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ARAŞTIRMA MAKALESİ **RESEARCH PAPER**

Contribution to the Knowledge of the Ichneumonidae (Hymenoptera) Fauna of Iğdır Province the East of Türkiye

Yeşim BULAK KORKMAZ* **Saliha ÇORUH**
Atatürk University, Faculty of Agriculture, Department of Plant Protection, 25240, Erzurum, TURKEY

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*: https://orcid.org/0000-0002-2645-5391
: https://orcid.org/0000-0002-6822-6677

***Corresponding author's:**
Yeşim BULAK KORKMAZ
Atatürk University, Faculty of Agriculture, Department of Plant Protection, 25240, Erzurum, Türkiye.
✉: yesim.bulak@atauni.edu.tr

Abstract: The survey was conducted during the period 2013-2016. A total of eight species belonging to subfamily Campopleginae, Cryptinae, Diplazontinae, Ichneumoninae, Pimplinae and Tryphoninae have been listed. The material of the family Ichneumonidae collected from Iğdır of Eastern Türkiye. Besides, *Diadegma elishae* (Bridgman,1884), *Diadegma mediterraneum* (Constantineanu, 1930), *Lysibia nana* (Gravenhorst, 1829), *Promethes sulcator* (Gravenhorst, 1829), *Ichneumon confusor* Gravenhorst, 1820 and *Tryphon* (*Tryphon*) *atriceps* Stephens, 1835 are reported for the first time from Iğdır. In addition, Diadegma *elishae* (Bridgman,1884) and *Ichneumon confusor* Gravenhorst, 1820 are second exact locality both Eastern Anatolia Region and Türkiye. A short zoocographical characterization and associated plants data of the specimens collected are given for each species.

Keywords: Hymenoptera, ichneumonidae, ığdır, Türkiye.

Türkiye'nin Doğusunda Yer Alan Iğdır İlinden Ichneumonidae (Hymenoptera) Türlerine Katkılar

***Sorumlu yazar:**
Yeşim BULAK KORKMAZ
Atatürk Üniversitesi Ziraat Fakültesi Bitki Koruma Bölümü, 25240, Erzurum, Türkiye
✉: yesim.bulak@atauni.edu.tr

Öz Bu çalışma 2013-2016 yılları arasında yürütülmüştür. Çalışmada Campopleginae, Cryptinae, Diplazontinae, Ichneumoninae, Pimplinae ve Tryphoninae altfamilyalarına ait sekiz tür tespit edilmiştir. Ichneumonidae örnekleri Türkiye'nin en doğusunda yer alan Iğdır ilinden toplanmıştır. Tespit edilen *Diadegma elishae* (Bridgman,1884), *Diadegma mediterraneum* (Constantineanu, 1930), *Lysibia nana* (Gravenhorst, 1829), *Promethes sulcator* (Gravenhorst, 1829), *Ichneumon confusor* Gravenhorst, 1820 ve *Tryphon* (*Tryphon*) *atriceps* Stephens, 1835 ise Iğdır ili için yeni kayıt niteliğindedir. Ayrıca *Diadegma elishae* (Bridgman,1884) ve *Ichneumon confusor* Gravenhorst, 1820 hem Türkiye hem de Doğu Anadolu bölgesi için ikinci kayıt olarak verilmiştir. Toplanan her tür için kısa bir zoocoğrafik dağılımı, incelenen materyal ve toplandığı bitki türleri verilmiştir.

Anahtar kelimeler: Hymenoptera, ichneumonidae, ığdır, Türkiye.

INTRODUCTION

Insects have lived on the earth longer (400 million years) and adapt to changes. It has long been recognized and documented that insects are the most diverse group of organisms, meaning that the numbers of species of insects are more than any other group. The Insecta with 1.070.781 species are the most successful group, and it alone accounts for over 80% of all arthropods (Zhang, 2013).

Hymenoptera is the third largest order of insects, comprising the sawflies, wasps, bees, and ants and over 150.000 species of hymenoptera have been recognized (Klopfstein et al., 2013). Collectively, Hymenoptera are

most important to humans as pollinators of wild and cultivated flowering plants, as natural enemies (Predator, parasite and parasitoids) of destructive insects and as makers of honey. The Hymenoptera places an important role in biological control of insect pest as 75% of the total species are parasitoids and predators (Begon et al., 1996; Carlo et al., 2009; Sulanç, 2021).

The Ichneumonidae, also known as the ichneumon wasps, Darwin wasps, or ichneumonids, are a family of parasitoid wasps of the insect order Hymenoptera. Ichneumonidae are one of the most diverse groups within the Hymenoptera with approximately 25.285 species currently described. (Yu et al., 2016).

