

Short note

Occurrence of *Viscum album* subsp. *album* L. on *Laburnum anagyroides* Medik. in Toruń, Poland

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Abstract. This short note presents two localities of the common mistletoe growing on the common laburnum found in central Poland in the city of Toruń in 2020. The common laburnum is one of the rare hosts of this recently rapidly spreading semi-parasite. The presented relationship between the two species has so far been reported in only several publications, mostly from the late 19th and early 20th century.

Keywords: common laburnum, European mistletoe, hosts of semi-parasite, monitoring, spread control, urban green space.

1. Introduction

So far, the occurrence of common mistletoe *Viscum album* L. on the common laburnum *Laburnum anagyroides* Medik. has not been observed in Poland. This species of shrub or small tree from the *Fabaceae* family, characterised by the exceptional beauty of its flowers, is not included on the list of 164 host taxa of mistletoe in Poland compiled by Bojarczuk 50 years ago (Bojarczuk, 1971), or the list of hosts presented in the comprehensive monograph “Biology and ecology of the European mistletoe (*Viscum album*, *Viscaceae*) in Poland” by Stypiński (1997) published 26 years ago. It is also not mentioned in any of the papers published in the last several years pertaining to the occurrence of mistletoe in large Polish cities, such as Szczecin (Ciaciura et al., 2006), Warsaw (Zachwatowicz et al., 2008) and Gdańsk (Chojnacki, 2019, 2020). The species is also missing from the comprehensive list of native and alien hosts of mistletoe observed in the Arboretum of the Polish Academy of Sciences in Kórnik (Bojarczuk, 1968, 1970; Tylkowski, 1982).

Throughout the entire range of mistletoe, the common laburnum has rarely been observed as its host. In the work “Hosts of *Viscum album*” by Barney, Hawksworth and Geils (1998), *Laburnum anagyroides* is listed among 452 taxa of trees and shrubs that are hosts of mistletoe, but only a few localities are mentioned. The above-mentioned list of hosts was based on a review of about 4,500 literature references pertaining to *Viscum album*, including about 630 papers focused mainly on the relationship between this semi-parasite and its hosts. Only nine of these papers, mostly published about 70–150 years ago, indicated *Laburnum anagyroides* as a host of mistletoe. According to these sources, such a relationship between mistletoe and laburnum was observed in Herefordshire in England (Bull, 1864) and in Switzerland (Coaz, 1918). The exact location in Switzerland – i.e. the town of Locarno in the canton of Ticino (Tessin) – was given by Tubeuf (1923) in “Monographie der Mistel” on page 316.

Recent works on the occurrence of mistletoe on *Laburnum anagyroides* include the paper by Buliř (2017)

who described the locality from an urban park in Lednice in the South Moravian Region of the Czech Republic after Spálavský's doctoral dissertation (2001). However, in his study on the occurrence of mistletoe in that park, Buliř (2017) does not confirm this earlier information. According to the aforementioned doctoral dissertation, mistletoe in the Lednice Park occurred on one of 13 specimens of *Laburnum anagyroides*, and on the only specimen of another species of laburnum – *Laburnum alpinum* (Mill.) Bercht. & J. Presl. The occurrence of mistletoe on *L. alpinum* at other sites was reported by i.a. Tubeuf (1923), Nagy & Stein (1989), Barney et al. (1998), and Idžojtić et al. (2006).

In view of scarce information on mistletoe infestation of *Laburnum anagyroides* and the lack of information on such a host–parasite relationship from Poland so far, as well as the rapid spread of mistletoe to new areas and infestation of new tree and shrub species observed in recent years, making the mistletoe infestation a transboundary problem (Chupakhina et al., 2020), we have prepared this short report on the mistletoe found on the common laburnum in Toruń in 2020. In this city, located in central Poland on the Vistula River with a population of about 200,000, mistletoe occurs very abundantly on dozens of tree species. Excessive growth of this semi-parasite made it necessary to remove it mechanically from trees and shrubs in the urban green

space around the Old Town. The mistletoe control was also carried out in some parks in the suburbs. Despite its abundant occurrence, little data have been published on the occurrence of *Viscum album* in Toruń. The paper by Nienartowicz (1998) reporting the occurrence of mistletoe on *Sorbus intermedia* Pers. in the central part of the city is one of the few publications.

