

The effect of lipid extraction methods on the fatty acid composition in *Nannochloropsis oculata*

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Abstract

Among the aquatic organisms, microalgae form the food chain of aquatic ecosystems. *Nannochloropsis* strains are sources of oils and fatty acids in various industries. During the winter of 2020, the effects of four different methods of microalgae sedimentation from the suspension culture medium and lipid extraction, including precipitation with ferric chloride (III) solution and hot extraction with a Soxhlet apparatus in chloroform-methanol solvent (2: 1) (A) as well as Extraction with a similar solvent under cold conditions (B), and also centrifugation for two minutes at 8000rpm and lipid extraction by Soxhlet (D), and extraction with similar solvent under cold conditions (C) were investigated on lipids composition of *Nannochloropsis oculata*. Gas chromatography (GC) analysis identified 11 identifiable fatty acids, of which 7 were saturated fatty acids and 4 were unsaturated fatty acids. The highest amount of lipids (73.01%) and saturated fatty acids (32.61%) were obtained using the sedimentation method with ferric chloride (III) (0.3 M) and extraction by Soxhlet with chloroform-methanol solvent method (B). The most suitable method for separating unsaturated fatty acids (29.63%) is due to the centrifugation approach and lipid extraction by the Soxhlet method with chloroform-methanol solvent (2: 1) (D). It is worth further investigation, but according to the results of this study, the use of optimized methods in the cultivation and processing industry of microalgae will enable productivity to be increased in the production of oils and fatty acids.

Keywords: *Nannochloropsis oculata*, Lipid, Fatty acid, Precipitation, Cold extraction.