

# Mechanisms Underlying Differences in Inoculum Production by *Phytophthora ramorum* in Mixed-Evergreen Versus Tanoak-Redwood Forest in California<sup>1</sup>

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## Abstract

Timing of inoculum production by *Phytophthora ramorum* occurs later in mixed-evergreen forest, as opposed to tanoak-redwood forest in California. This lag may be due, in part, to a greater decrease in the inoculum reservoir in California bay laurel (*Umbellularia californica*) leaves, the main source of inoculum, during the hot, dry summer months in mixed-evergreen forest. In our experiments, we focused on the mechanisms underlying this phenomenon. Using detached leaf inoculations, we compared the susceptibility of the California bay laurel populations and the aggressiveness of the corresponding pathogen populations between the two forest types. Although no difference in percent leaf area affected was observed between California bay laurel populations, lesion size was significantly smaller on leaves from mixed-evergreen forest regardless of origin of isolates, suggesting the potential for a smaller source of primary inoculum in this ecosystem. We also estimated chlamydospore production on, or inside, inoculated and naturally infected leaves from both forest types using clearing techniques. Surprisingly, chlamydospore production was zero in over 98 percent of inoculated leaves, and there was no conclusive evidence of chlamydospore presence in naturally infected bay leaves from either site. Summer measurements suggested that California bay laurel leaves from mixed-evergreen forest have significantly lower moisture content and water potential than bay laurel leaves from tanoak-redwood forest. Further studies are planned to address the influence of tree water potential on survival of *P. ramorum* in California bay laurel leaves.

*Key words:* cross inoculation, dormancy, sudden oak death, summer survival, transmission

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