

Recent rediscovery of the epiphytic moss *Orthotrichum pulchellum* Brunt. in Poland

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A b s t r a c t: *Orthotrichum pulchellum* Brunt. has been collected in Poland recently. So far, only one old record of the species from the nineteenth century is known from this country. The epiphytic moss has been discovered recently on three localities in the north-western part of the country. Diagnostic features and ecology are presented. The historical and recent findings of the species in Poland are briefly discussed and its current distribution is mapped. It is suggested that the species should be placed on the red-list of mosses in Poland in the category “Indeterminate”.

K e y w o r d s: *Orthotrichum pulchellum*, mosses, bryoflora, spreading, oceanic species, Poland

Introduction

During bryofloristic fieldwork in the Western Pomerania region, situated in the NW part of Poland, the epiphytic moss *Orthotrichum pulchellum* Brunt. was collected in 2012 and 2013. These findings are the first records of the species in the country since nearly one and half century. Previously, *O. pulchellum* was collected only once by R. Ruthe in Golice [*germ.* Grüneberg] near Mieszkowice on an erratic block (Ruthe 1867, cfr. Milde 1869, Limpricht 1895, Warnstorf 1906, Düll 1994). Unfortunately, no herbarium material of the species from this locality was located in the herbaria consulted, including B, JE, POZG and S. Interestingly, the record of this species from Poland was overlooked by Szafran (1961) who failed to include it in the moss Flora of the country.

Orthotrichum pulchellum has a disjunctive distribution including the western part of North America and Western Europe. On the European continent it was reported from many countries situated mainly along the western seacoasts (from southern Scandinavia to northern Spain). The number of its localities has increased recently and the moss appears to be spreading to the east (Frahm 2002, Mueller 2004, Plášek & Marková 2007, Marková & Plášek 2013).

Diagnostic features

Orthotrichum pulchellum is an epiphytic moss, about 1-1.5 cm high. From most related Central European species of the genus *Orthotrichum* it is distinguished mainly by crisped-flexuose stem leaves and exerted capsules. These characters make it similar to the species of the genus *Ulota*, with which it may be confused. However, *Orthotrichum pulchellum* can be easily distinguished from them by having 16 conspicuously orange exostome teeth (rarely united into 8 pairs), immersed stomata and a glabrous, at the base more or less plicate calyptra. In addition, the marginal cells of the leaf base (thin-walled, hyaline, quadratic), a marked characteristic for *Ulota* species, are lacking in *O. pulchellum*.

