

## RELATIONSHIP BETWEEN POLLEN AND FLORISTIC DIVERSITY IN THE RECENT LAKE SEDIMENTS AND MOSS POLSTERS IN CENTRAL EUROPE

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Palynological reconstruction of Holocene vegetation changes requires understanding of cross-scale relationships between floristic and pollen diversities. We explored the relationships in two regions differing in dominant vegetation and diversity patterns. The White Carpathians are a biodiversity hotspot of thermophilous vegetation comprising dry-mesic grasslands and broadleaved forests, while the Bohemian-Moravian Highland is dominated by species-poor coniferous forests, meadows and wetlands. In each region, 40 sites covering the major habitats were sampled for plant and pollen diversity. A detailed floristic survey in radii of 10 and 100 m and in two transects of 1,000 m was conducted at each site. Recent pollen diversity was sampled by gravity corer in ponds and quarries in the Bohemian-Moravian Highland at 20 sites. The rest of sites were moss polsters taken in the centre of each site. Altogether, 1260 plant species were recorded and more than 219 pollen taxa were identified. The total number of plant species was similar in both regions (942 species-poor region and 965 species-rich region), but number from Bohemian-Moravian Highland is biased large area surveyed around water deposits. When selecting 20 terrestrial sites with equal vegetation sampling effort and rarefied pollen sum to 827 pollen grains, we obtained expected pattern.

Palynological diversity follows floristic diversity according to habitats and regions. Interestingly, palynological diversity in ponds and quarries is significantly higher than terrestrial habitats in Bohemian-Moravian Highland, similarly as a floristic diversity due to larger sampling area. It indicates, that whole area of the lake shore and lake watershed contributes to the pollen assemblage in the lake.

Higher proportion of *Abies* in the recent lake sediments also links to better flotation capacity of the saccate pollen grains (Albert & Pokorný 2012). Another dispersal-depositional bias was identified at forested sites in both regions. They had a higher proportion of the regional pollen component (*Ambrosia*, *Artemisia*, Chenopodiaceae family) than the open sites, in spite of the fact that those taxa occupy open habitats. Pollen is trapped on the larger leaf/needle area of the trees and subsequently washed to a moss polster.

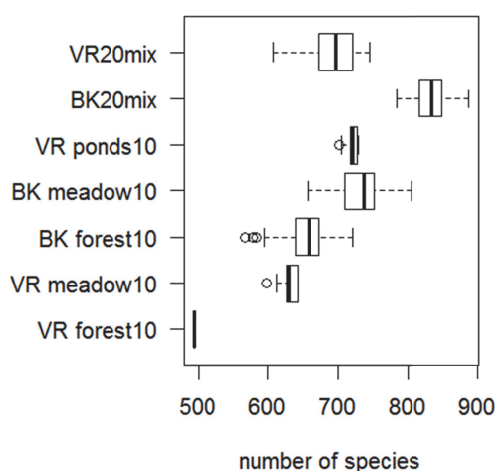


Fig. 1. Boxplot showing number of species (floristic) recorded in different regions/habitats (BK - White Carpathians, VR - Bohemian-Moravian Highland). Two upper graphs show floristic diversity at 20 terrestrial sites randomly selected independently on habitat. Five lower graphs floristic diversity at 10 sites randomly selected in each habitat

Regression analysis between floristic and palynological diversity showed similar R squared in both regions (0.5-0.6). Following Odgaard (1999) we tested whether the pollen productivity is a main bias influencing the palynological diversity. We calculated relative pollen productivity from the same pollen-vegetation dataset and found substantial differences in relative pollen productivity (eg. Poaceae 1, *Quercus* 1.5, *Picea* 2.1, *Betula* 2.5, *Alnus* 3.1). We divided pollen counts of the main dominants by those values and also rarefied pollen counts to equal pollen sum. We found that pollen productivity calculated from the same pollen-vegetation dataset did not improve the diversity relationship.

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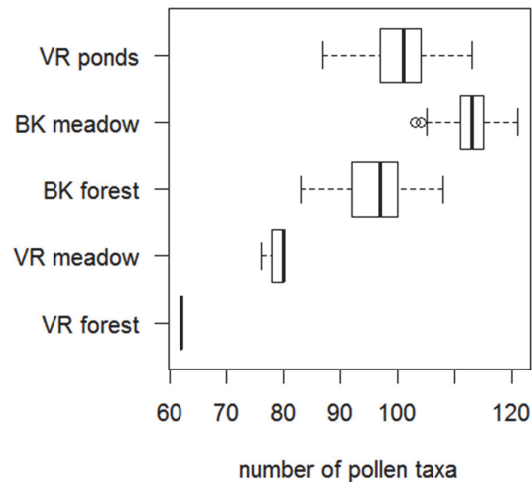


Fig. 2. Boxplot showing number of pollen taxa recorded in different regions/habitats (BK - White Carpathians, VR - Bohemian-Moravian Highland). Graphs show pollen diversity at 10 sites randomly selected in each habitat

#### REFERENCES

1. Albert B. Pollen Taphonomy and Hydrology at Vranský potok versus Zahájí Alluvial Pollen sites: Methodological Implications for Cultural Landscape Reconstruction in the Peruc Sandstone Area, Czech Republic. IANSA – 2012. – Vol. 3, № 1. – P. 85–101.
2. Odgaard B. V. Fossil pollen as a record of past biodiversity. Journal of Biogeography – 1999. – Vol. 26, № 1. – P. 7–17.

### NEW DATA ON THE QUATERNARY SEDIMENTS' STRUCTURE OF THE PETROZAVODSKAYA BAY OBTAINED WITH RESULTS OF THE SEISMIC PROFILING

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The data about quaternary deposits of the Petrozavodskaya bay was received during the expedition on the Onega lake in 2016. These researches were provided by Marine Research Center of Moscow State University, Saint-Petersburg State University and Northern Water Problems Institute of Karelian Research Center of RAS. The works included: seismic profiling, geological sampling and side-scan sonar. High-frequency electrodynamic source of radiation “Boomer” and low-frequency electrosparking source of radiation “Sparker” were used in seismic profiling. At last, 70 km of seismic profiles were received. The profiles form the polygon, 8 km at length and 2,5 km at width. For this report longitudinal profile NS\_GP\_S\_09 and transverse GP\_P\_03 were chosen (fig.1). They were analyzed and interpreted in software Kingdom IHS.