

# Revised biostratigraphic considerations of the Early Miocene locality Mfangano Island, Kenya: Implications for Miocene catarrhine evolution and faunal turnover

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Early Miocene deposits on Mfangano Island, Kenya, have produced more than 1600 fossils important for understanding early Neogene mammalian evolution in Africa. These specimens derive from deposits as old as ~19.81 Ma, which falls within a period of rapid faunal turnover in eastern Africa. However, exact provenance data for many specimens in the historic collections are lacking, making it difficult to place fossils in relative stratigraphic position. Historic and recent fossil assemblages were re-analyzed and compared to other contemporaneous eastern African assemblages to better situate the Mfangano communities within the broader context of Early Miocene mammal evolution. Historically, the Mfangano fauna as a whole was thought to be either intermediate between the younger Hiwegi and the older Tinderet biostratigraphic reference faunas or essentially indistinguishable from the younger Hiwegi reference fauna. Our results support the former conclusion. Basic species-level presence/absence data suggest that Mfangano's entire faunal assemblage is most like the Hiwegi fauna. However, the Mfangano fauna differs from Hiwegi assemblages, but is strikingly similar to older Tinderet assemblages, in the proportions of identifiable rodent specimens (specifically *Diamantomys/Paraphiomys* ratio). Furthermore, the Mfangano mammalian assemblage lacks the pecoran taxa *Canthumeryx* and *Propalaeoryx*, but includes the ochotonid *Kenyalagomys* and suid *Kenyasus*, four genera that are characteristic of the younger Hiwegi fauna. When the analysis is restricted to only Mfangano specimens with exact provenance, all found in the Makira Beds, our results support the hypothesis that the Mfangano fauna as a whole is derived from at least two distinct temporal units. The fauna found in the lowest stratigraphic sections of the Makira Beds is most similar to the older Tinderet fauna and lacks all taxa specifically characteristic of the younger Hiwegi fauna. Interestingly, the only hominoid fossil recorded from this unit is morphologically more similar to the Tinderet ape *Proconsul* than it is to *Ekembo*, known from the younger Hiwegi fauna from Rusinga Island. The younger Mfangano fauna occupies an intermediate position between the Tinderet and Hiwegi reference faunas. Specifically, the presence of *Ekembo*, *Kenyalagomys*, and *Kenyasus* plus the absence of large pecoran taxa supports the intermediate biostratigraphic position of this younger assemblage. Overall, our results corroborate the hypothesis that Mfangano fossils represent an interval of time between Tinderet and Hiwegi biostratigraphic reference faunas, recording evidence of a period of rapid faunal turnover. Further, this study demonstrates the importance of continued fossil collection, accompanied by detailed provenance data, to inform our understanding of this faunal turnover event in the Early Miocene of eastern Africa.