Floristic and structural characterization of eleven semideciduous forest fragments in a Protected Area of Campinas County, Southeast Brazil

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Abstract

Currently, forest fragmentation is said to be related to deleterious effects on biotic communities. Such effects would be: species loss, changes in species composition and structure, increasing rates of damaged or dead trees and canopy openness. The extent of these alterations has been mainly associated to the size of the forest fragments. It has been said that small fragments often have fewer species recorded for the same effort of observation than large ones. The main purpose of this work was to verify if there is a relationship between floristic composition, structure and some qualitative aspects (canopy quality and openness) and fragment size. Eleven semideciduous forest fragments of several sizes were chosen at the Environmental Protection Area of Campinas County, Southeastern Brazil. Ten of these fragments are smaller than 100ha and one is 244.9ha. The fragments <100ha were grouped into three classes: small (10-15ha), medium (16-25ha) and large (40-65ha). In each forest fragment, using the point-centered quarter method, 125 sampling points were surveyed, including only stems bigger than 10cm diameter at breast height. Each five hundred stems sample was compared with samples gathered by the same way at three distinct locations at the 244.9ha fragment. A total of 6500 individuals were sampled, distributed in 248 species and 55 families. The number of species for each sample of 500 individuals ranged from 47 to 110 species, however most fragments have shown about 100 species, despite its total area. Two samples showed a much lower richness: one of them, containing 47 species, was a small fragment, and the other, containing 65 species, was a large one. Most fragments have shown about 40% of the total species sampled, indicating a great contribution to the regional species pool. 25% (65 species) are rarely found at other floristic surveys made at São Paulo State, and 13.6% of the species were found for the first time at Campinas County. In addition, almost 22% of species have occurred in just one fragment, showing their importance for conservation purposes. The diversity indices and estimated richness didn't differ among fragments. Many species were numerous in only one or two fragments, but in all fragments occurred an abundance concentration, where few species showed great dominance. Stems density was 40% smaller in large fragments and in the 244.9ha fragment's samples, but there was no relation between fragment size and density, as occurred with other structural parameters and abundance. Cluster analysis has shown that same size fragments should be so heterogeneous as do distinct areas inside a same forest fragment, suggesting that observed variation has no relation with fragment size. Only the qualitative aspects distinguished fragments <100ha from the 244.9ha forest. Fragments <100ha seemed more disturbed than the 244.9ha forest areas, once their canopy openness were higher and the damaged and young trees' proportions were off balance, suggesting smaller regeneration rates. Our results didn't confirm the testing hypothesis since the forests' variations didn't seem to be associated to the fragments' size, but more possibly with environmental heterogeneity and disturbing events such as fires. However analyzed qualitative aspects suggested that the vegetation in <100ha fragments is perhaps being altered, which could affect forest composition, structure and richness in the future.

Key-words*:* Forest fragmentation, semideciduous forest, diversity, richness, forest structure

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