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Production, purification, and characterization of raw starch hydrolyzing thermostable acidic α-amylase from hot springs, India

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Alpha-amylase is an important hydrolytic enzyme used for various industrial processes. In the present study, a *Geobacillus bacterium* (K1C), producing a thermostable α-amylase was isolated from Manikaran hot springs, India. The purification and characterization of α-amylase were performed to explore its industrially desired properties. The optimum temperature and pH for α-amylase activity was 80°C and pH 6.0 respectively. The far-UV CD spectra when recorded revealed the presence of random coil conformation and showed an intermediate phase during temperature-induced unfolding. In the presence of substrate, the thermostability of the α-amylase was increased as 50% initial activity was retained at 70°C for 6 h and at 80°C for 2 h. Besides, the enzyme also showed remarkable pH stability as 90% of the initial activity was retained even after 48 h of incubation at pH 5.0, 6.0 and 7.0. Interestingly, amylase activity of the purified enzyme was Ca^{2+} ion independent, whereas the complete inhibition of activity was observed in the presence of Cu^{2+}, Pb^{2+}, and Hg^{2+}. The purified α-amylase was stable in the presence of detergents, organic solvents, and proteinase K. Moreover, the enzyme exhibited its ability to hydrolyze raw starches (e.g. rice, wheat, corn, potato) efficiently; thus suggesting its potential to be used for industrial applications.

Biography

Sarabjeet Kaur Sudan has completed her MSc from Shri Mata Vaishno Devi University, Katra. She has been selected for President Medal for her excellent academic performance during MSc Presently; she is pursuing PhD from Institute of Microbial Technology Chandigarh, India. She has published five research paper in esteemed journals and is also the member of ASM. She has her expertise in the exploration of the hydrolytic enzyme from microbes using cultivation-dependent and independent methodologies. She is passionate to use these enzymes for industrial applications.

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