Poster

OBTENCIÓN DE PRODUCTOS DE ALTO VALOR AÑADIDO A PARTIR DE CULTIVOS DE MICROALGAS EN AGUAS DE PROCESO DERIVADAS DE LODOS

ACHIEVEMENT OF HIGH-ADDED VALUE PRODUCTS FROM MICROALGAE CULTURES IN SLUDGE-DERIVED PROCESS WATER

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ABSTRACT

Motivation

Due to the increasing production of wastewater and leachate, the resulting environmental problems, such as the eutrophication of aquatic ecosystems where these pollutants may end up, are also increasing. The problems related to wastewater and leachate are caused by the high concentration of nutrients they contain, especially nitrogen and phosphorus, but also heavy metals and pesticides (Hernández-García et al., 2019).

Consequently, research is taking into consideration alternative solutions based on living organisms. Microalgae are gaining importance in the field of bioremediation, and there is a lot of previous research on the use of these organisms for their ability to remove nutrients and pollutants from the environment (Roccuzzo et al., 2016; Ye et al., 2019).

The company G2G Algae Solutions works with microalgae and they produce different products based on these organisms. It is interesting to look for an environmental solution that is also economically useful: we try to use wastewater and leachate to grow microalgae and, at the same time, transform these liquids into less polluted products, instead of using tap water.

Materials and Methods

Wastewater from an experimental process, in which the invasive macroalgae Rugulopterix okamurae is being utilized to make bricks, was used at different dilutions. The microalgae chosen were those belonging to the Trebuoxiophyceae family, added to the wastewater in a 1:2 ratio. The experiment was carried out with and without fertilizer for two weeks.

In another experiment, the conditions of the previous one were replicated, but leachate was employed instead of wastewater.

Every two days, some physicochemical properties were sampled: pH (using a pH meter), salinity (using a refractometer), cell density (using the Neubauer chamber), and chlorophylls a and b (using a spectrophotometer and the equations from Wellburn, 1994).

Results

Further experiments are needed in order to analyze the results, but the 75% dilution seems to be the best to achieve the desired results in terms of biomass production.

Conclusions:

Due to the high level of dilution (75%) of polluted water needed to reach the standard biomass production under the conditions studied, the economic viability of the project is in question. However, we are performing additional experiments to determine the bioremediation potential of Trebuoxiophyceae.

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