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A NEW RECORD FOR THE ICHNEUMONIDAE (HYMENOPTERA) FAUNA OF TÜRKİYE

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Abstract

This study was created by Ichneumonidae species collected from four different provinces (Ağrı, Iğdır, Kars, Muş) in the Eastern Anatolia region of Türkiye between 2022 and 2024. In this study, four subfamilies (Acaenitinae Forster, 1869; Anomaloninae Viereck, 1918; Ichneumoninae Latreille, 1802 and Tryphoninae Shuckard, 1840) were examined and six species were recorded. Of these species, *Dicaelotus pudibundus* (Wesmael, 1845) was identified for the first time in Türkiye, while *Erigorgus fibulator* (Gravenhorst, 1829); also a new record for the Eastern Anatolia Region. In addition, *Phaenolobus trochanteralis* Çoruh & Kolarov, 2013 is an endemic species for Türkiye. Several specimens were collected from the foothills of Mount Ararat, known as the "roof of Türkiye".

KEYWORDS: Ichneumonidae, new record, Türkiye, Mount Ararat

Introduction

The order Hymenoptera is an important order with parasitoids, predators and herbivorous insects as well as social groups (Austin & Dowton, 2000). It has more than 153,000 species worldwide, grouped into 8,423 genera belonging to 132 families (Aquiar *et al*., 2013).

The Ichneumonidae family, known as parasitic wasp has an important place in this respect in its order (Gauld & Bolton, 1988) and is also among the most abundant parasitoids in nature (Polaszek & Vilhemsen, 2023), and has undertaken an important task in maintaining ecological and biological balances (Townes *et al*., 1965).

Although some studies have been conducted on Ichneumonidae species in Türkiye, they are more limited than the studies conducted in other countries. Kolarov (1995) handled the most detailed study, and 393 Ichneumonidae species were given in the catalog published under the name of "A catalogue of the Turkish

Ichneumonidae". The studies started in the Thrace region, continued in the Northeastern Anatolia region and finally the Mediterranean region joined the studies. In the intervening 30 years, this number has been updated to approximately 1,521 species (Dalan & Çoruh, 2024; Ayhan, 2025).

The aim of this study is to contribute to the biodiversity of Ichneumonidae in Türkiye and the world by identifying species in the provinces of Ağrı, Iğdır, Kars and Muş (Fig. 1) in the Eastern Anatolia Region of Türkiye.

Materials and Methods

The material for this study consists of Ichneumonidae species collected in June, July, and August from habitats and ecosystems (Fig. 2) identified in Ağrı, Iğdır, Kars, and Muş provinces between 2022 and 2024. Ichneumonid individuals were evaluated according to their distinctive taxonomic characteristics, genus and species classifications were made, various sources were used in the identification of the specimens, and the second and third authors made diagnoses. The first author collected all samples.

In addition, digital photographs of the morphological characteristics of these species were taken and label information about their zoogeographic distribution, distribution in Türkiye, number of individuals, places of collection and plants visited were given.

Newly recorded types is indicated with an asterisk (*) in the text.

Figure 1. Map of study area.

