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Phytophthora himalsilva sp. nov. an unusually phenotypically variable species from a remote forest in Nepal.

Vettraino AM, Brasier CM, Brown AV, Vannini A.

Department of Plant Protection, University of Tuscia, Via S. Camillo de Lellis, 01100 Viterbo, Italy.

Abstract

The Himalaya have received little investigation for *Phytophthora* species. In a remote forest in Western Nepal ten isolates of an unknown *Phytophthora* were recovered from the rhizosphere of *Quercus*, *Castanopsis*, *Carpinus* and *Cupressus* spp. The *Phytophthora*, formally named here as a *P. himalsilva* sp. nov., is homothallic with either amphigynous or paragynous antheridia and papillate, highly variable sporangia which may also be facultatively caducous. Based on ITS, β -tubulin, and cox I sequences *Phytophthora himalsilva* falls within *Phytophthora* Clade 2c together with *Phytophthora citrophthora*, *Phytophthora meadii*, *Phytophthora colocasiae*, and *Phytophthora botryosa*. It is suggested that Clade 2c has radiated within Asia. Molecular and sporangial characters indicate that *P. himalsilva* and *P. citrophthora* may share a recent common ancestor although they have diverged in their breeding systems. Although highly local the *P. himalsilva* isolates exhibited significant variation in growth rates and optimum temperatures for growth. This may reflect adaptation to different niches within a heterogeneous sub-tropical to temperate forest environment. Their cox I polymorphisms were also rather variable, including possible clustering for subsite. The occurrence of a previously unknown *Phytophthora* in a remote forest in Nepal highlights once again the plant health risk associated with moving rooted plants and soil between different bio-geographical regions of the world and the need for rapid pathological screening of potential risk organisms.

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