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*Original article (Orijinal araştırma)*

# A rare and endemic species distributed in the Black Sea Region of Türkiye with first description of its female: *Agatharchus ponticus* Belousova, 1999 (Hemiptera: Heteroptera: Pentatomidae)

Türkiye'nin Karadeniz Bölgesi'nde yayılış gösteren nadir ve endemik bir tür ve dişinin ilk tanımı: *Agatharchus ponticus* Belousova, 1999 (Hemiptera: Heteroptera: Pentatomidae)

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## Abstract

During a study conducted in Amasya and Çorum Provinces of Türkiye between 2020-2021, the endemic species *Agatharchus ponticus* Belousova, 1999 (Hemiptera: Heteroptera: Pentatomidae) was recorded for the first time in the Black Sea Region. The female of the species, whose original description was based on a male specimen, is described here for the first time. In addition, new locality information has been added to the distribution area of the species, which have previously been known to be rare in Anatolia, and male and female genitalia with photographs are given to verify the identification of the species.

**Keywords:** *Agatharchus ponticus,* endemic, female description, Türkiye

## Öz

Amasya ve Çorum illerinde 2020-2021 yılları arasında yapılan çalışmada, endemik bir tür olan *Agatharchus ponticus* Belousova, 1999 (Hemiptera: Heteroptera: Pentatomidae), Karadeniz Bölgesi'nde ilk kez kaydedilmiştir. Tek erkek örneğe dayanılarak orijinal tanımı yapılmış olan türün dişisine ait ilk tanımlama bu çalışmada verilmiştir. Ayrıca daha önce Anadolu'da nadir olduğu bilinen türün yayılış alanına yeni lokalite bilgileri eklenmiş, erkek ve dişiye ait genital organ fotoğrafları verilerek türün ayırt edici karakterleri ortaya konmuştur.

**Anahtar sözcükler:** *Agatharchus ponticus,* endemik, dişi tanımı, Türkiye

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## Introduction

The suborder Heteroptera (Hemiptera) is currently known to be represented by more than 45,000 described species in more than 10 subfamilies globally, and more than 9,365 described species belonging to 1,632 genera are distributed in the Palaearctic Region (Aukema et al., 2013; Henry, 2017; Rider et al., 2018). The species of family Pentatomidae are known from all terrestrial biomes except Antarctica and it has 940 genera and 4,949 species belonging to 10 subfamilies (Rider et al., 2018). Pentatomidae is the third largest family of the suborder Heteroptera includes four subfamilies, 219 genera, 841 species and 19 subspecies in the Palaearctic and 61 genera and 174 species/subspecies in Türkiye (Henry, 2017; Fent & Dursun, 2022). However, Roca-Cusachs et al. (2021) reported that some tribes belonging to the subfamilies Podopinae and Pentatominae are not monophyletic. The recent studies in Türkiye revealed presence of 14 species from nine genera of Asopinae, 125 species from 39 genera of Pentatominae, one species from one genus of Phyllocephalinae and 34 species from 12 genera of Podopinae. Among these species, the type localities of 37 species, of which 15 are endemic, from 16 genera of Pentatomidae were given in Türkiye (Lodos et al., 1978, 1998; Önder et al., 1981, 1984, 2006; Lodos & Önder, 1983; Ahmad & Önder, 1990; Belousova, 1999; Fent & Aktaç, 1999; Tezcan & Önder, 1999, 2003; Awad, 2000; Awad & Pehlivan, 2001; Beyaz & Tezcan, 2002; Kıvan, 2004; Kıyak et al., 2004, 2019; Kment & Jindra, 2005; Özgen et al., 2005a,b; Bolu et al., 2006; Fent & Aktaç, 2007; Külekçi et al., 2009; Dursun & Fent, 2010, 2013, 2015, 2017, 2018; Fent, 2010; Fent et al., 2010; Matocq et al., 2014; Yazıcı et al., 2014; Çerçi & Koçak, 2017; Çerçi & Gözüaçık, 2019; Çerçi, 2021; Çerçi & Özgen, 2021; Fent & Dursun, 2022).

