



**MONITORING OCCURRENCE AND DISTRIBUTION OF *PHYTOPHTHORA* SPECIES IN FOREST STREAMS IN NORTH CAROLINA USING BAITING AND FILTRATION METHODS**

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The recent epidemics of sudden oak death, caused by *Phytophthora ramorum*, in the coastal forests of California and southwest Oregon have drawn attention to other species of *Phytophthora* present in natural ecosystems that may threaten forest tree health. Since *Phytophthora* species are well adapted to aquatic environments, the species present in a strategically-selected stream may represent the occurrence and distribution of *Phytophthora* species over the relatively large land area drained by this stream. Based on this assumption, five streams in three watersheds in the Pisgah National Forest in western North Carolina were monitored monthly for *Phytophthora* species. from April 2005 to March 2006. Filtration and two baiting methods were used to detect propagules of *Phytophthora* species in stream water. A 1-liter water sample was collected from each stream and vacuum-filtered with Nuclepore and Durapore membrane filters. In addition, wounded or non-wounded leaves of *Rhododendron maximum* were used as baits and were exposed in a stream for 3 days or 2 to 3 weeks, respectively.

*Phytophthora* species were detected from all five streams throughout the 12-month monitoring period. *P. cambivora*, *P. cinnamomi*, *P. citricola*, *P. citrophthora*, *P. gonapodyides*, *P. heveae*, *P. pseudosyringae*, and seven morphologically and genetically distinct groups of isolates were identified from 1560 isolates collected. *P. gonapodyides* was the most prevalent (1353 isolates) and was detected consistently throughout the monitoring period. *P. citricola*, *P. gonapodyides*, and *P. pseudosyringae* were widely distributed and occurred in all five streams. Diversity of *Phytophthora* species was greatest in July, when 11 species/groups were detected and least in February when only one species was detected. *P. gonapodyides* and *P. pseudosyringae* were the only two species recovered over winter months (from November to February). Thirteen of the 14 species/groups were detected by filtration while only eight species/groups were isolated with each baiting method. Overall, filtration was superior to baiting for detecting *Phytophthora* species in forest streams: it provided quantitative data on propagule density; it was more efficient than either baiting method; and it was more effective at detecting greater species diversity.