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Disease Notes

First Report of Root Rot of Watermelon Caused by *Ceratobasidium* sp. in Sonora, Mexico

A. Meza-Moller, Universidad Estatal de Sonora, Unidad Académica Hermosillo, Ley Federal del Trabajo y Perimetral S/N, Hermosillo, Sonora, Mexico ; and M. E. Rentería-Martínez, M. A. Guerra-Camacho, F. Romo-Tamayo, A. Ochoa-Meza, and S. F. Moreno-Salazar, Laboratorio de Biología Molecular, Departamento de Agricultura y Ganadería de la Universidad de Sonora, Carretera a Bahía de Kino Km. 21, Hermosillo, Sonora, Mexico

Watermelon is one of the major crops grown in Mexico and represents 4% of the total cultivated area with fruits in this country. In 2013, Sonora State was ranked second in the production of watermelon at a national level. Fungal and oomycete diseases are among the main biotic factors affecting watermelon production, particularly those caused by species of the genera *Fusarium*, *Phytophthora*, *Pythium*, and *Rhizoctonia*. During the spring of 2013, wilting or death symptoms were confirmed in approximately 50% of ungrafted watermelon plants grown in four sampled fields along the coast of Hermosillo and Guaymas Valley in Sonora, Mexico. On both roots and stems of infected plants, localized lesions were found that were 0.2 to 2.0 cm long, reddish brown, and slightly sunken on the stem base. In some cases, the discolorations encompassed nearly 90% of the root system. One-centimeter pieces from the edge of lesions on stems and roots were superficially disinfected with 1% sodium hypochlorite, then rinsed with sterile distilled water, placed onto petri dishes containing potato dextrose agar (PDA), and incubated at 25°C for 3 days. Fungal colonies were white initially, then turned brown, and septate



hyphae were 3.7 to 4.3 μm in diameter and branched at right angles with a constriction at the origin of the branch point. These characteristics are typical of the genus *Rhizoctonia*. Binucleate cells from five isolates were observed using a lactophenol aniline blue solution stain, according to *Ceratobasidium* morphological descriptions. Mycelia from five isolates grown on PDA was used for DNA extraction. The rDNA-ITS region was amplified using PCR with the universal fungal primers ITS1 and ITS4 (3). The purified products were separately sequenced in both directions using the same primer pair. The sequences obtained were 99% similar to those of *Ceratobasidium* sp. AG-F and AG-Fa isolates (accessions KC193238.1 on *Tagetes erecta*, HQ168370.1 on *Musa* spp., and JX913821.1 on soy-rice-weeds, respectively) from GenBank (2,4). The pathogenicity of the fungus was tested under growth chamber conditions. Sets of seven healthy watermelon seedlings of the Sugar red variety were inoculated with five isolates of *Ceratobasidium*. Three disks (8 mm in diameter) of mycelia grown on PDA were placed around the roots of each plantlet. The pots were maintained at $27 \pm 0.1^\circ\text{C}$ for 14 days with a photoperiod of 12 h. Seven uninoculated seedlings were used as a control. Initial symptoms showing water-soaked lesions developed on all inoculated seedlings within 6 to 7 days, while typical disease symptoms appeared after 10 to 14 days after inoculation. Seedlings without inoculum were free from infection. The fungus was re-isolated from the inoculated seedlings on PDA, and identified as *Ceratobasidium* sp., confirmed using morphological characteristics. A similar disease has been reported recently in Italy and Arizona (1); however, this report is the first description of a *Ceratobasidium* sp. causing root rot of watermelon in Sonora, Mexico. Agricultural areas where the study was carried represent 90% of the total area cultivated with watermelon in this state, so it is necessary to evaluate the impact of this pathogen in the crop.

References: (1) C. Nischwitz et al. APS joint meeting, 2013. (2) A. Saroj et al. Plant Dis. 97:1251, 2013. (3) T. J. White et al. PCR Protocols: A Guide to Methods and Applications. Academic Press, San Diego, CA, 1990. (4) J. Yin et al. Plant Dis. 95:490, 2011.
