Plant Disease

Disease Notes

First Report of Anthracnose Caused by *Colletotrichum spaethianum* on *Allium fistulosum* in Brazil

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The Welch onion (*Allium fistulosum* L.) is widely grown in temperate and subtropical regions worldwide and has many important culinary uses. Since 2012, symptoms typical of anthracnose have been observed on Welch onions in a vegetable garden located in the Japanese Colony of Manaus, Amazonas, Brazil (03° 04' 16" S and 59 59' 06" W). This disease occurred in 50% of the seedlings and the symptoms consist of brown necrotic spots that extend along the entire leaf. Acervuli collected directly from the leaves were plated onto potato dextrose agar (PDA) and then incubated at 25°C for three to four days. Single spore cultures were obtained from three isolates from different plants. On PDA medium, the isolates initially produced white colonies, which then turned gray and had an orange-colored conidial mass. On Spezieller Nährstoffarmer Agar (SNA) medium (Leslie and Summerell, 2006) they formed numerous black structures such as sclerotia, setae and acervuli. Conidia on SNA are hyaline, aseptate, curved or slightly curved with a rounded apex and truncated base, which is 13.1 to 20.2 µm long and 3.3 to 4.0 µm wide. The appressoria are solitary or in loose groups, dark brown, irregularly shaped, sometimes partially lobed, smooth walled, and from 5.6 to 10.8 µm long and 4.3 to 8.2 µm wide. An alignment of the actin (ACT) and chitin synthase (CHS-1) partial gene sequences showed 100% identity with *Colletotrichum spaethianum* (Allesch.) Damm, P.F. Cannon & Crous (CBS 167.49). Maximum likelihood analysis was done using the published sequences of the ACT and CHS-1 genes from *C. spaethianum* and other *Colletotrichum* species that have curved conidia (Damm et al. 2009; Vieira et al. 2014). The individual data sets were combined using the web tool FaBox (1.41) and analysis with PAUP (1000 *bootstrap* replicates). Based on morphological characteristics and phylogenetic analysis the isolates were identified as *C. spaethianum.* The sequences for the isolates obtained in the present study were deposited in GenBank (ACT Accession Nos. KT184300 to KT184302; CHS-1 Accession Nos. KT184303 to KT184305). The cultures were deposited in the Culture Collection of Microorganisms of the INPA (Instituto Nacional de Pesquisas da Amazônia) (INPA 2615, 2770 and 2774). Five Welch onion seedlings were sprayed with a conidial suspension (10^6 conidia ml^{-1}) for each isolate and control seedlings were sprayed with sterile water.

Plants were covered with plastic bags and maintained at 28°C ± 2°C in a greenhouse and a 12-h photoperiod. Symptoms typical of anthracnose were induced five days post-inoculation, and signs of the pathogen were observed at 12 days post-inoculation. No symptoms were observed in the control plants. *C. spaethianu*m was reisolated from symptomatic plants, completing Koch's postulates. *C. spaethianu*m has been described on *Hosta sieboldiana* in Germany, *Liliu*m sp. in South Korea, *Hemerocalli*s sp. in New Zealand (Damm et al. 2012), *Hemerocallis fulva*, *Hemerocallis citrin*e and *Peucedanum praeruptoru*m in China (Yang et al. 2012; Guo et al. 2013), and *Hemerocallis flava* in Brazil (Vieira et al. 2014). To our knowledge, this is the first report of *C. spaethianu*m on *A. fistulosu*m.

References:

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(2) M. Guo et al. Plant Dis. 97:1380, 2013.

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(4) W. A. S. Vieira et al. Plant Dis. 98:997, 2014.

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Fig. 1 A, *Colletotricum spaethianum* on PDA after 10 days growth. **B,** conidia. **C**-**D**, anthracnose symptoms on Welsh onion. **E,** acervuli. **F,** seta. **G**-**I,** appressoria. **J**, Maximum likelihood tree showing phylogenetic affinities of *Colletotrichum* isolates with *C. spaethianum* type (*) using combined analysis of genes ACT and CHS-1.