Phytophthora terminalis and *Phytophthora occultans*, two novel species infecting ornamental plants in Europe.

Abstract

In the past decade several *Phytophthora* strains were isolated from diseased *Pachysandra terminalis* plants suffering stem base and root rot, originating from the Netherlands and Belgium. All isolates were homothallic and had a felt-like colony pattern, produced semi-papillate sporangia, globose oogonia and had a maximum growth at ~ 27 C. Several additional *Phytophthora* strains were isolated from diseased *Buxus sempervirens* plants, originating from the Netherlands and Belgium, which had sustained stem base and root rot; similar strains also were isolated from *Acer palmatum*, *Choisya ternata* and *Taxus* in the United Kingdom. All isolates were homothallic and had a stellate colony pattern, produced larger semi-papillate sporangia and smaller globose oogonia than the isolates from *Pa. terminalis* and had a maximum growth temperature of ~ 30 C. Phylogenetic analyses of both species using the internal transcribed spacer region of the nuc rDNA (ITS), mt cytochrome oxidases subunit I gene (CoxI) and nuc translation elongation factor 1-α gene (TEF1α) revealed that all sequences of each species were identical at each locus and unique to that species, forming two distinct clusters in subclade 2a. Sequence analysis of partial β-tubulin genes showed that both taxa share an identical sequence that is identical to that of *Ph. himalsilva*, a species originating from Asia, suggesting a common Asian origin. Pathogenicity trials demonstrated disease symptoms on their respective hosts, and re-isolation and re-identification of the inoculated pathogens confirmed Koch's postulates.