

Article

Proctotrupeoidea (Hymenoptera) of Türkiye: New records and first checklist for Türkiye

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Abstract

This study is based on the material of the superfamily Proctotrupeoidea collected from Samsun province in the northern part of Türkiye from April to October 2022 and also on literature data. In addition to the six known species, *Helorus ruficornis* (Foerster, 1956), *Exallonyx crenicornis* (Nees, 1934), *Phaenoserphus viator* (Haliday, 1839) and genus *Phaenoserphus* Kieffer, 1908 were recorded for the first time from Türkiye. With this study, the second record of *Proctotrupes gravidator* (Linnaeus, 1758) from Samsun, previously only given from Denizli province, was confirmed. For each species, its chorotype was reported. This study also provided the first checklist of Türkiye for Proctotrupeoidea fauna.

Keywords Hymenoptera; Proctotrupeoidea; Heloridae; Proctotrupidae; new records; checklist.

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1 Introduction

The Proctotrupeoidea superfamily consists of eight families: Austronidae, Heloridae, Peleciniidae, Peradeniidae, Proctorenyxidae, Roproniidae, Vanhorniidae and Proctotrupidae. Apart from other small families with a few species, Proctotrupidae is the most speciose family (Huber, 2017). Only Heloridae and Proctotrupidae families are known members of this superfamily from Türkiye (Townes, 1977; Townes and Townes, 1981; van Achterberg, 2006; Can, 2022).

The Heloridae Foerster, 1856 is a small family which contains only one genus *Helorus* Latreille, 1802, and 18 valid species were described nearly worldwide. Larvae of chrysopid lace-wings (Neuroptera: Chrysopidae: Chrysopinae: *Chrysopa* species) are known hosts of the helorid family members (Can, 2022).

Proctotrupidae is a family of medium-sized parasitoid wasps, inhabiting all continents except Antarctica and preferring temperate and humid climates. Although species are mostly endoparasitoid of coleopteran larvae, some species attack centipedes, dipteran and lepidopteran larvae. In the world fauna, 30 genera and about 675 species are known (Izadzadeh et al., 2022).

In the Western Palearctic region, five species belonging to one genus of the Heloridae family (Can, 2022) and 60 species belonging to 15 genera from the Proctotrupidae family are known (Izadzadeh et al., 2016). Of these, two species from Heloridae (Townes, 1977; van Achterberg, 2006; Can, 2022) and four species from Proctotrupidae (Townes and Townes, 1981) are known in Türkiye. There is no compiled information about this superfamily in this country except for the Heloridae family prepared by Can (2022).

The aim of this research is to provide a species checklist for the Proctotrupoidea superfamily found in Türkiye, including new records of *Helorus ruficornis*, *Exallonyx cranicornis*, and *Phaenoserphus viator*.

2 Materials and Methods

Data presented in this study are based on literature and materials collected in the northern part of Türkiye during the spring and summer of 2022, using a malaise trap (Fig. 1). A few specimens were collected with a malaise trap from Samsun province. The collected specimens were kept in 75% ethanol, and then they were prepared as standard museum materials. The specimens were preserved in the Entomology Research Laboratory, Department of Biology, Tokat Gaziosmanpaşa University (Tokat, Türkiye). Identification of the specimens belonging to the Heloridae family was made according to the key in Izadzadeh et al. (2015), and the family Proctotrupidae according to Townes and Townes (1981). The photographs of the specimens were taken using a Leica M205C stereomicroscope controlled by the Leica Application Suite 3 software.



Fig. 1 Habitat of Samsun province where the specimens were collected.

3 Results

Superfamily **Proctotrupoidea**

Family **Heloridae** Förster, 1856

Genus **Helorus** Latreille, 1802

***Helorus ruficornis* Foerster, 1956** (Fig. 2)

Material examined: Samsun, Çarşamba, 41°12'43.2"N, 36°44'07.7"E, 22 m, 16.09 – 22.10.2022, 1 ♂.

Global distribution: Andorra, Austria, Bulgaria, England, Finland, France, Germany, Iran, Italy, Netherlands, Pakistan, Spain, South Africa, Sweden, Switzerland and U.S.A. (Townes, 1977; van Achterberg, 2006; Izadzadeh et al., 2015).

Remarks: This species is the first record for the fauna of Türkiye.



Fig. 2 *Helorus ruficornis*, lateral habitus of male.

