

Optimization of sub-critical water extraction (SWE) of lipid and eicosapentaenoic acid (EPA) from *Nannochloropsis gaditana*

ABSTRACT

Microalgae are a promising source of omega-3. The purpose of this study was to extract lipid with a relatively high content of eicosapentaenoic acid (EPA) from *Nannochloropsis gaditana* using subcritical water extraction (SWE). The effects of different temperatures (156.1-273.9°C), extraction times (6.6-23.4 minutes), and biomass loadings (33-117 g algae/L) on the extraction yield were studied. From the optimization study using central composite design (CCD), quadratic models generated for lipid yield and EPA composition were considered to be significant models ($p < 0.05$). The predictive equations were also formed for lipid yield and EPA composition. The predicted optimum lipid yield and EPA composition at 236.54°C, 13.95 minutes, and 60.50 g algae/L were 18.278 wt% of total biomass and 14.036 wt% of total fatty acid methyl ester (FAME), respectively.