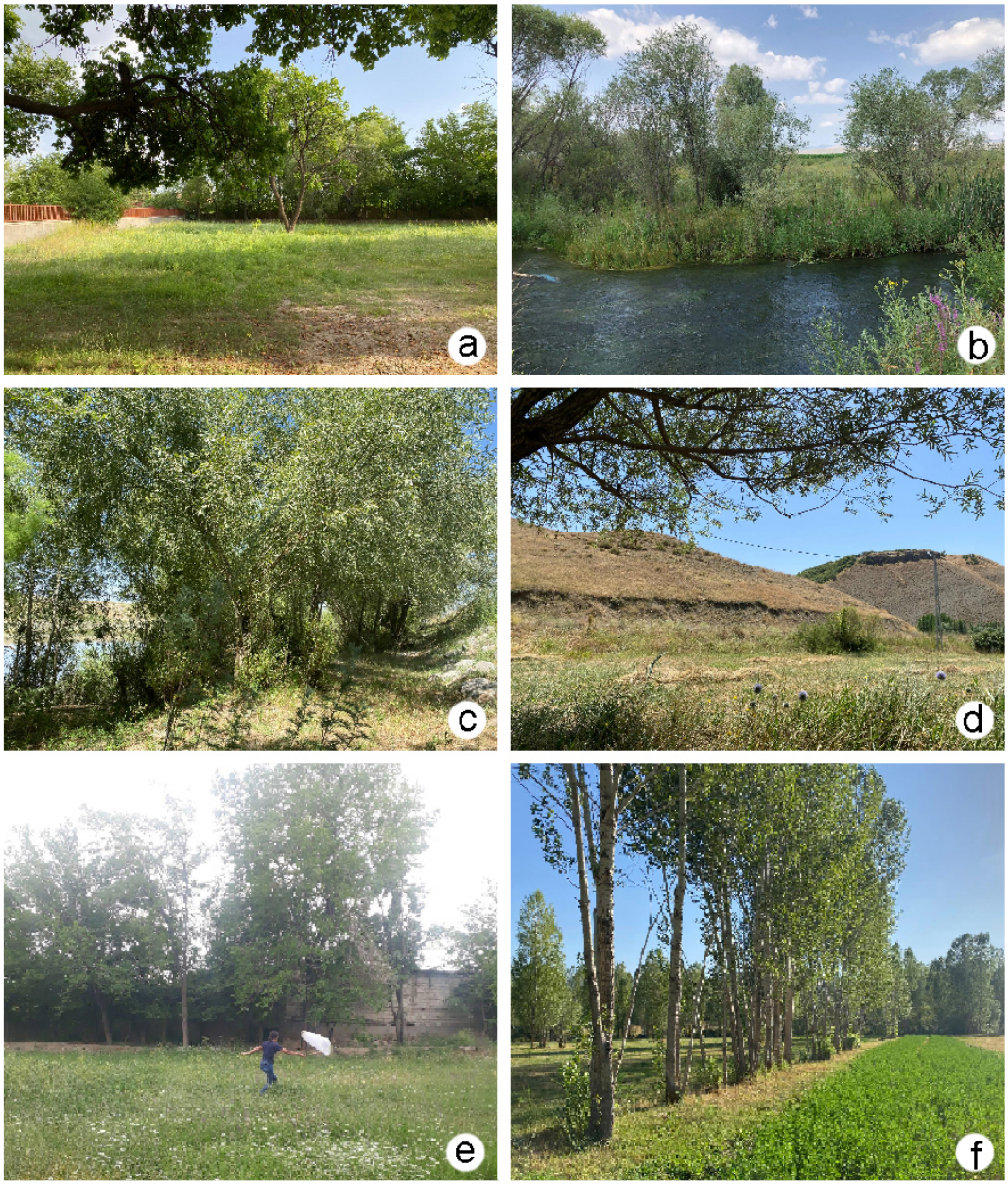

Figure 2. Images from the work area: a – Iğdır (Central), b – Ağrı (Central), c – Muş (Central), d – Muş (Korkut), e – Iğdır (Central), f – Muş (Bulanık).

Results and Discussion

Six species were brought together in the study.

Subfamily Acaenitinae Förster, 1869

***Phaenolobus trochanteralis* Çoruh & Kolarov, 2013** (Fig. 3a)

Material examined: Ağrı, Hamur, Derekenarı, 39°61'9514" N, 43° 00' 3420" E, 1,683 m, 03.06.2023, ♀ (Fig. 3b).

Distribution in the World**:** West Palaearctic Regions (Türkiye).

Remark: This species is endemic to Türkiye.

Figure 3. *Phaenolobus trochanteralis* Çoruh & Kolarov, 2013: a – Habitus; b – Distribution in Türkiye.

