

Forest composition affects ectomycorrhizal fungal community composition on *Quercus rubra* seedlings.

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ABSTRACT- Host composition is an important factor that may influence ectomycorrhizal (ECM) fungal diversity. We examined ECM fungal diversity on northern red oak (*Quercus rubra*) seedlings grown in situ and in soil cores from three northeastern U.S. forests dominated by two distinct tree species: northern red oak (*Quercus rubra*) and eastern hemlock (*Tsuga canadensis*). We hypothesized that seedlings growing in oak-dominated stands would be colonized by different ECM fungal morphotypes and exhibit greater morphotype richness than seedlings growing in hemlock-dominated stands, which are declining due to invasion by the hemlock woolly adelgid. Bait seedlings of northern red oak were planted and soil cores were taken from each of three oak- and hemlock-dominated stands located in a single watershed. Bait seedlings were grown for 20 weeks in the field. Oak seedlings planted in the cores were grown for 24 weeks in a climate-controlled greenhouse. For both bait and greenhouse seedlings, ECM fungal composition varied between oak- and hemlock-dominated stands. Moreover, ECM colonization and richness were significantly higher on bait and greenhouse seedlings grown in oak- compared to hemlock-dominated stands. Reduced ECM richness and colonization in hemlock-dominated stands was associated with significantly reduced bait seedling growth. These results suggest that spatial patterns in ECM fungal community composition may reflect forest composition or health. Further, ECM fungal community structure may regulate oak recruitment in hemlock stands as hemlocks decline in response to the hemlock woolly adelgid.