

Biochemical studies on thermostable superoxide dismutase isolated from *Juglans regia*: A functional enzyme

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Functional enzyme like Superoxide Dismutase (SOD: 1.15.1.1), has wide applications in the industry of pharmaceuticals, cosmetics, food and/or biotechnology. SOD is a primary antioxidant enzyme catalyzing the dismutation of superoxide free radical ($O_2^{\cdot-}$) (a disease causing agent). An important requirement for SODs intended for industrial applications is their thermal stability as thermal denaturation is a common cause of enzyme inactivation. In the present study, SOD has been isolated and characterized from *Juglans regia* (Walnut) kernels. The SOD enzyme obtained has been partially purified into two fractions based on 0-40% and 40-80% saturation level of ammonium sulphate; 0-40% fraction (72.46 Units/mg) having higher specific activity. The temperature optima of the partially purified SOD lied between 35°C to 40°C with thermo stability up to 70°C whereas the optimum value for pH being 5.0 with stability range of 4.0-7.0. All the tested detergents viz; Sodium Lauryl Sulphate (SLS), Cween-20 and Tween-80 and Tween-20 were found to inhibit the activity of enzyme, Cween-20 being most effective. Mg^{2+} and Ba^{2+} ions in the form of their respective salts, acted as potential inhibitors with about 50% reduction in enzyme activity. The results obtained herein indicate that *J. regia* (Walnut) kernel constitute an excellent source of SOD enzyme, which is an effective natural dietary antioxidant. It can be inferred from the present study that *J. regia*, a functional food, is a promising source of natural antioxidant (SOD) enzyme with potential application in oxidative stress-related diseases. The thermostability of the enzyme further enhances its importance making it industry friendly with high economical feasibility.

Biography

Nidhee Chaudhary is Professor at Amity Institute of Biotechnology, Amity University (AUUP), Noida, India. She has been in academia for over 15 years at various positions. She has more than 15 years of research experience with main interest in industrially and therapeutically important enzymes. She has supervised several Ph. D. (theses), M. Phil., M. Sc., M. Tech. and B. Tech. dissertations in the field of Enzymology and Bioprocess Technology. She has many international and national publications in journals of repute. She is member of various scientific groups like: Society of Biological Chemists, Society of Agricultural Biochemists, American Society of Microbiology. She has served as reviewer for several reputed Journals published by Elsevier and other well established groups.

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