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PRELIMINARY PHYTOLITH RESULTS FROM THE EARLY PLEISTOCENE WEST TURKANA, KENYA, DRILL CORE OF THE HOMININ SITES AND PALEOLAKES DRILLING PROJECT (HSPDP)

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Phytoliths are microscopic opal silica plant remains that can be deposited in soils and lake sediments after the plant-parts that produce them decay. Although phytoliths have been used extensively in archaeological studies, they are underutilized in limnogeological investigations. Pollen and phytoliths share some similarities in how they are extracted and quantified; however, there are significant differences in taphonomy, preservation and taxonomic resolution. A major strength of phytolith analysis is its ability to taxonomically resolve grasses (Poaceae) to subfamily, tribe and even lower levels of identification. In East Africa, the overwhelming majority of grasses can be categorized into four plant functional types (PFTs): C_3 cool climate/shade tolerant (Pooideae), C_3 wet/shade tolerant (Bambusoideae), C_4 mesophytic (Panicoideae), and C_4 xerophytic (Chloridoideae). Proportions of these grass PFTs can unambiguously be reconstructed from stratigraphic sequences using phytoliths. During the summer of 2013, the 216 m West Turkana drill core (2.0-1.4 Ma) was recovered by HSPDP researchers. Initial core descriptions, multi-sensor core logging and sampling at 32 cm resolution was completed in the fall of 2013 at LacCore (U of MN). Phytolith extraction at 96 cm resolution was recently completed. Organics and carbonates were removed from 1 cm^3 samples using strong acid and base. Clays were removed using gravity settling and siliciclastics were removed using density separation. Phytolith preservation ranged from excellent to poor. Intervals with poor preservation exhibited evidence of dissolution, most likely due to alkaline lake conditions. Intervals with low phytolith recovery often suffered from high amounts of cryptotephra and authigenic minerals. Well-preserved and high phytolith concentrations were observed in the 35 to 65 mblf interval. Below this level, ~1 m sections yielded well-preserved and highly concentrated phytoliths and other silica microfossils. These sections were separated by longer intervals (~10+ m) where there appears to have been total biogenic silica dissolution. Phytolith analysis is ongoing, but has already demonstrated the presence of taxa underrepresented in pollen studies from contemporaneous contexts, thus highlighting the complimentary aspect of this work.

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T241. Paleoenvironmental Reconstruction of Hominin Sites: Techniques—From the Unique and New to the Tried and True
Wednesday, 22 October 2014: 8:00 AM-12:00 PM

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