

## RELATING FUNCTIONAL AND STRUCTURAL TRAITS TO SPECIES PERFORMANCE IN THE EARLY STAGES FOR 15 TROPICAL TREE SPECIES

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The correlations between functional and structural traits and their link with species performance has been little explored for tropical trees and yielded contradictory results.

In this study, we specifically (1) tested the (de)coupling of the leaf/stem/root economic spectra already identified for tropical woody species. (2) We also examined whether the leaf/stem/root traits were correlated with biomass allocation and stem anatomy. (3) Finally, we explored the relationship between traits and performance at the seedling and saplings stages.

We selected 15 major tropical tree species, belonging to 9 families and 13 genera, and measured leaf/stem/root traits, whole plant biomass allocation (leaf/stem, and shoot/root ratio) and stem anatomy (tissue proportion, vessel density and diameter and fiber wall thickness) for ten nursery-raised seedlings. We analyzed the correlations between traits of the different organs and across tissue-to-organismal scales. We identified the different trait combinations and explored their correlation with seedlings growth in the nursery and saplings growth and survival in plantation.

We identified strong co-variations between leaf, stem, and root traits, supporting trait combination integrating the whole plant. This first trait axis was associated with species strategy of resource use (resource acquisition/conservation trade-off). Biomass allocation and structural traits tended to be correlated but orthogonal to the leaf, stem, and root traits. This second axis was associated with species hydraulic efficiency and stress resistance. We also found that traits associated with the first "acquisition-conservation" axis were good predictors of seedlings growth, but not of saplings growth and survival in plantations.

Our results suggest relationship between traits and performance, though whether this relationship are mediated by the environment or change through ontogeny remains to be explored.

