171

Yost, C.L., Kingston, J, Deino, A. L., and Cohen, A. S. (2018). [PP31C-1670 Phytoliths and Microcharcoal from the Baringo Basin, Kenya, Reveal Savanna Dynamics During the Plio-Pleistocene Transition](https://agu.confex.com/agu/fm18/meetingapp.cgi/Paper/394197). AGU Fall Meeting, Washington, D.C.

As part of the Hominin Sites and Paleolakes Drilling Project (HSPDP), plant phytoliths and microcharcoal were examined from the 227-meter long (3.31 to 2.57 Ma) Baringo Basin-Tugen Hills-Barsemoi (BTB) drill core. A total of 652 samples were collected at intervals that varied between ~10 and 32 cm, corresponding to submillenial to millennial scale temporal resolution (1200 yr ave). Microcharcoal was well-preserved and yielded a continuous record. Phytolith preservation varied between excellent to total dissolution in alternating intervals throughout the core. The phytolith and charcoal records exhibited long-term and short-term variability.

There is a general trend of decreasing woody cover, fire frequency, and fire intensity over time. Before ~3.0 Ma, dominant vegetation types varied between forest (80-100% cover), woodland (>40% cover), and grassland/wooded grassland (0-40% cover). The relatively high proportion of xeric short grass taxa to mesic tall grass taxa at this time may be the result of better adaptation to high fire frequency. After ~3.0 Ma, an open savanna predominated, and woody cover likely never exceeded 40%, indicating overall drier conditions. Throughout the record, the grass community varied between C4 tall grass (humid) and C4 short grass (arid) savanna types. Before 3.0 Ma, C3 grasses were moderately abundant at times, mostly likely growing underneath canopy, but are much reduced after 3.0 Ma. After 3.1 Ma, the level and duration of C4 tall grass dominance increases, suggesting enhanced warm season (monsoon) precipitation; however, decreased woody cover still indicates overall drier conditions. Thus, the combined phytolith and microcharcoal records indicate a significant shift in the seasonality of precipitation after 3.1 Ma.

Spectral analysis of microcharcoal influx exhibited strong periodicity in the eccentricity (~100 ka) and obliquity (~41 ka) bands (especially after 3.1 Ma for the latter), and weaker but statistically significant periodicity in the precession (19-23 ka) and half-precession (10-11.5 ka) bands. For well-preserved phytolith intervals, much of the mesic C4 tall grass versus xeric C4 short grass variability and grassy versus woody cover variability appears to be precessionally-paced, with mesic tall grasses peaking during insolation maxima.