Subfamily Anomaloninae Viereck, 1918

***Anomalon cruentatum* (Geoffroy, 1785)** (Fig. 4a)

Material examined: Ağrı, Central, 39°40'5848" N, 43°01'3355" E, 1,619 m, 03.07.2022, 14 ♂♂; Gizemlibahçe, 39°77'4796" N, 43°11'7954" E, 1,672 m, 27.06.2023, 4 ♀♀; Mount Ararat, 39°68'2331" N, 44°08'6786" E, 1,520 m, 23.07.2023, 3 ♀♀; Tutak, 39°45'2297" N, 42°76'5115" E, 1,670 m, 03.07.2023, 6 ♀♀, Oğlaksuyu, 39°45' 2297" N, 42°76'5115" E, 1,670 m, 27.06.2023, 2 ♂♂, 4 ♀♀. Iğdır, Karakoyunlu, 39°58'5003" N, 44°85'0893" E, 847 m, 29.07.2024, 12 ♀♀; Tuzluca, 39°99' 9608" N, 43°70'2327" E, 1,362 m, 12.07.2024, 4 ♂♂, 13 ♀♀. Muş, Central, 38°47'1528" N, 41°29'8258" E, 1,249 m, 23.07.2023, 15 ♂♂, 11 ♀♀; Bulanık, 39°41'5138" N, 42°19'1281" E, 1,510 m, 22.07.2023, 17 ♀♀, 39°03'1950" N, 42°19'1483 E, 07.08.2022, 1,566 m, 8 ♀♀; Korkut, Dere içi, 38°85'9935" N, 41°92'7614" E, 1,589 m, 08.08.2023, 11 ♀♀, Tan Village, 38°45'2972" N, 41°53'9365" E, 1,371 m, 23.07.2023, 8 ♂♂, 4 ♀♀. Kars, Central, 40°55'1034" N, 43°03'8274" E, 1,750 m, 13.07.2024, 11 ♀♀; Selim, 40°41'5714" N, 42°74' 2879" E, 1,876 m, 22.06.2024, 13 ♂♂, 5 ♀♀ (Fig. 4b).

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

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

Distribution in the World: Palaearctic and Oriental Regions.

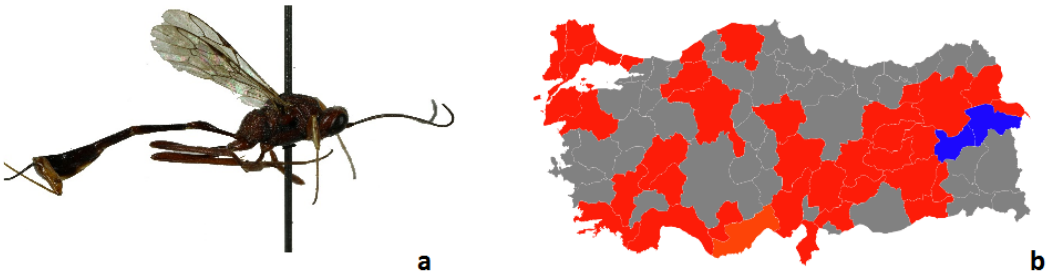

Figure 4. *Anomalon cruentatum* (Geoffroy, 1785)*:* a – Habitus, b – Distribution in Türkiye.

***Erigorgus fibulator* (Gravenhorst, 1829)** (Fig. 5a)

Material examined: Ağrı, Hamur, Derekenarı, 39°61'9514" N, 43°00'3420" E, 1,680 m, 01.06.2023, 6 ♀♀ (Fig. 5b).

Hosts: Lepidoptera: *Autographa gamma* (L.), *Diloba caeruleocephala* (L.), *Malacosoma castrense* (L.), *Smerinthus ocellatus* (L.), *Zygaena ephialtes* (L.), *Zygaena filipendulae* (L.).

Distribution in the World: Palaearctic Regions.

