

Pathogenicity of *Drechslera sorghicola* Isolates on Sorghum in Venezuela

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ABSTRACT

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Drechslera sorghicola was identified as the causal organism of target leaf spot of sorghum. The fungus produces well-defined and elongated spots, which vary in size and color according to the sorghum genotype. The disease may be of economic importance in regions where high humidity and favorable temperatures occur during the growing season.

Leaf spots of sorghum (*Sorghum bicolor* (L.) Moench) are caused by a variety of organisms. *Colletotrichum graminicola*, *Cercospora sorghi*, *Exserohilum turcicum*, and *Gleocercospora sorghi* have been reported in Venezuela (6). *C. graminicola* is one of

the most damaging pathogens in sorghum production. The other leaf spot diseases do not cause significant decreases in yield, except where high humidity occurs during the growing season. This investigation was undertaken to determine the cause of target leaf spot and to characterize the disease symptoms on different sorghum genotypes.

MATERIALS AND METHODS

Target leaf spot disease of sorghum was observed in breeding nurseries near Villa de Cura, Venezuela. High relative humidity and average temperatures of

26 ± 7 C were present in the field at the time of observation. Samples of infected leaves were collected from different sorghum cultivars. Leaves were washed under running tap water and surface-sterilized by soaking for 5 min in 0.5% sodium hypochlorite. Small pieces of diseased tissue were placed on regular potato-dextrose agar (PDA) medium and incubated for 5 days at room temperature (24–28 C) under alternate periods of 12 hr of darkness and fluorescent light. Pure cultures were made from each sample and microscopically examined for identification.

Five isolates used for pathogenicity tests were obtained from lesions that were different in color and size. The sorghum cultivars 78-RP2B-4-7, 78-RP2B-2-10, 78-RP2B-12-12, TAM-428, and SC-3541 were evaluated for susceptibility to the fungus isolates. These sorghum cultivars showed symptoms that were different from each other under field conditions. The test was conducted by spraying 14-

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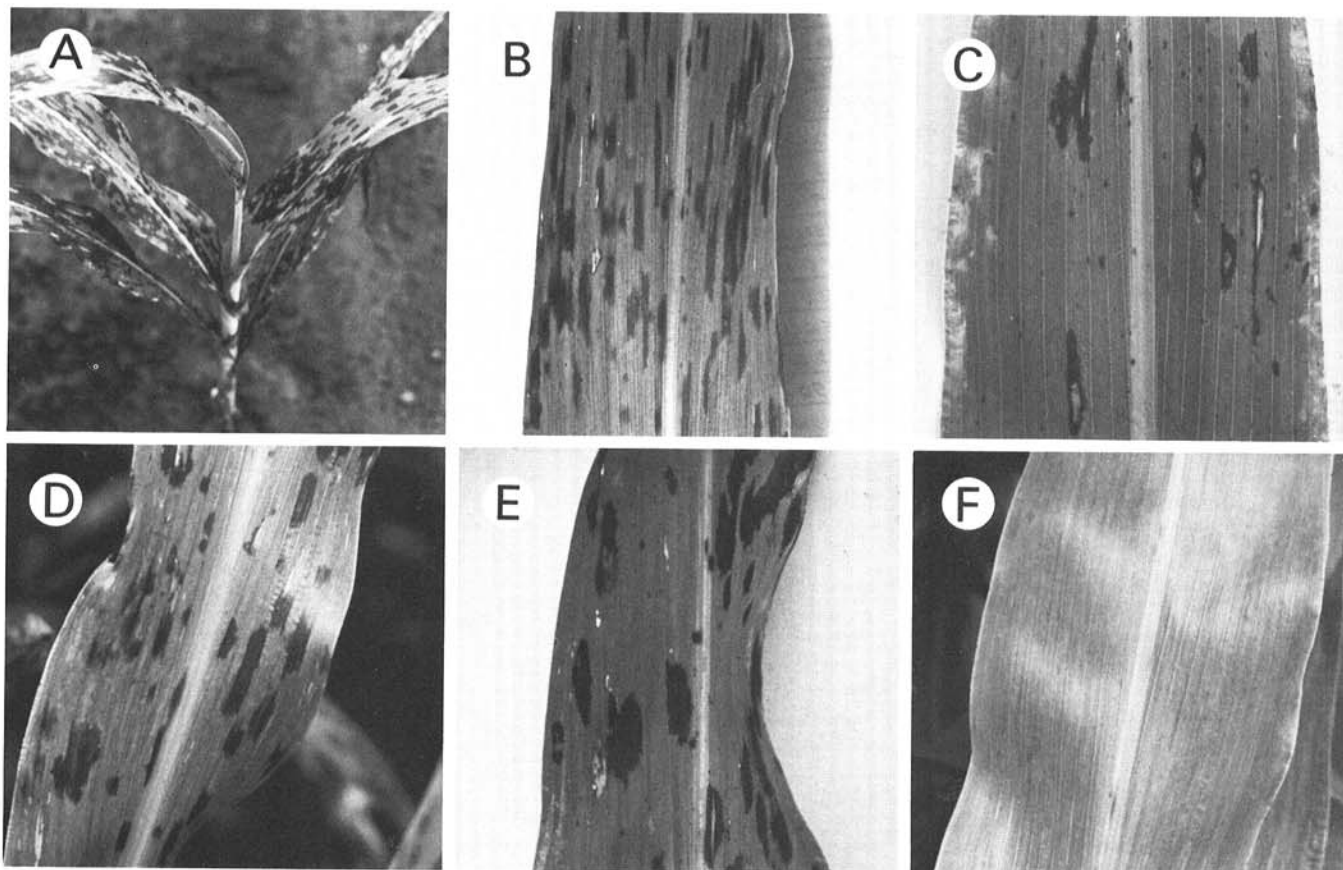


