**Fungal endophytes help tropical trees defend against natural enemies during early growth stages**

Flowering plants are adept at developing strategies to ward off enemies. Tough leaves, toxic alkaloids, and even the much-enjoyed caffeine in coffee are products of the evolutionary arms race between plants and the herbivores and pathogens that attack them. Plants have developed important symbioses with other organisms, such as fungi that live within their tissues (endophytes), to tackle challenges like warding off enemies. In the tropics, insect herbivores and fungal pathogens are plentiful. Yet, with all these enemies around, woody plants are highly diverse and thrive. In combination with plants’ leaf functional traits, could diverse endophytes that naturally infect seedlings provide benefits against natural enemies?

We developed an experiment in Gamboa, Panama, where we reared 7 tropical tree species in a greenhouse and then inoculated them naturally with fungal spores from a nearby forest. Having tree seedlings with low and high levels of endophytes, we presented leaves to leaf-cutter ants (insect herbivore) and tested how much of the leaf they harvested in a determined period. We also exposed tree seedling to a generalist pathogen and measured how much damage the pathogen caused.

We found that tree seedlings with high levels of endophytes suffered less herbivory damage compared to seedling with low levels. We did not observe differences in the damage caused by the generalist pathogen. Leaf functional traits, like leaf mass per area, also emerged as significant predictors of leaf damage outcomes. Our findings highlight the complex dynamics of plant-herbivore-pathogen relationships and underscore the importance of endophytes as a potentially low-cost, preemptive defense strategy for plants, especially during early growth stages. These insights shed light on the nuanced role of endophytes in plant ecology. Further, they open avenues for future research, particularly in exploring strategic resource allocation in plants and the specific contributions of endophytes to plant resilience.