Remark: This species is a new record for the Eastern Anatolia Region.

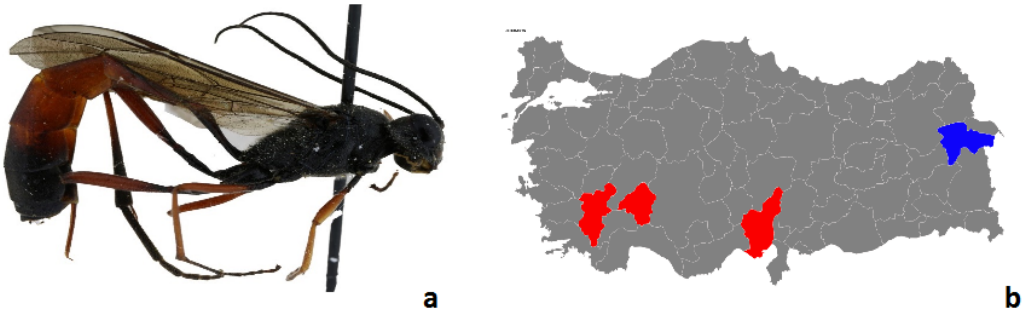

Figure 5. *Erigorgus fibulator* (Gravenhorst, 1829): a – Habitus, b – Distribution in Türkiye.

Subfamily Ichneumoninae Latreille, 1802

***Dicaelotus pudibundus* (Wesmael, 1845)** (Fig. 6a-c)

Material examined: Ağrı, Oğlaksuyu, 40°02'46" N, 41°20'23" E, 1,788 m, 07.06.2023, 2 ♂♂ (Fig. 6b)

Associated plant: *Pseudotsuga menziesii* (Mirb.).

Distribution in the World: Europea and West Palaearctic Regions.

Remark: This is a new record for the Ichneumonidae fauna of Türkiye.

Figure 6. *Dicaelotus pudibundus* (Wesmael, 1845): a – Habitus, b – Distribution in Türkiye.

***Tryphon signator* (Gravenhorst, 1829)** (Fig. 7a)

Material examined: Ağrı, Central, 39°73'4274" N, 43°08'9772" E, 1,639 m, 23.07.2023, 4 ♂♂, 39°77'4591" N, 43°11'8876" E, 1,673 m, 10.06.2024, 2 ♀♀, 39°73'3457" N, 43°08' 9080" E, 1,641 m, 10.06.2024, 5 ♂♂, 4 ♀♀; Mount Ararat, 39°39'1339" N, 43°0'5398" E, 1,613 m, 03.07.2022, 2 ♀♀; Tutak, Oğlaksuyu, 39°45'2297" N, 42°76'5115" E, 1,670 m, 03.07.2023, 4 ♂♂. Iğdır, Karakoyunlu, 39°58'5003" N, 44°85'0893" E, 847 m, 29.07.2024, 1 ♂, 4 ♀♀; Tuzluca, 39°99' 9608" N, 43°70' 327" E, 1,362 m, 12.07.2024, 2 ♂♂, 4 ♀♀. Muş, Central, 38°47'1528" N, 41°29'8258" E, 1,249 m, 23.07.2023, 15 ♂♂, 14 ♀♀; Bulanık, Kavaklık, 39°06'8676" N, 42°33'2777" E, 1,553 m, 06.06.2023, 2 ♀♀, 6 ♂♂, 39°41'5138" N, 42°19'1281" E, 1,510 m, 22.07.2023, 7 ♀♀, 39°03'1950" N, 42°19' 1483" E, 07.08.2022, 1,566 m, 6 ♀♀; Korkut, Dere içi, 38°85'9935" N, 41°92'7614" E, 1,589 m, 08.08.2023, 9 ♀♀, Tan Village, 38°45'2972" N, 41°53'9365" E, 1,371 m, 23.07.2023, 4 ♂♂, 3 ♀♀. Kars, Central, 40°55'1034" N, 43°03'8274" E, 1,750 m, 13.07.2024, 8 ♀♀; Selim, 40°41'5714" N, 42°74'2879" E, 1,876 m, 22.06.2024, 10 ♂♂, 2 ♀♀ (Fig. 7b).

