Diversity of fungal communities associated with hemlock at Kejimkujik National Park and National Historic Site over the last 30 years

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Fungi have essential ecosystem roles including decompose organic matter and forming symbiotic relationships with plants. Ectomycorrhizal fungi provide mineral nutrients and water to trees through the interaction of their hyphae with tree roots. In contrast, saprotrophic and lignicolous fungi are decomposers of organic matter and decaying wood. At Kejimkujik, these three fungal guilds are found within stands of Eastern hemlock (*Tsuga canadensis*). Hemlock is a foundational species that provides a specific habitat for many organisms. However, hemlock woolly adelgid (HWA, *Adelges tsugae*), an invasive insect, is causing severe hemlock decline in Eastern North America. This may negatively affect other species within hemlock stands, including fungi. By drawing upon existing fungal collections from Kejimkujik in Acadia University's E.C. Smith Herbarium, we are comparing current fungal communities to fungi collected in the 1990s from the same hemlock plot to observe if fungal diversity has changed over the past 30 years. Between the years of (2004-2007) over 1500 hectares of Eastern hemlock at Kejimkujik experienced light to severe defoliation by high densities of a Pale-winged gray moth (*Irodopsis ephyraria* Wlk.) larvae. We collected hemlock-associated fungi in Kejimkujik before and after the Pale-winged gray moth outbreak, and identified fungi within a hemlock plot containing HWA. DNA sequences obtained were compared with GenBank and examined using phylogenetic techniques to determine fungal species identities. We discovered some fungi present at Kejimkujik are also represented in our 1990s herbarium specimens from the same plot, indicating that some of the historic hemlock fungal community is still present.

Keywords: Ectomycorrhizal, Fungi, Hemlock Woolly Adelgid, Kejimkujik, *Tsuga canadensis*

Presentation type: Poster