

First Report of Littleleaf Disease Caused by *Phytophthora cinnamomi* on *Pinus occidentalis* in the Dominican Republic

T. Jung and G. Dobler, Bavarian State Institute of Forestry (LWF), Section of Forest Ecology and Protection, Am Hochanger 11, D-85354 Freising, Germany

Pinus occidentalis Sw. is an endemic species of the Caribbean island of Hispaniola (Dominican Republic and Haiti). It shows an extreme ecological plasticity and grows on a wide range of soil types from 0 to 3,175 m in elevation with annual mean temperatures ranging from 6 to 25°C and annual precipitation of 800 to 2,300 mm. *P. occidentalis* is a major component of forests above 800 m in elevation and forms pure climax forests above 2,000 m (4). For more than 10 years, stands of *P. occidentalis* in the Sierra (Cordillera Central) growing on a wide range of site conditions have suffered from a serious widespread disease. Symptoms include yellowing and dwarfing of needles, a progressive defoliation and dieback of the crown, and finally, death of weakened trees often caused by attacks by secondary bark beetles. Mature stands are mainly affected, but the disease is also present in plantations and natural regeneration that is older than 10 years. Disease spread is rapid, and occurs mainly along roads and from diseased trees downslope following the path of water runoff. Initially, *Leptographium serpens* was isolated from necrotic roots and was thought to be the causal agent (1). However, the symptoms of the disease more closely resemble those of littleleaf disease of *P. echinata* and *P. taeda* in the southeastern United States, which is caused by the aggressive fine-root pathogen *Phytophthora cinnamomi* Rands (3). Moreover, spread and dynamics of the disease are similar to the diebacks of *Chamaecyparis lawsoniana* in Oregon and *Eucalyptus* spp. in western Australia, which are caused by the introduced soilborne pathogens *Phytophthora lateralis* and *Phytophthora cinnamomi*, respectively. Soil samples containing the rhizosphere and fine roots of diseased *P. occidentalis* trees were collected in February 2002 at five sites near Celestina and Los Montones (Dominican Republic) and transported to the Bavarian State Institute of Forestry. The pathogen was baited from the soil by floating 3- to 7-day-old leaves of *Quercus robur* seedlings over flooded soil and placing the leaves on selective PARPNH agar (2). *Phytophthora cinnamomi* was isolated from the soil of all five sites. Crossing with A1 and A2 tester strains of *Phytophthora cinnamomi* confirmed that all isolates belong to the A2 mating type. In cross sections of necrotic fine roots, characteristic structures of *Phytophthora cinnamomi* such as nonseptate hyphae and chlamydospores could be observed. Our results indicate that the disease of *P. occidentalis* is caused by the introduced pathogen *Phytophthora cinnamomi*. Because of the ecological and economical importance of *P. occidentalis*, the disease poses a major threat to forestry in the Dominican Republic. Future research should include the mapping of the disease, pathogenicity tests on *P. occidentalis* and alternative pine species, in particular *P. caribaea*, screening for resistance in the field, and testing of systemic fungicides such as potassium phosphonate, which is known to be effective against *Phytophthora cinnamomi*.

References: (1) G. Dobler. Manejo y Tablas de Rendimiento de *Pinus occidentalis*. Plan Sierra, San José de las Matas, Dominican Republic, 1999. (2) T. Jung et al. Plant Pathol. 49:706, 2000. (3) S. W. Oak and F. H. Tainter. How to identify and control littleleaf disease. Protection Rep. R8-PR12, USDA Forest Service Southern Region, Atlanta, Georgia, 1988. (4) L. Sprich. Allg. Forst. Jagdztg. 168:67, 1997.