

Dwarf iris, *Iris pumila* L. (Iridaceae), a new species of the Croatian flora

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A small population of flowering *Iris pumila* L. was discovered in April 2007 on the loess cliff near Zmajevac in Bansko brdo (Baranja, Croatia). This locality is on the south-westernmost border of the Pontic-Pannonian distribution area of the dwarf iris. The stand was described in a phytocoenological relevé. Based on recent knowledge of its distribution, population measures, as well as causes of habitat threats, *Iris pumila* L. should be considered in Croatia an extremely rare and critically endangered taxon. The necessity of the protection of the loess cliffs is also emphasised.

Key words: *Iris pumila*, loess cliff, grassland, Pontic-Pannonian, flora, Baranja, Croatia

Introduction

The dwarf iris *Iris pumila* L. is a lowland and colline species with Pontic-Pannonian distribution, the western border of its area being in Austria and Moravia (SOÓ 1973, WEBB and CHATER 1980). It occurs in the Czech Republic and Slovakia (RANDUŠKA and KRIŽO 1986), but it is not present in Slovenia (MARTINČIĆ and SUŠNIK 1984). This continental-subcontinental species (BORHIDI 1995) can be found in several localities in Romania (PRODAN and NYÁRÁDI 1966), Bulgaria (DELIPAVLOV 1984) and in Serbia (STJEPANOVIĆ-VESELIČIĆ 1976, OBRADOVIĆ et al. 1986); moreover in the north-eastern part of Hungary, it is rather frequent. In South-Transdanubia its occurrence in Mecsek and the Villányi Mts has been noted (SOÓ 1973), but recent botanical surveys have not confirmed this. The southernmost population in Hungary can be found on a loess cliff near Dunaszekcső (FARKAS 1999).

Iris pumila L. was reported in the flora of Croatia and surrounding regions as a plant which grows in dry places (DOMAC 1984). In the flora of Slavonija and Baranja it is listed without localities or recent finding (RAUŠ and ŠEGULJA 1983) and the occurrence of this dwarf iris in Croatia is considered doubtful in the Checklist of the Flora of Croatia (MITIĆ 2000). Detailed literature and field research as well as investigations of the Herbaria (ZA,

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ZAHO, BP, BPU, WU, W, PAD, LJU) showed that there were no specimens from Croatia in herbaria, nor any recent data to confirm the occurrence of this species in Croatia (MITIĆ 2004). Therefore in the supplement that offers additional information and corrections to Index Florae Croaticae (NIKOLIĆ 1994, 1997, 2000), MITIĆ (2004) suggested that *Iris pumila* L. should be excluded from the checklist of Croatian flora. Accordingly this dwarf iris is not presented in the newest DataBase of Croatian flora (NIKOLIĆ 2007).

Iris pumila L. has stems not more than 1 cm long. Leaves are 4–17 mm wide, 3–15 cm long, straight or somewhat falcate. Flowers are solitary (rarely 2), purple or pale-yellow, sessile. Spathes are 5–10 cm, rounded or very slightly keeled on the back. The outer perianth segments (falls) are 6 cm long, with bearded limb (blade). The inner perianth segments (standards) are oblong, with a distinct claw. Perianth (hypanthial) tube is 4–9 cm long, 4–5 times longer than the ovary (WEBB and CHATER 1980, SIMON 2001). Its related taxon in Croatia, *Iris adriatica* Trinajtić ex Mitić, (syn.: *I. pseudopumila* Tineo) (MITIĆ 2002) belonging to the same complex (*I. pumila*), is an endemic taxon of Croatia, distributed over the area of central Dalmatia (MITIĆ 2004, NIKOLIĆ 2007).

Material and Methods

The determination of plants was done with the use of Hungarian (SIMON 2001) and Croatian (DOMAC 1984) handbooks. Gauss-Krüger coordinates of the site were determined using a GPS device (NIKOLIĆ 2006). Plant specimens were collected, prepared and deposited in Herbarium Croaticum (ZA) in Zagreb. A standard phytocoenological relevé with cover abundance indices (Tab. 1.) was made in the stand, according to the Braun-Blanquet methodology (MUELLER-DOMBOIS and ELLENBERG 1974).

Results

A population of flowering *Iris pumila* L. was discovered in April 2007 on a loess cliff near Zmajevac in Bansko brdo (Baranja, Croatia)(Fig. 1).