According to Bugała (1991), the described host of mistletoe – *L. anagyroides*, like two other taxa of the genus, i.e. *L. alpinum* and *L. x watereri*, occurs in Southern Europe and Asia Minor. *L. anagyroides* is a shrub up to 4–5 m high; in favourable conditions it may reach the form of a small tree. In earlier studies by Polish authors (Alwin et al., 1955; Browicz & Bugała, 1965), heights of up to 7 m are estimated for *L. anagyroides*, 10 m for *L. alpinum*, but only under favourable conditions.

Common laburnum, as a planted ornamental species, is not very common in Toruń, unlike mistletoe. In the 1950s, it was found at nine sites in the city (Sienicka & Kownas, 1957). Only some of these sites have survived to this day and a few new sites have been found.

In Toruń, specimens of common laburnum infested by mistletoe occur at two sites. Their location in 1 x 1 km squares of the ATPOL grid (Zajac & Zajac, 2001) covering the entire city area is presented in Figure 1.

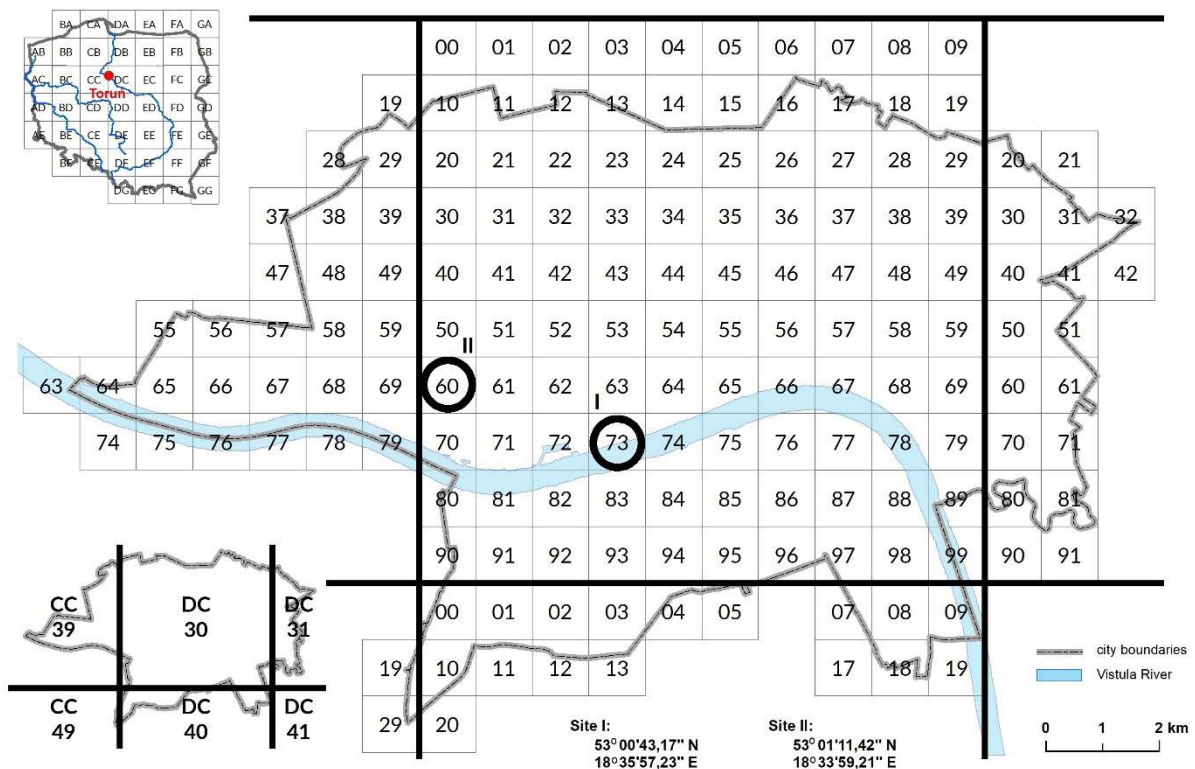


Figure 1. Localities of *L. anagyroides* infested by *Viscum album* in Toruń relative to the ATPOL grid squares (site I in square DC3073; site II in square DC3060)

