

New data on the chorology of some little known adventive species on the banks of the Danube River in Bulgaria

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Abstract: Some little known adventive species are presented in this paper. Most of them were discovered in the last decade for the flora of Bulgaria. They originate in North America and are currently considered to be well-established, or even invasive in Western and Central Europe. Recently the species have been extending their distribution into Eastern Europe.

Key words: adventive species, chorology, Danube River, ecology

Introduction

The research was carried out from 1999 to 2002, within the framework of the PhD thesis of the first author, and in 2003 as part of the Czech-Bulgarian project devoted to vegetation diversity of Bulgarian wetlands. All reference specimens are deposited in the herbaria of Sofia University (SO) and the Institute of Botany, Bulgarian Academy of Science (SOM). There were also phytosociological relevés recorded on some localities of the adventive species. However, these were primarily concentrated on stands of *Isoëto-Nanojuncetea* and *Bidentetetea* communities and will be published in other papers.

Results

List of the species

Ambrosia artemisiifolia L.

Danubian Plain: in a sand quarry on the bank of the Danube River, near Cherkovitzta village, with

flowers and fruits, 10.08.2003, LJ-24, SC (RTz), SOM 58882.

Dimitrov & Tzonev (2002) and Vladimirov (2003) have summarized the distribution of this species in Bulgaria. According to these authors, the distribution of *A. artemisiifolia* in Bulgaria includes the Danubian Plain (the towns of Mizia and Pleven, and the villages of Bozhouritsa and Rouptsi, Pleven district), Western Forebalkan (Soumer village, Montana district), and the Sofia region (the city of Sofia). The finds along the Danube River indicate that it has probably penetrated into Bulgaria with shipping. At this locality, the species is a dominant in a ruderal community.

Chenopodium ambrosioides L.

Danubian Plain: on the bank of the Danube River, near Dragash Voivoda village, Nikopol district, with flowers and fruits, 3.10.2000, LJ-34, SC (RTz), SO 100682.

Since 2000 the species has been found in the region near Cherkovitsa (LJ-24), Dubovan, Zagrazhden

and Goulyantsi (LJ-04), and Belene (LJ-43). Javashoff (1890) mentioned this species from sandy places in the Varna district, but it has not been confirmed for a long time. In the 20th century it was found by Cheshmedzhiev (1988) in the Vidin district, along the Danube River. The species probably also occurs in other areas along the Bulgarian bank of the Danube River.

***Echinocystis lobata* (Michx.) Torr.**

Danubian Plain: on the bank of the Danube River, near Somovit village, 19.09.2000, with flowers and fruits, LJ-33, SC (RTz), SO 101144.

The species was found for the first time in Bulgaria by Koceva & Dimitrov (1997) near the town of Svishtov. During field work, it was observed in many places on the bank of the Danube River. The plant competes in relations with *Bryonia alba* L., because these two species inhabit in very similar habitats. *B. alba* was not confirmed on the Danubian islands, although Stojanov (1948) reported it to be frequent on the islands near Belene town. *E. lobata* probably occurs along the entire course of the Danube (it is also seen near the towns of Nikopol and Belene) and should be considered invasive in the region.

***Lindernia dubia* (L.) Penn.**

Danubian Plain: on the bank of the Danube River, west of Belene town, with flowers and fruits, 27.06.2003, LJ-24; near Cherkovitsa village, Nikopol district, 28.06.03, LJ-34, SC (RTz & KŠ), SOM 158874.

According to Markova (1995), the species has been previously found in the Thracian Lowland as a weed in the rice fields. The localities on the bank of the Danube River are about 280 km away from the location of the first find of the species in Bulgaria, and both presently known populations almost certainly have independent origins. The species probably penetrated down to the lower stream of the Danube River from Central Europe by means of shipping. It could be possibly found in many other places along the Danube River and its tributaries.

***Panicum capillare* L.**

Danubian Plain: on the bank of the Danube River, between Dubovan village and Goulyantsi town, with fruits and flowers, 21.09.2000, SC (RTz), LJ-04, SO 100663; in the vicinity of Cherkovitsa village, with

fruits and flowers, 10.08.2003, LJ-24, SC (RTz), SOM 158875.

This species was recorded as new for the flora of Bulgaria by Deneva & Ljubenova (1996). Their material was gathered in the field of the Experimental Institute for Forage Plants near the town of Kostinbrod. The species was probably introduced with imported forage seed. The find on the riverbank of the Danube probably originated from shipping from Central Europe, where the species is widespread.

***Veronica peregrina* L.**

Danubian Plain: on the bank of the Danube River, near Cherkovitsa village, with fruits, 28.06.2003, LJ-24, SC (RTz & KŠ), SOM 158871.

Cheshmedzhiev & Vodenicharov (1998) found the plant as a new species for the Bulgarian flora on the bank of the Maritsa River (Thracian Lowland). The new locality is the second one in Bulgaria. The rareness of the species and the distinctness of its habitats are probably the main reasons it has not appeared in the country sooner. This plant should be searched for in other places along the Danube River and other large rivers in Bulgaria.

Conclusion

All the above-mentioned species from the bank of the Danube River are adventive plants of North-American origins. Most of them are well-known in Western and Central Europe, but in recent years they have found their way into Eastern Europe because of increased communication between the East and the West. Some of these species will be neutral for the flora and vegetation of Bulgaria, but others will play a negative role, especially in the ecological balance of the native plant communities. The large rivers, particularly the Danube in Bulgaria, will certainly play a significant role in the future expansion of some invasive species. Therefore, more intensive investigations will be necessary along the Danube River, as well as more effective controls on shipping.

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