

**A CONTRIBUTION TO THE ICHNEUMONINAE
(HYMENOPTERA: ICHNEUMONIDAE) OF TRABZON,
TURKEY**

Saliha Çoruh*, Janko Kolarov and Ömer Selim Ercelep*****

* Atatürk University, Faculty of Agriculture, Department of Plant Protection, 25240 Erzurum, TURKEY. E-mail: spekel@atauni.edu.tr

** University of Plovdiv, Faculty of Pedagogy, 24 Tsar Assen Str., 4000 Plovdiv, BULGARIA. E-mail: jkolarov@uni-plovdiv.bg

*** Atatürk University, Faculty of Agriculture, Department of Plant Protection, 25240 Erzurum, TURKEY.

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ABSTRACT: Thirty Ichneumoninae samples were collected from Black Sea Region (Trabzon, Ortahisar) during the summer period of 2017. A total of 11 species are recorded. Among them *Barichneumon fumipennis* (Gravenhorst, 1820) and *Centeterus rubiginosus* (Gmelin, 1790) are recorded for the first time from Turkey. For each species, individual diversity, geographical distribution, zoogeographical notes, hosts and associate plants data are summarized.

KEY WORDS: Hymenoptera, Ichneumonidae, Ichneumoninae, new records, Turkey, Trabzon

Turkey boasts a rich variety of landscapes, from its three coasts (bordering the Mediterranean, Aegean, and Black Seas) up to the mountains that reach 5137 meters in height. There are forests, shrub lands, large rivers, wetlands, and several mountain ranges. Turkey's unique position at the crossroads between Europe, Asia and Africa has provided an interesting mixture of species to populate these habitats (Gross, 2012).

Hymenoptera started to diversify around 281 million years ago (mya) (Peter et al., 2017). Today the order Hymenoptera (Fig. 1) (sawflies, wasps, ants, and bees) are one of four mega-diverse insect orders, comprising more than 153,000 described and possibly up to one million undescribed extant species (Grimaldi & Engel, 2005; Aguiar et al., 2013).

The taxonomy of the family Ichneumonidae is still poorly known. The family is highly diverse, containing 24,281 described species (Yu et al., 2016). Approximately 60,000 species are estimated to exist worldwide (Townes, 1969), though some estimates place this number at over 100,000. They are severely under sampled, and studies of their diversity typically produce very high numbers of species which are represented by only a single individual (Saunders & Ward, 2018; Fraser et al., 2008). Parasitoid wasps of the family Ichneumonidae are one of the most diverse and species-rich groups of organisms with a worldwide distribution (Spasojevic et al., 2018).

This is the second largest subfamily Ichneumoninae with about 437 genera and 4355 species in the world (Yu et al., 2016). Up to 1995, 65 Ichneumoninae species have been recorded (Kolarov, 1995).

Although the Ichneumoninae fauna of Turkey has been studied (Özdemir, 1996; Yurtcan et al., 1999; Çoruh et al., 2002; Özbek et al., 2003; Çoruh et al., 2005; Kolarov, 2007; Riedel, 2008; Çoruh & Kesdek, 2008; Çoruh & Özbek, 2008; Gürbüz et al., 2008; Riedel et al., 2010; Çoruh et al., 2011; Eroğlu et al.,

2011; Riedel et al., 2011; Çoruh & Özbek, 2013; Özdan, 2014, Çoruh et al., 2014; Kolarov et al. 2014, Çoruh et al., 2016; Kolarov et al., 2016; Çoruh, 2017; Sarı & Çoruh, 2018; Riedel et al., 2018) these studies still has not enough. The number of Ichneumoninae species has reached 241 with the above valuable studies and this study.

This paper aim to contribute to the knowledge of Ichneumoninae species distribution in Turkey with new records.

MATERIAL AND METHODS

Ichneumonids samples were collected by hand net in the period between June-August 2017 in the Black Sea Region (Ortahisar, Trabzon, Turkey) (Fig. 2).