Associated plants: *Chaerophyllum temulum* L., *Euphorbia esula* L.

Distribution in the World: Palaearctic Regions.

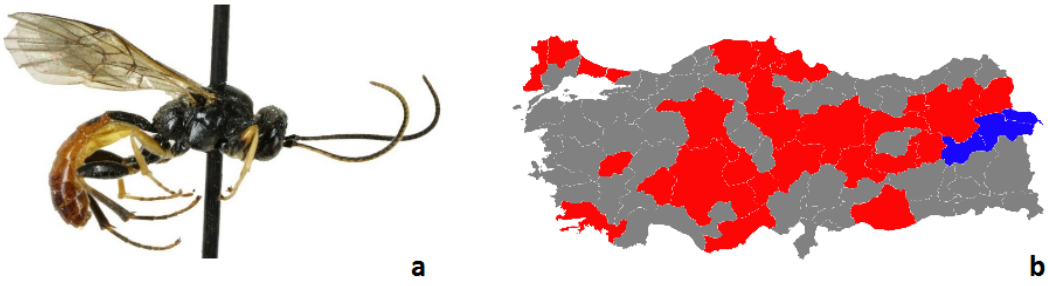

Figure 7. *Tryphon signator* (Gravenhorst, 1829): a) Habitus, b) Distribution in Türkiye.

***Phytodietus polyzonias* (Forster, 1771)** (Fig. 8a)

Material examined: Ağrı, Hamur, Airport, 39°38'4769" N, 43°00'3670 E, 3.07.2022, 1,619 m. ♀. Iğdır, Aralık, 39°51'2705" N, 44°31'5498" E, 812 m, 29.06.2024, 3 ♂♂, 4 ♀♀; Tuzluca, 39°99'9608" N, 43°70'2327" E,

1,362 m, 12.07.2024, 5 ♂♂, 2 ♀♀. Muş, Bulanık, 39°03'1950" N, 42°19'1483" E, 07.08.2022, 1,566 m, 3 ♂♂. Kars, Digor, 40°15'5340" N, 43°65'8902" E, 998 m, 13.07.2024, 5 ♂♂, 2 ♀♀; Sarıkamış, 40°34'1504" N, 42°59'3993" E, 2,058 m, 22.06.2024, 4 ♂♂, 4 ♀♀; Selim, 40°41'5714" N, 42°74' 2879" E, 1,876 m, 22.06.2024, 2 ♂♂, 2 ♀♀ (Fig. 8b).

Hosts: Coleoptera: *Anthonomus pomorum* (L.). Lepidoptera: *Acleris hastiana* (L.), *Acleris schalleriana* (L.), *Aleimma loeflingiana* (L.), *Ancylis mitterbacheriana* (Denis & Schiffermacher), *Ancylis upupana* (Treitschke), *Archips crataegana* (Hübner); *Archips oporana* (L.), *Archips rosana* (L.), *Archips xylosteana* (L.), *Choristoneura murinana* (Hübner), *Cnaemidophorus rhododactylus* (Denis & Schiffermacher), *Cydia zebeana* (Ratzeburg), *Diurnea flagella* (F.), *Drymonia ruficornis* (Hufnagel), *Epinotia nanana* (Treitdchke), *Epinotia tetraquetrana* (Hawarth), *Epirrhoe galiata* (Denis & Schiffermacher), *Eudemis porphyrana* (Hübner); *Lobesia botrana* (Denis & Schiffermacher), *Loxostege sticticalis* (L.), *Notocelia roborana* (Denis & Schiffermacher), *Notocelia uddmanniana* (L.), *Ostrinia nubilalis* (Hubner); *Pandemis cerasana* (L.), *Rhyacionia buoliana* (Denis & Schiffermacher), *Rhyacionia pinicolana* (Doubleday), *Sesia calliformis* (Clerck), *Sparganothis pilleriana* (Denis & Schiffermacher), *Spilonota ocellana* (Denis & Schiffermacher), *Tortrix viridana* (L.), *Yponomeuta malinella* Zeller, *Yponomeuta padella* (L.).

