First Report of Fusarium Wilt of Coriander (*Coriandrum sativum*) Caused by *Fusarium oxysporum* in Italy

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Coriander (*Coriandrum sativum* L.) belongs to the Apiaceae family, and it is widely used as seasoning throughout the world. In Italy, about 20 ha are grown for seed production and for consumption of the fresh green stems and leaves. In July 2018 in a commercial farm in Piedmont (northern Italy), 2-month-old plants of coriander grown outdoors (2,000 m^2) showed a previously unknown wilt. Approximately 15 to 35% of plants exhibited symptoms of stunting, chlorosis, and wilting. Eventually, affected plants collapsed and died. Brown discoloration of the vascular tissue was observed by dissecting the roots and stems of plants with advanced symptoms. Excised infected vascular tissues were washed in 1% sodium hypochlorite for 1 min, rinsed in sterile water, and plated on potato dextrose agar containing 25 mg/liter of streptomycin sulfate. After incubation at 22°C for 5 days, fungal colonies with a white to pale pink color developed (80% frequency). On carnation leaf agar, single-spore cultures of two selected isolates (FOC6 and FOC7) generated short monophialides with unicellular, ovoid-elliptical microconidia measuring 3.3 to 7.6 × 1.7 to 2.8 µm (mean 5.4 × 2.5 µm, $n = 40$). Macroconidia produced in sporodochia were three-septate, slightly curved, with a foot-shaped basal cell and a short apical cell, and measured 24.1 to 36.3 × 2.7 to 4.3 µm (mean 31.5 × 3.4 µm, $n = 40$). Chlamydospores were terminal and intercalary, single, in pairs, clusters, or in chains, and measured 7.9 to 13.1 µm (mean 9.6 µm, $n = 40$) in diameter. Such characteristics are typical of *Fusarium oxysporum* (Leslie and Summerell 2006). Genomic DNA from isolates FOC6 and FOC7 from 7-day-old pure cultures was extracted using the E.Z.N.A. Plant DNA Kit (Omega Bio-Tek). The identification of two isolates was performed by means of polymerase chain reaction (PCR) amplification of the elongation factor-alpha (EF-α) and the RNA polymerase II second largest subunit (RPB2), using the primers EF1/EF2 (O'Donnell et al. 1998) and 7cF and 11aR (Liu et al. 1999), respectively. The PCR products were purified and sequenced by BMR Genomics (Padova, Italy). For both isolates, the EF-α and RBP2 had sequences of 434 and 780 bp, respectively. The obtained sequences were subjected to BLASTn analysis and were 100% similar to *F. oxysporum* GenBank accession numbers MG252285.1 and LT746316.1, respectively. The sequences were deposited in GenBank with the accession numbers MH899124 and MH899125 for the EF-α sequences and MH899126 and MH899127 for the RPB2 sequences. Both *F. oxysporum* isolates were used for pathogenicity tests conducted in pots (3-liter volume) filled with steamed peat substrate in a greenhouse at 24 to 30°C (minimum and maximum air temperatures). Coriander seedlings (15 days old) were inoculated by dipping roots in a conidial suspension (1×10^6 conidia/ml) obtained from 7-day-old cultures in potato dextrose broth. Twenty plants (five plants/pot) per treatment were used in two repeated trials for both isolates with the same number of plants and maintained in the same condition. For controls, roots were dipped into sterile water. The first wilt symptoms developed 7 to 9 days after inoculation, and 13 to 15 days after inoculation 70 to 100% of the plants inoculated with both isolates were dead. All control water-inoculated plants remained healthy. A fungus morphologically identified as *F. oxysporum* was consistently reisolated from all the symptomatic plants. Coriander wilt has been reported in India, Argentina, and California, and the pathogen was named *F. oxysporum* f. sp. *coriandrii* (Koike and Gordon 2005). This is the first report of Fusarium wilt of coriander in Italy. Owing to the seedborne nature of *F. oxysporum* in coriander (Manoranjitham et al. 2003), an effort must be made to prevent the dissemination of this pathogen to other production areas by seeds.

References:

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