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TOPOGRAPHIC HETEROGENEITY DRIVE RICHNESS AND TREE HEIGHT IN TROPICAL FOREST? IMPLICATIONS ON ABOVEGROUND BIOMASS

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Determining the relative contribution of the drivers shaping the tree structure and diversity in forest communities along topographic gradients is a persistent theme in ecology, and is crucial for informed forest management practices. The objective of this study was to evaluate the effects of topographic heterogeneity on richness, maximum tree height distribution and aboveground biomass (AGB) in the Brazilian Atlantic Forest. We measured data of the maximum height (Hmax) of 157 tree species in 200 subplots (10 x 10 m) located in two different hillsides (100 subplots in each south and west area). Topographic variables were measured and calculated for each subplot. The topographic heterogeneity was determined by multivariate regression tree analyses. South area presents greater topographic heterogeneity in relation to the west area, as a consequence of this, a difference in richness and floristic composition was observed. The less heterogeneous area showed a significant difference in the distribution of Hmax between plateau and valley (11 and 19 m); however, in the most heterogeneous area, this difference was not observed. AGB remained relatively constant despite topographic heterogeneity (south = 249 Mg/ha and west 252 Mg/ha). Of the 85 species found in the west area, six were responsible for 50% of the AGB of the entire community, in which *Anadenanthera peregrina* was the most hyperdominant species with 37% AGB. In contrast, in the south area half of the community biomass production (127 species) was distributed in a larger number of hyperdominant species (21 species). These results suggest that, although there are differences in the distribution of Hmax between the extremes of the gradient in the west area, there could be structural adjustments such as breast height diameter and wood density that allow maintaining AGB values. AGB remains relatively constant despite variations in environmental heterogeneity, richness and Hmax along the topographic gradient.

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