Trabzon, historically known as Trebizond, is a city on the Black Sea coast of northeastern Turkey and the capital of Trabzon Province. Trabzon, located on the historical Silk Road, became a melting pot of religions, languages and culture for centuries and a trade gateway to Persia in the southeast and the Caucasus to the northeast.

Due to its spectacular nature and regular and plentiful rainfall Trabzon possesses a thick and abundant vegetation corner. Ortahisar, which is the largest district of the city, also has evidence that it is the oldest settlement with its historical and cultural heritage.

Our samples were collected from three different altitudes (150 m, 350 m, 700 m) by Ömer Selim Ercelep. Hazelnut gardens were preferred as the study area. Collected samples were transferred in to an aspirator and were killed ethyl acetate. Conventional standard methods (Çoruh & Özbek, 2008) were used for preparation of the samples. Material is preserved in Museum of Ataturk University, Erzurum (EMET). New records of species are marked by an asterisk (*). General distributions, hosts and associate plants of species were taken from Yu et al (2016).

Data on individual numbers, geographical and zoogeographical distributions of species are provided in tables (Tab. 1).

RESULTS

Family ICHNEUMONIDAE Latreille, 1802

Subfamily ICHNEUMONINAE Latreille, 1802

Anisobas hostilis (Gravenhorst, 1820)

Material examined: Trabzon: Ortahisar, Dolaylı, 150 m, 01.VIII.2017, 1 ♂.

Hosts: *Lacanobia suasa*, *Lycaena dispar*, *Lycaena dispar rutila*, *Lycaena virgaureae*, *Neozephyrus quercus*.

Associate plants: *Acer campestre*, *A. pseudoplatanus*, *Adonis vernalis*, *Anthriscus cerefolium*, *Chaerophyllum aromaticum*, *Chaerophyllum bulbosum*, *Ferulago sylvatica*, *Heracleum sphondylium*, *Rubus fruticosus*, *Salix fragilis*, *Thapsia villosa*.

Distribution of Turkey: Erzurum, Kars, Tekirdağ (Yurtcan et al., 1999; Özbek et al., 2003; Riedel et al., 2010, Çoruh et al., 2014; Çoruh, 2017, Sarı & Çoruh, 2018).

General Distribution: Europe, Algeria, Morocco, Turkey, Iran, Kazakhstan, Kyrgyzstan and Western China.

**Barichneumon fumipennis* (Gravenhorst, 1820)

Material examined: Trabzon: Ortahisar, Bostancı, 350 m, 04.VI.2017, 1 ♀.

New record for the Turkish fauna.

General Distribution: Europe.

****Centeterus rubiginosus* (Gmelin, 1790)**

Material examined: Trabzon: Ortahisar, Bostancı, 350 m, 29.VI.2017, 1 ♀.

Hosts: *Argyresthia bergiella*, *Cydia pomonella*, *Diplolepis rosae*, *Glyphipterix thrasonella*, *Pyropteron muscaeformis*.

Associate plant: *Myrmica ruginodis*.

New record for the Turkish fauna.

General Distribution: Europe, Azerbaijan, Iran, Kazakhstan and Mongolia.

***Cratichneumon viator* (Scopoli, 1763)**

Material examined: Trabzon: Ortahisar, Bulak, 700 m, 05.VI.2017, 1 ♂.

Hosts: *Abraxas grossulariata*, *Abraxas sylvata*, *Angerona prunaria*, *Atolmis rubricollis*, *Autographa gamma*, *Banchus hastator*, *Biston betularia*, *Brachionycha sphinx*, *Bupalus piniarius*, *Diprion pini*, *Ectropis crepuscularia*, *Ematurga atomaria*, *Eriogaster lanestris*, *Hylaea fasciaria*, *Hyphantria cunea*, *Hypomecis punctinalis*, *Leucoma salicis*, *Lymantria monacha*, *Macaria liturata*, *Macaria sexmaculata*, *Macaria signaria*, *Macaria truncataria*, *Melanchnra persicariae*, *Orthosia miniosa*, *Panolis flammea*, *Pieris brassicae*, *Plusia festucae*, *Protoarmia porcelaria*.

Associate plants: *Chaerophyllum aromaticum*, *Corylus avellana*, *Daucus carota*, *Ferulago sylvatica*, *Heracleum sphondylium*, *Inula helenium*, *Laserpitium latifolium*, *Listera ovata*, *Peucedanum oreoselinum*, *Pinus sylvestris*, *Rubus fruticosus*, *Vaccinium vitis-idaea*.

Distribution of Turkey: Bursa, Istanbul, Ordu, Rize (Fahringer, 1922; Kolarov, 1995, Kolarov et al., 2014; Kolarov et al., 2016; Çoruh, 2017).

General Distribution: Holarctic region.

***Diadromus collaris* Gravenhorst, 1829**

Material examined: Trabzon: Ortahisar, Dolaylı, 150 m, 24.VIII.2017, 1 ♀.

Hosts: *Acroleptopsis assectella*, *Lobesia botrana*, *Plutella xylostella*, *Brassica napus*, *Brassica oleracea*, *Brassica oleracea capitata*.

Associate plants: *Anthriscus sylvestris*, *Chaerophyllum aromaticum*, *Chaerophyllum bulbosum*, *Daucus carota*, *Heracleum sphondylium*, *Oryza sativa*, *Peucedanum oreoselinum*.

Distribution of Turkey: Ankara, Aydın, Erzurum, Kırşehir, Konya, Muğla, Rize, Yozgat (Avcı & Özbek, 1990; Özdemir, 1996; Çoruh et al., 2002; Kolarov et al., 2002; Özbek et al., 2003; Çoruh et al., 2013, Çoruh et al., 2014; Çoruh et al., 2016; Çoruh, 2017).

General Distribution: Afrotropical, Australasian, Palaeartic, Neotropical, Oceanic and Oriental Region.

***Heterischnus anomalus* (Wesmael, 1857)**

Material examined: Trabzon: Ortahisar, Bulak, 700 m, 27.VI.2017, 1 ♂.

Host: *Plutella xylostella*.

Associate plant: *Heracleum sphondylium*.

Distribution of Turkey: Artvin, Erzurum (Özbek et al., 2003; Çoruh et al., 2014; Çoruh, 2017).

General Distribution: Europe and Turkey.

***Heterischnus truncator* (Fabricius, 1798)**

Material examined: Trabzon: Ortahisar, Bostancı, 350 m, 02.06.2017, 1 ♂ 1 ♀; Bulak, 700 m, 12.VII.2017, 1 ♂ 2 ♀♀; Dolaylı, 14.VIII.2017, 4 ♀♀.

Hosts: *Alucita grammodactyla*, *Cnaemidophorus rhododactylus*, *Dalaca quadricornis*, *Emmelina monodactyla*, *Eriogaster lanestris*, *Heliothis virescens*, *Hyphantria cunea*, *Leucoma salicis*, *Marasmarcha lunaedactyla*, *Panolis flammea*, *Pterophorus pentadactyla*.

Associate plants: *Anethum graveolens*, *Daucus carota*, *D. carota sativus*, *Mentha* spp., *Oryza sativa*, *Rubus fruticosus*, *R. idaeus*, *Setaria glauca*.

Distribution of Turkey: Çanakkale, Isparta, Istanbul, Erzurum, Giresun, Trabzon, Rize (Kolarov, 1989; Kolarov, 1995; Kolarov et al., 1997; Yurtcan et al., 1999; Özbek et al., 2003; Çoruh et al., 2014; Kolarov et al., 2014; Özdan, 2014; Çoruh et al., 2016; Çoruh, 2017).

General Distribution: Europe, Azerbaijan, Turkey and Iran.

