A 2.5Ma year record of wetland development in the Congo basin inferred from hopanoid biomarkers

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We present a 2.5Ma record from the Congo deep sea fan (ODP 1075) of amino-bacteriohopanepolyols (amino-BHPs). The methanotrophic source of aminobacteriohopanepentol, a biomarker for aerobic methane oxidation (AMO)[1], in ODP 1075 is supported by compound specific $\delta^{13}C$ isotope values of -41‰[2]. High resolution intervals confirm aminopentol to vary on glacial-interglacial timescales with high concentrations of amino-BHPs recorded during warm, interglacial stages and low concentrations of amino-BHPs during cold, glacial stages. This increase in AMO intensity (as suggested by aminopentol concentrations) during interglacial stages is likely an imported signature from the Congo hinterland. Analysis of BHPs in soils from a range of sub-environments (forest, savannah etc.) did not contain the same signature whilst ediments from floodplain wetlands (Malebo Pool) were found to contain similar biomarker signatures as the marine sediments, suggesting a common source.

Wetlands are important and widespread sub-environments in all large tropical river catchments. Their extent responds to fluctuations in humidity, which changes at glacial-interglacial and shorter time scales in response to the level of humidity. Humidity in the interior of tropical Africa has been shown to be driven by fluctuations in the difference in sea surface temperature (SST) between the subtropical and tropical South Atlantic[3].

[1] Wagner *et al* 2014. *Org. Geochem.* **67**, 85–98. [2] Talbot *et al* in review. *Geochim. Cosmochim. Acta* [3] Schefuß *et al* 2005. *Nature* **437**, 1003-1006.