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Phylloplane Fungi Associated with Capsicum Varieties (*Capsicum annum* L.) of Sri Lanka and their Antagonistic Activity on the Causative Agent of Capsicum Anthracnose Disease**Diwankara, U.T., Deshappriya, N.****Department of Botany, University of Sri Jayewardenepura, Nugegoda, Sri Lanka***nelum@sci.sjp.ac.lk***Abstract**

Capsicum (*Capsicum annum* L.) is a vegetable cash crop cultivated in Sri Lanka. Anthracnose disease caused by *Colletotrichum* species is an economically important disease causing about 50% yield losses. Synthetic fungicides used to manage anthracnose disease cause environmental and health problems and thus less hazardous alternative strategies should be sought. Phylloplane fungi are being investigated as one such viable alternative, and therefore this study aimed to isolate and identify the phylloplane fungi from commonly cultivated capsicum varieties in Sri Lanka and evaluate their ability to control the causative agent of capsicum anthracnose disease. A fungal species associated with anthracnose symptoms in capsicum fruits was isolated and pathogenicity was confirmed using Koch's postulates. The isolate was identified as a *Colletotrichum* species based on morphological characteristics. The genomic DNA extracted from the *Colletotrichum* culture was subjected to PCR amplification of the Internal Transcribed Spacer (ITS) region with ITS1/4 primers, and the resulting PCR products were sent to Macrogen, Korea for sequencing. The obtained sequence was compared with the GenBank database using the BLAST tool, which confirmed its identity as *C. plurivorum* (Percent identity 100.00%, E value 0.0). Leaves from two-month-old, healthy, capsicum varieties of C.A.8, Hungarian yellow wax, and Muriya were collected randomly from the mid area of fields in the Colombo, Kalutara, and Nuwara-Eliya districts. Leaf wash and leaf imprint methods were used to isolate phylloplane fungi from collected samples. Thirty-six phylloplane fungi were isolated and identified using morphological characteristics up to the genus level. The most dominant fungal genera isolated were *Aspergillus*, *Penicillium*, and *Trichoderma* with 28.57, 9.90, and 9.90 percentage abundances respectively. Dual culture plate assays were conducted to evaluate the effect of phylloplane fungi on the colony growth of *C. plurivorum*. Amongst all isolates, eleven phylloplane fungi significantly inhibited ($P \leq 0.05$) the colony growth of the pathogen in dual culture assays. The highest percentage of inhibition was shown by *Trichoderma* sp.1 (82.67%). Using the sticky tape method, the antagonistic structures formed by the effective phylloplane fungi in dual culture plates were observed. *Trichoderma* sp. formed loops and coils around the hyphae of the pathogen, and these structures may have a role in the control of the colony growth of the pathogen. The study showed that phylloplane of capsicum varieties in Sri Lanka have diverse fungal flora and some of them had the ability to control the colony growth of *C. plurivorum* significantly. These findings will serve as a basis for further in-depth studies of their development as biopesticides against *C. plurivorum*.

Keywords: Phylloplane, Capsicum, Anthracnose disease, Biopesticides, *Trichoderma* sp.