First Report of Postharvest Fruit Rot Caused by Fusarium sacchari on Lady Finger Banana in Italy

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Thin-skinned banana "Lady finger", a diploid hybrid (AA) of *Musa acuminata,* is grown for its edible fruits and as an ornamental. In April 2019, in an open-air market in Catania (southern Italy), 42% of fruits in a stock of 2,000 pounds of this banana cultivar showed numerous small dark circular spots and dark brown to black, sunken lesions, lenticular in shape; crown, finger-stalk and tip-end rot. The surface of lesions was covered with salmon-pink spore masses. The stock, originated from Costa Rica and was repacked in Italy using transparent plastic wrapping, each containing a hand of six fruits. A *Fusarium* species (71% of isolations) was recovered on potato dextrose agar (PDA) supplemented with 100 µg/ml streptomycin and incubated at 27 ± 1°C for 5–7 days from 35 randomly sampled symptomatic fruits. A total of 71 isolates were obtained as pure cultures by single-spore isolations. On PDA, all isolates initially had white or light purple aerial mycelium that became violet with age and had an optimum growth of 27°C (7.6-12.3 mm/day). On CLA (carnation leaf agar), the cultures produced slender, slight falcate, 3 - 4 septate macroconidia with an acute apical cell (size ranges from 17.5 to 44.2 x 2.2 to 3.1 µm) and oval and slender microconidia arranged in false heads (size ranges from 5.1 to 14.0 x 1.7 to 3.8 µm). The conidiophores were mostly branched at one level. The β-tubulin (*β-tub*) and translation elongation factor 1 (*tef1*) genes of all isolates were amplified from gDNA using βt2α/βt2β (Glass and Donaldson, 1995) and EF1/EF2 (O'Donnell et al., 1998) primers, respectively. Pairwise alignments of *β-tub* and *tef1* sequences of all isolates showed 325/325 bp (100%) and 613/615 bp (99.67%) similarity, respectively, with those of *Fusarium sacchari* in GenBank (Accession Nos. KU603910 and GU377296, respectively). Being all the same, only the sequences of isolate CBS 145949 were deposited in GenBank (MN255816 and MN255818, respectively). Based on morphological (Leslie, et al. 2005; Leslie and Summerell, 2006;) and molecular features, isolates were identified as *F. sacchari* (E.J. Butler) W. Gams. Pathogenicity of CBS 145949 was tested by inoculating 24 wounded and 24 unwounded ripe fruits of "Lady finger",

surface disinfected with 70% ethanol and rinsed with sterile distilled water. Unwounded fruits were inoculated with mycelium disks (Abd Murad et al., 2017), while control fruits were inoculated with sterile agar disks. For wound inoculations, 1-mm wound was made on the peel with a sterilized needle and a drop of 5 µL spore suspension (5 x 10^5 spores/mL) was placed on three distinct spots per fruit. Twelve control fruits were inoculated with sterile distilled water. Fruits were incubated in a humid chamber at 27°C. All wounded inoculated fruits showed rot symptoms as those observed in the market 7 days after inoculation. Control and unwounded inoculated fruits remained symptomless. *F. sacchari* was re-isolated solely from inoculated fruits. These results indicate *F. sacchari* is a wound parasite on banana fruits. The high incidence of fruit rot observed in this stock was probably due to improper post-harvest management and poor packaging. *F. sacchari* has been reported as pathogen of banana in several producing countries (Abd Murad et al., 2017; Maryiani et al., 2019); however, to our knowledge, this is the first report of *F. sacchari* causing postharvest fruit rot disease on *Musa acuminata* "Lady Finger" worldwide and therefore, it needs to be properly managed to preserve marketability.

References

Abd Murad, N. B. et al. 2017. Journal of Applied Microbiology 123:1533. https://doi.org/10.1111/jam.13582.

Glass, N.L., and Donaldson, G.C. 1995. Applied and Environmental Microbiology 61: 1323.

Leslie, J.F. and Summarell, B.A. 2006. In: The Fusarium Laboratory Manual. Blackwell Publishing Ltd. https://doi.org/10.1002/9780470278376.

Maryani, N. 2019. Studies in Mycology 92:155. https://doi.org/10.1016/j.simyco.2018.06.003.

Leslie, J. F. et al. 2005. Mycologia, 97: 718. https://doi.org/10.1080/15572536.2006.11832801

O'Donnell, K. et al. 1998. Mycologia 90: 465. https://doi.org/10.1080/00275514.1998.12026933.