New Disease Reports

First report of leaf spot on *Cucurbita pepo* caused by *Fusarium incarnatum-equiseti* species complex in Jamaica

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Cucurbita pepo is the most economically important species in the genus *Cucurbita* (Cucurbitaceae) and is grown worldwide. Yellow-orange-fleshed varieties, known as curry pumpkin, are produced in Jamaica, and in particular the variety Bodles Globe is grown for export. Since 2012, chlorotic or necrotic leaf spot symptoms (Fig. 1) have been observed on about 60% of farms in the major production areas (Clarendon, Portland, St. Ann, St. Catherine, St. Elizabeth and St. Mary).

To determine the causal agent, 70 leaves of diseased pumpkin (cv. Bodles Globe) were collected from fields across the six major production areas. Leaves were surface-sterilised with sodium hypochlorite solution (0.5%), rinsed in sterile water and 1-cm segments cultured on potato dextrose agar (PDA) at 25°C for one week. A fungus with pink mycelium was consistently isolated and hyphal tips were transferred to fresh PDA plates to obtain pure cultures. The resulting cultures had dense, pink mycelium with elongate, crescent shaped macroconidia measuring 32 x 12 µm. Total genomic DNA was subsequently extracted from seven-day-old cultures (Cenis, 1992) and ITS1/ITS4 primers (White *et al*., 1990) were used in PCR amplification and sequencing of the rDNA internal transcribed spacer (ITS) region. The resulting sequences of two representative isolates (GenBank Accession Nos. KM580656 and KM580657) were identical to *Fusarium incarnatum-equiseti* species complex (FIESC) sequences (NRRL43297 and NRRL13379) present in the FUSARIUM-ID database (Gieger *et al*., 2004). The pathogen was therefore identified as FIESC based on the culture morphology and DNA sequence analysis.

To confirm pathogenicity, ten three-week-old *C. pepo* (cv. Bodles Globe) plants were inoculated through either a foliar spray (12.5 ml) or root-dip with spore suspensions (15 ml) that were harvested from 21-day-old cultures at concentrations of 10 conidia/ml and 10^5 conidia/ml respectively. Ten surface-sterilised fruits were also inoculated by wounding with a scalpel and applying 10^{12} conidia/ml (2 ml). Control plants and fruits were mock inoculated with sterile distilled water. All plants were covered with polyethylene bags for five days. Fruit was placed in a humidity chamber for 27 days at 22°C at 95% relative humidity. After 14 days, 13 to 33% of the root-dip inoculated plants exhibited veinal chlorosis and chlorotic leaf spots. After 14 days, lesions were observed on 30% of the inoculated fruit and by 21 days, 80-100% of fruit showed fungal growth originating from the area of inoculation which also appeared water-soaked. FIESC was consistently isolated from symptomatic leaves and fruit. Disease symptoms were not observed on spray-inoculated test plants nor the control plants and fruits and FIESC could not be isolated from this material. The experiments were repeated twice with consistent results each time.

To our knowledge, this is the first confirmed report of a member of the FIESC on *C. pepo* in Jamaica. Recent reports describe FIESC infecting cucurbits in Asia, such as *Cucumis trigonus* in India (Mali *et al*., 2015) and muskmelon (Cao *et al*., 2019) in China. While appropriate fungicide programmes can give adequate control, disease management should rely on preventative methods, such as avoiding infested fields and applying seed treatments.

References

Cao P, Li C, Xiang W, Zhao J, 2019. First report of *Fusarium incarnatum-equiseti* species complex causing fruit rot on muskmelon (*Cucumis melo*) in China. *Plant Disease* **103**, 1768. http://dx.doi.org/10.1094/PDIS-09-18-1603-PDN

Cenis JL, 1992. Rapid extraction of fungal DNA for PCR amplification. *Nucleic Acids Research* **20**, 2380. http://dx.doi.org/10.1093/nar/20.9.2380

Geiser DM., Jimenez-Gasco M, Kang S, Makalowska I, Veerarghavan N, Ward TJ, Zhang N, Kuldau GA, O'Donnell K, 2004. FUSARIUM-ID v. 1.0: a DNA sequence database for identifying Fusarium. *European Journal of Plant Pathology* **110**, 473-479. http://dx.doi.org/10.1023/B:EJPP.0000032386.75915.a0

Mali AM, Patil VB, Ade AB, Chavan NS, Kamble SS, 2015. First report of *Fusarium* sp. FIESC_17 on *Cucumis trigonus* in India. *Plant Disease* **99**, 1274. http://dx.doi.org/10.1094/PDIS-09-14-0881-PDN

White TJ, Bruns T, Lee S, Taylor J, 1990. Amplification and direct sequencing of fungal ribosomal RNA genes for phylogenetics. In: Innis MA, Gelfand DH, Sninsky JJ, White TJ, eds. *PCR Protocols: A Guide to Methods and Applications*. San Diego, CA, USA: Academic Press, 315-322. http://dx.doi.org/10.1016/B978-0-12-372180-8.50042-1

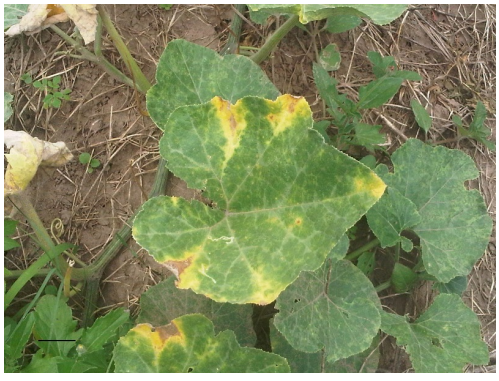

Figure 1

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