THE EFFECT OF DILUTION OF MEDIUM ON SELECTED CYANOBACTERIA DURING THEIR MASS CULTURING

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Introduction

Cyanobacteria are a group of gram-negative photosynthetic organisms. They have a highly diverse group of prokaryotic microorganisms exhibiting oxygenic photosynthesis and they are known for faster growth rates than terrestrial crops. They are considered to be one of the potential useful organisms to mankind in various ways. A number of important advances have occurred in cyanobacterial biotechnology in the recent years. Worldwide attention is drawn towards cyanobacteria for their possible uses in mariculture, food, feed, fuel, fertilizer, colourant, production of various secondary metabolites including vitamins, toxins, enzymes, pharmaceuticals, pharmacological probes and pollution abatement. Cyanobacteria require variety of nutritional elements such as N, P and some other macro and micro elements. During culturing of cyanobacteria such requirements are provided by BG 11 medium [1] and GO (BG 11-N_0) [2] medium. In the growth of cyanobacteria, those nutritions play an important role on their growing pattern, amount of biomass production, content of biomass, activation of enzymes, enzymatic reactions and biosynthesis of compounds such as vitamins. In the commercial scale culturing of cyanobacteria, the use of those chemical medium will demand high cost. Nowadays, the great challenges in cyanobacterial based industry are the increasing cost of growing media and low biomass growth. Therefore, the major limitation for growing cyanobacteria at commercial scale is the high cost of the growing medium. If we want to successfully establish a cyanobacteria mass culture unit, we have to cut down the cost of media. One method to cut down the cost is through dilution of culture media. If any cyanobacteria are able to grow well in diluted media it will be beneficial. However, reductions on the concentrations of available nutrients may change the biomass production rate and the contents of biomass. The objective of the present study is to assess the possibility of mass culturing of selected cyanobacteria in different diluted concentration of media recommended for cyanobacteria and study the performance of selected cyanobacteria during such nutritional stress conditions.

Materials and Methods

Unialgal strains of cyanobacteria

Three cyanobacterial strains (U1 - *Leptolyngbya* sp., U2 - *Phormidium* sp., and U49 - *Nostoc* sp.) were taken which were previously collected by biofuel research laboratory of the National Institute of Fundamental Studies (NIFS), Kandy, Sri Lanka.

Media preparation

To culture non nitrogen fixing cyanobacteria (U1 - *Leptolyngbya* sp. and U2 - *Phormidium* sp.), the BG 11 medium was prepared due to the method described by stainer and others [1]. To culture nitrogen fixing cyanobacteria (U49 - *Nostoc* sp.), the GO medium (BG 11-N_0) was prepared according to the method described by Ripka and others [2].