The Carpocorini Mulsant & Rey, 1866 one of largest tribes of family Pentatomidae are distributed worldwide and 120 species belonging to 29 genera have been identified in the Palaearctic Region and 39 species belonging to 16 genera in Türkiye (Aukema et al., 2013; Fent & Dursun, 2022). The genus *Agatharchus* Stål, 1876 belonging to tribe Carpocorini has two subgenera (*Agatharchus* s. str., and *Afghanotharchus* Belousova, 1999) and 12 species are currently recognized within the genus, all limited to the Palaearctic Region. *Agatharchus* s. str. contains eleven species and *Afghanotharchus* have a single species. A detailed study of the genus *Agatharchus* in Türkiye without *A. ponticus* was given by Awad (2000). Five species of the genus *Agatharchus* have been reported from Türkiye. Of these species, the type localities of *Agatharchus tritaenia* Horváth, 1897, *Agatharchus escalerae* Horváth, 1901 and *Agatharchus ponticus* Belousova, 1999 are located in Türkiye, the latter two species being endemic (Rider, 2006).

*Agatharchus ponticus* Belousova, 1999 was described from Erzurum-Pazaryolu (Belousova, 1999) based on a male specimen and since then, a male specimen was recorded in Elazığ-Haroğlu by Çerçi & Özgen (2021). One female, from Çorum is described below with the aim of presenting new information about *A. ponticus.*

## Material and Methods

The study material was collected between 2020-2021 under *Astragalus* sp. (Fabaceae) in provinces Amasya and Çorum. The male genitalia (pygophore, paramere and aedegus) were used for the species identification. For the preparation of genital organs, the sample was softened in hot water and the genitalia were extracted. Genitalia of male and female were examined using a Leica SZX stereoscopic microscope and body Canon 70D, ring flash, 69 mm. Macrotube, Canon 100 mm. IS USM 2.8L (Figures 1-12). Belousova (1999) and Çerçi & Özgen (2021) were followed in identification of the specimens. The material is deposited in the collection of Amasya University, Faculty of Science and Arts, Department of Biology. In addition, the localities where *A. ponticus* was detected in previous studies and in this study are shown on the map (Figure 13).

## Results and Discussion

**Pentatomidae Leach, 1815**

**Pentatominae Leach, 1815**

**Carpocorini Mulsant & Rey, 1866**

***Agatharchus* Stål, 1876**

***Agatharchus (Agatharchus) ponticus* Belousova, 1999**

Material examined. Amasya: Gümüşhacıköy-Maden, 40°52’14" N 35°12’50" E, 810 m, 7.IX.2021, 2♂♂, leg. A. Dursun; Çorum: Osmancık-Sarpunkavak, 40°56’47" N 34°41’47" E, 640 m, 19.X.2020, ♂, N. Akman; Yaylabaşı Bahçeler, 41°02’47" N 35°00’08" E, 1065 m, 8.III.2020, ♀, ♂, leg. N. Akman (det. A. Dursun and M. Fent).

Distribution in Türkiye. Erzurum-Pazaryolu (Belousova, 1999) and Elazığ-Haroğlu (Çerçi & Özgen 2021).

