There have been several ecological studies in forests of the Guayana Shield, but so far none had examined the changes in structure and composition of evergreen forests with altitude. This study describes and analyzes the structure, species composition and soil characteristics of forest stands at different altitudinal zones in Southeastern Venezuelan Guayana, in order to explain the patterns and the main factors that determine the structure and composition of evergreen forests along the altitudinal gradient. Inventories of 3,948 big (>10 cm DBH) and 1,328 small (5-10 cm DBH) woody stems were carried out in eleven plots, ranging from 0.1 to 1.0 ha, along a 188 km long transect with elevations between 290 and 1,395 masl. It has been found that 1) hemiepiphytes become more dominant and lianas reduce their dominance with increasing altitude and 2) the forest structure in the study area is size-dependent. Five families and 12 genera represented only 9% of the total number of families and genera, respectively, recorded throughout the gradient, but the two groups of taxa comprised more than 50% of the Importance Value (the sum of the relative density and the relative dominance) of all measured stems. Moreover, the results suggest that low species richness seems to be associated with the dominance of one or few species. Stand-level wood density (WD) of trees decreased significantly with increasing elevation. WD is an indicator of trees’ life history strategy. Its decline suggests a change in the functional composition of the forest with increasing altitude. The Canonical Correspondence Analysis (CCA) indicated a distinction of the studied forests on the basis of their altitudinal levels and geographic location, and revealed different ecological responses by the forests, to environmental variables along the altitudinal gradient. The variation in species composition, in terms of basal area among stands, was controlled primarily by elevation and secondarily by rainfall and soil conditions. There are other interacting factors not considered in this study like disturbance regime, biological interactions, productivity, and dispersal history, which could affect the structure and composition of the forests in the altitudinal gradient. In conclusion, it appears that the structural and floristic variability observed in the studied transect is produced by a combination of different climates and randomly expressed local processes interacting across a complex physical landscape.

**Keywords**

Floristic composition, forest structure, Venezuelan Guayana, altitudinal gradient.