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# Root microbiomes of tropical trees: Fungal dynamics affecting seedling performance

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Interactions between fungi and plant roots affect community dynamics and diversity. Tropical trees in Panama have shown to be negatively affected by soil from conspecific trees, apparently because of shared susceptibility to pathogens. Here, we test the hypothesis that root microbiomes that establish in *Virola surinamensis* seedlings vary depending on relatedness to the soil inoculum source and affect seedling growth performance. In a greenhouse experiment, seedlings were grown in: mother, male, other female (conspecific) and heterospecific. We isolated and sequenced fungal RNA from the ITS2 region in roots of 158 *V. surinamensis* seedlings using QIIME, MOTHUR and other bioinformatics tools in a custom pipeline, we assigned fungal taxonomy and relative abundance values. The abundance of specific fungal taxa within the community including *Rhizophagus clarus, Chaetothyriales* and *Sordariomycetes* were significantly elevated in particular source inocula. Abundances of some possibly pathogenic fungi (e.g., *Sympoventuriaceae, Fusarium* sp.,) were positively associated with maternal soil and hence candidates for negative effects of growing near a parent tree. Multiple fungal species were identified as being transmitted in a species-specific and/or sex-specific fashion. Abundance of certain fungal taxa was positively associated with the microbiome diversity and seedling growth performance (as was microbiome diversity itself), but there were no clear negative associations between particular fungal taxa and seedling growth. This work in conjunction with haplotyping of resistance genes in the same seedlings and mother is revealing mechanisms underlying important components of the community ecology and dynamics of tropical trees.

## Biography

Alyssa L Decker is a third-year undergraduate student at the Pennslyvania State University. She is pursuing a major in Biology and a minor in Microbiology. Her research is under the direction of James H Marden and focuses on the integration of soil microbiology and ecology.

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