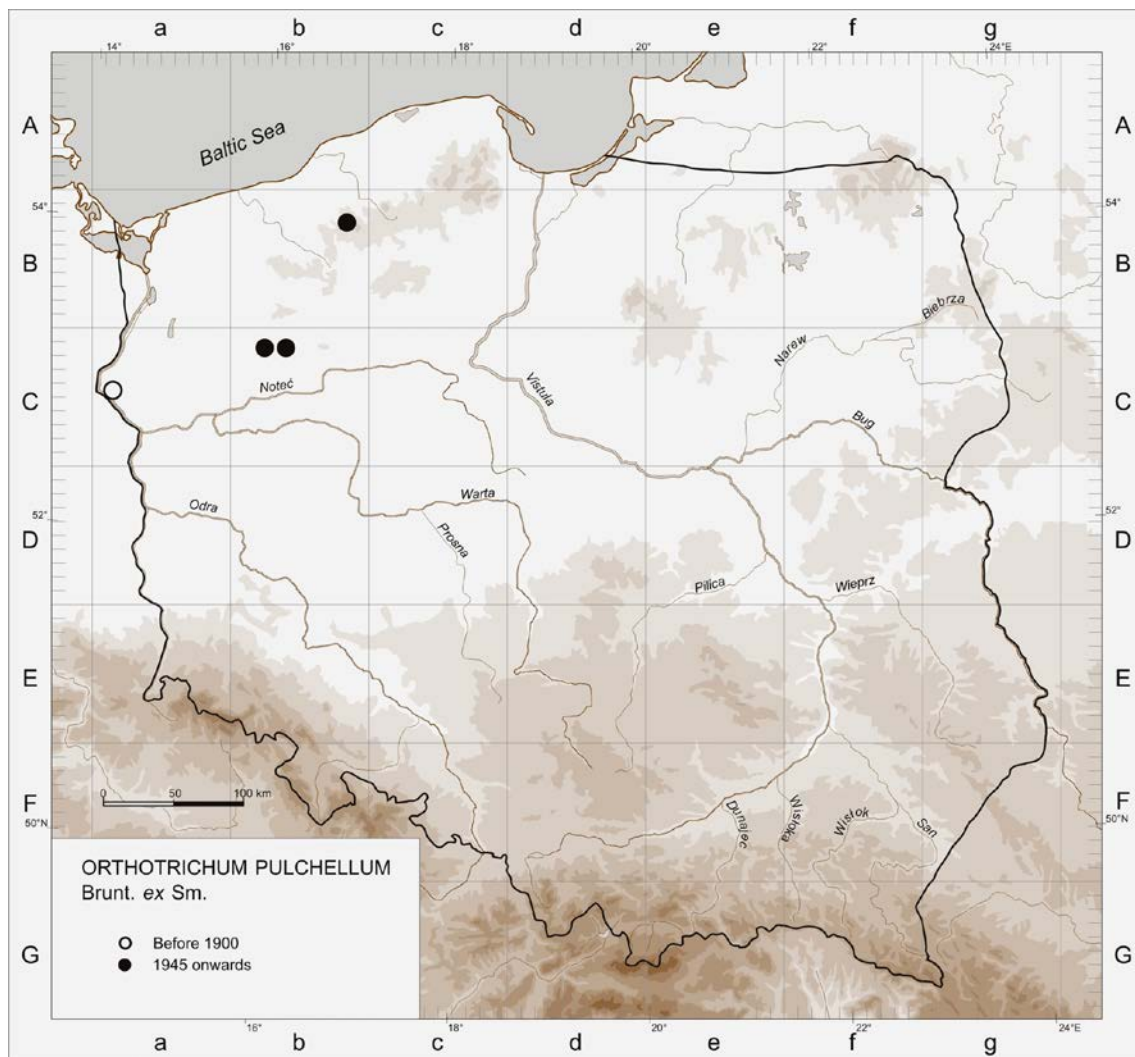
Description of the localities

Historical locality

- 1) ATMOS grid square [Ca 41], NW Poland, Western Pomerania, Pojezierze Zachodniopomorskie [=Western Pomeranian Lakeland], Pojezierze Myśliborskie [=Myślibórz Lakeland]: Golice village, 17 km NW of Mieszkowice town, on glacial erratic rock, a single tuft with a few sporophytes, leg. R. Ruthe (Ruthe 1867: p. 58; Milde 1869: p. 179; Limpricht 1895: p. 59; Warnstorf 1906: p. 385; Düll 1994: p. 184).

Recently discovered localities

- 2) [Cb 12], NW Poland, Western Pomerania, Pojezierze Południowopomorskie [=Southern Pomeranian Lakeland], Równina Drawska [=Drawsko Plain]: Bogdanka village, 11 km SE of Drawno town, near to Drawieński National Park, GPS (WGS-84): 53°08'49"N, 15°52'37"E, edge of a forest, along river; on a trunk of *Sambucus nigra*, 6. IV. 2012, leg. Jacob Koopman, teste V. Plášek [priv. herb. of Jacob Koopman, duplicates are in KRAM and Herbarium of University of Ostrava].
- 3) [Bb 28], NW Poland, Western Pomerania, Pojezierze Zachodniopomorskie [=Western Pomeranian Lakeland], Wysoczyzna Polanowska [= Polanów Heights]: Gołogóra village near Polanów town, GPS (WGS-84): 54°0'16"N, 16°44'31"E, along forest-road, on a trunk of *Salix* sp., 1. VI. 2012, leg. Jacob Koopman, teste V. Plášek [priv. herb. of Jacob Koopman, duplicates are in KRAM and Herbarium of University of Ostrava].
- 4) [Cb 13], NW Poland, Western Pomerania, Pojezierze Południowopomorskie [=Southern Pomeranian Lakeland], Pojezierze Wałeckie [=Wałcz Lakeland]: Drawieński National Park, near Tuczo town, 1 km S of edge of Sitno lake, right side of Płociczna river, a place of a former settlement called Rohrfort, GPS (WGS-84): 53°10'28"N, 16°01'33"E, in a cluster of *Acer pseudoplatanus*, on trunks and branches of eight trees of *Acer pseudoplatanus* and one *Rhamnus cathartica*, 0.3-3.0 m above ground, 14. V. 2013, leg. Albert Wiaderny, teste V. Plášek [priv. herb. of Michał Smoczyk #3227, duplicates are in KRAM and Herbarium of University of Ostrava].