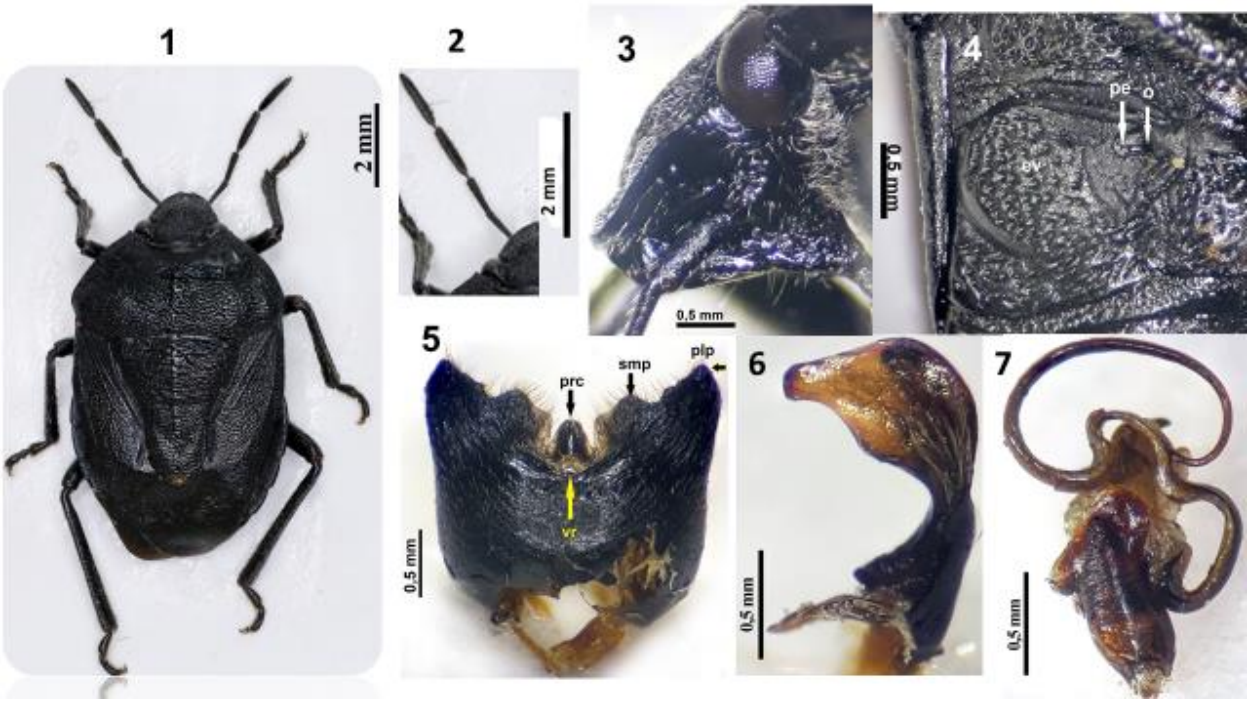
Distribution in Palaearctic Region. Türkiye (Rider, 2006).

Host plant. The specimens were collected under *Astragalus* sp. (Fabaceae).

Redescription of male (Figures 1-7). Surface of body black, rugose and punctures (Figure 1). Clypeus shorter than mandibular plates. Antennae black with short and long yellowish hairs. Lengths of antennomeres I-V (mm): 0.70, 1.0, 0.83, 1.08 and 1.25 (Figure 2). Labium blackish brown, with yellowish hairy and extends to metacoxa. Posterior edge of bucculae protrusive (Figure 3). Median of pronotum with intermittent yellowish carina. Pronotum posteriorly with transverse impression, sublaterally with roundish impression. Scutellum black, posterior area with yellowish callosity. Hemelytra, connexivum and abdominal dorsum black. Thoracic pleuron and sternum blackish brown, abdominal venter black with sparse, short, yellowish hairs. Peritreme of scent gland ostiole short and rounded apically, evaporatorium large, matte and rugose (Figure 4). Legs black, with short yellowish hairs, tibia with both short and sparse long hairs.

Pygophore black with yellowish hairs, the ventral rim (infolding) of pygophore is deeply incised medially, the rounded incision is limited by pair of submedial rectangular projections. Posterolateral projection of pygophore prominent, triangular in outline, distinctly projecting over the submedial projections (Figure 5). Basal plate large. Blade of paramere widely rounded dorsally, towards tip nearly straight; tip of paramere subquadrangular; ventral outline bisinuate. Outer surface of hypophysis with several setae (Figure 6). Apex of the ventro-lateral lobes of the conjunctiva narrowly hooked, vesica appearing as a rather long and curved (Figure 7).

Description of female (Figures 8-12). Surface of body black, rugose and punctured (Figure 8). Clypeus shorter than mandibular plates. Head with gray short hairs. Posterior part of head with yellowish callosity, lateral margins of anteocular part slightly upturned. Antennae black with short and long yellowish hairs. Lengths of antennomeres I-V (mm): 0.80, 1.15, 0.92, 1.28 and 1.22 (Figure 9). Labium blackish brown, labiomere II, yellowish brown with yellowish hairs and extending to metacoxae. Lengths of labiomeres I-IV (mm): 1.70, 1.90, 0.90 and 1.0. Bucculae yellowish brown with short yellowish hairs and posterior edge only slightly protrusive (Figure 10). Surface of pronotum, scutellum, clavus, corium and exocorium with very shallow black punctured. Pronotum medially with intermittent yellowish carina. Pronotal surface posteriorly with transverse impression and with one roundish impression sublaterally on each side. Pronotum with sparse, short gray hairs. Anterior and posterior parts of scutellum with yellowish callosity. Membrane blackish brown, abdominal dorsum black, connexivum blackish brown.




