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Composition and diversity of vegetation and pollen spectra along gradients of grazing intensity and precipitation in southern Africa

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Abstract

Understanding vegetation–modern pollen relationships is essential to provide confidence in fossil pollen reconstructions of long-term vegetation changes in savanna ecosystems. In this paper we compare the taxonomical composition and the diversity (Hill N0, N1, N2) of vegetation and modern pollen along precipitation and local grazing-intensity gradients in Namibian savannas. Modern pollen was extracted from surface soil samples collected from 5x5 m plots distributed along four 500 m gradients. Vegetation was surveyed in each plot. The results show a high correspondence between vegetation and pollen data in terms of composition. Precipitation and grazing explain a significant although low proportion of compositional change in the vegetation and pollen spectra. We identified pollen taxa as indicators of grazing pressure such as *Limeum*, *Alternanthera*, and particularly *Tribulus*. Correspondence between vegetation and pollen data in terms of taxa richness (N0) is limited, probably because of the influence of landscape heterogeneity and openness, as well as low pollen concentrations. In contrast, the effective numbers of common and dominant taxa (N1, N2) are consistent among the different datasets. We conclude that in spite of limitations, modern pollen

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