Podium Presentation: Session 1, Th (9:40)

Acheulean Ecology, Diet, and Technological Behavior: Plant Residues from Olduvai Gorge

Julio Mercader Florin[1], Fernando Diez-Martín[2], Manuel Domínguez-Rodrigo[3], Julien Favreau[1], Makarius Itambu[4], Patrick Lee [1], Audax Mabulla[5], Joaquín Panera[6], Robert Patalano[1], Alfredo Pérez-González[6], Raquel Rojas[7], Manuel Santonja[6], Laura Tucker[1]

1 - Department of Anthropology and Archaeology, University of Calgary · 2 - Department of Prehistory and Archaeology, Universidad de Valladolid · 3 - Department of Prehistory, Universidad Complutense Madrid · 4 - Departmentof Archeology and Heritage, University of Dar es Salaam · 5 - National Museum of Tanzania · 6 - CENIEH (Centro Nacional de Investigación sobre la Evolución Humana) · 7 - Asociación el Hombre y el MedioSusana Rubio-JaraIDEA (Institute of Evolution in Africa)

Several compendia have illustrated the reach of conventional approaches to exploring the evolutionary origin of omnivorous diets. Included are the cost of developing unusually large brains and bodies; tooth size, shape, enamel thickness, and mechanics and wear; and the chemical signal from diet left on bones and teeth. Over the last decade, a new interpretation of human origins has proposed a long history of dependence on fire, suggesting that humans are biologically adapted to cooked food. However, these studies have not provided direct indication of eco-niche exploitation, plant utilization, or the kind of food that was processed with stone tools.

As palaeoanthropologists, we are interested in proxies that link environments, diets, and technological behavior; especially during a time in human evolution when there may have been a shift towards complex omnivore diets. Lithic residue may contain multipronged proxies such as phytoliths and starches. These plant residues constitute a new source of data to understand landscape use, dietary adaptation, and tool function at early hominin sites. Great strides are now being made to increase the reliability of recovered signals by deploying stringent anticontamination protocols in both field and laboratory settings; along with utilizing new experimentation to understand the taphonomic durability and taxonomy of labile molecules.

Much has been revealed about the vegetation context of hominin activities at Olduvai Gorge (Bed I and II) through macrobotany, ethnoarchaeology, and the analysis of pollen, phytoliths, and biomarkers. However, no studies have explored the human ecology, dietary dimension, and functionality of Acheulean technologies as seen through direct evidence in the form of plant residue that may still reside on stone tool surfaces. Here, we study materials from the 'lower floor' of Thiongo Korongo (TK: upper Bed II >1.353±0.035Ma); a site first reported by L. Leakey [1], and later excavated by M. Leakey [2] and Santonja et al [3]. Stratigraphically, we concentrate on materials from approximately 4 m below the contact with Bed III: Achuelean percussion implements, hand-axes, core-tools, and light duty pieces. This lithic collection was expressly excavated for plant residue analysis and retrieved in the field under stringent anti-contamination conditions. Similarly, all analyses presented here were conducted in a clean-room laboratory. The evidence is more abundant than expected and includes epidermal and woody tissue, resin, fibers, starches, and phytoliths; all of which indicate recurrent plant processing.

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References:[1] Leakey, L. (1951). Olduvai Gorge. A report on the evolution of the hand-axe culture in Beds I-IV. Cambridge, Cambridge University Press.[2] Leakey, M. D. (1971). Olduvai Gorge, vol III. Cambridge, Cambridge University Press.[3] Santonja, M., J. Panera, S. Rubio-Jara, A. Pérez-González, D. Uribelarrea, M. Domínguez-Rodrigo, A. Mabulla, H. Bunn and E. Baquedano (2014). "Technological strategies and the economy of raw materials in the TK (Thiongo Korongo) lower occupation, Bed II, Olduvai Gorge, Tanzania." Quaternary International 322-323: 181-208.

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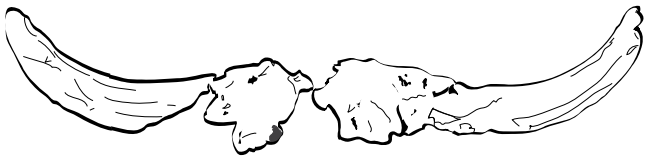

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