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Purification, Biochemical Characterization of β-Galactosidase from *Lens culinaris* and its Application in Food Industry

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ABSTRACT: Lactose is the naturally occurring ingredient present in milk ,which play major role in, food industry to improve sweetness, solubility, flavor and digestibility of dairy products, approximately 70% of African, American are lactose sensitive, they are unable to digest the lactose derived products , which lead to several health problem. β-Galactosidase is only the enzyme which hydrolysis the lactose into glucose and galactose. By utilizing the transgalactosylation properties of β-Galactosidase it can be used in the production of Galacto-oligosaccharide. β-Galactosidase purification steps were carried out by different precipitation and different chromatography techniques like HIC, gel filtration followed by affinity chromatography. All the experiment were performed at 4°C. β-Galactosidase was purified to homogeneity of 1657.84 fold purification with the specific activity of with the help of different procedure like acid precipitation, ammonium fractionation, hydrophobic interaction chromatography, gel filtration chromatography. The Km and Vmax of purified β- Galactosidase was found to be 5.26Mm & 90.90 µ/moles/min. The optimum pH and optimum temperature was found to be around 3.0 & 58°C respectively. The molecular mass of purified enzyme was determined by gel filteration on FPLC eluting single peak of approximately 78 KDa and on SDSPAGE it shows heterodimeric two band of 48 KDa and 30 KDa respectively. Purified β-Galactosidase after immobilization can be use for hydrolysis of lactose containing products like milk, food industry, pharmaceuticals etc. it can be use for synthesis of galactooligosaccharide (GOS) and it use as a prebiotics, which could be very beneficial for lactose intolerant people. A prototype of biosensor can be prepared with the help of immobilized β-Galactosidase.

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