Glycerolipid Analysis of Adaptation to Saline Changes in the Culture Conditions of Algae, Scenedesmus dimorphus, by GC-MS

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**Abstract**

Since fossil fuels are decreasing over time an alternative energy source will be soon required. The algae, *Scenedesmus dimorphus*, grows in freshwater and is known for its fast growth of glycerolipid content which is used for biodiesel production. After the algae is grown in optimal conditions, the released fatty acids and glycerolipids are transformed into fatty acid methyl esters (FAMEs) which are used as biodiesel.

The FAMEs were quantitatively determined by gas chromatography mass spectrometry (GC-MS) to determine the total glycerolipid content in the different algae samples. The samples that were analyzed include freshwater controls and saline adapted samples. Analysis also included using a calibration curve with calibrators ranging from 0.500 to 1,000 µM. In the calibration curve and algae samples, a heavy isotope internal standard of C16:0-d-2 was used to determine the accuracy of the results. Results: total percent glycerolipid content in each sample ranged from 2.95-8.5%. The lower range of results could be due to the control 2-L bottle which had no CO₂ since it did not have optimal growth conditions, and the bioreactor control was low possibly due to low light intensity. However, the 1.005 TSG for the 2-L bottle was similar to the controls which proves that adaptation is successful. Also, the bioreactor control was lower than the 1.005 TSG saline sample in the bioreactor which shows that increasing the salt concentration and controlling the environment is useful for saline adaptation.