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Paleoenvironmental reconstruction in East Africa at a critical period of hominin dispersion out-of-Africa (150-80 kyr)

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Climate may have played a critical role in early hominin evolution and dispersion, with rapid changes from humid to hyper-arid observed in East African palaeoclimate records. Many studies show linkages between these climate changes and hominin speciation and dispersion; however, few of them have focused on annual to decadal climate variability. This new study presents paleoenvironmental records (diatom assemblages and oxygen isotopes in diatom biogenic silica, $d^{18}O_{\text{diatom}}$) from the OI Njorowa Gorge in Kenya. The study site is located west of the African Rift Valley, from where important hominin dispersals are believed to have taken place. The study site preserves a stratigraphic record of interbedded diatomite beds spanning a key period of theorised hominin dispersals; 150,000 to 80,000 years ago. In this study, diatom assemblages and $d^{18}O_{\text{diatom}}$ records are used to understand past changes in moisture and precipitation patterns over East Africa as well as changes in lake water chemistry. $d^{18}O_{\text{diatom}}$ has been used in both lacustrine and oceanic settings since the early 2000s. It is however an under-utilised proxy that holds great potential, especially for diatomites from exposed lake beds where carbonate material is scarce or inexistant. The study also uses high resolution scanning XRF data from diatomite blocks to develop an age model for the diatomite beds at an annual timescale.