

Abstract

An integrated system of solar light, artificial light and organic carbon supply was developed for cyclic photoautotrophic-heterotrophic cultivation of photosynthetic cells. The energy source for the culture is automatically switched to solar light energy (when the weather is sunny), to artificial light energy (during the cloudy period of the day) or to organic carbon source (at night). Thus minimum amount of artificial light is used while ensuring continuous light supply to the culture during the photoautotrophic phase. The -tocopherol productivity by *Euglena gracilis* in this system was more than 5 times higher than the value obtained in pure photoautotrophic culture under the same experimental conditions.

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