**PRODUCTION OF BIOSURFACTANT BY *Serratia marcescens* UCP 1549 USING SUGARCANE BAGASSE AND WASTE COOKING OIL AS SUBSTRATES**

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**ABSTRACT**

Modern society produces high quantity of waste materials through activity related to industries, forestry, agriculture and municipalities. Millions of tons of hazardous and non-hazardous wastes are generated each year throughout the world and therefore there is a global concern for its management and utilization. One of the possibilities explored extensively is the use of organic matter rich but cheap agro-based raw materials or industrial wastes as substrates for microbial production. Biosurfactants are surface-active compounds produced by microorganisms, which are capable of reducing surface and interfacial tension at interfaces between liquids, solid and gases, thereby allowing them to mix or disperse readily emulsions in water or other liquids. They can be used in food and cosmetic industries, therapeutic sector, bioremediation and microbial enhanced oil recovery, since them typically have a lower toxicity and higher biodegradability than chemical surfactants. The aim of this work was investigate the production of biosurfactant by the bacterium *Serratia marcescens* UCP 1549 in low-cost medium containing sugarcane bagasse and waste cooking oil. Production media were prepared according to a $2^2$ factorial design and fermentations were carried out using at 28ºC during 48, 72 and 96h. Biosurfactant production was evaluated by determination of surface tension and emulsification index ($EI_{24}$) using as hydrophobic compounds corn oil, sunflower oil and waste cooking oil. The best result for reduction of surface tension (34 mN/m) was obtained after 96h of cultivation in medium containing 2% sugarcane bagasse and 5% waste cooking oil. For emulsification index the best result ($EI_{24}$=100% of waste cooking oil) was obtained after 72h of cultivation in medium containing 3% sugarcane bagasse and 15% waste cooking oil. In conclusion, it was demonstrated the ability of *S. marcescens* UCP 1549 to produce a biosurfactant with excellent emulsifying properties in low-cost medium.

**Keywords:** Biosurfactants, *Serratia marcescens*, surface tension, emulsification.

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