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FIRST RECORDS OF THE ALIEN SYCAMORE SEED BUG *BELONCHILUS NUMENIUS* IN SERBIA (HETEROPTERA: LYGAEIDAE)

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Abstract

The North American species *Belonochilus numenius* (Say, 1832) (Hemiptera: Heteroptera: Lygaeidae: Orsillinae) was first recorded in Europe in 2008, and is now present in most of the countries of Southern and Central Europe. The first specimen of *B. numenius* in Serbia was found in 2011 in Sremska Kamenica; it was later recorded in Zasavica, Mokrin and Novi Sad.

KEY WORDS: *Belonochilus numenius*, Hemiptera, invasive species, true bug

Introduction

The sycamore seed bug, *Belonochilus numenius* (Say, 1832) is a Nearctic invasive species with a continuously expanding range. Its native area of distribution is in Canada, the United States of America and Mexico (Slater, 1964; Wheeler, 1984; Ashlock & Slater, 1988; Maw *et al.*, 2000; Sweet, 2000).

In recent years, the species has continuously expanded its range in Europe and has been found in thirteen South and Central European countries, as well as on Madeira (Fig. 1) (Aukema *et al.*, 2013; Werner, 2014; Rabitsch & Heiss, 2015; Riba *et al.*, 2015; Gogala *et al.*, 2016).

Belonochilus numenius is a granivorous species and its primary hosts are trees of the genus *Platanus*, but it was also occasionally recorded on other deciduous trees in its native area (Wheeler, 1984). In Europe, individuals of *B. numenius* have been recorded exclusively on or near ornamental plane trees, mostly found in parks and tree allées, often on *Platanus* × *acerifolia* or London plane, which is a widely used hybrid in the

urban areas of Europe (Matocq, 2008; Gessé *et al.*, 2009; KÜchler & Strauß, 2010; Hradil, 2011; Rabitsch *et al.*, 2011; Torma 2012; Dusoulrier *et al.*, 2013; Kment & Cunev, 2013; KÜchler & Kehl, 2013; Rabitsch & Heiss, 2015; Riba *et al.*, 2015). The adults and nymphs of *B. numenius* have similar ecological needs; they spend most of their time feeding on plane seeds, rarely leaving globular fruits. In its native range, the species overwinters mostly in the egg stage on ripe fruits, but in the southern parts of the USA, adults may also survive winter hidden under the bark of plane trees. Wheeler (1984) investigated the biology of the species on populations from Pennsylvania, and the *B. numenius* in this area is multivoltine with 3-4 generations that overlap. The first generation of nymphs hatches in April-May, and the cycle of the last generation ends in September-October (Wheeler, 1984).



Figure 1. Distribution of *Belonochilus numenius* (Say) in Europe with the year of the first record in each country.

In most of the European countries where *B. numenius* is present, specimens are rarely noticed because they spend most of their lifetime on plane fruits, and this inconspicuous behavior, together with small population size, could adversely influence the recording of the species in new areas and countries. Thus far, there are no records of sycamore seed bug causing economic losses or aesthetically affecting urban plants (Steinmüller *et al.*, 2014; Sweet, 2000). Nonetheless, there are indications that *B. numenius* could become a serious urban pest. In July 2015, species outbreaks were recorded at a few locations in northeastern Spain, and reports of public nuisance have forced local authorities to treat urban greenery with insecticides. These incidents designated *B. numenius* as an urban pest for the first time (Riba *et al.*, 2015). How the species was introduced into Europe is still unclear, but there is certain probability that it was brought in with host plants and other goods, or by vehicles (Kment & Cunev, 2013; KÜchler & Strauß, 2010; Matocq, 2008; Rabitsch & Heiss, 2015). Also, Carapezza & Cusimano (2014) suggest that wind could play an important role in passive dispersion, and the species spread throughout the continent.

Results and Discussion

1. Sremska Kamenica [UTM DR00]

24.05.2011. Photo Dragiša Savić (Fig. 2), det. Jelena Šeat, confirmed by Petr Kment. The first specimen from Serbia was just photographed, and the photo is posted on the personal website of the author (www.naturefg.com).

2. Zasavica: Ravnje [UTM CQ87]

10.09.2011. 1m, leg. Mihajlo Stanković, det. Ljiljana Protić.

3. Mokrin [UTM DR58]

13.10.2012. Photo Ivan Pančić, det. Andrej Gogala. The specimen was not collected, only photographed, and the photo is posted in the gallery of online Alciphron database (Šeat, 2014).

4. Novi Sad [UTM DR01]

20.03.2013. 1m; 06.04.2013. 1m, leg. Marko Šćiban, det. Ljiljana Protić.

29.06.2014. 1m, leg. Radislav Mirić, det. Ljiljana Protić.

All specimens are stored at the Entomological Collection of the Natural History Museum in Belgrade.

According to records from Serbia and the description of the species' biology in its natural range (Wheeler, 1984), the adult individuals collected or photographed in Serbia may belong to at least two generations. The individuals recorded by Marko Šćiban in March and April may be overwintering adults surviving from the previous calendar year. The individual recorded by Radislav Mirić in June would be of the "first" generation, while the autumnal records by Mihajlo Stanković and Ivan Pančić would belong to the "second" generation. As the biology of European populations of *B. numenius* remains unstudied, our conclusions are based on Wheeler's research (1984) on native populations and should be taken with caution.

As *B. numenius* was recorded only individually, at this stage it is not causing any damage to plane trees. It is necessary to monitor the species for several years and record its abundance. The individuals spend most of their life cycle inside the plane tree fruits, and this hidden life may adversely influence its recording in new areas.

