INTENSIFICATION OF MICROBIAL EXOPOLYSACCHARIDE ETHAPOLAN BIOSYNTHESIS ON MIXTURE OF MOLASSES AND SUNFLOWER OIL

T. P. Pirog A. A. Voronenko, M. O. Ivakhniuk
The purpose of the research was to establish Acinetobacter sp. IMB B-7005 cultivation conditions, which provide the maximal synthesis of microbial exopolysaccharide ethapolan on a mixture of molasses and sunflower oil, and to explore the possibility of replacing refined oil in a mixture with molasses for waste one. On the basis of theoretical calculations of energy consumption for the synthesis of ethapolan and biomass, it was determined that the optimal molar ratio of the concentrations of energy-deficient (sucrose) and energy-excessive (sunflower oil) substrates in the mixture was 1.0:0.9. Experiments have shown that the highest values of exopolysaccharide synthesis were observed at a molar ratio of monosubstrates in mixture 1.0:1.1, which is as close as possible to the theoretically calculated one. It was shown that increasing concentration of molasses and refined oil in mixture from 1.0 to 1.5% was accompanied by increase in amount of synthesized exopolysaccharide and its synthesizing capacity by 1.2 and 1.3 times, respectively. The possibility of replacing refined oil in a mixture with molasses for various types of waste (after frying potatoes, meat, vegetables and mixed) was established. The maximum parameters of exopolysaccharide synthesis (concentration 14 g/l, synthesizing capacity 3.5 g exopolysaccharide/g biomass) were observed when using mixed waste oil for both inoculum obtaining and EPS biosynthesis. The obtained results testify to the possibility of development of universal technology for obtaining microbial exopolysaccharide ethapolan on a mixture of waste (molasses and waste oil) independent of the type and provider of waste oil.

**Key words:** microbial exopolysaccharides, synthesis intensification, mixture of substrates.


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