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Leaf wax biomarker as a proxy for regional climate variation during hominin evolution

 The extent to which climate variation influenced hominin evolution continues to be debated. This discussion is partly fueled by a lack of high-quality paleoclimate records from the sites of known hominin existence.  To further the understanding of this relationship, we generated paleo-environment records from the early Pleistocene in East Africa using organic biomarkers from ancient lake sediments. The sediments were drilled as part of the Hominin Sites and Paleolakes Drilling Project, an international effort to study the past climate of our hominin ancestors’ evolution and dispersal.

There are various theories on the link between climate change and the ability of *Homo sapiens* to eventually emerge and persist.  Many ideas, such as the concept that a drying Africa forced humans to come out of the trees and walk upright, are overly simplistic.  The more plausible “variability selection” hypothesis posits that higher-frequency environmental variations selected for generalist traits that allowed hominins to expand into variable environments.

We analyzed isotope ratios of terrestrial leaf waxes preserved in the lake sediments of West Turkana in Kenya. The sediment spans roughly 1.87-1.38 Ma, and contains some of the first fossils from the species *Homo erectus*.  The biomarker hydrogen isotopes provide relatively straightforward indicators of mean annual rainfall amount.  The timing and nature of critical transitions in human evolution recorded in this basin are compared against this environmental record to constrain the developing evolution hypotheses.

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