Statistical Optimization of the Medium Composition by Response Surface Methodology to Enhance Schizophyllan Production by Schizophyllum commune

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- Z. Naturforsch. 66 c, 173-181 (2011); received March 20/October 5, 2010

The response surface methodology (RSM) involving central composite design (CCD) was employed to optimize the fermentation medium for the cell growth and schizophllan production by *Schizophyllum commune* CGMCC 5.113 in submerged culture at pH 6.5 and 26 °C. The four variables involved in this study were glucose, yeast extract, ammonium nitrate, and magnesium sulfate. The statistical analysis of the results showed that, in the range studied, glucose and yeast extract had a highly significant effect on schizophyllan production. The optimal medium for schizophyllan production calculated from the regression model of RSM was as follows: glucose, 18 g/l; yeast extract, 0.5 g/l; NH₄NO₃, 0.48 g/l; and MgSO₄, 0.05 g/l, with a predicted maximum schizophyllan production of 11.74 g/l. These predicted values were experimentally validated. The excellent correlation between predicted and measured values justifies the validity of the response model. The results of bioreactor fermentation also show that the optimized medium enhanced schizophyllan production (12.80 g/l) by *S. commune* in a 5-1 fermenter.

Key words: Schizophyllan, Response Surface Methodology, Medium Optimization