Belonochilus numenius can be easily distinguished from European *Orsillus* species by the host plants (the genus *Orsillus* is trophically linked to conifers) and also externally visible characters (Gessé *et al.*, 2009; Küchler & Strauß, 2010). Consequently, identification of the species by photos is often feasible, and photo-sharing websites and online databases could play an important role in the monitoring of *B. numenius* in Europe and Serbia.

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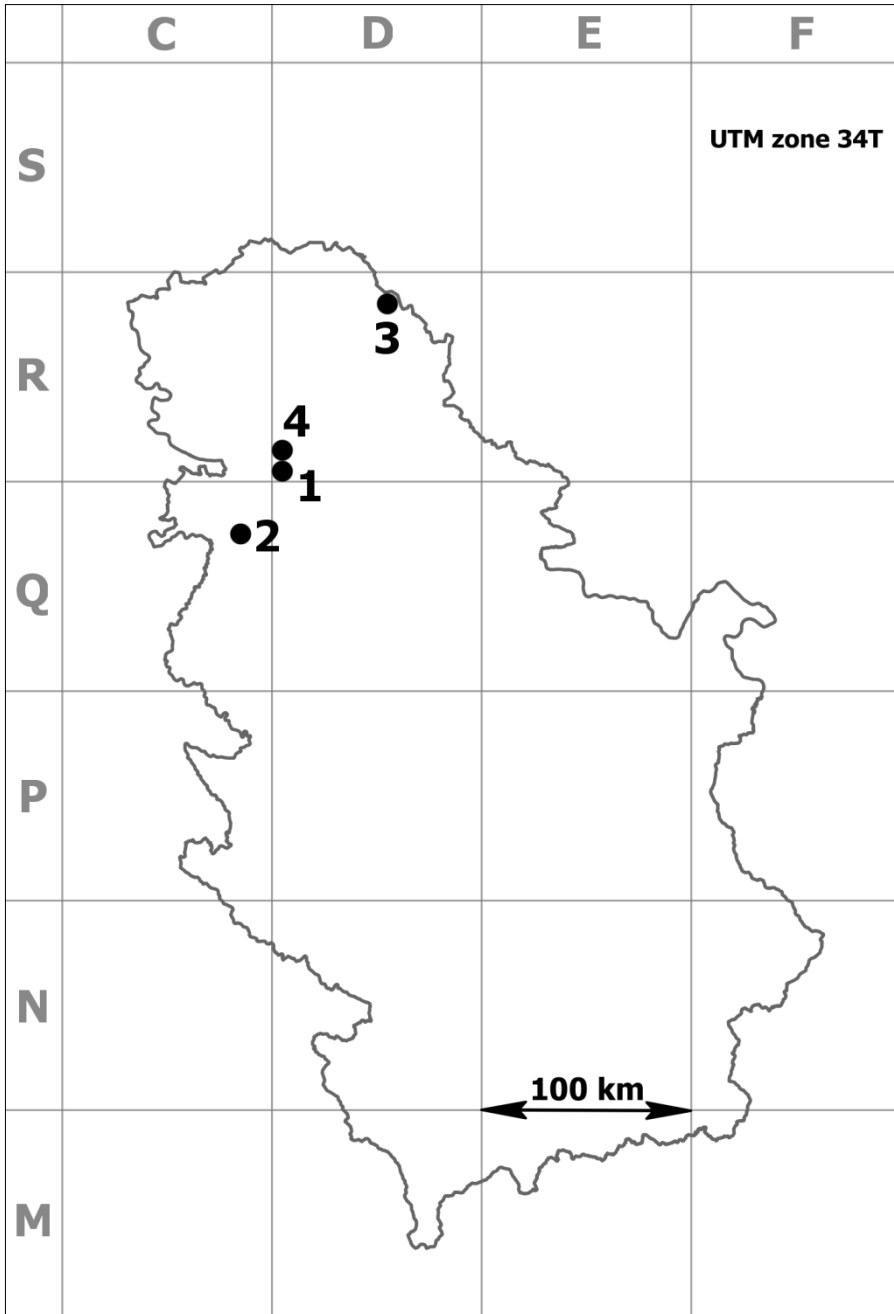


Figure 2. Records of *Belonochilus numenius* (Say) in Serbia (dots/codes indicate 10 x 10 km plots): 1 - Sremska Kamenica (DR00), 2 - Zasavica (CQ87), 3 - Mokrin (DR58), 4 - Novi Sad (DR01).



Figure 3. The first recorded specimen of *Belonochilus numenius* (Say) from Serbia (photo by Dragiša Savić).

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НАЛАЗИ АЛОХТОНЕ СТЕНИЦЕ *BELONCHILUS NUMENIUS* У СРБИЈИ

ЉИЉАНА ПРОТИЋ И ЈЕЛЕНА ШЕАТ

Извод

Неарктичка врста *Belonochilus numenius* (Say, 1832) 2008. године је први пут забележена на европском континенту и већ је регистрована у већини земаља Централне и Јужне Европе (Rabitsch & Heiss, 2015; Riba *et al.*, 2015; Werner, 2014). Домаћини врсте *B. numenius* су различите врсте и хибриди платана (род *Platanus*), на чијим лоптастим плодовима ове стенице проводе највећи део времена, хранећи се семенима. Присуство врсте *B. numenius* у Србији је потврђено на неколико локација (Сремска Каменица, Засавица, Мокрин, Нови Сад), а прве јединке су забележене 2011. године. На основу налаза из Србије и описа биологије врсте у нативном ареалу (Wheeler, 1984), адулти који су ухваћени или фотографисани у Србији могли би да припадају најмање два генерацијама. С обзиром на појединачне налазе, врста *B. numenius* у Србији за сада не представља опасност по урбано зеленило нити домаћинства.

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