

THE DISTRIBUTION OF *CAREX HARTMANII* CAJANDER IN POLAND

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ABSTRACT

The distribution of *Carex hartmanii* Cajander in Poland is described based on herbarium materials and supplemented by literature information and unpublished data. The brief description of its taxonomic characteristics, habitat and general distribution is also included.

KEY WORDS: Hartman's sedge, endangered taxa, localities, distribution map.

INTRODUCTION

Some closely related species have enough similar forms and habitat requirements that are often wrongly identified. The data referring to their localities are thus not fully reliable. Therefore, when making distribution maps, the taxa are treated jointly. Only a review of herbarium materials allows for presenting the cartograms that are proper for them. Among species, to which this problem refers, are *Carex hartmanii* and *C. buxbaumii*. Both sedges are included in the "Distribution Atlas of Vascular Plants in Poland" (Zajac and Zajac (eds) 2001) in the form of *Carex buxbaumii* aggregate. The distribution of these plants on the territory of Germany is also presented in the form of a common map, apart from their separate cartograms (Benkert 1998). In this connection, it was well-founded to take up a research on the occurrence of these species in Poland. With this end in view, a critical study of herbarium material was made. Basing on the results of carried out study, a distribution map of *Carex buxbaumii* in Poland was published (Sotek 2006a) and the occurrence of both sedges in the region of Northern Poland was presented (Sotek 2006b).

The Hartman's sedge is a rarely occurring and endangered species in Europe (Haeupler, Schönfelder 1988; Korneck et al. 1996; Benkert 1998; Wind et al. 1998; Holub, Procházka 2000; Moser et al. 2002). It is recorded in scattered localities, on swampy meadows, at stream banks, as well as on wet and variably wet meadows. It grows on soils moderately rich in nutrients, alkaline, neutral to moderately acid ones, peat-humous, sandy or loamy (Hegi 1967-1980).

Distribution of *Carex hartmanii* in Central Europe has not been completely recognized yet (Hegi 1967-1980; Tutin et al. 1980). Therefore, the present study aims at pre-

senting the distribution of *Carex hartmanii* in the territory of Poland, which will allow for obtaining a more complete picture of the shaping of range of this species in Europe.

MATERIAL AND METHODS

Description of the study object

The Hartman's sedge grows to a height of 0.3-0.7 m, develops narrow leaves (1-4 mm wide), which are grey-green and shorter than the stem. It is a loose-tufted plant, with creeping rhizomes. The apical spike is cylindrical, rarely female and more often bisexual, with few male flowers below, which however may take sometimes 1/4-1/3 of the ear length. Lateral spikes, 3-5 in number, are solely female, cylindrical, 1.5-3.5 cm long and 4-6 mm in diameter. The lowermost spikes can be sometimes branched. Female flowers have three stigmas. The flowering falls on May-June. Utricles are usually green or yellow-green, sometimes white-green, 2.7-3.5 mm long, and are poorly ribbed, with small papillae. On the top of utricle, a small beak is located with poorly developed straight teeth, or without them. Female glumes are symmetric, tipped with a longer or shorter husk. They are longer than utricles and generally cover them. No papillae are present along the midrib of female glumes (Mądalski 1960; Tutin et al. 1980; Rothmaler 1990; Egorova 1999).

General distribution

Carex hartmanii belongs to the Euro-Siberian sub-element. It occurs in areas of Central, Southern and Eastern Europe, in Middle Asia and in the western part of Siberia. In Central Europe, the Hartman's sedge reaches farthest to the north to the southern Fennoscandia, however does not cross 61° north latitude. In Europe, it was found, among others, in Austria, Finland, France, Germany, Norway, Po-

land, Czech Republic, Russia, Romania, Switzerland, Sweden, Hungary and Italy (Egorova 1999; Hegi 1967-1980; Hulten 1958; Hulten, Fries 1986). Hulten (1958) marked isolated localities in the southern part of the North America on a distribution map of this sedge. However, due to not taking *Carex hartmanii* into consideration in the "Flora of North America, North of Mexico" (2002) and frequent mistaking of this taxon with *C. buxbaumii*, it can be assumed with great probability that this species does not occur on the American continent.

