Under-recorded and critically endangered *Scirpus supinus* L. in Croatia – new records from the City of Slatina

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Abstract

The paper presents two new localities for the critically endangered *Scirpus supinus* L. (Cyperaceae) which was recorded during botanical surveys in surroundings of the City of Slatina in Slavonia. The species is associated with the alliance *Nanocyperion* and was found in damp microdepressions on agricultural land. Previously, only two localities had been known for *S. supinus* in Croatia, both of which are herbarium vouchers dating back to the mid-twentieth century and should be confirmed at those areas during future research.

Keywords: critically endangered, Cyperacae, flora, *Scirpus supinus*, Slavonia

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Sažetak

Rad donosi dva nova nalazišta za kritično ugroženu vrstu *Scirpus supinus* L. (Cyperacae) zabilježenu tijekom botaničkih istraživanja u okolici grada Slatine u Slavoniji. Vrsta se javlja unutar sveze *Nanocyperion* u vlažnim mikrodepresijama među obradivim površinama. Dosad su za vrstu *S. supinus* bila poznata samo dva lokaliteta u Hrvatskoj, oba kao herbarijski primjerci iz sredine prošloga stoljeća koje u budućim istraživanjima valja potvrditi na terenu.

Ključne riječi: Cyperacae, flora, kritično ugrožena, *Scirpus supinus*, Slavonija

Scirpus supinus L. is an annual caespitose sedge, a member of the Cyperaceae family, usually growing above water level as an indicator of flooding and moist soils. Its typical habitats are temporary pools, depressions, inundated agricultural land, rice fields, alluvial flats, inundated sandy lands, damp places and around lakes, reservoirs and ponds (Josifović et al. 1976, Lansdown 2014). The plant usually grows up to a height of 30 cm (Bojnansky & Fargašova 2007) and needs open, sandy places to establish a population. It has a wide distribution, but is scattered throughout its range and probably under-recorded (Lansdown 2014). Among other species within the genus *Scirpus*, it can be distinguished by its apparently lateral inflorescence, stem-like bract which overtops the spikelets by up to 15 cm and shortly apiculate, reddish or brownish glumes with a green midvein (Tutin et al. 1993).

According to The Plant List (2013) database, the currently accepted nomenclature for the species is *Schoenoplectiella supina* (L.) Lye. (Lidia 6: 27. 2003), but was originally published under the name *Scirpus supinus* L. (Sp. Pl. 49. 1753) which is also accepted by Flora Croatica Database (Nikolić 2016) and used in this paper. The following names are listed as known synonyms:

- *Cyperus supinus* (L.) Missbach & E.H.L.Krause (Deutschl. Fl. ed. 2, 2: 20. 1900);
- *Heleophylax supinus* (L.) Schinz & Thell. (Vierteljahrsschr. Naturf. Ges. Zürich 53: 587. 1908);
- *Isolepis pentasticha* Boeckeler (Flora 42: 446. 1859);
- *Isolepis simillima* Steud. (Syn. Pl. Glumac. 2: 95. 1855);
- *Isolepis striolata* Nees ex Boeckeler (Linnaea 36: 700. 1870);
- *Isolepis supina* (L.) R.Br. (Prodr. Fl. Nov. Holl. 221. 1810);
- *Schoenoplectus melanospermus* (C.A.Mey.) Grossh. (Fl. Kavkaza 1: 146. 1928);
- *Schoenoplectus supinus* (L.) Palla (Bot. Jahrb. Syst. 10: 299. 1888);
- *Scirpus adscendens* Willd. ex Kunth (Enum. Pl. 2: 198. 1837);

- *Scirpus guaraniticus* Pedersen (Bot. Tidsskr. 57: 42. 1961);
- *Scirpus halleri Vitman* (Summa Pl. 1: 150. 1789);
- *Scirpus lateralis* Forssk. (Fl. Aegypt.-Arab. 15. 1775);
- *Scirpus melanospermus* C.A.Mey. (Mém. Sav. Étr. Acad. St. Pétersbourg 1: 199. 1831);
- *Scirpus mucronatus* Roxb. nom. illeg. (Fl. Ind. 1: 219. 1820.);
- *Scirpus natans* Bojer nom. illeg. (Hortus Maurit. 383. 1837.);
- *Scirpus polycoleus* De Not. (Index Seminum (GE) 1847: 27. 1847);
- *Scirpus tristachyos* Zoll. ex Steud. (Syn. Pl. Glumac. 2: 96. 1855).

During botanical field surveys in 2015 and 2016, two new localities for *S. supinus* were found in the surrounding area of the village Gornji Miholjac, situated in the northern part of the City of Slatina (Fig. 1-2). The terrain configuration varies from horizontal plains, with scattered microdepressions that usually retain moisture throughout the vegetation period, to gently undulating contours within the elevation range of 108 – 112 m across the eastern administrative part of the village. From the aspect of land use, agriculture is generally dominant with a large share of sandy loam soils and the accompanying tobacco cultivation. With its affinities for the alliance *Nanocyperion*, the established ecological conditions appear very favourable for the occurrence and development of *S. supinus* (Fig. 3) in the area of Slatina. Both sites, however, appear threatened because of the enclosing weed vegetation and agriculture.

