plant disease

Editor-in-Chief: Mark L. Gleason
Published by The American Phytopathological Society

January 2006, Volume 90, Number 1
Page 109
http://dx.doi.org/10.1094/PD-90-0109A

Disease Notes

First Report of Dieback and Leaf Lesions on *Rhododendron* sp. Caused by *Phytophthora hedraiandra* in the United States

B. W. Schwingle, **J. A. Smith**, **R. A. Blanchette**, **S. Gould**, and **B. L. Blanchette**, Department of Plant Pathology, University of Minnesota, St. Paul 55108; **J. Pokorny**, USDA Forest Service, Northeastern Area State and Private Forestry, St. Paul, MN 55108; and **S. D. Cohen**, USDA, APHIS, PPD, Riverdale, MD 20737

Surveys for *Phytophthora ramorum* in Minnesota nurseries revealed the presence of *P. hedraiandra* de Cock & Man in't Veld and several other *Phytophthora* species but not *P. ramorum*. Symptomatic leaf and stem tissues from diseased *Rhododendron* and *Quercus* species were cultured on PARP, a selective growth medium for *Phytophthora* (3). The *Phytophthora* isolates obtained were later identified by sequencing the internal transcribed spacer (ITS) region of the rDNA and comparing the sequences with those in GenBank using BLAST searches (1). The ITS sequences of six cultures (GenBank Accession Nos. DQ139804-DQ139809), isolated during 2003 from various *Rhododendron* cultivars exhibiting leaf lesions and shoot dieback, showed 100% identity with the ITS sequence of *P. hedraiandra* (GenBank Accession No. AY707987) (2). This is a recently described pathogenic species from the Netherlands responsible for causing leaf spots on *Viburnum* spp. Since the ITS sequence of *P. hedraiandra* differs little from that of *P. cactorum* (2), we verified one isolate to be *P. hedraiandra* by sequencing the mitochondrial cytochrome *c* oxidase subunit I gene (*cox*1) (GenBank Accession No. DQ139810). Comparison of this sequence with the *P. hedraiandra* voucher specimen in GenBank (Accession No. AY769115) showed 99% identity, which was the closest match. Reproductive structures were measured on V8 juice agar. The average oogonium diameter for three isolates was 29 µm with a range of 26 to 32 µm, while the average antheridium length was 13 µm (11 to 15 µm). Sporangium length and width averages on crushed hemp seeds were 32 µm (28 to 36 µm) and 26 µm (21 to 30 µm), respectively, with the average length to width ratio of 1.25 (1.23 to 1.29). Pathogenicity tests on *Rhododendron* cv. Mikkeli were carried out using three of our *P. hedraiandra* isolates. Spore suspensions of 2 × 10^4 zoospores per ml were used to mist-spray shoots of five, 3-year-old plants for each isolate. Five controls were mist sprayed with water. After inoculation, plants were placed in plastic bags in a dark growth chamber (22°C) for 7 days and then moved to a greenhouse. Leaf blotches and shoot dieback were apparent 5 days after inoculation, and *P. hedraiandra* was reisolated from those symptomatic tissues and identified by an exact match of the ITS sequence. Necrotic areas lengthened from the shoot tips to the main stems of the plants while expanding into petioles and leaves. No symptoms were observed on control plants. To our knowledge, this is the first report of *P. hedraiandra* in the United States as well as the first report of Koch's postulates performed with *P. hedraiandra* on *Rhododendron* cv. Mikkeli. The significance of this disease to other woody plants in nurseries or the landscape is unknown, and further study is needed to determine the host range and extent of the disease that may occur from this introduction.

References: (1) S. F. Altschul et al. J. Mol. Biol. 215:403, 1990. (2) A. W. A.M de Cock and C. A. Lévesque. Stud Mycol 50:481, 2004. (3) D. C. Erwin and O. K. Ribeiro. *Phytophthora* Diseases Worldwide. The American Phytopathological Society, St. Paul, MN, 1996.

Cited by

Mini Review Article: An annotated list of new Phytophthora species described post 1996
T. Érsek and O. K. Ribeiro
Acta Phytopathologica et Entomologica Hungarica Dec 2010, Volume 45, Number 2: 251-266
CrossRef