Holmgren, 1860) (Figure 3-16a)

Material examined: Yoncalık: 39° 20' 8.16" N, 41° 4' 39.72" E, 1936 m, 15.XI.2022, 6 ♂♂, 2 ♀♀; 39° 20' 2.40" N, 41° 4' 46.92" E, 1937 m, 15.XI2022, 5 ♂♂, 2 ♀♀; 39° 20' 4.20" N, 41° 4' 49.08" E, 1938 m, 15.XI.2022, 3 ♀♀. Karlıova: 39° 17' 43.08" N, 40° 59' 43.08" E, 1857 m, 02.XII.2023, 4 ♀♀; 39° 17' 33.00" N, 40° 59 '45.24" E, 1861 m, 02.VII.2023, 4 ♂♂; 39° 17' 33.72" N, 40° 59' 48.48" E, 1863 m, 02.VII.2023, 3 ♂♂; 39° 17' 43.44" N, 40° 59' 48.12" E, 1866 m, 02.VII.2023, ♀.

Distribution: Oriental and Palaearctic, known from Türkiye (Figure 3-16b, Table 2).

Tryphon thomsoni Roman, 1939 (Figure 3-17a)

Material examined: Çukurtepe: 39° 25' 11.28" N, 41° 2'2 9.04" E, 1941 m, 06.XI.2022, 2 ♀♀; 39° 24' 14.76" N, 41° 2' 5.64" E, 1881 m, 10.VII.2022, 3 ♂♂; 39° 24' 13.68" N, 41° 2' 10.68" E, 1874 m, 15.VII.2022, 2 ♀♀. Ortaköy: 39° 24' 6.84" N, 40° 53' 16.44" E, 1967 m, 02.VII.2023, 2 ♀♀; 39° 23' 47.76" N, 40° 53' 39.12" E, 1909 m, 26.VIII.2023, 2 ♀♀, 39° 23'52. 44" N, 40° 53' 35.16" E, 1931 m, 26.VIII.2023, 4 ♂♂.

Distribution: Palaearctic, known from Türkiye (Figure 3-17b, Table 2).

Associate plant: *Peucedanum oreoselinum* (L.) (Yu et al., 2016).

Tryphon psilosagator Aubert, 1966 (Figure 3-18a)

Material examined: Çukurtepe: 39° 24' 14.76" N, 41° 2' 5.64" E, 1881 m, 10.VII.2022, 2 ♀♀; 39° 25' 11.28" N, 41° 2' 29.04" E, 1941, 06.XI.2022, 2 ♀♀; Hacılar: 39° 5' 47.40" N, 40° 48' 52.92" E, 1444 m, 20.X.2022, ♂. Halifan: 39° 8' 45.24" N, 40° 52' 26.40" E, 1728 m, 20.XI.2022, ♂; Ortaköy: 39° 23' 47.76" N, 40° 53' 39.12" E, 1909 m, 26.VIII.2023, 2 ♀♀;

Distribution: Palaearctic, known from Türkiye (Figure 3-18b, Table 2).

DISCUSSION

The Ichneumonidae within the Hymenoptera order holds an important place in terms of species diversity. The main reason for this importance is that many species are evaluated as biological control agencies. In the "Turkish Ichneumonidae Catalogue," where Ichneumonids have been evaluated over many years, 393 species are listed under 19 subfamilies with their initial details. (Kolarov, 1995).

The work carried out over the past 29 years initially gained momentum in the Thrace, Eastern Anatolia, and Mediterranean regions, and later spread throughout Türkiye. Today, it has been found that the number of Ichneumonidae species is approximately 1,500 (Barik & Çoruh, 2023a).

548 ichneumonid species belonging to 158 genera from 20 subfamilies have been recorded so far from the study area (Figure 4), which includes the region where most of the studies in Türkiye have been carried out and where the study carried out , while 316 species have been considered as new records for in country (Barik, 2022).

