

The Relevance of Crocodiles to Oldowan Hominin Paleoecology at Olduvai Gorge,

Tanzania

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The Plio-Pleistocene lake-margins at Olduvai contain a stunningly rich and well-preserved paleoanthropological record, but the spatial and temporal resolution of the record is too coarse to understand the ecological contexts of Oldowan hominin trace fossils at the level of the landscape facet, as developed by the Olduvai Landscape Paleoanthropology Project. Theoretically, hominin activities and trace fossils were largely determined by the distribution of resources and hazards across the landscape.

The goal of my thesis is to understand the paleo-wetland landscapes using a taphonomic approach. This thesis develops methods and criteria for identifying ecological contexts of the archaeological record through two neotaphonomic studies: (1) controlled observations of captive Nile crocodiles feeding on large mammal carcasses; and (2) field observations of Nile crocodiles feeding, and documentation of skeletal remains in modern wetland environments with the aim of understanding the interactions between crocodilians and mammalian carnivores for animal food.

My observations demonstrate that crocodiles produce definitive tooth marks and modification that are distinctive from those produced by mammalian carnivores. Both shed teeth and uningested bones modified by crocodiles are usually deposited in or near water where crocodiles live. Findings from this actualistic-oriented research provide a referential framework for the analysis of Olduvai samples from lakeshore deposits.

Results suggest that some of the Oldowan assemblages previously inferred as hominin “living sites”, may have been formed near crocodile habitats. This evidence is amplified by a lack of butchered crocodile bones and presence of large-bodied crocodiles in the fossil assemblages. Previously, crocodile remains were viewed as hominin food-refuse.

This study considers the extinct and large brevirostrine *Crocodylus* (“*Rimasuchus*”) *lloidi* as a major predator in paleo-wetlands, and their predation hazard is reflected in the toolkit by the preponderance of large stone pieces and manuports, herein inferred as ‘defense-tools’. The degree of long bone completeness and intensity of butchery in fossil assemblages are other archaeological proxies indicative of the proximity of hominin activities to water and their exposure to crocodile predation. This study introduces the importance of crocodilians for understanding early hominin land use behavior from taphonomic perspectives.

As the living representative of the large meat-eating archosaurians, crocodile feeding traces also present a unique opportunity for modeling bone modification and feeding behavior of carnivorous dinosaurs.