2. Description of sites

Site I was found in autumn 2019 near the intersection of Wały gen. Sikorskiego and Solidarności streets. It is an urban green space created in the early 20th century north-west of the Old Town, on the site of demolished medieval defensive walls and later bastion fortifications. The square is located in the vicinity of the walking path surrounding the Centre of Contemporary Art to the west, approximately 60 m behind the monument of Pope John Paul II. Detailed observations made on 27 April 2021 revealed three clusters of *L. anagyroides* consisting of 13, 14 and 7 shoots up to 6–7 m high, growing close together at a distance of 1–2 m from each other. These are probably offshoots grown at the base of laburnum trees felled several decades ago. The diameter at breast height of the shoots ranges from 2.9 to 11.9 cm. In the cluster consisting of 13 laburnum shoots, *Viscum album* grows on three of them in the numbers of two, one and one specimens. No mistletoe specimens were found in the cluster of laburnum consisting of 14 shoots. In the cluster of five shoots, mistletoe grows on two shoots of laburnum – one clump on one shoot and two clumps on the other shoot. In the latter, least abundant cluster, the shoots of laburnum are accompanied by two young uninfested trees of *Acer platanoides* L., 4.7 and 5.7 cm thick, and a several-year-old seedling of *Acer pseudoplatanus* L.

The mistletoe specimens observed in all clusters grow at a height of 4.5–6.5 m. The diameter of the largest specimen,

bearing many fruits, was 95 cm and its stems consisted of nine internodes. The diameter of the other clumps was about 50–60 cm. Two old specimens of the Norway maple, *A. platanoides*, heavily infested by *Viscum album*, grow in a large square at a distance of about 40–50 m from the laburnum clusters.

Site II is located at a campus within a small square in front of the building at 5 Gagarina St, which houses the NCU Publishing House. A small tree of *Laburnum anagyroides*, about 4 m high and 7.3 cm in DBH, grows near the south-eastern edge of the building, with one specimen of mistletoe, about 40 cm in diameter, overhanging from a branch at the base of the tree crown. A young specimen of rowan *Sorbus aucuparia* L. with two small clumps of mistletoe grows 4 m from the laburnum, indicating the likely presence of birds feeding on quite abundant fruit, which may have contributed to the transmission of mistletoe to *Laburnum anagyroides*. In addition, one large, abundantly fruiting mistletoe shrub was found on a plum tree, *Prunus cerasifera* Ehrh. 'Woodii', which grows at a distance of several metres from the laburnum.

The observed specimen of mistletoe on the common laburnum consists of 6 internodes. After several years of fairly rapid and undisturbed growth, symptoms of shrub desiccation were observed. Under conditions of heatwaves in late June and mid-July 2021, the intense yellowing and falling off of mistletoe leaves and segments was observed.



Figure 2. *L. anagyroides* clusters with mistletoe at site I



Figure 3. *L. anagyroides* tree infected by *Viscum album* at site II

The presence of mistletoe on new hosts is associated with the extensive spread of the species in Toruń, as is the case in other cities of Poland and Europe. The abundance of mistletoe makes it necessary for the city authorities to seek effective ways of controlling this semi-parasite and at the same time to monitor changes in its expansion and spatial distribution. Information on new hosts of mistletoe recorded in recent years in the city of Toruń, as well as changes in its occurrence on already known rare hosts, and the effects of measures taken to reduce the spread of this semi-parasite will be presented in the next short report and scientific papers.

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