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**Title:** *Nearctaphis bakeri* (Cowen, 1895) and *Illinoia liriodendri* (Monell, 1879) - two aphid species (Hemiptera: Aphididae) of alien origin new to the Polish fauna

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**Citation style:** Kanturski Mariusz, Mruk Karolina, Morawski Miłosz, Wojciechowski Waław, Depa Łukasz. (2017). *Nearctaphis bakeri* (Cowen, 1895) and *Illinoia liriodendri* (Monell, 1879) - two aphid species (Hemiptera: Aphididae) of alien origin new to the Polish fauna. "Rocznik Muzeum Górnośląskiego w Bytomiu. Entomologia" (Nr 26 (2017), s. 1-6).



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WOJCIECHOWSKI<sup>1</sup>, ŁUKASZ DEPA<sup>1\*</sup>

## *Nearctaphis bakeri* (COWEN, 1895) and *Illinoia liriodendri* (MONELL, 1879) – two aphid species (Hemiptera: Aphididae) of alien origin new to the Polish fauna

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**Abstract:** The paper presents data on the occurrence of two aphid species of North American origin in Poland: *Illinoia liriodendri* and *Nearctaphis bakeri*. First of them feeds on alien ornamental host plant – *Liriodendron tulipifera*, while the other is connected with clovers (*Trifolium* spp.) and other Fabaceae. Both were collected in 2015 in southern Poland and the possible means of their migration into territory of Poland are discussed.

**Key words:** migration, invasive species, America, Europe, pest, fauna.

### INTRODUCTION

Over the past century the intensification of transport and tourism increased the frequency of introduction of non-native insect species, which in many cases was followed by their successful establishment and further dispersion (KOLLÁR & BARTA 2016). The number of 102 alien aphid species is currently known to occur in Europe and many of them originate from Asia and North America (COEUR D'ACIER *et al.* 2010, RAKAUSKAS 2011). This constitutes about 6.4% of the total number of 1590 aphid species present in Europe (NIETO NAFRIA *et al.* 2013). In Poland, as many as 34 species of alien origin were earlier reported (WIECZOREK 2011) but this number changes, due to ongoing research and migration (HALAJ *et al.* 2016, WALCZAK *et al.* 2017).

Some of these species feed on alien and introduced, ornamental plants, and as such, are not a serious pest for agriculture or natural habitats, unless they switch to feed on native plants. Other, in case they are relatively oligophagous or may survive anholocyclically in unfavorable climate, may become threat for cultivated plants.

Here we present data on the first records of two alien aphid species in the fauna of Poland: *Illinoia liriodendri* and *Nearctaphis bakeri*, which raises to 38 the known number of aphid species of alien origin present in Poland

## MATERIAL AND METHODS

The collections took place during the ongoing studies on the aphid fauna in the southern regions of Poland: Gorlice in the Eastern Beskidy Mts. and in Bielsko-Biała at the northern foothills of the Western Beskidy Mts. (Western Carpathians). Both study sites are located near the important migration routes.

Bielsko-Biała is located near the Moravian Gate, which is a lowland between the Sudety Mts. and the Beskidy Mts. It constitutes a significant way for southern species to migrate north, and it also contributed to the establishment of the postglacial fauna north of Carpathian Mts. Gorlice, is located at the mouth of a few montane passes, aligned longitudinally, in the Eastern Beskidy, which are proven to be migration routes for xerophilic, Pannonian or even Mediterranean species.

Specimens of both species were collected during the detailed searching of their host plants in field, preserved in 70% ethanol and mounted on microscopic slide for determination. The slides are collected in the entomological collection of the Department of Zoology of the University of Silesia.

## RESULTS

### *Nearctaphis bakeri* (COWEN, 1895)

Collection site: Gorlice, town park; 49.656090 N, 21.166773 E; 12.06.2015, leg. K. Mruk; det. W. Wojciechowski; whitish-grey apterous viviparous female (Fig. 1) and a few larvae were collected from *Trifolium pratense*, on which they fed inside leaf sheaths.

### *Illinoia liriodendri* (MONELL, 1879)

Collection site: Bielsko-Biała; suburbs; 49.8301218 N, 19.0235113 E; 08.07.2015, leg. M. Morawski; det. Ł. Depa; a single alate female (Fig. 2.) and a few nymphs were collected from the underside of leaf of *Liriodendron tulipifera*.

