

Purification, Characterization, Optimization and Evaluation of Potential Bioactivity of Exopolysaccharides of *Curvularia lunata* †

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Abstract: Exopolysaccharides (EPS) are high-molecular-weight polysaccharides secreted by microorganisms; these polysaccharides have incredible applications in pharmaceutical industries. These are homopolymers or heteropolymers with a wide diversity of structures, capable of modifying the sensory properties of foods. Exopolysaccharides (EPSs) are recognized as high-value biomacromolecules for the last two decades. Exopolysaccharides (EPS) are carbohydrate polymers present on the surface of many bacteria. These products, including pullulan, scleroglucan, and botryosphaeran, have several applications in industries, pharmaceuticals, medicine, foods etc. Although EPSs are highly relevant, to date, information concerning their biosynthesis is scarce, and an extensive search for new fungal species that can produce novel EPSs is still needed. In most cases, the molecular weight variations and sugar compositions of EPSs are dependent on culture medium composition and different physical conditions provided during fermentation. In this study, the selection of nutrients for the EPS production from *Curvularia lunata* under submerged batch-culture conditions was made using the Plackett - Burman design matrix method. Subsequently, the optimal condition was determined using Response Surface Methodology (RSM). Thus, produced EPS was characterized by using thermogravimetric analysis (TGA). The identification of components at the molecular level was made using the GC-MS analysis. It showed the presence of glucose and mannitol and good thermal stability. Their functional groups were determined using the FTIR analysis. It was further studied for its anti-cancer properties, antioxidant and antimicrobial activities. Based on the studies done, it was evident that EPS was found to be with good antimicrobial, antioxidant activity, and anti-cancer activity effective against HeLa cells.

Keywords: Exopolysaccharides; Response Surface Methodology; thermogravimetric analysis; GC-MS; anti-cancer properties; antimicrobial activities.

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Conflicts of Interest

The authors declare no conflict of interest.