

## Abstract

Methods of regulating the ratio of photoautotrophic to heterotrophic growth rates in photoheterotrophic culture of *Euglena gracilis* were investigated. In normal photoheterotrophic culture (in the presence of excess organic carbon), the cells grew mainly by organic carbon assimilation (heterotrophic metabolism). The relative contribution of photoautotrophic metabolism increased with the increase in the light supply coefficient, the increase in the CO<sub>2</sub> concentration in the aeration gas and the decrease in the feed rate of organic carbon source. However, limiting the organic carbon supply was the most effective method of shifting the metabolic balance to the photoautotrophic side. In the presence of excess organic carbon source, the  $\alpha$ -tocopherol contents of the cells in photoheterotrophic culture were low even when the light supply coefficient and CO<sub>2</sub> concentration in the aeration gas were high. By limiting the organic carbon supply to the photoheterotrophic culture, the intracellular content of  $\alpha$ -tocopherol increased to the same level as those obtained in photoautotrophic cultures.

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