

Diatoms as paleoecological indicators of environmental change in the Lake Czechowskie catchments ecosystem (Northern Tuchola Pinewoods, Poland)

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In this study we investigated four cores of biogenic sediments from the lakes located in close vicinity. Three cores are situated along a transect in the Lake Czechowskie basin from its deepest point towards a former lake bay. The fourth sediment core was retrieved from the nearby Trzechowskie paleolake. Lake Czechowskie is located in the northern part of the Tuchola Pinewoods District (Northern Poland) in a young glacial landscape. At present, the majority of the area is forested or used for agriculture.

The main focus of the study was Late Glacial and early Holocene period. We performed diatom, Cladocera and pollen analyses, the chronology was established by varve counting, confirmed by AMS ^{14}C dating and Laacher See Tephra (Wulf et al. 2013). In this study we focused on the results of diatom analyses. Diatom assemblages are integrated indicators of environmental change because their distributions are closely linked to water quality parameters including such as nutrient availability.

At the beginning of Allerød there are more eutrophic diatom taxa such as *Staurosira construens*, *Pseudostaurosira brevistriata*, *Staurosira pinnata*. These species are widely distributed in the littoral mainly freshwater, many of which are species of epiphytic, preferring water rich in nutrients. At the end of the Allerød we observe significant changes within diatom assemblages. The increase of planktonic *Cyclotella comensis* together with the decrease of benthic *Staurosira construens* indicate the shortening of time with ice cover on the lake and longer time with summer stratification. In the Younger Dryas cooling we can see the increase of the abundance of diatom *Staurosira construens* which indicate cold spring and late ice-out (Bradbury et al., 2002). At the early Holocene planktonic diatoms increase in particular *Cyclotella comensis*, *Punctulata radiosa* and *Cyclotella praetermissa*. Some of *Aulacoseira* species at the end of Younger Dryas. The Holocene sediments showed no variation of the species composition. Planktonic diatoms dominate in all studied location, especially *Cyclotella comensis*, *Punctulata radiosa*, *Cyclotella praetermissa* and *Stephanodiscus parvus*.

The results of our research shows that diatom communities were sensitive to climatic changes, which are well reflected in lake environment conditions. The strongest shifts in species assemblages were noted at the beginning of the Allerød, the Younger Dryas onset and the transition into the early Holocene. The Late Glacial climate fluctuations caused more abrupt lake environment changes than during the Early Holocene.

This study is a contribution to the Virtual Institute ICLEA (Integrated Climate and Landscape Evolution Analysis) funded by the Helmholtz Association. The research was supported by the National Science Centre Poland (grant NCN 2011/01/B/ST10/07367).

Literature:

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