Isomaltooligosaccharides synthesis as prebiotics using dextranase from a novel strain of *Bacillus licheniformis* KIBGE IB25

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Commercially important biopolymer, dextran, is enzymatically degraded into lower molecular weight fractions of vast industrial potential. Among the hydrolytic products of dextran, isomaltooligosaccharides predominantly have prebiotic effect in humans and reduces the cariogenic effect of sucrose in oral cavity. Non-digestibility of these saccharides beneficially affect the host by improving intestinal microbial balance in the human colon and promotes the growth of *Bifidobacteria* in large intestine. Current research study focused on purification and analysis of kinetic parameters of dextranase from a newly isolated strain of *Bacillus licheniformis* KIBGE-IB25 for the synthesis of isomaltooligosaccharides. Dextranase was purified up to 35.75 folds with specific activity of 1405 U/mg and molecular weight of 158 kDa using ammonium sulphate precipitation, ultrafiltration and Sepharose CL6B column chromatography. Analysis of important kinetic parameters revealed that dextranase performs optimum cleavage of low molecular weight dextran (5000 Da, 0.5%) at 35ºC in 15 min at pH 4.5 with a K_m and V_{max} of 0.3738 mg/ml and 182.0 µmol/min, respectively. Thermal stability profiling of dextranase showed that it retained 80% activity up to 6 hours at 30-35ºC and remains 90% active at pH 4.5. Rapid cleavage of substrate at mild operational conditions makes it an ideal candidate for dextran removal in sugar processing industry and for commercial production of isomaltooligosaccharides.

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