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Species Diversity in Fallow Lands of Southern Cameroon — Implications for Management of Man-Made Landscapes

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Abstract

In West tropical Africa, concern for more profitable and ecologically sustainable fallow systems provided impetus for initial research, particularly given the reported increasing abundance of fallows of shortened duration. A lack of reliable information regarding the characteristics of these land use systems in the humid forest zone of southern Cameroon has hindered resource managers' attempts to develop adapted strategies. This information can be useful in helping target specific fallow management prototypes to particular areas and types of fallow. A study was initiated in 1998 to assess species diversity as influenced by fallow age and fallow type, and interactions between the invasive fallow species *Chromolaena odorata* (L.) R. M. KING & H. ROBINSON and native plants were investigated. An assortment of biotic variables and abiotic variables was assessed to determine the relative importance of each. In total, about 224 species of vascular plants were recorded from the study sites, belonging to 74 families. The present study revealed that species and functional diversity were significantly associated with vegetation structure and plant community composition in 5–7 years old fallows under different land use intensity regimes. Ordination analyses showed a clear pattern of distribution of species along a gradient of resource use intensity. The separation of species scores along the first two axis of the ordination diagram revealed three main groups of species. Group 1 mainly constituted of weedy species, while Group 2 was mostly made of secondary rapidly growing woody (or semi-woody) pioneer species, and species of Group 3 were mostly plants that are found in the under-storey of secondary forests in the area. *C. odorata* was present in nearly 95% of the sampled sites, and was commonly associated with *Cnestis ferruginea* DC., *Dichapetalum* sp. and *Haumania danckelmaniana* MILNE-REDH.. Although canopy height was the best predictor of species richness and diversity, litter depth and basal area added significantly to the explained variability. The results of this study indicate that soil physical and chemical properties were significantly correlated with the plant species composition across the three study environments, accounting for up to 30% of the variation in species distribution.

Keywords: Biodiversity, *Chromolaena odorata*, fallows, land use, species richness