CULTURE MEDIUM ALTERNATIVES FOR *SPIRULINA PLATENSIS*: A PROCESS INTEGRATION OF A THIRD GENERATION BIOREFINERY

Cabello-Galindo, A.[1]*, Rodríguez-Jasso, R.M.[1]**, Belmares Cerda, R.[1], Govea Salas, M.[1], Colla, L.M.[2], Ruiz, H.[1],

[1]Biorefinery Group, Food Research Department, School of Chemistry, Autonomous University of Coahuila, Saltillo, Coahuila 25280, Mexico.
[2]Graduate Program in Food Science and Technology, Universidade de Passo Fundo, Passo Fundo, Brazil.
*Presenting author: *alejandracabello@uadec.edu.mx **rrodriguezjasso@uadec.edu.mx
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Introduction. In recent decades, the global demand for food and energy has increased significantly, leading to the search for sustainable and efficient solutions to meet these needs. Microalgae have been identified as a potential source of food, biofuels, and chemicals due to their high productivity and ability to grow under extreme conditions[1]. However, using conventional culture media for microalgae growth is costly and may limit their large-scale application. Therefore, it is essential to search for alternative culture media that are sustainable, cost-effective, and capable of promoting microalgae growth [2-3].
This work aimed to evaluate the process integration of a biorefinery for *Spirulina platensis* cultivation using hydrolysates rich in sugars from hydrothermal processing of macroalgal biomass - *Sargassum* sp.

Methodology. This work used the liquid (hydrolysates) from two hydrothermal processing of *Sargassum* sp., 190°C/50 min, and 150°C/30 min [4]. Nine treatments were grouped into three groups (Table 1). Each treatment was inoculated with *S. platensis* at 15% (v/v). Kinetics were performed by sampling every 3 days for 24 days.

Table 1. Configuration of treatments using various concentrations of hydrothermal treatment liquid hydrolysates (HTLH)

190°C/50 min (with 0.7 g/L $NaNO_3$ addition)		190°C/50 min		150°C/30 min	
Treatment	**HTLH (%)**	**Treatment**	**HTLH (%)**	**Treatment**	**HTLH (%)**
1	5	**4**	5	**7**	5
2	10	**5**	10	**8**	10
3	15	**6**	15	**9**	15

Results. The treatment with the highest biomass production yield (1.94 g/L) was 5% HTLH (190°C/50 min) with nitrogen addition, followed by a similar treatment but without additional nitrogen source with a production yield of 1.23 g/L, and in third place was the treatment using 10% HTLH 150°C/30 min with a production yield of 1.09 g/L. This may be related to the fact that as the treatment intensity increases, the sargassum macroalgae's cell wall is hydrolyzed more effectively, releasing compounds that can serve as nutrients for the growth of *spirulina platensis*.

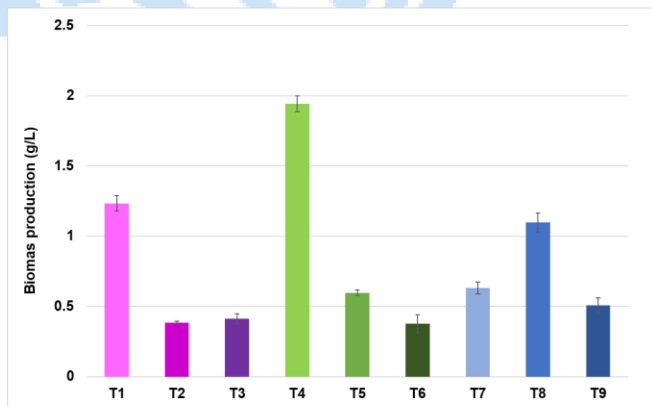

Fig. 1. Table of maximum biomass production obtained with each treatment (T).

Conclusions. It was found that the treatment with the highest biomass production yields was the 5% of hydrolysates from hydrothermal treatment (190°C/50 min) with the addition of $NaNO_3$ and could be considered an alternative culture medium for microalgal biomass production.

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