Diseases Caused by Fungi and Fungus-Like Organisms

First Report of *Diaporthe ueckerae* Causing Stem Canker on Soybean (*Glycine max*) in Colombia

N. López-Cardona,^{1,†} A. Guevara-Castro,¹ L. Gañán-Betancur,² and C. V. Amaya-Gómez¹

¹ Corporación Colombiana de Investigación Agropecuaria AGROSAVIA, Centro de Investigación La Libertad, Villavicencio, Meta, 500009, Colombia

² Washington State University, Department of Plant Pathology, Pullman, WA 99164, U.S.A.

Funding: Funding was provided by Ministerio de Agricultura y Desarrollo Rural (1000410: Estrategia de manejo integrado de plagas) and AGROSAVIA. Plant Dis. 105:4162, 2021; published online as <https://doi.org/10.1094/PDIS-04-21-0718-PDN>. Accepted for publication 24 June 2021.

In October 2018, soybean (*Glycine max* L.) plants displaying elongated black to reddish-brown lesions on stems were observed in a field planted to the cultivar BRS Serena in the locality of Puerto López (Meta, Colombia), with 20% incidence of diseased plants. Symptomatic stems were collected from five plants, and small pieces (~5 mm²) were surface sterilized, plated on potato dextrose agar (PDA), and incubated for 2 weeks at 25°C in darkness. Three fungal isolates with similar morphology were obtained (i.e., by subculturing single hyphal tips), and their colonies on PDA were grayish-white, fluffy, with aerial mycelium, dark colored substrate mycelium, and produced circular black stroma. Pycnidia were globose, black, occurred as clusters, embedded in tissue, erumpent at maturity, with an elongated neck, and often had yellowish conidial cirrus extruding from the ostiole. Alpha conidia were observed for all isolates after 30 days of growth on sterile soybean stem pieces (5 cm) on water agar, under 25°C and 12-h light/12-h darkness photoperiod. Alpha conidia ($n = 50$) measured 6.0 to 7.0 µm (6.4 ± 0.4 µm) × 2.0 to 3.0 µm (2.5 ± 0.4 µm), were aseptate, hyaline, smooth, ellipsoidal, often biguttulate, with subtruncate base. Beta conidia were not observed. Observed morphological characteristics of these isolates were similar to those reported in *Diaporthe* spp. by Udayanga et al. (2015). DNA from each fungal isolate was used to sequence the internal transcribed spacer region (ITS), and the translation elongation factor 1-α (TEF1) gene, using the primer pairs ITS5/ITS4 (White et al. 1990) and EF1-728F/EF1-986R (Carbone and Kohn 1999),

respectively. Results from an NCBI-BLASTn revealed that the ITS sequences of the three isolates (GenBank accessions MW566593 to MW566595) had 98% (581/584 bp) identity with *Diaporthe miriciae* strain BRIP 54736j (NR_147535.1), whereas the TEF1 sequences (GenBank accessions MW597410 to MW597412) had 97 to 100% (330 to 339/339 bp) identity with *D. ueckerae* strain FAU656 (KJ590747). The species *Diaporthe miriciae* R.G. Shivas, S.M. Thomps. & Y.P. Tan and *Diaporthe ueckerae* Udayanga & Castl. are synonymous, with the latter taking the nomenclature priority (Gao et al. 2016). According to a multilocus phylogenetic analysis, by maximum likelihood, the three isolates clustered together in a clade with reference type strains of *D. ueckerae* (Udayanga et al. 2015). Soybean plants of cultivar BRS Serena (growth stages V3 to V4) were used to verify the pathogenicity of each isolate using a toothpick inoculation method (Mena et al. 2020). A single toothpick colonized by *D. ueckerae* was inserted directly into the stem of each plant (10 plants per isolate) approximately 1 cm below the first trifoliate node. Noncolonized sterile toothpicks inserted in 10 soybean plants served as the noninoculated control. Plants were arbitrarily distributed inside a glasshouse and incubated at high relative humidity (>90% RH). After 15 days, inoculated plants showed elongated reddish-brown necrosis at the inoculated sites, which were similar to symptoms observed in the field. Noninoculated control plants were asymptomatic. Fungal cultures recovered from symptomatic stems were morphologically identical to the original isolates. This is the first report of soybean stem canker caused by *D. ueckerae* in Colombia. Due to the economic importance of this disease elsewhere (Backman et al. 1985; Mena et al. 2020), further research on disease management strategies to mitigate potential crop losses is warranted.

References:

- Backman, P. A., et al. 1985. Plant Dis. 69:641.
- Carbone, I., and Kohn, L. M. 1999. Mycologia 91:553.
- Gao, Y., et al. 2016. Syst. Biodivers. 14:102.
- Mena, E., et al. 2020. Front. Plant Sci. 10:1733.
- Udayanga, D., et al. 2015. Fungal Biol. 119:383.
- White, T. J., et al. 1990. Page 315 in: PCR Protocols: A Guide to Methods and Applications. Academic Press, San Diego, CA.

The author(s) declare no conflict of interest.

e-Xtra

Keywords: fungi, etiology, oilseeds and legumes, field crops

[†]Indicates the corresponding author.

N. López-Cardona; nlopezc@agrosavia.co