Abstract

The discovery of fossil rooted tree stumps in lowermost Lower Bed I from the western Olduvai Basin, Tanzania, age-bracketed by the Naabi Ignimbrite (2.038 ± 0.005 Ma) and Tuff IA (1.88 ± 0.05 Ma), provides the first direct, in situ, and to date oldest evidence of living trees at Olduvai Gorge. The tree relicts occur in an interval dominated by low-viscosity mass flow and braided fluvial sediments, deposited at the toe of a largely Ngorongoro Volcano-sourced volcaniclastic fan apron that comprised a widely spaced network of ephemeral braided streams draining northward into the Olduvai Basin. Preservation of the trees occurred through their engulfment by mass flows, post-mortem mold formation resulting from differential decay of woody tissues, and subsequent fluvially-related sediment infill, calcite precipitation, and cast formation. Rhizolith preservation was triggered by the interaction of rootinduced organic and inorganic processes to form rhizocretionary calcareous root casts. Phytolith analyses were carried out to complete the paleoenvironmental reconstruction. They imply a pronounced seasonality and indicate a wooded landscape with grasses, shrubs, and sedges growing nearby, comparable to the low, open riverine woodland (unit 4c) along the Garusi River and tributaries in the Laetoli area. Among the tree stump cluster were found outsized lithic clasts and those consisting of quartzite were identified as Oldowan stone tool artifacts. In the context of hominin activity, the identification of wooded grassland in association with nearby freshwater drainages and Oldowan artifacts significantly extends our paleoenvironmental purview on the basal parts of Lower Bed I, and highlights the hitherto underrated role of the yet poorly explored western Olduvai Gorge area as a potential ecologically attractive setting and habitat for early hominins.