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Ancient and recent DNA from East African lakes: insights into a highly variable environment

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Within the eastern branch of the East African Rift System there are a series of shallow lakes in close proximity, yet with strikingly different hydrological and geological features. Between 15 and 5 kyrs ago the rift comprised several large lakes that were fresh and several 100's of meters deep. Tectonically separated, these lakes underwent a tremendously different development in the course of a trend towards a drier climate since 6,000 years ago. Today the lakes range in alkalinity from pH 11 (Lake Elmenteita) to pH 8 (Lake Naivasha) and in depth from less than a meter to 15 meters. Using molecular genetic methods, we are characterizing present-day and historical limnic communities, focussing on diatoms and rotifers. A combination of geological and molecular genetic methods will draw a detailed picture of present day and historical connectivity of plankton assemblages and populations in the different lake basins, allowing 1) inferences about the size and degree of connectedness of former lakes and 2) insights into the time and mode of the response of the taxa studied to fluctuating and diverging environmental conditions. Apart from presenting tools to assess the presence and dominance of taxa meaningful for ecological reconstructions, molecular markers provide the opportunity to investigate intraspecific variability and phylogenetic affiliations of members of the limnic communities.