

ON THE ORIGIN(S) OF *DIPLODIA CORTICOLA*: CAUSAL AGENT OF COSMOPOLITAN CANKER DISEASE OF *QUERCUS* SPP.

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Abstract—*Diplodia corticola* (*Dc*) has emerged as an important canker pathogen of oaks in the United States with introductions to Maine, Massachusetts, West Virginia, Florida, and California since 2010. In 2014, symptomatic red oaks (*Quercus rubra*) were observed in Seneca State Forest (SSF), WV, exhibiting premature leaf drop with associated branch dieback, bleeding cankers, and mortality. Wood plugs were sampled from canker margins, and a dominant fungus was identified molecularly as *Diplodia corticola* using the fungal barcoding gene (ITS). Two WV *Dc* isolates, one ME isolate, and one MA isolate were used to confirm pathogenicity on red oak seedlings. By 8 weeks post-inoculation, all inoculated seedlings had cankers while controls remained canker-free. Combined canker area means for WV *Dc* isolates were significantly larger (P -value < 0.05, 4.8 cm²) than the controls (0.2 cm²). All sampled *Dc*-inoculated stems showed vascular streaks and occlusions, while controls remained asymptomatic. Combined means for WV *Dc* isolates showed longer streaking (P -value < 0.05, 23.6 cm) than the controls (0.0 cm). Isolations of *Dc* from 80 percent of cankers and 25 percent of symptomatic vascular tissues across all *Dc* treatments confirmed pathogenicity of *Dc*. Due to the synchronous nature of outbreaks among geographically distinct disease epicenters in the United States following similar outbreaks in Europe, questions regarding the origin of these various *Dc* introductions have been raised. Phylogenetic analyses and mating type assays are currently being conducted to further explore these relationships and determine if global decline of oaks by *D. corticola* can be attributed to an invasive pathogen.

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