Distribution Characteristics of Mineral Elements in Tree Species from Two Contrasting Secondary Forests in Ghana

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Abstract

Tree species in two contrasting forests were evaluated on three plots of 0-19 ha (0.57 ha) in each secondary forest. Tree species populations were 44 in Akyaakrom (AS), 29 in Dopiri (DS), and families were 18 in AS and 16 in DS. Tree densities were 121 and 99 in AS and DS, respectively, in 0.57 ha. In terms of tree species population, diversity and density, AS was superior to DS. The distribution of major mineral elements in the leaves showed mean concentrations in decreasing order of K > Ca > Mg > P > N in AS and Ca > K > Mg > P > N for DS. The bark samples showed concentrations in decreasing order of Ca > K > Mg > N > P in both forests. Generally, concentrations of Ca in the tree species bark samples of both forests were about three times higher than they were in the leaves. Soil nutrients showed that Ca, Mg and N concentrations were higher in the DS than in AS within 0-60 cm soil depths. However, at 30-45 cm depth, Ca, Mg, K and N concentrations were higher in AS than in DS. The nutrient element concentrations were high at 0-15 cm than further down the soil depths for the two forests. The land quality indexes of the principal nutrients N, P, K, Ca and Mg were higher in AS than in DS. Thus, eight tree families in AS and five in DS, and tree species numbers 23 and 12 were peculiar to each site. This may suggest the higher tree population and diversity recorded for AS than for DS.