

Medium optimization for chitinase production from *Trichoderma virens* using central composite design

Abstract

Medium development for chitinase production by *Trichoderma virens* was first carried out using conventional method of one-factor-at-a-time. The medium was further optimized using Central Composite Design in which response surface was generated later from the derived model. An experimental design of four variables including various initial pH values, chitin, ammonium sulphate, and methanol concentrations were created using Design Expert® Software, Version 6.0. The design consists of 30 experiments, which include 6 replicates at center points. The optimal value for each variable are 3.0 g/L, chitin; 0.1 g/L, ammonium sulphate; 0.4% (v/v), methanol; and initial pH, 4.0 with predicted chitinase activity of 0.1495 U/mL. These predicted parameters were tested in the laboratory and the final chitinase activity obtained was 0.1471 U/mL, which is almost reaching the predicted value. The optimal medium design showed an improvement of chitinase activity of 80.9% compared to activity obtained from the original *Absidia* medium composition.

Keyword: Chitinase; *Trichoderma virens*; Response surface methodology; Optimisation; Experimental design; Central composite design