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Palaeo-environmental evolution in Lake Lúngue, southern Mozambique, during the last 1000 years

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Abstract

Palaeo-environmental changes in Lake Lúngue, Mozambique, have been interpreted from diatom stratigraphy, mineral magnetic susceptibility and organic carbon variations in a sediment core. Lake Lúngue is located c. 30 km north of XaiXai City and 5 km from Malehice Locality and has an outlet toward the Limpopo River flood-plain on its western side. Eleven dates on shells and shell fragments indicated that the recovered core covers the last 1000 years. Changes in diatom assemblage composition indicate that the lake level changed in response to alteration in humidity and evaporation conditions. The lower part of the sequence is interpreted to represent an old meander bow feature of the Limpopo River based on the low frequency of diatoms and low organic carbon content. Prior to AD 1100, a threshold was being established with gradually in-filling of water, combined with high evaporation rates, marked by the dominance of typically brackish taxa (*Nitzschia compressa*, *Diploneis suborbicularis*). The period between c. AD 950 and AD 1100 is interpreted to be a period with high precipitation rates marked by the presence of halophilous taxa (*Cyclotella meneghiniana* and *Cyclotella atomus*) and decrease of brackish taxa (*Nitzschia compressa*, *Diploneis suborbicularis*). This trend continued until c. AD 1500 where the halophilous taxa (30-60%) dominated the environment, with a notable contribution from freshwater taxa (30-50%) and disappearance of brackish taxa (*Nitzschia compressa*), which is in turn regarded as the wettest period of the record. From c. AD 1500-1650 drier conditions prevailed, the concentrations of halophilous taxa increase (50-70%), the brackish taxa start to re-occur, although with different species (e.g. *Campylodiscus clypeus* and *Chaetoceros* resting spores). The period between AD 1650 and 1900 is marked by increases in evaporation rates that favoured increases in brackish taxa, although halophilous taxa dominated the environment. There is some agreement between Lake Lúngue record and other records from the Southern Hemisphere summer rainfall region, however, the

comparison should be cautiously because Lake Lúngue is part of a huge Limpopo River drainage system, with 13 tributaries, thus it is expected to respond to local rain season, but also to basin rain signals in case of flooding.

