New Disease Reports

First report of *Ceratocystis radicicola* associated with date palm disease in Oman

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Received: *01 Dec 2010.* ***Published:*** *28 Apr 2011.* ***Keywords:*** *Phoenix dactylifera, Thielaviopsis punctulata, date palm decline, ITS sequences, pathogenicity*

Date palm (*Phoenix dactylifera*) occupies about 54% of the cultivated area in Oman (MAF, 2004). Date palm decline symptoms including bending apex and apical cluster of leaves and/or wilting have been reported previously in Oman associated with various pathogens including *Thielaviopsis paradoxa* and *Phoma* sp. (Shivanathan & Al-Raisi, 1996). Surveys carried out during 2007 in infected orchards (A'Dakhiliyah region) revealed the presence of 180 wilted palms (38.3%) (Fig. 1a, b). *Ceratocystis radicicola* (anamorph *Thielaviopsispunctulata*) was consistently isolated from the infected tissues (apices and roots) in wilting palms whether or not there was apex bending. Tissue samples were plated on 2.5% potato dextrose agar (PDA), supplemented with 200 mg/l streptomycin sulphate/chloramphenicol plus 50 mg/l penicillin G, and incubated at 25°C. Two types of spores were present: hyaline, cylindrical phialoconidia formed in uniseriate chains, measuring 6.4-21.7 x 3.2-10.1 µm; and dark, ovate aleurioconidia measuring 12.5-19.4 x 8.0-13.0 µm. Total DNA was extracted from fourteen *Ceratocystis* isolates, collected from infected trees in the different regions. The ITS region of the DNA and part of the 18S and 28S ribosomal RNA was amplified using the universal primers ITS1 (5'-TCCGTAGGTGAACCTGCGG-3') and ITS4 (5'-CCTCCGCTTATTGATATGC-3'). The generated ITS sequences of all isolates confirmed their identity as *Ceratocystis radicicola,* with no intra-specific variation among the nucleotide sequence of the isolates. The length of the ITS rDNA region was 471 base pairs. The sequence from isolate DP01 was deposited in GenBank (Accession No. HM462018). In a phylogenetic tree obtained from ITS sequences, DP01clusters with *C. radicicola* isolates reported worldwide, separating all *C. radicicola* isolates from *C. paradoxa* isolates with a very high bootstrap support (Fig. 2).

Hardened tissue-culture date palm seedlings (cv. Bahlani) were incised at the leaf base and inoculated with 2 mm^2 agar plugs taken from seven-day-old *C. radicicola* cultures and then wrapped with parafilm to maintain tissue moisture. Similarly, control seedlings were inoculated with sterile PDA plugs. In a second pot experiment, roots of juvenile tissue-cultured suckers were exposed and directly drenched with *C. radicicola* conidial suspension (50 ml potato broth medium with 1.3 x 10^7 conidia/ml) without injuring the roots. Sterile liquid media was used with controls. Plants were maintained at 25-28°C, 75-85% relative humidity and 12/12 hour light/dark cycle using fluorescent lights. Wound inoculated seedlings showed tissue necrosis, apex rotting and seedling wilting 7-10 days after inoculation (Fig. 1c, c'). Suckers inoculated with conidial suspensions showed root rot and wilting three to five weeks after inoculation (Fig. 1d). *C. radicicola* was re-isolated from all of the infected tissues on PDA. *C. radicicola* is reported to cause black scorch in Kuwait under drought and salinity conditions (Suleman *et al.*, 2001). Similarly it has been isolated from diseased palms showing chlorotic and wilted leaves, necrosis of roots and lower crown portions in South Africa (Linde & Smit, 1999). In Oman, prolonged drought, increased water salinity and inadequate date palm management are thought to be predisposing trees to the infection. This is the first report of *C. radicicola* associated with diseased date palms in Oman.

Acknowledgements

We thank the Arab Organization for Agricultural Development (AOAD) for partially funding this research. We also thank Dr. Abdulla Al-Saadi for facilitating the molecular analysis of *C. radicicola*, we conducted at CAMS, Sultan Qaboos University (SQU).

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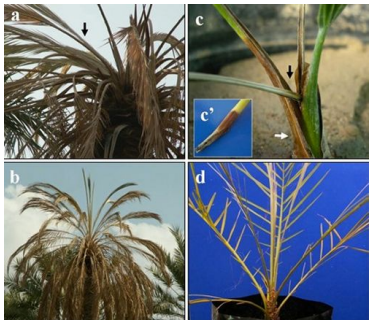

Figure 1

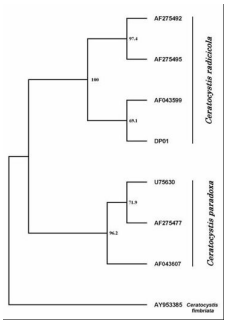

Figure 2

To cite this report: Al-Raisi YM, B'Chir MM, Al-Mandhari AM, Deadman ML, Gowen SR, 2011. First report of *Ceratocystis radicicola* associated with date palm disease in Oman. *New Disease Reports* **23**, 23. [doi:10.5197/j.2044-0588.2011.023.023]

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