

# High diversity of anatomical and hydraulic strategies of dominant Amazonian savanna woody species

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## Abstract

Amazonian savannas are isolated patches of open habitats found within an extensive matrix of tropical forest. Climate in Amazonia is transitioning to a state where savannas are more likely to occur than forests, but the hydraulic functioning of savannas species in Amazonian vegetation remain unknown and unexplored. We measured 22 leaf, wood and hydraulic traits, including embolism resistance (as P50), hydraulic safety margin and isotope-based water use efficiency, for the seven dominant woody species (75% of biomass) in an Amazonian savanna plants. We found a wide variation in resistance to embolism ( $-1.66 \pm 0.06$  MPa and  $-5.07 \pm 0.46$  MPa) and structural anatomy with species investing in three different functional strategies to tolerance the drought. (1) species with high leaf succulence have less efficient water use increase Gmax, minimizing the risk for xylem. (2) Species that have higher embolism resistance by reinforcement of the intervacular walls of the longest vessels. (3) Species that decrease the spread of embolism by thickening of the membrane of the intervacular pit of short vessel elements. Our results suggest no unique dominant functional strategy among Amazonian savanna species illustrating the multiple ways to adapt to increasing of seasonality in those environments.

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