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Biogeochemical analysis of newly dated lacustrine cores: a first look at Quaternary paleoenvironment in coastal Mozambique

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In order to better quantify the role of climate variability in southeastern Africa, and its impact on the evolution and spread of anatomically modern humans, our international and interdisciplinary team cored a series of coastal lakes during the summer of 2019. Here, we present data from lake Nyalonzelwe, one of many interdunal lakes present along the coast in the Inhambane region of southeastern Mozambique. Nyalonzelwe sits 5m above MSL and is bounded by a Pleistocene dune system, reaching between 29-121m in elevation, protecting the lake from the Indian Ocean. The sedimentological record of Nyalonzelwe presents over 6m of stratigraphic variability, including a varve sequence spanning the basal 2m, making it an incredibly rare record of seasonal resolution climate variability and the first record of its kind in Mozambique. Two cores, C1 and C4, with depths of 6.12m and 6.22m respectively, were collected for multiproxy biogeochemical analyses and C¹⁴ dating using a Livingstone corer. This work seeks to present the results of Carbon, Hydrogen, Nitrogen (CHN) elemental analysis for core C1, sampled at 10 cm intervals and aragonite/calcite ratios for gastropod assemblages across C4, sampled at 1 cm resolution in preparation for stable isotope analysis.

CHN analysis was conducted using an Elementar model Vario EL III at the University of Algarve CCMAR for both organic and inorganic carbon present in sediment samples from C1. Aragonite/calcite ratios for identified gastropod species, namely *Melanoides tuberculata*, were collected from individual representatives in samples from C4 with more than 8 individuals present and determined using Fourier Transform Infrared Spectroscopy at the University of Connecticut. Nyalonzelwe cores C1 and C4 are stratigraphically correlated. Together these data represent the first look at Quaternary paleoenvironmental evolution in southeastern coastal Mozambique and the importance of climate (in)stability in the region and its impact on early modern human populations. This work was supported by the project PTDC/HAR-ARQ/28148/2017, funded by the

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