

ABSTRACT

The present study was carried out on the production of laccase by response surface methodology (RSM) produced from *Trichoderma viride* using surface culture fermentation process and its purification was carried out during this study. The effects of several factors were checked on the production of laccase enzyme such as effect of various carbon, nitrogen sources, various concentration levels of sucrose, peptone, KH_2PO_4 , MgSO_4 , CaCl_2 , FeSO_4 and ZnSO_4 was observed on the production of laccase. The results indicated that 7g sucrose, 7g peptone, 1g KH_2PO_4 , 2g FeSO_4 , 0.5g CaCl_2 and 2g MgSO_4 mg/100 ml gave the maximum production of laccase. The maximum laccase production was observed as 1.481 ± 0.001 mg/ml/min when pH of fermentation medium was 6.0 and incubated at 30°C for 5 days with optimized culture medium. A statistical technique, response surface methodology (RSM), was applied for the identification, screening and optimization of fermentation factors to produce laccase under laboratory conditions by *Trichoderma viride*. Surface culture fermentation technique enhanced the production of laccase. In the first step Plackett-Burman Design (PBD) three process parameters and seven ingredients were used to assess the effect on broth medium. It was observed that sucrose, peptone and pH played the crucial role in enhancing the yield of laccase. In the second step, the effect of concentration levels of sucrose, peptone and pH were optimized using Box-Behnken Design (BBD) under the same fermentation conditions. The optimized concentrations of sucrose, peptone and pH were 12%, 14% and 7 respectively, which significantly improved the yield of laccase.