Cost-Effective Production, Optimization and Functional Properties of Exopolysaccharides (EPSS) from Haloalkaliphilic Bacteria Isolated from Saline Desert of Kutch, Gujarat

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ABSTRACT

This report elucidates cultivation dependent diversity and exopolysaccharide synthesis potential of the haloalkaliphilic bacteria isolated from saline desert soil of Little Rann of Kutch, India. EPSs are sustainable biological entity that is biocompatible, non-toxic and biodegradable. Due to multifunctional properties, Exopolysaccharides (EPS) are widely used across various fields, including food, pharmaceuticals, medicine, environmental management, agriculture, and cosmetics. However, very few studies are available on halophilic EPSs. In present study, total of 134 unique morphotypes were isolated using five different media to maximize diversity. Of these, 32 isolates were selected based on morphological differences, and EPS production was screened using the Congo red agar method and string test. The EPS production from isolate HM07 was optimized using one factor at a time (OVAT) approach for different nutrient sources and culture parameters. The highest EPS production was achieved with 5% inoculum size, 5% sucrose, at pH 8 after 96 hours of incubation. Cost-effective production was achieved using agro-waste and kitchen waste as raw substrates. Additionally, functional properties of EPS were studied for its potential use in food and environmental applications. The exploration of EPSs from halophilic bacteria in the Little Rann of Kutch could lead to the discovery of novel taxa and unique exopolysaccharides.

Keywords: Halophiles, Exopolysaccharides, Saline desert, Optimization, Cost-effective production, Functional properties

How to Cite

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