Associated plants: *Chaerophyllum aromaticum* L., *Chaerophyllum bulbosum* L., *Daucus carota* L., *Euonymus europaeus* L., *Pastinaca graveolens* M. Bieb., *Quercus robur* L.
Distribution in the World: Palaearctic Regions.

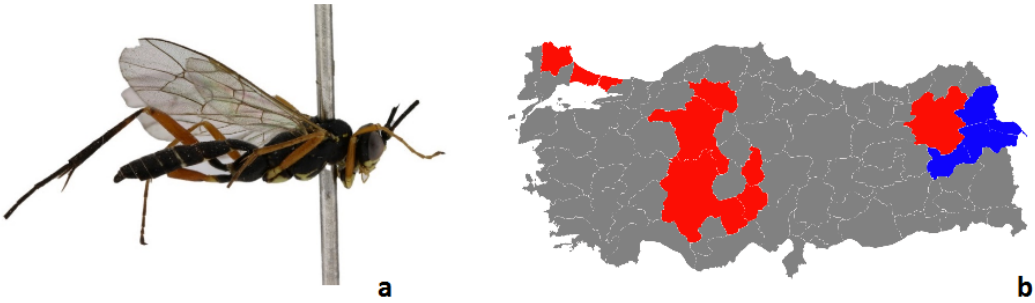

Figure 8. *Phytodietus polyzonias* (Forster, 1771): a) Habitus, b) Distribution in Türkiye.

Discussion

This study examined six species belonging to four subfamilies. One of these species, *Dicaelotus pudibundus* (Wesmael, 1845), is a new record for Türkiye.

The first subfamily of the study, Acaenitinae Foerster, is represented by one genus and one species. The species *Phaenolobus trochanteralis*, belonging to the genus *Phaenolobus*, has only been collected in Erzincan and Erzurum in Türkiye and worldwide (Çoruh & Kolarov, 2013; Çoruh *et al*., 2014). Its description is based on a specimen collected by Prof. Dr. Hikmet Özbek on 01.07.2000, at an altitude of 2,000 m in Çirişli, Çat, Erzurum. This species is endemic to Türkiye. Furthermore, Ağrı province has been identified as the third locality where this species has been found.

Table I. Data on Available Species.

Names of Taxa	IN	VD	SD	GR	ZR	HR	PVR	FRT
Family: Ichneumonidae Latreille, 1802								
Subfamily: Acaenitinae Forster, 1869 Genus: *Phaenolobus* Foerster, 1868								
Phaenolobus Trochanteralis	1	D	H	EAR	WP	-	-	Çoruh and Kolarov 2013 ♠
Subfamily: Anomaloninae Viereck, 1918 Genus: *Anomalon* Panzer, 1804								
Anomalon Cruentatum	165	A, C, D, E	H, T, A	AR, BSR, CAR, EAR, MtR, MR, SAR	ORR, P	x	x	Kohl, 1905
Genus: *Erigorgus* Förster, 1869								
Erigorgus Fibulator	6	D	H	AR, MtR	P	x	-	Gürbüz *et al.*, 2009a**
Subfamily: Ichneumoninae Latreille, 1802 Genus: *Dicaelotus* Wesmael, 1845								
****Dicaelotus Pudibundus***	2	E	H	*	E, WP	-	x	New record
Subfamily: Tryphoninae Shuckard, 1840 Genus: *Tryphon* Fallén, 1813								
Tryphon Signator	118	A, B, C, D, E	H, T, A	AR, BSR, CAR, EAR, MtR, MR, SAR	P	-	x	Kolarov, 1987
Genus: *Phytodietus* Gravenhorst, 1829								
Phytodietus Polyzonias	37	A, C, D, E, F	H, T, A	CAR, EAR, MR, MtR,	P	x	x	Özdemir, 2001