The study aimed to detect the Ichneumonidae fauna of Karlıova district of Bingöl province. Field studies were carried out especially between 2022 and 2023. Karlıova district was determined as the sample locality area of the study, and samples were collected from varying altitudes of the district in different months. A total of 256 samples from 16 genus belonging to different subfamilies were obtained, and their identification results were determined to belong to 18 species (Table 3).

Table 3. Data of collected species

Çizelge 3. 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 of Türkiye (FTR)

Vertical distribution (VD) (meter): A: 1251-1500 , B: 1501-1750 , C: 1751-2000 . Seasonal dynamics (SD):, Jl: July, Aug: August, S: September, O: October, N: November. 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):

Taxa name	IN	VD	SD	GR	ZR	FRT
FAMILY ICHNEUMONIDAE LATREILLE, 1802						
ANOMALONINAE VIERECK, 1918						
Genus *Anomalon* Panzer, 1804						
Anomalon cruentatum	46	B,C	Jl, Aug, S, O, N	AR, BSR, CAR, EAR, MR, MtR, SAR	ORR, P	Kohl, 1905
BANCHINAE WESMAEL, 1845						
Genus *Exetastes* Gravenhorst, 1829						
Exetastes adpressorius	16	A,C	Jl, O	BSR, CAR, EAR, MR, MtR	HOL	Fahringer, 1921
Genus *Lissonota* (*Loxonota*) Aubert, 1993						
Lissonota (*Loxonota*) *lineata*	17	C	Jl, O, N	EAR, MtR, SAR	P	Öncüer, 1991
Genus *Lissonota (Lissonota))* Gravenhorst 1829						
Lissonota (*Lissonota*) *pleuralis*	14	B, C	Jl, Aug, N	BSR, EAR, MR	P	Kolarov et al. 1997a
CAMPOPLEGINAE FORSTER, 1869						
Genus *Campoletis* Förster, 1869						
Campoletis crassicornis	5	B, C	Jl, N	BSR, EAR, MtR, MR	E, P	Kolarov & Beyarslan, 1995
CREMASTINAE FORSTER, 1869						
Genus *Cremastus* Gravenhorst, 1829						
Cremastus geminus	2	B	N	EAR, MR	P	Kolarov, 1997
Cremastus spectator	13	C	Jl, Aug, N	MR, MtR	P	Kolarov, 1997
CRYPTINAE KIRBY, 1837						
Genus *Aritranis* Förster, 1869						
Aritranis longicauda	17	A, C	Jl, O, N	MtR	E, P	Gürbüz & Kolarov, 2008
Genus *Cryptus* Fabricius 1804						
Cryptus viduatorius	28	C	Jl, Aug, O, N	BSR, EAR, MR, MtR	P	Kolarov, 1987
Genus: *Latibulus* Gistel, 1848						
Latibulus argiolus	3	C	Jl, O	CAR, EAR	P	Fahringer, 1922
CYLLOCERIINAE WAHL, 1990						
Genus *Cylloceria* Schiødte, 1838						
Cylloceria melancholica	5	C	Jl	EAR	HOL	Çoruh et al., 2002
ICHNEUMONINAE LATREILLE, 1802						
Genus *Spilichneumon* Thomson, 1894						
Spilichneumon occisorius	8	C	Aug, N	BSR ,CAR, EAR, MtR	P	Özdemir, 1996
Genus *Virgichneumon* Heinrich, 1977						
Virgichneumon maculicauda	11	C	Jl, N	EAR	P	Riedel et al., 2010
OPHIONINAE SHUCKARD, 1840						
Genus *Ophion* Fabricius 1798						
Ophion mocsaryi	8	C	Jl, N	BSR, EAR, MR, MtR	P	Kolarov, 1989
PIMPLINAE WESMAEL, 1845						
Genus *Perithous* Holmgren, 1859						
Perithous septemcinctorius	10	C	Jl, N	EAR, MtR	HOL	Kolarov & Gürbüz, 2004
TRYPHONINAE SHUCKARD, 1840						
Genus *Netelia* Gray 1860						
Netelia fuscicornis	30	A, B, C	Jl, N	AR, BSR, CAR, EAR, MR, MtR	ORR, P	Tolkanitz, 1981
Genus *Tryphon* Fallén, 1813						
Tryphon thomsoni	15	C	Jl, Aug, N	BSR, EAR, MR, MtR, SAR	P	Kolarov & Beyarslan, 1994
Tryphon psilosagator	8	A, C	Au, O, N	AR, EAR, MtR	P	Kolarov & Beyarslan, 1994

