Lake Tanganyika Holocene Record on Variability in Precipitation in the Malagarasi Catchment Basin

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Abstract
The stable isotope composition of organic carbon (OC), abundance of OC and nitrogen, and C/N ratios for core T97-69V are used to document late Holocene variability in the sources of organic matter (OM) in the Malagarasi delta (Lake Tanganyika) and in precipitation in the Malagarasi catchment basin. Core T97-69V, located at latitude 5°12.92′S and longitude 29°40.50′E, was retrieved at a water depth of 60 m. The organic δ13C values for this core ranges from −25.0λ to −19.8λ and averages −23.0∀λ. The δ13C values decrease down-core to the base of the core with one spike of depleted δ13C values interrupting this general trend. A similar trend of down-core decrease is also observable for the contents of OC and nitrogen whose abundance averages 3.75∀1.1% and 0.4∀0.1% respectively. In contrast, the C/N ratios with mean value of 11∀2.3 do not display any clear down-core trend. Furthermore, there is a sharp shift in the stable isotope compositions of OC to lower values at about 200 cm. An enrichment in 13C in the upper 200 cm associated with higher contents of OC and nitrogen and relatively low C/N ratio values can probably be attributed to complete utilisation of available nutrients (high primary productivity) in conjunction with deposition of large proportion of C4 material derived from the catchment areas. Low isotope values of up to 4λin the lower 200 cm of the core suggest higher input of C3 type of material derived from phytoplankton and terrestrial plants. Furthermore, a downcore decrease in 13C suggests that the level of precipitation in the Malagarasi Basin has decreased since mid-Holocene, and most likely this trend was associated with a decrease in the lake levels. Two spikes of low isotope values may suggest period of above normal precipitation that resulted into transportation of a significant quantity of terrestrial OM.