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OPTIMIZING A SOLVENT SYSTEM FOR LIPID EXTRACTION FROM CYANOBACTERIA

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Due to higher photosynthetic efficiency, higher biomass production, rapid lipid accumulation and faster growth than other conventional crop products, cyanobacterial lipids have great potential for the production of carbon neutral biodiesel. Biodiesel gives less harmful emissions than conventional diesel and hence the use of biofuel is a shift toward "sustainable energy". This study was carried out to optimize a solvent system to extract lipids from cyanobacteria.

Many solvent systems, namely, n-hexane, chloroform: methanol (2:1), n-hexane: ethanol (3:2), chloroform: n-hexane (1:1), dichloromethane: methanol (1:1), n-hexane: isopropanol (1:1) and diethyl ether systems were used to extract lipids from cyanobacteria. The extracted lipid yields (g/1 g of dried biomass) of solvent systems were 1.11, 1.61, 1.71, 2.15, 3.41, 4.33 and 1.95 wt.%, respectively. Fatty acid methyl ester (FAME) compositions were 81.32, 78.27, 76.39, 29.01, 85.72, 92.39 and 80.09%, respectively for each solvent system. The GC-MS analysis revealed that the most abundant fatty acid types of *Microcystis* were palmitic acid (C16:0) and its derivatives (14-methyl pentadecanoic acid) which are more suitable for a quality biodiesel product. About 4.33 wt.% of lipids and 92.39% FAME composition were obtained from the n-hexane/isopropanol solvent system. Thus, this preliminary study indicates the potential use of cyanobacteria for biodiesel production and the optimized, n-hexane: isopropanol (1:1) solvent system found to be the most efficient when compared to the other solvent systems employed in the present study.

Keywords: Cyanobacterial bloom, lipid extraction solvent systems, fatty acid methyl esters

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