

# Renewed explorations of the Mid-Pleistocene site, Isimila, Tanzania

Sabrina C. CURRAN<sup>a</sup>, Paul E. PATTON<sup>a</sup>, Cassy MTELELA<sup>b</sup>

a: Department of Sociology and Anthropology, Ohio University, b: Geology Department, University of Dar es Salaam



The Isimila fossil beds

## INTRODUCTION

Isimila, located in central Tanzania (Fig. 1), is well-known for its vast assemblage of Acheulean tools, where hand-axes exist in densities similar to Olorgesailie, Kenya. Most publications on Isimila occurred in the 1960s and 70s (see Fig. 2 for a historical summary) and although the site currently exists as a tourist destination, there have been few archaeological publications on the site in recent decades. Here we report on the findings from two brief field sessions in 2016. Our primary goals in these expeditions were:

1. Obtain permits to work at Isimila
2. Evaluate likelihood of finding additional fossil specimens, deposits, and chronometric dates
3. Assess taphonomic histories for new specimens
4. Establish potential for Isimila as a cultural heritage research center

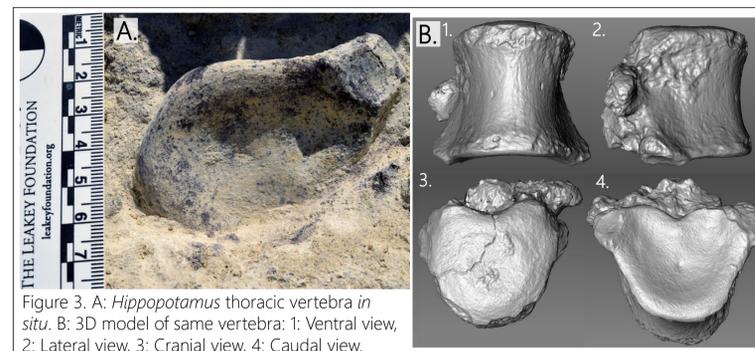


Figure 3. A: *Hippopotamus* thoracic vertebra *in situ*. B: 3D model of same vertebra: 1: Ventral view, 2: Lateral view, 3: Cranial view, 4: Caudal view.

## FINDINGS

- Fossils are abundant in *ex situ* contexts and evident in *in situ* contexts (n > 780 specimens ranging from nearly complete to small fragments)
- *In situ* remains:
  - Include partial pelvis, vertebrae, and dental remains including a large tusk (all were 3D-digitized; see Figure 3 for an example)
  - Very well preserved with little bone surface modification
- *Ex situ* remains:
  - n ~ 760, mostly small fragments, some of which are identifiable
  - Weathering stages 0-4, limited carnivore damage, and exhibiting some polishing, suggesting that they may have been deposited in fluvial or lacustrine contexts
- Preliminary taphonomic assessment of new fossils revealed two specimens with likely cut-marks. Despite the abundance of stone tools at the site, these are the first reported cut-marks on fossils from Isimila (Figure 4)
- Most fossils were assigned to *Hippopotamus*, although specimens of turtle and crocodile (both previously unreported), *Suidae* (cf. *Kolpochoerus*), and *Bovidae* were recovered
- The potential for finding further fossil material is high
- Isimila sedimentary succession is characterized by sicciclastic conglomerate, sandstone and mudstone, and volcanic tuff beds deposited in alluvial to lacustrine environments (Figure 5)



Figure 4. Possible cut-marks (among other taphonomic bone-surface modifications)

## FUTURE GOALS

- Obtain radiometric dates
- Continue stratigraphic profiling: detailed stratigraphic measurements
- Systematic excavation in main fossiliferous bed
- Provenience specimens with Trimble total station
- Collection of bulk samples to screen for micro- and macrobotanicals
- Paleoeological reconstructions using community analysis and ecomorphology (*Bovidae*)
- Detailed paleoenvironmental reconstruction through time
- Paleoclimate studies via detailed facies analysis petrology and clay (XRD) mineralogy
- Funding for infrastructure repairs (Fig. 6a)
- Better establishment of tourist pathways and signage (Fig. 6b)

