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Polystichum braunii
in the Hojná Voda virgin forest (South Bohemia) –
a new Alpine migration element for Bohemia

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Abstract: Until now, *Polystichum braunii* has only been reported in South Bohemia from the Blanský les (Český Krumlov district), about 120 years ago. There is no existing herbarium specimen from the locality and the locality has never been verified again. For this reason, *P. braunii* had been considered as an uncertain taxon for the flora of South Bohemia. A new locality of the species was found in 2002, close to the village of Hojná Voda, on the slope of Vysoká Hill in the Novohradské hory Mts. *P. braunii* grew at the locality as only two specimens in a stony beech forest in the National Natural Monument Hojná Voda (virgin forest). The locality is situated in the vast Alpine-Carpathian disjunction of the distribution of *P. braunii*. *P. braunii* in South Bohemia probably represents a new Alpine migration element for Bohemia. We suggest its classification as a critically endangered plant species of South Bohemia. A map of its distribution within the Czech Republic was compiled.

Key words: Dryopteridaceae, ferns, Pteridophyta, Czech Republic, Novohradské hory Mts, floristic records

1 Introduction

The authors of the paper, together with Karel Boublík, have been carrying out a grid mapping of vascular plants in the territory of the Novohradské hory Mts since 2000. In the course of a field survey in 2002 the species *Polystichum braunii* was found in the virgin forest Hojná Voda, the occurrence of which in South Bohemia was only mentioned once, in a doubtful record from the late 19th century (CHÁN 1999). The aim of the article is to give information about a new locality and point out its phytogeographical importance.

The Novohradské hory Mts are situated in South Bohemia, c. 10 km SW of the town of Nové Hradý. In the north-south direction, it lies between the village of Horní Stropnice and the state frontier with Austria, and in the west-east direction between the village of Malonty and the state frontier. They are an off-shot of a vast mountain area, which is called Freiwald and Weinsberger Wald in Austria (CHÁBERA et al. 1972). In terms of regional phytogeography they are regarded as a montane phytogeographical district (SKALICKÝ in HEJNÝ & SLAVÍK 1988). The flora of the Novohradské hory Mts is featured by a relatively rich occurrence of montane, boreoalpine and subatlantic species. Plants of the Alpine migration element are richly represented there (e.g. *Veratrum album* subsp. *album*,

Willemetia stipitata, *Ranunculus aconitifolius*, *Soldanella montana*, *Crocus albiflorus*, *Cardamine trifolia*). A comparably high concentration of Alpine migrants in the Czech Republic can only be found in the south-eastern Bohemian Forest (KUČERA 1984). The significance of the Novohradské hory Mts for biological sciences is demonstrated by a high number of small-scale protected areas (ALBRECHT et al. 2003), including the two oldest forest reserves in the Czech Republic – the National Natural Reserve Žofínský prales and the National Natural Monument Hojná Voda, which were established as early as 1838 by the then owner of the domain J. A. Buquoy. Efforts to establish the Protected Landscape Area Novohradské hory have been undertaken repeatedly since 1964 (POLÁK 2002). The area was declared a protected area of natural water accumulation in 1974 (POLÁK 1983), a natural park in 1999 and a bird area in 2004.

The Novohradské hory Mts are, despite their relatively high importance for biological sciences, an insufficiently surveyed area. The first botanical records were carried out by A. Schott and J. Jahn in the late 19th century (SCHOTT 1894, 1896, JAHN 1894). In the course of the following 60 years nobody paid interest to the botany of the area in detail. Botanical research of the Novohradské hory Mts was carried out from the 1960s to the early 1990s by S. Kučera, however, most of the data collected by him have not been published yet. The relatively low degree of research done and the high scientific significance were the main reasons for which the authors started a detailed grid mapping survey of vascular plants (into map fields with the size of 1/64 of the basic field of the Central European grid mapping sensu EHRENDORFER & HAMANN 1965). This contribution is one of the partial outputs of the mapping project, the same as some works already published (LEPŠÍ & LEPŠÍ 2002, 2004a, 2004b, CHÁN et al. 2004, LEPŠÍ et al. 2006).

