

Incidence and Distribution of Resistance in a Coast Live Oak/Sudden Oak Death Pathosystem¹

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Abstract

In coastal California, infection by the pathogen *Phytophthora ramorum*, causal agent of sudden oak death, results in extensive mortality of native oak species including *Quercus agrifolia* (coast live oak). However, apparently resistant *Q. agrifolia* have been observed within native populations. In this study (Conrad and others 2019), we monitored disease progression from 2010 to 2017 in *Q. agrifolia* artificially inoculated with *P. ramorum* and disease incidence in *Q. agrifolia* left to become naturally infected in the same stand. After seven years, 61% of artificially inoculated *Q. agrifolia* died while 27% appeared to be resistant (i.e. in remission, no longer showing active symptoms of *P. ramorum* infection) (N = 149). In addition, 13% of non-inoculated *Q. agrifolia* showed symptoms of natural *P. ramorum* infection, e.g. bleeding exudate (N = 423). Canker length measured approximately one year following inoculation was a significant predictor of *Q. agrifolia* resistance and survival ($P < 0.001$). Canker length was also used to examine the distribution of resistant and susceptible *Q. agrifolia* across the landscape using inverse distance weighted analysis. This analysis revealed resistant and susceptible *Q. agrifolia* are aggregated, suggesting resistance is a heritable trait. A better understanding of the amount and distribution of resistant *Q. agrifolia* within native populations can be used to facilitate the restoration of disturbed habitats and identify sources of germplasm for future breeding efforts.

Literature Cited

Conrad, A.O.; McPherson, B.A.; Lopez-Nicora, H.D.; D'Amico, K.M.; Wood, D.L.; Bonello, P. 2019. Disease incidence and spatial distribution of host resistance in a coast live oak/sudden oak death pathosystem. *Forest Ecology and Management*. 433: 618-624. DOI: 10.1016/j.foreco.2018.11.035.

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