

Purification of α -Amylase from Thermophilic *Bacillus licheniformis* and its Application in the Production of Ethanol

Reena Gupta* and Kalpana Hiteshi

Department of Biotechnology, Himachal Pradesh University, India

An α -amylase from thermophile *Bacillus licheniformis* was purified by using DEAE- Cellulose column chromatography followed by Sephadex G-75 column chromatography. Native and SDS-PAGE analyses showed a single band for the purified enzyme, with an apparent molecular weight of 33 kDa. This showed that the enzyme was purified to homogeneity, was a monomer and had no subunits. The α -amylase immobilized on Whatman™ filter paper showed maximum activity at 55°C of incubation temperature, 10 min of incubation time and pH 8.5 of 0.1M Tris-HCl buffer. The immobilized enzyme gave maximum activity with 0.175% (w/v) of substrate (starch) concentration and showed K_m and V_{max} value of 0.74 mM and 6.39 $\mu\text{mol/g/min}$ respectively. Immobilized enzyme retained almost 50.25% of its original activity after 9th cycle of reusability. During storage, immobilized enzyme retained relative activity of 90.87% and 56.28% upto 10 and 40 days respectively. The immobilized enzyme produced maximum amount of reducing sugar from maize stalk juice extract when incubated at 55°C of temperature at pH 8.5 and for 20 min of incubation. It was observed that there was a 50-fold increase in production of ethanol from extract of maize stalk treated with immobilized α -amylase (27.33%) as compared to the untreated sample (18.92%).

Biography:

Reena Gupta is presently working as Professor in the Department of Biotechnology, Himachal Pradesh University, Shimla. Her area of specialization is Biochemistry, Immunology and Enzyme Technology. She had completed B.Sc. (Hons.) and M.Sc. (Hons.) in Biochemistry from Panjab University, Chandigarh in the year 1985 and 1987 respectively. She did her Ph.D. in 1992 from Panjab University, Chandigarh and Post Doctorate from May 1993 to Oct. 1995 from IMTECH (Institute of Microbial Technology), Chandigarh. She has 22 years of teaching and 29 years of research experience. She completed four Research Projects funded by UGC, New Delhi and one Project funded by DEST, Shimla. Her total number of publications in peer reviewed Journals of international repute are 87 (National and International). She is a Member of five National Professional Bodies.