New Disease Reports

First report of chilli anthracnose caused by *Colletotrichum karstii* in India

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Chilli, *Capsicum annum*, is an annual herbaceous vegetable and spice grown in almost all the states of India. Anthracnose (fruit rot) of chilli caused by *Colletotrichum* species results in both pre- and post-harvest fruit decay with yield losses of up to 50% (Pakdeevaraporn *et al*., 2005). The different species of *Colletotrichum* causing chilli anthracnose reported from India include: *Colletotrichum acutatum*, *C. capsici*, *C. coccodes*, *C. dematium*, *C. gloeosporioides* and *C. siamense*. In August 2014, chilli fruits showing typical anthracnose symptoms of sunken necrotic tissues with concentric brown black rings of acervuli were obtained from a farmer's field in Jalna, Maharashtra, India.

Small pieces of necrotic tissue were examined under a microscope and spores inoculated on potato dextrose agar (PDA) containing 50 mg/l streptomycin sulphate. The plates were incubated at 28°C for 5 to 7 days and a pure culture of the *Colletotrichum* isolate was obtained by sub-culturing on fresh PDA plates. The colonies had white aerial mycelia with an orange conidial mass (Fig. 1). The colour of the colony on the reverse side was light orange. The mycelial growth rate on the PDA plate at 28°C and a 16/8 h light/dark cycle respectively, was 11 mm per day. Conidia were single celled, cylindrical with rounded base and apex. Mean length and width of conidia was 13.11 ±1.22 µm and 6.2 ±0.34 µm, respectively (Fig. 2).

Molecular characterization of the *Colletotrichum* isolate was based on ITS rDNA and partial β-tubulin gene sequence comparisons. PCR amplification was done using the universal primer pair ITS 4/5 (ITS region of the nuclear ITS1-5.8S - ITS2 rDNA; White *et al*., 1990) and β-tubulin gene Bt2a/b primers (Glass *et al*., 1995). Both sequences were deposited in GenBank (Accession Nos. KX492583 and KX492584, respectively) and aligned with published sequences using MEGA version 6.0 (Tamura *et al*., 2013), and phylogenetic analysis was done (Fig. 3). Blast searches in the NCBI database revealed that the ITS and β-tubulin gene sequences had 98% and 99% identity to *Colletotrichum karstii* (KT284369 and KC293650, respectively) confirming that the isolate obtained from infected chilli is *C. karstii*.

To confirm pathogenicity, chilli fruits and seedlings were wounded with a sterile syringe and inoculated with 10 µl of a conidial suspension (c. 10^5 conidia/ml). Sterile water was used as a control. Inoculated fruits and seedlings were kept in a chamber at 28°C with 90% humidity. After seven days typical anthracnose symptoms were observed on chilli fruits and leaves (Fig. 4). This demonstrated that *C. karstii* re-isolated from symptomatic chilli fruits was able to cause anthracnose, thereby fulfilling Koch's postulates.

Colletotrichum karstii as a causal agent of chilli anthracnose has been reported in Brazil (Lima *et al*., 2013) and China (Wang *et al*., 2016). To our knowledge, this is the first report of chilli anthracnose caused by *C. karstii* in India.

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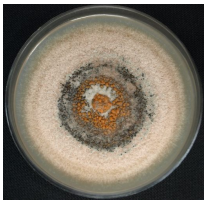

Figure 1

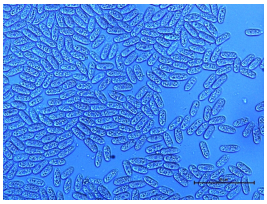

Figure 2

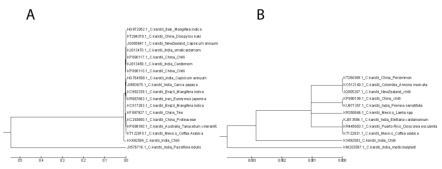

Figure 3

Figure 4

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