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A record of *Juncus sphaerocarpus* from dry grasslands near Rokytná (Moravia, Czech Republic)

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ROLEČEK J. 2011: A record of *Juncus sphaerocarpus* from dry grasslands near Rokytná (Moravia, Czech Republic). *Acta Musei Moraviae, Scientiae Biologicae* (Brno) **96(1):** 199–204. – A recent record of *Juncus sphaerocarpus*, a critically endangered plant species, is reported from the surroundings of Rokytná village near the town of Moravský Krumlov. It is the only recent site for the species in south-western Moravia. The population recorded consists of more than 200 individuals. The habitat of the species is unusual, being a periodically wet patch in a dry rocky grassland. It is discussed that the occurrence of ephemeral wetland species such as *J. sphaerocarpus* in dry rocky habitats has been observed before in other parts of Europe and that such species may form a regular component of xerothermic vegetation at appropriate sites.

Key words. *Juncus sphaerocarpus*, floristics, endangered species, ephemeral wetland vegetation, disturbed dry grassland, Czech Republic

Juncus sphaerocarpus is a characteristic species of ephemeral wetland vegetation (*Isoëto-Nanojuncetea* classis). It inhabits disturbed, periodically wet habitats such as wet field depressions, wet fallow land, disturbed reed-bed margins and channel banks. It prefers clayey, base-rich soils in regions of quite warm, (sub)continental or (sub)Mediterranean climate. It is often accompanied by annual rush species of the *Juncus bufonius* aggregate. Its habitus is a good example of an r-strategist (KLOTZ *et al*. 2002): a gracile annual species with a small root system producing a great quantity of small seeds persisting in a soil seed bank for a long time.

Juncus sphaerocarpus is considered a critically endangered species in the Czech Republic (HOLUB & PROCHÁZKA 2000). Historical data on its occurrence come mainly from warm and dry lowlands and hilly landscapes in southern Moravia and north-western Bohemia (HOLUB & KUBÁT 1999). In the last 20 years, it has been observed only in the south-western part of Bílé Karpaty Mts (Velká nad Veličkou, Hrubá Vrbka and Slavkov villages; JONGEPIER & JONGEPIEROVÁ 2006, K. FAJMON, *in litt.*), at some sites near Sedlec village near the town of Mikulov (J. DANIHELKA, *pers. comm.*) and at Rozkoš reservoir near Česká Skalice in eastern Bohemia (F. KRAHULEC, *in litt.*). There is no recent record of the species from north-western Bohemia (K. KUBÁT, *in litt.*).

On 17 June 2010, *Juncus sphaerocarpus* was recorded in a dry grassland near Rokytná village near the town of Moravský Krumlov. I spotted several individuals while walking along a small footpath in dry, rocky grassland on the steep western slope of Vinohrady Hill, a feature built of base-rich Permian conglomerates. The soil was still wet after plentiful rainfall in the preceding weeks. I visited the place again on 28 June to



Fig. 1. *Juncus sphaerocarpus* is an annual tussocky rush species with globose capsules. Unlike the related *J. tenageia*, its flowers and fruits also appear in the lower half of its stems.

Obr. 1. Sítina kulatoplodá je jednoletý trsnatý druh s charakteristicky kulovitými tobolkami. Na rozdíl od příbuzné sítiny rybniční (*J. tenageia*) má květy a tobolky i ve spodní polovině lodyhy.



Fig. 2. Vinohrady Hill near Rokytná village. *Juncus sphaerocarpus* was spotted at the transition between steep rocky outcrops and dry grasslands on the milder slope in the right third of the picture.

Obr. 2. Vrch Vinohrady (místně též zvaný Tábor) u obce Rokytná. Sítina kulatoplodá byla nalezena na přechodu mezi strmými skalnatými svahy a stepními trávníky na hlubší půdě v pravé třetině záběru.

determine its population size and to record the composition of the local vegetation. During the survey, two micropopulations of *J. sphaerocarpus* were found *ca* 30 m from each other, each consisting of more than 100 individuals. The vegetation composition at the first site is illustrated by the following relevé.

Rokytná village, western slope of Vinohrady Hill, a footpath in dry rocky grassland, 0.7 km SE of the church in Rokytná, 49°03′35.2″ N, 16°19′38.7″ E (WGS-84), 28.6.2010, 0.4 m² (2 × 0.2 m), 275 m a.s.l., slope 5°, orientation 270°, herb layer cover 20%.

Juncus sphaerocarpus 2a, *Anagallis arvensis* 1, *Centaurea stoebe* +, *Cerastium glutinosum* +, *Echium vulgare* +, *Sedum album* +, *Setaria viridis* +, *Teucrium chamaedrys* +, *Hypericum perforatum* r, *Koeleria macrantha* r, *Poa bulbosa* r, *Seseli osseum* r, *Stachys recta* r, *Thymus praecox* r.

The relevé shows that the footpath harbours a mixture of species of dry rocky grasslands, rocks, but also of highly disturbed human-made habitats, such as *Anagallis arvensis* and *Setaria viridis*. The latter species is widespread on trampled places in dry rocky grasslands in the region. The other *J. sphaerocarpus* micropopulation inhabits disturbed dry grassland vegetation adjacent to the footpath, the composition of which is illustrated by the following relevé.

Rokytná village, western slope of Vinohrady Hill, wet disturbed patch in a dry rocky grassland, 0.7 km SE of the church in Rokytná, 49°03′36.2″ N, 16°19′38.9″ E (WGS-84), 28.6.2010, 1 m² (1 × 1 m), 275 m a.s.l., slope 20°, orientation 300°, herb layer cover 20%.

