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The Effect of Mountain Laurel Soil on Emergence and Survival of two Hardwood Species

Oaks are facing several threats to their ability to regenerate, including pathogens and mesophication. The way that other plants chemically and biotically alter soil may also play a role in the ability of oak seedlings to survive in different locations throughout the forest. *Kalmia latifolia*, a shrub commonly found in Appalachia, forms thickets which tend to have low hardwood regeneration. We have observed a visible difference between oak sapling densities inside and outside of these thickets. In contrast, we have observed that seedlings with the same mycorrhizal association as *K. latifolia*, primarily *Oxydendrum arboreum*, do not have lower sapling density in the thickets. To determine the cause of this phenomenon, we conducted a greenhouse experiment in which *Quercus alba* and *O. arboreum* seedlings were grown in conspecific and *K. latifolia* soil with sterilization and light treatments. The light treatment has two levels which replicate light conditions in the understory of an upland hardwood forest and in a *K. latifolia* thicket. We tracked emergence and death events for the duration of the experiment and analyzed the data using a Bayesian survival analysis. The results of these analyses reveal that *Q. alba* emergence and mortality are not significantly affected by a plant-soil feedback. *O. arboreum* experiences greater survival rates in *K. latifolia* soil compared to conspecific soil, with the greatest difference in non-sterile field soil, indicating a positive biotic effect.