

Improvements in the cultivation of *Botryococcus braunii* using commercial fertilisers

Bermejo, E.^{1,a}, C. González¹, Z. Montero-Lobato¹, C. Vílchez¹, I. Garbayo¹, M. Cuaresma¹

¹ Algal Biotechnology Group, CIDERTA, RENSMA and Faculty of Sciences, University of Huelva, Spain.

^a Present address: Biochemical and Bioprocess Engineering Group, Department of Chemical Engineering and Analytical Science, The University of Manchester, U.K; elisabeth.bermejo@dqcm.uhu.es / elisabeth.bermejo@manchester.ac.uk.

Agricultural fertilisers (NPKs) have been recognised as an alternative to make microalgae cultivation cheaper as well as simpler in terms of the preparation of the medium. *Botryococcus braunii*, a green microalga, has the almost unique capacity to accumulate and excrete large amounts of long chain hydrocarbons and/or interesting groups of polysaccharides which can be further converted into bio-products. However, limitations in growth are currently hindering its industrial production. In this work, the use of different agricultural fertilisers (NPKs) was evaluated for the cultivation of two *B. braunii* races (A and B) in terms of productivity and final media labour and cost. Results corroborated that fertilisers-based media are easier to prepare and their prices are considerably lower compared to common culture media. At the same time, a good growth performance and photosynthetic efficiency can be maintained, and carbohydrate and hydrocarbon productivities can be further enhanced. However, special attention should be given to each particular strain since different behaviour in growth and metabolite production can be observed depending on the media composition.

The significantly higher productivities obtained, together with the important reduction in media price when using commercial fertilisers, and the advantages related to the easiness to prepare the culture media based on NPKs represent an important achievement for the development of an industry based on these renewable products.

Keywords: *Botryococcus braunii*, fertilisers/NPK, cost-reduction, hydrocarbons, polysaccharides, productivity improvement.

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