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Abundance of Fungal Species in Healthy and Agarwood Resinous Tissues of *Gyrinops walla*

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Abstract

Agarwood is a resinous substance embedded in stem tissues in *Aquilaria* and *Gyrinops* species, belonging to the Thymalaeaceae tree family. Agarwood resin formation is induced as a self-defence mechanism, mainly to protect from fungal attacks. Due to strong aromatic properties, agarwood tissues and resins extracted from those tissues become a highly priced non-timber forest product used in the fragrance and traditional medicine industries. *Gyrinops walla* has been recorded only in Sri Lanka in recent decades, which is the only member of the genus agarwood-producing species naturally grown in the country. Since fungal species induce the agarwood resin formation, this study aimed to identify the fungal diversity in the resin-embedded and healthy stem tissues of *G. walla*. Healthy and agarwood resinous tissue samples were collected from *G. walla* trees growing in Kirimetimulla, Olugala, Elpitiya, Morapitiya, and Weheragala of the low country wet zone of Sri Lanka. Five trees were sampled in each location. Those tissues were immediately sealed in polythene bags after collection to minimize contamination. Those were surface sterilized in the laboratory and cultured on Potato Dextrose Agar and Malt Extract Agar media. Once the colonies were formed, isolation was done by the single spore isolation method. It was possible to isolate 8 different morphotypes from Kirimetimulla, 9 from Morapitiya, 7 from Weheragla, 7 from Olugala, and 6 from Elpitiya. A total of 12 morphologically different isolates were identified from healthy and resinous *G. walla* tissues from all five locations by Macroscopic and microscopic analysis. Among them, *Aspergillus* sp., *Botryosphaeria* sp., *Lasiodiploidea* sp., *Fusarium* sp., *Trichoderma* sp., and *Penicillium* sp. were common in all locations. Studies are underway to identify the possibility of inducing agarwood resin formation by inoculating laboratory-grown pure cultures of the above species.

Keywords: *Gyrinops walla*, Agarwood, Fungal diversity, Fungal isolates, Induce