

# Application of Response Surface Methodology for Optimizing Process Parameters in the Production of Amylase by *Aspergillus flavus*NSH9 under Solid State Fermentation

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## ABSTRACT

*Amylase is recognized as one of the important commercial enzymes. This group of enzymes has the ability in hydrolyzing starch into smaller oligosaccharides. The present work aimed to determine the optimum fermentation conditions for maximum production of crude amylase enzyme by Aspergillus flavus NSH9 employing response surface methodology (RSM). Central composite design (CCD) was applied to determine the optimal fermentation condition with respect to the four main process parameters such as temperature, initial moisture content, pH and the incubation period. Solid state fermentation (SSF) was performed using 5.0 g of sago hampas inoculated with  $1 \times 10^7$  spores  $mL^{-1}$  following the experimental design obtained using CCD and further optimized by RSM. The initial moisture, pH and temperature showed significant effect on the amylase production ( $p < 0.05$ ). The maximum amylase activity produced was achieved and recorded as  $1.055 \pm 0.03 U mL^{-1}$  after four days of fermentation period with 100% (v/v) moisture holding capacity, pH 6.5 and temperature at 28°C. The optimum fermentation conditions for amylase production was determined with A. flavusNSH9 on sago hampas.*

**Key words:** Solid state fermentation, *Aspergillus flavus*NSH9, Sago hampas, Central Composite Design, Response Surface Methodology,

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