LOCAL-SCALE HYPERDOMINANCE IN CARBON STOCK IN THE ATLANTIC FOREST: FOCUSING ON TREE FUNCTIONAL ATTRIBUTES

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Carbon storage is one of the most important ecosystem services on a global scale, contributing strongly to the balance between atmosphere and biosphere. Forest ecosystems represent the largest terrestrial carbon reservoir and its biodiversity and ecological interactions affect the maintenance of C stocks. To evaluate the relative importance of tree species in carbon storage, in terms of functional attributes, we identified the carbon hyperdominant species, which together account for ~50% of forest’s total carbon storage. We established 50 10x10m contiguous plots in one old-secondary forest (OSF), one mid-secondary forest (MSF) and one young-secondary forest (YSF); where all live trees with DBH > 3.18 cm were measured, identified and classified by successional strategy (pioneer and shade tolerant), dispersal syndrome (zoochoric and non-zoochoric) and wood density (softwood < 0.7 g/cm³ and hardwood ≥ 0.7 g/cm³). As expected by their successional stage, the OSF presented the highest carbon stock (163.95 MgC ha⁻¹) followed by MSF (108.84 MgC ha⁻¹) and YSF (47.37 MgC ha⁻¹). We verified six carbon dominant species in the OSF: all were shade-tolerant, 50% zoochoric and 66% hardwood species. Sloanea granulosa with only two individuals held the second largest carbon storage (11.4%). The MSF presented four carbon hyperdominant species of which 75% were pioneer, zoochoric and softwood. In YSF only the two species Miconia cinnamomifolia and Tapirira guianensis, both pioneer and zoochoric, held ~50% of total carbon stock. Our results show that carbon dominant species in late-successional forests are mainly shade-tolerant, what could explain their larger carbon storage, once this species have a greater potential to store carbon than pioneer; whereas in younger forests are mainly pioneer species and, regardless of forest successional stage the zoochoric are the most carbon hyperdominant species. Our results suggest that few species (~2.7%) are responsible for approximately half of the total carbon stored by forests, at local scale.

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