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Acceleration of cycad diversification towards the end of pliocene in African

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Abstract

Gymnosperms have long been regarded as living fossils. Recent studies have challenged this view, triggering a surge towards a better understanding of gymnosperm phylogenetic diversification. In this study, we focus on African cycads, the genus *Encephalartos* a monophyletic gymnosperm group endemic to Africa. Combining multiple statistical tests, we provided evidence for a rate-variable cladogenesis in the genus over time with a sudden shift in diversification of a southern African lineage towards the end of Pliocene. This shift contrasts with the emerging pattern of adaptive radiation. Several factors including background extinction and ecological stasis could underlie the pattern observed. Furthermore, the period of the shift corresponds to a change of climatic regime into glaciation events globally but a periodic shift between wetter and drier conditions in Africa, suggesting a link between this unique environmental context and the acceleration in diversification of *Encephalartos* species on the African continent.