

Studies on Structural and Physical Characteristics of a Novel Exopolysaccharide from *Bacillus Cereus* Strain xx2010

Devendra Singh, Manjunatha B.S., Geeta singh*

*Division of microbiology, Indian Agricultural Research Institute
New Delhi – 110012*

ABSTRACT

Exopolysaccharide (EPS) producing osmotolerant bacteria was isolated from *wheat rhizosphere soil* and on the basis of morphology, biochemical and molecular characterization it was identified as *Bacillus cereus* strain xx2010. In shake flask incubation for 72 h at 30 °C, the quantity of EPS produced by the isolate was 2.8 g/L in modified MRS broth and 3.4 g/L in EPS medium (a newly formulated simplified synthetic medium). The EPS was non-gelling and non-film forming. It was completely soluble in water and 1N sodium hydroxide solution. The purified EPS contained 80% of total carbohydrates, 10.2% of reducing sugars, 2.5% of moisture and 0.6% of proteins.

The EPS consisted mainly of glucose (81%) with minor quantities of rhamnose, arabinose (1.8% each), galactose, glucuronic acid, mannose and sucrose. FTIR analysis of the EPS of the culture revealed qualitative differences in chemical composition. EPS displayed a strong absorption band of –OH at 3418.0 cm⁻¹ and COOH at 1631.48 cm⁻¹ showing it to be polysaccharide. EPS produced by the osmotolerant bacteria was found to be heteropolymer-containing different functional groups. The presence of alkanes, alcoholic, secondary amines, sulphonates, ether and nitro group in EPS samples indicated the occurrence of carbohydrates, proteins and their derivatives as the major chemical constituents. The GC analysis of *Bacillus cereus* strain xx2010 EPS revealed that it was glucogalactan, D-Galactopyranose, alpha-D-Mannopyranose, alpha-D-Glucopyranose in nature. Intrinsic viscosity of the polymers was 1.14 mL mg⁻¹.

References:

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