

# Occupancy of lichens and bryophytes along a moisture gradient in the eastern Amazon, Brazil

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## Abstract

Lichens and bryophytes have been pointed out as organisms sensitive to alteration of forest habitats and have been evaluated as possible indicators of forest integrity. Thus, the present study aimed to evaluate the occupancy of these organisms along a moisture gradient at the Caxiuanã National Forest (State of Pará, Brazil). We assessed three different environments: *igapó* forest, *terra firme* forest, and the experimental site of the ESECAFLOR project. Five circular plots were established in each treatment, and all trees with a diameter at breast height (DBH) equal or higher than 10 cm were included. We used a square centimeter grid, positioned on the tree stems at breast height to count occupied crosses by lichens and bryophytes. Differences in the occupancy of both organisms among treatments were tested by analyses of variances (ANOVA). A linear regression model was also applied to evaluate the dominance between organisms. The occupancy for both lichens and bryophytes varied between environments ( $p < 0.001$ , and  $p = 0.014$ , respectively). However, lichens showed higher occupancy in the *terra firme* (45.6%), while bryophytes showed a higher occupancy in the *igapó* (32.9%). A dominance relationship between lichens and bryophytes was also evidenced ( $R^2 = 0.316$ ;  $p < 0.001$ ). Our finds highlighted that the occupancy of both organisms may be influenced by the humidity. The dominance among these organisms probably occurs due to competition for sites between them.