Studies on Ichneumonidae of Türkiye have gained acceleration in recent years. Çoruh et al., (2013), reported 975 species in 282 genera for Türkiye Ichneumonidae fauna. Now, the number of Ichneumonidae species has reached 1439 with valuable studies: Çaylak & Çoruh, 2020a, b; Çoruh, 2018; Çoruh et al., 2018; Çoruh et al., 2019; Çoruh, 2019a, b; Çoruh, 2022; Çoruh et al., 2022; Çoruh & Riedel, 2022; Doğru, 2022; İnecikliоğlu, 2022; Kıraç & Gürbüz, 2020; Kolarov et al., 2017; Kolarov et al., 2020; Kolarov et al., 2021; Kolarov & Çoruh, 2022; Narmanlıoglu & Çoruh, 2017; Özdan & Gürbüz, 2019; Riedel et al., 2018; Sarı & Çoruh, 2018; Vas 2019a, b; Schwardz, 2020, Teymuroğlu, & Çoruh, 2021, Yurtcan et al., 2021).

The purpose of this study is to identify the Ichneumonidae species collected from Eastern corner of Türkiye, to make this data available to researchers and relevant people and to contribute the biodiversity.

MATERIAL AND METHOD

Study area: This study was conducted in Iğdır Province, located in Eastern of Türkiye Figure 1 and it has a microclimate with a continental climate close to the Mediterranean climate. Iğdır Plain altitudes range from 817 to 1662 m. samples were collected from *Prunus armeniaca* L. and *Malus domestica* L. orchards during the seasons of spring and summer of 2013-2016.

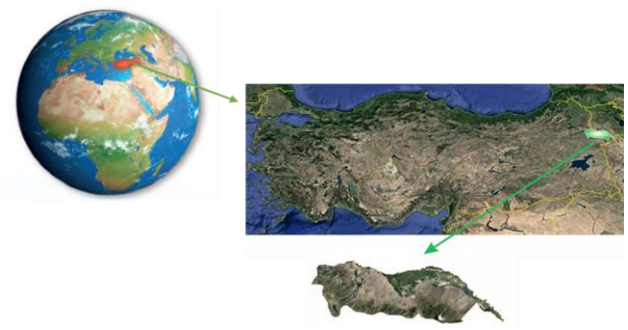

Figure 1. Location of study area.

Sampling method: The specimens were collected between April and August. Sweeping nets were used to obtain samples on fruit orchards.

The collected specimens were killed with ethyl acetate and prepared and labeled according to taxonomic rules and regulations. All examined material was collected by first author and determined by second author and deposited in the Entomology Museum Erzurum, Türkiye (EMET). General distributions and associated plants of the species were taken from Yu et al. (2016). Additionally different distributions information on the species is summarized in Table 1 and 2.

RESULTS AND DISCUSSION

We here report 17 samples belonging to eight species seven genera for Iğdır, *Diadegma elishae* (Bridgman,1884), *Diadegma mediterraneum* (Constantineanu, 1930), *Lysibia nana* (Gravenhorst, 1829), *Promethes sulcator* (Gravenhorst,1829), *Ichneumon confusor* Gravenhorst, 1820 and *Tryphon* (*Tryphon*) *atriceps* Stephens, 1835 are reported for the first time from Iğdır.

Subfamily Campopleginae Förster,1869

***Diadegma elishae* (Bridgman, 1884)**

General distribution: Eastern Palaearctic, Europe and Western Palaearctic Regions.

Distribution in Türkiye: Kars (Çoruh et al., 2005; Çoruh et al., 2014).

Material examined: Iğdır, Melekli, 854 m, 39°95.894' N 044°90.576' E, 06.V.2014, ♀, Tuzluca, İncesu, 1039 m, 40°06.855' N 043°25.366'E, 29.IX.2013, ♀.

Associated plants: Unknown.

Remarks: New locality record for Iğdır and second exact locality from Türkiye. This species collected on *Prunus armeniaca* L.

***Diadegma mediterraneum* (Constantineanu, 1930)**

General distribution: Europe and Western Palaearctic Regions.

Distribution in Türkiye: Bursa Erzincan, Erzurum and Kahramanmaraş (Çaylak & Çoruh, 2020b; Çoruh et al., 2005, 2014, 2016; Kolarov & Beyarslan 1995).

Material examined: Iğdır, Tuzluca, Üçkaya, 1505 m, 39°95.896' N 043°326.915' E, 31.VIII.2013, ♂, Aralık, Köprüler, 817 m, 39°52.698' N 044°30.710' E, 02.X.2013, ♂, Oba, 902 m, 39° 57.400' N 043°59.782' E, 26.VII. 2016, ♂, Tuzluca, Küçükova, 1662 m, 39°56.902' N 043°40.638' E, 13.VII.2015, ♂, Tuzluca, Gaziler, 1034 m, 40°06.131' N 43°28.624' E, 03.X. 2013, ♂.

