

***Polygonum graminifolium* Wierzb. in Slovakia and along the Hungarian-Slovak border on the Danube**

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Abstract: *Polygonum graminifolium* Wierzb. is a poorly known plant that has been overlooked by botanists for more than half a century and until recently had no current records in Hungary and Slovakia. The study examines the occurrence of the species along the Hungarian-Slovak border on the Danube. In addition to old literature and herbarium data, it presents the currently known occurrences. Some of these, including the Slovakian one, are new localities. It is a rare plant on the open gravel (or stony) surfaces of the riverbed, which have been dry for a long time. Other species are often absent in these habitats. Other species (in low numbers) are found mainly where some silt or sand has been deposited between the gravels or stones. *Polygonum graminifolium* may occur elsewhere along the Danube, but it is often difficult to find.

Keywords: floodplain, gravelly soil, pioneer vegetation, rare species.

Introduction

Polygonum graminifolium Wierzb. is a poorly known species. (Another species, *Polygonum graminifolium* Hoffm. ex Meisn. which is the synonym of *Persicaria acuminata* (Kunth) M. Gómez, is native to the Americas – World Plants Database). According to Jalas & Suominen (1979), *Polygonum graminifolium* Wierzb. is an endemic plant of the middle and lower part of the Danube. The species has been recorded in Hungary, Slovakia, Serbia and Romania (Akbroyd 1993; Grulich et al. 2016). Some of the old records are doubtful, only those with herbarium specimens

can be considered as confirmed, especially if the locality is far from the Danube. Austrian data is doubtful (Fischer et al. 2008).

In Hungary, the majority of herbarium specimens were collected in Budapest. The last specimen was recorded here in 1935. On the section of the Danube above Budapest, known only from Komárom and Vác. It was more common south of Budapest to Dunaújváros and a lot of data were collected in the first half of the 20th century. Further down the Danube, only one occurrence is known (Dunaszekcső). Later, this species disappeared from botanists' sight for decades. Only recently has been rediscovered. It has been found in Budapest (Pintér & Bajor 2019), in Kisorozsi (Pintér in Molnár et al. 2019) and in several places along the Danube from Komárom to Baracs (first observation in 2015) (Riezing 2020).

Szujkó-Lacza & Kováts (1993) referring to herbarium specimens (stored in BP) reported from the sand steppes of the Duna-Tisza köze from the vicinity of Csévharaszt and Fülöpszállás, but these plants are not *Polygonum graminifolium*. Literature also mentions it from the margin of the Transdanubian mountains (Bodajk), near Lake Balaton (Siófok), and from the southern part of the Tiszántúl (Vésztő) (Soó 1970), but these are probably erroneous. Data from Szeged (Soó 1970) require confirmation.

In Serbia, until the first half of the last century, it was collected along the Danube (Novi Sad, Beograd, Stara Palanka) and the Tisza (near Zrenjanin, close to the Danube). It was not found after the 1930s until today. It is currently known only from one locality (Dragan Obradov in litt.).

In Romania, only old specimens are known. Most of the data come from the vicinity of the locus classicus site (Bazias) and its surroundings (between Bazias and Moldova Veche). Along the Danube, it is also known from the Iron Gate Gorge (Svinita), Calafat and the lowest part of the river (Dobrodgea, Danube delta). Old data also from the Mures River (Săvulescu 1952; Oprea 2005). The data from Satu Mare county (Karácsonyi 1995) are doubtful.

The first mention of the species in the study area comes from Gáyer (1916) from the historical Komárom county. He wrote: „*Komárom, a vasúti rakodónál*” (Komárom, at the railway loading dock). Unfortunately, we do not know which side of the Danube was meant by this name. At this time, the current Hungarian side was already attached to Komárom town but was still mostly referred to as Komárom-Újváros. Although the railway was built on both sides of the Danube by the beginning of the 20th century, the industrial estate was in the southern (today's Hungarian) part, so the "railway loading dock" probably refers to this side (Riezing 2020). The first data definitely from Slovakia comes from the herbarium of Károly Lyka: „*Kováčspatak 1916.07.13.*” (BP) – Kováčov, near Štúrovo. Skřivánek later collected it near Štúrovo in 1934 (Grulich et al. 2016) and Šourek near Kováčov in 1950 (Chrtěk 1963). Despite of the relatively frequent surveys related to ephemeral vegetation around this section of the Danube (Dítětová et al. 2016; Melečková et al. 2016; Dítě & Dítě 2019), the species was not confirmed in the recent years. In connection with

its new record from Slovakia, the paper presents the known occurrences along the Hungarian-Slovak border.

Material and Methods

The study was carried out between 2019 and 2022, during periods of persistent low water levels in the Danube, late summer and autumn. In Hungary, I studied the section between Gönyű and Esztergom (more than 70 km long), and in Slovakia, the area of Komárno. I selected the sites to be surveyed based on my previous field experience, aerial photographs and on-site observation of the coastline through binoculars. The acronym "BP" in the citations refers to the herbarium of the Hungarian Natural History Museum in Budapest. Plant names follow Király (2009). Herbarium specimens are in the author's herbarium (it will be deposited in BP).

