

Paper Number: 1965

Lake Empakat – new tephrochronological data on the stratigraphic record of northern Tanzania

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This research presents new data on the tephrochronology and stratigraphy of northern Tanzania, recorded in the sedimentary sequence of Lake Empakat, Empakaai Crater, northern Tanzania. Eight ash layers were described in a 2-meter core of lake sediment. Geochemical, mineralogical, petrographic and magnetic investigation of ash layers shows that (1) all ash layers are products of highly explosive eruptions of melilite-bearing magmas; (2) most of the eruptions originate from a complex magmatic system(s), which is reflected in complex zoning of phenocryst phases; (3) all ash horizons are very well preserved in the lake environment: only the groundmass and easily weathered phases like melilite are affected by weathering, however completely fresh volcanic glass is still preserved around the phenocrysts; (4) bulk rock magnetic susceptibility does not always allow precisely discriminate ash horizons from the lacustrine deposits. Due to limited stratigraphic exposure, the volcanic record of the region is rather sparse, and pinpointing from which volcanic centres the eruptions originate is difficult. In the Empakat core, however, the most likely potential source (both from geochemistry and age) is the currently active stratovolcano of Oldoinyo Lengai situated 20 km NNE of the Empakat Lake. The combination of our new data with existing chronological data from Ryner et al. [1], retrieved from the same core, provides precise ages of the voluminous highly explosive eruptions in this region of East Africa, during the Pleistocene-Holocene transition.

References:

[1] Ryner et al. (2007) *Palaeogeography, Palaeoclimatology, Palaeoecology* 248: 440-458

