Biological and Applied Sciences

Vol.59: e16150632, January-December 2016
http://dx.doi.org/10.1590/1678-4324-2016150632
ISSN 1678-4324 Online Edition

BRAZILIAN ARCHIVES OF
BIOLOGY AND TECHNOLOGY
A N I N T E R N A T I O N A L J O U R N A L

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

**Siti Ratina Mustafa[1], Ahmad Husaini[1*], Cirilo Nolasco Hipolito[2], Hasnain Hussain[3], Nurshikin Suhaili[1], Hairul Azman Roslan[1].**

*[1]Universiti Malaysia Sarawak - Molecular Biology Kota Samarahan, Sarawak Malaysia; [2]Universiti Malaysia Sarawak - Chemical Engineering Kota Samarahan, Sarawak Malaysia; [3]Molecular Biology Faculty of Resource Science and Technology Universiti Malaysia Sarawak , Kota Samarahan, Malaysia.*

## ABSTRACT

*Amylase is recognized as one of the important commercial enzymes. This group of enzymes has the ability in hydrolyzing starch into smaller oligosacharides. 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 $1x10^7$ sporesm$L^{-1}$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 ± 0.03U m$L^{-1}$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. flavus*NSH9 on sago hampas.*

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

[*]Authors for correspondence: haahmad@frst.unimas.my