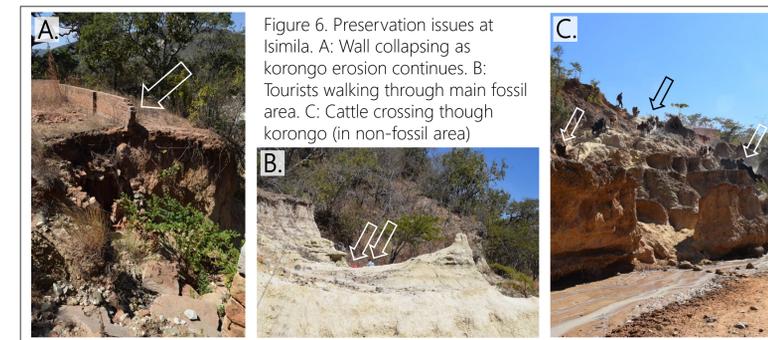


Figure 6. Preservation issues at Isimila. A: Wall collapsing as korongo erosion continues. B: Tourists walking through main fossil area. C: Cattle crossing through korongo (in non-fossil area)

## Acknowledgements

We thank the Tanzania Commission for Science and Technology; Eliwasa Maro, Joseph Temu, and Mohammed Ngoma of the Department of Antiquities; and Nancy Stevens and Patrick O'Connor (Ohio University) for initiating this project. This research was funded by the Ohio University Research Council and Ohio University's International Travel Fund. We dedicate this poster to the memory of Joseph Temu.



## References

Clark, J. D., and M. R. Kleindienst (1974) The Stone Age cultural sequence: terminology, typology and raw material. In *Kalambo Falls Prehistoric Site* volume 2, edited by J. D. Clark, pp. 71-106. Cambridge University Press.

Cole, G.H., and M. R. Kleindienst (1974) Further Reflections on the Isimila Acheulian. *Quaternary Research* 4:346-355.

Cole, James et al. 2014-17: <https://www.brighton.ac.uk/research-and-enterprise/groups/past-human-and-environment-dynamics/the-isimila-stone-age-project.aspx>

Coryndon, Shirley C., A. W. Gentry, John M. Harris, D. A. Hooijer, Vincent J. Maglio, and F. Clark Howell (1972) Mammalian Remains from the Isimila Prehistoric Site, Tanzania. *Nature* 237:292.

Hansen, Carl L., and Charles M. Keller (1971) Environment and Activity Patterning at Isimila Korongo, Iringa District, Tanzania: A Preliminary Report. *American Anthropologist* 72: 1201-1211.

Howell, F. Clark, Glen H. Cole, and Maxine R. Kleindienst (1962) Isimila: an Acheulian occupation site in the Iringa Highlands, Southern Highlands Province, Tanganyika. *Actes du IVe Congrès Panafricain de préhistoire et de l'étude du quaternaire* 43-80.

Howell, F. Clark, Glen H. Cole, Maxine R. Kleindienst, Barney J. Szabo, and Kenneth P. Oakley (1972) Uranium-series Dating of Bone from the Isimila Prehistoric Site, Tanzania. *Nature* 237:51-52.

Pickering, R. (1957) Report on the Pleistocene beds exposed on the Isimila River, Iringa District. Geological Survey of Tanganyika, Rep. RP/4:1-6.

Willoughby, Pamela R. (2012) The Middle and Later Stone Age in the Iringa Region of southern Tanzania. *Quaternary International* 270:103-118.