Fig. 1. Field symptoms produced by *Drechslera sorghicola* on different sorghum genotypes. (A) Target leaf spot on young plants, (B) narrow brown lesions on cultivar TAM-428, (C) reddish lesions with light colored centers on 78-RP2B-2-10, (D) tan lesions on 78-RP2B-12-12, (E) purple lesions on 78-RP2B-4-7, and (F) small light brown lesions on SC-3541.

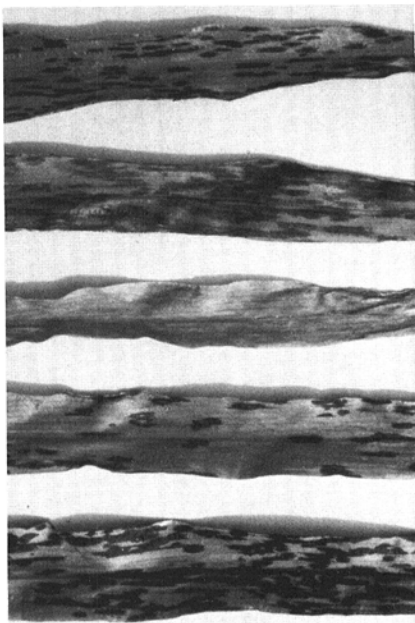


Fig. 2. Lesion types produced by *Drechslera sorghicola* after artificial inoculation of different sorghum genotypes. From top to bottom: narrow brown lesions on cultivar TAM-428, tan lesions on 78-RP2B-12-12, light brown lesions on SC-3541, lesions with reddish margins and light centers on 78-RP2B-2-10, and purple lesions on 78-RP2B-4-7.

day-old plants with a spore suspension at a concentration of 4×10^4 spores per milliliter for each isolate. The inoculated plants were placed in a moist chamber at 100% relative humidity and 28 ± 5 C. After 72 hr, the plants were removed from the chamber and placed on greenhouse benches. Disease reaction was recorded 8 days after inoculation.

RESULTS AND DISCUSSION

Field symptoms. Target leaf spot of

sorghum was found on plants at different growth stages. In most diseased plants, the spots were well defined, delimited by the leaf veins, and elongated. Individual lesions ranged in length from small spots (2–3 mm) to large lesions (10–15 mm). Lesions sometimes coalesced to produce extensive areas of necrotic tissue. Numerous foliar lesions were observed on cultivar 78-RP2B-3-27 (Fig. 1A). Lesions were narrow and brown on cultivar TAM-428, reddish with light-colored centers on 78-RP2B-2-10, tan on 78-RP2B-12-12, purple on 78-RP2B-4-7, and light brown on SC-3541 (Fig. 1B–F). This variation in color with the host has been indicated by Tarr (8).

Causal organism. All isolates were identified as *Drechslera sorghicola* (Lefebvre & Sherwin) Richardson & Fraser (7), a fungus previously identified as *Helminthosporium sorghicola* (3). It grows slowly on PDA medium, producing a compact dark brown mycelium. Conidia are slightly curved, golden brown, with three to seven pseudosepta, and 40–80 μ m long. Although germination of conidia is mainly bipolar, lateral germination was observed in some instances.

Pathogenicity tests. Figure 2 shows the variation in symptoms among five sorghum cultivars inoculated with *D. sorghicola* isolates. The variation in lesion types was similar to that observed in the field (Fig. 1B–F). Each isolate of the fungus was able to incite the same pattern of symptom expression on the series of five sorghum genotypes. This observation demonstrates that the lesion types were determined by the genotype of the sorghum cultivar. The small rectangular spots produced on cultivar TAM-428 are similar to those produced by *Cercospora sorghi*, the causal

organism of grey leaf spot of sorghum. On cultivar SC-3141 all isolates of the fungus produce only small light brown spots. This reaction might be considered a moderate type of resistance.

Target leaf spot has been observed on several species of sorghum in the United States (3,5), Israel (2), India (4), and the Philippines (1). Detailed studies on the host-parasite relationship of *H. sorghicola* and sorghum were reported by Elazegui and Exconde (1).

This report appears to be the first record of *D. sorghicola* on sorghum in Venezuela. Although the disease has been considered of negligible economic importance, further studies are needed to determine its effects on yield.

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