

EVALUATION OF THE PHYTO-TOXICITY OF BIOLOGICAL SURFACTANT PRODUCED BY *MUCOR CIRCINELLOIDES* UCP 0001

MARQUES, N. S. A. A.; TENÓRIO, E. E. O.; CIRNE, A. A.; ALVES, M. F.; FRANÇA, I. B.; OLIVEIRA, C. V. J.; SÁ, A. V. P.; D'LAMARE, A. M. M.; SILVA, L. A. R.; TAKAKI, G. M. C.

UNIVERSIDADE CATÓLICA DE PERNAMBUCO (RUA DO PRÍNCIPE, 526 – BOA VISTA, RECIFE-PE, CEP: 50050-900)

ABSTRACT:

Surfactants are amphiphilic compounds with increasing advantages for many industrial applications due to their valuable properties. In particular, there is environmental sustainability and the important role that biosurfactants will increasingly play in the near future, for example, via the use of renewable by-products as substrates, waste reduction, and potential reuse of the treated waste. *Mucor circinelloides* is a fungus belonging to the phylum Mucoromycota and the order Mucorales and it has been used in several studies in the production of biomolecules of industrial interest. The main of this study was to evaluate the toxicity of a biosurfactant. For the biosurfactant production, a previously established the production medium composed by cassava waste water (2.15%) and residual oil (0.28%) were used. An aliquot (1 mL) of suspension containing 10^7 sporangiospores/mL was inoculated into the 12 assays containing the production medium. The flasks were incubated at 150 rpm, at 28°C, pH 4.5 for 96 h. After that period, the cell free metabolic liquid was used to determine the surface tension. For the phytotoxicity assays, concentrations of 0.1%, 0.5% and 1%, respectively of the metabolic liquid were prepared. The chemical surfactant Triton X100 was used as a positive control and water as a negative control. Seeds of *Allium cepa* and *Brassica oleracea* were used as bioindicators of toxicity and cultivated for 168 h and after this period the germination index (GI) was calculated. The results obtained from the reduction of surface tension confirmed the presence of a biosurfactant produced by *M. circinelloides* with variations from 56.7 mN/m to 34.2 mN/m. At the maximum dosage of the biosurfactant the GI of 282.32% and 86.31% were obtained for *Brassica oleracea* and *Allium cepa*, respectively. In addition, the phytotoxicity test revealed that the dosages of biosurfactant tested were not toxic for the two seeds tested. The results indicated that the biosurfactant produced by *M. circinelloides* is ecologically compatible when coming into contact with the environment.

Keywords: biosurfactant; toxicity, *Allium cepa*; *Brassica oleracea*

Development Agency: Fundação de Amparo à Ciência e Tecnologia do Estado de Pernambuco (FACEPE) e Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq).