Türk Tarım ve Doğa Bilimleri Dergisi 11(1): 49–56, 2024

https://doi.org/10.30910/turkjans.1378577

TÜRK
TARIM ve DOĞA BİLİMLERİ
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JOURNAL of AGRICULTURAL
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Araştırma Makalesi

Doğu Anadolu Bölgesi İçin Yeni Bir Kayıt *Heterischnus ridibundus* (Costa, 1885) (Hymenoptera: Ichneumonidae: Ichneumoninae)

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Geliş Tarihi: 20.10.2023 Düzeltme Geliş Tarihi: 20.12.2023 Kabul Tarihi: 20.12.2023

ÖZ

Heterischnus ridibundus (Costa, 1885), Doğu Anadolu için yeni kayıttır ve Türkiye'nin Kuzeydoğu Anadolu (Iğdır) bölgesinden toplanmıştır. Şu ana kadar tanımlanan *Heterichnus* cinsine ait türlerin mevsimsel dağılımı, yayılışları bilgileri ve Türkiye'den türlerin ilk kaydı ve referans bilgileri sunulmuştur.

Anahtar kelimeler: Hymenoptera, Ichneumonidae, *Heterischnus,* Türkiye.

Heterischnus ridibundus (Costa, 1885) (Hymenoptera: Ichneumonidae: Ichneumoninae), a new record for the Eastern Anatolia, Türkiye

ABSTRACT

Heterischnus ridibundus (Costa, 1885), a new record for Eastern Anatolia, is collected from Northeastern Anatolia (Iğdır) in Türkiye. The species is figured and the species which of the genus *Heterichnus* identified so far, is presented seasonal composition, distributional information, the first record of the species from Türkiye and reference information.

Key words: Hymenoptera, Ichneumonidae, *Heterischnus,* Türkiye.

INTRODUCTION

Darwin wasps (Ichneumonidae) are among the most diverse and abundant parasitoids. Biologically, most ichneumonoids are primary parasitoids, with both solitary and gregarious endo- and ectoparasitoidism usually of Holometabola larvae, especially Lepidoptera (Polaszek and Vilhemsen, 2023). These insects play a crucial role in the functioning of agricultural ecosystems and maintaining the equilibrium in arthropod populations (LaSalle and Gauld, 1993). Their role as bioindicators of land-use and human impact is well known (Idris et al., 2014).

The subfamily Ichneumoninae is the second largest subfamily of Ichneumonidae, with 437 genera and with 4355 described species (Yu et al., 2016). They are usually large, conspicuously colored insects. They have a 5-sided areole, a dorsoventrally flattened abdomen, and a short or absent sternaulus. Another feature is that the clypeus is cut to expose the labium (Bernardo et al., 2021).

The genus *Heterischnus* Wesmael, 1859 is a genus of parasitoid wasps belonging to the subfamily Ichneumoninae. The species of this genus are found in Europe and Northern America. This genus is represented by 58 species in the world. Till 1995 (Kolarov, 1995), only 65 ichneumoninae species belonging to 27 genera have been documented. After 1995, with the below mentioned contributions (Özdemir, 1996; Kolarov et al., 1997; Yurtcan et al., 1999; Çoruh et al., 2002; Kolarov et al., 2002; Özbek et al., 2003; Çoruh et al., 2005; Kolarov, 2007; Çoruh and Özbek, 2008; Çoruh and Kesdek, 2008; Riedel, 2008; Gürbüz et al., 2008; Yurtcan and Okyar, 2008; Riedel et al., 2010; Çoruh et al., 2011; Eroğlu et al., 2011; Riedel et al., 2011; Çoruh et al., 2011;

Çoruh and Özbek, 2013; Çoruh et al., 2014; Kolarov et al. 2014a,b, Özdan, 2014; Çoruh, 2017; Riedel et al., 2018; Çoruh et al., 2019; Bulak Korkmaz and Çoruh, 2022; Çoruh et al., 2022; Doğru, 2022; İnecikliоğlu, 2022; Kaplan and Riedel, 2022) the numbers of Ichneumoninae fauna of Türkiye reached to 242 species and 61 genera.

The aim of this paper is to examine all the species in the genus *Heterischnus* Horstmann, and to give general information by figuring the *Heterischnus ridibundus* (Costa, 1885), new for the Eastern Anatolia region of Türkiye.

MATERIAL AND METHODS

Iğdır is a city in the easternmost point of Türkiye, close to the Armania, Nakhchivan Autonomous Republic and Iranian border and located at an altitude of 850 m. This study was carried out in apricot orchards in Iğdır Province (Figure 1).

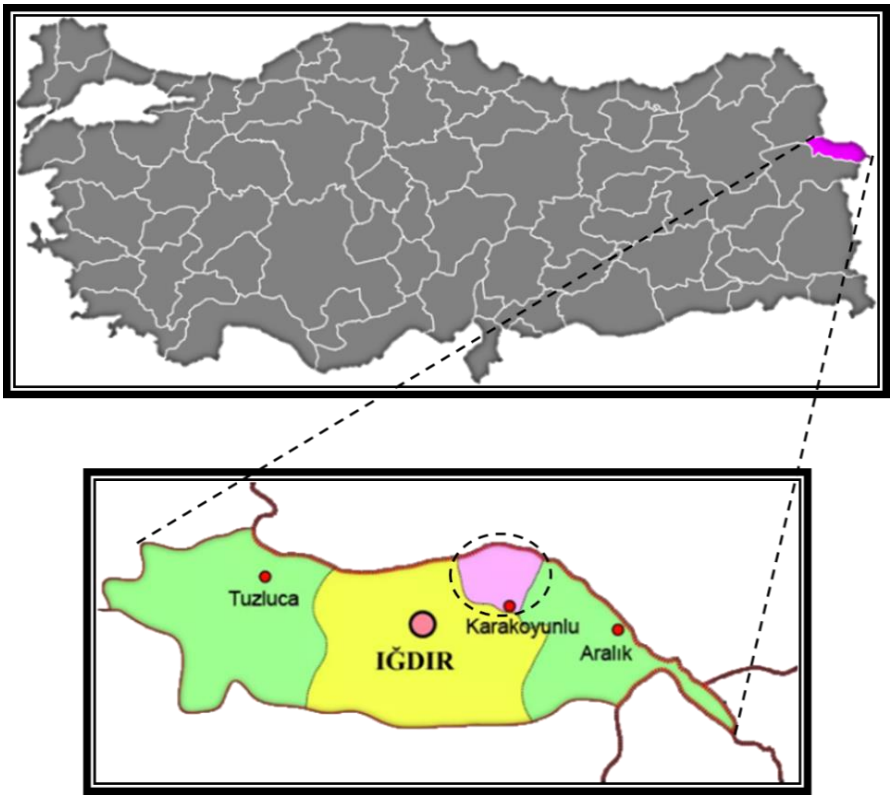


Figure 1. Location map of Iğdır Province

The example in this study was collected first week of October, Karakoyunlu district using the knocking (impact) method. This method, a branch from each of the trees was selected from four directions and at different heights, and each branch was hit three times with a stick, causing the insects on the branches to fall on the square-shaped Japanese umbrella.

The collected specimen was killed with ethyl acetate and prepared and labeled according to taxonomic rules and regulations. It is deposited in the Entomology Museum Erzurum, Türkiye (EMET). General distributions and associated plants of the species were taken from Yu et al. (2016).

RESULTS AND DISCUSSION

Subfamily: Ichneumoninae Latreille, 1802

Genus *Heterischnus* Wesmael, 1859

Heterischnus Wesmael, 1859: 83. Type species: *Ichneumon pulex* Müeller. Monotypic.

Rhexidermus Förster, 1869: 192. Type species: *Rhexidermus japonicus* Ashmead. Monotypy by inclusion in Ashmead (1906).

Posocentrus Provancher, 1875: 273. Type species: *Posocentrus huardi* Provancher. Monotypic.

Ischnopsidea Viereck, 1914: 77. Type species: *Ichneumon thoracicus* Gravenhorst. Monotypic and original designation.

Aethiopischnus Heinrich, 1938: 127. Type species: *Aethiopischnus olsoufieffi* Heinrich. Monotypic and original designation.

Heterischnus is easily recognized by the following characteristic features: unidentate, falciform mandible; epistomal suture distinct; basal flagellomeres slender and elongate; scutellum moderately narrow, convex, and distinctly elevated above metanotum; areolet of the fore wing is closed hind coxa simple; thyridium wide. 11 species belonging to *Heterischnus* have been identified in Türkiye so far.

Table 1. *Heterischnus* list of Türkiye

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

Names of Taxa	IN	VD	SD	GR	ZR	FRT
SUBFAMILY ICHNEUMONINAE LATREILLE, 1802						
GENUS *HETERISCHNUS* WESMAEL, 1859						
Heterischnus anomalus (Wesmael, 1857)	4	A, E, G	M, J, Jl, Aug	BSR, EAR	E, WP	Özbek et al., 2003
Heterischnus bicolorator (Aubert, 1965)	1	H	Jl	BSR	P	Riedel et al., 2018
Heterischnus coxator (Thomson, 1891)	1	H	Jl	BSR	E, WP	Riedel et al., 2018
Heterischnus excavatus (Constantineanu, 1959)	5	A, B	J	BSR	E, WP	Kolarov et al., 2014
Heterischnus filiformis (Gravenhorst, 1829)	1	F	M	EAR	E, WP	Riedel et al., 2018
Heterischnus nigricollis (Wesmael, 1845)	1	G	Aug	EAR	P	Riedel et al., 2018
Heterischnus pictipes (Kriechbaumer, 1894)	1	C	J	EAR	E, WP	Riedel et al., 2018
Heterischnus pulex (Müller, 1776)	1	C	J	EAR	E, WP	Riedel et al., 2018
Heterischnus ridibundus (Costa, 1885)	9	A,	M, Aug	BSR, MR	E, WP	Yurtcan et al., 1999
Heterischnus schachti Diller,1995	2	G	J	EAR	E, WP	Kolarov et al., 2014
Heterischnus truncator (Fabricius,1798)	20	A, B, D, H	J, Jl, Aug, N	BSR, EAR, MR, MtR	P	Kolarov, 1989

Vertical distribution (VD) (metre): A: 0-500 m, B: 501-750 m, C: 751-1000 m, D: 1001-1250 m, E: 1251- 1500 m, F: 1501-1750 m, G: 1751-2000 m, H: 2001-2500 m. Seasonal dynamics (SD): M: May, J: June, Jl: July, Aug: August, N: November. Geographical regions (GR): BSR: Black Sea Region, EAR: Eastern Anatolia Region, MR: Marmara Region, MtR: Mediterranean Region. Zoogeographical regions (ZR): E: Europe, P: Palaearctic, WP: Western Palaarctic.

Table 2. Provinces and references of collected species in Türkiye

Names of Taxa	Distributions in Türkiye	Reference (s)
SUBFAMILY ICHNEUMONINAE LATREILLE, 1802		
GENUS *HETERISCHNUS* WESMAEL, 1859		
Heterischnus anomalus (Wesmael, 1857)	Artvin, Erzurum, Trabzon	Özbek et al., 2003; Çoruh et al., 2014; Çoruh, 2017; Çoruh et al., 2019; Kolarov et al., 2020
Heterischnus bicolorator (Aubert, 1965)	Erzurum	Riedel et al., 2018
Heterischnus coxator (Thomson, 1891)	Rize	Riedel et al., 2018
Heterischnus excavatus (Constantineanu,1959)	Erzurum, Giresun, Rize	Kolarov et al., 2014; Çoruh et al., 2016; Çoruh, 2017
Heterischnus filiformis (Gravenhorst, 1829)	Bingöl, Kars	Riedel et al., 2018; Kaplan and Riedel, 2022
Heterischnus nigricollis (Wesmael, 1845)	Erzurum	Riedel et al., 2018
Heterischnus pictipes (Kriechbaumer, 1894)	Iğdır	Riedel et al., 2018
Heterischnus pulex (Müller, 1776)	Erzurum	Riedel et al., 2018; Kolarov et al., 2020
Heterischnus ridibundus (Costa, 1885)	Artvin, Edirne, Kırklareli, Tekirdağ	Yurtcan et al., 1999; Çoruh 2017; Riedel et al., 2018
Heterischnus schachti Diller,1995	Erzurum	Kolarov et al., 2014; Çoruh 2017
Heterischnus truncator (Fabricius,1798)	Çanakkale, Erzurum, Giresun, Isparta, İstanbul, Kırklareli, Rize, Trabzon, Tekirdağ	Kolarov, 1989; Kolarov 1995; Kolarov et al., 1997; Yurtcan et al., 1999; Özbek et al., 2003; Özdan 2014; Kolarov et al., 2014b; Çoruh et al., 2014; Çoruh et al., 2016; Çoruh et al., 2019; Özdan and Gürbüz 2019

***Heterischnus ridibundus* (Costa, 1885)**

Material examined: Iğdır: Karakoyunlu, Fatih, 39°58.856' N, 044°09.964' E, 844 m, 02.X.2013, 1 ♀, leg: Y. Bulak Korkmaz (Figure 2).

Remark: This species collected from *Prunus armeniaca* L.

Distribution: Algeria, Bulgaria, Czechoslovakia, France, France-main, Germany, Greece, Greece-main, Italy, Poland, Spain, Switzerland and Türkiye. In Türkiye known from Artvin, Edirne, Kırklareli and Tekirdağ provinces. With this study, Iğdır was added to the provinces where the species is distributed in Türkiye.

References from Türkiye Yurtcan et al., 1999 and Riedel et al., 2018.

Heterischnus Wesmael, 1859 a genus of the Ichneumoninae subfamily, evaluated in this study. Totally, 11 *Heterischnus* species (Table 1) have been recorded so far in Türkiye. Currently, the number of Ichneumoninae species is 242, and the number of Ichneumonidae species is 1442.

Heterischnus specimens were collected from different localities from Anatolia. In total, there are 46 specimens of eleven species belonging to genus *Heterischnus,* till now. When the species existing in Anatolia are analyzed, it is seen that, *Heterischnus truncator* (Fabricius) is the most abundant species, with 20 specimens. *Heterischnus bicolorator* (Aubert), *H. coxator* (Thomson, 1891), *H. filiformis* (Gravenhorst), *H. nigricollis* (Wesmael), *H. pictipes* (Kriechbaumer) and *H. pulex* (Müller) are collected as a single specimen in Anatolia. *Heterischnus ridibundus* (Costa), the subject of the study, which was represented by nine individuals until now, are reached 10 individuals with this present.

According to Table 1, While *H. truncator* collected from four different altitudes, *Heterischnus anomalus* collected from three altitude. Eight of the total species collected from a single altitude range. It is a fact the most species were from the range of 0-500 m. *H. ridibundus* has been collected from only one altitudinal range (0-500 m) so far, while the present species are collected from 844 m altitude.

Seasonal activities of insects are very important. The specimens the study was evaluated also in this respect. These species were generally collected May, June, July, August, and November months in general. However, June and July had more dense populations (Table 1). As seen in table 1, eight species collected in a single month. Nevertheless, *H. truncator,* collected in four different months in a year. It was observed that *H. truncator* has a very high adaptations different altitude and different climate conditions. While *Heterischnus*

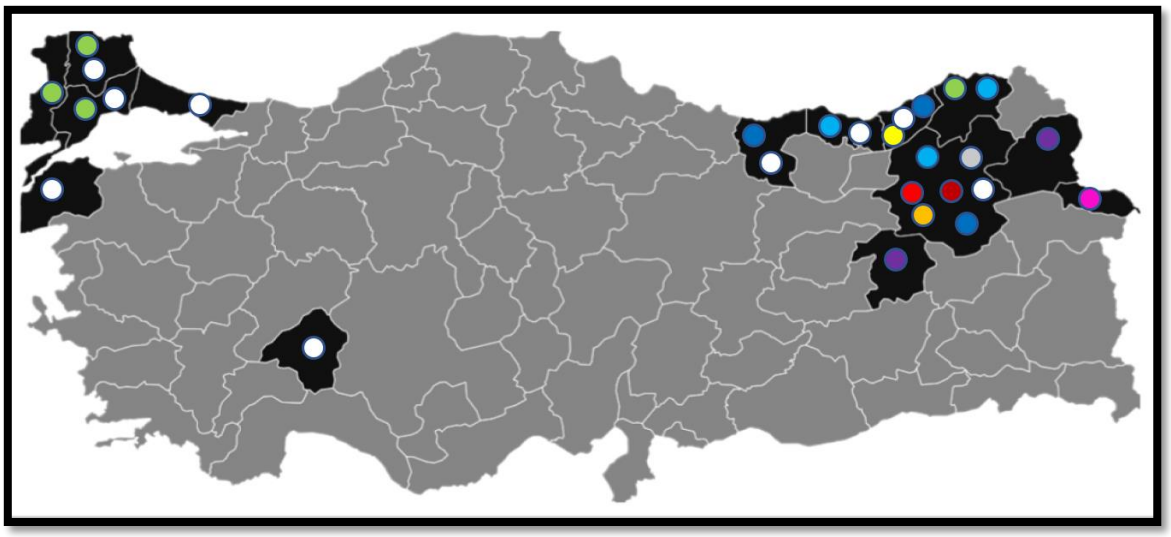
ridibundus was collected in May and August in previous studies, it was collected in October in this study. This is the first time the species sampled in October.

Figure 2. *Heterischnus ridibundus* (Original)

The research covers four geographic regions of Türkiye (Table 1 and Figure 1). When table 1 is detailed it becomes is clear that, *H. truncator* found also four different regions. While *H. ridibundus* collected from the Black Sea and Marmara regions in previous studies, in this study it collected from Eastern Anatolia. The species is a new record for all but two regions. The names of provinces where the samples collected are summarized in Table 2 (Figure 3).

The study material was also analyzed according to their distributions in the world. While all the species are found in the Western Palearctic and Europe, 3 species are found in Palaarctic region. *Heterischnus schachti* is currently only found in Türkiye and therefore the species is endemic. *H. ridibundus* is distributed in Algeria, Bulgaria, Czechoslovakia, France, Germany, Greece, Italy, Poland, Sardinia, Spain, Switzerlandand and Türkiye so far.

In conclusion, it can be said that every new faunistic data that will be found and recorded will help future studies and researchers dedicated to Ichneumonids.



Heterischnus anomalus (Wesmael, 1857)		*Heterischnus pictipes* (Kriechbaumer, 1894)	
Heterischnus bicolorator (Aubert, 1965)		*Heterischnus pulex* (Müller, 1776)	
Heterischnus coxator (Thomson, 1891)		*Heterischnus ridibundus* (Costa, 1885)	
Heterischnus excavates (Constantineanu, 1959)		*Heterischnus schachti* Diller, 1995	
Heterischnus filiformis (Gravenhorst, 1829)		*Heterischnus truncator* (Fabricius, 1798)	
Heterischnus nigricollis (Wesmael, 1845)			

Figure 3. Distribution of *Heterischnus* in Türkiye

Conflict of Interest Statement: The authors declare that they have no conflict of interest.

Contribution Rate Statement Summary of Researchers: The authors declare that they have contributed equally to the article.

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