New Disease Reports

First report of *Phytophthora cinnamomi* associated with stem cankers of *Quercus cerris* in South Africa

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Quercus cerris (Turkey oak) is native to the orient and southeastern Europe (Balci & Halmschlager, 2003a). These trees are also commonly planted as non-native ornamentals in countries including South Africa. Recently, bleeding cankers on the stems, typical of *Phytophthora* infection, were found on *Q. cerris* trees growing on the Vergelegen Estate near Somerset West in the Western Cape Province of South Africa (Fig. 1). *Phytophthora* species have been recognised as being involved in the decline of *Quercus* spp., including *Q. cerris*, in eastern and north-central USA and Europe (Balci *et al*., 2007). Species isolated from soil associated with declining *Q. cerris* include *P. citricola*, *P. cryptogea*, *P. quercina,* and *P. syringae* (Balci & Halmschlager, 2003a,b), while *P. ramorum* and *P. cinnamomi* have been isolated directly from sapwood of trees showing bleeding cankers in Europe (Brown & Brasier, 2007).

Isolations were made from diseased tissues of four *Q. cerris* trees using selective medium (Jung *et al*., 1996). Single hyphal tip cultures of putative *Phytophthora* spp. were transferred to V8 agar and stored in the culture collection (CMW) of the Forestry and Agricultural Biotechnology Institute at the University of Pretoria. DNA of all isolates was extracted and the ITS gene regions amplified and compared with sequences downloaded from GenBank (Accession Nos. AF266764, AY302148, AY302149, EF055303). The most parsimonious tree was obtained by PAUP analysis of the ITS dataset. The morphological characteristics for the four isolates from *Q. cerris* were the same as those described for *P. cinnamomi*, with typical corraloid hyphae. The sequences (GU799635, GU799636, GU799637, GU799638) of all isolates were identical to that of authenticated *P. cinnamomi* sequences. Four isolates (CMW 33386, 33387, 33388, 333889) identified as *P. cinnamomi* were tested for mating type by pairing these with known *P. cinnamomi* mating tester strains. Results of these pairings showed that isolate CMW33386 was of the A1 mating type and the remaining three isolates were of the A2 mating type. Plerotic oospores (38.5 µm in average diameter) were formed after seven days on V8 agar. Amphigynous antheridia were uni- or bicellular (16.2 x 17.6 µm average) (Fig. 2).

It was impossible to obtain *Q. cerris* seedlings in South Africa so inoculation trials were conducted on six seedlings each of *Q. robur* and *Q. suber* and additionally 30 *Q. palustris* trees to determine whether the isolates collected were pathogenic to *Quercus* spp. A mycelial agar plug (6 mm) representing isolates of two different mating types were inserted into the stems of trees including an equal number for each isolate and a control inoculation with a sterile V8 agar plug. The seedlings were kept in a greenhouse at 25-30°C for two weeks. Necrotic lesions that developed were measured and photographed. The *P. cinnamomi* isolates produced lesions on all three *Quercus* species (Fig. 3). Lesions on *Q. suber* and *Q. palustris* were similar in length for both isolates. However, CMW33387 produced significantly larger lesions than CMW33386 on *Q. robur*. *Phytophthora cinnamomi* was re-isolated from all the lesions using the same selective medium. Results of this study have shown that *P. cinnamomi* is the most likely cause of the disease on *Q. cerris*. To the best of our knowledge, this is the first report of *P. cinnamomi* on *Q. cerris* in South Africa.

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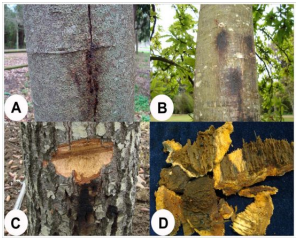

Figure 1

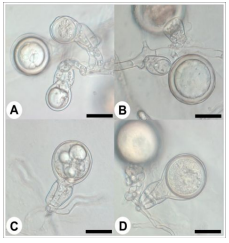

Figure 2

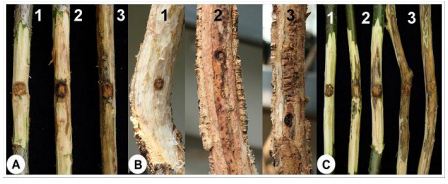

Figure 3

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