

Paleo-environmental characterization of Holocene sediments in Lake Afdera, Afar, Ethiopia

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The Danakil Depression, an area located in the northern Afar in Ethiopia, is a tectonically active region formed by the rifting of the Arabian, Somalian, and Nubian plates. The Danakil's elevation reaches down to -120m below sea level and coralgall reefs around its margins witness several marine incursions since the Pleistocene. At the southern part of the Danakil Depression is localized the hypersaline Lake Afdera.

The aim of this study is to understand the paleo-environmental setting of Lake Afdera during the late Holocene and understand the impact of volcanic and seismic events on the lake functioning. Five short gravity cores were retrieved of which one in the northern part of Lake Afdera was studied in-depth. Sediment descriptions, XRF elemental analyses and $^{137}\text{Cs}/^{210}\text{Pb}$ dating were performed to provide a comprehensive background to better understand the functioning of the lake. The presence of varved sediments provides an excellent paleoenvironmental archive and are the result of seasonal change driven by the Monsoon occurring in the area. Furthermore, on interannual basis, El Niño Southern Oscillation (ENSO) impacts the region as well leading to intense droughts. This study provides the base for further paleoenvironmental and palaeoecological research in Lake Afdera.

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