

Project Information for the Mycobiota - Soil Litter Project

Project Details

Principal Investigator: Richard E. Baird

Project Description: Develop baseline data of forest litter microfungi present on presumed healthy American beech, Fraser fir, and eastern hemlock being attacked by exotic disease/insect pests in GSMNP.

Project Dates: **Start Date:** 5/6/2005 **End Date:** 9/10/2005

Protocol: Soil litter from four healthy tree (≥ 20 dbh) of each species per location were sampled on each sampling dates. Four subsamples were collected within 1 m of the tree boles, on the north (0°), east (90°), (180°), and west (360°) sides of each tree for uniformity. Each subsample was raked by hand from a 10 cm² area into large office envelopes unsorted.

Project Notes: American beech, Fraser fir, and eastern hemlock are important forest species of the Great Smoky Mountains National Park (GSMNP). American beech stands are being attacked by *Nectria coccinea* var. *faginata* (beech bark disease), Fraser fir by the insect *Adelges piceae* (Balsam woolly adelgid), and eastern hemlock by *Adelges tsugae* (hemlock woolly adelgid). All three pests are currently causing devastating losses to these tree species in the park. Therefore, timely sampling of organisms such as fungi must be conducted before further losses occur and baseline data are no longer available.

Summary: During May, July, and September in 2005, 8 litter samples were obtained under canopies of healthy American Beech (*Fagus grandifora*), Fraser fir (*Abies fraseri*) and eastern hemlock (*Tsuga canadensis*). Since the three tree species are being devastated by exotic pest, baseline data on microfungi was obtained in stands rated as healthy. During one sampling date, a total of 1,224 microfungal isolates were obtained, with 441 from American beech, 399 from Fraser fir, and 384 from eastern hemlock with 32 genera identified. The Fungi Imperfecti comprised over 95% of all fungi observed across all tree species. When isolation frequencies were compared between tree species no significant difference occurred. The most common fungi identified were *Trichoderma* spp. On Eastern hemlock, *Trichoderma* spp., *Pestalotiopsis* sp., and sterile white cultures on American beech, and *Penicillium* spp. With sterile white cultures from Fraser fir litter. In 2005, a total of 46 taxa identified during the study are first reports for the GSMNP.

Data Summary

Data Collection Year(s):

Number of Sites Sampled:	9
Number of Samplings:	18
Number of Orders Identified:	24
Number of Families Identified:	29
Number of Genera Identified:	75
Number of Species Identified:	58
Number of Specimens Identified to Species:	132

Number of Specimens not Identified to Species:	147
Total Number of Individuals Counted (actual or estimated):	3416
Percentage of Major Watersheds Sampled:	18 %