**Modelling of the growth of *Nannochloropsis gaditana* in different reactor geometries, experimental kinetic parameters from batch cultures and biochemical analysis of the obtained biomass.**

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Microalgae are unicellular and photosynthetic microorganisms that grow using inorganic salts, CO2 and light, and are applied in numerous industrial sectors due to their variety and properties. Due to the lack of information on how microalgae respond to external inputs and to the different environments in which they grow, today the industrial application is not exploited as it should.

It is therefore necessary to create models that allow to predict microalgal growth in different photobioreactors to improve our knowledge, still poorly investigated.

In this work the Monod equation for the specific growth rate was combined with the Lambert-Beer law for the non-homogeneous light distribution in a flat photobioreactor.

Model kinetic parameters related to the cultivation of the microalga *Nannochloropsis gaditana* were obtained from batch cultivations under different photon-flux densities inside a quasi isoactinic photobioreactor. These parameters were applied in a mathematical model, based on the geometric system considered, for obtaining microalgae growth curves.

Biochemical analyses on the obtained biomass were also executed at the end of each batch cultivation to assess how light distribution influences biomass composition.

The obtained model allowed to successfully predict the growth of the microalga *Nannochloropsis gaditana* in the different photobioreactor geometries.