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Antifungal Activity of Some Natural Plant Extracts Against Causal Agent of Anthracnose Disease of Chilli

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Abstract

Anthracnose caused by *Colletotrichum* species is a common postharvest disease of chilli fruit in Sri Lanka. The aim of the study was to isolate the chilli anthracnose disease causing *Colletotrichum* species and control the organisms by the application of natural plants extracts. Two *Colletotrichum* isolates ISO 1 and ISO 2 were isolated from chilli anthracnose diseased fruits and they were identified as *Colletotrichum capsici* and *Colletotrichum gloeosporioides* respectively based on the morphological features. Crude extracts of five spices, viz. *Cassia* sp., *Lantana* sp., *Ricinus* sp., *Cinnamomum* sp., and *Catharanthus* sp. were made using cold water, hot water and ethanol extraction and they were tested for their anti-fungal effects against the two *Colletotrichum* isolates isolated from chilli anthracnose diseased fruits. Pathogenic variations of the fungal isolates in terms of pathogenicity and virulence were determined by *In vitro* inoculation assays using healthy chilli fruits. All five spices studied showed significant anti-fungal activity at three extraction methods *In vitro*. The cold-water extract of *Cassia* sp., *Cinnamomum* sp., and *Catharanthus* sp. exhibited good anti-fungal activity against all two tested fungi. In the case of the hot water extracts, *Catharanthus* sp., and *Lantana* sp. showed the best anti-fungal activity against all two tested fungi. Ethanol extracts of *Cassia* sp., *Ricinus* sp., and *Catharanthus* sp. showed more than 10% inhibition against ISO 1. Of the three extraction methods, cold water extraction was generally more effective than other extraction methods. Cold water extract of *Cinnamomum* sp. inhibited the growth of ISO 1 and ISO 2 respectively 87.78% and 86.34%. Against two isolates cold water, hot water and ethanol extracts of *Catharanthus* sp. was effective in imposing more than 10% inhibition. Recommended dosage (1.8 gL^{-1}) of the fungicide Homai (Thiophanate-methyl 50%+Thiram 30% WP) completely inhibited the mycelial growth of two isolates in vitro. Virulence of the *Colletotrichum* sp. varied significantly in terms of rapidity and extent of disease spread.

Keywords: Anti-fungal effects, Pathogenic variations, Anthracnose, Postharvest disease