

Title Identification of *Phytophthora cryptogea* as the cause of rapid decline of Petunia (*Petunia × hybrida*) in Chile

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Abstract

Phytophthora cryptogea was consistently isolated from diseased tissue taken from the crown and necrotic roots of grandiflora type petunia (*Petunia × hybrida*) that were collected in gardens in five public parks in Santiago, Chile in 2004 and 2005. Symptoms included leaf wilting and foliar chlorosis, followed by partial necrosis, and extensive dark-brown to reddish cankers in the crown. Disease incidence was over 50% and infected plants died within 7 to 10 days after transplanting. This pathogen was identified on the basis of colony morphology, morphological characterization of the sexual and asexual reproductive structures, and temperature range. The identification of *Phytophthora cryptogea* was further corroborated by the internal transcribed spacer sequence analysis (GenBank accession number EF093534). Isolates of *P. cryptogea* were pathogenic on 10-week-old white grandiflora petunia plants that were inoculated on the roots or on the crown using mycelium fragments, or via soil inoculation using zoospores. A rapid decline was observed after soil inoculations with zoospores. Root fresh weight decreased significantly and the root rot index and severity of foliage symptoms increased significantly ($P \leq 0.05$), relative to noninoculated plants after 14 days of incubation. Two isolates (Ph-1 and Ph-2) were pathogenic on bell pepper and one isolate (Ph-1) was pathogenic on tomato after root inoculation. Two isolates (Ph-2 and Ph-3) were pathogenic on the fruit of avocado, bell pepper, cherry tomato, cucumber, kiwifruit, lemon, pear, pepino, and potato tubers, demonstrating the pathogen's ability to cause postharvest infection of fruit of a wide range of host plants. The efficacy of mefenoxam at 0.1 mg/ml mixed with either chlorothalonil at 1.0 mg/ml or mancozeb at 1.6 mg/ml was demonstrated in this study, whereas chlorothalonil and mancozeb alone did not control disease development. No significant differences were obtained between foliage and soil drench applications. This study demonstrated that *P. cryptogea* is the cause of the rapid decline found on petunia in Santiago, Chile and, to our knowledge, this is the first report giving a detailed description of a disease caused by *P. cryptogea* on petunia.