

Distribution of mangroves along environmental gradients on San Andres Island (Colombian Caribbean)

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Abstract

Species richness and distribution along environmental gradients in mangroves have been linked to abiotic and eco-physiological factors. The small surface area of San Andres Island, Colombia, the relatively low environmental variability, as well as the lack of permanent freshwater courses may prevent the formation of a zonation pattern, leading to a homogeneous composition and structure of the forests. The goal of this study was to evaluate the mangrove types, including their structure and floristic composition under the influence of five environmental factors. The primary relationships among tree species and flooding levels, salinity, pH, soil depth, and soil texture were investigated along 86, 500-m² plots established across 20 transects throughout the San Andres Island shoreline. Canonical Correspondence Analysis identified four mangrove groups, with the first two canonical axes explaining 65% of the variation in the data. The grouping of species along those axes was mainly associated with inundation level and soil depth. Two mangrove groups were classified as fringe mangroves that grow on highly saline and relatively shallow soils under the direct influence of tides. The remaining two were classified as riverine mangroves that grow on lower salinity soils influenced by sporadic freshwater flows and isolated from direct tidal influence.

Rhizophora mangle L. was present in the four mangrove groups but, on the highest saline soils where fringe mangroves grew, *Avicennia germinans* (L.) L. was dominant. In riverine mangroves, *Laguncularia racemosa* (L.) Gaertn., and *Conocarpus erectus* L. were the most important species.

Keywords

mangrove types, structure, diversity, zonation