



Abstract

Identification of Pathogens in Seedlings of Indian Sandalwood and Screening of Fungal Endophytes against the Plant Patho-Genic Fungi [†]

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Abstract: Indian sandalwood (*Santalum album* Linn.), an evergreen tree, indigenous to the Indian peninsula, is known for its fragrant heartwood worldwide. Sandalwood plantations are gaining importance throughout the Indian subcontinent, demanding large-scale production and the establishment of nurseries with quality planting material (QPM). However, sandalwood seedlings succumb to devastating diseases at nurseries, leading to high mortality of the plant stock. Therefore, there is a dire need for the effective management of these diseases. In our study, we isolated and identified phytopathogenic fungi, such as *Fusarium solani* causing wilt disease with seedling mortality of 25% and *Colletotrichum siamense* causing anthracnose disease with a disease incidence of 75%. We identified and characterized a total of 90 fungal endophytic isolates from leaf, stem, and root tissues of disease escaped or apparently healthy seedlings of sandalwood. Total fungal endophytes isolated from the disease-escaped sandalwood seedlings comprised 33.3% *Colletotrichum siamense*, 26.6% *Diaporthe melonis*, 13.3% *Aspergillus sclerotiorum*, 13.3% *Fusarium oxysporum*, 13.3% *Paraphoma radicina*, 6.6% *Alternaria alternata*, and 6.6% *Pestalotiopsis microspora*. Molecular identification using the nuclear ribosomal DNA internal transcribed spacer (ITS) sequences was performed, and those species which could not be resolved with ITS sequence were subjected to multi-locus gene (beta-tubulin (TUB2), the glyceraldehyde-3-phosphate dehydrogenase (GAPDH) gene, the chitin synthase 1 gene (CHS-1), the actin gene (ACT), and the glutamine synthetase (GS) gene) analysis, and the sequences were deposited to GenBank. Dual culture test assay revealed that the fungal endophytes *Aspergillus sclerotiorum* and *Diaporthe melonis* showed the highest percent inhibition of 63.08% and 61.54%, respectively, against *Fusarium solani* and *Diaporthe melonis*, and *Fusarium oxysporum* showed the highest percent inhibition of 55.38% and 67.69% in the case of the pathogen *Colletotrichum siamense*. This study will be useful for the management of seed, soil, and airborne pathogens of Indian sandalwood.

Keywords: Indian sandalwood; endophytes; pathogen; management



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