Macrofungal Diversity in Different Stages of Secondary Growth Forest

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Introduction

- Macrofungi fill essential niches in forest ecosystems, forming links between trophic levels, contributing to nutrient cycling, and improving plant growth, nutrition and stress resistance.
- Very little research has been done on the structure of these communities in tropical forests. Studying fungal communities can help us evaluate the health of the forest.
- 40% of the forests in the tropics are in secondary growth stages. Fungal assemblages could be a useful tool for assessing secondary forest health and regrowth.

Objective and Hypothesis

- Our objective was to characterize macrofungal assemblages in a pre-montane cloud forest and to quantify if community structure changes with forest age.
- We hypothesized that there would be higher abundance, richness, and diversity in older sections of secondary growth due to larger amounts of downed wood.

Materials and Methods

- We identified forest ages around the UGA Costa Rica Campus in San Luis de Monteverde by talking to a local arborist.
- We divided the forest into three age classes, <30 years, between 40-60 years, and >70 years.
- To survey, we walked three 25m line transects per age class.
- Numbers of macrofungi were counted or estimated, and a picture was taken of each for later identification. Each fruiting body was counted because of the difficulties of identifying fungal individuals.

Results

We found a lot of fungi! 6398 counted!

Richness numbers increase as forest age increases.

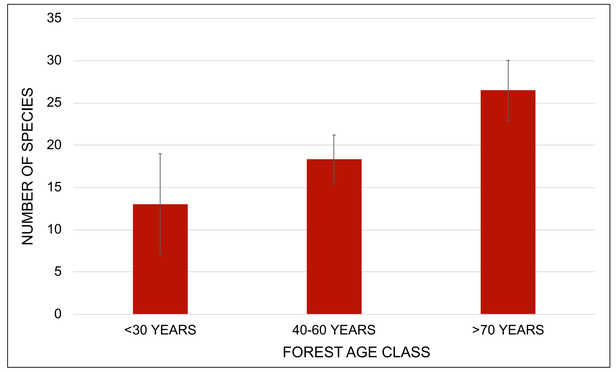
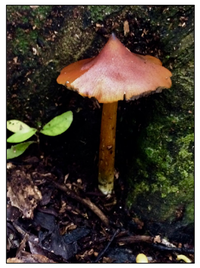
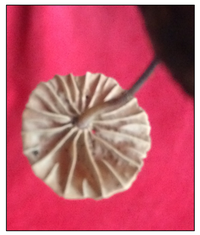


Fig. 1. Average richness of each forest age class





Shannon Diversity index values increase as forest age increases.

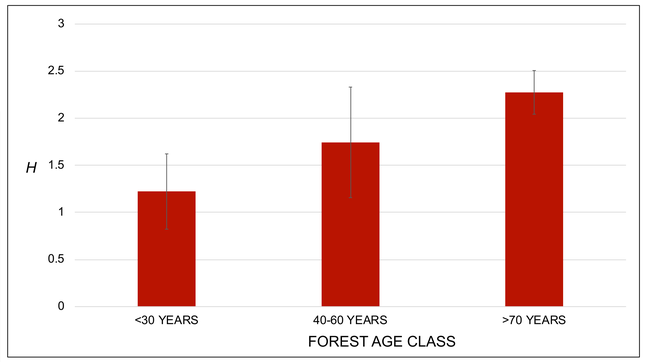


Fig. 2. Mean Shannon Diversity index values for each forest age class.

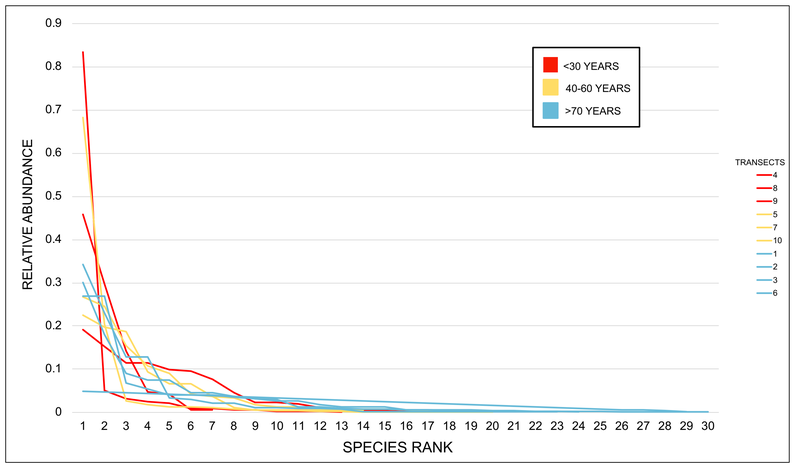


Fig. 3. The relative rank abundance of each species transect plotted next to each other

The ranked abundance graph shows that the older growth forest has a more even community distribution with much higher richness. The younger growth sections had some species that would dominate the community, composing up to 80% of all individuals found.

Conclusions and Future Direction

- Macrofungal diversity increases with secondary forest age.
- We did not find increased abundance with stand age as hypothesized. This is likely because of the limitations of the field sampling methods. The numbers of present basidiocarps were dependent on rainfall events.
- There is a need for more research on macrofungal assemblages in primary forests to allow for comparisons with the older stands of secondary growth.
- This project sets a baseline upon which research can be expanded at the UGA Costa Rica campus, and we can keep learning about the fungus amongst us!

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