

Multi-proxy record of past environmental changes from a tropical peatland (Kyambangunguru, Tanzania)

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Résumé:

Tropics are key components of the atmospheric circulation partly responsible for the variations of climatic conditions. Thus, by improving our knowledge on past climate variations in these areas, notably in terms of temperature fluctuations and hydrological regimes, we may be able to better constrain the driving forces of climate regulation. Peat bogs have a great potential of accumulation and preservation of organic matter due to their physical and chemical conditions and therefore appear as ideal settings for the application of organic proxies. The Kyambangunguru site (SW Tanzania) is a former Maar lake system being filled up by ombrotrophic peat. This evolution is frequent in Maar lakes of this region but its environmental causes remain unclear. In order to track when and why this conversion occurred, a 4 m core covering ca. 4,000 years BP (based on ¹⁴C dating) was collected in the middle of the peat bog. A multi-proxy approach involving elemental, molecular (GDGTs, n-alkanes), isotopic (δ D) as well as microscopic (macro-rests, micro-fossils, palynofacies) analyses was applied along this core. Results of n-alkanes, GDGTs and elemental analyses all showed a clear shift between 1,590 and 2,215 years BP, likely corresponding to an ecosystem change from a lake to a peat bog. Notably, at this depth, the high C/N values indicates a low decomposition of the organic matter while the GDGTs derived proxies show more acidic and warmer climatic conditions.