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1 Spectroscopic analysis of chromatographically separated molecular fractions of sedimentary dissolved organic matter

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Investigation of the properties of sedimentary organic matter is an important topic of

environmental and geological sciences. During sediment formation different compounds accumulate. Thus sediment investigations can be used as a tool to assess the contamination of aquatic ecosystems. Each sediment layer represents an archive for environmental conditions corresponding to a certain time period.

Sedimentary organic matter in the lake consists of organic constituents both in particulate and dissolved phases. As dissolution, precipitation, adsorption and other processes are occurring in sediment, the dissolved organic matter (DOM) should reflect the results of those processes. DOM itself is considered to be polydisperse mixture of organic macromolecules with still unknown structure, a wide variety of molecular masses and numerous chemical properties.

Analytical methods based on size exclusion chromatography have been often used to characterize DOM. Great advantages of this method are its non-destructive char-

acter, small sample volumes required for analyses and minimal sample pretreatment. Method is reliable and sensitive. However, method is relative since its accuracy depends on the calibration material. Standard material should be of the same structure that the analysed compounds which is difficult to achieve in case of DOM analysis. When high-performance size exclusion chromatography (HPSEC) as separation method is coupled with diode-array detector (DAD) it is possible to obtain and store spectra of individual peaks (molecular fractions of DOM) in chromatogram, calculate the absorbance ratio and estimate purity of molecular fractions.

In present study, the previously described HPSEC - DAD method has been used to analyse dissolved organic constituents from Lake Võrtsjärv sediment samples taken in 2003. The frozen sediment core (120-cm long) was sliced into 1-cm thick subsamples. Pore-water for analyses was extracted from thawed sediments by centrifugation. The nondegradative approach used for analysis enabled to separate 7 molecular fractions of DOM. These were devided to high-, humic-like and low- molecular fractions. The temporal changes of separated fractions will be presented together with detailed spectroscopic analyses. As a result the differences or similarities of separated molecular fractions by optical properties will be discussed.