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Cellulase production by *Aspergillus niger* using Central Composite Design statistical tool

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Abstract

In the present study, the litter soil samples were collected from the area of Kattalagar Kovil. Soil samples were collected from ten different locations in leaf litter degrading soil environment of Kattalagar Kovil (Tamilnadu, India). The soil samples were serially diluted and the potential fungal strains were isolated from the soil sample. These fungal strains were designated as F1 to F12. Among the 12 isolates, cellulase producing fungi were confirmed by Congo red method. The potential cellulase producing fungal strain was confirmed as *Aspergillus* sp. by colony morphology on Sabouraud's Dextrose agar plate and Lacto Phenol Cotton Blue Staining. The *Aspergillus* sp. was sequenced by 18S rRNA sequencing. The fungal gene sequence was submitted in NCBI with accession Number MF621961. In this study optimum parameters for cellulase production by *Aspergillus niger* using central composite design (CCD) model was analyzed. The optimal level of the key variables (pH, temperature, peptone and KCl) was used to determine the effect of their interactions on cellulase production using the statistical tool (CCD). At these optimized conditions the maximum cellulase production was found to be 0.977 IU/ml.


Keywords: Cellulase, CCD, RSM, *Aspergillus niger*, pH, temperature, peptone and KCl

INTRODUCTION

Cellulases are the inducible bioactive compounds produced by microorganisms during their growth on Cellulosic matters. Cellulases are the inducible bioactive compounds produced by microorganisms during their growth on Cellulosic matters. Cellulolytic activity is a multicomplex enzyme system and consists of three major components; endo- β -glucanase (EC 3.2.1.4), exo- β -glucanase (EC 3.2.1.91) and β -glucosidase (EC 3.2.1.21) (Shankar, 2012).



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