Diseases Caused by Fungi and Fungus-Like Organisms

First Report of Pulp Rot in Externally Asymptomatic Pomegranate Fruit Caused by *Talaromyces albobiverticillius* in Henan Province, China

Siliang Huang,^{1,2,†} Ting Li,¹ Tiantian Yang,¹ Xueling Zheng,¹ Di Yang,³ Gang Fu,³ Guoyue Hu,¹ Aili Tao,^{1,2} Languang Wang,⁴ Tao Xu,⁴ and Yuying Li^{1,2}

¹Nanyang Normal University, Nanyang 473061, Henan, China

²Engineering Research Center of Soft-Seeded Pomegranate in Henan Province, Nanyang 473061, Henan, China

³Guangxi Academy of Agricultural Sciences, Nanning 530007, Guangxi, China

⁴Henan Renhe Kangyuan Agricultural Development Co., Ltd., Xichuan 474450, Henan, China

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As a popular deciduous fruit tree, pomegranate (*Punica granatum* L.) is grown from tropical to temperate zones worldwide, and China has at least 120,000 hm² of cultivation area. In August 2020, severe pulp rot occurred in the externally asymptomatic preharvest pomegranate fruit on a 3-year-old soft-seeded variety (Tunisia) in the Zhanghe village (32°40'34" N, 111°44'20" E) of Jiuchong township, Xichuan county, in Henan province, China, with 6.4 to 20% (average 12.6%) pulp rot incidence evaluated from 11 freshly sampled fruits (360 pulps per fruit investigated). The fruits showed no external symptoms. However, browning occurred on some of their pulps before harvest while normal fruits were white or pink. The surfaces of the externally asymptomatic fruits were sterilized with 75% ethanol and air dried in a clean bench. The surface-disinfected fruits were dissected with a sterilized knife. Brown pulps from the fruits were picked up using flame-sterilized tweezers and placed on potato dextrose agar (PDA) plates. After 5 days of incubation at 28°C, pure fungal cultures with similar phenotypic features developed from the affected pulps. Two randomly selected isolates (Tp-2 and Tp-8) were used for the study.

The colony surfaces of the isolates were grayish green with claret-red exudates. Claret-red pigments were commonly secreted into the medium from the colonies. Conidia were unicellular, hyaline to grayish, and mostly rugby ball-shaped with dimensions of 2.2 to 3.5 (2.7) × 1.6 to 2.0 (1.8) μm (*n* = 50) for Tp-2 and 2.2 to 3.1 (2.6) × 1.6 to 2.2 (1.8) μm (*n* = 50) for Tp-8. The rDNA internal transcribed spacer (ITS) and β-tubulin gene sequences of the isolates were amplified with primers ITS1/ITS4 and Bt2a/Bt2b, respectively. Sequences were submitted to GenBank with accession numbers MW132153 and MW132077 for the rDNA-ITS sequences and MW507822 and MW507823 for the β-tubulin gene sequences of Tp-2 and Tp-8, respectively, with a maximal sequence identity greater than 99% to multiple strains of *Talaromyces albobiverticillius* based on BLAST analyses. In the neighbor-joining phylogenetic trees constructed using rDNA-ITS and β-tubulin gene sequences, both Tp-2 and Tp-8 formed a clade with multiple strains of *T. albobiverticillius*, clearly separated from other *Talaromyces* spp. Conidial suspensions (10⁶ spores ml⁻¹) of Tp-2 and Tp-8 were separately injected into five pomegranate fruits (Tunisia) sampled from an orchard free of the disease with a sterilized syringe. Five fruits inoculated with sterilized water were used as a control. The inoculated fruits were incubated at 25°C for 10 days and cut out through the inoculated sites. Pulp rot symptoms occurred in the Tp-2- and Tp-8-inoculated fruits, similar to the naturally affected pulps. The control pulps remained symptomless during the inoculation tests. Fungal cultures with the same phenotypic features as the inocula were constantly isolated from the brown pulps of the inoculated fruits, verifying both Tp-2 and Tp-8 as the causal agents of the disease based on Koch's postulates. During long-term (30 to 40 day) storage at ambient conditions, fruits sampled from affected orchards developed brown lesions on their peels from which *T. albobiverticillius* cultures could be isolated. *T. albobiverticillius* was reported as the pathogen causing postharvest fruit rot on pomegranate in Italy (Mincuzzi et al. 2017). This is the first report of *T. albobiverticillius* causing pulp rot in externally asymptomatic pomegranate fruit in China.

Reference:

Mincuzzi, A., et al. 2017. J. Plant Pathol. 99:287.

The author(s) declare no conflict of interest.

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[†]Indicates the corresponding author.
S. Huang; silianghuang@aliyun.com