

MICROALGAE CULTIVATION IN GREEN WALL PANEL (GWP®) PHOTOBIOREACTORS FOR THE OBTAINMENT OF BIOACTIVE MOLECULES

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About the author:

MSc degree in 2006 in Tropical and Subtropical Agriculture with a thesis on “Microalgae for oil: strain selection, lipid induction and outdoor mass cultivation”. PhD in 2011 in Agriculture Microbial Biotechnology at the University of Florence with a thesis on “Energetic and economic assessment of a disposable panel reactor for *Nannochloropsis* sp. biomass production”. F&M employee since 2011 and partner since 2015.

Company info:

Fotosintetica & Microbiologica S.r.l. (F&M) is a spin-off company of the University of Florence founded in 2004 to exploit the know-how on microalgae physiology and mass cultivation developed by the university team. F&M offers consultancy on microalgal cultivation for several applications, among which CO₂ sequestration and wastewaters treatment, feed, food supplements, nutraceutical and bioactives. F&M offers consultancy and training on all stages leading from strain isolation to biomass production and valorization. F&M commercializes several cultivation systems: glass bubble columns for inoculum production, annular columns, the Green Wall Panel (GWP®) series and raceway ponds for pilot and large-scale cultivation. F&M knowledge, along with proprietary photobioreactor technologies and a collection of over 1200 microalgal strains, makes the company the ideal partner for starting applied research and commercial activity on microalgae.

Abstract:

F&M proprietary photobioreactor, the GWP®, has been installed by several companies and universities for research and industrial algal biomass production, and also for large-scale integrated GWP®/ponds plants for clients aiming at producing commodities. Continuous in-house research has been conducted both to improve and simplify the system, and to test the cultivation of a large variety of microalgae and cyanobacteria. Besides the microalgae cultivated worldwide such as *Chlorella*, *Arthrospira*, *Nannochloropsis*, *Tetraselmis*, *Phaeodactylum*, *Isochrysis*, *Porphyridium*, *Nostoc*, which were grown in the GWP®, more recently, thanks to the participation in the H2020 project NOMORFILM (“Novel marine

biomolecules against biofilm. Application to medical devices.”), F&M has acquired knowledge on the potential and limitations that may be encountered with less common strains such as those selected within the NOMORFILM project because active against biofilm forming bacteria. In this framework the cultivation of strains that might grow in aggregates of coccoid cells or of filaments, might form capsules that favors attachment to the photobioreactor walls, might be highly sensitive to light, has to be conducted not at the expense of the strain bioactive properties, very often linked to secondary metabolites. These aspects will be discussed.

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Keywords:

Green Wall Panel, mass cultivation, bioactive strains



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