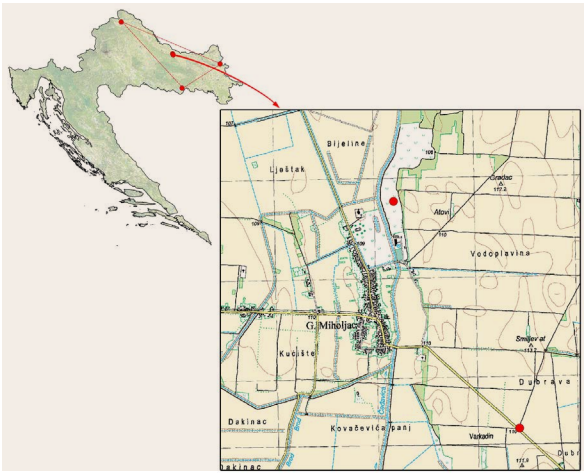

Figure 1. Known sites (red dots) of *Scirpus supinus* L. in Croatia, with delineated extent of occurrence (red triangle); enlarged map shows two recent records near the village of Gornji Miholjac (City of Slatina).

Figure 2. Habitat setting of *Scirpus supinus* L. at: a) north of village Gornji Miholjac Bijeline, surrounded by *Echinochloa crus-galli* (L.) P.Beauv. (25 July 2015), b) southeast of village Gornji Miholjac, Dubrava, with *Nicotiana tabacum* L. cultivated above the waterlogged soil (13 August 2016). (Photo: D. Prlić).

The following descriptions contain date and geographical details of the two newly recorded sites (Fig. 1), including GPS coordinates based on the HTRS96 national coordinate system (Lapaine & Tutić 2007):

1) North of village Gornji Miholjac, Bijeline, coordinates: E590454, N5070859, 108 m a. s. l., 25 July 2015;
2) Southeast of village Gornji Miholjac, Dubrava, coordinates: E591712, N5068604, 109 m a. s. l., 13 August 2016.

According to the available distribution data for *S. supinus* in Flora Croatica Database (Nikolić 2016), with just three previously known localities the species had therefore been largely under-recorded in Croatia. Two of the earlier records were herbarium vouchers stored in Herbarium Croaticum (ZA): one was collected by Stjepan Horvatić on 5 August 1949 as a weed species at "Jelas polje" near Slavonski Brod (ZA 11405), while

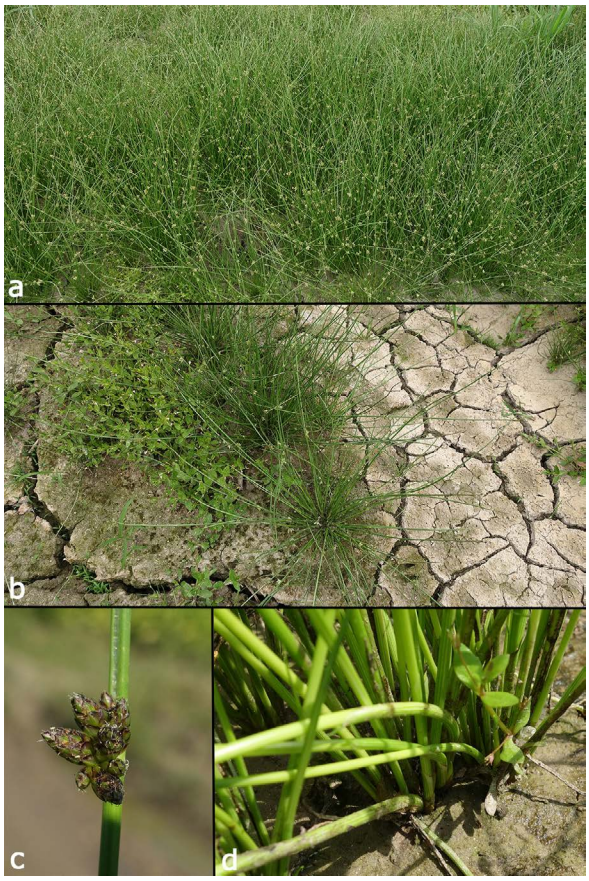

Figure 3. Details of *Scirpus supinus* L.: a) Dense overgrowth (25 July 2015), b) Caespitose habit, with *Lindernia procumbens* (Krock.) Philcox underneath (25 July 2015), c) Inflorescence with typical brownish glumes (13 August 2016), d) Tufts emerging from the soil (13 August 2016) (Photo: D. Prlić).

the other specimen was collected by Ruža Koščec in the surrounding area of Varaždin on moist soil near the Drava River (ZA 11404), dating back to 27 July 1943. Due to their date of collection, both records should be confirmed during floristic surveys of those localities in the future. The herbarium contains three additional vouchers, of which one belongs to foreign plant material, while the other two have undefined collection sites. Croatian herbaria ZAHO (Herbarium Ivo and Marija Horvat) and CNHM (Croatian Natural History Museum) keep no vouchers of *S. supinus*. The third known locality was recorded during vegetation research in the area between the Drava-Danube confluence and the forest Haljevo in Baranya region (Jovanović 1965). A detailed interpretation of the exact locality was not given, however, considering its ecological preferences, *S. supinus* most likely exists within the borders of Kopački rit Nature Park.

