Abstract

The production of biomass by microalgae is considered a clean alternative compared to other plant crops that require large areas for cultivation and that generate environmental impacts. This study evaluated the influence of temperature and nutrients on lipid contents of cultured species of freshwater microalgae, with a view toward using these lipids for biodiesel production. Two strains of Monoraphidium contortum, a culture containing Chlorella vulgaris and Desmodesmus quadricauda and another strain of Microcystis aeruginosa were maintained in the laboratory for six days, in five culture media: modified ASM-1 (control, with high concentrations of phosphate and nitrate; phosphorus-deficient; non-limiting phosphate; nitrogen-deficient; and non-limiting nitrate). The cultures were then exposed to temperatures of 13°C, 25°C (control) and 37°C for eight days (n=3). Lipids were extracted by the cold-solvent (methanol and chloroform) method. On average, the highest total lipid yields were observed when the strains were maintained at 13°C and in the non-limiting nitrate medium. The lipid percentage varied depending on the concentration of algal biomass. This study showed that manipulation of controlling factors can increase the lipid concentration, optimizing the total production in order to use this raw material for biodiesel.

Keywords

Energy biomass, Monoraphidium, Chlorella, Desmodesmus, Microcystis, lipid accumulation