

Isolation, Purification and Characterisation of Non-Digestible Oligosaccharides Derived from Extracellular Polysaccharide of Antarctic Fungus *Thelebolus* Sp. IITKGP-BT12

Authors : Abinaya Balasubramanian, Satyabrata Ghosh, Satyahari Dey

Abstract : Non-Digestible Oligosaccharides(NDOs) are low molecular weight carbohydrates with degree of polymerization (DP) 3-20, that are delivered intact to the large intestine. NDOs are gaining attention as effective prebiotic molecules that facilitate prevention and treatment of several chronic diseases. Recently, NDOs are being obtained by cleaving complex polysaccharides as it results in high yield and also as the former tend to display greater bioactivity. *Thelebolus* sp. IITKGP BT-12, a recently identified psychrophilic, Ascomycetes fungus has been reported to produce a bioactive extracellular polysaccharide(EPS). The EPS has been proved to possess strong prebiotic activity and anti-proliferative effects. The current study is an attempt to identify and optimise the most suitable method for hydrolysis of the above mentioned novel EPS into NDOs, and further purify and characterise the same. Among physical, chemical and enzymatic methods, enzymatic hydrolysis was identified as the best method and the optimum hydrolysis conditions obtained using response surface methodology were: reaction time of 24h, β -(1,3) endo-glucanase concentration of 0.53U and substrate concentration of 10 mg/ml. The NDOs were purified using gel filtration chromatography and their molecular weights were determined using MALDI-TOF. The major fraction was found to have a DP of 7,8. The monomeric units of the NDOs were confirmed to be glucose using TLC and GCMS-MS analysis. The obtained oligosaccharides proved to be non-digestible when subjected to gastric acidity, salivary and pancreatic amylases and hence could serve as efficient prebiotics.

Keywords : characterisation, enzymatic hydrolysis, non-digestible oligosaccharides, response surface methodology

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