Diseases Caused by Fungi and Fungus-Like Organisms

First Report of *Colletotrichum acutatum* Causing Anthracnose on Olives in Albania

M. Cara,¹ M. K. Iliadi,² C. S. Lagogianni,² E. J. Paplomatas,² J. Merkuri,³ and D. I. Tsitsigiannis^{2,†}

¹ Department of Plant Protection, Faculty of Agriculture and Environment, Agricultural University of Tirana, Rruga “Paisi Vodica”, Kodër-Kamëz, Tirana 1029, Albania

² Laboratory of Plant Pathology, Department of Crop Science, Agricultural University of Athens, Athens, 11855, Greece

³ Didactic and Scientific Research Center, Durrës, Albania

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Olive trees (*Olea europaea* L.) are among the most important fruit tree crops grown in Albania, covering an estimated 8% of the arable land of this country. The highest amount of olive production in Albania is concentrated in the coastal districts of Fier, Berat, Elbasan, Lezha, Tirana, Kruja and Vlora, all with Mediterranean climate conditions. Anthracnose is the main disease of olive fruit caused by different *Colletotrichum* spp. primarily belonging to two complexes, *C. acutatum* sensu lato (s.l.) and *C. gloeosporioides* s.l. (Cacciola et al. 2012; Schena et al. 2014). On July 2018, field observations of about 50 olive trees in the Ishull Shengjin Lezhe Region (54% prevalence), 1 km away from the coast, showed severe symptoms of mummified olive fruits in about 20 to 40% disease incidence and 30% disease severity of the Italian table olive cultivar Frantoio trees, resulting in premature fruit drop or mummification. The causal agent was isolated directly from infected fruits on potato dextrose agar and rose bengal nutrient media. Microscopic examinations of five single-spore isolated fungal colonies showed acervuli with typical conidia of the genus *Colletotrichum* that were aseptate, straight, hyaline, subcylindrical with rounded ends, and 12.3 to 22.1 µm long (mean = 17.4 µm) and 2.5 to 7.3 µm wide (mean = 5.9 µm) ($n = 50$ conidia) (Damm et al. 2012). To identify the fungal species, DNA from two single-spore isolates (Col-3-ALB and Col-9-ALB) isolated from fruits was extracted, and six genes

were amplified (*ITS*, *GAPDH*, *CHS-1*, *HIS3*, *ACT*, and *TUB2*) using the primers reviewed in Damm et al. (2012). Polymerase chain reaction products were sequenced, and BLAST analysis showed 100% identity to *C. acutatum* for both isolates (GenBank accession nos. for Col-9-ALB: MT218337 [*ITS1-5.8-ITS2*], MT274748 [*CHS-1*], MT274749 [*HIS3*], MT274750 [*GAPDH*], MT274751 [*TUB2*], and MT274752 [*ACT*]). Phylogenetic analysis using the concatenated sequences of Col-9-ALB, the type species of *Colletotrichum acutatum* (112996), a previously identified published Greek *C. acutatum* isolate (O9), and three *C. godetiae* strains confirmed the identification of Col-9-ALB as *C. acutatum*. Pathogenicity tests were performed in the laboratory to confirm the ability of *C. acutatum* isolates to cause disease on olive drupes. Fruits were surface disinfected with 0.1% NaClO for 3 min and rinsed with ddH₂O. Artificial inoculations with the two above isolates were performed by spraying 24 olive fruits per isolate (cv. Kalamon, eight olive fruits per replication) with a spore suspension (10⁶ conidia/ml). Olive fruits sprayed with sterilized water served as an untreated control. After inoculation, olive fruits were placed in closed sterile plastic boxes and kept at 26°C with a 12-h photoperiod. First rot symptoms and formation of acervuli by the pathogen were initiated 3 days after inoculation. Eight days postinoculation, all treatments exhibited typical anthracnose symptoms similar to those observed in olive orchards (extensive fruit rot). To fulfill Koch's postulates, *C. acutatum* was reisolated from 10 random symptomatic olive fruits/isolate, and their identity was confirmed from all samples. To our knowledge, this is the first report of *C. acutatum* causing fruit rot on olive trees in Albania. It is important to further study the epidemiology for the disease under local climate conditions and on different olive cultivars in order to develop effective management strategies for this destructive disease of olive.

References:

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[†]Indicates the corresponding author.

E-mail: D. I. Tsitsigiannis; dimtsi@aua.gr