

Beyond ramorum - the Other Phytophthoras in Western Forests¹

Everett Hansen²

Abstract

Little is known about indigenous *Phytophthora* species in natural ecosystems, although increasing evidence suggests that a diverse, trophically complex, *Phytophthora* community is important in many forests. In Oregon, 32+ *Phytophthora* species have been identified from forests. Globally, the number of described species has steadily increased, with a dramatic spike in recent years as new species have been split from old and other species have been discovered through exploration of new forest habitats triggered by the *P. ramorum* epidemics. In Oregon, almost two-thirds of the species were recently described. Forest soil, streams, and the upper canopies of trees are now being explored for *Phytophthora* diversity, and a new appreciation for the ecological amplitude of the genus is emerging. Three ecological assemblages, or guilds, of *Phytophthora* species can be distinguished in this accumulated work (fig. 1). Around the world, 10 to 15 species are regularly identified in surveys of temperate forest soils. Taxa in ITS clade 6 are especially numerous in forest streams and may be saprophytic in this habitat. In the upper canopies of trees in western tanoak forests, three or four *Phytophthora* species (including *P. ramorum*) with similar pathogenic behavior are encountered. Species from all three habitats—soil, streams, and upper canopies—occasionally cause lethal bole cankers on trees. A very few become invasive under circumstances we cannot yet predict.

Preventing the next invasion by a *Phytophthora* species is as much a political and economic challenge as a biological one. We have learned much through the *P. ramorum* experience about the importance (danger) of the nursery trade as a pathway for invasion, and in the United States, the nursery industry has responded to reduce the threat. Recent emphasis on Best Management Practices and Oregon's "Grower Assisted Inspection Program" assure that nursery stock in interstate commerce is healthier and less likely to harbor pathogens. Success with the larger horticultural nurseries shifts the focus, however, to gaps in protective education programs. Smaller native plant nurseries supplying stock for wildland rehabilitation, and the agency botanists that buy from them, would both benefit from focused plant health training.

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² Department of Botany and Plant Pathology, Oregon State University, Corvallis, OR 97331.
Corresponding author: hansene@science.oregonstate.edu.

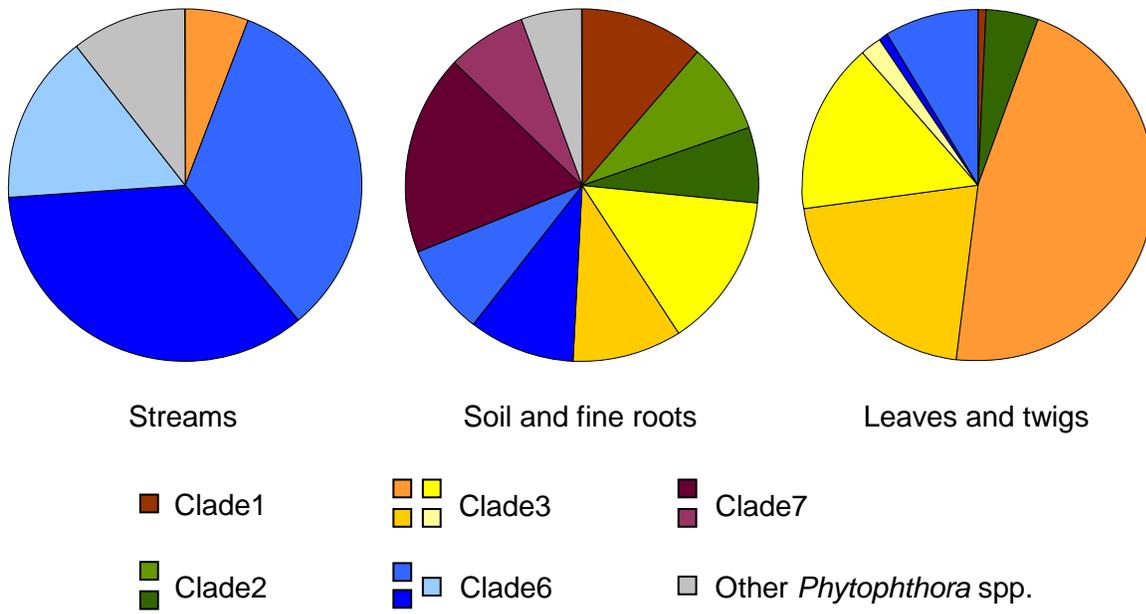


Figure 1—Clades associated with three ecological assemblages of *Phytophthora* species.