Lipid production from *Nannochloropsis sp.* grown in palm oil mill effluent

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Abstract. Palm oil mill effluent (POME) used as a medium to culture marine algae *Nannochloropsis sp*. with the aim of producing the highest possible biomass, in turn the highest amount of lipid. The lipid is proposed to be transesterified into methyl esters, then the fatty acids composition was determined. Optimization on the influences of nutrients on the biomass produced was carried out. The experimental nutrients were the amounts of nitrate, phosphate and silicate. At 25±2 ºC, the lipid content in the biomass harvested at the end of a 14-day batch culture quantified under the following optimized values: nitrate concentration of 1.5 mg L^{-1}, phosphate concentration of 7.0 mg L^{-1}, and silicate concentration of 10.0 mg L^{-1}. The highest dry mass concentration of 520 mg L^{-1} obtained on day 14 and the lipid content that extracted from the biomass was 612±11 mg g^{-1} dry weight. The maximum productivities of the biomass and the lipids were 37.1±4.7 mg L^{-1} d^{-1} and 22.7±0.5 mg L^{-1} d^{-1}, respectively.

Keywords: *Nannochloropsis sp*.; microalgae; lipids; industrial wastewater; palm oil mill effluent

Introduction

Owing to the capability to secrete a high amount of lipid and the ability to produce a long-chain polyunsaturated fatty acids, species of *Nannochloropsis* have been sought-after by many researchers. One of the aims of optimization work on microalgae is to obtain the highest possible lipid. *Nannochloropsis*, a microalga with high lipid content with a fast growth rate and able to grow in moderate conditions [8:14]. In addition, *Nannochloropsis* is being permitted for food-based purposes by the US Food and Drug Administration and the European Novel Food Regulation. In addition to the several benefits of this species [15], the fact that the *Nannochloropsis sp*. is competent in producing higher lipid (Table 1), made *Nannochloropsis sp*. as one of the suitable candidates for biofuel applications [12].

Open, Available from: https://www.intechopen.com/books/palm-oil/palm oil-mill-effluent-as-an-environmental-pollutant
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