

LANDSCAPE ATTRIBUTES DRIVE SPATIAL MICROCLIMATE CONFIGURATION OF BRAZILIAN ATLANTIC FOREST FRAGMENTS

Theme: Impacts of Local and Global Changes on the Atlantic Rain Forest

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Habitat fragmentation imposes profound impacts on the tropical forest microclimate, but the microclimatic configuration of isolated forest patches and its implications for biodiversity persistence and habitat management are not clear. In this study we assessed a set of 10 aged, (~80 years) fragments (3.0 – 3,500 ha in size) of the Atlantic forest to examine to what extent fragment microclimatic attributes are correlated with distance to the nearest edge as frequently proposed in the literature. We used 129 sampling points and took a total of 516 measures of air temperature and humidity, vapor pressure deficit and light incidence to characterize the microclimate of forest fragments in terms of their relative deviation from the surrounding matrix. As expected, fragments as a whole presented strong internal variation and strongly differed from the microclimate exhibited by the open matrix of sugar-cane fields. Distance to nearest edge and three other explanatory variables proved to have minor effects on the microclimate of forest fragments. Conversely, we identified percentage of forest cover and fragment area as the most significant explanatory variables driving their microclimatic configuration: as forest cover increases at landscape scale, forest microclimate deviates less from the open matrix (a forest-mediated matrix buffering). Our results suggest that microclimatic conditions are spatially complex as they do not correlate with the distance to the nearest forest edges; but are driven by a forest-mediated buffering of the surrounding matrix that minimize heat and humidity exchanges between forest and non-forest habitats, thus shaping the microclimatic signature of isolated forest fragments.