Currently, the species is listed as a strictly protected (Anonymous 2013, 2016) and a critically endangered (Nikolić & Topić 2005) vascular plant in Croatia. However, due to the restricted geographic distribution and probable habitat degradation, it is important to assess its threat category according to the new IUCN Red List guidelines (IUCN Standards and Petitions Subcommittee 2016). Taking into account all five known localities up to date, both extent of occurrence (EOO) and area of occupancy (AOO) have been calculated. The EOO is calculated as the minimum convex polygon (convex hull), whereas the area of occupancy (AOO) is estimated by calculating the total area of all 2x2 km grid cells with *S. supinus* occurrence. As a result, the EOO equals 7781.5 km^2 (Fig. 1) and AOO amounts to a total of 5 grid cells equalling an area of 20 km^2. As a consequence of wide dispersion of localities, the EOO value falls within the range for Vulnerable (VU) species, yet the AOO and small number of localities qualify as conditions for an Endangered (EN) species. It should also be taken into account that *S. supinus*, as a habitat specialist, has an increased risk of extinction because of its fragmented range and restricted habitat type which is susceptible to threats such as hydroamelioration and agriculture. The taxon should therefore be downlisted from Critically Endangered (CR) to the category of Endangered (EN) species, following the subcriteria EN B2ab(iii, iv).

New field observations have been added to the Flora Croatica Database (ID 25507) and should serve as an invitation to increase research efforts in agricultural areas, particularly for inundated microdepressions, as habitats for various plant taxa possibly under-recorded on the national level.

References

- **Anonymous (2013):** Ordinance on Strictly Protected Species (In Croatian). Official Gazette 144/13. http://narodne-novine.nn.hr/clanci/sluzbeni/2013_12_144_3086.html (accessed October 5, 2016).
- **Anonymous (2016):** Ordinance on Amendments to the Ordinance on Strictly Protected Species (In Croatian). Official Gazette 73/16. http://narodne-novine.nn.hr/clanci/sluzbeni/2016_08_73_1745.html (accessed October 5, 2016).
- **Bojnansky, V., Fargašova, A. (2007):** Atlas of seeds and fruits of Central and East-European flora, The Carpathians Mountains Region. Springer, Dordrecht, The Netherlands.
- **IUCN Standards and Petitions Subcommittee (2016):** Guidelines for Using the IUCN Red List Categories and Criteria. Version 12. Prepared by the Standards and. Petitions Subcommittee. http://www.iucnredlist.org/documents/RedListGuidelines.pdf (accessed February 27, 2017).

- **Josifović, M., Stjepanović, L., Janković, M. M., Gajić, M., Kojić, M., Diklić, N. (1976):** Flora SR Srbije VIII (In Serbian). Srpska akademija nauka i umetnosti, Beograd.
- **Jovanović, B. 1965:** Biljni svet – osnovne karakteristike autohtone flore i vegetacije Beljskog lovno-šumskog područja. Jelen – bilten Lovno-šumskog gazdinstva 3: 61-78.
- **Lansdown, R. V. (2014):** *Schoenoplectiella supina*. In: IUCN 2014. IUCN Red List of Threatened Species. Version 2014.1. http://www.iucnredlist.org/details/168964/0 (accessed October 8, 2016).
- **Lapaine, M., Tutić, D. (2007):** New Official Map Projection of Croatia - HTRS96/TM. Kartografija i geoinformacije 6 (no.spec.): 34-53.
- **Nikolić, T., Topić, J. (eds.) (2005):** The Red Book of Vascular Flora of Croatia. Ministry of Culture, State Institute for Nature Protection, Zagreb.
- **Nikolić, T. (2016):** Flora Croatica Database. University of Zagreb, Faculty of Science, Department of Botany and Botanical Garden, Zagreb. http://hirc.botanic.hr/fcd (accessed October 5, 2016).
- **The Plant List (2013):** Version 1.1., *Schoenoplectiella supina* (L.) Lye. http://www.theplantlist.org/tpl1.1/record/kew-262928 (accessed October 6, 2016).
- **Tutin, T. G., Heywood, V. H., Burges, N. A., Moore, D. M., Valentine, D. H., Walters, S. M., Webb, D. A. (1993):** Flora Europaea, Volume 5: Alismataceae to Orchidaceae. Cambridge University Press, Cambridge.