

Summary

This study forms a baseline for the long-term study of the ecological functioning of the seasonal floodplains of the Okavango Delta. As an introduction, the Okavango Delta physiography is described. The climate, soils and geology, topography, hydrology and vegetation are briefly described. Phytosociology and patterns of vegetation of the seasonal floodplains of the Okavango Delta were studied. Grasslands in the floodplains exhibit a marked zonation pattern along various environmental gradients. Application of the Braun-Blanquet methods of vegetation survey followed by a polythetic divisive classification technique (TWINSpan) resulted in delineation of eight vegetation communities of which five were further divided into sub-communities. The eight communities are *Cyperus articulatus-Schoenoplectus corymbosus* community, *Alternanthera sessilis-Ludwigia stolonifera* community, *Miscanthus junceus-Digitaria scalarum* community, *Imperata cylindrica-Setaria sphacelata* community, *Paspalidium obtusifolium-Panicum repens* community, *Setaria sphacelata-Eragrostis inamoena* community and *Sporobolus spicatus* community.

Ordination of floristic data was performed using DECORANA. The environmental factors include soil pH, elevation, depth and duration of flooding, Na, P, K, Ca and Mg. Ordination of floristic data successfully identified discontinuities which agreed well with field observation. Elevation, which influences duration and extent of flooding (moisture gradient), was identified as the main determinant of variation in spatial distribution of vegetation communities. Other environmental factors such as soil physical and chemical properties also contribute to spatial arrangement of vegetation but their implication in terms of zonation is not always clear.

The study investigated the variations in soil mineral nutrients content in relation to seasons and flooding regimes. Soils samples were collected during the raining season, before flooding and after flooding, and analysed for pH, Na, P, K, Ca, and Mg. An analysis of variance was performed using the Turkey's test to establish whether there is any

significant statistical difference and statistical interaction in soil mineral contents of different vegetation communities at different seasons at  $p = 0.05$ . The results showed that in some cases are significant differences while in some cases there is non. The forage quality of most dominant species in the study area was investigated and correlated with grazing pressure. Digestibility was found to the highest correlation with grazing intensity.

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