Diseases Caused by Fungi and Fungus-Like Organisms

First Report of Stem and Root Rot of Coriander Caused by *Fusarium equiseti* in China

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Coriander (*Coriandrum sativum* L.) is one of the most important vegetables used as a seasoning in China. During the summer of 2019 and 2020, 2-month-old coriander plants with stem and root rot were observed in commercial fields located in Tianjin, China. Symptoms were first observed when temperatures were about 24°C. Diseased plants had chlorotic lower leaves, were stunted, had rotted roots and stems, and eventually wilted and died. In severe cases, disease incidence was approximately 85%. Plant samples with the same symptoms were collected from five fields by five-point sampling method (four plants per point; 20 plants per field), out of which 20 plants were arbitrarily selected for pathogen isolation. Root tissue fragments (3 mm²; three fragments per plant) at the boundary of the symptomatic area were excised, washed in 1% NaClO for 2 min, rinsed in sterile distilled water (SDW), and incubated on PDA containing 50 mg/liter of streptomycin sulfate. Plates were incubated at 25°C for 5 days in the dark. Twenty-five percent of the isolates were tentatively identified as *Fusarium equiseti* according to cultural and morphological characteristics (Leslie and Summerell 2006). Colonies developed abundant white aerial mycelium with pale brown pigments on PDA. Microconidia were single-celled, hyaline, nonseptate, ovoid, and ranged from 4.6 to 17.6 × 1.5 to 3.8 µm ($n = 40$). Macroconidia were mostly five-septate, slightly curved at apex, and ranged from 13.3 to 34.6 × 2.2 to 4.3 µm ($n = 40$).

Chlamydospores with thick, roughened walls were abundant in clumps or chains, ellipsoidal or subglobose. Diseased-plant samples and pathogen isolates were deposited to the China General Microbiological Culture Collection Center. Species identity was confirmed by amplifying and sequencing the ITS, TEF1- α , mtSSU, and RPB2 (Carbone and Kohn 1999; Li et al. 1994; Miller and Huhndorf 2005). BLASTn analyses of ITS amplicon (GenBank no. MT579854), TEF1- α (MT586131), mtSSU (MT587798), and RPB2 (MT648497) genes obtained with cognate sequences available in GenBank showed 99.8% (498 of 499 bp), 100% (493 of 493 bp), 99.7% (625 of 627 bp), and 98.9% (656 of 663 bp) identity to *F. equiseti* (LS479418 [ITS], KU939020 [TEF1- α], MF667972 [mtSSU], and MG839490 [RPB2]) in NCBI databases, respectively. Pathogenicity tests were conducted with each *F. equiseti* isolate. Plants were grown in sterilized 10-cm diameter plastic pots containing steamed peat substrate, and three replicated pots (five plants per pot) were included in each treatment. Fifteen-day-old coriander plants were inoculated with 5 ml of 1×10^6 conidia/ml suspension by a root-drenching method. Control plants were inoculated with SDW. Each treatment was incubated in a greenhouse at 29/22°C (12 h/12 h, light/dark) and watered every other day to keep high humidity. After 4 days, symptoms similar to those observed in the field were observed on inoculated plants, whereas control plants remained symptomless. Reisolation of *F. equiseti* from inoculated plants fulfilled Koch's postulates, and identification was confirmed by morphological and molecular methods. To our knowledge, this is the first report of *F. equiseti* causing coriander stem and root rot in China. This pathogen poses a threat to coriander production, and its accurate identification is necessary to develop effective management strategies.

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