

Distribution of pteridophyte communities along environmental gradients in Central Amazonia, Brazil.

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In studies of understory plant community composition, generally a large part of the compositional variation remains unexplained and may be related to environmental variables that have not been measured in the field, such as light availability. Using the pteridophyte community as a model, we investigated the importance of environmental heterogeneity and geographic distance on the spatial distribution. Inventories were done on 38 plots of 250 x 2.5 m distributed over 150 km² of dense tropical forest. The inclusion of canopy openness increased the predictive power of the environmental model by 9 to 27%, even under the narrow range of 4 to 8.3 % of canopy openness found in our plots. However, there are still a large amount of unexplained variance (55 to 65%), and this single attempt to improve estimation of community composition suggests that light is not the main factor lacking in previous models. The response of the community to the light gradient was hierarchical, with most species concentrated in low light plots and a few common and abundant species occurring all-over the gradient. Therefore, we could not see evidences of light partitioning along the observed range. Soil properties were the major determinants of community composition, in accordance with most previous studies. However, there was no consistence in the effect of terrain slope on community composition for two close sites. Intensity of mass effects associated with different topographic conditions may be the cause of the observed pattern. Our results do not support the occurrence of dispersal limitation for

pteridophytes at the mesoscale (150 km²). Instead, environment was a better predictor of community composition. Although environmental variation determines high turnover of species locally, regional turnover was low.

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