Biofixation of CO_2 from Synthetic Combustion Gas Using Cultivated Microalgae in Three-Stage Serial Tubular Photobioreactors

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Coal is the most abundant of the fossil fuels, with reserves estimated at 10^2 billions of tons. The feasibility of using coal as a fuel depends upon reducing emissions of gas when it is burnt, such as carbon dioxide (CO_2), sulfur oxides (SO_x), and nitrogen oxides (NO_x). The removal of CO_2 with microalgae may be one of the most efficient ways of reducing this gas, without the need for radical changes in the world's energy supply and production methods. *Spirulina* sp. LEB-18 and *Scenedesmus obliquus* LEB-22 were cultivated in serial tubular photobioreactors, with the aim of measuring the potential of CO_2 biofixation and the resistance of the microalgae to SO_2 and NO. *Spirulina* sp. and *S. obliquus* had CO_2 biofixation scores of 0.27 and 0.22 g L^{-1} d^{-1}, respectively. Both microalgae were resistant to SO_2 and NO, and grew during the 15 d they were cultivated, which proves that using microalgae is an efficient method of biofixation of CO_2 emitted when fossil fuels are burnt.

Key words: Carbon Dioxide, Microalgae, Photobioreactor