## DISCUSSION

*Nearctaphis bakeri* is a species of North American origin but now it is widespread in Northern Hemisphere, including Europe, Turkey (GÖRÜR 2004), Central Asia, Middle East, North Africa, Japan (BLACKMAN & EASTOP 1984), India and Pakistan (HASSAN *et al.* 2010). This species was recorded in Slovakia, south of Poland, as early as in 1977 (GOFFOVÁ & WOJCIECHOWSKI 2013) and in glasshouse in Germany in 1989 (THIEME 1991). It is considered to be a serious pest on *Trifolium pratense* and other cultivated Fabaceae, able to transfer plant viruses e. g. soybean dwarf virus (SbDV) or yellow mosaic potyvirus (BYMV) (HAMPTON *et al.* 2005, HARRISON *et al.* 2005, SCHNEIDER *et al.* 2011).

*Illinoia liriodendri* is also native to North America and it is found on *Liriodendron tulipifera* but also records from *Magnolia* are known (FRANJEVIĆ *et al.* 2015). It was first time

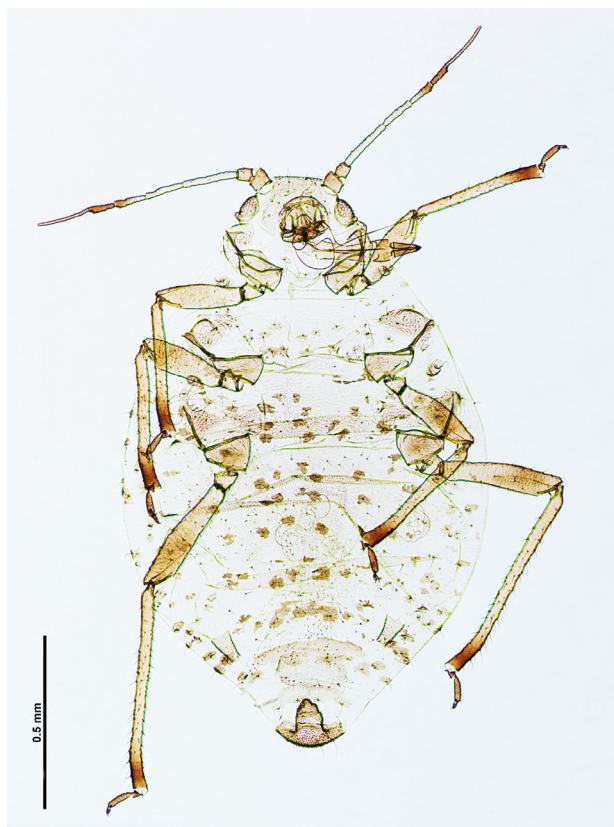


Fig. 1. The mounted specimen of the collected *N. bakeri*.

recorded in Europe in France in 1998 (RABASSE *et al.* 2005) and in a short time spread across most of Europe: Italy - 2001 (LIMONTA 2001); south-western and central Europe (BOZSIK 2012).

It is interesting, that both species were collected in southernmost part of Poland. *N. bakeri* was collected in close proximity of the so called Moravian Gate, which is a lowland between Carpathian Mts. and Sudety Mts. It is an established route of migration of southern species towards Poland. Also *N. bakeri* was found at the mouth of the Dukielska montane pass, which recently is proven to be also a migration route (TASZAKOWSKI 2012, 2015, TASZAKOWSKI *et al.* 2015). It is however uncertain, whether this sort of migration results from natural causes or is mediated by human activity. In case of *N. bakeri* we may suspect natural means of dispersion, because clovers are widely distributed natural component of central European plant associations and there exist little environmental barrier for their settlement. *I. liriodendri* on the contrary, it requires very specific plant species of alien origin, and may spread mostly through transportation of seedlings of *L. tulipifera*. And while *I. liriodendri* seems to be fairly harmless, *N. bakeri* may become a pest of cultivated clovers and other Fabaceae, so its occurrence in Poland may require further studies. What needs to be especially investigated is whether those species spread through natural dispersal abilities or through human transportation.



Fig. 2. The mounted specimen of the collected *I. liriodendri*.

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Fig. 3. Locations of collection sites and possible migration routes.

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Accepted: 3 June 2017; published: 22 June 2017

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