P1.79 - DEVELOPMENT OF A COST-EFFECTIVE MEDIA FOR BIOSURFACTANTS PRODUCTION BY *PSEUDOMONAS AERUGINOSA*

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Keywords: Biosurfactantes; Pseudomonas aeruginosa #112; Rice husk; Vine pruning; waste cooking oils.

ABSTRACT

In the last years, the textile industry has shown a growing interest in biosurfactants due to their biocompatibility, biodegradability, and versatility at various pH and temperature ranges. These compounds have found applications as softeners, wetting agents, lubricants, foam stabilizers, and even in the scouring of wool. This study aims to develop an economically efficient medium for biosurfactant production by *Pseudomonas aeruginosa* #112. Firstly, waste cooking oils after treatment (WCOT), a residue rich in lipids, was evaluated as an inducer of biosurfactants production. Different concentrations of these substrates (1, 2.5, 5, and 10 % w/v) were tested, and glucose was used as a carbon source. In the experiments with 1 % of WCOT it was observed a significant ($p \leq 0.05$) reduction in the surface tension from 48.4 mN/m to 34.8 mN/m, suggesting the biosurfactant production. Furthermore, rice husk (RH) and vine pruning (VP) residues were identified as alternative carbon sources for biosurfactants production, when combined with WCOT. Both residues are rich in cellulose, which can be broken down into free glucose. An enzymatic pre-treatment that combines xylanase and cellulase was used to hydrolyze residues and release free glucose. The obtained results demonstrate that the combination of 1 % OUAT with hydrolyzed RH or VP resulted in a substantial (53 %) reduction in surface tension. At the end of the fermentation, 1.65 g/L and 0.26 g/L of biosurfactant were recovered for the experiments with hydrolyzed PV and RH, respectively. Additionally, the critical micelle dilution results demonstrate that the two tested media allow biosurfactant production and effective reduction of the surface tension of distilled water, even at low concentrations. This is the first report of biosurfactant production using a mixture of these three agro-industrial residues, which can be very useful for the sustainable production of these promising molecules.

Acknowledgements:
The authors acknowledge the financial support from integrated project be@t – Textile Bioeconomy (TC-C12-i01, Sustainable Bioeconomy No. 02/C12-i01/2022), promoted by the Recovery and Resilience Plan (RRP), Next Generation EU, for the period 2021 – 2026. The authors also acknowledge the Portuguese Foundation for Science and Technology (FCT) under the scope of the strategic funding of UIDB/04469/2020 unit.