Diseases Caused by Fungi and Fungus-Like Organisms

First Report of Stem Canker of Tomato Caused by *Fusarium striatum* in Mexico

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Tomato (*Solanum lycopersicum* L.) is an important vegetable crop in Mexico. During 2015 and 2016, symptoms of stem canker were observed on tomato plants in two greenhouses located in the states of Sinaloa and San Luis Potosi, Mexico. Symptomatic plants exhibited dark brown cankers on stems and brown discoloration of the pith, as well as chlorosis, senescence of leaves, and wilting. At the base of diseased plants, orange-red perithecia developed. Disease incidence ranged from 1 to 5% in the two greenhouses. Pieces from symptomatic stems were surface disinfested by immersion in a 1% sodium hypochlorite solution for 2 min, rinsed in sterile distilled water, and placed in Petri plates containing acidified potato dextrose agar (PDA). The plates were incubated at 25°C for 6 days under a 12-h photoperiod. *Fusarium*-like colonies were consistently isolated, and 10 monoconidial isolates were obtained. A representative isolate of each site was selected for morphological characterization, phylogenetic analysis, and pathogenicity tests. The two isolates were deposited in the Culture Collection of Phytopathogenic Fungi at the Research Center for Food and Development (accession nos. CCLF11 and CCLF12). Colonies on PDA at 25°C for 7 days exhibited moderate and cream aerial mycelium. Microscopic examination showed falciform, hyaline macroconidia ($n = 100$), four- to five-septate, measuring 40 to 75 $\times$ 4 to 6 μ m. Microconidia

($n = 100$) were cylindrical, hyaline, zero- to one-septate, measuring 7.8 to 9.5 $\times$ 3.1 to 4.8 μ m. Chlamydospores were absent. To further identify the pathogen, total DNA was extracted, and the RNA polymerase second-largest subunit (RPB2) and a portion of the translation elongation factor 1- α (TEF1- α) were amplified by polymerase chain reaction (PCR) using the primers 5f2 (Liu et al. 1999)/7cr (Reeb et al. 2004) and EF1-728F/EF1-986R (Carbone and Kohn 1999), respectively. The sequences were deposited in GenBank (RPB2: MT263727, MT263728; and TEF1- α : MT249025, MT249026). A phylogenetic analysis was performed by the maximum likelihood method with a combined dataset of RPB2 and TEF1- α sequences for *Fusarium* and *Neocosmospora* species (Sandoval-Denis and Crous 2018). The phylogenetic tree grouped the two isolates, CCLF11 and CCLF12, within the *Fusarium striatum* clade with 99% bootstrap support. Pathogenicity of the two isolates was verified by inoculation of colonized PDA plugs (5-mm diameter) on the wounded stem surface of ten 2-month-old tomato plants from cultivar Sun 6200. Ten control plants were inoculated with PDA plugs without mycelia. All plants were kept under greenhouse conditions at 25 to 35°C and regularly watered. Symptoms of stem canker were observed on all inoculated plants after 15 days, whereas stems from control plants remained healthy. After 45 days, perithecia were observed on stem cankers. Koch's postulates were fulfilled when the fungus was reisolated from the stems of inoculated plants and not from control plants. *F. striatum* has been previously reported causing stem canker of tomato in greenhouses in Canada and the United States (Moine et al. 2014). To our knowledge, this is the first report of *F. striatum* causing stem canker of tomato in Mexico. This fungal pathogen represents a severe threat and has the potential to cause significant yield losses in tomato greenhouses, so further research is required to define effective management strategies.

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