

Development of Molecular Diagnostics for *Phytophthora kernoviae* a New *Phytophthora* Threatening U.K. Trees, Woodlands, and Ornamental Plants¹

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Abstract

In autumn 2003, a new *Phytophthora* species, informally designated as *Phytophthora kernoviae* and previously known as *Phytophthora taxon C*, was isolated by the Central Science Laboratory (CSL) from rhododendron bushes from a woodland area in southwest England. Concurrent with this, Forest Research (FR) isolated a similar *Phytophthora* from a large bleeding canker present on a mature beech tree (*Fagus sylvatica*) and from an adjacent rhododendron at a second southwest site. *P. kernoviae* has since been isolated from soil and also found on other plant species: *Liriodendron tulipifera*, *Pieris formosa*, *Magnolia stellata*, *Michelia* sp., *Gevuina avellana*, *Fagus sylvatica* and *Quercus ilex*. Morphological assessment by CSL and FR (Brasier and others 2004, 2005) revealed these isolates to be the same species having papillate, caducous to mouse-shaped sporangia (average size 39.6 x 25.6 µm, range 30 to 50 x 20 to 32 µm), being homothallic with amphigynous atheridia approximately 11 x 10 µm and oogonia with an average diameter of 25 to 27 µm. Sequence information from the internal transcribed spacer regions (ITS one and two) of the nuclear ribosomal gene repeat were also aligned with data provided from Dr. David Cook of the Scottish Crop Research Institute. These sequences were identical to each other and distinct from other sequences on the Genbank sequence database, with the closest match to *P. boehmeriae*. Further alignment of this sequence data with that from 45 other *Phytophthora* isolates, representing 10 *Phytophthora* species, including *P. ramorum* and *P. boehmeriae*, has allowed us to identify areas for PCR primer design. Based on these areas, and areas in the cytochrome oxidase gene (subunits I and II), TaqMan[®] primers and probes have been designed and are currently being evaluated on pure cultures and plant samples from the U.K. Work is also under way to use *P. kernoviae* primers for on-site use and to profile *P. kernoviae* isolates with molecular methods including AFLP.

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