

***HIEROCHLOË ODORATA* (L.) P. BEAUV. IN RESTORED OX-BOW LAKES IN  
OPOLE (SW POLAND)**

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**ABSTRACT:** During floristic studies conducted in 2011 within the area of restoration project in Odra river valley in the city of Opole, the new locality of one of the rarest and threatened species in Opole Silesia, regarded presently as regionally extinct - *Hierochloë odorata* were found. A list of locations based on the literature data and new observations of *Hierochloë odorata* in anthropogenic habitats are presented. Details of newly discovered site with short habitat's description are given.

**KEY WORDS:** threatened plants, Opole province, flora conservation, Odra River

***Introduction***

*Hierochloë odorata* is a perennial rhizomatous grass of inflorescence shoots from (10-) 25 to 60(-90) cm high, known commonly due to typical smell of coumarin. Leaves are 3-6 mm wide, green. Inflorescence pyramidal with 25-100 spikelets. Lemmas of male florets are sparsely ciliate, lemmas of hermaphrodite floret with more or less appressed hairs towards apex (Rutkowski 2009; Weimarck 2005). Within the species *sensu lato*,

subspecies *baltica* G. Weim. is recognised as occurring in NW Russia and Baltic region (Weimarck 2005, Chrtek and Jirásek 1964).

*Hierochloë odorata* occurs mostly on wet meadows (including *Molinion*), riversides and lake margins (Weimarck 2005; Conert 1998). Zarzycki et al. (2002) suggest that the *Molinietalia caeruleae* order is the typical habitat of *Hierochloë odorata*, however the species has been found also in man made habitats and even ruderal communities (Ćwikliński and Głowacki 1996; Rostański et al. 2005; Geśicki 2006). The species represents Circum-Boreal sub-element (Zajac M., Zajac A. 2009). It is also classified as a submeridional-moderate-boreal and continental species of circumpolar distribution (Meusel et al. 1965). Its range covers northern and central Europe, north Asia and North America (Weimarck 2005). It prefers sandy, wet and fertile soils, usually acidic and rich in humus. The species is legally protected in Poland (Rozporządzenie 2012).

In Poland *Hierochloë odorata* has sparse distribution and most of its localities is situated in the lowlands of northern and central Poland (Gawłowska et al. 1989; Zajac A. and Zajac M. 2001). In the Opole voivodeship *H. odorata* has been reported from only two localities in Siedlec and Ulanowice near Otmuchów (Fiek 1881; Schube 1903) in Strzelińskie Hills mesoregion in south-western part of the province. Because the species, despite the thorough monitoring of the historical localities, has not been confirmed after 1945, it was evaluated as regionally extinct (Nowak A. et al. 2008). It is regarded as an endangered species in Upper as well as Lower Silesia (Parusel et al. 1996; Kački et al. 2003) and critically endangered in Czech republic (Procházka 2001). At the scale of Poland the species is considered as vulnerable (Zarzycki and Szelağ 2006).

### **Methods**

Field investigations were conducted in 2011. The relevés were made using the Braun-Blanquet method (Braun-Blanquet 1964). The syntaxonomical classification is given due to Matuszkiewicz (2007). The nomenclature of plants follows Mirek et. al. (2002).

The localities description comprises exact stand location, population size, plant assemblage in which *Hierochloë odorata* occurs and threats on new sites.

### **Results and conclusions**

#### **The new location**

A new site of *Hierochloë odorata* is located to the centre of Opole city (N 50° 40' 44.7'', E 17° 54' 13.7''; ATPOL square: CE95) (fig. 1). It is a grassland area on the banks of the artificially restored ox-bow lakes in Odra river valley. Floristic

composition of the community in which *Hierochloë odorata* has been recorded is presented in the relevé below:

Opole; 50° 40' 44.7'', E 17° 54' 13.7''; Date: 26.06.2011; height: 148 m a.s.l.; surface: 25m<sup>2</sup>; cover of the herb layer (c) – 85%; number of species in relevé – 23; *Hierochloë odorata* +, *Trifolium hybridum* 3, *T. pratense* 2, *Poa pratensis* 2, *Festuca rubra* 2, *Polygonum lapathifolium* 1, *Vicia cracca* 1, *Taraxacum sp.* 1, *Plantago lanceolata* 1, *Astragalus cicer* 1, *Carex hirta* 1, *Ranunculus repens* 1, *Lysimachia nummularia* 1, *Agrostis alba* +, *Lythrum salicaria* +, *Potentilla anserina* +, *Leucanthemum vulgare* +, *Tanacetum vulgare* +, *Dactylis glomerata* +, *Conyza canadensis* +, *Leontopodium taraxacoides* +, *Lotus uliginosus* +, *Phragmites australis* +.

