RECENT AND PAST DIVERSITY AND ONGOING ENVIRONMENTAL CHANGE WITHIN CENTRAL EUROPEAN OMBROTROPHIC WETLANDS

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The peat bogs in the Jizerské hory and in the Jeseniky Mts. (crossborder area among Czech Republic, Poland, and Germany), represent unique ecosystems within Central Europe, characterized by ombrotrophic conditions, a very low pH and an unaffected water regime.
Both regions, 150 km distant mountain ridges in the Sudeten Mts., differ in their air contamination and deposition loads, especially that which was supplied to them in the past. The depositional load was high, particularly at the end of the 1980's; and only recently have the first symptoms of environment recovery been observed.
Permanent sampling plots were established in both areas in 1991 - 1993, in order to monitor the environmental changes. Diatoms, desmids, testate amoebae, bryophytes, and vascular plants were sampled recently at 59 permanent plots. At the same set of plots, water-chemistry and water-level dynamics had been monitored three times a year during 15 years before the species-data sampling. Furthermore, bryophyte herbarium specimens were used for studies on the past diatom diversity. We tested the species-environment relationships by Canonical correspondence analyses with Monte Carlo permutation tests and by the Mantel tests.
A total of 47 diatom species occurred at 59 sites within13 ombrotrophic mires along the Czech-Polish-German border areas. Both regions do not differ in diatom species richness, and the two-group pattern along Axis 1 in NMDS ordination analysis do not correspond with the regional distribution. The inter-site variation in diatom assemblages is lower than the intra-site variation. The combination of three environmental variables (conductivity, pH, and hight above water table - HWT) appears to be able to explain the diatom distribution patterns.
While all taxonomic groups responded to a natural gradient of water level, only short-lived and well-dispersing diatoms and testate amoebae responded to the pH/calcium gradient which has appeared recently in one region because of aerial liming. Single measurements of environmental parameters were sufficient to describe this pattern.
We confirmed that long-lived organisms do not respond as rapidly to changing environment to indicate reliably either ongoing environmental change or restoration of natural conditions. On the other hand, response of well-dispersing short-lived organisms differs by taxonomic group and may be obscured by more complex relationship to environment. Bioindication systems should therefore include more groups of organisms. Herbarized bryophytes has been successfully used to assess subrecent diatom diversity in mires sensu „paleolimnology withouth a core".