E: Europe, HOL: Holarctic, ORR: Oriental, P: Palearctic.

When Table 2 is evaluated, it is understood that out of 10 different subfamilies, 46 samples from Anomaloninae (1 species), 47 samples from Banchinae (3 species), 5 samples from Campopleginae (1 species), 15 samples from Cremastinae (2 species), 48 samples from Cryptinae (3 species), 5 samples from Cylloceriinae (1 species), 19 samples from Ichneumoninae (2 species), 8 samples from Ophioninae (1 species), 10 samples from Pimplinae (1 species) and 53 samples from Tryphoninae (3 species) are available (Figure 5).

Figure 4. Map of region
Şekil 4. Bölge haritası

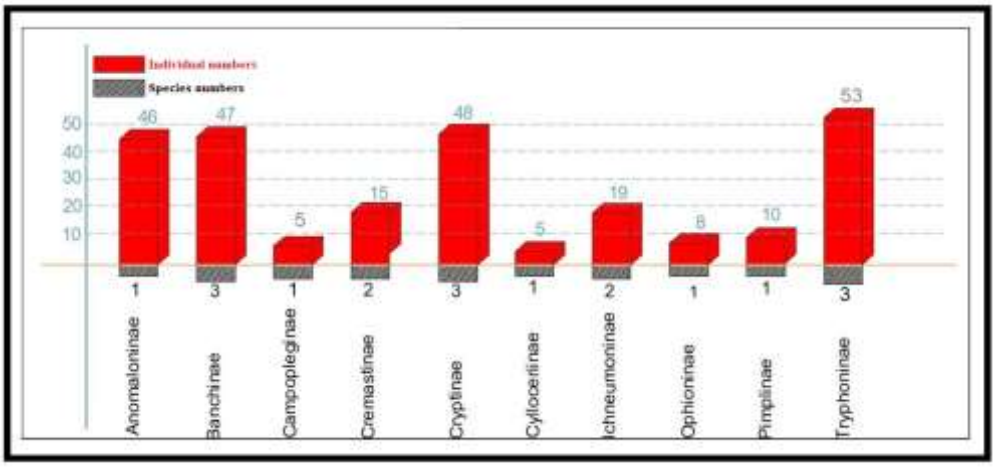


Figure 5. Distribution of species according to subfamilies.
Şekil 5. Altfamilyalara göre türlerin dağılım.

Faunistic and systematic studies on Ichneumonidae in Bingöl province are limited. A thesis study included the province of Bingöl, and while three species were recorded from this province (Çoruh and Özbek, 2008). While Kaplan and Riedel (2022) recorded 35 ichneumonidae species from this province, in another study, nine species were reported from Bingöl (Kaplan, 2023). Along with the number of species, a large number of individuals were also collected in these studies.

When we look at the density of the samples obtained, we see that Tryphoninae makes up 20.7% of the total number of samples with 53 individuals, Cryptinae makes up 18.5% with 48 individuals, Banchinae makes up 18.1% with 47 individuals, and Anomaloninae makes up 17% with 46 individuals (Figure 6).

