Paleoenvironmental Reconstruction of an Early Miocene Primate Site; Loperot, Kenya

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During the earliest Miocene, Old World apes and monkeys diverged from a common ancestor but, despite their abundance in Africa, are rarely found together. A new Miocene site (Loperot, Kenya) is unique because it contains both ape and monkey fossils. In an attempt to explain why, we use paleontology and geology to reconstruct the ancient ecosystem. Our hypothesis is that Loperot is a closed-canopy forest similar to other nearby early Miocene primate sites.

The fossils are found in quartz sands interbedded with red silts. We used grain size, sediment texture, grain shape, and mineralogy of the sand units as a proxy for depositional environment, transport distance, and to indicate provenance. The sands are crossbedded, poorly sorted, angular and contain fossils of crocodiles, gomphotheres, pigs, primates, and a whale. The red silts exhibit ped structures and contain gypsum.

Our data indicate that the sands represent a large, proximal meandering river system and that the red silts are paleosols. The interbedded nature of these units suggests periods when the landscape was dynamic, as the river system migrated, followed by periods of stasis, when soils formed on the floodplains. Pollen data suggest that the Loperot paleoenvironment was a riparian forest with a large meandering river, rather than a closed-canopy forest. These results provide information about the ecosystem of early primate paleocommunities and may help guide future exploration for early Miocene primate fossils.

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