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TRACE ELEMENT EVIDENCE FOR TROPHIC LEVEL IN EXTANT MAMMALS FROM LAIKIPIA, KENYA: IMPLICATIONS FOR EASTERN AFRICAN FOSSIL HOMININ DIET RECONSTRUCTIONS

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Abstract

Trace element analysis (Sr/Ca, Ba/Ca) has been utilized to gauge diet in fossil hominins. Biopurification of trace elements relative to calcium at higher trophic levels results in lower ratios in carnivorous mammals than in herbivores. Previous work characterizing South African ecosystems has been used to infer meat consumption in *Australopithecus* and *Paranthropus*. Trace element ratios have not yet been reported from modern or fossil eastern African modern ecosystems. Prior to the application to eastern African fossils, a study of eastern African extant mammals from modern ecosystems with analogous floral and faunal community structures as Plio-Pleistocene habitats is warranted. In this study, I analyzed Sr/Ca and Ba/Ca from bulk enamel of 92 individuals representing 32 extant mammal species with known feeding ecologies from the Laikipia District, Kenya. Diet categories include C_4 grazers, C_3 browsers, mixed C_3-C_4 herbivores, carnivores, and omnivores. I found that Sr/Ca ratios of carnivores, omnivores and mixed C_3-C_4 herbivores are significantly lower than those of C_3 browsers and C_4 grazers. Unlike the South African findings, C_3 browser and C_4 grazer Sr/Ca ratios do not differ from one another. Ba/Ca ratios are highest in C_4 grazers followed by C_3 browsers, mixed C_3-C_4 herbivores, omnivores, and finally carnivores. Insectivory and consumption of underground storage organs amongst omnivores may be determined with trace elements. Since these patterns differ from South African ecosystems (Sponheimer et al. 2005), a comparable study should be conducted with eastern African fossil faunal assemblages before hominin trace elements are interpreted.