On-site real-time PCR detection of Phytophthora ramorum causing dieback of Parrotia persica in the UK

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In Europe Phytophthora ramorum mainly causes dieback of Rhododendron and Viburnum, but in the UK it has also been reported on other ornamentals including Hamamelis (Giltrap et al., 2004) as well as on a limited number of tree species (Brasier et al., 2004). In November 2004, Defra’s PHSI collected samples from a public garden in south Wales where P. ramorum was under eradication. Each sample was tested on-site by CSL using real-time (TaqMan®) PCR for P. ramorum on a Cepheid SmartCycler (Tomlinson et al., 2005). This identified P. ramorum on Parrotia persica (Persian ironwood; Hamamelidaceae), which was causing necrotic leaf lesions and twig dieback. Duplicate material was also sent to CSL where P. ramorum was consistently isolated from both stem and leaf tissue following surface decontamination and isolation onto semi-selective medium (Lane et al., 2002). An ITS sequence was obtained from a culture of P. ramorum isolated from P. persica (GenBank DQ066919) and this was identical to other P. ramorum isolates on GenBank. Pathogenicity of the isolate was confirmed by wound-inoculating healthy leaves of P. persica with mycelial plugs and incubating these in a damp chamber at room temperature (c. 20°C) in the laboratory for six days. Extensive lesions developed on the leaves and the pathogen was re-isolated from the leading edge; thus completing Koch’s postulates. Healthy wounded leaves, inoculated with agar alone, did not develop symptoms.

This is the first report of P. ramorum affecting P. persica. The infected plant was destroyed and measures were taken to eradicate the pathogen according to European Union phytosanitary legislation and the EU was notified.

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References


First report of Phytophthora boehmeriae on black wattle in Brazil

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Black wattle (Acacia mearnsii) is an Australian tree species cultivated in several countries. In Brazil, particularly in Rio Grande do Sul State (RS), approximately 140 000 ha are cultivated for tannin extraction (Dos Santos et al., 2005).

The gummosis complex, which has Phytophthora nicotianae as one of the causal agents, is the main disease of black wattle in Brazil and is characterised by lesions at the trunk base with gum exudation (Dos Santos et al., 2005). Different symptoms were observed in plantations at the municipality of Piratini, RS (southern Brazil) and were characterised by dark lesions without gum exudation on trunks of 3- to 4-year-old wattle trees up to 10 m height. Isolates of Phytophthora spp. were obtained from the diseased material and deposited in the Brazilian collection of Phytophthora species, under accession numbers CBF 307, 308 and 309. Sporangia of all isolates were ovoid to spherical, papillate and caducous, measuring 35 µm ± 1.42 ± 30 µm ± 1.37, with a length/width ratio of 1:1-61, mean depth of papillae of 4.83 µm ± 0.04, and pore exit of 4.69 µm ± 0.04. The isolates were homothallic, forming pterotic oospores with smooth walls and amphigenous antheridia. The ITS sequences obtained for isolates CBF 307 (AY428533), CBF 308 (AY428534), and CBF 309 (AY428535) were identical and most closely matched those of two isolates of P. boehmeriae KACC40173 (AY228076) from Korea and SCRP23 (DQ297406) from China. This and the morphological similarity (Erwin & Ribeiro, 1996) suggest that these isolates are P. boehmeriae. However, seven clear single base pair differences were noted between the Brazilian and other P. boehmeriae isolates. This, combined with isozyme variation (Oudemans & Coffey, 1991) suggests that further studies are needed to confirm the taxonomic status of P. boehmeriae.

Pathogenicity tests were done by inoculating five 1-year-old wattle plants with 7 mm mycelial discs of 5-day old cultures of the three isolates used in this study. The mycelial discs were placed in 7 mm diameter holes made in the bark with a cork borer, at 5 cm above the soil. Plants were maintained at approximately 25°C and were assessed 45 days after inoculation. All three isolates were pathogenic to black wattle and were re-isolated from the lesions.

Phytophthora boehmeriae was reported as one of the causal agents of the gummosis complex of black wattle in South Africa (TPCP, 2004) and is of quarantine importance for the citrus industry in Brazil. This is the first report of the involvement of P. boehmeriae in the aetiology of the gummosis complex of black wattle in Brazil.

References


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