Diseases Caused by Fungi and Fungus-Like Organisms

First Report of *Fusarium petrophilum* Causing Fruit Rot of Spaghetti Squash in California

Albre A. Brown,[†] Marinell C. Soriano, Suzanne R. Latham, and Cheryl L. Blomquist

California Department of Food and Agriculture, Plant Pest Diagnostics Laboratory (CDFA-PPDC), Sacramento, CA 95832

Plant Dis. 106:1072, 2022; published online as <https://doi.org/10.1094/PDIS-08-21-1683-PDN>. Accepted for publication 1 September 2021.

Spaghetti squash (*Cucurbita pepo* L. subsp. *pepo*) is a yellow-skinned squash that forms translucent spaghetti-like strands when cooked. California leads the nation in total squash production, the majority of which is grown in the San Joaquin Valley. In October of 2019, severe fruit rot of *C. pepo* L. subsp. *pepo* (*C. pepo*) was observed in fruit harvested from seven cultivated fields in San Joaquin County, California. Infected fields incurred up to 30% postharvest losses. At harvest, fruit appeared healthy. After 10 days in a shaded storage shed, scattered buff to tan ringed lesions extending into the flesh of infected fruits were observed. Lesions had visible sporodochia at the center that were variable in size and continued to expand in storage. Tissue (~1 mm³) from the lesion margins of symptomatic fruit (*n* = 8) was surface sterilized in 75% ethanol for 1 min followed by 0.6% sodium hypochlorite for 1 min, and aseptically transferred to half strength acidified potato dextrose agar (0.5 APDA) and incubated at 22 to 25°C. Fungal colonies that grew from the pieces were light yellow, with mycelium that was flat and mucoid. Sporodochial conidia were falcate and robust with 3 to 5 septa and measured 44.2 to 51.6 × 4.6 to 5.9 μm (average 46.3 × 5.2 μm). Aerial conidia were profuse, borne on short monophialides, ovoid to reniform, and measured 5.1 to 12.6 μm × 3.2 to 5.6 μm (average 4.2 × 6.1 μm). DNA extracted from two isolates was amplified with primers ITS1/ITS4 and EF-1H and EF-2T using PCR to obtain sequences from the internal transcribed spacer (ITS) (White et al. 1990) and elongation factor 1α (EF1α) genetic regions. Sequences from both isolates were identical. Sequences from isolate MVAP50001827, GenBank nos. MZ081401 (ITS) and MZ102267 (EF-1α) matched 100% to

sequences of representative isolates of *Fusarium petrophilum* (Q.T. Chen & X.H. Fu) D. Geiser, O'Donnell, Short & Zhang, 2013 (Chen and Fu 1987; Short et al. 2013) from *Cucurbita* species, MF535516 (ITS) and MF580776 (EF-1α), respectively (González et al. 2018). To fulfill Koch's postulates, conidia were harvested from a culture of isolate MVAP50001827 and grown for 7 days on 0.5 APDA at room temperature (22 to 25°C). A 3-cm³ syringe with a 25-gauge needle was used to wound and inject 200 μl of 1 × 10⁶ conidia ml⁻¹ into three equally spaced points 1 mm deep into the rind of *C. pepo* fruit (*n* = 4). *C. pepo* fruit (*n* = 4) serving as negative controls were treated similarly with 200 μl of sterile deionized water. Fruit was incubated in a growth chamber at 27°C under 12-h diurnal cycle lighting conditions. Ten days post inoculation, lesions densely covered with white sporodochia had expanded to 7 cm diameter and 5 cm deep on average (average fruit size 31 × 11 cm). Twenty days post inoculation, severe fruit rot was observed. *F. petrophilum* did not grow from the controls, and was successfully reisolated from the symptomatic inoculated fruits, completing Koch's postulates. Seeds inside the inoculated fruits were completely colonized and covered in conidia. Twenty-five seeds from the original source seed lot were tested for *F. petrophilum* by surface sterilizing and plating onto 0.5 APDA. No *F. petrophilum* grew from tested seed. Postharvest fungal diseases can affect profitability of winter squash, which is often held in storage, and sold when market prices are optimal. To our knowledge, this is the first report of *F. petrophilum* infecting spaghetti squash (*C. pepo* L. subsp. *pepo*) in California.

References:

- Chen, Q. T., and Fu, X. H. 1987. Acta Mycol. Sin. Suppl. 1:328.
González, V., et al. 2018. Plant Dis. 102:1662.
Mbofung, G. Y., et al. 2007. Phytopathology 97:87.
O'Donnell, K., et al. 1998. Pro. Natl. Acad. Sci. USA 95:2044.
Short, D. P. G., et al. 2013. Fungal Genet. Biol. 53:59.
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: vegetables, postharvest, *Cucurbita pepo*

[†]Indicates the corresponding author.
A. Brown; Albre.Brown@cdfa.ca.gov