

Poster #120

Root Traits of the Most Common Tree Species in El Verde, Puerto Rico

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Fine roots are important for plant nutrient and water acquisition, but are understudied in tropical ecosystems. Fine-root traits are related to species phylogeny and environmental conditions. However, it is not well defined which of these traits are genetically based and which follow an environmental strategy. The goal of this study was to measure fine-root traits of the most common plant species at the El Verde Field Station in the El Yunque National Forest, Puerto Rico, and compare them across species and with leaf litter of the same species.

We collected root voucher samples from six common tree species in El Verde. We also collected leaf litter and eight soil cores from differing ridge and valley topography. We analyzed morphology, architecture, and nutrient concentrations in first, second, and third-order fine roots and compared nutrient concentrations with nutrient concentrations in leaf litter. Further, we installed in-growth cores, four in the ridge and four in the valley, in order to measure fine-root growth every 2 months.

We found that each species seems to have a particular combination of traits that differ from the others. For instance, *Dacryodes excelsa* is the species with the smallest root diameter, and the largest distribution of roots in the surface soil layers, with the highest concentration of phosphorus, and the highest branchiness. This species is among the most common in the area, along with *Prestoea montana*, which in contrast to *Dacryodes*, has the largest root diameter, highest branching ratio, and a consistent distribution of biomass throughout the 30 cm soil profile.

Root morphology, architecture, and chemistry are all likely important influences in tree nutrient acquisition, and subsequently ecosystem nutrient cycling. This research begins to explore these relationships to support improved representation of tree phosphorus acquisition in terrestrial biosphere models.