

3RD WORLD BIOTECHNOLOGY CONGRESS

December 03-04, 2018 Sao Paulo, Brazil

Feasible technical and economic solutions for EPA production by *Pythium irregulare* using vinasse, wastewater, as main raw material

Bruna S Fernandes¹, Bruno C Klein², Joao Paulo Fernandes Vieira³, Reinaldo Ferreira⁴, Marcelo Zaiat⁵, Rubens Maciel Filho¹, José GC Pradella⁵

¹University of Campinas, Brazil

²Brazilian Centre of Research in Energy and Materials, Brazil

³Raizen, Brazil

⁴Dedini S/A Indústrias de Base, Brazil

⁵University of São Paulo, Brazil

Vinasse is a rich carbon source and low-cost feedstock produced in huge amounts from the process of ethanol production. In 2019, the Brazilian Ministry of Agriculture, Livestock and Food Supply estimate growth of ethanol domestic consumption of 58.8 billion liters, more than double the amount recorded in 2008. This represents the annual production of more than 58.8 billion liters of vinasse, which is currently used as fertilizer in the sugarcane crop, due to its high concentration of minerals, mainly potassium. However, studies indicate some disadvantages such as the generation of Greenhouse Gas emission during vinasse distribution in the crop, as well as the possibility of contaminating the groundwater and soil. Therefore, the development of programs for sustainable use of vinasse is a priority. One profitable process is the bioconversion of vinasse into biocompounds such as lipids, by microorganisms. Promising high value-added lipids, for instance, polyunsaturated fatty acids (PUFAS), with a predicted market of millions of US\$, can be produced using vinasse as a carbon source, to guide an innovative e feasible concept for sustainable production. In this context, Omega 3 Eicosapentaenoic acid (EPA), a PUFA, not synthesized by humans but an important dietary supplement with a promising market, was produced by *Pythium irregulare*, an oleaginous Oomycete, able to accumulate large amounts of lipids and the production was evaluated according to several technical and economic solutions and scenarios. The results of this study showed a great alternative for EPA production applied to human consumption, considering different microbial bioreactors configuration, alternative extraction and refinement processes.

Biography

Bruna Soares Fernandes graduated from University Federal of São Carlos (Brazil) on chemical engineering. She did Master and Doctoral degree at University of São Paulo (Brazil) on Hydraulic and Sanitation engineering. She worked at Dedini/Paques BV as new technologies leader focused on wastewater treatment. During the four last years, she got a position as Technical Coordinator of R&D project of Ergostech, Sapporo Brewery and Petrobras. She and her team developed a process, in which it was patented. Since 2015, she is in a Postdoctoral position at the Brazilian Centre of Research in Energy and Materials and University of Campinas. Her main interests are waste treatment and bio-products obtainment from biological processes.

brunasofer@hotmail.com

Notes: