Paleoanthropological Implications Of Vegetation And Wild Plant Resources In Modern Savanna Landscapes, With Applications To Plio-Pleistocene Olduvai Gorge, Tanzania

Sandi R. Copeland, Ph.D. 2004, Department of Anthropology, Rutgers, the State University of New Jersey

Dissertation Committee: Robert Blumenschine, John W.K. Harris, Craig Feibel, Colleen Hatfield

Abstract

The ways that early hominins used plants for food, shelter, and tools are important to our understanding of human evolution, but are elusive due to few plant fossils and few traces of plant use in the archaeological record. For this dissertation I developed and applied a methodology that uses modern vegetation to model the availability of ancient plant resources for hominins.

The case study is that of lowermost Bed II, Olduvai Gorge, Tanzania, a paleolandscape with traces of hominin land use about 1.75 million years old. I studied the vegetation in three modern analog settings in northern Tanzania: Lake Manyara, Serengeti, and Ngorongoro Crater. I examined the relationships between landscape units, physiognomy, species composition, plant foods, and refuge trees. The relationships are indirect and difficult to simplify, but some patterns were apparent, for example, bushland habitats tend to have edible fruit-bearing shrubs, forests have trees with edible fleshy fruits, and marsh habitats abound with edible underground parts from sedges and *Typha*. Physiognomic types, plant foods, and refuge tree distribution across semi-arid savannas reflect the uneven distribution of plant-available water and other environmental variables like soil salinity and alkalinity.

I applied the plant findings in the modern habitats to the Olduvai case study through landscape facets, which are similar in the modern habitats in terms of geomorphology, hydrology, and ecology to those reconstructed for lowermost Bed II. I created a series of maps depicting the possible distribution of plant resources (fruit, leaves, etc.) across the paleolandscape. At Olduvai, edible fruits, leaves/shoots, and refuge trees were concentrated in the alluvial fans, edible seeds/pods and underground parts were concentrated in the Eastern Lake Margin, and edible grass seeds and flowers characterized the western basin.

For paleoanthropology in general, this study suggests that hominin diets differed from those of modern apes, and edible sedges and grasses may have contributed to the C_4 isotopic signature that is characteristic of early hominins. This study demonstrates that modern analog vegetation studies can improve upon the simplistic vegetation reconstructions that exist for most early hominin sites, thereby contributing toward a better understanding of hominin paleoecology.