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Programme and Abstracts

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Are colluvial soils on kopjes a potential geoarchive of palaeoenvironmental change in semi-arid regions?

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Sources of recent (Holocene) palaeoenvironmental change are infrequent across semi-arid regions. Yet, arid and semi-arid areas cover over 40% of the terrestrial Earth and are important environmental and cultural landscapes that are a major source of natural capital and ecosystem services (Grove, 1977, Thomas, 2011). In arid regions, minor hydroclimatic variability and disturbances have profound effects on the abiotic characteristics and the supported biota, which can rapidly and often irreversibly be modified by anthropogenic pressures (Sinclair and Fryxell, 1985; Miles et al., 2006). Kopjes are subaerially exposed portions of weathered and eroded inselbergs that intermittently punctuate the savannahs and woodland ecosystems of Serengeti National Park, northern Tanzania, a UNESCO World Heritage Site (Fig. 1). The protrusion of these landforms above the grass-dominated savannahs and their ruiniform geomorphology (Migoń et al., 2017) make them key components to the soil, vegetation, and wildlife, of savannahs. Kopjes and rocky hill habitats represent <1% of the total area of Serengeti National Park yet contribute greatly to biodiversity (Timbuka and Kabigumila, 2006; Byrom et al., 2015a and b). Historically, people have made use of kopjes for rock shelters (Bower and Gogan-Porter, 1981; Bower and Chadderdon, 1986), specialised foraging locations and viewpoints for hunting, communications, and cultural use (Mabulla, 2005).

Because there are so few palaeoenvironmental geoarchives in semi-arid lands and because of the importance of kopjes to biodiversity and people, we wanted to investigate the natural history and potential resilience of these ecosystems. We collected the soil profile from a small crack, dammed behind woody shrubs, on the surface of a granitic inselberg in the Moru Kopjes, Serengeti National Park, Tanzania (Fig. 1 foreground). The soils within the crack supported grasses, *Aloe* sp., and two shrub species. Preliminary soil descriptions show poorly sorted regolithic soils derived from the parent granite, which are rich in rootlets and contained minor abundances of charcoal. Soil characterisation and microfossil analyses (pollen, charcoal, grass cuticle, phytoliths) continue and radiocarbon dating of the stratigraphy is pending. We expect to develop a dataset useful for first asking whether these types of deposits can be useful for developing Holocene-aged palaeoenvironmental records that will be interpreted alongside other forms of retrospective data, such as historical photography, maps, and ethnographic data.



Figure 1. A east-facing view from atop Ngong Rock, Moru Kopjes, showing the colluvial soil site (foreground) and the flat savannah landscape surrounding the kopjes (background). Photograph taken 20 November 2018.

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