Individual numbers (IN), vertical distribution (VD), seasonal dynamics (SD), geographical regions (GR), zoogeographical regions (ZR), host records (HR), PVR: visited plant; first record of Türkiye (FRT) of specimens

Vertical distribution (VD) (metre): A: 800-1000 m, B: 1001-1250 m, C: 1251-1500 m, D: 1501-1750 m, E: 1751-2000, F: 2001-2250; Seasonal dynamics (SD): J: June, Jl: July, A: August. Geographical regions (GR): AR: Aegean Region, BSR: Black Sea Region, CAR: Central Anatolia Region, EAR: Eastern Anatolia Region, MR: Marmara Region, MtR: Mediterranean Region. Zoogeographical regions (ZR): E: Europe, ORR: Oriental Region, WP: Western Palaerctic, P: Palaerctic.

*	New rocord from Türkiye
**	New record from East Anatolia Region
♠	Endemic

The subfamily Anomaloninae Viereck, is the second subfamily of the study. This subfamily is represented by two species belonging to 2 genera and 171 individuals. *Anomalon cruentatum* (Geoffroy) is the most abundant species among those identified, with 165 individuals. This species, distributed across seven different regions of Türkiye, was collected from 36 different provinces, four different altitudes, and all three months of the year. Of the four provinces that form the basis of this study, Ağrı and Muş provinces are new localities for this species. *Erigorgus fibulator* (Gravenhorst), another species in this subfamily, had previously been collected from Isparta (Gürbüz *et al*. 2009a,b), Adana (Gürbüz *et al*., 2011), and Denizli (Kıraç & Gürbüz, 2020), but was collected from Ağrı province in this study and identified as a new record for the Eastern Anatolia Region.

Table II. Provinces where the species previously collected in Türkiye.

Names of Taxa	Provinces	Reference (s) list
Family: Ichneumonidae Latreille, 1802		
Subfamily: Acaenitinae Forster, 1869		
Genus: *Phaenolobus* Foerster, 1868		
Phaenolobus trochanteralis	Erzincan and Erzurum	Çoruh and Kolarov, 2013; Çoruh *et al*., 2014b
Subfamily: Anomaloninae Viereck, 1918		
Genus: *Anomalon* Panzer, 1804		
Anomalon cruentatum	Adana, Adıyaman, 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 & Kılınçer, 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; Buncukçu, 2008; Kırtay, 2008; Gürbüz *et al.,* 2008; Gürbüz *et al.* 2009a,b; Birol, 2010; Gürbüz *et al.,* 2011; Çoruh *et al.,* 2014; 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; Kıraç & Gürbüz, 2020; Barik, 2022; Kaplan & Riedel, 2022; Doğru 2022; Çoruh *et al.,* 2022; Dalan, 2024.
Genus: *Erigorgus* Förster, 1869		
Erigorgus fibulator	Adana, Denizli and Isparta	Gürbüz *et al.,* 2009a,b; Gürbüz *et al.,* 2011; Kıraç & Gürbüz, 2020.
Subfamily: Ichneumoninae Latreille, 1802		
Genus: *Dicaelotus* Wesmael, 1845		
****Dicaelotus pudibundus***	Ağrı	New record
Subfamily: Tryphoninae Shuckard, 1840		
Genus: *Tryphon* Fallén, 1813		
Tryphon signator	Aksaray, Ankara, Bayburt, Bingöl, Çorum, Edirne, Elazığ, Erzincan, Erzurum, Isparta, İstanbul, Kars, Kastamonu, Kayseri, Kırklareli, Konya, Malatya, Mersin, Muğla, Niğde, Samsun, Sinop, Sivas, Şanlıurfa, Uşak and Yozgat	Kolarov, 1987; Öncüer, 1991; Kolarov, 1994; Kolarov & Beyaslan, 1994; Kolarov, 1995; Kolarov *et al*., 1999; Yurtcan *et al.,* 2002; Gürbüz, 2005; Çoruh *et al.,* 2005; Gürbüz & Kolarov, 2006a; Yurtcan *et al.,* 2006; Gürbüz *et al.,* 2009a; Birol, 2010; Kolarov & Çoruh, 2012a; Yaman, 2014; Çoruh, 2019; Korukcu & Çoruh, 2024.
Genus: *Phytodietus* Gravenhorst, 1829		
Phytodietus polyzonias	Ankara, Çankırı, Erzurum, İstanbul, Konya, Kırıkkale, Nevşehir and Niğde	Özdemir, 2001; Özdemir & Özdemir, 2002; Yurtcan *et al.,* 2002; Yaman, 2014; Çoruh, 2019; İneciklioğlu, 2022; Tezcan & Gülperçin, 2024.

