



Production and Optimisation of Cellulases on Pre-treated Groundnut Shell by *Aspergillus niger*

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Abstract : *The objective of this study was to optimise the different cultural conditions i.e. temperature, pH and incubation period and to determine the influence of different biochemical parameters i.e. effect of acid and alkali pre-treatment, amino acids and nitrogen sources by Aspergillus niger on groundnut shell as a lignocellulosic substrate for production of cellulase enzyme using submerged fermentation. The cellulase enzyme production was analyzed by measuring the amount of glucose liberated using the dinitrosalicylic acid assay method. The optimum pH was about 4.5, the optimum temperature was 30°C and the optimum incubation period was 5 days for the production of cellulase on groundnut shell substrate by Aspergillus niger. Alkali pre-treatment was found to increase*

the cellulase enzyme production as compared to untreated and acid pre-treated substrate. Among nitrogen sources peptone showed the most pronounced effect than other. Methionine and asparagine were found to be stimulatory for cellulase activity. This study reports groundnut shell as potent inducer of cellulase enzyme by Aspergillus niger.

Key Words: *Aspergillus niger, Cellulase, Endoglucanase, Exoglucanase, Groundnut shell, submerged fermentation.*

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Introduction :

Enzymes, the most remarkable and highly specialized proteins, have extraordinary catalytic power. They catalyse hundreds of stepwise reactions that degrade nutrient molecules, conserve and transform chemical energy, and make biological macromolecules from simple precursors. Cellulases are among the industrially important hydrolytic enzymes and are of great significance in present day biotechnology. Cellulases are widely used in the food, feed, textile and pulp industries (Nakari and Pentilla, 1996).