Family **Proctotrupidae** Latreille, 1802

Subfamily **Proctotrupinae** Latreille, 1802

Tribe **Proctotrupini** Latreille, 1802

Genus *Exallonyx* Kieffer, 1904

Exallonyx crenicornis (Nees, 1934) (Fig. 3)

Material examined: Samsun, Çarşamba, 41°12'43.2"N, 36°44'07.7"E, 22 m, 03–16.09 2022, 1 ♀, 1 ♂.

Global Distribution: Austria, Czechia, England, France, Germany, Ireland, Italy, Norway, Scotland, Sweden (Townes and Townes, 1981).

Remarks: This species is the first record for the fauna of Türkiye.

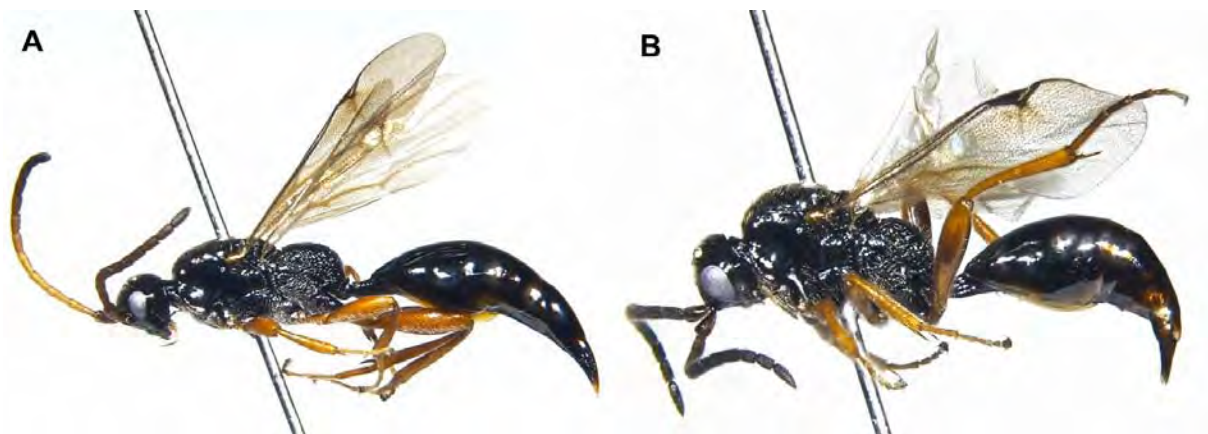


Fig. 3 *Exallonyx crenicornis*, A. lateral habitus of female, B. lateral habitus of male.

Genus *Phaenoserphus* Kieffer, 1908

Phaenoserphus viator (Haliday, 1839) (Fig. 4)

Material examined: Samsun, Çarşamba, 41°12'43.2"N, 36°44'07.7"E, 22 m, 03–16.09 2022, 9 ♂♂.

Global Distribution: Austria, Canada, Czechia, Denmark, England, Finland, France, Germany, Hungary,

Ireland, Italy, Japan, Russia, Spain, Sweden, Switzerland, U.S.A (Townes and Townes, 1981; Abuin and Lopez, 2016).

Remarks: This species is the first record for the fauna of Türkiye.



Fig. 4 *Phaenoserphus viator*, lateral habitus of male.

Genus *Proctotrupes* Latreille, 1796

Proctotrupes gravidator (Linnaeus, 1758) (Fig. 5)

Material examined: Samsun, Çarşamba, 41°12'43.2"N 36°44'07.7"E, 22 m, 15.07–19.08.2022, 1 ♀; 16.09 – 22.10.2022, 2 ♀♀, 3 ♂♂.

Global Distribution: Austria, Belgium, China, Croatia, Czechia, Denmark, England, Finland, France, Germany, Hungary, Iran, Ireland, Italy, Japan, Jordan, Mongolia, Netherlands, Poland, Romania, Russia, Scotland, Slovakia, Spain, Sweden, Türkiye, Ukraine (Izadzadeh et al., 2022).

Distribution in Türkiye: Denizli (Townes and Townes, 1981).

