

ABSTRACT

The present study is concerned with biosynthesis of Endo -1, 4- β -glucanase by locally isolated strain of *Trichoderma viride* in submerged fermentation using shake flask. Cultural conditions were optimized for enhanced production of endoglucanase. Different fermentation media were examined and it was found that Mandel and Reese (1960) medium composed of 1.4g $(\text{NH}_4)_2\text{SO}_4$, 2.0g KH_2PO_4 , 0.3g urea, 0.3g $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$, 0.0014g $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$, 0.005g $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$, 0.0016g MnSO_4 , 0.002g CoCl_2 , 0.002g CaCl_2 , 2.0ml Tween-80 and 1.0g polypeptone with wheat bran (1%) as carbon source gave better production of enzyme. Effect of incubation temp, pH, inoculum and fermentation time on endoglucanase production was also carried out. Optimal endoglucanase activity (2.25 U/ml/min) was achieved with 4% spore inoculum after 72 h of inoculation at 30°C and initial pH 5.5. Enzyme produced was further characterized in terms of kinetic and thermodynamic parameters. K_m and V_{max} were determined using various transformations of Michaelis-Menten equation i.e., Lineweaver-Burk plot, Eadie-Hofstee plot and Hanes-Wolff plot. It was found that Lineweaver- Burk plot gave more accurate K_m and V_{max} values of 0.46% and 2.20 U/ml/min respectively. The energy of activation E_a , enthalpy (ΔH) and entropy (ΔS) of activation were calculated using Arrhenius equation and found to be $E_a = 53.56$ KJ/mol, $\Delta H = 51.29$ KJ/mol, $\Delta S = -9.68$ J/mol/K respectively. Endo-1, 4- β -glucanase produced was most active at 50°C and pH 5.0 after reaction time of 30 min.