

Fungal Diversity and Bioprospecting of Termite-Associated Fungi from Northern-Western Ghats of India

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Abstract : The diversity of fungi isolated from two different termite species viz., *Odontotermes assmuthi* and *O. abesus* was investigated by dilution-plate method, combined with morphological characteristics and sequencing of internal transcribed spacer region. In total, ninety-six fungi were isolated and purified, out of which 69 isolates were obtained from *O. assmuthi* belonging to 18 genera and 31 species, whereas 27 isolates were obtained from *O. abesus* belonging to 15 genera and 17 species. The fungal strains were screened for laccase, amylase, cellulase and pectinase enzymes production. Twenty-seven strains were positive for laccase, 59 strains were positive for amylase, 71 strains were positive for cellulase and 72 strains were positive for pectinase enzymes. The antimicrobial activities of the isolated fungi were tested by the dual plate culture method against standard pathogens. Bioactive secondary metabolites were identified by HPLC and LCMS. Four isolates viz., *Penicillium goetzii* MG 57, *Epicoccum* sp. MG 39, *Penicillium tanzanicum* MG 30, *Aspergillus polyporicola* MG 54, showed positive antimicrobial activity against standard pathogens, *Streptococcus pneumonia* MCC 2425, *Staphylococcus aureus* MCC 2408, *Pseudomonas aeruginosa* MCC 2080, *Escherichia coli* MCC 2412, *Enterococcus faecalis* MCC 2409, *Klebsiella pneumonia* MCC 2451, *Micrococcus luteus* MCC 2155 and *Candida albicans* MCC 1151. In conclusion, the study showed that the insect gut harbor fungal diversity, which is futuristic with biotechnological potential and could be a good source of enzymes and antibiotics.

Keywords : termites, fungi, its, enzyme, antimicrobial activity

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