## METHODS

- Pedestrian survey of entire Isimila korongo system
- Locate and record fossiliferous locations
- Excavate *in situ* remains, collect *ex situ* remains
- Digitize fossils with identifiable features using an HDI 120 structured blue-light scanner (LMI Technologies)
- Examine all remains for bone surface modifications and other taphonomic signatures such as breakage patterns
- Preliminary sedimentologic analysis and stratigraphic profiling
- Collect samples for dating
- Establish future goals for Isimila through collaborative efforts with M. Ngoma (Isimila) and J. Temu (TZ Antiquities)

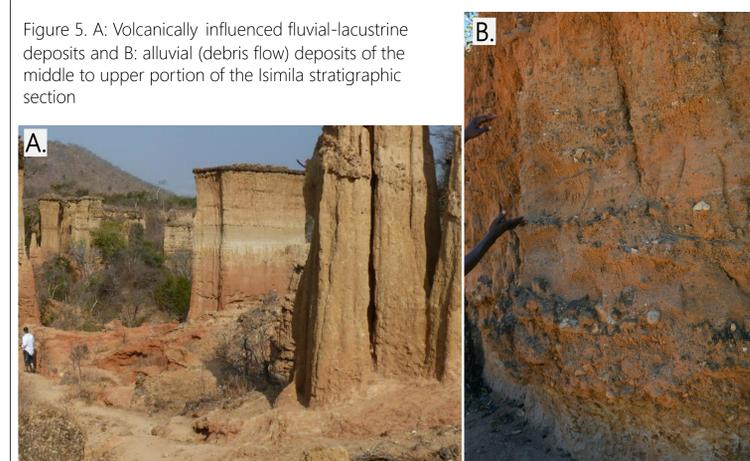


Figure 5. A: Volcanically influenced fluvial-lacustrine deposits and B: alluvial (debris flow) deposits of the middle to upper portion of the Isimila stratigraphic section

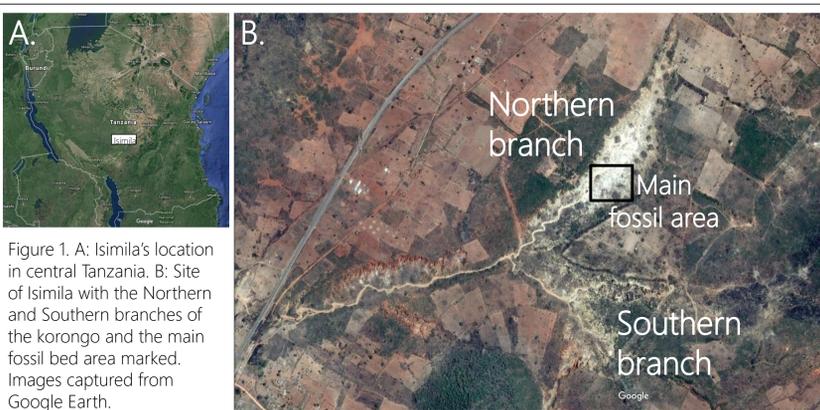


Figure 1. A: Isimila's location in central Tanzania. B: Site of Isimila with the Northern and Southern branches of the korongo and the main fossil bed area marked. Images captured from Google Earth.

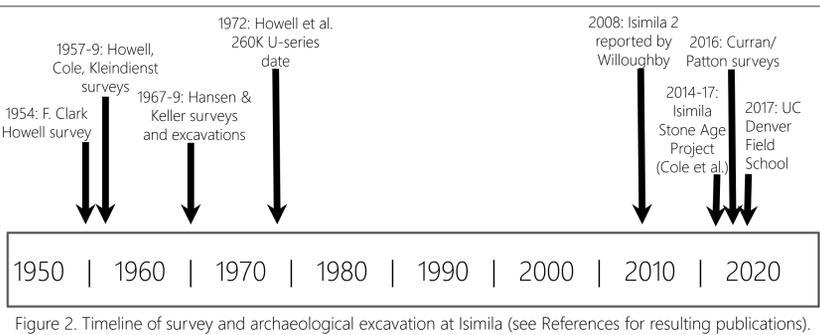


Figure 2. Timeline of survey and archaeological excavation at Isimila (see References for resulting publications).