

## First Record of Sycamore Seed Bug *Belonochilus numenius* (Say, 1831) (Hemiptera: Heteroptera: Lygaeidae) in Turkey

Barış ÇERÇİ<sup>1\*</sup> Tandoğan ORUZ<sup>2</sup>

<sup>1</sup>Faculty of Medicine, Hacettepe University, Ankara, TURKEY

<sup>2</sup>Hürriyet Mahallesi, Güven Caddesi, 57/5, Tire/İzmir, TURKEY

\*Corresponding author, E-mail: [www.heteropteran99@gmail.com](mailto:www.heteropteran99@gmail.com)

**ABSTRACT:** Sycamore Seed Bug *Belonochilus numenius* (Say, 1831) is recorded from Izmir, for the first time in Turkey. This species is an invasive alien species in Europe and has been spreading there since its first record from France in 2008. In this paper, its current distribution in Europe and biology is summarized. Additionally, its habitus and that of similar species known from Turkey are illustrated.

**KEYWORDS:** *Belonochilus numenius* (Say, 1831), fist record, Heteroptera, Turkey.

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### INTRODUCTION

*Belonochilus numenius* (Say, 1831), commonly referred to as Sycamore Seed Bug is a Nearctic species of the subfamily Orsillinae (Lygaeidae). It is one of the many alien Heteroptera species recently introduced to Europe (Rabitsch, 2008; Davranoglou, 2011; Petrakis & Moulet, 2011; Baena & Torres, 2012, Lupoli et al., 2020). Since its first record in Spain in 2008, it has spread throughout most of the European countries, except northern ones. *Belonochilus numenius* is a seed bug living and feeding on different *Platanus* trees (Wheeler, 1984; Matocq, 2008; Srebrova et al.,

2019). A more detailed discussion on its distribution and biology is given below.

In recent years, many new alien Heteroptera species were recorded from Turkey, e.g. *Corythucha arcuata* (Say, 1831), *Corythucha ciliata* (Say, 1831), *Perillus bioculatus* (Fabricius, 1775), *Leptoglossus occidentalis* Heidemann, 1910, *Zelus renardii* (Kolenati, 1856), *Amphiareus obscuriceps* (Poppius, 1909), *Amphiareus constrictus* (Stål, 1860), *Halyomorpha halys* (Stål, 1855), *Campylomma miyamotoi* Yasunaga, 2001. Most of these alien species were first introduced in Europe and later

introduced to Turkey, most probably due to expansion of their distribution in Europe and subsequent arrival to Turkey (Mutun, 2003; 2009; Kivan, 2004; Arslangündoğdu & Hızal, 2010, Fent & Kment, 2011; Çerçi & Koçak, 2016; 2017; Çerçi et al., 2019).

## MATERIAL AND METHODS

The specimen of *Belonochilus numenius* examined in this paper was found in a sub-urban area, lying on the concrete pavement next to a building. More detailed information about collecting circumstances is given below. The habitus photographs were taken with a Nikon D3300 DSLR Camera combined with 68 mm extension tube and Lomo 3.7X microscope lens. The specimen examined is preserved in the private collection of the first author.

## RESULTS

### *Belonochilus numenius* (Say, 1831)

#### (Figure 1A)

Material examined: Turkey: İzmir, Selçuk, N 37°57'49.5" E 27°22'25.7", 25.11.2020, 1 female, T. Oruz leg., B. Çerçi det. & coll.

**Comments:** The collected specimen was first photographed and shared in the observation sharing platform iNaturalist (Oruz, 2020). It was found on the outside wall of a business store. The habitat around the building includes various palm, plane, fig, and olive trees, as well as orchards of peach. The surrounding suburban area has many orchards and gardens, rather than buildings. The most immediate tree to the specimen was a *Platanus* sp. The examination of the near trees did not offer any additional specimens.

