INVESTIGATING ANATAGONISTIC ACTIVITY OF FUNGAL ENDOPHYTES TOWARD PATHOGENS OF WESTERN WHITE PINE (*PINUS MONTICOLA*)

Emily Martin[1], Beau Larkin[1], Richard Sniezko[2], and Lorinda Bullington[1]

North American white pine populations have experienced increased mortality due to the invasive fungal pathogen *Cronartium ribicola*. Research has shown that white pines may defend against *C. ribicola* infection by hosting diverse fungal endophyte communities. Tree genetics appear to influence these endophyte communities and some fungal endophytes can be vertically transmitted, through seeds, from parent to offspring. Vertically transmitted fungi are often mutualists of plants and can facilitate host defenses against pathogens as seedlings mature. We plan to isolate and screen vertically transmitted fungi from resistant western white pines (*Pinus monticola*), for antagonistic activity that may inhibit infection, survival, and growth of *C. ribicola*. Western white pine seeds and needles will be collected from healthy trees throughout the Pacific Northwest and MPG North, Swan Valley, MT. We will culture tissue to isolate fungal endophytes and test for their ability to inhibit pathogen growth with microspectrophotometry, microscopy, and dual cultures. Fungi previously found to occur more often in resistant white pines will also be screened against pathogens. Microspectrophotometry will allow us to monitor pathogen growth and measure the inhibitory effects of toxic antimicrobial compounds produced by fungal endophytes. Dual cultures and microscopy will allow us to observe competition and mycoparasitism between pathogens and endophytes. With these methods we can screen many fungal endophytes at a time and quantify and compare their inhibitory effects. Fungal endophytes exhibiting the most effective antagonistic activity will be selected and used in western white pine seedling inoculation trials in 2019.

[1] MPG Ranch, Missoula, MT, 59801, (www.mpgranch.com, www.mpgnorth.com).
[2] Dorena Genetic Resource Center, USDA Forest Service, Cottage Grove, OR 97424, (lbullington@mpgranch.com).

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