



Diatom DNA as historical information

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This survey is about the reconstruction of paleo environmental conditions in East Africa using recent and historic lakes sediments of shallow lakes in Kenya. This interdisciplinary approach combines the molecular analysis of ancient diatom DNA and the morphological analysis of diatom assemblages of short sediment cores to reveal the potential of molecular genetics in geosciences.

This study comprises the investigation of two short sediment cores from Lake Naivasha (Kenya) taken in 2007, covering a stretch of ca. 80 years. Several sediment slices were analysed by molecular methods that concludes in species identification based on DNA fragments. Therefore total DNA was extracted and applied to a diatom DNA specific PCR amplifying a gene fragment that is frequently used for species identification. After cloning PCR products, clones were sequenced, sequences from different diatom species were analysed. As a comparison permanent slides were prepared for each sediment sample for counting diatom valves.

The results suggest that DNA damage, perhaps species depended, and specific factors of PCR contribute to an overhang of two dominant diatom species (*Aulacoseira ambigua* and *Aulacoseira granulata*) represented by the molecular approach whereas rare species seen by light microscopy are not yet identifiable with molecular methods. Moreover changes in diatom assemblages and the reconstructed conductivity indicate a decrease of lake level around 1940. This shift seems to be also represented in the molecular approach as a decrease in the amount of diverse diatom DNA sequences found, what is probably caused by worse DNA preservation conditions at that time.