This species was originally described from Pennsylvania, USA by Say (1831). It was later recorded from many states across United States, as well as Canada and Mexico in Northern America (Slater, 1964; Ashlock & Slater, 1988). Its discovery in Europe was first announced by Matocq (2008), from Corsica, France. However,

the earliest specimen of this species in Europe was recorded by Gessé et al. (2009), a male collected in 11.08.2008, from Barcelona, Spain. After its initial findings in Europe, it was quickly recorded from many European countries. It is now known from Albania, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czechia, France, Germany, Greece, Hungary, Italy, North Macedonia, Montenegro, Serbia, Slovakia, Slovenia, Spain and Switzerland (Matocq, 2008; Gessé et al., 2009; Kuchler & Strauß, 2010; Rabitsch et al., 2011; Hradil, 2011; Torma, 2012; Werner et al., 2013; Kment et al., 2013; Kment & Cunev, 2013; Werner, 2014; Gogala et al., 2016; Protić & Šeat, 2016; Kulijer & Miljevic, 2016; Rabitsch, 2018; Davranoglou & Koutsoukos, 2018; Srebrova et al., 2019; Martinović et al., 2019; Martinović, 2020; Aukema, 2020). It should be noted that it has not yet been recorded from any northern and eastern European countries. This new record from İzmir constitutes the first record of this species both from Turkey and Asian continent.

*Belonochilus numenius* is essentially associated with *Platanus* spp., although its nymphs were also occasionally collected from *Ambrosia trifida*, *Celtis occidentalis* and *Salix* sp. (Froeschner, 1944; Wheeler, 1984). Its lifecycle on *Platanus* was documented in detail by Wheeler (1984) and summarized followingly: The species survives winter in the eggs which are inserted singly between nutlets of the fallen fruit of the tree. Nymphs feed on these fallen fruits until they become adult in late May. Around this time, first generation adult females lay eggs on the new season fruits that are attached to the tree. Second and third generation of nymphs can be observed in June and August, respectively.

*Belonochilus numenius* (Fig. 1A) is similar to several species of the subfamily Orsillinae Stål, 1872 that are already known from Turkey. Especially species of the genus *Orsillus* Dallas, 1852 can be easily confused with *B. numenius* in the first view because of similarly elongated head

and flat and slender body shape. Species of *Orsillus* that are known from Turkey are *Orsillus reyi* Puton, 1871 (Fig. 1B), *Orsillus maculatus* (Fieber, 1861) (Fig. 1C) and *Orsillus depressus* Dallas, 1852 (Fig. 1D) (Önder et al., 2006). Although these three species are in overall morphology and coloration similar to *B. numenius*, latter is distinguished from them easily by the single tooth of the forefemur. *Orsillus* species always have more than one tooth on forefemur (Péricart, 1998). Some other morphological features of *B. numenius* such as slenderer body, more or less transparent hemelytra, lack of marmorated pattern of the corium, stronger and longer keel along the midline of scutellum can be useful in identification but these features can show variability among different populations. *Orsillodes longirostris* Puton, 1884 (Fig. 1E), a very rare species belonging to subfamily Rhyparochrominae Amyot & Serville, 1843 that has only been recorded from Turkey twice (Çerçi & Tezcan, 2020), may also be confused with this species in the first glance due to its elongated head and flat body. But after a thorough look, one can appreciate many obvious distinguishing features, including totally black scutellum and partially black head and pronotum, distinct punctuation of hemelytra, wide abdomen and distinctly expanded forefemurs.

## DISCUSSION

In recent years, many Heteroptera species have been recorded from Turkey for the first time. Among them, there are also several species which originally did not distribute in Western Palaearctic region but introduced here and established as invasive alien species. These species have the potential to pose a threat to native species and the ecosystem that they integrate into. They can also have a negative impact on the national economy if they damage economically important agricultural crops. Therefore, it is important to know the distribution of invasive alien species.

With this regard, the first record of *Belonochilus numenius* from Turkey is important as it shows that this species continues to spread in the Western Palaearctic region. Although this first record is important to create an awareness for further research, field surveys should be done in the future to demonstrate the expansion of this invasive species in Turkey.

