

Isolation and Characterization of Phytotoxins Secreted by *Phytophthora ramorum*¹

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Abstract

Most *Phytophthora* species secrete a variety of small, hydrophilic proteins that induce a hypersensitive-like response to varying degrees in host and non-host plant species. Our research focuses on the potential role of these proteins in the biology and susceptibility of host species to sudden oak death (SOD). In this paper we reported on the purification and characterization of several proteins from the culture filtrates of *P. ramorum* media. Exposure of leaf discs from several host species (*Umbellularia californica* and *Rhododendron* spp.) to semi-purified protein fractions resulted in altered membrane integrity and alkalization of a bathing solution. Such physiological changes are consistent with the hypersensitive-like response shown in other *Phytophthora* species, and appear to develop prior to any visual symptoms (e.g., wilting and/or necrosis). We have also conducted preliminary studies exploring leaf physiological responses distal to *P. ramorum* infection zones (i.e., stem inoculations). Similar to the protein assays, changes in membrane integrity and function may be observed in uninfected, non-symptomatic leaf tissues. The potential role of these phytotoxins in the development and impact of SOD was discussed.

Key words: *Phytophthora ramorum*, phytotoxins

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