

## **Evaluation of Cellulase and Xylanase Production by *Micrococcus* Sp. Isolated from Decaying Lignocellulosic Biomass Obtained from Alice Environment in the Eastern Cape of South Africa**

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**Abstract :** Cellulose and hemicellulose account for a large portion of the world's plant biomass. In nature, these polysaccharides are intertwined forming complex materials that requires multiple and expensive treatment processes to free up the raw materials trapped in the matrix. Enzymatic degradation remains as the preferred technique as it is inexpensive and eco-friendly. However, the insufficiencies of enzyme battery systems in the degradation of lignocellulosic complex motivate the search for effective degrading enzymes from bacterial isolates from uncommon environment. The study aimed at the evaluation of actinomycetes isolated from saw dust samples collected from wood factory under bed. Cellulase and xylanase production was screened through organism culture on carboxyl methyl cellulose agar and Birchwood xylan. Halo zone indicating lignocellose utilization was shown by an isolate identified through 16S rRNA gene as *Micrococcus luteus*. The optimum condition for the production of cellulase and xylanase were incubation temperature of 25 °C, fermentation medium pH 5 and 10, agitation speed of 50 and 200 (rpm) and fermentation incubation time of 96 and 84 (h) respectively. The high cellulose and xylanase activity obtained from this isolate portends industrial relevance.

**Keywords :** carboxyl methyl cellulose, birchwood xylan, optimization, cellulase, xylanase, micrococcus, DNS method

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