ALPHA ARTS AND SCIENCE COLLEGE

PORUR, CHENNAI

(A Christian Minority Insitution)

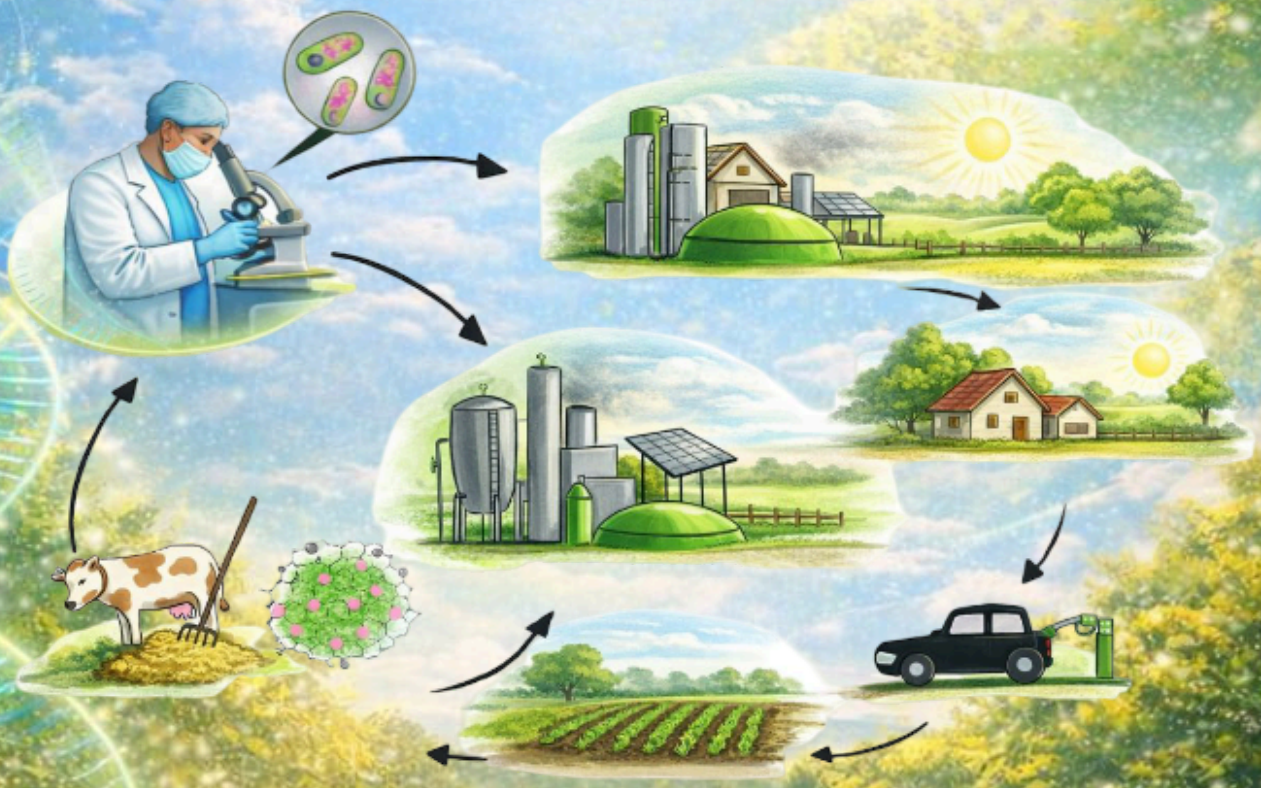
(Reaccredited by NAAC and TUV Certified)

Affiliated to University of Madras

PG Department of Biotechnology

9th National Colloquium on NextGen Bioenergy - 2026

11th FEBRUARY, 2026



Published by

Department of Biotechnology

Issue No : 10

ISBN: 978-93-47021-03-9

Optimization of Lipase Production by Aspergillus flavus- One factor at a time approach

Anitha Ganesan and Vardhana Janakiraman*

Department of Biotechnology, Vels Institute of Science, Technology and Advanced Studies, Pallavaram, Chennai- 600117

Corresponding Author email id : vardhana88@ymail.com.

Abstract

Fungal lipases are industrially important enzymes due to their versatile, stable, and eco-friendly nature, nurturing them as an attractive candidate for various biotechnological applications. In this study, crude lipase production by *Aspergillus flavus* was investigated under submerged fermentation. In the present study, lipase production by the selected fungi was evaluated through systematic optimization of nutritional and physical parameters using a one-factor-at-a-time approach. Incubation time exhibited a clear growth phase–dependent pattern, with enzyme response increasing from 24 h (0.61) and reaching a maximum at 96 h (2.90), indicating higher enzyme synthesis during the late exponential to stationary phase. Temperature markedly affected lipase production, with optimal enzyme variability observed at 30 °C (5.44), followed by a gradual decline at elevated temperatures. Initial pH significantly influenced enzyme activity, with pH 6 supporting the highest variation in lipase production (3.36 U/mL). Inoculum size analysis showed a lower inoculum levels were favorable, as 1% inoculum resulted in the highest response value (5.18), while increasing inoculum concentrations led to reduced enzyme production, likely due to nutrient limitation and metabolic stress. Overall, the ANOVA trends clearly demonstrate that cultivation conditions and substrate selection significantly regulate lipase production by *A. flavus*. The optimized parameters identified in this study provide a basis for further statistical optimization and support the potential application of fungal lipase in industrial and environmental bioprocesses.

Keywords*:* *Aspergillus flavus*; submerged fermentation; one-factor-at-a-time approach; growth phase–dependent pattern; ANOVA.

****