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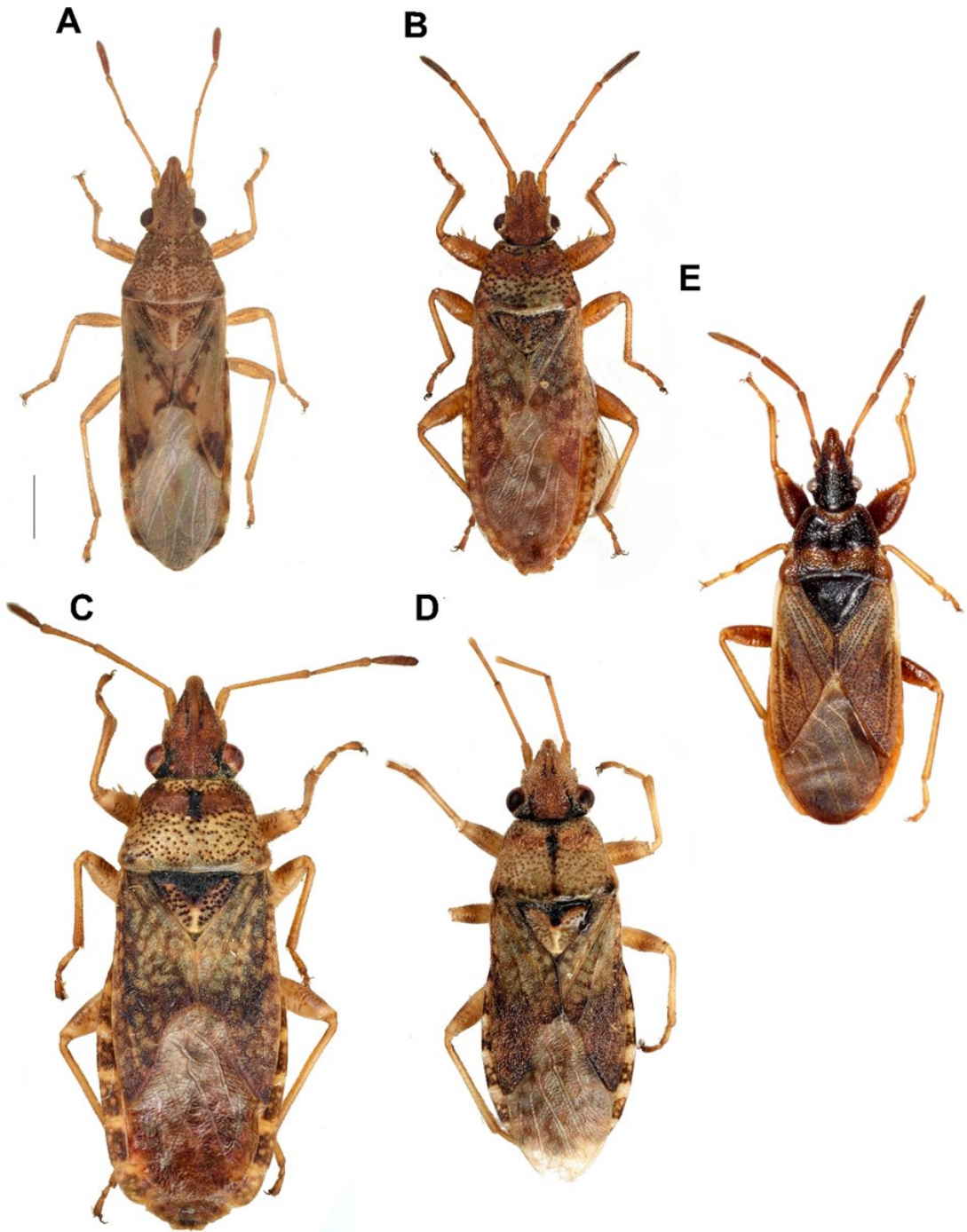
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**Figure 1A-E.** **A** – *Belonochilus numenius* (Say, 1831), female from İzmir, **B** – *Orsillus reyi* Puton, 1871, male from İstanbul, **C** – *Orsillus maculatus* (Fieber, 1861), female from İzmir, **D** – *Orsillus depressus* Dallas, 1852, female from Karaman, **E** – *Orsillodes longirostris* Puton, 1884, female from Antalya. Scale bar = 1 mm.