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Morphological and molecular identification of fungal pathogens associated with cultivated rubber trees in Sri Lanka

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Fungal pathogens are one of the major threats on cultivated rubber (*Hevea brasiliensis*) trees globally. Although rubber pathogens are traditionally known based on morphology, less or no molecular data are available for some pathogenic species in Sri Lanka. Emergence of pathogens can be due to climatic changes and introduction of new clones. Therefore, assessment of fungal pathogens associated with rubber trees in Sri Lanka is essential. The major objective of this study is to accurately identify foliar fungal pathogens associated with rubber plants in Sri Lanka based on morphology and phylogenetic analysis. Single spore isolation was carried out to obtain pure cultures of fungi from diseased leaf samples collected randomly from selected sites. Internal transcribed spacer (ITS) region of all isolates were sequenced to determine the generic placement of isolates. Phylogenetic analysis was performed based on five gene regions including partial actin (ACT), beta tubulin (TUB2), chitin synthase (CHS-1), glyceraldehyde-3 phosphate dehydrogenase (GAPDH) and ITS for the isolates within the *Colletotrichum gigasporum* and *C. truncatum* species complexes. Putative DNA lyase (Apn2), DNA lyase-mating type 1 intergenic region (Apn2-MAT1) and ITS regions were used for *C. gloeosporioides* species complex. The analysis was done based on ITS and GPDH for isolates belonged in *Curvularia*. According to the morphological and molecular data, *Curvularia verruculosa*, *Colletotrichum truncatum* and one unknown species belonged in *Colletotrichum gigasporum* complex identified in this study were the first global fungus-host association records on *Hevea*. Three isolates were first records of host-pathogen association in Sri Lanka, namely *Colletotrichum siamense*, *Curvularia senegalensis* and *Phyllosticta capitalensis*. Both *Curvularia* spp. recorded are first records of those fungi in Sri Lanka. Pathogenicity tests confirmed that *Colletotrichum* isolates leading to typical anthracnose symptoms are correlated with the species belong in gloeosporioides complex while *C. gigasporium* and *C. truncatum* species are also capable of successfully colonizing on rubber leaves. Hence, this study reveals a previously unknown diversity of foliar fungi associated with cultivated rubber trees in Sri Lanka.

Keywords: leaf diseases, plantation crops, species complexes

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