



High integration and low plasticity of wood traits allow plant species to occur in drier environments of the Atlantic Forest

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The commonness of species within local assemblages depends on how their functional traits covary, either through an integrated network of traits, also known as trait coordination, or a flexible network with close meaning to phenotypic plasticity. Trait integration and plasticity are expected to vary in opposite directions, forming a key trade-off that would explain the local species abundance. We sampled seven leaf and wood traits of 138 species from three vegetations in the Atlantic Forest to evaluate: (1) how species relative abundance, plasticity, and integration are associated; (2) how strong is the trade-off between plasticity and integration; and (3) how plasticity and integration vary along a rainfall gradient from 1,600 to 1,000 mm. Species abundance was not related to integration or plasticity, except for in one vegetation when leaf plasticity was involved. We found support for an integration-plasticity trade-off related to wood traits, but not related to leaf traits. Wood integration, wood plasticity, and leaf integration varied sufficiently across the rainfall gradient, with high integrations found in drier environments as a probable adaptation for hydraulic safety. These results suggest that distinct forests are marked by changes in the plant trait network, particularly if there is a meaningful rainfall gradient, but the relationship between species abundance, trait integration and plasticity may be not present within local assemblages. Our study highlights the importance of trait integration and plasticity as key indicators of vulnerability of tropical species to drought, which should be considered even more in further studies in the context of climate change.

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