***Oronotus binotatus* (Gravenhorst, 1829)**

Material examined: Trabzon: Ortahisar, Bostancı, 350 m, 02.VI.2017, 4 ♂♂ 1 ♀, 20.VII.2017, 1 ♂ 1♀; Dolaylı, 150 m, 04.VI.2017, 1♀, 07.VII.2017, 1♀. 01.VIII.2017. 1 ♂.

Distribution of Turkey: Ordu, Giresun, Trabzon (Çoruh et al., 2016).

General Distribution: Europe and Georgia.

***Stenichneumon culpator* (Schrank, 1802)**

Material examined: Trabzon: Ortahisar, Bostancı, 350 m, 09.VII.2017, 1 ♂; Bulak, 700 m, 19.VI.2017, 1 ♂; Dolaylı, 150 m, 18.VI.2017, 1 ♂; 24.VIII.2017, 1 ♀.

Hosts: *Aporia crataegi*, *Autographa gamma*, *Euphydryas maturna*, *Euthrix potatoria*, *Mellicta athalia*, *Plusia festucae*, *Setina aurita*, *Trichiura crataegi*, *Trichoplusia ni*.

Associate plants: *Angelica sylvestris*, *Anthriscus sylvestris*, *Carum carvi*, *Chaerophyllum bulbosum*, *Corylus avellana*, *Daucus carota*, *Heracleum sphondylium*, *Laserpitium latifolium*, *Pastinaca*; *Pastinaca graveolens*, *Peucedanum oreoselinum*, *Poa pratensis*, *Quercus sessiliflora*.

Distribution of Turkey: Erzurum, Giresun (Riedel et al., 2010; Kolarov et al., 2014; Çoruh, 2017).

General Distribution: Holarctic region.

***Tycherus fuscicornis* (Wesmeal, 1845)**

Material examined: Trabzon: Ortahisar, Dolaylı, 01.VIII.2017, 1 ♂.

Hosts: *Epiblema cirsiana*, *Olethreutes hercyniana*.

Associate plants: *Daucus carota*, *Heracleum sphondylium*.

Distribution of Turkey: Anatolia (Diller & Mark, 2014).

General Distribution: Europe, Turkey and Armenia.

***Vulgichneumon deceptor* (Scopoli, 1763)**

Material examined: Trabzon: Ortahisar, Dolaylı, 24.VIII.2017, 1 ♂.

Host: *Callophrys rubi*.

Associate plants: *Acer pseudoplatanus*, *Adonis vernalis*, *Angelica* sp., *Anthriscus trichosperma*, *Chaerophyllum aromaticum*, *Daucus carota*, *Ferulago sylvatica*, *Foeniculum vulgare*, *Heracleum sphondylium*, *Medicago sativa*, *Melilotus indica*, *Pastinaca graveolens*, *Peucedanum oreoselinum*, *Scutellaria* sp.

Distribution of Turkey: Erzurum, Nevşehir, Trabzon (Özdemir, 1996; Kolarov et al., 2014); Çoruh et al., 2014; Çoruh et al., 2011; Riedel et al., 2010; Çoruh, 2017).

General Distribution: Europe, Georgia, Turkey and Iran.

Zoogeographical notes

The zoogeographical characterization mainly follows the chorotype classification of the Near East fauna proposed by Taglianti et al. (1999). After investigation of the recent geographic distribution of the species listed above, they can be divided into the following groups:

1. Cosmopolitan range has *Diadromus collaris*.
2. Two species have Holarctic ranges – *Cratichneumon viator* and *Stenichneumon culpator*.
3. With Centralasian-European-Mediterranean range is the species *Anisobas hostilis*.
4. Centralasian-European range has the species *Centeterus rubiginosus*.
5. With Turano-European ranges are two species – *Heterischnus truncator* and *Vulgichneumon deceptor*.

Most numerous are the species with European ranges. Here belong the species *Barichneumon fumipennis*, *Heterischnus anomalus*, *Oronotus binotatus* and *Tycherus fuscicornis*.

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Figure 1. Hymenoptera species.