Results and Discussion

Polygonum graminifolium has some recent data from the Hungarian side of the Danube: Komárom (Szőny), near the boat station and Almásfüzitő, Prépost Island (Riezing 2020). I assumed that the plant could also be found on the Slovak side of the Danube. After a few years of surveying in Slovakia I finally found the species under the railway bridge west of Komárno in August 2022. A total of 23 specimens were found scattered around (N 47.75859° E 18.08705°). I also found the species at Komárom on the section between the Monostori Bridge and the Erzsébet Bridge (from N 47.75454° E 18.08386° to N 47.75060° E 18.10972°). This is the largest known population in Hungary. I counted more than 1570 individuals in 2022. Most of the plants are near the railway station (maybe this is the place Gáyer (1916) wrote about?). These are the westernmost known occurrences of the species. Later (in October 2022) I observed the species along the shore of Prímás Island in Esztergom. Not far from here, Daniel and Zuzana Dítě also discovered some plants on the Danube bank below the Esztergom Basilica (Dítě Z. in litt.). The distribution (old and recent data) of *Polygonum graminifolium* in the study area is shown in Fig. 1.

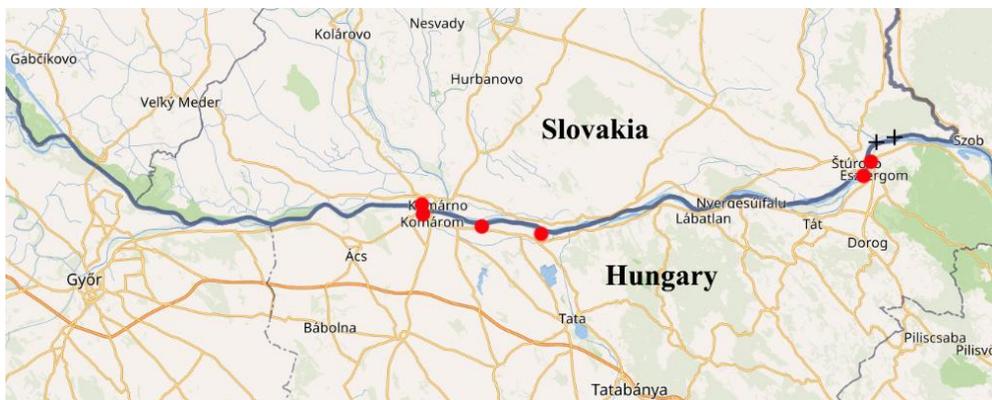


Fig. 1 Distribution of *Polygonum graminifolium* Wierzb. in the study area (red dots: recent localities, „+”: historical localities).

Polygonum graminifolium grew on coarse gravelly, gravelly-sandy or gravelly-stony surfaces in the riverbed, which has been dry for a long time (Fig. 2.). Soó (1970) and Grulich et al. (2016) also mention from muddy soil, but on soils with finer texture and muddy habitats, it was not seen. In Komárom, plants can also be found in habitats where silt has been deposited between the stones. In Slovakia, at the Komárno site, plants grow on gravel soil scattered with stones and concrete rubble on the higher part of the Danube floodplain (Fig. 3.). Degen also reports from the gaps in the stone blocks (Degen 1921 BP). On these dry, bare surfaces, no other plants often appear; or they are scattered and isolated (Riezing 2020). Soó (1970) mentioned the dry weed communities as a type of habitat, and later Hungarian literature wrote about roadside weed communities (Simon 2000) and trampled grasslands (Király 2009). This is probably a misunderstanding of the term „ruderalis” in some of the herbarium labels, which refer to floodplain weed communities.

The following species have been previously found in the habitat of *Polygonum graminifolium*: *Rorippa sylvestris* (L.) Besser (most often), *Portulaca oleracea* L. (often), *Chenopodium rubrum* L., *Cyperus fuscus* L., *Dichostylis micheliana* (L.) Nees, *Echinochloa crus-galli* (L.) P. Beauv., *Persicaria dubia* (Stein) Fourr., *Polygonum aviculare* L., and tiny willow seedlings (Riezing 2020).

In Komárom, there are mostly no other plants in the habitat of *Polygonum graminifolium*. Other species were recorded mainly where some silt or sand has been deposited between the stones: *Chenopodium glaucum* L. (locally common), *Persicaria dubia* and *P. lapathifolia* (L.) Delarbre (uncommon), *Amaranthus* sp. (seedling), *Bidens frondosa* L., *Butomus umbellatus* L. (seedling), *Carex* sp., *Chenopodium album* L., *C. rubrum*, *Cirsium arvense* (L.) Scop. (seedling), *Cyperus fuscus* (on muddy soil patches), *Digitaria sanguinalis* (L.) Scop., *Lycopus europaeus* L., *Plantago altissima* L., *Polygonum arenastrum* Boreau, *P. aviculare*, *Populus* × *euramericana* (seedlings), *Portulaca oleracea*, *Ranunculus sceleratus* L. (seedling), *Rorippa sylvestris*, *Rumex* sp. (seedling), *Salix alba* L. and *S. purpurea* L. (seedlings). Most of these species had only one or very few individuals.



Fig. 2 Typical habitat of *Polygonum graminifolium*, Komárom (Hungary).



Fig. 3 *Polygonum graminifolium* in Slovakia, Komárno.

In the Slovakian site (Komárno), the following species were found together with *Polygonum graminifolium* or in its surroundings: *Carex* sp., *Chenopodium rubrum*, *Dichostylis micheliana*, *Digitaria sanguinalis*, *Juncus compressus* Jacq., *Persicaria dubia*, *Plantago altissima*, *Polygonum aviculare*, *Portulaca oleracea*, *Rorippa sylvestris*.

Polygonum graminifolium may occur elsewhere along the Danube, but it is often difficult to find. It is not common, often appears in small numbers and is difficult to predict where to search. Based on our current knowledge, it is worth exploring the stony and gravelly riverbed that has been dry for a long time. In these places, no other plants are usually found.

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