Figures 1-7. *Agatharchus ponticus* male: 1) Dorsal view; 2) Antennae; 3) Bucculae; 4) Evaporatorium surface; 5) Pygophore (ventral view); 6) Paramere; 7) Aedegus (ev: evaporatorium of metathoracic scent gland; o: ostiole; pe: peritreme; prc: proctiger of genital capsule; plp: posterolateral lobes of genital capsule; smp: submedial projection; vr: ventral rim).

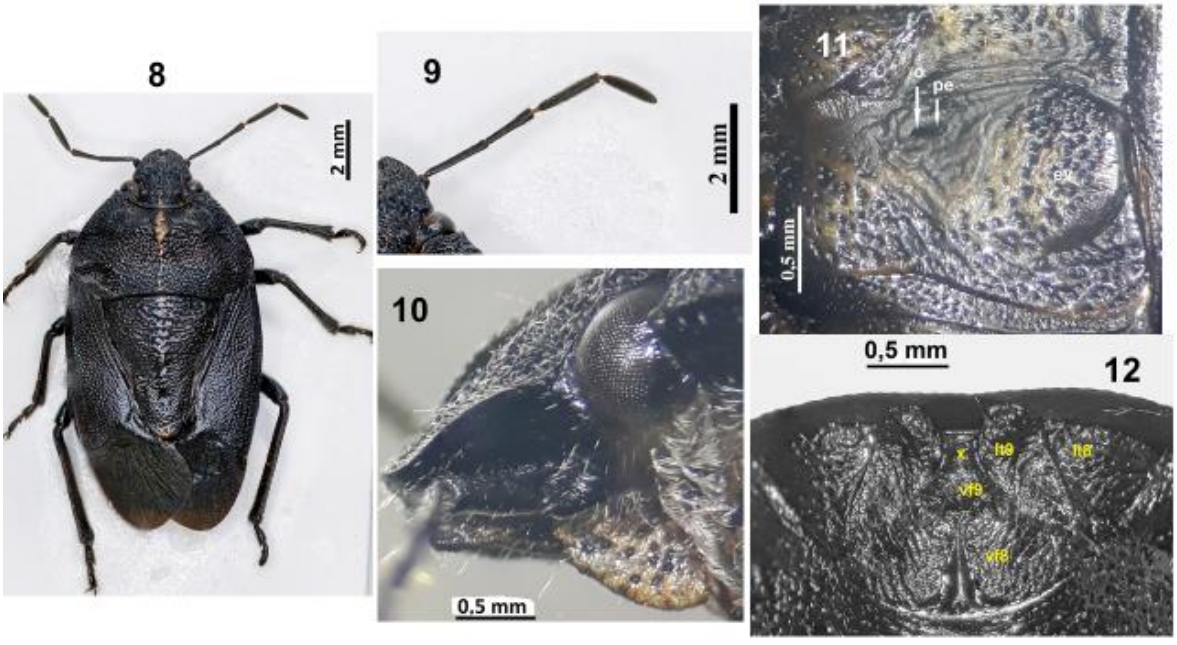
Thoracic pleuron and sternum and abdominal venter blackish brown with very shallow black punctures. Peritreme of scent gland ostiole short and rounded apically, evaporatorium large and folds with prominent, fold-like gyrification, laterally narrowed (Figure 11).

Legs blackish brown with yellowish hairs. Tibia black with yellowish and black hairs, inner surface densely covered with short spines. Tarsus blackish brown with dense hairs. Surface of laterotergites IX and valvifers VIII black, rugose with black hairs. Lateral and posterior margins of valvifers VIII convex, laterotergites IX in apical half parabolic, broadly rounded of external genitalia of female (Figure 12).

Measurements (mm). Total length 11. Length of head 3, width of head 2.9, intraocular width 1.5. Length of pronotum 2.8, width of pronotum 6. Length of scutellum 4.3 and width of scutellum 3.9.

