

## PhD Dissertation Defense

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**Defense Date:** November 23, 2015

**Title:** Fungal Biodiversity of *Acer Rubrum* Varies By Seasons, Host Tissue, Wetland Type, And Region

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### ABSTRACT

Fungal communities that colonize plant roots and photosynthetic tissues are understudied in many biomes, and diversity studies concerning fungi in wetland ecosystems are only recently being explored. Endophytic and mycorrhizal fungi are now known to reside in wetlands, however much still remains to be studied on their contributions to biodiversity and their spatial distribution across different wetland types. Using Automated Ribosomal Intergenic Spacer Analysis (ARISA) and Ion Torrent Sequencing, this research explored the biodiversity of wetland fungi as a function of specific wetland type, region, tissue type, and seasonality in four different wetlands within the Chesapeake Bay Watershed. Specifically, the community structure and biodiversity of fungi on leaves and roots of *Acer rubrum* were studied. Leaf fungal communities were comprised of mostly Ascomycota with a few Basidiomycota, while root fungal communities were comprised of mostly Ascomycota and Basidiomycota, with a few from the Glomeromycota and Zygomycota. This study determined that diversity between leaf and root fungi differ, with roots having significantly greater species richness than leaves, and that leaf fungal communities are partly driven by seasonal changes showing shifts in leaf fungal communities with seasonal progression throughout the year. This study also determined that wetland type and region influenced fungal biodiversity in both above and belowground plant tissues. Although these results show that there are shared species of fungi that were cosmopolitan and occurred at all locations, indicator species for locations and regions varied, and there were many fungi that occurred in only one location but not others. Leaf and root fungi therefore may form specific types of communities at the local level but are still influenced overall by the broader geographic region those localities are found in.