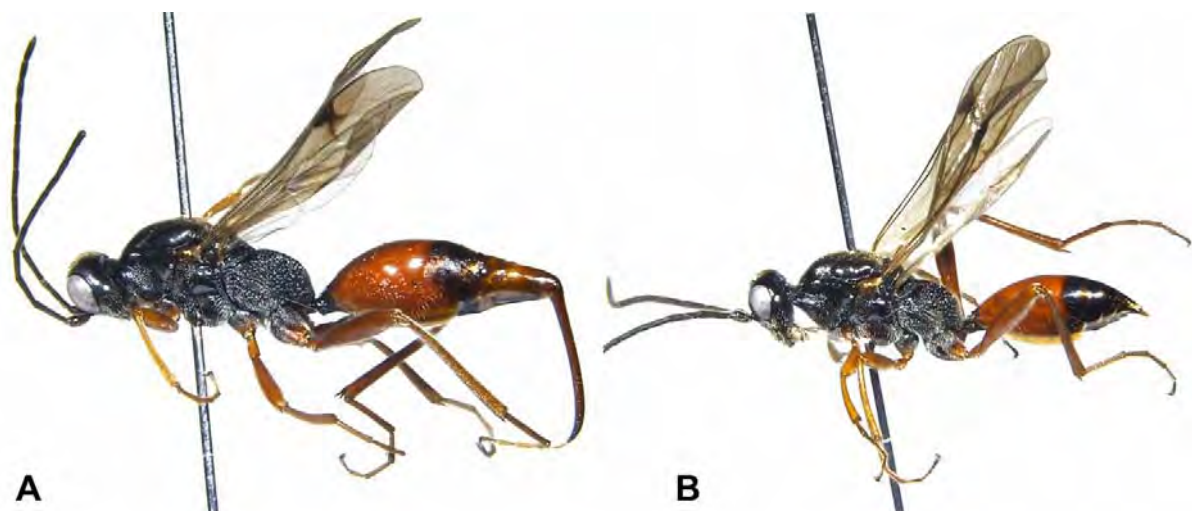


Fig. 5 *Proctotrupes gravidator*, A. lateral habitus of female, B. lateral habitus of male.

4 Discussion

In this study, four species were identified, of which *Helorus ruficornis* belonging to the Heloridae family, *Phaenoserphus viator* and *Exallonyx crenicornis* belonging to the Proctotrupidae family were reported for the first time from Türkiye. In addition, *Proctotrupes gravidator* was recorded for the first time from the Black Sea region together with Samsun province.

The distributions of the newly recorded species in the Palearctic region appear to be very wide, although scattered. The presence of these species in Türkiye was largely expected based on the previous distribution pattern. However, as with many other hymenopteran groups, they have not yet been registered in many countries, probably due to insufficient systematic or faunistic studies.

According to this study, the Türkiye fauna of Proctotrupeoidea is represented by a total of nine species that belong to five genera and two families (Table 1). This paper represents the first established checklist for Türkiye Proctotrupeoidea. From the biogeographical point of view, according to the categories presented by Taglianti et al. (1999), the chorotypes of the nine species listed in the Türkiye are the following: *Helorus anomalipes* (Holarctic); *H. ruficornis* (Holarctic); *H. striolatus* (Western palearctic); *Exallonyx certus* (Turano-Mediterranean); *E. crenicornis* (European); *E. striatus* (South West Anatolian Endemic); *Phaenoserphus viator* (Holarctic); *Phanoserphus calcar* (Palaeartic); *Proctotrupes gravidator* (Holarctic and Oriental part of China).

Total number of species is far from the estimated number of species to represent the superfamily. Compared to neighbouring countries such as Georgia (21 species) (Japoshvili and Ljubomirov, 2021; Japoshvili, 2022), Iran (28 species) (Izadzadeh et al., 2015, 2022) and Russia (twice that of Iran) (Kolyada, 2012), the nine species of Proctotrupeoidea that exist in Türkiye are still quite few. It is expected that the number of species will increase considerably if further and intensive faunistic studies are carried out in the future.

Table 1 Proctotrupeoidea species known in Türkiye.

Family	Species	Distribution in Türkiye	References
Heloridae	<i>Helorus anomalipes</i> (Panzer, 1798)	Ankara	Townes, 1977; Can, 2022
	<i>Helorus ruficornis</i> Foerster, 1956	Samsun	Current study
	<i>Helorus striolatus</i> Cameron, 1906	Bingöl, Kocaeli	van Achterberg, 2006; Can, 2022
Proctotrupidae	<i>Exallonyx certus</i> Townes, 1981	Bolu, Denizli	Townes & Townes, 1981
	<i>Exallonyx crenicornis</i> (Nees, 1934)	Samsun	Current study
	<i>Exallonyx striatus</i> Townes, 1981	İzmir	Townes & Townes, 1981
	<i>Phaenoserphus viator</i> (Haliday, 1839)	Samsun	Current study
	<i>Phanoserphus calcar</i> (Haliday, 1839)	Bolu	Townes & Townes, 1981
	<i>Proctotrupes gravidator</i> (Linnaeus, 1758)	Denizli, Samsun	Townes & Townes, 1981, Current study

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