Diseases Caused by Fungi and Fungus-Like Organisms

First Report of *Corynespora cassiicola* Causing Target Spot on Cotton (*Gossypium hirsutum*) in South India

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Target spot with unusual symptoms was observed in upland cotton at the Regional Agricultural Research Station, Lam, Guntur, Andhra Pradesh, India, in 2017. Symptoms appeared about 60 to 65 days after planting with minute pinhead-sized light orange to brick red spots that gradually expanded as circular to oval or irregular concentric spots and finally became target spots with a yellow halo. These symptoms were also observed during 2019-20 and 2020-21 in diagnostic field visits in the Krishna zone of Andhra Pradesh, India. Frequent showers had intensified disease severity and defoliation of different cultivars (L 1060, RCH 659 BGII, NDLH-1938, and Jaadoo BG II) examined. Leaf pieces containing healthy and diseased portions were surface sterilized with 0.1% HgCl₂ for a minute, rinsed three times in distilled water, and placed on PDA at 27 ± 1°C for pathogen development. The obtained pathogen was purified using the single spore isolation technique. Purified colonies were gray on top of the culture plate and grayish brown on the bottom of the culture plate with flat, aerial round colonies having a fibrous texture with dense mycelium. Conidiophores were indeterminately septate with intermediate branching. Enteroblastic conidiogenous cells produced subhyaline conidia that were solitary or in chains, straight to curved, 83.43 ± 31.73 × 7.61 ± 1.43 µm with 7.27 ± 2.19 pseudosepta. Morphological characteristics of the isolated fungus were consistent with the original description of *Corynespora cassiicola* on cotton (Conner et al. 2013; Fulmer et al. 2012; Jones 1961), which confirmed it as *Corynespora* morphologically. A pathogenicity test was conducted on popular hybrid Jaadoo BG II using three isolates, Lam (CGGL 19001), Koniki (CPIK 19009), and Venkatapuram (CKMB 19011), obtained during the 2019-20 survey. Fifty days

after sowing, a conidial suspension containing 1 × 10⁴ spores per ml was sprayed on healthy plants maintained in pots under protected conditions. Immediately after spraying, the plants were covered with polypropylene for 48 h to prevent cross-contamination and to ensure humidity for pathogen establishment. Healthy plants sprayed with sterile water served as controls. After seven days of incubation, inoculated plants developed brick red spots initially that developed into target spots. The absence of symptoms in control plants indicated the pathogenic nature of the fungus. The pathogen was reisolated from diseased tissue to confirm its pathogenicity according to Koch's postulates. The identity of the pathogen was further examined using ITS primers. DNA was isolated from a 10-day-old culture using the CTAB method. The internal transcribed spacer (ITS) regions of three isolates were amplified using ITS1 and ITS4 primers and the obtained amplicons (550 bp) were used for sequencing. The sequenced data were deposited in NCBI (accession numbers MZ314930, MZ314928, and MZ314927). A BLAST search in GenBank revealed 99% homology of the CGGL 19001 isolate with sequences of *C. cassiicola* (accession number MN393240) while the CPIK 19009 and CKMB 19011 isolates showed 100% homology with *C. cassiicola* in cotton (accession numbers MN393238, MN228955, MN733135, MN288934, and MN393238). Based on symptoms, fungal morphology, a pathogenicity test, and ITS sequences, the fungus was identified as *C. cassiicola*, the pathogen of cotton causing target spot disease. Sarma and Nayudu (1970) isolated *Corynespora* from different host plants including cotton but could not prove its pathogenicity on cotton. Target spot of cotton associated with *C. cassiicola* has been reported from Central India (Salunkhe et al. 2019), but this is the first report of *C. cassiicola* in cotton from South India. Identification of the target spot pathogen is very important as it is emerging as a dominant foliar pathogen for which management strategies are needed.

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