Rapid Communication

An overview of the first occurrences of *Rhodotypos scandens* in Austria

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Abstract

I give an overview of the first two records of black jetbead (*Rhodotypos scandens*) (Rosaceae, Magnoliopsida), a native of East Asia, in Austria. The species is locally established in a deciduous forest in the eastern lowlands of Austria c. 10 km north of Vienna. The population consists of c. 1,000–2,000 specimens distributed over an area of c. 2.5 ha. The composition of the invaded vegetation has been documented by three relevés. In addition, an escaped population of 17 young specimens of *Rhodotypos scandens* is recorded from Vienna. *Rhodotypos scandens* is widely naturalized in forests of the eastern USA, where it is considered to be invasive. Recently, in several Central European countries escaped populations of *Rhodotypos scandens* have been documented. Thus, the future spread of this species in Europe should be monitored.

Key words: alien flora, biological invasions, forests, horticulture, vascular plants

Introduction

The numbers of alien vascular plant species are increasing rapidly (Seebens et al. 2017), and horticulture is known to be the most important cause of this phenomenon (Hulme et al. 2018; van Kleunen et al. 2018). The distribution of alien species across habitats in the recipient regions is highly uneven (Kalusova et al. 2017). In contrast to the eastern USA, where deciduous forests have become rather heavily invaded (Albrecht 2001; USDA 2019), zonal temperate forests in Europe are known to exhibit relatively low levels of invasion (Chytrý et al. 2005, 2008). However, recently evidence has accumulated that the number of invasions of alien plants in European temperate forests is rapidly increasing (Essl et al. 2011, 2012). The invasion of alien species in these habitats is largely driven by introducing alien species for silviculture (Krivánek et al. 2006), by the spread of ornamental species from gardens and public spaces into adjacent forests (Essl et al. 2012), and it is further facilitated by climate warming (Walthéry et al. 2009). Not only do already introduced alien species spread further in forests, but also new alien species that have hitherto not been found are recorded. Here, I report and discuss the first records of such an addition to the alien flora of Austria: *Rhodotypos scandens*.
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Figure 1. *Rhodotypos scandens* at the site near Seyring: flower (A), cluster of four shiny black drupelets from the preceding year (B), details of a dense stand (C, D); 24th April 2019. Photos by F. Essl.

**Materials and methods**

The checklist of alien vascular plants of Austria has been published in the early 21st century (Essl and Rabitsch 2002); thereafter, many additions to the alien flora of Austria have been recorded, and an update of the Austrian checklist of alien plant species is underway (Essl et al. *in prep.*). During botanical field work in eastern Austria, a population of *Rhodotypos scandens* was recorded in May 2011; this record has been shortly mentioned in a list of additions to the alien flora of Austria (Stöhr et al. 2012). In 2019, this site was re-visited and data on population size was collected. The accompanying vegetation and invaded vegetation types were documented by three relevés using the Braun-Blanquet (1964) method. In addition, a population of 17 escaped specimens of the species has been recorded in Vienna.

**Results**

**Species description**

Black jetbead (*Rhodotypos scandens* (Thunb.) Makino, Rosaceae) is a shrub native to China, Korea and Japan that grows 2–3 m tall. Leaves are opposite, simple ovate-acute, 3–6 cm long and 2–4 cm broad with a serrated margin (Figure 1). The conspicuous flowers are white, 3–4 cm diameter; flowering in Austria is from mid-April to mid-May. The fruit is a cluster of 1–4 shiny black drupelets 5–8 mm diameter (Wu et al. 2003).
**Figure 2.** Location of the established population of *Rhodotypos scandens* near Seyring in eastern Austria, and a detailed map of its distribution in forest remnants.

**Records and population size**

The population of *Rhodotypos scandens* is located in forest remnants in an intensively used agricultural matrix 1.5 km northeast of Seyring in lower Austria c. 10 km north of Vienna (48°40′ 50″ N; 16°31′ 14″ E) (Figure 2). The population extends over an area of c. 2.5 ha. Population density varies from scattered individuals (≤ 1 ind./100 m²) to a dense cover (10–20 ind./100 m²) of *Rhodotypos scandens* in the understorey. Total population size was estimated at c. 1,000–2,000 specimens in April 2019. In addition, juvenile plants of *Rhodotypos scandens* were regularly found.

