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A hydraulic perspective on the interspecific diversity of drought resistance strategies in coexisting tropical rainforest tree species of French Guiana

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Abstract:

- The impressive tree species diversity of the Amazon rainforest has shown an associated wide-range of trait responses related to water use efficiency but little is known about embolism resistance traits in tropical tree species.
- Predicting tree species' responses to an increase in frequency and severity of drought events is therefore challenging. Experimental data is needed in order to deepen our understanding on the ecophysiological mechanisms involved in tolerance and avoidance strategies of tree species in this ecosystem.
- In this ongoing study, we characterize leaf and stem hydraulic traits, i.e. predawn (Ψ_{pd}) and minimum (Ψ_{min}) leaf water potential and leaf water potential at turgor loss point (π_{tlp}) as well as embolism resistance traits for a broad range of co-occurring canopy tree species.
- Preliminary results point out a broad range of interspecific variability in branch vulnerability to embolism. Further work will include predawn and minimum water potential measurements during the dry season to determine the magnitude of experienced stress and calculate hydraulic security margins. This will fuel discussions on the ecological relevance of these traits in predicting a species' drought-resistance.