The newly discovered population of *Hierochloë odorata* is located within the area of man-made habitat. The artificial ox-bow lakes were created within the embankments of "Ulga" channel in Odra River valley as a result of compensation measures undertaken in 2001. The population of *Hierochloë odorata* is located at the edge of middle pond (ca. 7,1 acres) in-between the two side ponds (6,3 acres and 19,85 acres). Since the creation of the reservoirs the flora monitoring was implemented focused on the endangered and legally protected species (Nowak A. and Nowak S. 2007). The population of *Hierochloë odorata* was found after 10 years of this inventories, so, the occurrence of that plant is surely not a direct result of the ox-bow lake creation. This is rather an indirect effect of creation a suitable habitats for the development of early successional meadow communities, from Molinietalia order, typical for periodically inundated alluvia's of Odra River. This features makes the population in Opole similar to other known from river valleys in Poland (Zajac A. and Zajac M. 2001). The difference is only the origin of habitat. In the case of Opole, the habitat was created due to conservation project dealing with recreation and restoration of typical for river valleys, eutrophic, small water bodies, generally for rush and water plant species maintenance. The neighbourhood of the ox-bow lakes is used as a meadow and mowed three times a year. Since 2005 also sheep grazing has been introduced.

Due to instability and dynamics of river side habitats as well as because of the high anthropogenic pressure in the city centre related to the recreational usage of the area of the Odra River valley, the population of *Hierochloë odorata* seems to be at considerable risk of disappearance. The small population size (several specimens) also support this suggestion. Thus, the maintenance of these population depends on careful monitoring and effective conservation management of the area.

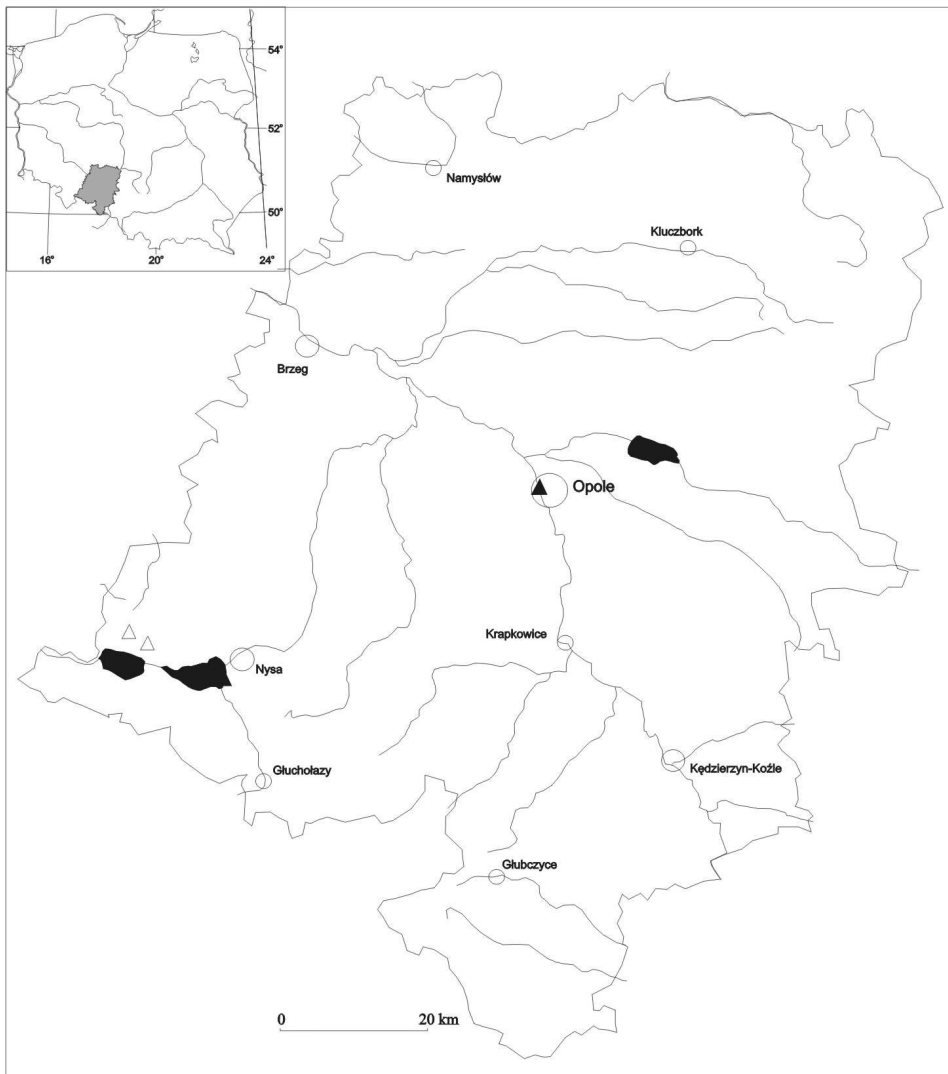


Fig. 1. Distribution map of *Hierochloë odorata* (L.) P. Beauv. in Opole Silesia. Δ - literature locality not confirmed after 1990, ▲ - new locality.

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