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***Carex grayi* J.CAREY (Cyperaceae) – first record in Austria**

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Abstract

The first record of *Carex grayi* J.CAREY (Cyperaceae) in Austria is presented. The species was found in 2008 in a roadside ditch in the southern part of the Kamp valley near Plank am Kamp, Lower Austria. Records of this unmistakable, North American sedge in Europe are presented and the demands on its habitats are discussed. The species seems to have the potential to establish itself in parts of Europe.

Key words: *Carex grayi*, *Carex* sect. Lupulinae, Cyperaceae, neophyte, Flora of Austria.

Zusammenfassung

Der Erstfund von *Carex grayi* J.CAREY – der Morgenstern-Segge – in Österreich wird vorgestellt. Diese Art wurde seit 2008 in einem Straßengraben im südlichen Kamptal bei Plank am Kamp (Niederösterreich) beobachtet. Die Verbreitung dieser unverwechselbaren, nordamerikanischen Segge in Europa wird besprochen und ihre Standortansprüche werden diskutiert. Die Art dürfte das Potential besitzen, sich in Teilen Europas zu etablieren.

Introduction

Carex is one of the species-richest genera in Austria. The Austrian excursion flora (FISCHER et al. 2008) lists more than 100 taxa. Only three taxa are alien species, one – *Carex cristatella* – was found in 1854 and probably disappeared soon (WALLNÖFER 2006), so two are remaining – *Carex bebbii* and *Carex vulpinoidea* (WALLNÖFER 1993, 2012). KOOPMAN (2011) reports 30 introduced *Carex* taxa in Europe, 15 of which were introduced from North America. Twelve further species, originating from Australia or New Zealand have been discovered only in the United Kingdom. North America obviously is the main source for alien species in continental Europe. KOOPMAN (2015) lists ten introduced species in the Netherlands, six of which come from North America and three from other regions of Europe. In the "Manual of the alien plants of Belgium" (2015) ten introduced *Carex* taxa are listed for Belgium, eight of them from North America and two from Europe.

Description of *Carex grayi*, its habitat requirements and origin

The species belongs to the section Lupulinae TUCKERMAN ex J.CAREY. Six very closely related species (*Carex grayi*, *C. intumescens*, *C. gigantea*, *C. louisianica*, *C. lupuliformis*, *C. lupulina*) of this section all are native to North America. The whole section has large, unmistakable perygynia – the largest in the entire genus (BALL & REZNICEK 2002).

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Carex grayi has erect culms, (25) 40–90 (110) cm high, 6 to 12 basal leaves with purplish red basal sheaths, rounded ligules, and 12–34 cm long and 4–11 mm wide blades. The inflorescences are 2.5 to 17 cm long, with peduncles of the proximal pistillate spikes of 0.7–3.5 cm. The spikes are densely (4) 8–35-flowered, separate to aggregated, globular, $2.5\text{--}4.2 \times 2.6\text{--}4.1$ cm. The usually, single terminal staminate spike measures $0.5\text{--}6.5$ cm \times 1–4 mm. The most distinctive characteristics are the rhombic-ovoid perygynia with 16–25 strong veins each. Radiating in all directions, they have a cuneate, dull, glabrous or sometimes hispidulous base and measure $12.5\text{--}20 \times 4\text{--}8$ mm. Fruiting occurs from May to August (BALL & REZNICEK 2002).

The plants in Lower Austria fit well to this description. The plants are about 85 to 90 cm high; leaves are $31\text{--}40$ cm \times 7–8 mm. The perygynia have a size of $14.8\text{--}16.1 \times 4\text{--}8$ mm. The spikes are stalked (about 14 mm).

In North America "mesic to wet deciduous forests, forest openings, usually on fine alluvial or lacustrine deposits and river bottoms" are given as natural habitats (BALL & REZNICEK 2002). The species originates from the East of the United States and Southeast of Canada. The western border of its distribution area is a line from Oklahoma and Kansas to Ontario in Canada.

Records of *Carex grayi* in Europe

The species has been cultivated in Europe at least since the later 19th century. KOOPMAN (2011) lists the species as cultivated in Austria, Belgium, France, Germany, the Netherlands and the United Kingdom. The data base Waarnemingen.be (2015) reports three introduced records (2011 and 2013) in Belgium and the data base Waarneming.nl (2015) seven records in the Netherlands from 2001 to 2013 (one record dates back to 2001, the others were detected after 2010). According to Filip Verloove (pers. communication), at least one record in Belgium can be regarded as established. As can be seen on the pictures in the above mentioned database, it grows in that place in a shady deciduous forest. The probably oldest record of escaped plants in Europe is documented in the Herbarium Leipzig (sheet LZ 162821). Peter Gutte and Peter Otto (pers. communication) confirmed the records in Leipzig from the year 2000 and in Dahlen in Lower Saxony in 2011 on a wet place adjacent to a *Carici elongatae-Alnetum* and a *Molinio-Quercetum*, respectively. This demonstrates the potential for the species to penetrate into natural habitats. PYŠEK et al. (2012) and ŘEPKA & GRULICH (2014) report it from a wet site near the railway station Zastávka u Brna, about 50 km north of the Austrian border in southern Moravia. The plants were found in 2010 and had obviously escaped from nearby gardens. Due to construction works, the plants did not survive there for more than one season (HRBÁČ in HADINEC & LUSTYK 2012).

The new record of *Carex grayi* in Austria

On a bicycle tour in early August of 2008 along the Kamp valley in the Waldviertel (north-western part of Lower Austria) three tufts of a sedge in a shady roadside ditch attracted my attention. The site is located in the SE Waldviertel near Plank am Kamp ($48^{\circ}32'39''$ N, $15^{\circ}41'10''$ E). The ditch is situated not far from the railway station "Altenhof". The small population has not grown, but has been stable and fruited from 2008



Fig. 1: *Carex grayi* growing in a roadside ditch in Lower Austria (photos: J. Tintner, M. Olifiers).

to 2015 every year in August. The surrounding vegetation on the growth place consists of *Cornus sericea*, *Salix caprea* (shading the ditch), *Prunus domestica*, *Rubus caesius*, *Ligustrum vulgare*, *Urtica dioica*, *Euonymus europaea*, *Galium mollugo*, *Hylotelephium maximum*, *Ranunculus repens*, *Dactylis glomerata*, *Lapsana communis*, *Trifolium repens*, *Calystegia sepium* (Fig. 1). Adjacent to the ditch a dry embankment is covered by *Vicia cracca*, *Clinopodium vulgare*, *Lactuca serriola*, *Euphorbia cyparissias*, and *Medicago falcata*.

Herbarium specimen: Österreich, Niederösterreich, Waldviertel, Kamptal: schattiger Straßengraben nahe der Bahnhaltestelle Altenhof südlich von Plank am Kamp, ca. 230 m, 48°32'39" N, 15°41'10" E, 31.8.2015, J. Tintner s.n. [W 2015-17015].

Potential of *Carex grayi* to become an intrusive neophyte

Carex grayi in Lower Austria has probably escaped from a garden. It could have been placed there together with garden waste or even deliberately abandoned. Also the adjacent *Cornus sericea* is a neophyte which frequently escapes from gardens. The site fits well to the species demands. Such a habitat is rather common in Central Europe. All the records of escaped plants in Europe including the presented one demonstrate the potential for this species to survive in suitable habitats in Central Europe such as shady deciduous forests, their boundary areas as well as more or less ruderal roadside ditches, seeping ponds or river and lake banks. It can be assumed that the species might become a neophytic member of the European flora.

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