

## SCREENING OF KEY ABIOTIC FACTORS FOR BIOMASS PRODUCTION OF PAVLOVA GYRANS

### Agricultural, Marine and Food Biotechnology

#### PO - (595) - SCREENING OF KEY ABIOTIC FACTORS FOR BIOMASS PRODUCTION OF PAVLOVA GYRANS

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#### Body

Microalgae biomass is an important source of bioactive compounds with commercial interest (*e.g.*, polyunsaturated fatty acids, proteins, pigments) for several industrial sectors such as cosmetics, pharmaceutical, food, and feed. Known for their plasticity and high growth rates under different environments, a precise control of microalgae cultivation is of the utmost importance to maximize biomass productivity and its biochemical composition, reducing, at the same time, the production costs involved. Nutritional conditions and abiotic parameters (*e.g.*, temperature, light) are well-documented in bibliography as the main responsible factors for significant variations in microalgae biomass productivities and bioactive compounds' profile.

The aim of this study was to evaluate the main culture variables impacting the biomass growth of marine microalga *Pavlova gyrans*, an interesting species commonly used as feed in aquaculture due to its biochemical profile, which presents high concentrations of polyunsaturated fatty acids (*e.g.*, eicosapentaenoic acid (EPA), docosahexaenoic acid (DHA)) and several valuable phytosterols and pigments (*e.g.*, carotenoids). The study was carried out by the application of a Plackett-Burman design (PB) as a screening tool to identify the physicochemical factors that favour biomass productivities ( $p$ -value<0.1).

Using PB, it was possible to assess the impact of 17 independent variables in the biomass productivity, namely the concentration of each nutrient of the growth medium (13 in total), as well as the salinity, airflow, inoculum size, and light intensity. Biomass productivity ranged from 72 to 256 mg<sub>ash-free dry weight</sub> (AFDW).L<sup>-1</sup>.d<sup>-1</sup>, while the maximum biomass produced ranged from 0.8 to 2.2 g AFDW.L<sup>-1</sup>.Light intensity ( $p$ -value<0.001) and NaNO<sub>3</sub> concentration ( $p$ -value=0.001) were found to have a positive effect on this parameter. On the contrary, the use of higher concentrations of CuSO<sub>4</sub>.5H<sub>2</sub>O negatively affected the growth of *P. gyrans* ( $p$ -value=0.073).

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**Palavras-chave** : Plackett-Burman design, Pavlova gyrans, Biomass, Abiotic factors