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LIGHT INTENSITIES MAXIMIZING PHOTOSYNTHESIS AND KINETICS OF PHOTOCHEMICAL STEPS IN *Graesiella emersonii* UNDER DIFFERENT CULTIVATION STRATEGIES

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Abstract

The aim of this paper is studying light intensity values which maximize the photosynthesis in microalgal cultures by means of models of the photochemical process and by changing cultures strategies. The photosynthetic performances of *Graesiella emersonii* under batch, fed-batch, semi-continuous cultivation modes and with only air sparged or CO_2 added to air were quantified by means of gas exchange measure and pulse amplitude modulated fluorimetry (PAM); kinetics of the photochemical processes was determined processing data from PAM and using the well-known Eilers and Peeters model. Both PAM, via the kinetic model, and gas exchange techniques allowed to identify similar light intensities maximizing the photosynthesis rate at least when CO_2 was added to air. When CO_2 wasn't added some discrepancies appeared between the two methods used. These discrepancies seem to suggest that, in suffering conditions and in presence of some cumulative effects, the kinetic model used could be less accurate and perhaps need some adjustments.

Key words: microalgae, photobioreactor, photosynthesis, pulse amplitude modulated fluorimetry, *Graesiella emersonii*

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