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Influence of the method of disintegration of biomass of microalga *Chlorella sorokiniana* on the production of lipid fraction

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Abstract

This article discusses the effect of the disintegration of the cell wall of the microalgae Chlorella sorokiniana on the output of the lipid fraction. The biomass of the microalgae Chlorella sorokiniana was grown under laboratory conditions in special photobioreactors at a temperature of 25 °C, with a constant aeration of a mixture of carbon dioxide and air at a rate of 1.5 liters/min, illumination 2200-2800 Lx. Nutrient medium for cultivation contained macro – and micronutrients for high-speed growth of microalgae. Selection of optimal cultivation parameters allows obtaining biomass with desired properties.

Disintegration was carried out with the homogenization of biomass and under the influence of microwave radiation. Extraction of lipids was carried out on a semi-automatic extractor according to the Randall method, using organic solvents. The output of the lipid fraction without treatment was 10.18% after the destruction of the cell wall 14.45% with the homogenization of biomass and 13.85% under the influence of microwave radiation. A qualitative analysis of the lipid fraction, carried out under gas chromatography, obtained under various conditions showed that there was no significant difference in composition from the disintegration method. Lipid fractions (more than 50%) in both cases consist mainly of unsaturated fatty acids, of which irreplaceable unsaturated fatty acids constitute more than 18% for both samples.

The residual biomass formed after the extraction of the lipid fraction can be used as fertilizer in the plant, for the manufacture of sorption materials for the purification of industrial water and as a biofuel. The purpose of this study was to study the effect of cell wall disintegration on the output of the lipid fraction and qualitative composition.

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