The type locality as well as the second record of *Agatharchus ponticus* were given from the Eastern Anatolia Region from Türkiye (Belousova, 1999; Çerçi & Özgen, 2021).). In the present study, new faunistic record of *A. ponticus* from Black Sea Region are given and the previously unknown female is described. *Agatharchus ponticus* is a rarely distributed and endemic species in Anatolia. It is characterized by the second antennomere 1.2 times as long as the third and by clypeus shorter than mandibular plates in males. In the female, the clypeus is shorter than mandibular plates, but the second antennomere is 1.25 times longer than third. Evaporatorium of metathoracic scent gland of male and female are large, with large fold-like gyrification, laterally narrowed. As reported in the original description of the species based on a single male specimen (holotype) by Belousova (1999), there is no yellowish-white medial longitudinal stripe on pronotum and scutellum (dorsum entirely black). In the second male record of Çerçi & Özgen (2021) from Elazığ, on the other hand, the medial part of pronotum and scutellum bear a continuous yellowish-white stripe. Males reported in the present study lack the median stripe in accordance with Belousova (1999), while only a small yellowish-white callose spot is present apically on scutellum. In the female specimen, anterior half of pronotum bears a distinct pale median stripe (less distinct in posterior part) and scutellum

is both anteriorly and apically bearing yellowish-white callose spot (Figures 1 & 8). Morphological characters of pygophore are given for the first time in this study (Figure 5). The morphological characters of bucculae, vesica and parameres fit with the description of holotype by Belousova (1999).




Figures 8-12. *Agatharchus ponticus* female: 8) Dorsal view; 9) Antennae; 10) Bucculae; 11) Evaporatorium surface; 12) Genitalia. (ev: evaporatorium of metathoracic scent gland; lt8-9, laterotergites 8-9; o: ostiole; pe: peritreme; t8: tergite 8; vf 8-9: valvifers 8-9; x: segment X).

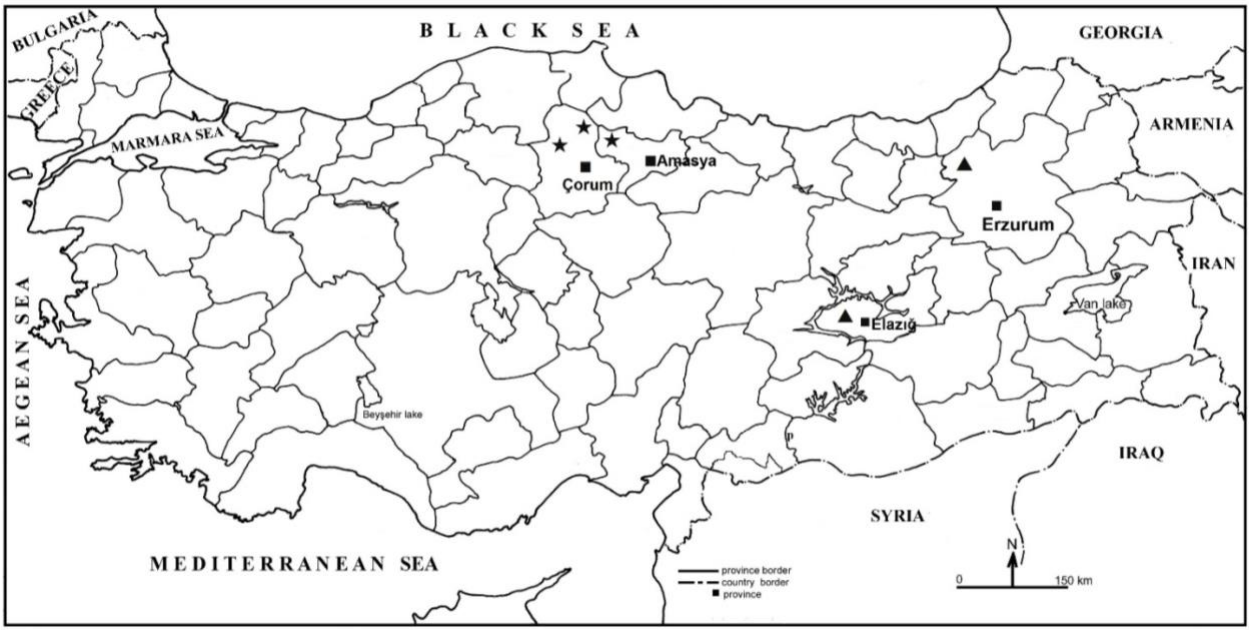



Figure 13. Distribution of *Agatharchus ponticus* in Türkiye (▲, records of previous studies; and ★, this study).

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