When the collected samples are evaluated in terms of the number of individuals, *Anomalon cruentatum* (46 individuals), *Netelia fuscicornis* (30 individuals), and *Cryptus viduatorius* (28 individuals) are common in the region, while *Cremastus geminus* (two individuals) was the least common species.

The samples were collected from distances between 1250 m and 2000 m. There are four species in the altitude range of 1250-1500 m, five species in the altitude range of 1501-1750 m, and 17 species in the altitude range of 1751-2000 m. Most of the collected samples were taken from an altitude of 1751-2000 meters, while the fewest samples were taken from an altitude of 1250-1500 meters (Figure 7a). This situation has resulted in an outcome parallel to the frequency of visits to the examined areas.

While the samples that made up the study were collected mainly in July, August, September, October and November, it was considered interesting that so many samples were collected in November. While this situation is directly proportional to the preferred months of visit, the most samples were collected in November and the fewest samples were collected in September (Figure 7b, 8).

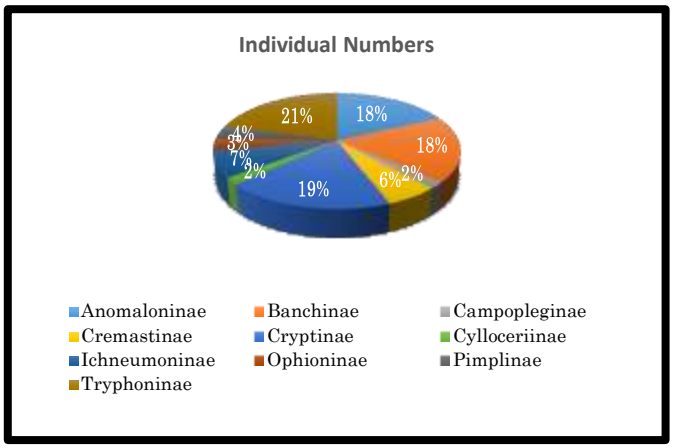
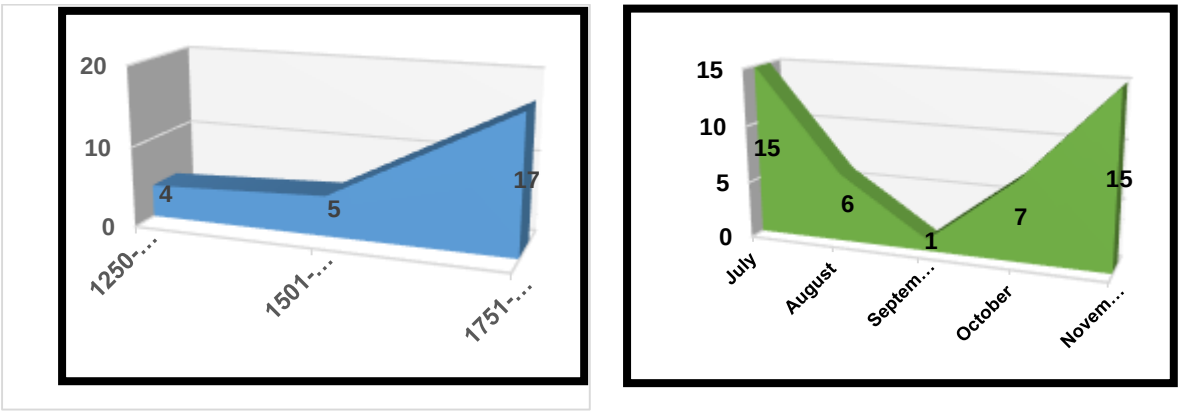


Figure 6. Distribution on subfamily according to individual numbers.
Şekil 6. Birey sayılarına göre altfamilya dağılımı.



a b

Figure 7. Distribution of species: a) according to altitude, b) according to months.
Şekil 7. Türlerin dağılışı: a) rakıma göre, b) aylara göre.