Methods

The starting point for presenting the distribution of *Carex hartmanii* in Poland was a review of herbarium materials. Herbarium sheets, made available by the following herbaria: BIL – Herbarium of Białowieża, KRA – Herbarium of the Jagiellonian University in Cracow, KRAM – Herbarium of the Polish Academy of Sciences in Cracow, KTU – Herbarium of the Silesian University in Katowice, LBL – Herbarium of the Marie Curie-Skłodowska University in Lublin, LOD – Herbarium of the University of Łódź, OLS – Herbarium of the Varmian-Masurian University in Olsztyn, POZ – Herbarium of the Adam Mickiewicz University in Poznań, SZCZ – Herbarium of the Agricultural University in Szczecin, SZUB – Herbarium of the University of Szczecin, TRN – Herbarium of the Nicolaus Copernicus University in Toruń, UGDA – Herbarium of the University of Gdańsk, WA – Herbarium of the Warsaw University, WRAB – Herbarium of the Agricultural University in Wrocław, WRSŁ – Herbarium of the University of Wrocław, WSRP – Herbarium of the University of Podlasie, hb. Woł. – Herbarium of Dan Wołkowycki, were verified.

The scientific description of herbarium materials was mainly made basing on the features given by Egorova

(1999), paying particular attention to: a) cylindrical shape of spikes; b) flowers in the apical spike – few male or exclusively female; c) length of utricles; d) symmetry of female glumes; e) absence of papillae on the midrib of female glumes.

Basing on the carried out verification of herbarium sheets, it was found that *Carex hartmanii* was frequently identified as *C. buxbaumii*, whereas only occasionally happened that *C. buxbaumii* was identified as *C. hartmanii*. In this connection, in order to present a more precise picture of the distribution of *C. hartmanii* in Poland, it was resolved on taking into consideration not only the herbarium materials and those from own studies, but also published and unpublished localities, with respective data being presented on the distribution map by different symbols. All unpublished data are taken from ATPOL Data Base.

The distribution map of the Hartman's sedge was made with cartogram method, according to rules adopted at ATPOL, in which a basic grid unit is a 10×10 km square (Zając 1978). Habitat details are based on information from the descriptions on the herbarium labels, the literature and the author's own observations.

RESULTS

The Hartman's sedge occurs mainly on the territory of southern and central Poland (Fig. 1). Its most numerous localities are concentrated in the south-western and southern part of the country. The farther to the north, the less records of its occurrence are present and they are more scattered. In the northern part of the country, only four localities of this sedge occurrence are known, i.e. in the "Drożkowe Łąki" reserve in the Wolin National Park, the "Pia-

