PP11F-05: Paleoenvironmental change as seen from a multiproxy perspective in the West Turkana Kaitio core (WTK13), Kenya

Monday, 11 December 2017
08:49 - 09:00
New Orleans Ernest N. Morial Convention Center - 343

The Hominin Sites and Paleolakes Drilling Project's (HSPDP) primary goal is to provide high quality environmental records to test whether and how Earth system dynamics influenced the evolution of hominins in Africa. To this end, multiproxy records from individual basins are essential to understanding how paleoenvironments changed in relation to shifts in the climatic and/or tectonic regimes both locally on a basin-scale and regionally across East Africa. Because of its rich combination of paleoanthropologic and geologic data, the West Turkana Kaitio (WTK13) core is an important component of this synthesis. Using a combination of tephra chronology and paleomagnetic data, the core has been dated to 1.87-1.37 Ma. The sedimentology records deposition on a dynamic lacustrine margin becoming more influenced by channel and floodplain processes through time. Multiproxy records provide a window into paleoevironments of the Turkana Basin that operated on shorter time scales than this dominant first-order facies shift. Processional cycles (21 kyr) are picked up by indicator records where the preservation of the archive was good enough to allow for high-resolution analysis. However, interestingly, the biomarker record suggests that the hydroclimate of the Turkana Basin, while highly variable at the Milankovitch-scale, exhibits no directional trend in the mean values towards wetter or drier conditions. The combined phytolith and pollen records suggest that grasses, albeit with fluctuating abundances of C_4 mesophytic and C_4 xerophytic taxa, dominated the landscape throughout most of the core. This indicates that despite climatic variability, resource availability may have maintained some general consistency for hominins in the area. Ultimately, the time period spanned by the WTK13 record is significant for our understanding of hominin evolution as it covers an interval of increasing aridity on the African continent as observed in distal marine records. This synthesis demonstrates how paleoenvironment of the Turkana Basin responded to these broader paleoclimatic trends. With this core, it is possible to refine this record both spatially, by looking directly at a basin where hominin evolution occurred, and temporally, by sampling on a sub-Milankovitch scale.

Plain Language Summary

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