Diseases Caused by Oomycetes

First Report of Crown and Root Rot Caused by *Pythium aphanidermatum* on Tomato in Italy

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During May and June 2020, symptoms of crown and root rot were observed on *Solanum lycopersicum* L. plants (cvs. Meneghino and Vortex), grown in a plastic tunnel in Cuneo province (northern Italy). The first symptoms developed 40 to 60 days after planting, with air temperatures ranging from 13 to 29°C (minimum and maximum night/day). The collar and stem of 20 to 30% of plants out of 600 had brown discoloration, water-soaked, and soft rot symptoms. Affected plants were stunted and quickly wilted, showing an extensive root rot. Tissue fragments of 1 mm² were excised from the margins of the lesions of the root and crown of 20 plants, dipped in 1% sodium hypochlorite (1 min), rinsed in sterile water, and plated on potato dextrose agar (Merck, Germany) with 25 mg/liter of streptomycin sulfate and on a BNPR semiselective medium for oomycetes (Masago et al. 1977). Plates were incubated under constant fluorescent light at 22°C and after 3 days developed an abundant aerial mycelium on both media. Two isolates were selected as representative (34-20V1; 34-20V2) and plated on V8 medium (vegetable mix, 300 g; agar, 15 g; CaCO₃, 1.5 g; distilled water, 1 liter); they showed aseptate hyphae, 3.8 to 9.9 µm (6.2 µm mean, *n* = 30) wide. Oogonia were globose, smooth and 16.8 to 29.4 µm (23.5 µm mean, *n* = 30) diameter. Antheridia were barrel-shaped, and oospores were globose, 15.3 to 26.1 µm (21.8 µm mean, *n* = 30) in diameter. These morphological characters allowed identifying the microorganism as a *Pythium* sp. (Spencer 2005). The internal transcribed spacer region of rDNA of 34-20V1 and 34-20V2 isolates was amplified using the primers ITS1/ITS4 and sequenced. A

BLAST analysis (Altschul et al. 1997) of the 801-bp sequences obtained from the isolates 34-20V1 (GenBank accession no. MW131326) and 34-20V2 (GenBank accession no. MW131327) showed a 99.9% homology (800/801 nucleotides) with the sequence of *Pythium aphanidermatum* strain CBS 118.80 (GenBank accession no. AY598622). Pathogenicity tests were performed twice on 30-day-old plants (cv. Meneghino) grown in 12-liter pots, containing a steam-disinfested peat substrate, infested with 1 g/liter of wheat and hemp kernels (2:1 v/v) colonized with the 34-20V1 and 34-20V2 isolates of *P. aphanidermatum*. Ten plants per pot were planted in three pots filled with the infested medium, and the same number of plants were planted in the noninfested substrate as a control. Pots infested with both isolates were kept completely randomized in the greenhouse at 22 and 26°C. The first symptoms developed 4 to 7 days after planting; 17 to 20 days after, 50 to 80% of plants were dead. Control plants remained healthy. *P. aphanidermatum* was consistently reisolated from the crown and root lesions. *P. aphanidermatum* is a pathogen with a wide host range (Farr and Rossman 2020), and it was previously observed in northern Italy on *Capsicum annuum* (Garibaldi et al. 2014). *P. aphanidermatum* is an important agent of crown and root rot of tomato worldwide (Farr and Rossman 2020). It may also cause severe damage to tomato grown soilless (Stanghellini and Russell 1971) or under field conditions following flooding (Le et al. 2003), and it is particularly critical at warm temperatures (Kläring et al. 2001). To our knowledge, this is the first report of the presence of *P. aphanidermatum* on tomato in Italy. The spread of this disease could cause serious damage considering the importance of the crop in Italy.

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