



Programa EngIQ – Edição 13 – Informação adicional dos projetos

Projetos de doutoramento com início em outubro de 2021.

**EngIQ\_BD2021-04:** Valorization of Algae-Based Side-Streams through Microbial Biopolymers Production. **Empresa:** Biotrend

The industrial cultivation of algae biomass targeting the production of nutrition products, biomaterials, chemicals, biopharmaceuticals and biofuels, has been increasing in the last years. This increment has led to a growing amount of algae-derived side- or waste-streams that must be treated and/or valorized in order to assure the environmental sustainability of the overall algae production process. While some algae wastes may be valorized as feedstock for animal feed, other algae-derived wastes, more complex and non-feed grade, are currently valorized as fertilizers or used for biogas production through anaerobic digestion processes. However, algae waste streams are rich in organic compounds that have the potential to be converted into higher added value products such as biodegradable biopolymers such as polyhydroxyalkanoates (PHAs). PHAs are microbially synthesized polyesters, displaying thermoplastic properties similar to traditional plastics yet being completely biodegradable upon disposal in the environment. This project targets the development of an environmental and economically sustainable process that uses algae waste streams as feedstock for PHA production. This technology has not yet been explored and will be carried out through a multi-step process where algae wastes are firstly pre-treated to obtain a liquid fraction with high carbon content, which will be converted into organic acids through acidogenic fermentation. The organic acid rich stream will be used as feedstock for the microbial production of PHA using aerobic mixed microbial cultures (MMC) and an innovative production process. Finally, the produced PHA will be extracted from the bacterial cells, purified, and characterized.

The implementation of this process would simultaneously contribute to the environmental sound management of algae industrial wastes and to the establishment of a sustainable bioplastic production system, thus aligning with the EU strategy for mitigating the plastics accumulation.

O diretor do EngIQ

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