2 Material and methods

The distribution map of this species within the Czech Republic is based on the compilation of data from literature (ČELAKOVSKÝ 1883, SLAVÍK 1986, HRADÍLEK 1997, HORN et al. 1999, KOŠNAR & KOŠNAR in HADINEC et al. 2004). The basic squares of the Central European grid mapping was used (EHRENDORFER & HAMANN 1965). The altitude and coordinates (WGS-84) of the new locality were taken from the electronic version of Geobáze (ANONYMUS 2000). Names of taxa follow KUBÁT et al. (2002) and the nomenclature of the syntaxa follows MORAVEC et al. (1995). Taxa not included in these publications and syntaxa are mentioned with their authors. To estimate the abundance of species in the phytosociological relevé we used an extended Braun-Blanquet scale (2m = cover 1–5%, 2a = 6–15%, 2b = 16–25%; cf. WESTHOFF & VAN DER MAAREL 1973).

3 European and World distribution

The centre of distribution of *Polystichum braunii* in Europe is situated in the mountains – the Pyrenees, Alps, Carpathians and southern Scandinavia. Outside these areas the species is rare in Europe. It is also known from the Caucasus, Iran, the Far East and Japan. North America is home to plants whose taxonomic relationship to the Euro-Asian *P. braunii* has not been clarified satisfactorily (DOSTÁL in KRAMER 1984, ŠOURKOVÁ in HEJNÝ & SLAVÍK 1988).

4 Ecological requirements in Central Europe

In Europe its most common habitat are montane and submontane shady forests with high air humidity (Fagion, Tilio-Acerion, Athyrio alpestris-Piceion), rarely subalpine tall-fern vegetation of plains (Dryopterido-Athyrium). It favours soils rich in nitrogen and bases, grows on mildly acidic rocky and clay soils (DOSTÁL in KRAMER 1984, ŠOURKOVÁ in HEJNÝ & SLAVÍK 1988).

5 Distribution in the Czech Republic, Austria and Germany

In the Czech Republic *Polystichum braunii* is abundant only in North Moravia and Silesia, where its occurrence is part of its Carpathian distribution, otherwise it is rather rare or completely absent in most of Czech territory (ŠOURKOVÁ in HEJNÝ & SLAVÍK 1988) (see Fig. 1). In Austria it occurs mainly in the Central Alps. It is almost absent in the northern parts of the country (JALAS & SUOMINEN 1972) and there are also no records from the provinces Vienna and Vorarlberg (FISCHER et al. 2005). There is only one record in Upper Austria – in the Kogelgassenwald virgin forest near the lake Hinterer Gosausee (SPETA 1985). However, the locality could not be verified, and it is probable that it had been confused with *Polystichum aculeatum* (O. Stöhr in litt. 2006). There are only two localities recorded in Lower Austria: the surroundings of Aspang and Kranichberg (JANCHEN 1966). In Germany the species occurs very rarely in the Allgäuer Alps, in Hessen (Hoher Meissner), the Southern Black Forest and there is a small, recently discovered population near Staatsforst Zwiesselerwaldhaus in the Bavarian Forest (HORN et al. 1999).

It is obvious from the distribution described above that there is an extensive disjunction between the Carpathian and Alpine areas, interrupted by a few isolated localities (e.g. the Bavarian Forest, South Moravia).

6 Historical records from South Bohemia

The only evidence of the occurrence of *Polystichum braunii* in South Bohemia is an old record from the Blanský les near Český Krumlov – “U Krumlova v Blanském lese!” (ČELAKOVSKÝ 1883). The find was made by F. Mardetschläger, the deacon in the Slavkov parish near Český Krumlov, who was preoccupied with the research of flora in the surroundings of Český Krumlov and České Budějovice (MARDETSCHLÄGER 1869, KLÁŠTERSKÝ et al. 1982). He made some of his finds available to the then organiser of the Czech floristic research L. Čelakovský, who, besides his own research, collected and published the finds of his collaborators, regional amateur botanists. He put an exclamation mark to plants that he revised himself. Mardetschläger's locality of *P. braunii* is followed by an exclamation mark, too, however, it is not quite clear whether Čelakovský only saw a herbarium specimen or whether he visited the locality in person. The herbarium specimen (provided that it was made), however, has not been preserved till today (ŠOURKOVÁ in HEJNÝ & SLAVÍK 1988). Mardetschläger's locality has never been verified since the first find, it was merely quoted (cf. TANNICH 1929, DOSTÁL 1948-1950, 1989, SLAVÍK 1986). For this reason the species had been considered as an

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