Juncus sphaerocarpus 2m, *Thymus praecox* 2m, *Festuca valesiaca* 1, *Hypericum perforatum* 1, *Iris pumila* 1, *Sedum sexangulare* 1, *Acinos arvensis* +, *Centaurea stoebe* +, *Echium vulgare* +, *Erodium cicutarium* +, *Koeleria macrantha* +, *Poa bulbosa* +, *Potentilla arenaria* +, *Sedum album* +, *Trifolium campestre* +, *Medicago minima* r, *Seseli osseum* r.

The relevé records the vegetation of the dry continental grassland of the *Festucion valesiacae* classis that borders with the dry rocky grassland dominated by *Festuca pallens* where the slope is milder and the soil deeper and richer in clay. Outside the relevé, *Stipa pennata*, *S. pulcherrima*, *Carex supina*, *Inula oculus-christi* and other steppe species occur. Several species preferring shallow soils, such as *Sedum album*, *Poa bulbosa* and *Echium vulgare*, penetrate the grassland from the surrounding rocky habitats. Despite the dominance of dry grassland species, the soil was wet in the place where *J. sphaerocarpus* grew and the water was actually oozing through in places. There were more such wet patches in the dry grassland, particularly at the boundary between deep-soil and rocky grassland, where the water was flowing out onto bare rock. These patches apparently act as minute periodical springs, potentially supporting short-lived wetland species such as *J. sphaerocarpus* during rainy periods but remaining dry for most of the year. Moreover, the area where the relevé was taken was disturbed by wild pigs attracted by an abundance of bulbs (*Iris pumila*, *Muscari tenuiflorum*) and thus promoting the ecesis of *J. sphaerocarpus* as well.

The record of *J. sphaerocarpus* in such an unusual habitat and in a region where no historical occurrence of the species has been reported (the nearest historical site, near Únanov, lies 25 km off) may seem accidental. Its association with a trampled footpath, in particular, suggests a temporary character for the occurrence, perhaps resulting from recent human introduction, perhaps even by a botanist: the seeds of *J. sphaerocarpus* may be dispersed by animals via mud (Holub & Kubát 1999) and their import on field boots from another frequently visited site in southern Moravia is possible. However, I would like to highlight several circumstances supporting the hypothesis of natural origin for the species in dry grassland near Rokytná.

In June 2004, I observed *J. sphaerocarpus* on an andesite outcrop at Sár-hegy Hill near Gyöngyös, in Hungary. It was growing on a flat, rocky surface with a thin cover of fine-grained to coarse-grained weathered material, together with *Juncus bufonius* agg., *Polycnemum* sp., *Sedum sexangulare* and *Trifolium arvense*. The soil in the place was dry at the time; however, it might have become quite wet in rainy periods, since drainage of the flat terrain was impaired. A similar situation has been described by Rudner (2005) and Deil *et al*. (2008) from south-western Portugal (Serra de Monchique). The vegetation of the *Isoëto-Nanojuncetea* classis, including e.g. the annual rush *Juncus capitatus*, occurs there around syenite outcrops in a spatial and temporal mosaic with ephemeral xerophilous vegetation of the *Tuberarietea* classis and perennial grasslands of the *Lygeo-Stipetea* classis. It inhabits shallow accumulations of fine-grained to coarse-grained weathered material around flat rocky outcrops, i.e. habitats analogous to those on the Rokytná conglomerates and Sár-hegy andesite. In spite of the differences in climate between the regions, the basic seasonal pattern of moisture availability is similar: the spring is wet and the summer dry.

It seems that, given suitable conditions (soil properties and the course of precipitation over the vegetation season seem to be of particular importance – spring 2010 was extremely wet), central European dry grasslands may also regularly include

species of the *Isoëto-Nanojuncetea* classis. Thus, *Juncus sphaerocarpus* may be a permanent component of the dry grasslands near Rokytná, although it may survive long periods merely in soil seed bank.

The taxonomical concept and vascular plant species nomenclature follow KUBÁT *et al*. (2002). Nomenclature of central European syntaxa follows CHYTRÝ & TICHÝ (2003); nomenclature of Mediterranean syntaxa follows DEIL et. al (2008). The voucher of *Juncus sphaerocarpus* from Rokytná is deposited at the herbarium of the Department of Botany and Zoology, Masaryk University, Brno, Czech Republic (BRNU).

Souhrn

Článek přináší zprávu o nálezu sítiny kulatoplodé na slepencové stepi u Rokytné nedaleko Moravského Krumlova. Jde o první nález tohoto kriticky ohroženého druhu v území a jeho jedinou recentní lokalitu na jihozápadní Moravě (podle aktuální informace R. Němce z Jihomoravského muzea ve Znojmě bylo v roce 2010 nalezeno několik nových populací i v blízkém okolí Znojma). Nalezená populace je tvořena více než 200 jedinci. Stanoviště druhu je s ohledem na jeho ekologické nároky neobvyklé: jde o periodicky vlhká místa v okolí pěšiny na skalní stepi na úbočí vrchu Vinohrady. V článku je diskutována skutečnost, že sítina kulatoplodá a další jednoleté druhy sítin už byly na podobných stanovištích jinde v Evropě pozorovány a že tudíž nelze vyloučit možnost, že je tento druh na příhodných místech trvalou součástí přirozené xerotermní vegetace. Nepříznivá období může dlouhodobě přežívat v půdní semenné bance, naopak mimořádně vlhké jaro roku 2010 mohlo být pro něj zvlášť příznivé.

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