One of the subfamilies included in this study is the Ichneumoninae Latreille subfamily. One species and two individuals represent it. *Dicaelotus pudibundus* (Wesmael) was collected from Ağrı province, contributing to the study as new records.

Tryphoninae Shuckard is the final subfamily of this study. Two genera, two species, and 155 individuals represent it. *Tryphon signator* (Gravenhorst) is a Palaearctic species that was included in this study at five different altitudes and in the four provinces where the study was conducted, and has a distribution area in seven different regions of our country.

When the species are evaluated according to their collection localities within the study area (Table III), it is seen that samples were taken from different localities and altitudes in the provinces of Ağrı, Iğdır, Kars, and Muş, where the study was conducted. Accordingly, all species were labeled from Ağrı province, three species from Muş, Kars and Iğdır province. Accordingly, Ağrı was the province with the most species (Table III).

Of the existing species, *Anomalon cruentatum, Tryphon signator,* and *Phytodietus polyzonias* were sampled from all four provinces of the study area. These species already have a wide distribution area in Türkiye and the world. Despite this, *Phaenolobus trochanteralis, Erigorgus fibulator*, and *Dicaelotus pudibundus* have been added to the literature only from Ağrı province.

Table III. Provinces where the species collected in study area.

Taxa name	New localities where species are collected			
	Ağrı	Iğdır	Kars	Muş
Acaenitinae Forster, 1869				
Phaenolobus Trochanteralis	*			
Anomaloninae Viereck, 1918				
Anomalon Cruentatum	*	*	*	*
Erigorgus Fibulator	*			
Ichneumoninae Latreille, 1802				
Dicaelotus Pudibundus	*			
Tryphoninae Shuckard, 1840				
Tryphon Signator	*	*	*	*
Phytodietus Polyzonias	*	*	*	*

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НОВИ НАЛАЗ ЗА ФАУНУ ICHNEUMONIDAE (HYMENOPTERA) ТУРСКЕ

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Извод

У раду су наведени прикупљени примерци шест врста фамилије Ichneumonidae у четири различите провинције (Агри, Игдир, Карс, Муш) у региону Источне Анадолије у Турској у периоду између 2022. и 2024. године. Истражене су четири потфамилије (Acaenitinae Forster, 1869; Anomaloninae Viereck, 1918; Ichneumoninae Latreille, 1802 и Tryphoninae Shuckard, 1840).

Dicaelotus pudibundus (Wesmael, 1845) је први пут регистрована у Турској, као и *Erigorgus fibulator* (Gravenhorst, 1829); који такође представља нови налаз за регион Источне Анадолије. Врста *Phaenolobus trochanteralis* Çoruh & Kolarov, 2013 је ендемична за Турску. Неколико примерака је сакупљено у подножју планине Арарат, познате као „кров Турске“.

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