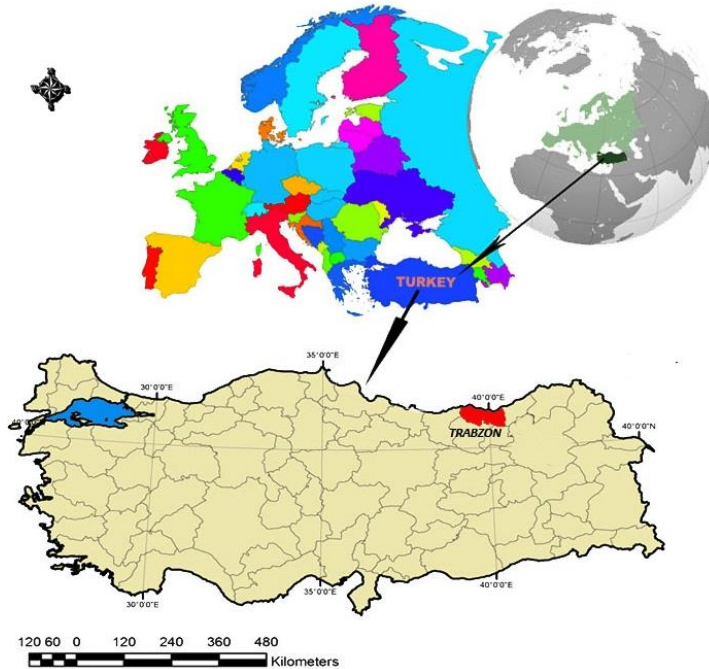


Figure 2. Study area.

Table 1. Faunistic evaluations of Ichneumonidae species.

Collected species from Trabzon, Ortahisar Village						
Name of species	IN ♂ ♀	Collected from locality	Distribution in Turkey	General Distribution	NR	
SUBFAMILY: ICHNEUMONINAE LATREILLE, 1802						
<i>Anisobas hostifilis</i> (Gravenhorst, 1820)	1	Dolaylı	Erzurum, Kars, Tekirdağ	Europe, Algeria, Morocco, Turkey, Iran, Kazakhstan, Kyrgyzstan and Western China		
* <i>Barrichneumon fumipennis</i> (Gravenhorst, 1820)	1	Bostañcı	New record for the Turkish fauna.	Europe	X	
* <i>Centeterus rubiginosus</i> (Gmelin, 1790)	1	Bostañcı	New record for the Turkish fauna.	Europe, Azerbaijan, Iran, Kazakhstan and Mongolia	X	
<i>Craffichneumon vitator</i> (Scopoli, 1763)	1	Bulak	Bursa, Istanbul, Ordu, Rize	Holarctic region		
<i>Diadromus collaris</i> Gravenhorst, 1829	1	Dolaylı	Ankara, Aydın, Erzurum, Kırşehir, Konya, Muğla, Rize, Yozgat	Cosmopolitan		
<i>Heterischmus anomalus</i> (Wesmael, 1857)	1	Bulak	Artvin, Erzurum	Europe and Turkey		
<i>Heterischmus truncator</i> (Fabricius, 1798)	2	Bostañcı, Bulak, Dolaylı	Çanakkale, Isparta, Istanbul, Erzurum, Giresun, Trabzon, Rize	Europe, Azerbaijan, Turkey and Iran.		
<i>Oronotus binotatus</i> (Gravenhorst, 1829)	6	Bostañcı, Dolaylı	Ordu, Trabzon, Giresun	Europe and Georgia.		
<i>Stenichneumon culpator</i> (Schränk, 1802)	3	Bostañcı, Bulak, Dolaylı	Erzurum, Giresun	Holarctic region		
<i>Tycherus fuscicornis</i> (Wesmael, 1845)	1	Dolaylı	Anatolia	Western Palaearctic		
<i>Vulgichneumon deceptor</i> (Scopoli, 1763)	1	Dolaylı	Erzurum, Nevşehir, Trabzon	Europe, Georgia, Turkey and Iran		

(IN): Individual numbers; (NR): New record