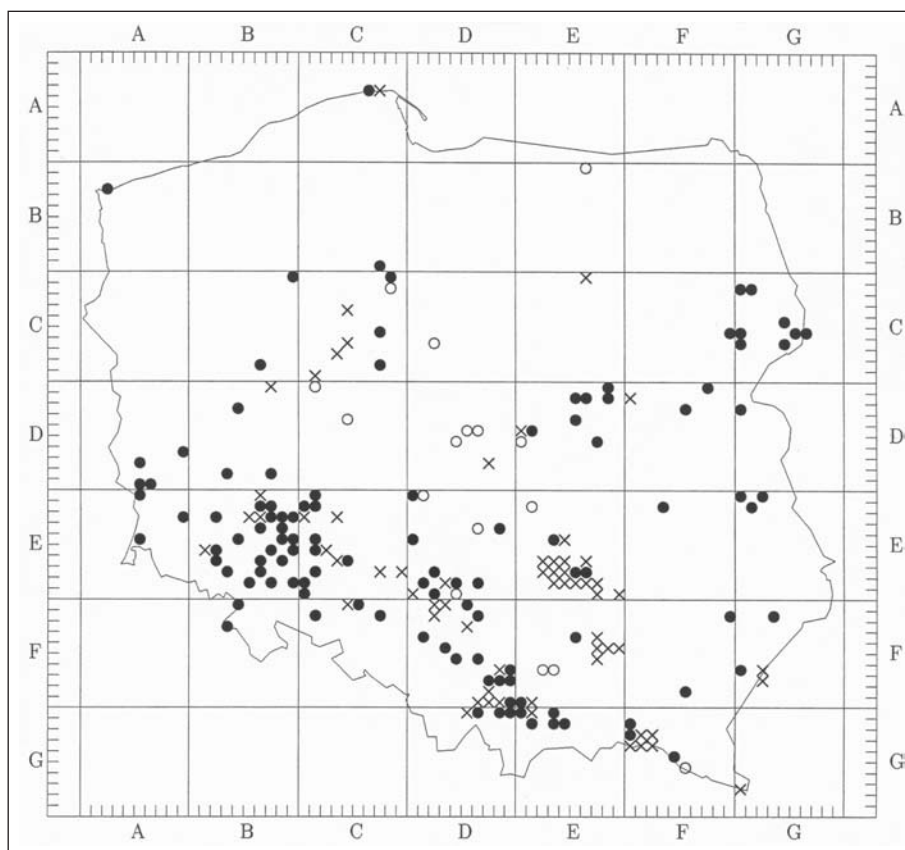


Fig. 1. Distribution of *Carex hartmanii* Cajander in Poland.
 ● station herbarial
 ○ station published
 × station unpublished

śnickie Łąki” reserve on the Kashubian Shoreland, in the vicinity of Dębki at the mouth of the Piaśnica river, and to the west of Korsze, a town in the Kętrzyn County, the Varmian-Masurian Province.

This species was often collected in Lower Silesia, however most localities from this area have not been confirmed for a long time now. The largest concentrations of recently recorded localities of the occurrence of *Carex hartmanii* are found in the Małopolska Upland, the West Beskidian Piedmont and the Western Beskids (Maków Beskids and Little Beskids).

The Hartman’s sedge grows in Poland on wet and variably wet meadows. It is sometimes met at stream banks, lake shores and pond-sides, in thickets and their vicinity, on forest margins and forest meadows, on grassy slopes, as well as on ditch escarpments. It appears in phytocenoses of the Molinietales order and in communities of the Magnocaricion alliance. In some localities, e.g. in the “Piaśnickie Łąki” reserve, it occurs in the Caricetum buxbaumii association. Populations of *Carex hartmanii* are frequently characterised by a low number of individuals and take up small areas. Frequently, its individuals are widely scattered.

DISCUSSION

In Poland, *Carex hartmanii* is recorded first of all in the south of the country, as opposed to *C. buxbaumii* (Sotek 2006a). Both these related to each other taxa show similar habitat requirements and sometimes occur together, e.g. in the “Piaśnickie Łąki” reserve (Herbichowa, Herbich 1993). More frequently, however, the presence of the Hartman’s sedge is found. This results most likely from its wider ecological spectrum (Hegi 1967-1980; Sotek 2006b). The collective map of *Carex buxbaumii* agg. published in the “Distribution Atlas of Vascular Plants in Poland” (Zajac and Zajac (eds) 2001) is primarily an illustration of the occurrence of the Hartman’s sedge.

In comparison with the range of *Carex hartmanii* in Germany (Haeupler, Schönfelder 1988; Benkert 1998), more localities of this sedge in Poland reach to the north. In Western Germany, almost all sites of its occurrence are more to the south, than those recorded in Poland.

Many historical localities of *Carex hartmanii*, dating back to the 19th century and the first half of the 20th century, have not been confirmed later, e.g. from the territory of Lower Silesia, like in Eastern Germany (Benkert 1998). It appears that a considerable part of them can be with great probability considered as not existing today. Some localities, which are in a close vicinity to urban agglomerations, were destroyed in result of development of these areas. Other ones, in particular those taking up small areas, could disappear, because this sedge is a weakly competitive species in relation to plants with similar habitat requirements. In this connection, attempts should be taken to find again old localities of the occurrence of the Hartman’s sedge, not only historical ones but also those that were recorded last time in the 50s and the 60s. In particular that some of the populations existing today, e.g. in the vicinity of the heritage park in Osowicze in the Podlasie region (Podlachia), are also at the stage of gradual disappearance. They are frequently characterised by a small number of individuals and their wide scattering. A serious threat for the localities of

C. hartmanii is posed by the spreading of willow thickets and purple moorgrass and the expansion of competitive sedges, as well as by the groundwater lowering. Many populations of this species may survive should they are under monitoring and active protection.

The Hartman’s sedge has been recognised as an endangered species in the neighbouring countries – Germany and Czech Republic (Korneck et al. 1996; Holub and Procházka 2000). On the other hand, it has not been placed so far on the red list of plants in Poland (Zarzycki and Szelaż 2006). Nevertheless, this species should be placed on that list under the threat category of endangered taxa due to a considerable reduction of the number of its localities in some regions of the country and a high degree of threat to the existing populations.

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