Late Quaternary vegetation development and disturbance dynamics from a peatland on Mount Gorongosa, central Mozambique

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Highlights

- Presents the first late Pleistocene – Holocene palaeoenvironmental record from Mozambique
- Late-Pleistocene podocarp forest/Erica-heathland shifts to forest/grassland mosaic in Holocene.
- Increases in biomass burning and disturbance taxa coincide with Iron Age land-use activity.
- Investigates climate-fire-land-use interactions from latitudinal zone (15–20°S) where few records exist.

Abstract

Few long-term climate and environmental records are available for southeast Africa where millennial scale shifts in the north-south position of the Intertropical Convergence Zone (ITCZ) and changes in Indian Ocean sea surface temperatures interact with local controls (e.g., fire, hydrology) to influence vegetation and ecosystem dynamics. Reconstruction of late-Pleistocene – Holocene environmental change from peat sediments obtained from Mount Gorongosa, central Mozambique, provides insight into vegetation, climate and disturbance interactions over the past c. 27 kyr. During the late Pleistocene, cool and wet climatic conditions supported Podocarpus forest and Ericaceae-heathland until drier conditions led to grassland expansion and a hiatus in peat deposition between c. 22.5 and 7.2 cal kBP. Increased temperatures and fire activity since c. 7.2 cal kBP led to further expansion of grasslands. Continued warming helped maintain grasslands and fostered a diverse mix of Podocarpus forest with a large number of subtropical trees and miombo woodland taxa (especially Brachystegia spp.) until regional land-use associated with the rise of Iron Age activity promoted an increase of disturbance related taxa over the last 1–2 millennia. Recent migration of people onto the Mount Gorongosa massif in the last fifty years are linked to an increase in fire activity that is unprecedented in the 27 kyr record, resulting in shifts in vegetation composition and structure. This long-term record of environmental change from central Mozambique highlights complex interaction
between overlapping climatic influences and documents important vegetation transitions linked to millennial scale climatic controls, disturbance processes and more recent land-use change from a region where few records exist.