First Report of Anthracnose and Stem End Rot Diseases Caused by Colletotrichum gloeosporioides and Neofusicoccum australe on Avocado Fruits in Turkey

D. S. Akgül and Q. N. Awan, Çukurova University, Agriculture Faculty, Department of Plant Protection, Phytopathology, 01330 Adana, Turkey; P. G. Güler, Biological Control Research Institute, Turkish Dept. of Agriculture, 01321, Adana, Turkey; and N. Önelge, Çukurova University, Agriculture Faculty, Department of Plant Protection, Phytopathology, 01330 Adana, Turkey.

ABSTRACT

Organic avocado production has been increasing in recent years in Turkey. During a survey of organic avocado (cv. Hass) orchards in Mersin Province, symptomatic fruits were found with anthracnose and stem end rot in two orchards (~3 ha area) in 2015. The mean percentage of symptomatic fruits was 45% for these orchards. Brownish-green sunken lesions around many infection sites with acervuli were seen on fruits affected from anthracnose. Blackish softening lesions were observed on stem ends of the fruits affected from stem end rot. Mycological isolations were done after surface sterilization by dipping the infected fruits in 1% sodium hypochlorite for 3 to 5 min followed by rinsing with sterile distilled water. Small pieces of infected tissues from the fruit skin were cut and plated onto potato dextrose agar (PDA) amended with streptomycin-sulfate (0.015%). After 3 to 4 days, fungal colonies were subcultured on fresh PDA and petri dishes were incubated at 24°C, under a 16/8 h light/dark cycle. Generally, two kinds of pathogenic fungi were isolated and their symptoms were observed on the same fruits. The first species produced circular, grayish white to green colonies with orange conidial masses. One-celled, straight, and generally cylindrical conidia were abundantly produced on PDA after 10 to 12 days. Another species initially produced hyaline dense aerial mycelia, becoming greenish-gray on the upper surface, and black on the bottom of the plates. It produced single-celled, hyaline, ellipsoidal conidia with round apices within pycnidia. On the basis of morphological and cultural characteristics, detailed in studies of Weir et al. (2012) and Ismail et al. (2013), the species were identified as Colletotrichum gloeosporioides and Neofusicoccum sp. For molecular identification, actin and β-tubulin (TUB2) genes of C. gloeosporioides and ITS1, 5.8S ITS2 rDNA, and β-tubulin (TUB2) genes of N. australe were amplified and sequenced. ACT512F/ACT783R, T1/Bt2b, and ITS4/ITS5 primer pairs were used in PCR amplifications (Mahmodi et al. 2014; White et al. 1990). The sequences were compared with those deposited in GenBank. C. gloeosporioides isolate (CUZF10AV1) showed 100% similarity with KP823752 (actin) and JQ247640 (TUB2); N. australe isolate (CUZF11AV1) showed 100% similarity with JX271822 (ITS) and JQ918160 (TUB2). The DNA sequences

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were deposited into GenBank under accession numbers KU836642, KU836641, KU836640, and KU836639 for these genes, respectively. Pathogenicity tests were conducted with detached avocado fruits and the same procedure was used to test both pathogens. Mature fruits (cv. Hass) were surface sterilized with 1% sodium hypochlorite for about 3 to 5 min followed by rinsing with sterile distilled water. After that, mycelial agar plugs (5 mm²) of *N. austral*e or 10 µl conidial suspension (10⁷ conidia·ml⁻¹) of *C. gloeosporioides* were placed on incised fruits. Fruits were placed in plastic boxes and incubated at 25°C and 90% relative humidity for 15 days. Control fruits were inoculated with sterile agar plugs and distilled water. Ten fruits were used for each pathogen and this test was repeated twice. After symptom occurrence, the isolates were reisolated successfully and the symptoms were similar to those occurring naturally in the field. No symptoms were observed on control fruits. To our knowledge, this is the first report of *C. gloeosporioides* and *N. austral*e as postharvest pathogens of avocado in Turkey.

**References:**