In May 2013, one young escaped specimen of *Rhodotypos scandens* was recorded near the entrance to the Department of Botany and Biodiversity Research of the University of Vienna at Rennweg 14, Vienna (48°11′ 43″ N; 16°23′ 01″ E). In 2019, this escaped population has grown to a total of 17 young specimens.

**Invaded vegetation types and accompanying vegetation**

The forest remnants invaded by *Rhodotypos scandens* at the site near Seyring are dry Pannonian lowland forests, which were originally dominated by oak species (*Quercus cerris, Q. robur*). However, forestry has strongly changed tree species composition and currently the tree layer is dominated by the alien *Robinia pseudoacacia* (Supplementary material Table S1), and other alien species (*Celtis australis*) and native Austrian trees that were introduced for silviculture (*Pinus nigra, P. sylvestris*) are further important components in the tree layer.
Discussion

To my knowledge, the populations reported here represent the first escaped occurrences of black jetbead in Austria. Previously, the species has been listed as “casual” for Vienna, but no locality had been provided (Fischer 2014). While one occurrence of *Rhodotypos scandens* reported here is rather small, the other population near Seyring in Lower Austria is locally established (see also Stöhr et al. 2012).

Currently, the species is missing from the alien vascular plant checklists of Slovakia (Medvecká et al. 2012), and Switzerland (Infoflora 2019). However, in some other Central European countries, a few escaped populations of *Rhodotypos scandens* were recently recorded. For the Czech Republic, Pyšek et al. (2012) list this species as an addition to the alien flora: “a locally naturalized population has been observed since the early 1990s in the Borůvky forest between Valtice and Břeclav, southern Moravia, where the species has spread and formed a vital population. The species was introduced to cultivation in the region probably in the 1920s”. Further, *Rhodotypos scandens* is locally established in Poland (Tokarska-Guzik et al. 2012, Tokarska-Guzik pers. comm.) as well as in Hungary, where several populations are known in hardwood gallery forests along the Danube river (Király et al. 2009, Király pers. comm.). In Germany, a few casual records have recently been made in the federal states Bavaria (Bayernflora 2019), Hessen and Sachsen-Anhalt (Floraweb 2019; Butler 2018). In Western Europe, few records of *Rhodotypos scandens* are known. In Belgium, it is a casual species that had been first recorded in 1947 (Verloove 2006). For the British Isles, no records have been reported so far (Clement and Foster 1994; BSBI 2019).

At the site near Seyring *Rhodotypos scandens* invades dry Pannonian lowland forest remnants which are dominated by *Robinia pseudoacacia*, a tree native to the USA which has become widespread in Europe. Lowland forests remnants in eastern Austria have been shown to be severely invaded by many alien plants (Essl et al. 2011, 2012), with many species most likely still spreading on the landscape scale. Given the dense population of *Rhodotypos scandens*, it is likely that adjacent—but currently not invaded—forest remnants are susceptible to future spread of the species. It is unknown how and when *Rhodotypos scandens* was introduced to this site. Possibly, specimens of the species had been planted for ornamental reasons, although no evidence for that could be detected during field work.

In the eastern USA, *Rhodotypos scandens* was introduced into the ornamental nursery trade in 1866. Currently, it is widely naturalized in 17 states mostly east of the Mississippi in forests, forest edges and at roadside banks (USDA 2019). Dense stands of black jetbead are assumed to suppress native herbaceous and shrub species and to compete with tree seedlings, and accordingly the species is listed as invasive in several US states (USDA 2019).
I conclude that given the invasive spread of *Rhodotypos scandens* in the temperate eastern USA, the future spread of this species in Europe should be monitored, and preventive measures should be taken to ensure that it will not become invasive in Europe as well.

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Supplementary material

The following supplementary material is available for this article:

**Table S1.** Phytosociological relevés of forest stands at the site near Seyring invaded by *Rhodotypos scandens*.

This material is available as part of online article from:
http://www.reabic.net/journals/bir/2019/Supplements/BIR_2019_Essl_Table_S1.xlsx