Disease Note

Diseases Caused by Fungi and Fungus-Like Organisms

First Report of *Fusarium keratoplasticum* Causing Strawberry Root Rot in Sinaloa, Mexico

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Strawberry (*Fragaria* × *ananassa*) is a fruit of economic importance for Mexico, occupying the third place in world production, with an approximate production of 861,337 metric tons (SIAP 2021). In January 2021, in Culiacan, Sinaloa, Mexico (24°46′46″N, 107°27′04″W), wilting symptoms (stunted growth, leaf yellowing and wilting, necrosis in vascular bundles, and root rot and wilting) were observed on commercial strawberry crops, with an incidence of 5 to 10%. Tissue samples from symptomatic roots were cut, disinfected with alcohol, sodium hypochlorite, and sterile water, and then plated on potato dextrose agar (PDA). Fifteen monosporic isolates were obtained by single-spore culturing (Hansen and Smith 1932). Typical *Fusarium* spp. colonies were obtained from all root samples. On PDA, the colonies were abundant with white aerial mycelium, hyphae were branched and septate, and a light-yellow pigmentation was observed in the center of old cultures (Leslie and Summerell 2006). In 10-day-old cultures grown on carnation leaf agar medium, macroconidia were slightly curved, showing three marked septa, broad central cells, slightly tapered apices, foot-shaped basal cells, and measured 59.6 to 73.4 ($\bar{x}$ = 68.7) × 10.4 to 14.9 µm ($\bar{x}$ = 13.6) (n = 40). Microconidia (n = 40) were thin walled, hyaline, ovoid, unicellular, and measured 19.7 to 32.2 ($\bar{x}$ = 26.6) × 8.8 to 11.8 µm ($\bar{x}$ = 10.2). The translation elongation factor-1 alpha (EF1-α) gene (O'Donnell et al. 1998) was amplified by polymerase chain reaction and sequenced. Maximum likelihood analysis was carried out using the EF1-α sequence from the isolate FKTFRESCULSIN (GenBank accession no. OK491929) and other *Neocosmospora* and *Fusarium* species. Phylogenetic analysis revealed that the isolate was *Fusarium keratoplasticum* (currently named *Neocosmospora keratoplastica*) belonging to the *F. solani* species complex. Pathogenicity tests were performed on strawberry plants (cv. Camarosa) grown on autoclaved sandy loam soil mix. Twenty plants were inoculated by drenching with 20 ml of conidial suspension (1×10^5 CFU/ml) in an isotonic saline solution of FKTFRESCULSIN grown on PDA. Ten uninoculated plants served as controls. Plants were maintained for 60 days under greenhouse conditions (25 to 30°C). The assay was conducted twice. Root and stem rot similar to that observed on the infected plants in the field was observed. No symptoms were observed on uninoculated control plants after 60 days. The pathogen was reisolated from necrotic tissue from all inoculated plants and identified as *F. keratoplasticum* by sequencing the partial EF1-α gene and based on its morphological characteristics, thus fulfilling Koch's postulates. To our knowledge, this is the first report of root rot and wilt of strawberry caused by *F. keratoplasticum* in Mexico. This finding contributes knowledge to the scientific community, since there is little information about this pathogen causing damage to plants in the world. Strawberry is an important crop in Mexico, and the occurrence of this disease could threaten strawberry production.

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