Associated plants: Unknown.

Remarks: This species collected on *Prunus armeniaca* L. and new locality record for Iğdır.

Subfamily Cryptinae Kirby, 1837

***Lysibia nana* (Gravenhorst, 1829)**

General distribution: Eastern Palaearctic, Europe, Nearctic, Oceanic, Oriental and Western Palaearctic Regions.

Distribution in Türkiye: Adana, Aydın, Balıkesir, Bursa, Edirne, Isparta, Istanbul, and İzmir (Çoruh et al., 2014, Çoruh, 2019a; Fahringer, 1922; Gürbüz & Kolarov, 2008; Kolarov, 1995; Kolarov & Beyarslan, 1994; Kolarov et al., 1997b; Kolarov et al., 2002), Erzincan, Gümüşhane (Alaserhat & Güçlü, 2020); Erzurum (Özbek & Çoruh, 2012).

Material examined: Iğdır, Oba, 902 m, 39° 57.400' N 043°59.782' E, 26.VII.2016, 2 ♂♂, Akyumak, 866 m, 39° 59.109 N 044° 03 545 E, 19.VIII.2014, ♀.

Associated plants: *Aegopodium podagraria*, *Alnus glutinosa*, *Larix europaea*, *Larix polonica*, *Oryza sativa*.

Remarks: This species both new exact locality from Eastern Anatolia and new record for Iğdır. Besides this species collected on *Prunus armeniaca* L. and *Malus domestica* L.

Subfamily Diplazontinae Viereck, 1918

***Promethes sulcator* (Gravenhorst,1829)**

General distribution: Eastern Palaearctic, Europe, Nearctic, Oriental and Western Palaearctic Regions.

Distribution in Türkiye: Ankara, Çankırı, Isparta, Kayseri, Kırşehir, Konya, (Özdemir, 2001); Edirne, Tekirdağ (Yurtcan et al., 1999); Ardahan, Erzurum (Çoruh, 2011; Çoruh et al., 2014); Afyon, Antalya, Isparta, Kahramanmaraş, Mersin, Muğla (Kolarov, 2015).

Material examined: Iğdır, Melekli, 858 m, 39°56.444' N 044°05.442' E, 10.VIII.2015, ♂, Çalpala, 894 m, 40°01.021' N 043°52.035' E, 31.VIII.2013, ♂.

Associated plants: *Angelica sylvestris*, *Oryza sativa*, *Phragmites australis*, *Picea abies*, *Picea excelsa*, *Poa pratensis*, *Triticum aestivum*.

Remarks: This species collected on *Prunus armeniaca* L. and new locality record for Iğdır.

Subfamily Ichneumoninae Latreille,1802

***Ichneumon confusor* Gravenhorst, 1820**

General distribution: Eastern Palaearctic, Europe and Western Palaearctic Regions.

Distribution in Türkiye: Kars (Çoruh et al., 2014; Çoruh, 2017; Riedel et al., 2010).

Material examined: Iğdır: Tuzluca, Egrekdere, 1216 m, 40°00.599' N 043°38.637' E, 13.VII.2016, ♀.

Associated plants: *Chaerophyllum aromaticum*, *Chaerophyllum bulbosum*, *Crataegus oxyacantha*, *Daucus carota*, *Deschampsia cespitosa*, *Fagus sylvatica*, *Ferulago sylvatica*, *Heracleum sphondylium* and *Peucedanum oreoselinum*.

Remarks: New locality record for Iğdır and second exact locality from Türkiye. This species collected on *Prunus armeniaca* L.

Subfamily Pimplinae Wesmael, 1845

***Itoplectis viduata* (Gravenhorst,1829)**

General distribution: Eastern Palaearctic, Europe, Nearctic and Western Palaearctic Regions.

Distribution in Türkiye: Ankara (Kolarov et al., 1997a; Özdemir & Özdemir 2002); Bursa (Kolarov et al., 1997a); Bitlis, Erzincan, Erzurum, Iğdır, Kars (Çoruh, 2005; Çoruh, 2010; Çoruh, 2016; Çoruh & Kolarov, 2010; Kolarov, 1995; Özdemir & Kılınçer, 1990; Özdemir & Özdemir, 2002; Teymuroğlu, 2021; Teymuroğlu & Çoruh, 2021; Tuatay et al., 1972); Çankırı (Özdemir & Özdemir, 2002); Edirne (Konca, 2015).