Bansko brdo stretches in the NE-SW direction along 21 km, and on its south-eastern part there are very steep, 25–58 m high loess cliffs (BOGNAR 1990). On these sheer slopes open loess grassland vegetation is formed: *Agropyro cristati-Kochietum prostratae* Zólyomi 1958.

According to IUCN standards (B1,2, C2 and D criteria) (NIKOLIĆ 2005), on the basis of population size, distribution area as well as causes of habitat threats, this dwarf iris should be considered a critically endangered (CR) taxon in Croatia. Its population consists of fewer than 50 individuals, isolated in an area smaller than 10 km². It grows in Pontic-Pannonian dry grassland vegetation, which is restricted to the easternmost border of Croatia, along the Danube River. Loess cliffs make an extremely rare, unique, endangered habitat in Croatia. The main threats are the digging of loess and making flat vertical surfaces, which happened during road construction under the cliffs, as well as deposits of waste loess material along the road. These interventions enable the growth of alien, invasive trees: Black-lo-cust tree, *Robinia pseudacacia* L. and Tree of Heaven, *Ailanthus altissima* (Mill.) Swingle. The protection of loess cliffs should be an important task, which can help maintaining the dry steppe habitat.

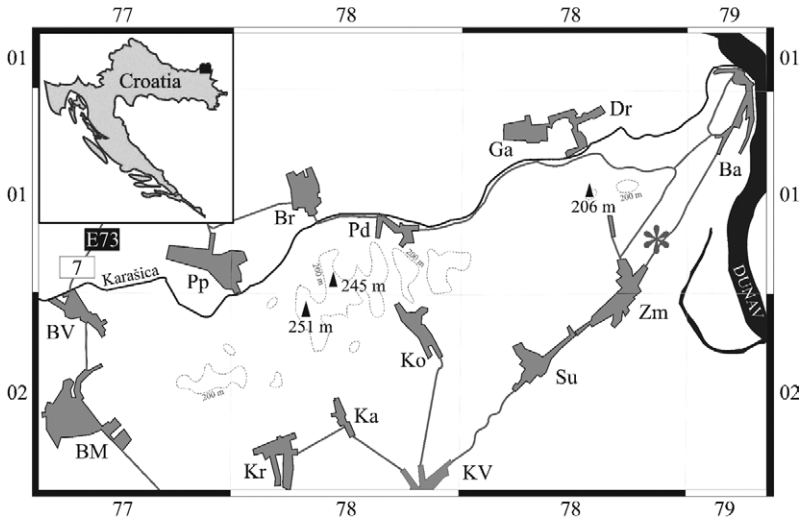


Fig. 1. The locality where *Iris pumila* occurs (in Banske brdo, Baranja, Croatia). * – 5796977, 5081091 (Gauss-Krüger coordinates). Grid: Central European Flora Mapping System. Abbreviations: **Ba**: Batina; **BM**: Beli Manastir; **Br**: Branjina; **BV**: Branjinski Vrh; **Dr**: Draž; **Ga**: Gajić; **Ka**: Kamenac; **Kr**: Karanac; **Ko**: Kotlina; **KV**: Kneževi Vinogradi; **Pd**: Podolje; **Pp**: Popovac; **Su**: Suza; **Zm**: Zmajevac

Tab. 1. Grassland vegetation (*Agropyro cristati-Kochietum prostratae* Zólyomi 1958) containing dwarf iris, *Iris pumila* L. Location: Croatia/ Zmajevac (on loess wall), Position (Gauss-Krüger coordinates): 5797035, 5081160. Altitude: 86 (+/- 7) m, Plot size: 4 m², Exposure: 165°, Declination: 60°, Cover total: 70%, Cover E1: 70%, Cover E0: 1%, Cover litter layer: 5%, Cover bare loess: 25%, Height E1: 110 cm, Height E0: 7 mm, Cover abundance scale: »Braun-Blanquet old«.

