

Plant Pathology Seminar Series

“Fungal Conservation and Ectomycorrhizal Fungi in the Pacific Northwest”

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Abstract

Ectomycorrhizal fungi are an important component of deciduous and coniferous forest communities. Modern practices in forest management may reduce the presence of ectomycorrhizal fungi, and air pollution and climate change endangers their habitat (1). In Europe, ectomycorrhizal fungi are already facing decline and potentially extinction, and efforts have been initiated aimed at the conservation of these fungi (1). A study in southwestern England showed that mushrooms are appearing on average 8 days earlier each decade, and sporocarps of some species are now forming in both fall and spring (3). Studies on chanterelles (*Cantharellus* sp.) in the Netherlands have shown a decline in populations over the past three decades, and the decline was correlated with increasing soil acidification, air pollution and the increased presence of understory plants that do not support ectomycorrhizal fungal associations (2). In the Pacific Northwestern US (PNW), forest management strategies put ectomycorrhizal fungi at risk of decline. Old growth forests, defined as being 200 to 1,000 years old, are dominated by Douglas fir, western hemlock, western red cedar, grand and silver fir, and Sitka spruce in the PNW (4). Old growth forests also contain a large accumulation of dead organic matter and specific ectomycorrhizal associations. Old growth forests in the PNW have declined to 17% of their former presence (5). Second growth forests, logged within the past 40-100 years, are composed of different dominant tree species than old growth stands. After a clear cut, second growth forests tend to be dominated by red alder, big leaf maple, and shrubs such as salmonberry which prefer more acidic soils (6). Studies on the biodiversity of ectomycorrhizal fungi led to the creation of the Northwest Forest Plan in 1994 (7). Studies in the HJ Andrews Experimental Forest near Salem, Oregon have shown a significant correlation between chanterelle species and forest stand age or elevation (8). Recent studies in the PNW have focused on chanterelle populations in relation to a forest management strategy known Green Tree Retention (9). Leaving stands of coniferous trees known to harbor ectomycorrhizal fungi such as chanterelles during timber harvest can preserve ectomycorrhizal fungal populations and biomass near levels of pre-timber harvest (10). If ectomycorrhizal fungi are utilized as indicators of a healthy, taxonomically diverse ecosystem in the PNW, forest management strategies can be utilized to prevent the decline of ectomycorrhizal fungi as has occurred in Europe.

4:10 pm • Monday, October 26, 2009 • 343 Johnson Hall

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