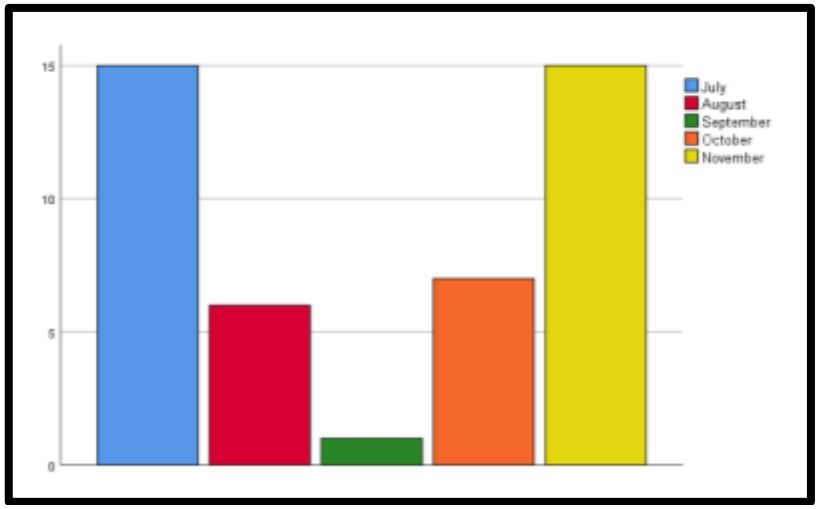


Figure 8. Difference between altitudes according to the chi-square test.
Şekil 8. Chi-square testine göre rakımlar arasındaki fark.

	Observed N	Expected N	Residual
July	15	8,8	6,2
August	6	8,8	-2,8
September	1	8,8	-7,8
October	7	8,8	-1,8
November	15	8,8	6,2
Total	44		

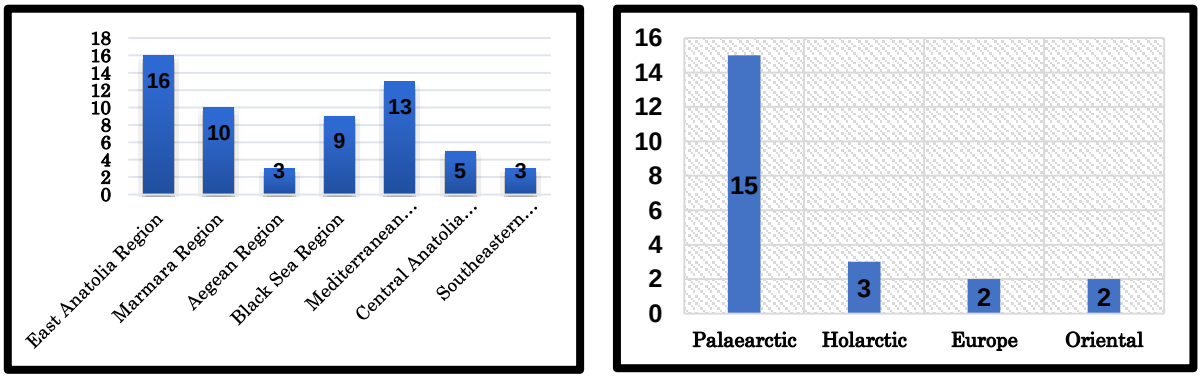
Test Statistics

	Months
Chi-Square	16,909[a]
df	4
Asymp. Sig.	0,002

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

The localities where the collected samples were previously collected in Türkiye were determined. Accordingly; while 16 of the species that constitute the studies were previously recorded from Eastern Anatolia Region, 13 were collected from Mediterranean Region and 10 from Marmara Region. This situation is directly proportional to the density of the regions studied. The regions where the species were least distributed were Southeastern Anatolia Region and Aegean Region, with three species each (Figure 9a). When examined on a provincial basis, it was also analyzed that the samples were previously obtained from 58 different provinces, and that Erzurum, Isparta, Ankara and Adana were the provinces where the most samples were obtained.

