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Isolation and characterization of cellulases from termite guts for biofuel application

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Abstract: Depleting fossil fuels and environmental pollution attracted the scientific community for searching the alternative fuels. Biofuels production from lignocellulosic biomass has recently received tremendous attention. Lignocellulosic raw materials can be converted to ethanol by pretreatment, sacchariffication and subsequent fermentation. For sacchariffication steps thermochemical process like acid hydrolysis widely used. Generation of fermentation inhibitors (Hydroxy methyl furfural, furfural, acetic and formic acids), low yields of sugars and high energy inputs limiting the usage of thermochemical processes. Consequently, enzymatic hydrolysis is a more environmentally and effective approach for achieving better sugar yield. The cost and variations in catalytic activities of cellulases enzyme limiting the wide usage in sacchariffication process. Still researchers are prospecting for robust and cheap cellulases for making bioethanol production process economical. In this work we isolated cellulase producing bacteria from termite gut. Pure colonies isolated and characterized as *Bacillus sp*. Further the *bacillus* strain cultured for cellulase production. Cellulases was separated by precipitation and purified by ion exchange chromatography and characterized as β-glucosidase (70kd). Further process conditions (pH, temperature and incubation time) optimized for sacchariffication process.

Keywords: biomass, bioethanol, pretreatment, cellulase, sacchariffication

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