<i>Iris pumila</i> 3	<i>Fumaria schleicheri</i> +
<i>Agropyron cristatum</i> ssp. <i>pectinatum</i> 2	<i>Onopordum acanthium</i> +
<i>Sisymbrium orientale</i> 2	<i>Euphorbia helioscopia</i> r
<i>Artemisia campestris</i> 2	<i>Muscari neglectum</i> r
<i>Sedum maximum</i> 2	<i>Convolvulus arvensis</i> r
<i>Erodium ciconium</i> 2	<i>Holosteum umbellatum</i> r
<i>Veronica hederifolia</i> 1	<i>Veronica arvensis</i> r
<i>Setaria verticillata</i> 1	

Discussion

In connection with the vegetation in north-eastern Croatia, semi-ruderal fragmented grasslands of *Agropyro cristati-Kochietum prostratae* Zólyomi 1958 were described (RAUŠ et al. 1985). At that time, among the characteristic species such as *Artemisia campestris*, *Centaurea micranthos*, *Bromus squarrosus*, *Chondrilla juncea*, *Bothriochloa ischaemum* etc., no records of *Iris pumila* were made.

According to Soó (1973), *Iris pumila* L. grows on calcareous, warm, dry, loose, basic or slightly acidic soil with low humus content and fertility, on rocky ground, mainly on limestone, dolomite, loess or sand substrata. While Soó (1973) and OBRADOVIĆ et al. (1986) reported that this plant rarely grows on salinas, BORHIDI (1995) considered it to be an explicitly calciphilous plant and ultrabasic specialist which does not occur on saline or alcalic soils. In the Czech Republic and Slovakia it grows on stony surfaces and walls, in dry grasslands in steep sunny positions, mostly on calcareous substrata (RANDUŠKA and KRIŽO 1986). It can be found mainly in rocky grasslands, rocky forests, loess or sand grasslands as well in dry pastures, and according to Soó (1973) it is a characteristic species of *Festucetalia valesiacae*. In Serbia, to the south of the Sava and Danube rivers, this dwarf iris occurs in dry grasslands (e.g. *Humileto-Stipetum grafianae* R. Jov. 1955, *Potentilieto-Caricetum humilis* R. Jov. 1955) (STJEPANOVIĆ-VESELIČIĆ 1976). In Vojvodina, in the southernmost part of the Great Hungarian Plain, it is found in different steppe communities, e.g: *Koelerio-Festucetum wagnerii* Stjep.-Vesel. 1953, *Chrysopogonetum pannonicum* Stjep.-Vesel. 1953 (STJEPANOVIĆ-VESELIČIĆ, 1953), *Crambo – Artemisietum campestris* Stevanović 1984 (STEVANOVIĆ 1984), *Koelerio gracilis – Festucetum valesiacae* Parabučki, Butorac 1988 (PARABUČKI and BUTORAC 1993).

Iris pumila is legally protected in Hungary, and is considered a rare, potentially threatened taxon (FARKAS 1999). In Serbia it is also protected, treated as an endangered (EN) taxon (IGIĆ and BUTORAC 1998). The general causes of threats to steppe plants in Croatia as well as in neighbouring countries are habitat loss as a consequence of e.g. agricultural changes, infrastructure development, degradation and abandonment of grasslands (STEVANOVIĆ 1999, BUTORAC et al 2002, TOPIĆ and NIKOLIĆ, 2005).

Iris pumila can be found in Croatia on the edge of its distribution area, therefore it is faced with an extremely high risk of extinction.

The loess cliff is favourable not only for *I. pumila*, but for some other endangered (*Xeranthemum annuum* L.) and critically endangered (*Agropyron cristatum* (L.) Gaertn. ssp. *pectinatum* (M. Bieb.) Tzvelev) plants found earlier in Bansko Brdo (TOPIĆ et al. 2005 a, b). Since this vegetation type and loess cliff habitat is very rare and sporadically distributed in Croatia, this area was considered an IPA (Important Plant Area) site and proposed as a Natura 2000 site even before *Iris pumila* was found. This habitat is endangered with the invasion of black-locust tree and tree of heaven, thus supplying soil with inadequate nitrogen levels, and shading the habitat. This iris, like other *Agropyro cristati-Kochietum prostratae* plants is a full-light plant of open, dry habitats, growing only in soils extremely poor in mineral nitrogen (BORHIDI 1995). Therefore the most suitable cliff inclination to be covered by mentioned vegetation seems to be 60–80°, and not surrounded by black-locust and *Ailanthus* trees.

The occurrence of *Iris pumila* L. in Croatia is confirmed. On the basis of the present knowledge of its populations, this iris should be considered an extremely rare and critically endangered taxon in Croatia. The necessity of the protection of loess cliffs as Pontic-Pannonian dry grassland habitats is pointed out. The find of the *Iris pumila* here confirms the uniqueness of these habitats.

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