Lignin-Degrading Enzymes from Mycelial Cultures of Basidiomycete Fungi Isolated in Tanzania

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Abstracts

This research involved field surveys in different geographical locations in Tanzania for collection of fungi species, identification of the isolates, and screening for lignin-degrading enzyme production. Out of 18 saprophytic fungi (both wood and non-wood inhabiting) isolates, 17 were positive in the rhemazol brilliant blue-R (RBBR) decolorization test; 15 of the isolates oxidized guaiacol while 7 and 12 oxidized α-naphthol and pyrogallol, respectively. The cultures with 1% glucose concentration showed the fastest growth of mycelia and highest MnP, LiP, and Lac activities. MnP was found to be dominant among the tested isolates and *Laetiporus sulphurae* had the highest LiP activity of 65.2 U/m*l*. Most of the fungi isolates produced more than two extracellular enzymes, suggesting that these isolates possess the ability to degrade lignin or related polyphenolic compounds, and thus they can be used in upgrading low quality animal feed. The selected fungi isolates reduced cellulose and hemicellulose contents in rice straw by an average of 10% and 35%, respectively, delignification ratio of 23% and increased its relative crude protein content by more than 50%.

Keywords: Animal Feed, Basidiomycete Fungi, Lignin-Degrading Enzymes, Rice Straw