FIRST EXPERIENCE IN GROWING *Arthrospira platensis* USING LOW ENTHALPY WATERS IN THE CANARY ISLANDS

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Abstract: The potential use of the low enthalpy geothermal water from La Florida volcanic gallery, situated in the South Tenerife (Canary Islands), were evaluated for the cultivation of *Arthrospira (Spirulina) platensis*.

La Florida gallery conditions, such as the mineral composition and constant mild temperature range (20-30ºC) of the water, as well as the possibility of using the CO_2 emissions of the gallery, support the photosynthetic performance and productivity of the cultures in a cost-effective culture system compared to conventional.

Growth of five different strains of *Spirulina*, including a native strain from Fuerteventura Island, were assayed in a new formulated culture medium to enrich the chemical composition of the geothermal water (Reduced Low Cost medium: RLC) The growth rates of the different strains cultivated in this media range from 2.3 to 3.4 d^{-1}, higher than the obtained for *Spirulina* cultivated in the ordinary growth medium (Aiba & Ogawa, 1977) modified by Schlösser (1994). Proximal analysis, pigment concentration and antioxidant activity of the biomass obtained presented promising values to be considered at the nutritional level (e.g. 71.8% of proteins). Moreover, microbiology and heavy metals analyses showed that *Spirulina* dry biomass complies with the food quality and safety regulations standards. These results demonstrate the feasibility of using the local geothermal resources for the cultivation of Spirulina to produce competitive products in an environmentally friendly system, favoring the diversification of the rural economy.

Key words: Arthrospira, low enthalpy water, CO_2, temperature

References:

Aiba, S. and Ogawa, T. (1977). Assessment of Growth Yield of a Blue-Green Alga, Spirulina Platensis, in Axenic and Continuous Culture. J. Gen. Microbiol. 102, 179–182.

Schlösser, U.G. (1994). SAG—Sammlung von Algenkulturen at the University of Göttingen Catalogue of Strains. Bot. Acta, 107, 113–186.

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