Material examined: Iğdır: Çalpala, 987 m, 39°59.901' N 043°54.308', E, 19.VIII.2015, ♂; Tuzluca, Çıyrıklı, 1095 m, 40°07.957' N 43°34.515' E, 28.IV.2013, ♂.

Associated plants: *Anethum graveolens*, *Daucus carota*, *Heracleum sphondylium*, *Peucedanum oreoselinum* and *Quercus robur*.

Remarks: This species collected on *Prunus armeniaca* L.

***Scambus sagax* (Hartig, 1838)**

General distribution: Eastern Palaearctic, Europe and Western Palaearctic Regions.

***Distribution in Türkiye*:** Bayburt, Iğdır, Kars (Çoruh, 2005; Çoruh, 2010; Çoruh, 2017; Çoruh & Kolarov, 2010; Çoruh & Özbek, 2008; Çoruh & Tozlu, 2008).

Material examined: Iğdır: Çalpala, 889 m, 39°59.901' N 043°54.308' E, 16.VIII.2014, ♂.

Associated plants: *Anethum graveolens*, *Anthriscus sylvestris*, *Chaerophyllum bulbosum*, *Daucus carota*, *Daucus carota sativus*, *Euphorbia nicaeensis*, *Euphorbia virgata*, *Fraxinus excelsior*, *Heracleum sphondylium*, *Larix europaea*, *Larix polonica*, *Pastinaca graveolens*, *Picea* spp., *Pinus sylvestris*, *Prunus cerasifera*, *Salvia sylvestris*.

Remarks: This species collected on *Malus domestica* L.

Subfamily Tryphoninae Shuckard, 1840

***Tryphon* (*Tryphon*) *atriceps* Stephens, 1835**

General distribution: Eastern Palaearctic, Europe and Western Palaearctic Regions.

Distribution in Türkiye: Afyonkarahisar, Aksaray, Ankara, Antalya, Artvin, Bayburt, Bolu, Denizli, Diyarbakır, Edirne, Elazığ, Erzincan, Erzurum, Eskişehir, Isparta, İçel, İstanbul, Kars, Kırklareli, Malatya, Muğla, Niğde, Sivas, Yozgat (Beyarslan et al., 2006; Çoruh et al.,

2014; Çoruh, 2019b; Çoruh et al., 2005; Eroğlu et al., 2011; Gürbüz, 2005; Gürbüz & Kolarov, 2006; Gürbüz et al., 2009; Kolarov, 1994; Kolarov & Çoruh 2012; Kolarov et al., 1999; Özdemir, 2001; Sarı & Çoruh 2018; Shaw & Kasparyan, 2005; Yurtcan & Beyarslan, 2002; Yurtcan et al., 2006; Yaman, 2014).

Material examined: Iğdır: Sarıçoban, 867 m, 40°018.166' N 044°011.158' E, 12.V. 2014, ♀.

Associated plants: *Anthriscus sylvestris*, *Chaerophyllum temulum*, *Heracleum sphondylium*, *Peucedanum oreoselinum*.

Remarks: This species collected on *Prunus armeniaca* L. and new locality record for Iğdır.

Table 1. Distributions of Collected Species

Geographical Regions Sea	Aegean Region	Anatolia	Black Sea Region	Eastern Anatolia Region	Mediterranean Region	Marmara Region	South Eastern Region
Diadegma elishae				■ ■ ■			
Diadegma mediterraneum				■ ■	■	■	
Lysibia nana	■			■	■	■	
Promethes sulcator	■	■		■ ■	■	■	
Ichneumon confusor				■ ■ ■			
Itoplectis viduata				■			
Scambus sagax				■			
Tryphon (Tryphon) atriceps	■	■	■	■ ■	■	■	■

■ Second exact locality from Türkiye
■ New locality record for Iğdır
■ Regional distributions of species

Table 2. Zoogeographic Distribution of Collected Species

Zoogeographical Regions	Eastern Palearctic	Europea Mediterranean Region	Nearctic Mediterranean	Oriental	Western Palearctic
Diadegma elishae	■	■			■
Diadegma mediterraneum		■			■
Lysibia nana	■	■	■	■	■
Promethes sulcator	■	■	■	■	■
Ichneumon confusor	■	■			■
Itoplectis viduata	■	■	■		■
Scambus sagax	■	■			■
Tryphon (Tryphon) atriceps	■	■			■

CONCLUSION

As a result, eight ichneumon wasps species belonging to seven genera were recorded that six of these species were new records for Iğdır. In addition, *Diadegma elishae* (Bridgman, 1884) and *Promethes sulcator* (Gravenhorst, 1829) were recorded second exact locality from Türkiye.

Additionally both the regional distribution of for each species and their zoogeographic distribution are given in Table 1 and 2.

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