

CULTIVATION SYSTEMS OF COELASTRELLA SP. ISOLATED FROM LICHENS COLLECTED IN THE NORTH OF PORTUGAL

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Body

There is a growing interest towards finding new bioactive compounds from natural, safe and sustainable sources and extremophilic microalgae have emerged as one of the most promising options. Lichens are constituted by microalgae/cyanobacteria cells associated with a fungus that are subjected to especially extreme conditions, resulting in the production of a great variety of specific biologically active metabolites. However, lichens have not been considered so far as a potential commercial source of bioactive compounds mostly due to their extremely low growth rates. In this work microalgae of the genus *Coelastrella sp* were isolated from lichens collected in the northern region of Portugal and the optimal conditions for biomass productivity were identified: temperature of 18 °C, pH 7 and light intensity of 250 µm. Three cultivation systems were evaluated, namely the bubble column (BC), flat panel (FP) and split cylinder airlift (SCA) photobioreactors, in order to evaluate and compare their influence on the growth and productivity of microalgae. The BC photobioreactor showed the lowest biomass productivity (P_{max}) and specific growth rate (μ_{max}), and the biomass concentration reached by FP and SCA was, respectively, 14.4 and 35.4% higher than that of BC. The SCA presented the highest P_{max} of $0.113 \pm 0.019 \text{ g.L}^{-1}.\text{d}^{-1}$ and μ_{max} of $0.187 \pm 0.00913 \text{ d}^{-1}$. These values are a very significant advance in otherwise very slow-growing cultures, and point at the possibility of using these strains in larger scale cultivation systems in the near future.

Palavras-chave : Photobiont, microalgae, photobioreactor, lichen, productivity, biomass