

# ASSESS THE POTENTIAL OF BIOMASS PRODUCTION AND EXOPOLYSACCHARIDES BY A ANTARCTIC FUNGUS USING DIFFERENT ALTERNATIVE MEANS OF CULTURE

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## Abstract

Exopolysaccharides (EPSs) are extracellular polysaccharides may be produced by some fungi and bacteria. They are produced during the stationary phase of microbial growth, and are considered secondary metabolites. The EPSs produced by microorganisms are used in industrial activities in the food branch, medical and cosmetics. In food processing are used to impart texture characteristics such as body, viscosity and consistency. Its production by fungi enables the use of submerged culture, providing a potential increase in biomass production, and enable the use of regional raw materials and industrial byproducts. This study aimed to evaluate the EPSs production using a fungus isolated from antarctic soil of the Brazilian Antarctic Station Comandante Ferraz (temporary named FA4), subjecting it to different alternative culture media using industrial byproducts. It were tested five combination of alternative culture media using alternative compounds: whey, crude glycerin derived from biodiesel production, refined glycerin derived from biodiesel production and tailing brewer's yeast. As reference (positive control) it was used a medium composed of standard analytical reagents: 3,0g NaNO<sub>3</sub>; 1,0g KH<sub>2</sub>PO<sub>4</sub>; 0,5g MgSO<sub>4</sub>.7H<sub>2</sub>O; 0,5g KCl; 1,0g yeast extract; 30,0g glucose; 1L deionized water, pH 7. For the definition of alternative culture media the glucose and yeast extract were replaced by the cited alternative compounds. In the experiments, the fungus FA4 grew in Erlenmeyer flasks containing 50mL of culture media during 25 days at 15°C manual orbital shaking three times a day. The content of the flasks was centrifuged at 4000rpm during 30min. for cell removing. For the EPS extraction the supernatant was added in four parts ethanol and the clotted EPS was removed and dried in frost-free freezer before being weighed. All assays were performed in triplicate. The results showed that the most promising alternative culture media for the production of EPS by fungus FA4 was the one who combine whey and tailing brewer's yeast (3,0g NaNO<sub>3</sub>; 1,0g KH<sub>2</sub>PO<sub>4</sub>; 0,5g MgSO<sub>4</sub>.7H<sub>2</sub>O; 0,5g KCl; 1,0g tailing brewer's yeast; 625mL whey; 375mL deionized water; pH 7.), considering that it has achieved the highest yields, not differing from the reference culture medium, besides representing the possibility of using by-products that can be purchased at low cost, making them of great interest to use as primary sources of carbon and nitrogen for the production of fungal EPSs.

Keywords: *fungi, antarctic soil, exopolyssacharide, culture media*

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