Map 1: Distribution of *Orthotrichum pulchellum* Brunt. in Poland.

Discussion

The epiphytic moss *Orthotrichum pulchellum* is considered to be an oceanic species (Schäfer-Verwimp 2001, Frahm 2002). Its occurrence is known from the west coast of North America and accordingly along European seacoasts. The results of a recent survey in Germany showed an increasing number of localities and it looks as if the moss is spreading to the east (Frahm 2002). For example, in Saxony the species was found in 2002 for the first time and after two years it was observed in more than 20 localities (Mueller 2004). As a species new to the Czech Republic it was recorded in 2006 (Plášek & Marková 2007) and currently more than 20 localities are known, situated mainly in the western part of the country (Marková & Plášek 2013).

The spreading of this oceanic species inland is apparently related with both the climate changes and air quality improvements (Bosanquet 2009). Among the significant climate elements can be considered the effect of mild winter temperatures and higher precipitation. Such climate changes have recently been confirmed by meteorologists in Europe. Likewise, improving the air quality has a positive effect on the spreading of most epiphytic bryophytes.

Orthotrichum pulchellum was recorded growing at the bark of *Sambucus nigra*, *Acer pseudoplatanus*, *Salix* sp. and *Rhamnus cathartica* in the study area. From the historical locality near Golice the species was mentioned for a granite erratic (Ruthe 1867), which is very unusual for this species.

At the locality in the Drawieński National Park near Tuczno this species was found growing together with *Orthotrichum speciosum*, *Radula complanata*, *Frullania dilatata*, *Hypnum cupressiforme*, *Brachythecium rutabulum* and the lichen *Parmelia sulcata*. Higher above the ground, on drier bark of *Acer pseudoplatanus*, *Orthotrichum pulchellum* forms its own aggregations, with very few individuals of *Radula complanata* or *Parmelia sulcata*, while on more humid bark below, it grows among the bigger tufts of *Orthotrichum speciosum* and a small number of individuals of *Hypnum cupressiforme* and other large pleurocarpous mosses typical for basal parts of trunks. *Orthotrichum pulchellum* occurs in corticolous epiphytic moss communities from the order *Orthotrichetalia* Hadač in Klika & Hadač 1944 (Hübschmann 1986, Marstaller 1993).

Considering the present spreading of *Orthotrichum pulchellum* in Europe, the species is probably under-recorded in Poland. There are several localities of this species in Brandenburg and Mecklenburg-Vorpommern in Germany situated close to the Polish boundary (Meinunger & Schröder 2007). This clearly suggests the possibility of the discovery of the species in western Poland in the areas along the Oder and the Lusatian Neisse rivers.

Orthotrichum pulchellum has not been hitherto placed on the red-list of mosses in Poland (Żarnowiec et al. 2004). It was because only species of which voucher collections are available have been placed on it. Certainly, the species should be added to this list in the “I” (indeterminate) or “DD” (data deficient, according to new IUCN guidelines version 3.1 – IUCN 2012) categories. At the moment there is not enough information to indicate which of the threatened categories in the IUCN system is appropriate for *O. pulchellum* in Poland. The newly discovered populations are in a good condition and unthreatened. At the localities in the Drawieński National Park and its surroundings (near Tuczno and Bogdanka), the status of protection of habitats, where this species was found, may be considered as sufficient (national park with its buffer zone). Both sites 2 and 3 (Polanów and Bogdanka) are little influenced by human activity, so the populations seem to be rather safe. Both consist of several tufts with sporophytes. The population near Tuczno is very rich and there are spots on the bark of trees, where *O. pulchellum* is a dominant species. Along the banks of the Płociczna river, potential habitats for this species are very common: riparian forests from the alliance *Alno-Padion* with *Orthotrichetalia* communities as synusia; the same refers to the valleys of other rivers in the Drawieński National Park, which are connected to Płociczna (Cieszynka, Runica, Słopica,

and Drawa with its tributaries) so it seems there are no barriers for spreading of *Orthotrichum pulchellum* in this area.

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