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CONGRESS-VII

September 12-13, 2026 GAZİANTEP, TÜRKİYE

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Keynote & Invited

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SEPTEMBER 12-13, 2026 Gaziantep, Türkiye

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TOPIC TITLE	AUTHORS	AFFILIATION
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HAp/Cellulose Biofilms Derived from Moroccan Natural Resources: Preparation, Characterization, and Methylene Blue Adsorption	Soumia Berrahou, Souhayla Latifi Sanaa Saoiabi	Mohammed V University
Activated Sludge Processes for Sustainable Wastewater Treatment: Principles, Challenges and Recent Advances	Abderrazzak Ihouaten Khadija El-Moustaqim Jamal Mabrouki	Ibn Tofail University/Mohammed V University
Evaluation Of Algal Properties And Chlorophyll Content For Light Reduction In The Built Environment	Muhammad Hanafi Ismail, Rashidi Othman, Wan Syibrah Hanisah Wan Sulaiman	International Islamic University MALAYSIA
A Block Hybrid Linear Multi-Step Method For The Solutions Of Stiff Initial Value Problems Of Ordinary Differential Equations	M. M. Maitala, J.P. Chollom, C.Y. Ishola, A. Adams	National Open University/University of Jos
The Effects of Financial and Non-Financial Rewards on Employee Motivation: Evidence from a Branch-Level Panel of ASA Bangladesh	Fatematuz Zohora Nigar Sultana,	University of Rajshahi/University of Barishal/BANGLADESH
The Effect of Chopper Blade Patterns on the Performance of a Multifunctional Chopper Machine	Muhammad Zaky Rizqullah Nurrosidi	University of Jember
Aqueous Wastewater Treatment: Modeling the Adsorption Isotherms of Organic Pollutants on Red Spruce Sawdust Activated Carbon	ELANZAOUI Said	University IBN ZOHR

Moderator is responsible for ensuring the smooth running of the presentation, managing the group discussion and dynamics

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EVALUATION OF ALGAL PROPERTIES AND CHLOROPHYLL CONTENT FOR LIGHT REDUCTION IN THE BUILT ENVIRONMENT

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Abstract

The increasing demand for sustainable building technologies has encouraged the development of biological systems that can simultaneously contribute to environmental performance and building envelope functions. Microalgae and cyanobacteria are increasingly investigated for building-integrated photobioreactors because their pigmentation, biomass density, and photosynthetic activity can influence light transmission and shading while providing additional environmental benefits. Previous studies have established that light availability, photoperiod, pH, and cultivation conditions strongly influence microalgal growth, pigmentation, and photosynthetic performance (Wang et al., 2014; Wágner et al., 2018). In building applications, these characteristics are particularly relevant because microalgal photobioreactors can act as dynamic shading elements and potentially modify solar radiation and visual conditions within buildings (Talaie et al., 2020; Talaie & Prieto, 2024). This study investigated the effects of optimized pH and photoperiod conditions on the optical properties and chlorophyll content of four algal species, namely *Pseudanabaena amphigramulata*, *Alkalinema* sp., *C. radiosa*, and *D. brasiliensis*, with emphasis on their potential application for light-intensity reduction in the built environment. The algae were cultivated using BG11 under different pH and photoperiod conditions, and the optimum condition for each species was determined based on its growth performance. Colour characteristics were subsequently evaluated using the CIELAB system, including lightness (L^*) and colour coordinate a^* , using a Mettler-Toledo UV7 spectrophotometer. Chlorophyll content was determined spectrophotometrically after extraction using ethyl acetate and chloroform, with absorbance measured at 480, 648, and 666 nm. The results demonstrated distinct species-specific optical responses under optimized cultivation conditions. *P. amphigramulata* achieved its optimum condition at pH 8 and a 12-hour photoperiod, recording a green-intensity value (a^*) of 52.27, lightness (L^*) of 65.43, and chlorophyll content of 4.02. *Alkalinema* sp. recorded a^* of 47.05, L^* of 77.23, and chlorophyll content of 4.01 at pH 8 and an 18-hour photoperiod. *C. radiosa* and *D. brasiliensis* achieved optimum conditions at pH 10 and pH 8, respectively, with 24-hour photoperiods and chlorophyll contents of 3.95 and 3.75. Among the tested species, *P. amphigramulata* exhibited

the lowest L^* value and highest chlorophyll content, indicating a darker and more strongly pigmented biomass that may provide greater potential for solar-light attenuation. These findings suggest that species selection and optimization of cultivation conditions are important for developing algae-based shading components. The results provide an experimental basis for further investigation of microalgae photobioreactors as adaptive shading and light-management systems within sustainable building envelopes, particularly in tropical built environments.

Keywords: Microalgae; cyanobacteria; CIELAB; chlorophyll; light attenuation; photoperiod; pH; building-integrated photobioreactor; built environment.



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