The zoogeographic distribution of the species constituting the study was also attempted to be analysed. Fifteen species in Palaerctic Region and three in Holarctic Region. It is also determined that the European and Oriental Regions host only two species (Figure 9b).



a b

Figure 9. Distribution of species: a) according to geographic regions, b) according to zoogeographical regions.
Şekil 9. Türlerin dağılış: a) coğrafik bölgelere göre, b) zoocoğrafik bölgelere göre.

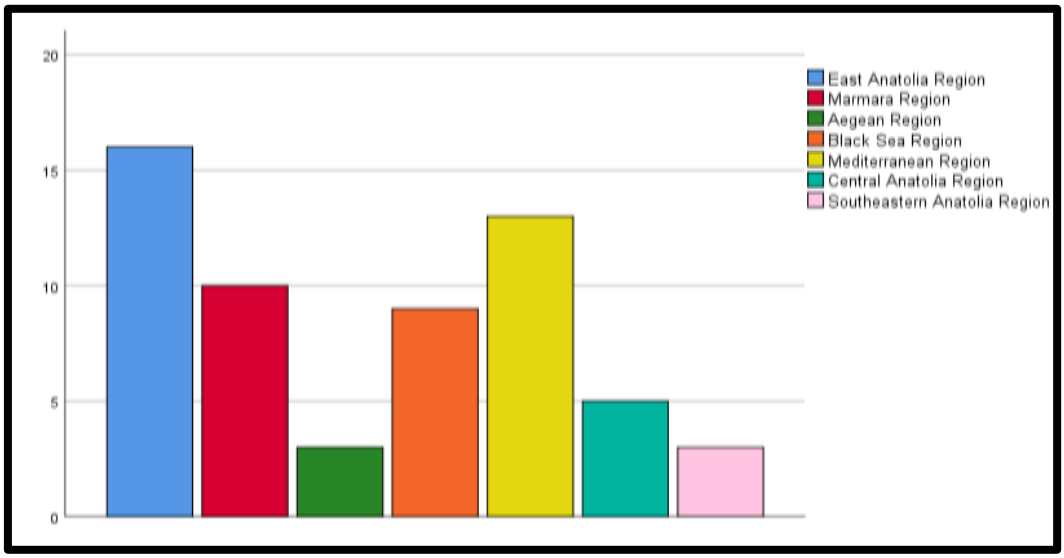


Figure 10. Difference between geographic regions to the chi-square test.
Şekil 10. Chi-square testine göre coografik bölgeler arasındaki fark

	Observed N	Expected N	Residual
East Anatolia Region	16	8,4	7,6
Marmara Region	10	8,4	1,6
Aegean Region	3	8,4	-5,4
Black Sea Region	9	8,4	0,6
Mediterranean Region	13	8,4	4,6
Central Anatolia Region	5	8,4	-3,4
Southeastern Anatolia Region	3	8,4	-5,4
Total	59		

Test Statistics

	Geographic-Regions
Chi-Square	18,000[a]
df	6
Asymp. Sig.	0,006

a. 0 cells (0,0%) have expected frequencies less than 5. The minimum expected cell frequency is 8,4.

Cremastus geminus was last recorded in 2000 (Pekel & Özbek, 2000), *C. melancholica* was last recorded in 2002 (Çoruh et al., 2002); *V. maculicauda* was last recorded in 2011 (Çoruh et al., 2011), *Ophion mocsaryi* was last recorded in 2011 (Gürbüz et al., 2011). These species were not encountered in subsequent studies, but were detected again in this study.

Considered as a whole, out of the 18 existing species, 15 species, except three, is new records for Bingöl province, *Cremastus spectator* and *Aritranis longicauda* species is new records for the Eastern Anatolia Region.

The new additional records obtained in this study will provide a good basis for future studies.

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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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